ALASKA PENINSULA/BECHAROF NATIONAL WILDLIFE REFUGES

King Salmon, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1990

REVIEWS AND APPROVALS

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Ronald E. Hood — Refuge Manager
3/4/91 — Date
_____ — Associate Manager Review
_____ — Date

_____ — Regional Office Approval
_____ — Date

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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 1,500 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 6,000 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 (Figure 1) are superimposed over this rugged range of mountains.

On December 1, 1978 President Jimmy Carter established the **Becharof National Wildlife Monument** by Proclamation 4613. Two years later, the Becharof Monument became the **Becharof National Wildlife Refuge.** On December 2, 1980 President Jimmy Carter signed the Alaska National Interest Lands Conservation Act (Alaska Lands Act). This act also created the **Alaska Peninsula National Wildlife Refuge.**

The Ukinrek Maars on the south side of Becharof Lake are a vivid reminder of the volcanic heritage of the Aleutian Mountain Range. 6/4/90, RDP

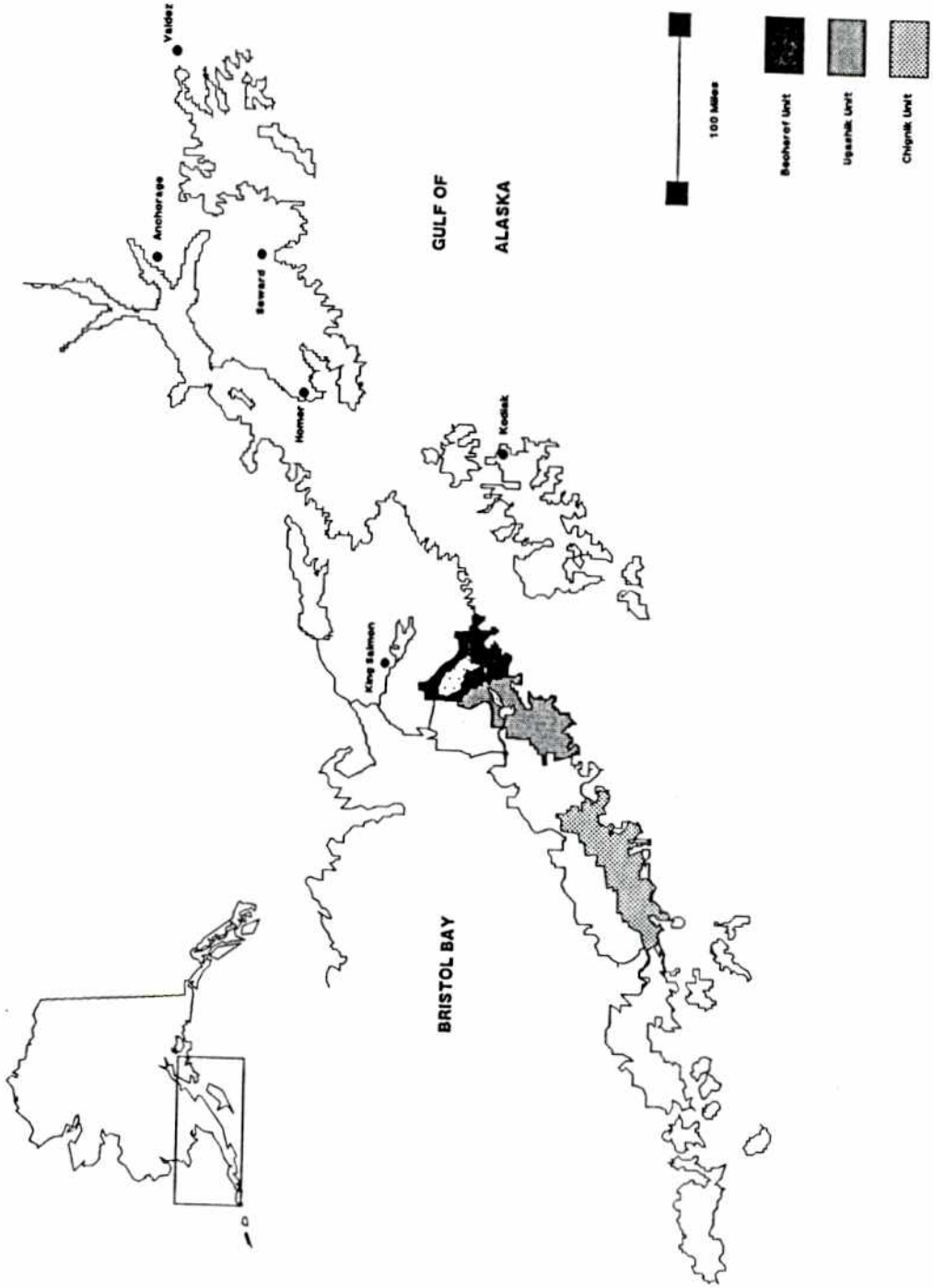


Figure 1. Location of the Becharof and Alaska Peninsula National Wildlife Refuges.

The **Becharof Refuge** contains approximately 1.2 million acres (Figure 2). It is 10 miles south of King Salmon and 295 miles southwest of Anchorage. 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 sea cliffs of the Pacific coast. Nesting and migratory waterfowl are found on wetlands and lakes throughout the refuge.

Section 302(2)(B) of Alaska 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.

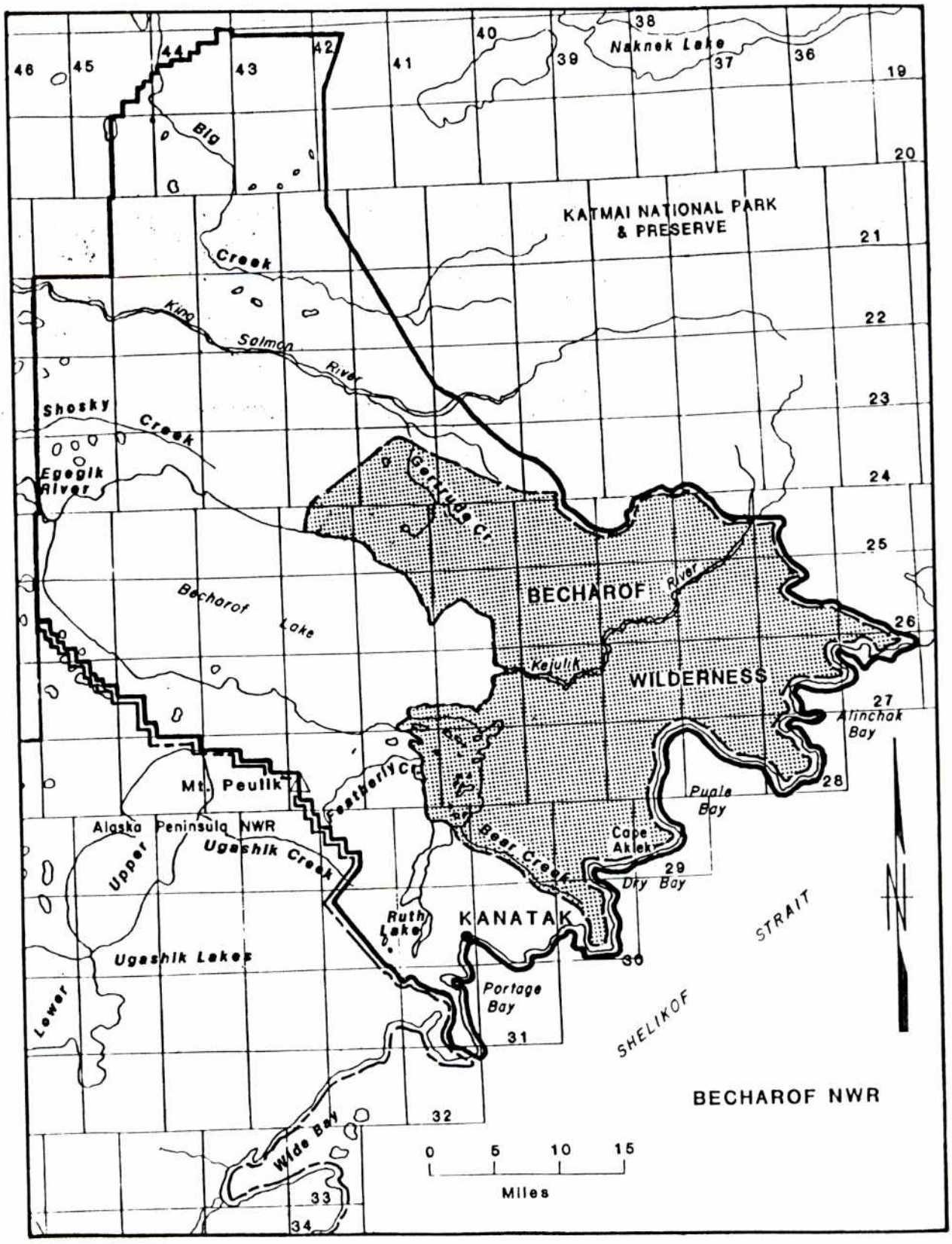


Figure 2. Becharof Refuge.

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.

Mount Chiginagak's 6,700-foot peak dominates the Ugashik Unit of the Alaska Peninsula Refuge. This volcano was last active in 1929. 7/16/90, REH

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.

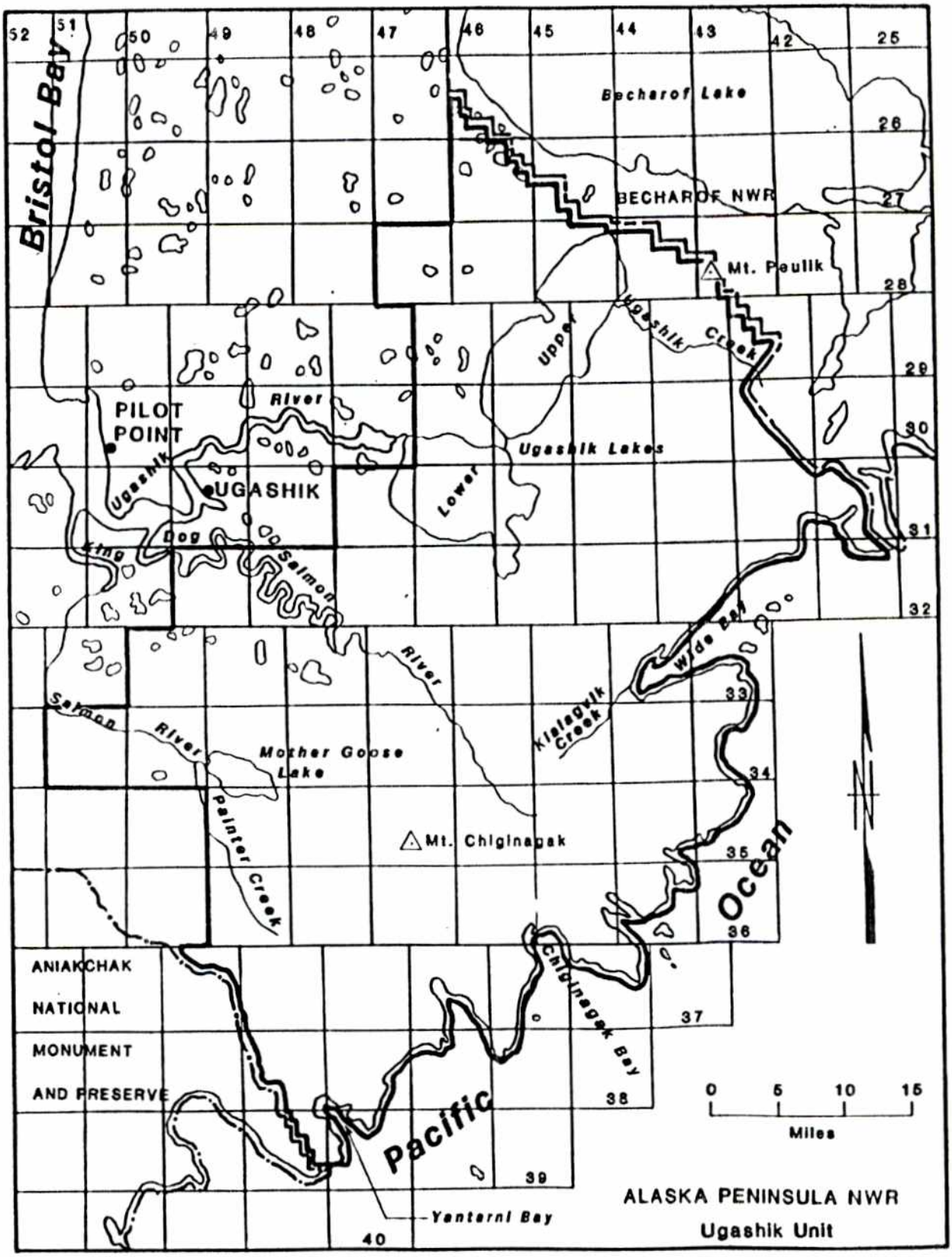


Figure 3. Alaska Peninsula Refuge.

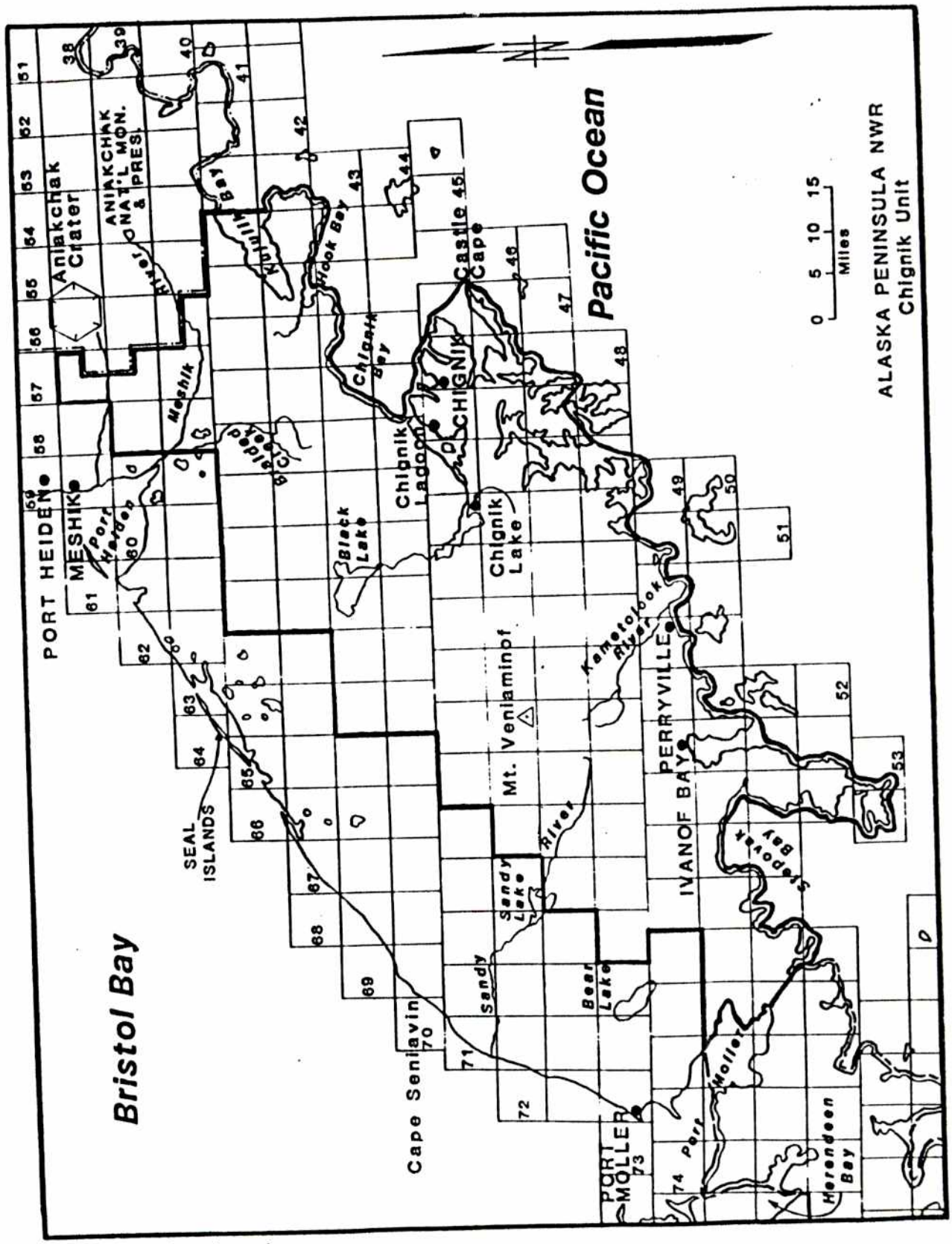


Figure 3. Continued.

The interplay of volcanic activity with shoreline erosion and glacial scour has made the Alaska Peninsula Refuge the most scenically diverse of Alaska's refuges. This is Humpback Bay, Chignik Unit. 2/14/90, REH

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. 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, wolf 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 Alaska 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

-- Public Use Management Plan development continues throughout the year (Section D.2.).

-- Exxon Valdez oil spill related assessment and response activities continue this year (Section F.14.).

-- The Alaska Board of Fisheries closes the Ugashik lakes to arctic grayling fishing (Section H.17.).

-- The spring brown bear hunting season is the target of an interagency law enforcement task force (Section H.17.).

-- Exxon Company, U.S.A., conducts a "Take Pride in America" clean-up of a 1950's oil exploration site (Section H.22.).

-- Regional construction team completes several Maintenance Management System (MMS) projects (Section I.2.).

-- The Service purchases a 17-acre inholding on Kejulik River in Becharof Refuge Wilderness (Section C.1.).

-- Assistant Regional Director John Rogers and Associate Manager George Constantino conduct station inspection (Section J.3.).

-- Volunteers complete "Take Pride" clean-up of Myers' lodge at Ugashik Narrows (Section H.22.).

-- Service Director John Turner, Special Assistant Mike Brennan and Regional Director Walter Stieglitz visit Becharof Refuge (Section J.3.).

-- Refuge receives "Certificate of Merit" award for an aggressive "Take Pride" program (Section H.22.).

-- Administrative Law Judge's creative decision may lead to an administrative nightmare (Section C.1.).

-- Refuge oversees first federally administered subsistence big game hunting season (Section H.17.).

-- Bermuda Triangle moves to Alaska (Section J.3.).

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 percent of the time. In summer, this occurs only 20 percent 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.

Mount Chiginagak viewed from the west (Bristol Bay side). Note the heavy fog bank along the Pacific coast in the background. The Aleutian Mountain Range frequently exerts dramatic influence on the Alaska Peninsula weather.
7/16/90, REH

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 (F) in December, the coldest month, and 54 degrees F in July, the warmest month. Extremes range from -48 degrees F to 88 degrees F.

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

At King Salmon the dangerous effects of wind chill can be dramatic. Interior Alaska is known for low winter temperatures and the Aleutian Islands for 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

The year started off with near normal temperatures. January's daily minimum temperatures remained below the freezing mark everyday except for two, enabling the Naknek River to freeze over and become safe for crossing. February exhibited temperatures which were both the lowest and most abnormal for the year (Table 1.). As a result Becharof Lake (Alaska's second largest) became completely ice covered. By the end of the quarter temperatures warmed enough causing Becharof Lake and Naknek River to begin opening.

The low temperature for the quarter was -39 degrees F occurring on February 10th, while the high was 49 degrees F occurring on March 26th. Precipitation was above normal for each month during the quarter, resulting in over four feet of snowfall. The year began with eight inches of snow cover, peaking at 17 inches February 28th and ended the quarter with three inches. The winds blew in excess of 40 mph on five days. Peak winds were 52 mph on January 15th.

April - June

The Spring quarter began with mild temperatures during April, while near normal temperatures were exhibited in May and June. Becharof Lake had completely reopened during the beginning of April, while the Naknek River became completely open at mid-month. Most Alaska Peninsula lakes were completely open by the end of April. The low for the quarter was 22 degrees F occurring on April 5th and 10th, while the high of 78 degrees F occurred on June 29th. Daily minimum temperatures remained above freezing beginning May 23rd. The quarter exhibited eight clear days. Precipitation was normal. The last measurable snow fall occurred on April 5th. The ground remained free of measurable snow cover after April 7th. Thunder was heard on two occasions during the quarter -- April 25th and May 5th. The winds did not hit the 40 mph mark at any time during the entire spring quarter.

On May 1st, King Salmon experienced an earthquake measuring 6.4 on the Richter scale. According to the seismologist report, the quake was centered 10 miles south of the community and 150 miles beneath the earth's surface. The earthquake was so deep that only a few people noticed it in the King

Table 1. 1990 Climatological Data - National Weather Service, King Salmon, Alaska.

Month	Temperature (degrees F)				Precipitation (inches)			Max. Snow on Ground (inches)	Wind (mph)		Sky Cover[a] (days)		
	High	Low	Avg.	Norm.	Total	Norm.	Snow		Avg.	Peak	Clear	Pt. Cldy.	Cldy.
Jan	38	-28	17	13	1.44	1.04	14.9	9	10	52	4	5	22
Feb	39	-39	-02	15	1.61	0.88	20.3	17	10	47	9	6	13
Mar	48	-14	25	19	1.71	1.13	13.5	15	11	43	7	5	19
Apr	57	22	39	31	0.89	1.05	3.4	3	10	39	6	4	20
May	63	27	46	42	1.52	1.18	0.2		11	38	1	2	28
Jun	78	33	51	50	1.22	1.50			10	33	1	6	23
Jul	81	39	56	55	5.08	2.08			9	32	3	6	22
Aug	73	39	56	54	2.02	3.13			10	38		7	24
Sep	63	28	48	47	2.75	2.78			12	47	1	6	23
Oct	51	02	32	32	2.38	1.92	15.7	9	9	40	5	7	19
Nov	41	-13	17	23	2.10	1.40	6.9	6	11	52	13	7	10
Dec	47	-31	20	12	2.89	1.24	18.9	11	12	56	7	3	21
Totals					25.61	19.33	93.8				57	64	244

[a]Sky cover: Clear = 0 to 0.3 cloud cover; Partly cloudy = 0.4 to 0.7 cloud cover; and cloudy = 0.8 to 1.0 cloud cover.

Salmon area, but shock waves were significant enough to be felt in areas like Dillingham, Kodiak and Anchorage -- 300 miles away.

Hazardous flying conditions created by ash blowing off the Aniakchak (National Monument) caldera. The ash cloud covered approximately 125 square miles and extended up to 6,500 feet. 7/90, DAD

July - September

The summer quarter exhibited normal temperatures. The high for the year was 81 degrees F which occurred on July 19th. Temperatures exceeded 70 degrees F on 12 days. The low for the quarter was 28 degrees F which occurred on September 25th. However, the resulting frost was not hard enough to kill the gardens. Twice the normal amount of precipitation fell in September, however, the summer quarter experienced slightly above normal amounts of rain. Thunder was recorded four times and no measurable amount of snowfall occurred. Four clear days were recorded for the quarter with none being recorded all of August. August also marked a record fifth consecutive month in which the winds did not hit the 40 mph mark in King Salmon. According to National Weather Service records, this is the first time in King Salmon's recorded history that such an event has occurred, with four consecutive months being the previous record.

October - December

The fall quarter began with nearly normal temperatures during October and November. However, December exhibited temperatures eight degrees above normal. The first hard frost occurred on October 2nd when the temperature dipped to 21 degrees F. Area lakes began freezing over by the end of

October and by mid-November much of the Naknek River became ice covered. Most of the river was ice covered and safe for crossing by late November to early December. The first local snowfall for the season was on October 12th when 4.3 inches were recorded. However, all traces of snow had melted by October 18th. A total of 41.5 inches of snow fall occurred during the season. The greatest snow depth was 11 inches recorded December 12th-13th. However, the year ended with only a trace amount of snow cover. There were 25 clear days recorded for the quarter -- the normal being 55 clear days per year. Peak winds for the quarter were from the west at 56 mph recorded on December 12th and 52 mph on November 25th. It is interesting to note that the King Salmon winds rarely blow westerly in excess of 40 mph -- the past average being once in five to ten years. This resulted in many parked aircraft being badly damaged and some wings collapsed as 95 percent of the locally owned aircraft are secured facing east.

C. LAND ACQUISITION

1. Fee Title

On November 16, 1978, the Secretary of the Interior invoked his emergency withdrawal powers under Section 204(e) of the Federal Land Policy Management (Organic Act) and withdrew land throughout Alaska. Part of this withdrawal was Public Land Order (Order) 5653 (as amended), included lands which are now the Alaska Peninsula Refuge. In December 1980 the passage of the Alaska National Interest Lands Conservation Act (Alaska Lands Act) 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 Alaska Lands Act, the Becharof Monument became the Becharof National Wildlife Refuge.

Along with the Alaska 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 continues 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
	Native Selected Lands	175,953[b]
	Native Conveyed Lands	113,545
	Native Allotment Application	591
	Native Allotment Certificate	---
	Historical Place Selection	145
	State of Alaska Selection	142,419[b]
	Private	68
Sub-total		1,389,304
Chignik[c]	Federal	1,665,190
	Native Selected Lands	271,358[b]
	Native Conveyed Lands	430,329
	Native Allotment Application	4,509
	Native Allotment Certificate	296
	Historical Place Selection	140
	State of Alaska Selections	123,990[b]
	Agricultural Selections	220
	Private	1,045
Sub-total		2,497,077
Grand Total		3,886,381

[a]The discussion of the Pavlof Unit of the Alaska Peninsula Refuge can be found in the Izembek Refuge Annual Narrative.
[b]Some acreage has been selected by both Native Corporations and the State of Alaska.
[c]Seal Cape, a part of the Alaska Maritime Refuge, is administered as part of this Unit. It's 8,200 acres are included in the table.

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	1,153,017
	State & Native dual Selection	640
	State Selected Lands	32,446
	State Conveyed Lands	160
	Native Selected Lands	80,958
	Native Selected Land (subsurface only)	15,535
	Native Conveyed Lands	640
	Native Allotment Certificate, patent surveyed	320
	Historical Place Selection	560
	Private	173
Grand Total		1,284,449

Highlights of land acquisition activities in 1990 include:

-- The Fiscal Year 1990 budget contained $125,000 for the purchase of a 17-acre inholding on the Kejulik River in the Becharof Refuge Wilderness area. This property, owned by Jay Hammond, was patented under an application for a Trade and Manufacture (T&M) site. Mr. Hammond has been trying to sell the property to the Service for several years. The purchase was completed in late October. Milestones during the year included:

- 02/15/90 - Realty initiated the writing of the environmental assessment.
- 04/29/90 - A Level I Contaminants Survey was conducted by Refuge Manager (RM) Ronald Hood and Volunteer Shirley Hood. No evidence of contaminants was found. Certification that no contaminants are present was forwarded to Realty on April 30th.
- 07/90 - An appraisal was completed by Mr. Fred Ferrara of Alaska Valuation Service. His appraised fair market value of the property was $134,300.
- 07/26/90 - Acting Regional Director John P. Rogers signed a letter to Mr. Hammond indicating the Service's interest in obtaining an option to purchase the property for the appraised price. On July 27th, Mr. Hammond accepted the offer.
- 09/90 - A long awaited Solicitor's Office opinion on the title was received in early September. Mr. and Mrs. Hammond signed the deed and a check for $134,000 was authorized.
- 10/12/90 - RM Hood signed the "Certificate of Inspection and Possession" for the property.
- 10/24/90 - A check for $134,000 was mailed to the Hammonds. The 17-acre parcel is now part of the Becharof Wilderness Area.

-- A Bureau of Indian Affairs (BIA) archeological field crew conducted surveys along the southeast shore of Becharof Lake from Gas Rocks to Ruth River in late May. They were evaluating selections made by Koniag,

Inc. under Section 14(h)(1) of the Claims Act. The crew used the station's Island Arm administrative cabin as a base camp. Daily radio contacts were made to assist them in their work and for safety. Regional Archaeologist Chuck Diters inspected their work on May 30th.

-- One of the consequences of the passage of the Alaska Lands Act was the inheritance of land problems from other Federal Agencies. Federal Power Project 620 withdrawal for a water transmission line within the City of Chignik illustrates the issue. The Service now owns a 50-foot right-of-way in downtown Chignik. This land has little or no value for fish and wildlife. It has a great capacity to create administrative workloads that divert our attention from real resource issues. This was demonstrated in June when a resident requested a special use permit for a sewer hook-up that had to cross the right-of-way. On June 13th, a memorandum was forwarded to Realty requesting that some mechanism be found to transfer the property to the village corporation. On June 28th, Bill Mattice advised us that the Bureau of Land Management (BLM) would be transferring the property in September. No word that this was accomplished has been received to date.

-- The court case, United States vs Guild, AA-8433--T&M Site Contest, moved slowly toward settlement. Mr. Bernard Guild claimed 80 acres under a T&M site application on the Egegik River, Becharof Refuge. The Service sought to limit the T&M site to a maximum of 10 acres.

This cabin, a critical part of the T&M Site application, was over 20 chains west of the location shown on the original application. Somehow the BLM inspector found it to be within the site. The applicant has not used the site for years, but will end up with 20 acres of refuge land anyway.

8/28/90, REH

A letter dated July 5, 1990, from the Assistant Regional Solicitor to the Regional Director transmitted the decision of the Administrative Law Judge in the case. In his decision, the judge directed the BLM to do the following:

1. In addition to the 10-acre uncontested portion of the claim, approve approximately 10 acres embracing the tent frame structures,....

2. Approve patent to that portion of the northern trail-road running along the north/west boundary of the claim, which connects the non-contested area to the above described area embracing the tent frame structures. Such trail road shall be of sufficient width to accommodate reasonable vehicular traffic between the two "10-acre" sites.

A decision was made not to appeal this decision. While we believe the judge's decision to be wrong, the likelihood of overturning it is not good -- and we did protect 60 acres from development.

An Administrative Law Judge's decision gave the applicant 10 acres on the Becharof Lake outlet (Egegik River). Another successful "land-grab" in Alaska. 8/28/90, REH

On August 30th, a meeting was held in Assistant Regional Solicitor James Mothershead's office among the Service, BLM and Mr. Bernard Guild to discuss the Judge's ruling in the case. RM Hood represented Becharof Refuge. All parties seemed to be shocked when Hood resurfaced the issue that the cabin and storage building constructed by Mr. Guild was approximately 10 chains (660 feet) west of the T&M Site application.

Former RM John Taylor had brought this to the BLM's attention in memoranda dated 2/10/84 and 4/26/84. Hood confirmed this observation with an aerial photo taken in 1989. The meeting ended with the agreement that an on-the-ground meeting was required before further progress could be made. This meeting was scheduled for September 13th.

On September 13th, Hood accompanied Richard Stephenson, BLM Realty Specialist, and Bernard Guild, applicant, on an onsite visit at the Becharof Lake outlet. Mr. Stephenson was able to confirm that the original application and the following field examination by a BLM Realty Specialist contained significant errors. As pointed out in RM John Taylor's memorandum of April 26, 1984, the improvements (cabin and garage) are at least 20 chains (0.25 mile) and maybe as much as 40 chains (0.5 mile) west of the location shown on the original application. One corner on each 10-acre tract was established and marked for surveyors. An attempt was made to establish a route for the access road along the river between the two tracts. There were no visible remains of the alleged access road. The road will be 0.5 to 0.75 mile long and will be a surveyor's nightmare.

-- The Yantarni Bay lands issue identified in 1989 continues to fester. Pursuant to Section 1427 of the Alaska Lands Act, 68,438 acres of lands on the southern-most tip of the Ugashik Unit were conveyed to two native corporations. Koniag, Inc., by virtue of Interim Conveyance (IC) No. 338, holds subsurface interests in the lands. Afognak Native Corporation was conveyed the surface estate by IC Nos. 337 and 339. As agreed to in Section 1427, Afognak Native Corporation surrendered the surface estate to BLM by quit claim deed several years ago.

By memorandum, dated June 6, 1989, BLM State Director Wayne Boden advised the Service that completing the exchange would be made a management objective for FY 1990. The lack of any progress during the year prompted a memorandum from Regional Director Walter O. Stieglitz to the State Director, BLM dated November 21, 1990. Serious management concerns were again identified and a request "for expedited action on a clearance of title and return to refuge administration" was made. A meeting among BLM, the Regional Solicitor's Office and our Division of Realty followed on December 12th. The meeting revealed the BLM had lost the Quit Claim deeds and new ones would have to be obtained from Afognak Native Corporation --- Surprise! Surprise! Surprise! In the meantime, the "squatters" at the Yantarni Bay air strip continue to operate and establish third party interests that will be extremely difficult to deal with once the land returns to refuge status!

D. PLANNING

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 significant developments occurred again this year.

Public Use Management Plan (PUMP). Work on this step-down management plan progressed sporadically throughout the year. The almost total loss of Regional Office (RO) planning assistance, lack of refuge staff planning experience, extremely heavy field season work and changing RO priorities all served to delay production of a plan. Highlights of this years activities included:

-- In December 1989, Workbook 2 was developed and mailed to over 200 participants. It encouraged help in identifying and selecting options to manage various public use issues on the refuges.

-- Work on the PUMP reached a frantic pace in January and early February. Workshops were held in ten villages, Anchorage and Kodiak. An informational presentation on the plan was made to the Lake and Peninsula Borough Assembly. See Section D.3. for additional information.

-- A meeting on the PUMP was held in Associate Manager (AM) George Constantino's office on July 26th. In attendance were Constantino, RM Hood, Outdoor Recreation Planner (ORP) Rodriguez, Natural Resource Planner Mike Haase, and Ascertainment Biologist Leslie Slater. The goal of the meeting was to get the planning effort back on track after delays caused by the Exxon Valdez oil spill (2nd year's work), the interagency spring brown bear law enforcement effort, and the summer field season.

-- Leslie Slater, Ascertainment Biologist, was detailed from Realty to assist on the PUMP. She worked August 1-31 to produce a summary of the responses to Workbook 2. She also produced a planning update to be mailed to the public.

-- Another version of the planning update was drafted and approved in October. It was mailed on November 5th to over 250 participants.

Office Automation Plan (OAP). An OAP was completed in October and forwarded to the RO for approval. The purpose of the plan is to provide a tool for planning the acquisition and use of automated data processing (ADP) equipment and services.

Telecommunication Service Plan (TSP). The TSP was completed in November. This plan describes telecommunication functions required by the Alaska Peninsula/Becharof Refuges through 1995. It covers telephone, ADP and radio systems.

3. Public Participation

From January 9th to February 14th, workshops were held in twelve villages and cities, (South Naknek (9 attendees), Naknek/King Salmon (14 attendees), Egegik (9 attendees), Pilot Point/Ugashik (6 attendees), Port Heiden (5 attendees), Chignik Lake (14 attendees), Chignik Lagoon (11 attendees), Chignik Bay (6 attendees), Anchorage (23 attendees), Kodiak (15 attendees), Ivanof Bay (5 attendees) and Perryville (18 attendees).

These workshops were very informative with active input on the 18 issues identified in Workbook 2.

An informational presentation on the plan was made to the Lake and Peninsula Borough Assembly on the 20th by RM Hood. ORP Rodriguez compiled the responses received in response to Workbook 2. Eighty responses were received.

In October, a planning update was drafted and approved for the PUMP. Approximately 265 were mailed out in early November to planning participants.

Public meeting on the PUMP in Ivanof Bay, Alaska.
02/13/90, JLR

4. Compliance with Environmental Mandates

On May 31st, Regional Archaeologist Chick Diters, accompanied by RM Hood, conducted an archaeological survey in the vicinity of Alaska Department of Fish and Game's proposed fish weir, located at the outlet of Orzinski Lake, Chignik Unit. No archaeological sites were identified in the immediate vicinity of the weir or the proposed camp. Most of the land surface in this area appears to be relatively recently deposited gravel.

Regional Archaeologist Chuck Diters discovers an archaeological site at Orzinski Lake. 5/31/90, REH

Lithic artifact found at Orzinski Lake site.
5/31/90, REH

Although there were no sites in the immediate vicinity of the project, a site was identified some 200 yards to the east of the lake outlet. This site is characterized by several house-pits and other surface depressions, as well as a lake-front erosional face that reveals hearths, fire cracked rock, lithic manufacturing debris and lithic artifacts. A detailed report on the newly discovered site will be prepared along with documentation of the site for the Alaska Heritage Resources Survey. Given the current paucity of known sites along the Pacific coast of the Alaska Peninsula, this may prove to be an important site, and may warrant additional work in the future.

On June 1st, Diters completed an archaeological survey of three proposed fence construction projects at the refuge headquarters in King Salmon. His assessment was that the proposed work would have no effect on any archaeological or historic resources.

As discussed Section C.1. the Service purchased 17 acres from Jay Hammond this year. The purchase included an old cabin that needs to be removed. Section 107 of the NHPA procedures will have to be accomplished first. As a first step, RM Hood wrote Mr. Hammond in October and requested any information that he had on history of the cabin. His interesting reply is on the following page.

Henry Shaw's cabin. 4/29/90, REH

Nov. 18, 1990

Dear Ron:

Appreciate your help in finalizing the Kejulik transaction. You asked about the history of the old cabin.

In the late forties it was occupied by one Henry Shaw and wife plus small child. Henry, we later found out, was a 3 time loser going by the name of Murphy.

Game Warden Bob Mahaffey and myself flew in to check a ??? in 1949. An illegal moose was hanging in the wind break. Wolves has worked it over. No one apparently home. We went the kitchen but looked no further. We followed a dog sled trail to Jake Gregory's cabin near Cleo Creek. Jake told us Murphy had been shot by his wife during a drinking spree. She & Jake had placed him in a back room (which we'd not checked). Jake took off for his place and Tootsie (? I believe) went by dogs back to Egegik to "report".

Mahaffey & I went to Egegik to check up on her and found out from the then Marshall, Speed Huff, that she'd "forgotten" to report the circumstances of Murphy's demise.

Upon returning to the Kejulik site with Huff and several others, Murphy was located in the back bedroom. Since they'd left a white cat in the room with him "to keep the shrews from nibbling". Murphy was to say the least, a sorry sight. Speed Huff opened the door and a very fat white cat ran out. Speed blew it away and then threw up. To this day white cats make my gorge rise.

One of the reasons I built my place near the old cabin was that it was "taboo" for local villagers. for [sic] years they would not come near the place. In recent years, however, I'm sure the "taboo" has been forgotten.

Hope all goes well,

Jay

5. Research and Investigations

Becharof NR90 - "Island Denning and seasonal Movement of Brown Bear within Becharof National Wildlife Refuge"(74510-83-01)
A brown bear capture/collaring effort was initiated in 1983 to study bear use of Becharof Refuge. Study objectives were to examine the extent of island denning in Becharof Lake, seasonal movement between the refuge and Katmai National Park, parameters delineating winter dens, and to establish a data base of brown bear movement. See Section G.8. for data results.

Alaska Peninsula NR90 - "Brown Bear Studies at Black Lake" (74510-88-01) In 1988, a ten-year cooperative interagency study was initiated on brown bears in the Black Lake area of Alaska Peninsula Refuge. The project involves the National Park Service, the Fish and Wildlife Service, and the Alaska Department of Fish and Game as the lead agency. Each agency contributes one-third of the necessary funding each year, along with personnel for assistance. See Section G.8. for data results.

Alaska Peninsula NR90 - "Alaska Peninsula - Upper Braided Creek" (88-7-11) Funding for this "Refuge Contaminant Issue of Concern" study was originally provided in Fiscal Year 1988. A major purpose for which the Alaska Peninsula Refuge was established was to ensure water quality within the area. 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 go into production within the next ten years. This study was designed to provide background information on selected water quality parameters. A control was included in the study design with an annual sampling schedule. A bell Jet Ranger helicopter was used in 1989 and 1990 to reduce sampling costs (versus a week-long field camp). Resulting data will eventually be used to evaluate possible impacts of the planning mining operation on the water quality of Braided Creek. Sampling was concluded in 1990, with the final report anticipated for production in 1991.

6. Other

Deputy Manager Rick Poetter attended an agency scoping meeting at the Alaska Department of Transportation & Public Facilities, in Anchorage on November 5th. The study is being conducted by the agency to determine whether the existing airport at Chignik Lagoon meets the aviation needs of the community. The village of Chignik Lagoon is located within the boundaries of the Alaska Peninsula Refuge, but the land is owned by the Chignik Lagoon Native Corporation. The present airfield has been determined to be "incompatible" due to its length and location, which is in the middle of the community. Frequent "invasion" of people, dogs, etc. onto the runway compound the problems. One proposal is to build a new airfield by placing fill material in the lagoon, just west of the village. Another is to build a tri-community airfield in the Mitrofania Valley and build access roads to it from the villages of Chignik, Chignik Lagoon and Chignik Lake. Due to the mountainous terrain, these roads would be very difficult and expensive to construct and maintain. A viable solution will be difficult to arrive at. The draft environmental assessment is due to be released in March, 1991.

E. ADMINISTRATION

The Fish and Wildlife Service (Service) plans to reorganize the four Alaska Peninsula refuges (Alaska Peninsula Refuge, Alaska Peninsula Unit of Alaska Maritime Refuge, Becharof Refuge and Izembek Refuge). To accomplish the proposed reorganization, the Service submitted draft language which would amend the appropriate sections of the Alaska National Interest Lands Conservation Act as it pertains to refuge boundaries in Alaska. This language was submitted to the House Interior Committee in 1989, for use in a draft Alaska Omnibus Act. As written, the Becharof Refuge will be consolidated with the Chignik and Ugashik Units of the Alaska Peninsula Refuge. Seal Cape will be removed from the Alaska Maritime Refuge and incorporated into the Alaska Peninsula Refuge. The resulting "Conservation System Unit" will be named the Alaska Peninsula National Wildlife Refuge. The Pavlof Unit of the Alaska Peninsula Refuge will be incorporated into the Izembek 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. In October, 1989 approval was received to operate both refuges under one annual work plan (74510).

1. Personnel

5 4 7 8 1 3 6 2
11/90, JPL

PERMANENT

1. Ronald Hood, Refuge Manager, GS-485-12, 09-15-85, PFT
2. Richard Poetter, Deputy Refuge Manager, GS-485-11, 04-23-89, PFT
3. Randall Arment, Assist. Refuge Manager/Pilot, GS-485-12, 10-03-82, PFT
4. Donna Dewhurst, Wildlife Biologist, GS-485-11, 02-26-89, PFT
5. Jose Rodriguez, Outdoor Recreation Planner, GS-023-07, 08-27-89, PFT
6. Dwight Mumma, Biological Tech., GS-404-05, 02-19-84, PFT (local hire)
7. Gary Terry, Maintenance Worker, WG-4749-08, 07-31-88, PFT
8. Janice Collins, Refuge Secretary, GS-318-05, 06-11-84, PFT
9. Elizabeth Maynard, Clerk Typist, GS-322-03, 03-12-90 - 10-19-90 (not pictured)

TEMPORARY

10. Gregory Thomson, Biological Tech., GS-404-05, 04-23-90 - 9-28-90, Seasonal
11. Kent Hankins, Biological Tech., GS-404-05, 05-29-90 - 9-21-90, Seasonal
12. William Struble, Park Ranger, GS-025-05, 06-11-90 to 09-15-90, Seasonal

14 13 15
07/25/90, RDP

YOUTH CONSERVATION CORPS (YCC)

13. Oliver Sasser, Enrollee, 06-04-90 to 07-27-90
14. Michael Swain, Enrollee, 06-04-90 to 07-27-90
15. Georgia Zharoff, Enrollee, 06-04-90 to 07-27-90

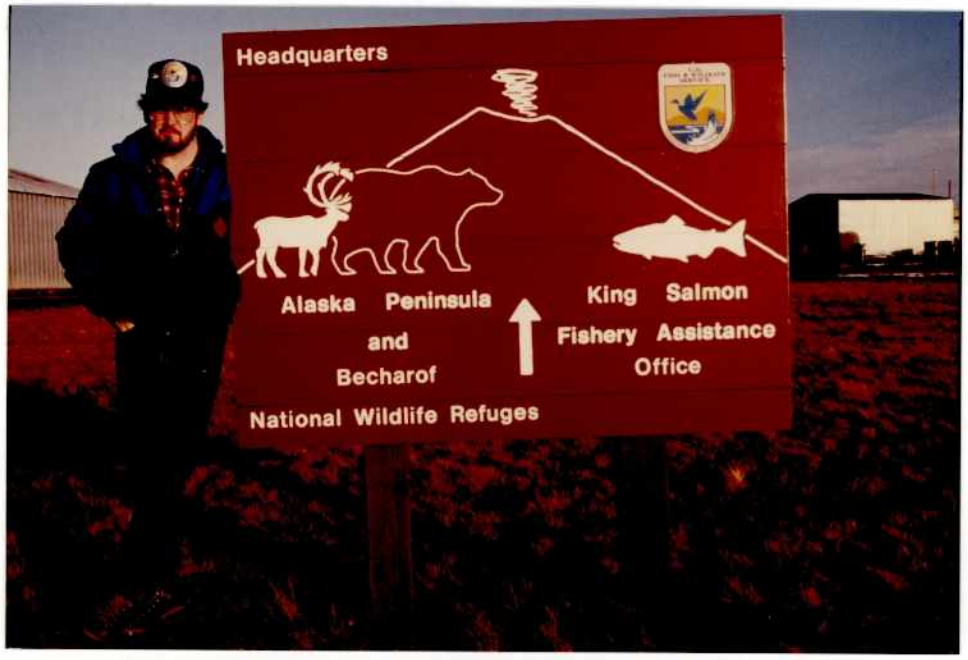
STUDENT CONSERVATION ASSOCIATION (SCA)

Robert Kirk, Ontario, Canada, 10-16-89 - 01-08-90, Headquarters
Edward Gilmartin, Irvington, New York, 1-2-90 - 3-13-90, Headquarters
Lynn Schwartz, Allentown, New Jersey, 4-24-90 - 8-24-90, Puale Bay Camp
Gregor Yanega, Auburn, Washington, 6-5/90 - 9-14-90, Puale Bay Camp
Jeffery Morales, Fillmore, California, 6-3-90 - 9-9-90 Ugashik Narrows Camp
Alison Zirkle, Clayton, Missouri, 6-1-90 - 9-23-90 Ugashik Narrows Camp

VOLUNTEERS

Mary Auburn, Minneapolis, Minnesota, 6-2-90 - 9-23-90 Ugashik Narrows Camp
William Stahl, Austin, Texas, 6-2-90 - 8-26-90, Puale Bay Camp
Chris Simoniello, Miami, Florida, 5-31-90 - 9-7-90 Puale Bay Camp
Patrick Opay, Hartland, Wisconsin, 6-4-90 - 8-20-90 Oil Spill Survey Crew

Kent Hankins (11) and Volunteer Pat Opay heading out to conduct more shoreline assessments. 07/31/90, RDP



SCA Volunteer Rob Kirk was only with us for nine days in 1990 before his assignment ended. 12/89, RDP

SCA Volunteer Eddie Gilmartin obtaining some fresh air after long hours of cranking out paperwork. 02/90, DAD

BT/Puale Bay field camp leader Greg Thomson posing for staff photo at historic site on Katie Creek.
07/05/90, CS

Puale Bay field camp personnel. Left to right are FWS/SCA Volunteers Chris Simoniello, Gregor Yanega, Bill Stahl and Lynn Schwartz. 08/23/90, GLT

Ugashik Narrows field camp personnel ready to head out. Left to right are Mary Auburn, Jeff Morales, Aily Zirkle and Bill Struble. 8/90, JLR

The staffing plan for the Alaska Peninsula/Becharof Refuges was approved by Regional Director Walter Stieglitz on April 8, 1989 (Figure 4). The funded positions require 7.5 Full-Time Equivalents (FTE). One position is local-hire which does not count as an FTE. The funding for the maintenance position is shared with the King Salmon Fishery Assistance Office (KSFAO). The FTE allocation history is shown in Table 4. The lower than expected use in 1990 appears to be a reflection of the method used to account for FTE's rather than actual use since the refuge was fully staffed throughout the year.

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

	Full Time Equivalent			
FY	AKP	BCH	TOTAL	USED
90	5.0	4.0	9.0	7.93
89	5.0	4.0	9.0	6.68
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

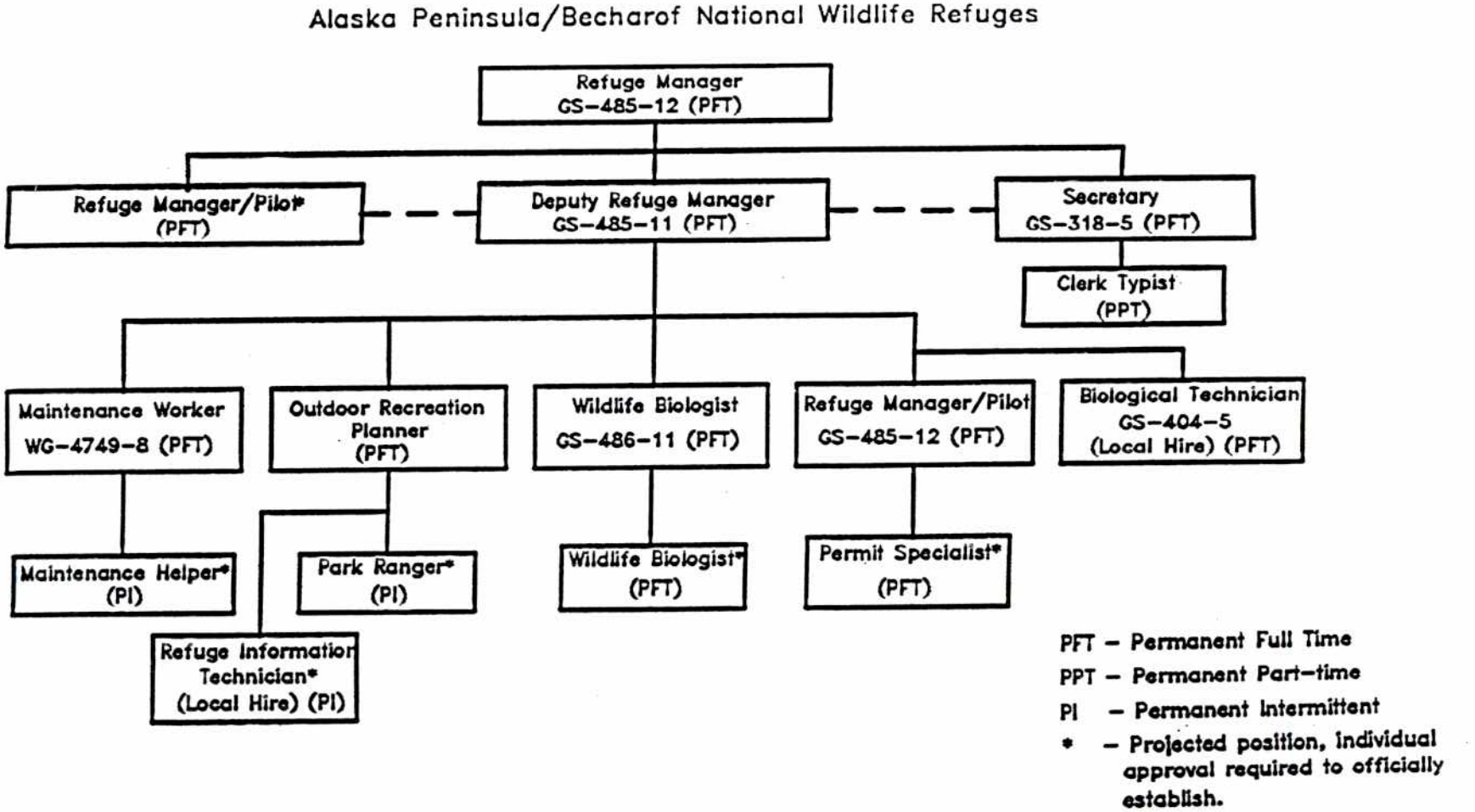


Figure 4. Approved staffing pattern.

Highlights of the year included:

- Wildlife Biologist (WB) Donna Dewhurst was presented with a Special Achievement Award on January 8th. The award recognized Donna's exemplary efforts in working with the Exxon Valdez oil spill. She was detailed to Kodiak as the Station's representative and spent long diligent hours coordinating efforts. She also spearheaded gathering of needed biological data during the first responses and throughout the summer during the operation of two field camps. These field camps were designed and implemented by Donna, which involved the locating of personnel, designing and implementing monitoring studies, and providing pre-camp safety training.

- Refuge Manager (RM) Hood administered the Office of Personnel Management clerk/typist test to four candidates on January 15th. All qualified and were listed on the certificate. The permanent part-time Clerk/Typist (CT) (GS-322-03) position was filled on February 23rd. This position has been vacant since October 1, 1989. Elizabeth Maynard was the successful applicant and she entered on duty March 12th. She terminated her employment on October 19th when she accepted a GS-04 CT position with the Maintenance Division of Katmai National Park, King Salmon, Alaska. By year's end, the position had not been filled.

- WB Dewhurst attended the Pintail Workshop in Anchorage on January 17th and 18th.

- Assistant Manager/Pilot (ARM/P) Randy Arment was presented a Special Achievement Award on January 29th, for sustained high performance

DRM Poetter presenting ARM/P Arment with a Special Achievement Award. 01/29/90, REH

during the period of 10/01/88 to 06/30/89. This award recognized Randy's efforts with the 1989 special use permit program. A substantial number of changes were placed upon the program by the Regional Office (RO) and Randy was instrumental in implementing these changes. He was also recognized for his taking over the Deputy Refuge Manager's (DRM) duties, while the position was vacant. Randy was instrumental in the completion of flying reconnaissance, wildlife surveys and resupply trips into rugged areas along the Pacific coast, relevant to the Exxon Valdez oil spill. While assisting with the oil spill missions, Randy also spearheaded a highly successful "Challenge Grant - Take Pride in America" cleanup project in the Mother Goose Lake area.

- Biological Technician (BT) Dwight Mumma was also presented a Special Achievement Award on January 29th. This award recognized his sustained high performance during the period of 10/01/88 to 06/30/89. Moose excelled in requisitioning and maintaining needed field gear and supplies required for the running of the two field camps monitoring the Exxon Valdez oil spill. He was indispensable in the initial set-up and removal of the camps. His expertise in bear safety was instrumental in the completion of the field season without personnel being hurt. Moose also contributed significantly to the supplying of the research field camp at Cinder Lagoon. His efforts allowed for the smooth functioning of this valuable camp.

BT Mumma receiving a Special Achievement Award from DRM Poetter. 01/29/90, REH

- Maintenance Worker (MW) Gary Terry was also presented with a Special Achievement Award on January 29th! This award recognized Gary's diligent efforts during the exceptionally severe weather experienced in

January of 1989. Frozen pipes, cracked boilers, gas fuel-pump failures, vehicle fuel line freeze-ups, and other severely cold weather related problems were experienced in a short period and thanks to Gary's creativeness, ingenuity and patience, timely repairs were implemented. Gary was also recognized for putting forth an outstanding effort in keeping up with the extra demand for maintaining the boat motors, 4-wheelers, generators and other field camp gear in good working order, thus preventing camp "down-time." Gary was also commended for his supervision of the five enrollee YCC program. Gary worked extremely well with the youths, instilling upon them proper work ethics while at the same time teaching them basic maintenance skills and accomplishing a variety of work projects.

MW Terry receiving a Special Achievement Award from DRM Poetter. 01/29/90, REH

- DRM Poetter traveled to the Federal Law Enforcement Training Center in Brunswick, Georgia to attend a week long training session dealing with Archaeological Resources Protection. The training started on February 5th and covered the in's and out's of the Archaeological Resources Protection Act (ARPA). This training is highly recommended for all

refuge enforcement officers and good for all others to be aware of. The ARPA has substantial penalties built into it and is a very useful law.

- RM Hood traveled to Anchorage on February 5th for required Equal Employment Opportunity (EEO) training.

- WB Dewhurst attended the Eielson Air Force Base Arctic Survival Training, held the week of February 12th. Outdoor Recreation Planner (ORP) Rodriguez and DRM Poetter attended the same training the week of February 19th. The training is very beneficial by providing the student with the knowledge and confidence to be able to survive not only arctic conditions but also any other emergency situation that a person can get into in Alaska, or in the remote areas of the lower 48 states.

- ORP Rodriguez attend the Public Use Meeting and Alaska Recreation and Parks Association meeting February 26th-28th.

- DRM Poetter and ARM/P Arment attended their annual Law Enforcement Refresher training held March 1st-6th in Marana, Arizona. WB Dewhurst attended the second session held March 15th-20th. Randy Arment earned top honors in the firearms qualification with a score of 297 on the practical pistol course (PPC). He also shot the high score on the night-fire course. Randy also received honors for his ability in the physical fitness testing during the training. DRM Poetter earned the second highest PPC score with a 296, but when in a gun fight, second place just won't cut it.

- ORP Rodriguez attended a CISPUS Workshop March 5th-9th in Randle, Washington. Jose indicated it was a very informative and enjoyable learning experience. Courses attended included public involvement, facilitating meetings, preparing effective briefings, plus many more very useful sessions. This training course is highly recommended for all personnel involved in dealing with meetings of any type, especially public meetings and/or interacting with the public.

- DRM Poetter attended a Cross-Cultural Awareness seminar sponsored by the RO March 29th and 30th. It was a very well presented and beneficial program, recommended for everyone. We are all prejudiced in one way or another and need to recognize this as a fact and be able to deal with it.

- RM Hood and DRM Poetter attended the Project Leader's Meeting held in Anchorage April 2nd-5th. A half day session on the 2nd was devoted to the topic of "Drug-Free Workplace."

- ARM/P Arment attended the Firearms Instructor Training Program administered by the Department of the Treasury, Marana Operations April 9th-20th. Classroom and fire range course instruction was expressed as excellent. Each participant was required to successfully complete a written exam, work a hot firing line, and prepare a 15 minute classroom presentation on firearms and their use.

- ARM/P Arment attended the Federal Aviation Administration's Accident Prevention Program, Seaplane Safety Seminar held on April 21st at Elmendorf Air Force Base.

- A workshop concerning Oil Spill Hazardous Material (OWSWOPER) was presented by the U.S. Coast Guard, in Anchorage, May 2nd. RM Hood, DRM Poetter, ARM/P Arment, WB Dewhurst, BT Mumma, BT Thomson and SCA Volunteer Lynn Schwartz attended from this station. This training was a requirement for working with the oil spill.

- KSFAO Biologist Jeff Adams presented a 3.5 hour Experienced Defensive Driver Course on May 26th to the KSFAO and Refuge staffs. Refuge participants included: RM Hood, DRM Poetter, ARM/P Arment, ORP Rodriguez, BT Mumma and CT Maynard. To meet the present Regional requirements for Defensive Driving Training, each employee must have eight hours of training during every three years.

- BT Mumma and WB Dewhurst each received recognition, for their special contributions to the Service and the Department in responding to the Exxon Valdez oil spill, in the form of a Natural Resource Response Award for Exceptional Service. These awards were signed by Secretary of the Interior Manuel Lujan, Jr. and presented in July by Manager Hood.

BT Mumma proudly displays his Natural Resource Award from the Secretary of the Interior for his efforts in quickly responding to the Exxon Valdez oil spill.
07/25/90, RDP

- WB Dewhurst received a Special Achievement Award in August for her continuing efforts on the Exxon Valdez oil spill damage assessment studies. Recommending Official Rowan Gould submitted the award for this second season of coastal studies including beached bird surveys, bald eagle surveys and seabird colony censuses along the 725 miles of affected refuge shoreline, on the Alaska Peninsula.

- DRM Poetter attended a Steel Shot Seminar in Anchorage August 5th-7th. It was sponsored by the Alaska Department of Fish and Game with steel shot expert Tom Roster on hand to thoroughly explain the facts about shooting steel shot, for the taking of waterfowl. It was described as a very informative session which included a day of actual shooting, using numerous steel shotshells on clay targets.

- On August 6th and 7th, Chief, Contracting and General Services Winston Jacobson conducted a procurement/property review of the Alaska Peninsula/Becharof Refuges. Thanks to Secretary Collins' careful and diligent work, no significant problems were discovered.

- Secretary Collins was detailed to the RO to assist Administrative Officer Ruth Johnson from August 7th to September 6th. She was extended through September 28th to continue her assistance with the year-end financial work. Jan went in on detail with practically no notice. She took over the duties of Budget Assistant with very little supervision. This included the logging and tracking of all personnel actions, travel authorizations, training requests, and acquisitions. She interacted with the Personnel Office, Budget and Finance, and Contracting and General Services on a daily basis. Jan set up the year-end closeout desk for Refuges and Wildlife. She was responsible for recording, verifying documents, and submitting to Budget and Finance Office all financial obligations for the field stations and regional offices under Refuges and Wildlife. She was responsible for financial tracking of six Regional office budgets; due to computer failure at a field station two more budgets became her responsibility. She served as Acting Administrative Officer as needed. In addition to the above duties, Jan also reconciled the Alaska Peninsula/Becharof refuges financial tracking system with the Denver reports and took care of a multitude of other tasks for this station (long distance).

- Furlough Notices were signed by all staff and submitted to the RO August 28th. Most believed it to be another political ploy and went along, peacefully!

- Refuge Officers Dewhurst and Poetter qualified with their service revolvers September 4th. Firearms Instructor Arment put them through their paces. Scores were a few points lower than usual due to a change to the heavy .357 caliber loads.

- Secretary Collins received a Sustained Performance Award during the first week of September. Jan was recognized for her outstanding performance; particularly the budget area. The Denver Finance Center converted to a new financial system in FY 1990. This was a particularly stressful exercise since no reports were received from Denver for much of the year; then partial reports were received with no

guidance for interpreting the reports. In spite of this adversity, she provided the RM with the budget information that he required in a manner that allowed him to meet and exceed his reporting and planning requirements.

- RM Hood represented Region 7 at the Fourth Annual Take Pride in America National Awards Ceremony held in Washington D.C. on September 18th (see Section H.22.).

- RM Hood attended a seminar September 20th and 21st on the Quarters Management Program that Region 7 will implement in February 1991. This program features a rental rate survey process that is statistically based and alleged to have greater objectivity.

- In October, BT Thomson received a performance award for his conscientious efforts in supervising the Puale Bay field camp. He was also recognized for serving on the oil spill reconnaissance team. Great job, Greg!

- DRM Poetter traveled to Homer, November 13th, to represent the Station at the Coastal Refuge Managers Fall Coordination Meeting. The meeting was held on the Motor Vessel Tiglax. The main purpose was to review issues of importance and concerns of refuge managers and to discuss the budget for FY-1991 (not finalized by year's end). It was an excellent meeting and very beneficial to get a chance to meet as a smaller group. The staff of the Alaska Maritime Refuge, especially the Tiglax crew, made us all feel right at home and did an excellent job hosting the meeting.

- ARM/P Arment attended the annual ground school during the week of December 3rd. On the 4th, Regional Director Stieglitz presented Randy with a Six-Year Silver Pilot Award. Flying the Alaska Peninsula rarely gives up such awards.

2. Youth Programs

The Youth Conservation Corps (YCC) non-resident program began June 4th and ended July 27th. Local schools were contacted, in March, to notify them of employment opportunities for young people in the Refuges' YCC program during the summer. King Salmon residents Oliver Sasser, Mike Swain and Georgia Zharoff were selected in a random drawing from the applications received.

MW Terry provided the daily supervision of the enrollees again this year. ORP Rodriguez provided overall supervision and program coordination.

During their first week, the enrollees attended appropriate sessions of the training put on for the field crews. Training covered included: first aid; cardiopulmonary resuscitation (CPR); boat handling and engine maintenance; bear safety; cold-water survival and hypothermia training; radio use; 4-wheeler certification (for compound use only); and general equipment care.

Work projects centered around the "Take Pride in America" theme, which included: landscaping and seeding of Quarters Nos. 28 and 29 lawns; mowing and trimming compound lawns; washing and waxing of vehicles; demolition and

removal of the old pumphouse (Bldg. No. 13, see photo, this section); performed station fire extinguisher inspections; installed a variety of safety placards/signs in various locations around the station; cleaned and organized the flammable storage building; helped strip the excess (1979) Dodge pick-up of useful accessories; helped convert and test the 18 ft. Lund boat that was outfitted with a steering column and 60hp outboard jet motor; assisted with work on station boat dock anchoring system; partial painting of the KSFAO administrative trailer, painting the maintenance shop floor; constructing weatherport floors; helped load/unload aircraft with equipment/supplies of the field camps; assembled the new bunkbeds; and transplanted trees; and a variety of minor maintenance which helped improve the appearance of the headquarters site and quarters.

Enrollees Swain (left) and Sasser in the process of transplanting a spruce tree removed from the boundary line to beautify the compound. Bldg. No. 13, in the background was later dismantled/removed by the crew.

06/90, REH

The enrollees, MW Terry and SCA Volunteer Aily Zirkle (from Ugashik Narrows public use camp) spent the week of June 25th at the administrative cabin on Island Arm of Becharof Lake. Gary and Aily supervised/chaperoned the

enrollees as they completed cabin maintenance projects including: cleaning and making repairs to the sink, windows, floors, ceiling and walls; painting inside and out; clean-up of the outside areas of debris and litter; etc.

In July, a similar work project was completed on the Mother Goose Lake administrative cabin. Some of the work completed included: disassembling and removing old metal landing mats; burning a useless wooden boat; gathering and transporting litter/garbage; painting the inside of the cabin; and refurbishing and cleaning the cabin.

All three enrollees completed their eight week program. Thanks go to Mike, Georgia and Oliver for all their help in making this a highly successful and enjoyable program.

3. Other Personpower Programs

The Student Conservation Association (SCA) program proved again to be an excellent source of energetic and dedicated resource assistant volunteers for the field camps.

Winter volunteers have proven to be a useful resource for the Refuges' biological program. In early January (5th), we had a "changing-of-the-guard" of SCA volunteers with Robert (Rob) Kirk completing his three month stay and returning to his home in Ontario, Canada. Rob drafted reports on oil spill bird mortalities, shoreline impact monitoring and produced some much needed computer graphics using Lotus-Freelance Plus. Volunteer Edward (Eddie) Gilmartin from Irvington, New York arrived January 4th. On March 21st, Eddie concluded his 12-week stay and returned to Dartmouth College. Eddie's accomplishments included completing the inventory and organization of the refuge herbarium (362 species, 1,305 specimens) and working on data from the Island Arm brown bear study. Using winter SCA volunteers was an experimental program for the refuges, which has been very successful in providing a cost-efficient means of obtaining assistance in data analysis, while also providing additional opportunities for volunteer experience in Alaska.

SCA Volunteers Lynn Schwartz and Gregor Yanega were selected to help staff the Puale Bay field camp this year. Lynn was from Allentown, New Jersey and Gregor was from Auburn, Washington. See Section G.5. for details of their duties.

Two SCA Volunteers were selected and assigned to the Ugashik Narrows public use field camp. Jeffery Morales came to us from Fillmore, California and Aily Zirkle was from Clayton, Missouri. See Section H.9. for details of their duties.

SCA Volunteer Jeff Morales was afforded an excellent opportunity to assist the KSFAO by conducting a fish sampling trip down Gertrude Creek (Becharof Refuge) from August 10th-22nd. Jeff helped Fisheries Biologist Jeff Adams collect specimens of rainbow trout, dolly varden and arctic grayling. He was provided a special treat by demonstrating rainbow trout tagging and electroshocking during the field visit by Fish and Wildlife Service Director John Turner.

Prior to the SCA volunteers going afield, an intensive training session is held. Training included: first aid; CPR; boat handling and engine maintenance; bear safety; firearms (.375 rifles and 12-gauge shot guns) certification; cold-water survival training; local flora identification/collection; radio use; 4-wheeler certification; and equipment care. The session was highlighted with a Friday evening of volleyball, a taco feed and a float trip down the Naknek River on Saturday.

4. Volunteer Programs

A total of four volunteers were utilized this year. Their primary missions were to staff the two field camps and work on the oil spill survey crew.

Chris Simoniello of Miami, Florida worked at the Puale Bay field camp along with Bill Stahl of Austin, Texas. An accounting of their work activities is presented in Section H.5.

One volunteer, Mary Auburn from Minneapolis, Minnesota spent her summer staffing the Ugashik Narrows field camp. An accounting of her duties can be found in Section H.9.

Patrick Opay from Hartland, Wisconsin was selected to assist with the oil spill survey crew. His duties required considerable time in helicopters over the Pacific Coastline of the Refuges. Details of his duties are explained in Section F.14.

During the week June 4th, a training session was held for the volunteer staff. This training is crucial to maintaining the well-being of the volunteers. The training included: first aid; CPR; boat handling and engine maintenance; bear safety; firearms (.375 rifles and 12-gauge shot guns) certification; cold-water survival training; local flora identification/collection; radio use; 4-wheeler certification; and equipment care. The session was highlighted with a Friday evening of volleyball, a taco feed and a float trip down the Naknek River on Saturday.

5. Funding

Since FY 1987, a disturbing pattern has been repeated annually - our funding has not been finalized until mid-fiscal year. This pattern again was repeated in FY 1990. Funding figures were received in April. A final funds advice was received in mid-July. The funding history for both refuges is presented in Tables 5 to 7.

Table 5. Alaska Peninsula Refuge funding Fiscal Years 1984 to 1990 (in thousands).

FY	1260					1360	TOTAL
	Base	MAINT.	RPRP	CIP	TOTAL		
90	$352.0	$ 37.0[a]	$20.0[b]	$ 6.0	$415.0	--	$415.0
89	$368.0	$ 12.0	$ 5.0[b]	$ 5.0	$390.0	--	$390.0
88	$234.5[c]	$ 75.5	$50.0	$27.0	$387.0	--	$387.0
87	$323.0[d]	$135.0[e]	--	--	$458.0	--	$458.0
86	$180.6	$ 66.4	--	--	$247.0	--	$247.0
85	$179.5	$235.5[f]	--	--	$415.0	$ 5.0[g]	$420.0
84	$285.0	$130.0[h]	--	--	$415.0	$10.0[g]	$425.0

[a] Maintenance Management System (MMS) funds.
[b] Challenge grant funds.
[c] Includes $20,000 for Arctic nesting goose information program.
[d] Includes $115,000 for radio system purchase.
[e] Includes $45,000 for large ARMM projects.
[f] Includes $180,000 for large ARMM projects.
[g] Earmarked to assist King Salmon Fisheries Resource Station in developing a Fishery Management Plan.
[h] Earmarked 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 1990 (in thousands).

FY	1260					1360	TOTAL
	Base	Maint.	RPRP	CIP	TOTAL		
90	$314.0	--	--	--	$314.0	--	$314.0
89	$335.0	5.0	--	--	$335.0	--	$335.0
88	$280.0	$ 68.0[a]	$ 30.0	$ 30.0	$408.0	--	$408.0
87	$237.0	$256.0[b]	$ 45.0	--	$538.0	--	$538.0
86	$201.6	$ 56.4	$101.0	--	$359.0	--	$359.0
85	$216.0	$169.0[c]	$101.0	--	$486.0	$ 5.0[d]	$491.0
84	$240.0	$ 80.0[e]	--	--	$320.0	$10.0[d]	$330.0

[a] Earmarked for large ARMM projects.
[b] Includes $151,000 for large ARMM projects.
[c] Includes $132,000 for large ARMM projects.
[d] Earmarked to assist King Salmon Fisheries Resource Station in developing a Fishery Management Plan.
[e] Earmarked for large ARMM projects.

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

FY	AKP	BCH	TOTAL
90	$352.0	$314.0	$666.0
89	$368.0	$335.0	$703.0
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.

The Exxon Valdez oil spill continued its fiscal impacts into FY 1990. Authorization was received from the Assistant Regional Director - Oil Spill to spend $36,000 for sea bird colony assessment work at Puale Bay. Another $20,000 was authorized for bald eagle nest/production assessment. At mid-April, we were authorized to complete an onsite inspection of all 725 miles of coastline that was either impacted or potentially impacted by the oil spill. A budget of $259,000 was approved. A Bell 206 helicopter was stationed at King Salmon from April 25th to August 10th while the beach walks were being accomplished (See Section F.14.).

6. Safety

Constant attention to safety can not be emphasized enough in field operations on the Alaska Peninsula. These operations are most often located in rugged remote areas that host healthy populations of brown bears. Persistent changing weather conditions dictate aircraft and boating activities.

Aircraft are the primary means of transportation within the refuge system on the Alaska Peninsula. Places where lower 48 "pavement pilots" would never dream of landing become "bush landing strips". Several small aircraft accidents occurred on and around the refuges this year (see Section J.3.).

An on-refuge crash of a refuge chartered DeHavilland Otter took place while our Puale Bay field camp was being removed. A Bell 206 helicopter was used to sling the gear 13 miles to a sandy/gravel landing strip adjacent to Becharof Lake. The Otter on wheels, chartered from Alaska Cargo Service in Dillingham, was then used to transport the gear to King Salmon. After having been loaded with field camp gear, the aircraft attempted to take off (last load). During the ground run the Otter ran off the end of the sand blow collapsing the main landing gear and subsequently damaging the aircraft. Neither pilot or Service crew member were injured.

This DeHavilland Otter was used to fly logistical support for the Puale Bay field camp. 9/23/90, GLT

The Alaska Peninsula/Becharof Refuges supports the safety program with an active Station Safety Committee. Monthly presentations related to current field operations and climatic hazards are made by the committee. Monthly safety topics covered for 1990 are as follows:

January	Heart attacks and frostbite
February	Ice safety
March	Poisons and flammables
April	Aircraft safety
May	Defensive Driving (3.5 hours)
June	Seasonal Staff Orientation and Safety Training (40 hours)
July	Canning salmon and cold weather elements
August	None (staff not available)
September	None (staff not available)
October	Surviving winter conditions; "The Lost Hunter"; back injuries and high blood pressure
November	Frostbite and other cold weather injuries
December	Ground water and your family's health and rabies control

During the week June 4th, a 40-hour training session was held for the incoming summer seasonal staff including five biological technicians, 11 volunteers (totals include Puale Bay Camp, Ugashik Narrows Camp, oil spill helicopter crew, and FAO crews) and the three YCC enrollees. Training covered: first aid; CPR; boat handling and engine maintenance; bear safety; firearms (.375 rifles and 12-gauge shotguns) certification; cold-water survival training; local flora identification/collection; radio use; 4-wheeler certification; and equipment care. The session was highlighted with a Friday evening of volleyball, a taco feed and a float trip down the Naknek River on Saturday.

Health Aid Gene Toole utilizing the bunkhouse to present first-aid and CPR classes to this year's seasonal staff.
06/05/90, JLR

No major injuries occurred this year. A minor injury occurred when Secretary Collins slipped on ice and hurt her foot in February. Two other minor injuries occurred at the end of the field season. BT Mumma pulled a lower back muscle while lifting field camp gear; a half day of work was missed. MW Terry hurt his back while moving a boat motor for the KSFAO. Terry missed a few days of work while getting his back checked by a specialist in Anchorage.

Using her initiative, WB Dewhurst completed Emergency Medical Technician II Training in November. Upgrading from Level I to Level II certification enabled her to perform Intravenous infusions (IV's), administer emergency medications and use advanced airways. Skills performed under standing orders of a sponsoring physician and maintained by volunteering with the local rescue squad. Training was completed during off-duty time. Donna's volunteer effort will enhance the stations' wilderness rescue capabilities.

Highlights of safety committee meetings and station safety inspections throughout the years are listed below.

Items addressed at the July/August meeting and inspections:

(1) MW Terry and the YCC crew accomplished:
- "No Smoking", "Fire Extinguisher" and "Explosive" placards were placed around the compound and the hangar;
- new ladders were dispersed around the compound and hangar;
- additional fire extinguisher were hung, where needed, around the compound and hangar;
- all fire extinguisher were inspected for sufficient charge;
- parts ordered for repairs of the aviation fuel pump at the dock; and
- safety strips installed on the ramp to the dock.

(2) Additional equipment necessary for safe completion of station activities are:
- leather and cotton gloves, goggles, and ear muff for YCC personnel; and
- mustang suits for coastal field camps.

(3) Safety training for seasonal employees was well received by permanent and seasonal personnel.

(4) Renewed emphasis was placed on safety and eye protection during refueling aircraft due to an incident of fuel splashing into a person's eyes while refueling helicopter.

(5) Renewed emphasis was expressed on placement of window guards on all government trucks due to the breakage of the rear window of the refuge's S-10 truck during gear transport.

Items addressed at September/October meetings and inspections:

(1) DeHavilland Otter accident while transporting gear and personnel to King Salmon from field camp.

(2) Minor back injuries sustained by two personnel in separate incidents during September and October.

(3) Fire alarm in Building No. 4 (headquarters) needs repair. Local contractors had previous obligations so a contractor from Anchorage was contacted to do the repair work.

(4) Safety Officer training was denied by Regional Office. Training is being submitted again in FY 1991.

(5) Fire extinguishers have been checked and placed where required.

(6) Empty fuel cans and flammable liquids have been stored in the fuel shed and fireproof locker in the shop.

(7) Excess unused laboratory chemicals need to be properly disposed of. RO Safety Officer was notified on this issue.

Items addressed at November/December meeting and inspections:

(1) Alaska General Alarm replaced a smoke detector and repaired the fire alarm system in the main office building, and the alarm in the bunkhouse was repaired; safety committee will inspect and clean alarms at succeeding quarterly meetings.

(2) RO Safety Officer recommended contacting the King Salmon Air Force site for assistance with disposal of unused laboratory chemicals; they were unable to offer any assistance; a list of chemicals was forwarded to the RO Safety Officer for review and recommendation of proper disposal.

(3) Recommendation for basic tool and emergency supplies for station vehicles will be solicited from eh RO Safety Officer.

New business conducted at the November/December meeting:

(1) Quarterly safety inspection was completed December 14th.

(2) Comments for the second review of the draft Bear/Firearms Safety Program were forwarded to the RO.

(3) Personal Emergency Locator Transmitters orders were forwarded to the RO.

(4) New batteries were ordered for the emergency lights in the main office (Building No. 4).

7. Technical Assistance

RM Hood, DRM Poetter, ARM/P Arment and ORP Rodriguez attended a meeting of the Lower Bristol Bay Fish and Game Advisory Committee held in Pilot Point on October 17. Questions on the upcoming public involvement effort for Federal subsistence management were fielded. The committee was urged to provide input into the effort.

A public meeting in the public involvement effort for subsistence management was held in Naknek on October 29th. Outdoor Recreation Planner (ORP) Rodriguez assisted the Subsistence Team conducting the meeting. The team consisted of ARM Dick Munoz (Kodiak Refuge), ARM Bob Winkleman (Kenai Refuge), and Interpreter Chuck Hunt (Yukon Delta Refuge). The Bureau of Land Management (BLM) was represented by Mr. Van Waggoner, the Fish and Wildlife Service (FWS) regional subsistence group was represented by Fishery Biologist Larry Peterson. Of the 22 attendees, 18 were FWS, National Park Service (NPS) or BLM employees. The subsistence issue is quite an interesting topic, and although only four members of the public attended the meeting, many good and pertinent points were made. ORP Rodriguez has been appointed as the local representative/coordinator attended the public meetings in Chignik, Egegik and Cold Bay.

DRM Poetter attended the Naknek/Kvivhak Fish and Game Advisory Committee meeting held in Naknek the evening of November 29th. The meeting centered around big game species and on the northern portion of the Naknek River drainage (Unit 9C). An emergency closure on the taking of cow moose was put into effect for that area of Unit 9C after aerial counts showed 101 moose (58 cows) left in the area. In 1989, about 160 moose moved north into the Branch River drainage from the Naknek River drainage and have not returned to date. A proposal was made to look at this area for designation in the "Tier 2" category, which would require the issuing of permits based on a point system. This should give preference to local hunters that can show they have had previous use of the resource.

8. Other Items

Camp Logistics

The five-person Puale Bay field camp was initiated this year on June 17th and kept out until September 20th. Logistics of moving the weatherport tents, wooden floors, stoves, fuel, etc. involved use of a chartered Dehavilland Otter to land on the beach at low tide. A Bell 206 helicopter was then used to sling the equipment to the actual camp site approximately four miles away. The Puale Bay beach is the right consistency to land a loaded plane, but not necessarily take-off from (when loaded with field gear). Consequently, in the fall, the helicopter had to be used to sling equipment 20 miles to the nearest dirt landing strip at Bible Camp, where it was transferred to the Otter for the final leg to King Salmon. Of course, sometimes luck and the weather cooperates and sometimes it doesn't (see Section E.6.).

Other aspects of logistics for the Puale Bay camp include resupplying them with food and mail every 10 days or so... a task that can only be accomplished by helicopter, PA18 or Cessna 185. In past years we tried larger planes (Cherokee Six, Cessna Caravan) and got them stuck on the beach! Once the people, equipment, and supplies are at the camp, they still have to contend with periodic flash floods of nearby creeks, winds gusting 40-50 knots during summer gales, brown bears as uninvited dinner guests (see Section G.8.), and the usual endless string of mechanical problems with motors, radios, heaters, etc. With the tight margin of safety and the associated high costs of maintaining field camps such as Puale Bay, it is important to recruit technicians and volunteers with some prior field experience.

The Puale Bay field camp was concluded on September 21st, but removal of the camp equipment ended up taking six days! A Bell 206 helicopter was initially used to sling the gear 13 miles to Bible Camp, adjacent Becharof Lake. A DeHavilland Otter on wheels chartered from Alaska Cargo Service, Dillingham, AK was then used to transport the gear to King Salmon. On the "last load", the plane ran out of runway. Neither the pilot or BT Thomson was hurt in the resulting crash; but major damage was incurred to the plane. The helicopter was again called up to help salvage camp equipment on board the Otter and sling it back to the airstrip. Next came an Office of Aircraft Service's Grumman Goose. Strong winds and high waves on the lake forced the Goose to land 1/2-mile from the gear. Strong backs and several trips later, everything finally ended up back in King Salmon, except the 4-wheeler trailer and a "missing" empty storage barrel.

Refuge staff training and conference attendance.

Training/Meeting	Location	Dates
Refuge Manager Ron Hood:		
EEO Training	Anchorage, AK	2/6 - 2/7
Project Leader's Meeting	Anchorage, AK	4/2 - 4/6
Drug-Free Workplace Training	Anchorage, AK	4/2
3rd Alaska Interagency Bear Workshop	Anchorage, AK	4/10 - 4/11
Hazard Material Training (OWSWOPER)	Anchorage, AK	5/1 - 5/2
Defensive Driver Training	King Salmon, AK	5/26
Subsistence Planning Meeting	Girdwoord, AK	6/14 - 6/15
Take Pride in America Awards Ceremony	Washington, D.C.	9/17 - 9/18
QMIS Rental Survey Training	Anchorage, AK	9/19 - 9/22
Deputy Refuge Manager Rick Poetter:		
Archeological Resources Protection Training	FLETC Brunswick, GA	2/5 - 2/8
Arctic Survival Training	Eielson AFB Fairbanks, AK	2/19 - 2/23
Law Enforcement Refresher Training	Marana, AZ	3/1 - 3/7
Pre-Retirement Seminar	Anchorage, AK	3/28
Cross Cultural Seminar	Anchorage, AK	3/29
Project Leader's Meeting	Anchorage, AK	4/2 - 4/6
Drug-Free Workplace Training	Anchorage, AK	4/2
Hazard Material Training (OWSWOPER)	Anchorage, AK	5/1 - 5/2

Training/Meeting	Location	Dates
Defensive Driver Training	King Salmon, AK	5/26
ADF&G Steel Shot/ Shooting Clinic	Anchorage, Ak	8/5 - 8/7
Project Leader's Meeting	Homer, AK	11/14 - 11/15
Assistant Refuge Manager/Pilot Randy Arment:		
Law Enforcement Refresher Training	Marana, AZ	3/1 - 3/6
Firearms Instructor Training	Marana, AZ	4/9 - 4/19
Aviation Safety Seminar	Anchorage, AK	4/21
Hazard Material Training (OWSWOPER)	Anchorage, AK	5/1 - 5/2
Defensive Driver Training	King Salmon, AK	5/26
Ground School Recurrent Training	Anchorage, AK	12/3 - 12/7
Outdoor Recreation Planner Jose Rodriguez:		
Alaska Recreation and Parks Association Meeting	Anchorage, AK	2/26 - 2/28
Arctic Survival Training	Eielson AFB Fairbanks	2/19 - 2/23
CISPUS Workshop	Randle, WA	3/5 - 3/8
Hazard Material Training (OWSWOPER)	Anchorage, AK	5/1 - 5/2
Defensive Driver Training	King Salmon, Ak	5/26
Wildlife Biologist Donna Dewhurst:		
Pintail Workshop	Anchorage, AK	1/17
Arctic Survival Training	Eielson AFB Fairbanks, AK	2/12 - 2/15
Law Enforcement Refresher Training	Marana, AZ	3/14 - 3/20

Training/Meeting	Location	Dates
3rd Alaska Interagency Bear Workshop	Anchorage, AK	4/10 - 4/11
Hazard Material Training (OWSWOPER)	Anchorage, AK	5/1 - 5/2
Emergency Medical Technician II Training	Naknek, AK	11/6 - 12/5 (employee initiative)

Refuge Secretary Jan Collins:

Supervisory Training	Correspondence Study	comp. 7/10
Detail to RO	Anchorage, AK	8/8 - 9/30

Biological Technician "Moose" Mumma:

Hazard Material Training (OWSWOPER)	Anchorage, AK	5/1 - 5/2
Defensive Driver Training	King Salmon, AK	5/26

Maintenance Worker Gary Terry:

Defensive Driver Training	King Salmon, AK	5/26

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.

Little information is available on the cover types 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
	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

[a] Data from Bristol Bay Land Cover Cooperative Mapping Project.
[b] Due to scale of Landstat cover type mapping, total land cover acreage does not correlate with land status acreage.
[c] Includes Ugashik, Chignik and Pavlof management units.

The Kialagvik Ice Field spurs off numerous coastal glaciers from Wide Bay south to Agripina Bay.
8/90, DAD

Alaska Peninsula rivers and creeks support wet meadows of lush vegetational growth including a wide diversity of wildflowers. 8/90, DAD

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 Meshik River drainage is an example of the vast wetland complexes located along the Bristol Bay side of the Aleutian Range. 8/90, DAD

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 "pothole" 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.

Moderately well drained areas are dominated by moist tundra. This type makes up about five percent of the area on Becharof Refuge (Table 8) 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.

The small flowers of rock jasmine and moss campion dot the alpine tundra with color. 6/90, DAD

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.

12. Wilderness and Special Areas

Becharof Refuge. Approximately 400,000 acres or one third of the refuge was established under the Alaska Lands Act as the Becharof Wilderness. 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.

On January 1st, four private inholdings existed within the wilderness area. Three of the inholdings are owned by guides. Registered guide, Philip Shoemaker, owns two of the parcels and has built new lodges on both. The Service completed the purchase of the third, a 17-acre inholding, from former Alaska Governor, Jay Hammond on October 24th. It is now included in the Becharof Wilderness Area (see Section C.1.).

Mt. Peulik and the adjacent Ugashik caldera as viewed from the southwest (proposed wilderness). 8/90, DAD

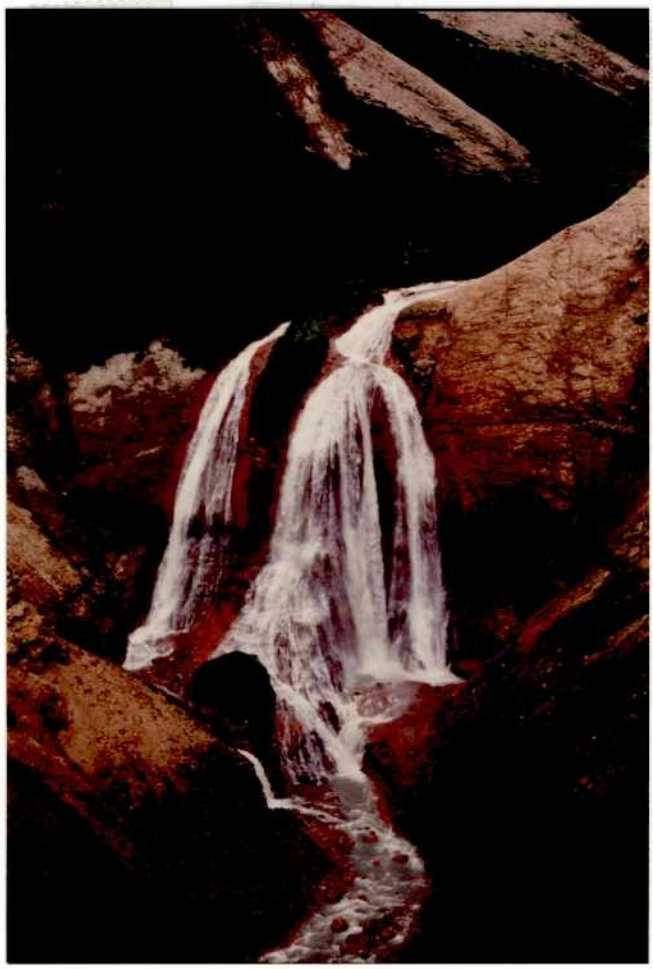
View at the top of Mt. Peulik looking toward Becharof Lake (proposed wilderness). 8/10/90, REH

An additional 347,000 acres (29 percent) 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. No Congressional action has been taken on this proposal to date.

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. No Congressional action has been taken on this proposal to date.

The Ugashik caldera as viewed from Mt. Peulik looking to the south (proposed wilderness). 8/10/90, REH

Inactive steam vents/maars inside the Ugashik caldera (proposed wilderness). 8/10/90, REH



Scenic waterfall on Hot Springs Creek as it exits the Ugashik caldera (proposed wilderness). 8/10/90, REH

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.

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 3,700 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.

The intracaldera cone of Mt. Veniaminof barely smokes today, in contrast to its last eruption in 1983 (proposed wilderness). 5/90, DAD

14. Exxon Valdez Oil Spill

On March 24, 1989, the oil tanker Exxon Valdez ran aground in Prince William Sound spilling 11 million gallons of crude oil into the Gulf of Alaska. Within two months, prevailing currents carried the oil into the Shelikof Strait impacting shorelines of Kodiak and the Alaska Peninsula. The first documented shoreline oil impacts on the Alaska Peninsula/Becharof refuges occurred on April 30, 1989. Personnel from the Refuge, State of Alaska, and Exxon continued to monitor coastal impacts of the oil from May to November 1989. Clean-up activities were conducted by Exxon/Veco on the Becharof Refuge, until September of that year. Over the winter, Exxon set up an oil impact monitoring program in Chignik, surveying beaches of the Alaska Peninsula Refuge's Chignik Unit through March 1990.

In spring 1990, Exxon developed interagency teams to survey beaches with known oil impacts in 1989. These Shoreline Survey Assessment Teams (SSAT) began surveying refuge beaches in April 1990. Following written guidance provided by Acting Regional Director Rogers, dated April 23, 1990, the refuge initiated an independent program of shoreline impact reconnaissance and assessment, using standardized SSAT survey techniques. The primary purpose of the Service's reconnaissance program was to survey, on foot, as much of the 1170 kilometers (km) (725 mi) refuge coastline as possible. Program objectives included:

A) Determine the current extent of visible oil impacts on refuge coastline,

B) Assess the habitat impacts for treatment versus non-treatment recommendations, and
C) Survey for any adverse impacts to local wildlife.

Volunteer Lynn Schwartz completes a reconnaissance survey of Orzinski Bay in the Refuge's Chignik Unit.
5/90, DAD

In addition, these surveys documented relative abundance and distribution of surface and subsurface oil, approximately one year following initial shoreline impacts.

Shoreline assessment surveys were conducted from April 26th to August 13th, using a chartered Bell 206 helicopter for access. A detailed discussion of survey results is available through the refuge report "Exxon Valdez Oil Spill Impact Assessment on the Pacific Coast of the Alaska Peninsula and Nearshore Islands, Cape Kubugakli to American Bay."

Oil Impact Categories, as used in this discussion are defined as:

Wide	>6 meters and >50 percent oil cover,
Medium	>6 meters and <50 percent oil cover or 3-6 meters and >10 percent oil cover,
Narrow	<3 meters and >10 percent oil cover, and
Very Light	<10 percent oil cover, regardless of width.

Oil coating on rocks was frequently still visible 16 months after the spill, despite the action of winter surf. 6/90, DAD

Oil Impact Extent and Distribution

Overall, shoreline oil impacts observed along the Alaska Peninsula, one year after the Exxon Valdez spill, were very light to none except for the Becharof Refuge (Table 9). Despite clean-up efforts during 1989, the Becharof Refuge still averaged 25 percent impacted shoreline, due to scattered patches of narrow to wide bands of oil. The heaviest impacts recorded were in the lower energy bays (Alinchak, Puale, Dry, Island).

Table 9. Quantities of shoreline oil impacts from the Exxon Valdez oil spill observed from April - August 1990, from Cape Kubugakli to American Bay along the Alaska Peninsula, Alaska.

Geographic Unit	Oil Impact Categories %Wide	%Med	%Nar	%VLight	%None	Total Area (meters)
Becharof Refuge						
Alinchak Bay	<1	2	1	23	74	63,965
Puale Bay	<1	--	<1	23	76	23,129
Cape Aklek,Oil Creek	--	<1	2	2	96	16,071
Dry Bay	<1	<1	6	65	28	9,221
Cape Unalishagvak	--	--	--	<1	99	1,400
Island Bay	<1	<1	<1	41	57	13,524
Portage Bay	--	--	<1	10	89	27,043
Overall Becharof	<1	1	1	22	75	153,353
Alaska Peninsula Refuge - Ugashik Unit						
Wide Bay	--	--	--	<1	99	97,474
Imuya Bay	--	--	--	<1	99	14,000
Agripina Bay	--	--	--	<1	99	30,300
Port Wrangell	--	--	--	<1	99	50,554
Chiginagak Bay	--	--	--	<1	99	47,917
Nakalilok Bay	--	--	--	<1	99	17,414
Yantarni Sound	--	--	--	<1	99	14,160
Yantarni Bay	--	--	--	<1	99	14,881
Overall Ugashik Unit	--	--	--	<1	99	262,700
Alaska Peninsula Refuge - Chignik Unit						
Kujulik Bay	--	--	--	<1	99	37,765
Cape Kumlium	--	--	--	<1	99	5,282
Hook Bay	--	--	--	--	100	3,520
Chignik Bay	--	--	--	--	100	4,400
Lumber Bay	--	--	--	<1	99	15,250
Jack Bay	--	--	--	--	100	11,990
Castle Bay	--	--	--	--	100	1,508
Castle Cape	--	--	--	<1	99	20,600
Warner bay	--	--	--	<1	99	16,255
Devil's Bay	--	--	--	<1	99	13,500
Kuiukta Bay	--	--	--	<1	99	79,726
Mitrofania Bay	--	--	--	<1	99	40,152
Anchor Bay	--	--	--	--	100	11,584
Perryville	--	--	--	<1	99	19,688
Humpback Bay	--	--	--	<1	99	18,090
Ivanof Bay	--	--	--	<1	99	19,292
Kupreanof Peninsula	--	--	--	<1	99	25,747
Stepovak Bay	--	--	--	--	100	101,840
Overall Chignik Unit	--	--	--	<1	99	446,205

Alinchak Bay -- Alinchak Bay, being the furthest north, received some of the heaviest impacts (Table 9). Oil tended to collect in the intertidal lagoons on both the north and south ends of the bay. Oil pooled along the edges of these shallow mudflats in areas inaccessible during all but the lowest tides. Harbor seals and migrating shorebirds were common in these shallow lagoons, but no detrimental impact from the oil was observed this year. On Alinchak's higher energy beaches, oil coat and stain was still very apparent on accumulated driftwood and debris.

Alinchak Bay -- from a distance it still looks pristine.
8/90, DAD

Puale Bay -- The Kekurnoi Islets of Puale Bay were not checked on foot in 1989, but inspection this year by an Exxon survey team found large patties and accumulations of mousse warranting type "A" clean-up and bioremediation. Islet impacts were rated as light and very light, and type "A" treatment was later conducted by Exxon on the closest two islets.

Along the mainland shoreline of Puale Bay, the heaviest impacts were found adjacent to the Kekurnoi Islets and at the mouth of Helen Creek. Early in the summer, Exxon reported a wide band of pooled oil and asphalt pavement, and subsequently conducted type "A" treatment to remove it. At Helen creek, a wide band of pooled oil covering 10 m^2 was discovered by a Service survey team in June. The oil was melting in the sun, creating strong rainbow sheen in the creek and adjacent cove.

The wide, sandy beaches and lagoon at the head of Puale Bay, contained scattered patches of mousse patties, warranting type "A" treatment early in June 1990. The sandy beaches on the bay's south side, between Teresa and Trail Creeks, also contained scattered mousse patties warranting a request by the Service for beach treatment in 1990. Overall, the "moderate" impacts seen in Puale Bay during 1989 were largely non-existent by the summer of 1990.

Dry Bay -- Dry Bay had the highest percent cover by oil impacts (72 percent) along the refuge shoreline; however, most of the impact was very light (Table 9). Dry Bay is primarily a low energy, intertidal mudflat that goes completely dry on extreme low tides. Oil impacts seen in 1990 were concentrated along the south side of the bay near the outfall of Rex Creek. Patches of narrow to wide bands of oil were present along the edge of the bay extending into the supratidal grasses. A silver to rainbow sheen was visible when walking across the interior of the bay at low tide. Type "A" treatment was requested by the Service for the south side of the bay.

Island Bay -- Jute Island at the mouth of Island Bay, is the home for hundreds of burrowing tufted puffins. The island has a high energy, steep, rocky coastline making access difficult. Despite its prominent location, only sparse amounts of oil stain and coating were found on the rocks.

Exxon helicopter fuel cache located at Island Bay.
6/6/90, REH

The only 1990 Exxon helicopter fuel cache was located just inland of the head of Island Bay, making surveys convenient for both Exxon and the Service. A wide band (60 m^2) of pooled oil on the south side of the bay, was the southern extent of moderate oil impacts observed in 1990 (Table 9). The remainder of Island Bay contained scattered patches of patties, tarballs, and staining on driftwood, covering about 40 percent of the shoreline (Table 9).

Ugashik and Chignik Units -- From Portage Bay southward along the Alaska Peninsula, only very light oil impacts were documented (Table 9). Observed impacts were patchy, usually only infrequent patties or staining on driftwood. No oil impact was evident in 1990 for several localized areas, primarily higher energy, north-facing capes between bays. The southern extent of observed shoreline impact was on the north side of the Kupreanof Peninsula, adjacent to Ivanof Bay.

American Bay, the southernmost portion of the Refuges' Pacific coastline, survived the oil spill with no visible shoreline impacts. 5/90, DAD

Despite ranking as a very light impact, one section near the head of Wide Bay, had treatment requested by the Service in 1990. The area involved a more concentrated patch of oil patties on a sandy beach.

Shoreline and Offshore Sheen

Varying types of oil film or nearshore sheen, were observed throughout the study area; however, an accurate relationship to the Exxon Valdez spill was not determined. Generally the type of petroleum creating the sheen could not be readily identified in the field. In several cases, diesel from bilge-water was suspected to have come from local fishing boats or processors. In May 1990, a Service survey crew documented a diesel spill, from a fish processor in Ivanof Bay, with sheen impacting shoreline over two kilometers from the vessel.

While conducting shoreline reconnaissance, a refuge survey crew discovered this diesel spill from a fish processor in Ivanof Bay. 5/90, DAD

Sandy beaches from Alinchak Bay south to Kejulik Bay consistently exhibited patchy sheen in the lower intertidal zone and wherever water pooled. Observed film color varied from rainbow to silver, with the most visible sheen documented in Alinchak, Puale, Dry and Island Bays.

Despite speculation that sheening would not be visible until mid-summer, refuge survey crews observed shoreline rainbow sheening in Island Bay as early as late April, while pockets of unmelted snow still covered the supratidal zone. The beaches of Alinchak through Island Bay (heaviest impacted beaches in 1989) appeared to still be saturated with oil on the surface, producing sheen when disturbed by walking. Yet, test pits dug along those segments revealed a patchy distribution, with sheen predictably strongest near areas still containing narrow to wide bands of oil.

In Puale and Alinchak Bays, patches of pooled oil in rocky crevices were monitored periodically throughout the 1990 summer. Observations of sheen

distribution and breakdown were similar to those documented on Kodiak Refuge. Periods of calm water and sun combined to produce fresh sheen in water directly flushed over melting oil. Sheen patches were also limited in size, spreading only 1-3 meters (m) from the origin. Helen Creek, in Puale Bay, was the only example of extensive sheen, with pooled oil along the stream bank exuding sheen into the creek, with sheen carried 40 m downstream to the stream's outlet. Once in Puale Bay, the sheen was quickly dispersed with surf action, preventing any formation of offshore bands of sheen.

Exxon helicopter departs Alinchak Bay with U.S. Coast Guard inspection team. The Guard's onsite Commander agreed with the Service's recommendation for additional clean-up. 8/10/90, REH

Surveys for offshore sheen were conducted incidentally to the 1990 shoreline surveys. Observations were made usually while flying across bays and around capes enroute to survey beaches. On April 25th, an unusually calm day allowed the survey crew to fly the Becharof Refuge coast looking for sheen. Numerous long lines of light brown foam/mousse, with rainbow sheen, were sighted in Puale and Alinchak Bays. In Alinchak, one of the lines of foam appeared to extend onto an accessible mudflat, so it was investigated. What appeared to be brown mousse-like foam from the air, turned out to be decaying green algae producing a sheen. We were never able to positively link any lines of mousse or offshore sheen to the Exxon Valdez oil spill during the 1990 study period.

Subsurface Oil

Signs of subsurface oil were primarily restricted to the area from Alinchak Bay to Island Bay, with subsurface oil film found as far south as Agripina

Bay. Most of the subsurface oil found was film on sediments or on the water backfilling the pits. Layers of buried oil were found in areas still containing asphalt pavement, pooled oil or in areas with a history of pooled oil. Sediments saturated with oil were found in Alinchak Bay, Puale Bay, and Island Bay, but these appeared to be isolated patches. Subsurface oil documented in Puale Bay, during the summer of 1989 was not evident this year.

Oil Impacts in the Intertidal Zones

The upper one third of the intertidal zone received, by far, the highest impact observed on the Alaska Peninsula. In agreement with last year's observations, oil impacts accumulated at the mean high tide line, generally with the debris/driftwood line. During the 1990 surveys, this impact was primarily sparse tarballs, patties and staining on driftwood. In the heavier impacted Becharof Refuge coast, all tidal zones were effected. Proceeding south along the peninsula, the impacts became more restricted to the upper beach. Sheening was the one exception, being more common on the lower one third of the intertidal zone.

Shoreline Ecological Assessment - Invertebrates/Plants

Information on oil related mortality of intertidal life was restricted to observations of beached remains. Items common and ubiquitous to most beaches surveyed included: jellyfish, alaria, bull, wrack, and colander kelp, red laver, confetti, and rockweed. More noteworthy observations of mortality included:

May 26 - Scattered single blue mussel shells, few drilled, Kujulik Bay;
May 30 - 100-300 butter clam shells, 16 sand dollars - Island Bay;
June 9 - Four stickleback fish carcasses floating in a intertidal pool covered with thick sheen - Alinchak Bay;
June 12 - One octopus carcass - Agripina Bay;
June 23 - Numerous shells of butter clams, cockles dungeness crabs and 15 jellyfish (Aurelia, (Cyanea) - Puale Bay; and
July 10 - 50-60 carapaces of dungeness crabs, 20-30 jellyfish (Aurelia) Port Wrangell.

Shoreline Ecological Assessment - Avian/Marine Mammals

Observations of marine bird and mammal mortalities were much lower than in 1989 (Table 10). Similar to last year, alcids were the most common bird carcasses found. Most of the carcasses had no sign of oiling present, the exception being:

April 30 - Horned puffin - old/dried carcass w/light oiling - Island Bay;
May 8 - Unidentified bird - old/dried carcass w/heavy oiling - Dry Bay;
May 8 - Sea otter pup - fresh w/light oiling (sheen) - Dry Bay; and
June 25 - Northern fulmar - decomposing with moderate oiling - Puale Bay.

Table 10. Carcass inventory of birds and mammals documented while conducting shoreline assessment surveys, April - August 1990, from Cape Kubugakli to American Bay along the Alaska Peninsula, Alaska.

Birds	
Procellariidae	
Northern fulmar	3
Sooty shearwater	1
Hydrobatidae	
Fork-tailed storm-petrel	1
Phalacrocoracidae	
Unknown cormorant	1
Accipitridae	
Bald eagle	1
Laridae	
Black-legged kittiwake	5
Glaucous-winged gull	2
Alcidae	
Tufted puffin	5
Horned puffin	2
Unknown puffin	1
Parakeet Auklet	1
Common murre	4
Unidentified Bird	10
Total bird carcasses	37
Mammals	
Mustelidae	
Sea otter	4
Otariidae	
Steller sea lion	1
Erethizontidae	
Porcupine	1
Delphinidae	
Pilot whale	1
Eschrichtiidae	
Gray whale	1
Total mammal carcasses	8

The only carcasses returned to King Salmon, for frozen storage, were two fresh sea otters (one adult, one pup) and one adult bald eagle.

Results of Exxon's 1989/1990 Clean-up Activities

During 1989, shoreline clean-up by Exxon/VECO consisted of "type A" treatment (manual pick-up using shovels) on sandy beaches. Clean-up activities concentrated on Puale Bay for most of the 1989 summer, with an end-of-season effort applied to Alinchak and Dry Bays. The Alaska Peninsula

Refuge never received detailed documentation on the 1989 clean-up, so some questions remain to this date. Some beaches were suspected to have been treated in 1989, because large plastic bags filled with oil patties and sand were found on the sites during 1990 surveys. The main 1989 clean-up effort, in Puale Bay, did make significant improvements in removing surface oiling, but enough oil remained to warrant repeat treatment in 1990. Possibly, some of the Puale Bay oil may have been covered and uncovered by tides, over the winter, creating the need for later treatments.

Shoreline segments identified in 1990 for treatment by Exxon stretched from Alinchak Bay south to Wide Bay. Treatment efforts again concentrated in Puale and Alinchak bays, with no effort south of Teresa Creek in Puale Bay. Additional treatment sites were requested by the refuge for Dry, Island and Wide bays, but treatment was not conducted in 1990. Shoreline treatment during 1990 consisted of "type A" methods combined with bioremediation ("Customblen" fertilizer). Service Biologists Otto Florschutz and John Hardister, and BT Greg Thomson monitored all shoreline treatment. All 1990 shoreline treatment was satisfactorily completed with the exception of one segment in Alinchak Bay.

Bioremediation in the form of "Customblen" fertilizer (visible as small shot-like pellets in center of photo) was used in Alinchak and Puale bays clean-up sites.
8/90, DAD

Wildlife Impact Damage Assessment

The assessment of the oil spill impacts on refuge wildlife went beyond the initial documentation of beached carcasses. On a regional level, several

specially funded damage assessments projects were initiated in 1989 to emphasis species specific impacts. Many of these projects were continued in FY 1990. Not all of the projects applied to the Alaska Peninsula, so our involvement was restricted to the following projects: "Population Surveys of Seabird Nesting Colonies...with Emphasis on Changes of Numbers and Reproduction of Murres" and "Assessing the Effects of the Exxon Valdez Oil Spill on Bald Eagles." See Sections G.5. and G.6. for further discussion of study methodology and general results for the Alaska Peninsula.

G. WILDLIFE

2. Endangered and/or Threatened Species

Aleutian Canada Geese

Aleutian Canada geese were sighted on two different occasions on the Pacific coast of the peninsula. On May 5th, a group of six small Canada geese was sighted on the Kekurnoi Islets of Puale Bay. Biologist Dewhurst and Volunteer Lynn Schwartz were able to get close enough to read one red-plastic leg band (#374), with the remaining five geese being non-banded. Upon conferring with WB Vern Byrd at Adak, we identified the goose as being banded in 1983 at the Del Norde County Airport in Crescent City, California. On May 23rd, another group of five small Canada geese was sighted from the helicopter near Kumlik Island off the coast of Aniakchak National Monument. Subspecies confirmation was not possible on this group of geese. These are the first records of Aleutian Canada goose sightings along the northern Alaska Peninsula.

This flock of six Aleutian Canada geese staged on the Kekurnoi Islet of Puale Bay during spring migration.
5/5/90, DAD

Steller Sea Lions

Steller sea lions were added to the threatened list this year, providing only the second threatened and/or endangered species to use Alaska Peninsula habitat. Most of the coastal habitat use is on the nearby islands of the Alaska Peninsula Unit of Alaska Maritime Refuge including: Alinchak Islets, Kekurnoi Islets, Aiugnak Columns, Ugaiushak Island, Sutwik island, Kak Island, Atkulik Island, Chankliut Island, and Spitz Island. The only two documented mainland haul-outs are currently on Kupreanof Point of the Kupreanof Peninsula and Seal Cape, both in the Refuge's Chignik Unit. In June, the Alaska Peninsula/Becharof refuges sought and received a permit from National Marine Fisheries to observe and monitor sea lions along the Pacific coast. Records of abundance and distribution were kept throughout the summer, while conducting oil spill-related surveys. Careful observations were made for marked individuals and pups. None of the haul-outs appeared to be active breeding colonies.

Steller sea lions crowd rocky haul-outs along the Refuge's Pacific coastline. 6/90, DAD

3. Waterfowl

Emperor Geese

Emperor geese are a northern flyway species, with 80 to 90 percent of the population remaining within Alaska throughout the year. This Alaska contingent nests along the coastal fringe of the Yukon-Kuskokwin Delta and the eastern coast of Siberia. Thousands of geese stage along the Bristol

Bay coastline each spring and fall enroute to and from their Aleutian Island and Alaska Peninsula wintering areas.

"Migration watches" for emperor geese were initiated in 1986 during fall staging on the lagoon at Cinder River, along the Bristol Bay side of the Alaska Peninsula. In 1988, the Alaska Fish and Wildlife Research Center initiated a six-year study of neck-collared emperor geese to examine mortality, behavior, and migration routes. In past seasons, geese were monitored at two sites, Cinder River and Nelson Lagoon (discussed in Izembek's Annual Narrative). In autumn 1990, two sites were added to the survey: Port Heiden and Seal Islands (Figure 5).

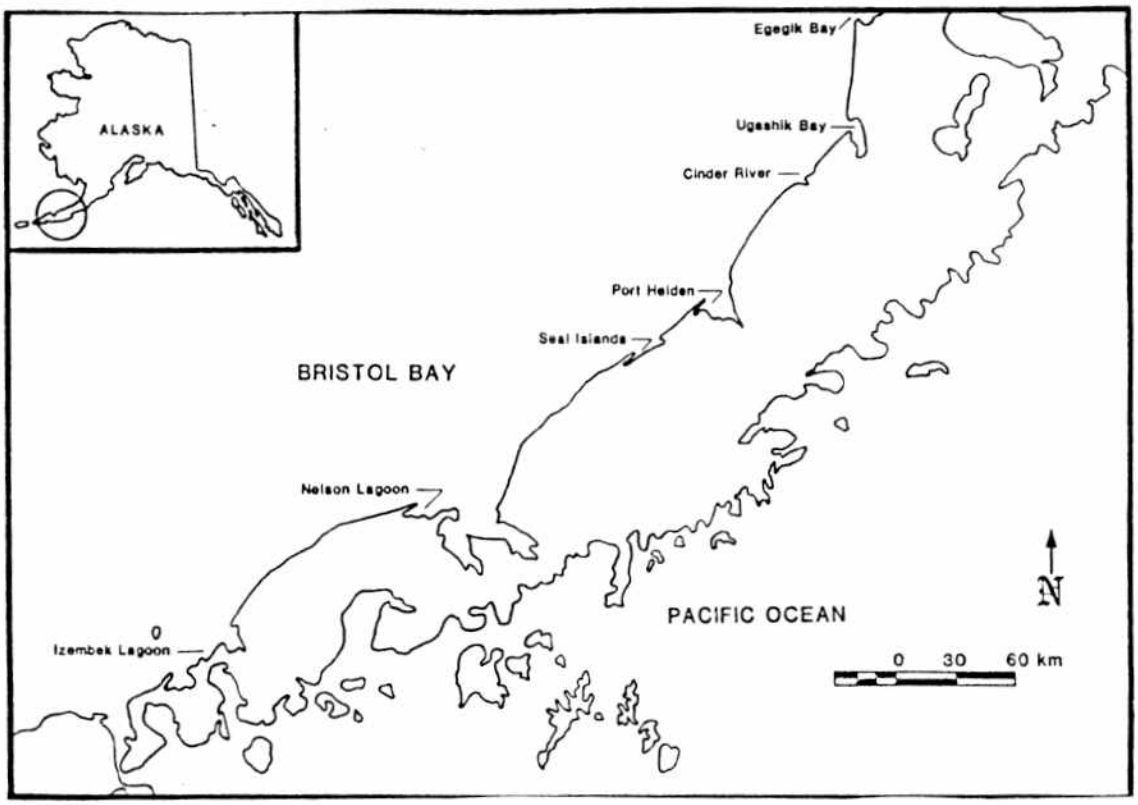


Figure 5. Major estuaries on the Alaska Peninsula that are used by emperor geese during spring and fall migration.

During the spring surveys at Cinder River the proportion of juveniles increased from April to May, with age ratios increasing from 21.7 $\pm$ 2.8 percent to 31.9 $\pm$ 6.0 percent. Apparently breeding adults migrated to the Yukon-Kuskokwim Delta before juveniles and non-breeders, and family associations were weak. The mean length of staging in the Alaska Peninsula lagoons was 8.4 days.

"Migration Watches" at Cinder River have monitored staging emperor geese since 1986. 4/90, JAS

During autumn 1990, the peak number of geese observed varied from 8,000 to 13,000. Biologists Rod king and Alan Brackney estimated 11,910 geese on the October 17th aerial survey. A total of 238 neck-collared geese were documented at Cinder River, of which 44 were also observed at other study sites during the same period. This increase over the 153 collared geese seen in Fall 1989 was largely due to a less than 50 percent increase in the number of newly banded birds in 1990. Of the collared individuals, 130 stayed at Cinder River for more than a month.

Two personnel were stationed at Strogonof Point in Port Heiden from September 21st to October 6th. They observed geese near the village of Meshik and then departed for Seal Islands, where they stayed until October 29th. Due to the large size of the Port Heiden and Seal Islands lagoon complexes, ground based population estimates were not feasible. Biologists King and Brackney estimated 21,677 and 19,990 geese on their October 17th aerial survey. Within each lagoon, only a small portion of the goose population was accessible to ground personnel. Total collared geese seen were 119 at Strogonof Point, 13 at Meshik, and 72 at Seal Islands. Of these identified geese, 165 were unique to these areas and not seen elsewhere on the peninsula.

Mark-recapture results indicate that annual survival was among the lowest recorded for geese. At Cinder River, adult goose survival has ranged from 61 to 69 percent, with a much lower juvenile survival of 11 to 39 percent. The highest rate of mortality occurred from summer banding to fall migration. Over the fall, juveniles composed a declining proportion of the observed sample of geese.

Greater White-fronted Geese

In 1988, the Alaska Peninsula Refuge assisted the Alaska Research Center in a study of subpopulations of greater white-fronted geese on the Alaska Peninsula. Based on observations of white-fronts in the Ugashik drainage, in early summer, it was determined that a small population of molting geese (both greater white-fronts and Taverner's Canada geese) uses the habitat in the vicinity of Hook Lagoon, along the Bristol Bay coast. An effort to band the molting geese was successfully initiated in 1988, providing incentive to continue the banding project on an annual basis.

Results of following collared white-fronted geese over the 1989/1990 winter yielded positive motivation to continue the Bristol Bay banding effort. In summary, during 1989, geese were radio-collared on the Yukon-Kuskokwin Delta (20) and the Bristol Bay Lowlands (Alaska Peninsula - 15, Nushagak Peninsula -15), with the later being all non-breeding birds. Over 80 percent of the collared birds were relocated on staging or wintering grounds, with Klamath Basin, CA being the most important for fall staging. Bristol Bay geese arrived in Oregon and California significantly earlier than Yukon Delta birds. At least 75 percent of the 24 Bristol Bay geese sighted south of Alaska spent time in Mexico, either on the west coast (n=2) or in the interior highlands (n=18). One collared bird was found at both locations (Figure 6).

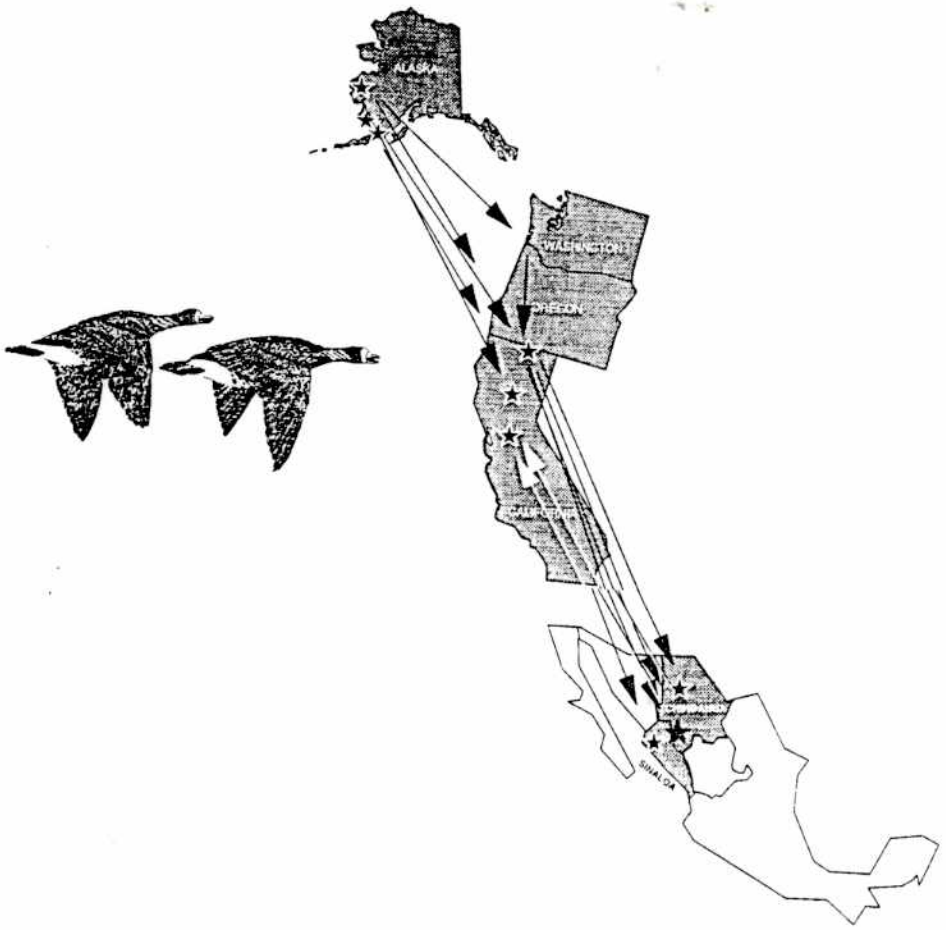


Figure 6. Migration route of Pacific Flyway white-fronted geese that are banded/neck collared on the Alaska Peninsula.

Most of the radioed geese in Mexico were located in the state of Chihuahua at Laguna Babicora, Laguna de los Mexicanos, Laguna de los Bustillos, Laguna de Pedernales and Laguna Toronto. Most (75 percent) of the geese found in Mexico in December 1989 returned to the San Jaoquin Valley or Sacramento-San Joaquin Delta of California by the end of January 1990. Indications are that the Bristol Bay geese may be part of a subpopulation which migrates into Oregon and California in early September, continues to Mexico by early October, and returns to California in January. Although little is known of harvest rates in central Mexico, winter mortality rates may differ substantially between the two subpopulations of white-fronted geese, emphasizing the need for continued radio-collaring and banding efforts in Alaska.

BT Mumma and Hankins apply collar-mounted radio transmitters to white-fronted geese.
7/5/90, RDP

In June 1990, Biologist Dennis Orthmeyer, Northern Prairie Wildlife Research Center, again lead this year's cooperative banding effort between Togiak and Alaska Peninsula refuges to capture the molting Bristol Bay white-fronted geese. On the Alaska Peninsula, a drive-trap was set up on a lake near Mud Creek to capture the flightless geese. Capture attempts were made on June 29th and July 5th, using a Bell 206 helicopter and the refuge's Cessna 206 to drive the birds into the trap. Togiak Refuge's BT Diane Campbell joined refuge personnel (WB Dewhurst, DRM Poetter, ARM/P Arment, BT Mumma and Hankins, and Volunteer Opay) in the banding effort. Twenty-four white-fronts were captured and fitted with both radio collars and aluminum leg bands. Blood samples and a variety of other measurements were taken from the captured geese. Adverse winds combined with just plain bad luck contributed to the low number of geese captured.

To follow-up on movements of the collared geese, ARM/P Arment and BT Mumma conducted an aerial survey on July 26th in the refuge's Cessna 206 from Ugashik Bay south to Muddy Creek. A total of 10 signals were received, with several transmitting on the mortality frequency. On August 11th, WB Dewhurst and BT Thomson resurveyed the banding site area in a Bell 206 helicopter, attempting to locate the downed transmitters. Two radio collars (167.350 and 167.120) were found along with a collar (167.590) on a live bird mingling with the 40-50 geese remaining in the area. No sign of a carcass, other than a couple of down feathers, was found with the downed transmitters, and the collars were intact, indicating they were not "shucked" collars. The other two transmitters (176.619 and 166.020) reported to be in mortality mode were not heard on this trip.

As of mid-December 1990, 83 percent of the 69 white-fronted geese collared in the Bristol Bay area this year were re-confirmed in California or Mexico. Of the 19 remaining active collars from Hook Lagoon on the Alaska Peninsula, 89 percent were confirmed on the wintering grounds.

Duck Production Surveys

The new state-wide plan for duck brood surveys was implemented in 1990. The Alaska Peninsula/Becharof refuges became one portion the Bristol Bay Lowlands - Waterfowl Production Area, also including Togiak and Izembek refuges and all State and Native lands from Togiak Bay south to False Pass.

A typical waterfowl production survey plot near Seal Islands on the Alaska Peninsula. Note the rare profile of Mt. Veniaminof in the background. 7/90, DAD

The entire production area, 23,393 square miles, was classified as "low strata" for waterfowl brood densities. Twenty one-mile-square sampling plots were chosen using a computer program that randomly selects latitude-longitude coordinates within the study area boundaries. Sampling plot distribution was: Nushagak Peninsula (Togiak Refuge) - 10 plots; Alaska Peninsula, Kvichak River to Port Moller (Becharof, Alaska Peninsula Refuge - Ugashik and Chignik units) - 7 plots; and the Alaska Peninsula, Port Moller to False Pass (Alaska Peninsula Refuge - Pavlof Unit, Izembek Refuge) - 3 plots. Of the seven plots in this station's management area, only three are actually on refuge lands.

A standard operating procedure was developed for brood surveys across the State. The low density strata of Bristol Bay was to be surveyed by helicopter only. WB Donna Dewhurst was chosen to conduct the brood surveys for the entire production area. Surveys were conducted on June 15th-23rd, censusing 375 total waterbodies. Of the 100 broods observed, species breakdown included: 29 - green-winged teal; 17 - mallard; 13 - pintail; 10 - scaup; five - black scoter; two - widgeon; two - tundra swan; one - oldsquaw; and one - common golden-eye, averaging 1 brood/3.6 waterbodies.

Expanding the survey results using statistics yielded some surprising totals. Bristol Bay duck production was estimated at (in thousands of broods): 82.1 - dabblers; 12.9 - divers; 11.7 miscellaneous; totalling 107.8. The miscellaneous production included tundra swans, red-necked grebes, red-throated loons, and sandhill cranes. Estimated young produced were: 430,000 dabblers; 66,900 divers; and 67,800 miscellaneous, totalling 569,300. Bristol Bay was second only to the Yukon-Kuskowin Delta in duck production! Evidentally, even though the Bristol Bay Lowlands represent low brood densities, the shear size of the area ends up contibuting a significant portion of Alaska's total duck production.

5. Shorebirds, Gulls, Terns and Allied Species

Seabird/Oil Related Studies
Puale Bay Field Camp

Sponsored by monies from continuing Exxon Valdez oil spill wildlife damage assessment projects in 1990, the Refuge operated a remote field camp, from June 17th - September 21st, in Puale Bay, along the Pacific coast of Becharof Refuge. This was the second year for this field camp, located near the mouth of Teresa Creek, on the south side of the bay (Figure 7). The camp was staffed by four volunteers (both Student Conservation Association and FWS) with a seasonal biological technician as camp coordinator. Camp objectives included:

A) Population censusing seabird colonies from Puale Bay to Cape Unalishagvak,
B) productivity monitoring of murre and cormorant colonies,
C) beached bird surveys, and
D) collecting murre eggshells for hydrocarbon analysis.

Oil Spill wildlife damage assessment studies on murre colonies continued again this summer from the Puale Bay field camp. 7/90, DAD

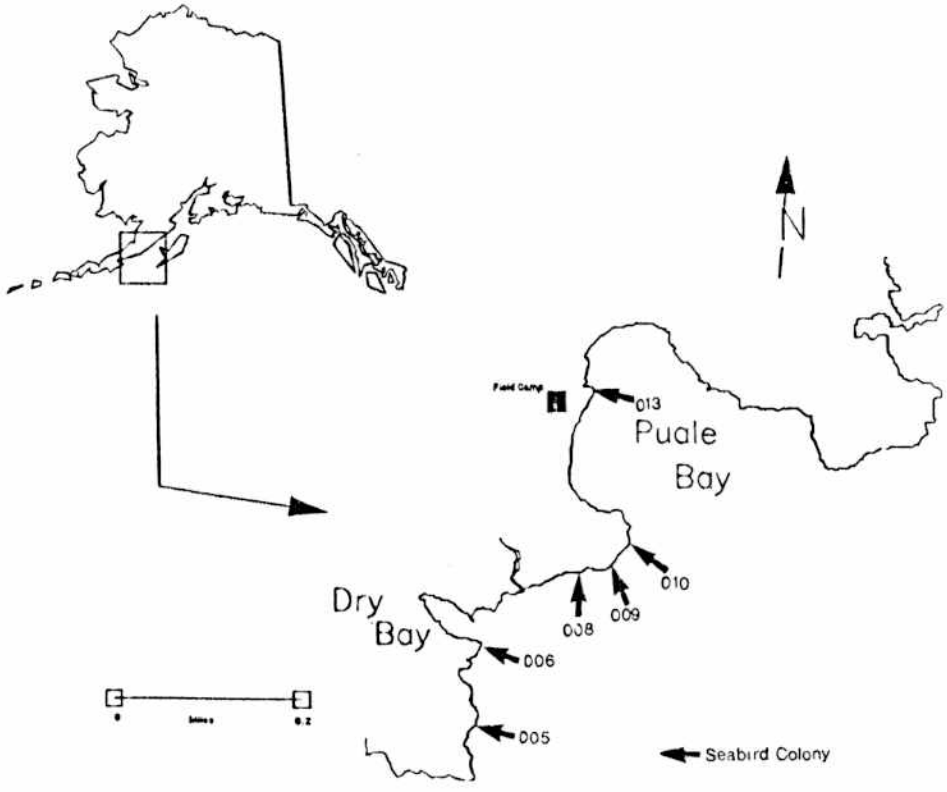
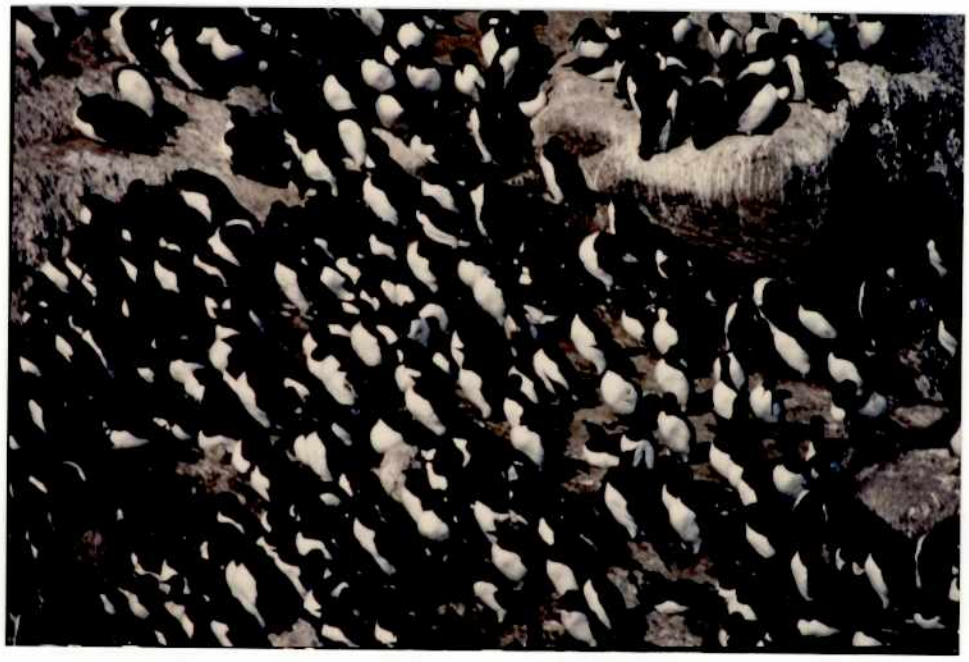


Figure 7. Location of the Puale Bay field camp and local seabird colonies along the Pacific coast of the Alaska Peninsula, June - September 1990.



Murres congregated on larger ledges prior to settling down for egg laying. 6/90, DAD

Population Censusing of Seabird Colonies

Censusing seabird colonies in Becharof Refuge was conducted from July to August to determine if numbers of selected species of breeding colonial seabirds in oiled areas have significantly changed from pre-spill surveys. Species studied emphasized common and thick-billed murres, but also included black-legged kittiwakes, tufted and horned puffins, and red-faced, pelagic and double-crested cormorants. Data from Alaska Peninsula colonies was incorporated into a larger study encompassing the entire spill area. Survey methods involved a combination of land-based plots and total counts from boats. Inflatable rafts were used to conduct replicate counts, but observers were not able to count the larger (less than 5,000 birds) murre colonies due to the instability of the rafts. The Service's Motor Vessel (M/V) Surfbird, from the Raptor Management Office in Juneau, was used again this year to successfully census these larger colonies.

A murre's eye view of the M/V Surfbird providing a platform for colony population censusing.
8/90, GLT

Tufted puffins were also common Puale Bay breeders, but even more difficult to survey than the murres. 7/90, GLT

Results from 1990 seabird population surveys are currently restricted from printing in this report due to pending oil spill legal cases.

Productivity Monitoring of Murres

The productivity of common and thick-billed murres nesting in Puale Bay colony 013, was monitored using land-based plots established in 1989. Cormorant nests within the colony were also monitored. The study period extended from June to September, 1990. Results from 1990 murre productivity monitoring area are also currently restricted from discussion in this report, due to pending oil spill legal cases.

Becharof and Ugashik Lake Cormorant Colonies

Four double-crested cormorant colonies were discovered this summer on the refuges' larger lakes. Thanks to observations from the Ugashik Narrows field camp crew, two colonies were identified on islands of the Lower Ugashik Lake. Twenty-seven nests were documented along the cliffs of two islands, with over 38 chicks observed. Following this cue, we decided to investigate other lake islands for seabird nesting. The third and largest cormorant colony was located on "Egg Island" near Gas Rocks, on Becharof Lake. Twenty-four active cormorant nests were found along the cobble shoreline of this flat, grassy island inhabited by several hundred nesting glaucous-winged gulls. The forth colony was located on a similar flat island near the Severson Peninsula of Becharof Lake, with 22 active nests counted. Both colonies on Becharof Lake appeared to be easily accessible by mammalian predators (foxes, bears), but showed no sign of predation.

Double-crested cormorant colony on Egg Island on Becharof Lake. 8/90, DAD

6. Raptors

Aerial random plot surveys of Refuge bald eagles were established in 1983 and repeated in 1987. In response to a request by the Migratory Bird Management Division in 1989, the Refuge initiated eagle productivity monitoring along the Pacific coast from Cape Kubugakli to Cape Kunmik, to investigate effects of the Exxon Valdez oil spill on eagle reproduction. In 1990, the survey area was expanded to include the Chignik Unit and Aniakchak National Monument. Bell 206 Jet Ranger helicopters were used in all surveys in 1990. Productivity monitoring involved three to four replicate surveys conducted during incubation, hatchling, and fledgling stages.

An unusual bald eagle "eyrie" nest site near Oil Creek, along the Pacific coast. 7/90, DAD

In 1990, 245 nests were surveyed. Nest distribution among management units included: Becharof Refuge - 14; Ugashik Unit - 26; Chignik Unit - 99; Aniakchak Monument - 17; and Alaska Peninsula Unit of the Alaska Maritime Refuge - 89. Further results were restricted from presentation in this report due to pending oil spill legal cases.

7. Other Migratory Birds

The 5th annual King Salmon-Naknek Christmas Bird Count took place on December 15th. Local results were submitted to the National Aububon Society, which sponsors and publishes results in the ornithological journal American Birds. Even though the count is not held on refuge lands, Alaska Peninsula Refuge coordinates this event. Fifteen volunteers donated their Saturday to seek out birds from Lake Camp to Pederson Point.

Despite blowing snow and the Naknek River being mostly frozen, 15 different species were spotted with a total count of 1,399 individuals. Two new species and record high counts for five species were recorded during the year's count (Table 11).

Table 11. Species composition and numbers of birds recorded in the King Salmon-Naknek Christmas Bird Count, 1986-1990.

Species	1986	1987	1988	1989	1990
Greater scaup	0	0	0	2	0
King eider	0	0	0	2	0
Oldsquaw	0	0	1	0	0
Common goldeneye	30	0	2	340	0
Common merganser	293	1,259	44	827	767
Red-breasted merganser	0	0	1	147	70
Merganser sp.	125	0	0	117	49
Duck sp.	0	0	0	36	0
Bald eagle - adult	8	14	4	8	5
immature	2	2	2	4	3
unknown	0	3	1	4	1
Northern goshawk	0	0	1	1	0
Peregrine falcon	1	0	0	0	0
Willow ptarmigan[b]	0	1	0	24	47
Glaucous-winged gull	0	60	80	107	0
Gull sp.	0	0	3	2	0
Rock dove	1	0	0	0	0
Boreal owl[a]	0	0	0	0	1
Owl sp.	0	0	0	2	0
Downy Woodpecker	0	0	0	2	2
Gray Jay	0	0	21	38	11
Black-billed Magpie[b]	42	26	41	40	65
Common Raven	231	246	285	237	226
Black-capped chickadee[b]	20	5	18	23	63
Boreal Chickadee[b]	4	3	0	7	9
Chickadee sp.	0	6	0	29	0
Northern Shrike	1	3	0	1	0
White-crowned sparrow	1	0	0	0	0
Snow Bunting[b]	0	0	0	1	31
Pine Grosbeak	4	0	10	36	0
White-winged crossbill	0	0	0	175	0
Common redpoll	19	0	60	71	4
Hoary redpoll[a]	0	0	0	0	3
Redpoll sp.	0	0	0	99	12
Fringillidae sp.	0	0	0	85	0
Totals	782	1,628	574	2,467	1,399

[a]New species recorded during 1990 count.
[b]Record high quantity recorded during 1990 count.

Rock sandpipers are common year-round residents of the Alaska Peninsula coasts. 5/90, DAD

King eiders are a rare occurence on the Christmas Bird Count. More commonly, they hit powerlines across the Naknek River during spring migration and are brought to the refuge office for rehabilitation. 4/90, DAD

8. Game Mammals

Both the Alaska Peninsula and Becharof refuges are open to sport and subsistence hunting of game animals. 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

Becharof Refuge Bear Study

Based on an interest of brown bear denning on the islands of Becharof Lake, Alaska Peninsula, a study was initiated in 1983. Over the next three summers, 44 bears were radio-collared for monitoring of winter denning and seasonal habitat use. Aerial radio-tracking continued into 1990, with a total of 384 flight hours and mean tracking success rate of 15 percent. Three 1984 transmitters were still active in March 1990, after four years and seven months! No collared bears were found to den on the Becharof Lake islands, but seven island dens were discovered by ground examination. Of the 82 dens located using radio-tracking, 58 were found in Katmai National Park, 50 - 70 miles from the collaring sites. Sixty percent of the dens were located at 1,500-2,500 ft elevations with 42 percent having southerly openings. Seasonal movement patterns indicated dispersal from den sites in April through June, with bear concentrations around Becharof Lake developing in August. Eighty-six percent of all collared bears returned to the general collaring site over the study period. Most of the fall movement back to den sites occurred in October, indicating many of the bears would already be in Katmai (no hunting area) during the fall hunting season. This study was concluded in April 1990, with report writing scheduled for the winter of 1990/1991.

Bear/Stream Surveys

Annual bear/stream surveys were conducted in August by BT Mumma and ARM/P Arment in the Becharof and Ugashik Lakes area. Streams with concentrations of spawning sockeye salmon were aerially surveyed for bears using Izembek Refuge's Super Cub on floats (N745). A series of four to five replicate surveys were conducted of the Becharof Lake/Island Arm, Ugashik Lake, and Bible Creek/Kujulik River drainages on August 13th - 23rd. Survey techniques were modified this year: a) to standardize the distance traveled up each stream and b) to add streams omitted in previous years' surveys. Additions included Bible Creek, the Kejulik River drainage, Ore creek, Lodge Creek, and the side branches of Mumma Creek.

Bible Creek was first surveyed on August 14th yielded the highest single stream count of 46 bears. The number of bears on Bible Creek decreased on replicate surveys suggesting that its peak may have been at an earlier date than other Becharof Lake streams.

Mean numbers of bears counted included: Bible Creek - 28, Kejulik River drainage - 23, Ugashik Lake streams - 32, and Becharof Lake/Island Arm streams - 44, with a mean total of 127 bears. Of all the bears sighted, 50 percent were singles, 28 percent were yearling cubs, 18 percent sows w/cubs, and 4 percent newborn cubs.

Aerial view of the Bible Creek drainage -- home to at least 46 brown bears during the sockeye runs.
8/90, DAD

Comparisons from previous year's surveys show a decline in the percentage of newborn cubs in all areas surveyed. Surveys on the Becharof Lake/Island Arm streams provided the only comprehensive comparison over the past decade (Figure 8). At Island Arm, the number of bears sighted increased for the first time since 1987 (Figure 8). The consistent decline in newborn cubs was the only pattern apparent for sex/age composition of the population.

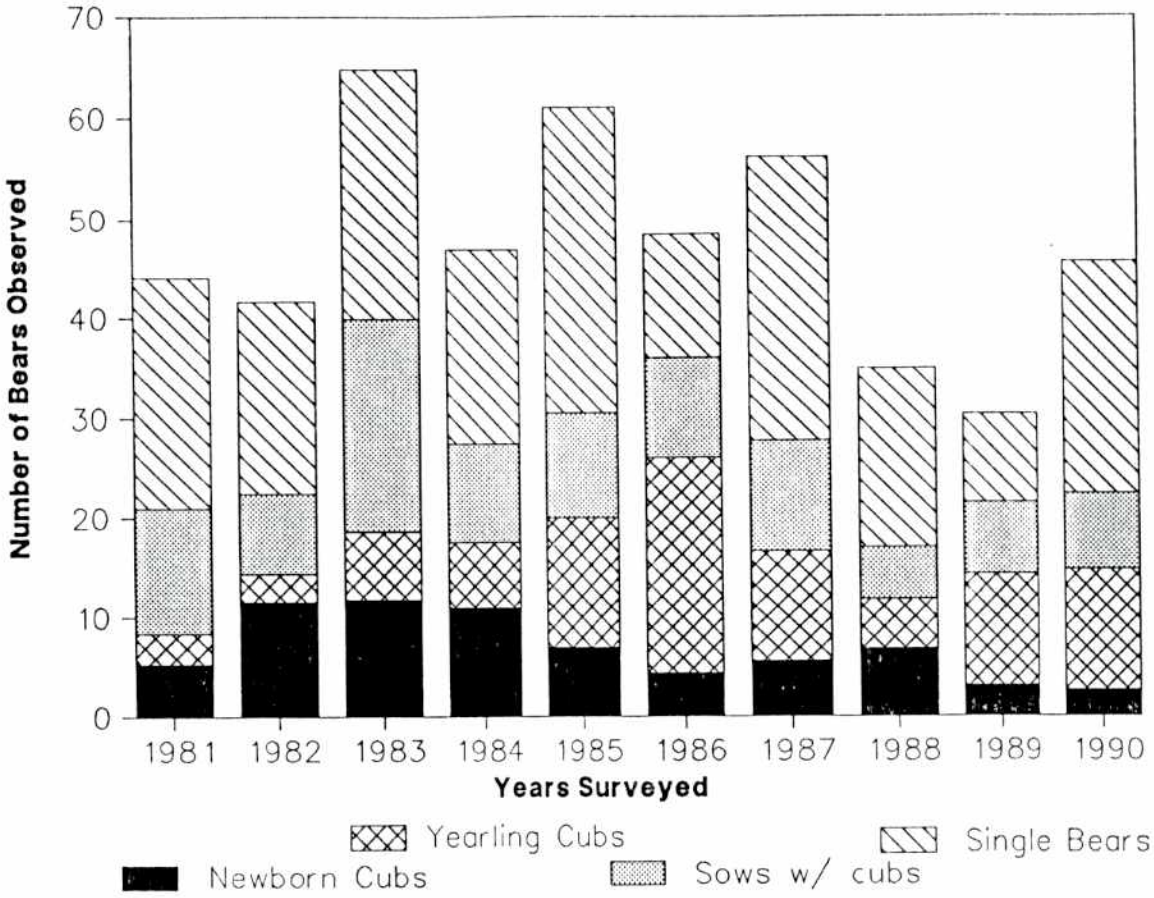


Figure 8. Composition of brown bears observed on the Becharof Lake/Island Arm tributaries, 1981-1990.

Summer 1990 Field Camp Bear Encounters

During the 1990 field season, June 16th through September 22nd, the two refuge field camps documented 139 total people/bear encounters. Of these encounters, 92 percent occurred at the Puale Bay field camp.

After the high number of people/bear encounters and bear damage to inflatable boats at the coastal field camps in 1989, extra precautions were taken to minimize these for the 1990 Puale Bay camp. A 20 ft. by 20 ft. electric fence was installed around the inflatable boats and other camp gear stored on the beach. The fence was made of five high-tensile wires spaced eight inches apart, starting from the ground. Alternating ground and hot wires will ensure the trespasser will receive the full load from the New Zealand type charger.

Brown bears frequently travel the beach at Puale Bay, creating the need for an electric fence around the boating equipment. 9/90, GLT

Additional efforts to ensure safe camp operation in bear country included giving detailed training to camp personnel on bear/firearms safety (see E.6). A biological technician experienced with bears and firearms (Greg Thomson - leader of the 1989 Oil Creek camp) was hired to lead this year's camp and a system of detailed record keeping was developed to better document the people/bear encounters.

As in 1989, a majority of the 1990 Puale Bay bear encounters required no actual interactions (82 percent), usually consisting of visual observations only. The average estimated distance for bear observations was 400 yds (N=104). At 150 yds (N=13), camp personnel initiated hazing consisting of waving their arms and shouting. At 110 yds (N=10), hazing escalated to the use of cracker shells and flares. The only successful use of rubber slugs was at 40 ft (Table 12).

Table 12. Brown bear deterrents used in the Puale Bay field camp, Becharof Refuge, Alaska, June-September 1990.

Hazing Methods	Effects				
	No Response	Stood Upright	Slow Depart	Fast Depart	Non-Agress Approach
Waving/Shouting	4[a]	2	5	2	0
Cracker Shells	3	0	4	2	0
Crackers & Flares	1	0	1	0	0
Shot in the Air	0	0	0	2	0
Rubber Slug at Bear	0	0	0	1	0
Electric fence - Witnessed	0	0	1	1	0
Started 4-wheeler	0	0	0	0	1

[a]Numbers designate how many times use of the hazing technique generated the given response.

The Puale Bay field crew waving and shouting urged this young bear up for a better look and sniff. 8/90, LLS

Lone sub-adult bears made up 27 percent of the bears encountered at Puale Bay. Sows and unknown single bears comprised another 32 percent with the remainder being evenly divided among boars, sows w/cubs, and multiple sub-adults.

The Puale Bay field camp was located near Teresa Creek, which supports a healthy spawning run of chum and pink salmon; as expected, most of the bear observations/encounters occurred at the stream (40 percent). Bears also tended to travel either along the beach or parallel to the mountain range in the tundra flats, accounting for 14 and 23 percent (respectively) of the bear encounters. Bears were least encountered in the grassy sand dunes, and only 8 percent occurred inside the camp perimeter.

The Ugashik Narrows field camp had far less bear encounters than Puale Bay, and did not keep as detailed of records for data comparison. The camp crew did report observing bears on nine days, mostly near spawning streams. Hazing, using cracker shells and flares, was resorted to on three occasions when bears disrupted camp at night. The cracker shells and flares were shot out blindly over the lake, since darkness prevented getting good sightings on the bears. The lakeside camp was located in the evening-travel-lane for insomniac bears, and repeated hazing apparently just coerced them to avoid the weatherport tents.

Barren-ground Caribou

The Alaska Peninsula caribou herd is subdivided into northern and southern herds. The southern herd remains south of Port Moller and ranges to Cold Bay, and is monitored by the Alaska Department of Fish and Game (ADF&G), assisted by Izembek Refuge. The northern herd ranges from Port Moller northward to the Naknek River drainage, utilizing both the Alaska Peninsula and Becharof refuges. The northern herd is managed by ADF&G, assisted by Alaska Peninsula/Becharof Refuge staff.

Smaller herds of caribou live isolated in the mountain valleys along the Pacific coast. 6/90, DAD

Historically, the size of the northern herd fluctuated widely with apparent peaks just prior to the turn of the century, and again in the early 1940's when the population was estimated at 20,000 caribou. The last population low occurred during the late 1940's with an estimated 2,000 caribou. Since that time the herd experienced steady growth until 1984 when the population peaked at 20,000 (Figure 9). A slight decrease was noted for this year, with the estimated herd population falling to 17,000. Composition of the northern Peninsula herd (bull/cow/calf), surveyed in the fall, has demonstrated annual fluctuations, but consistently with half of the herd composed of cows (Figure 10).

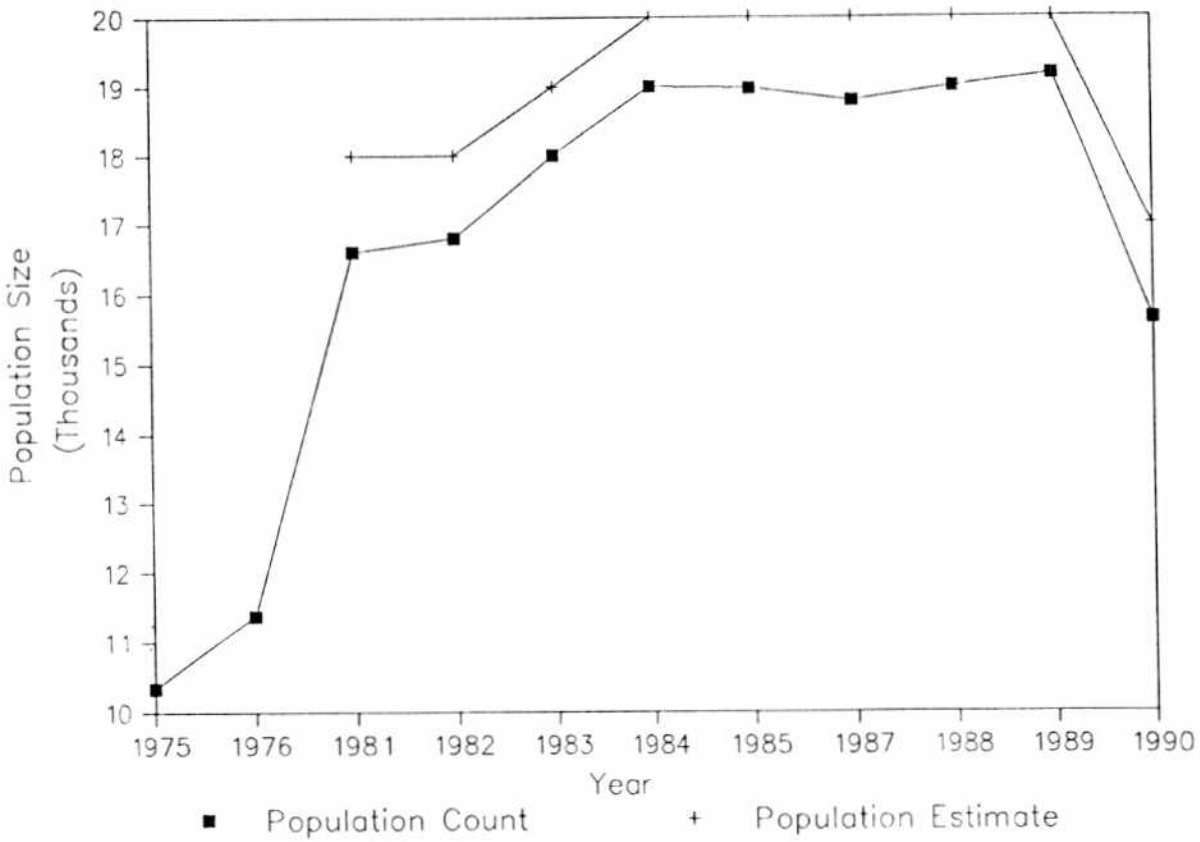


Figure 9. Observed and estimated population size trends of the Northern Peninsula caribou herd, 1975-1990.

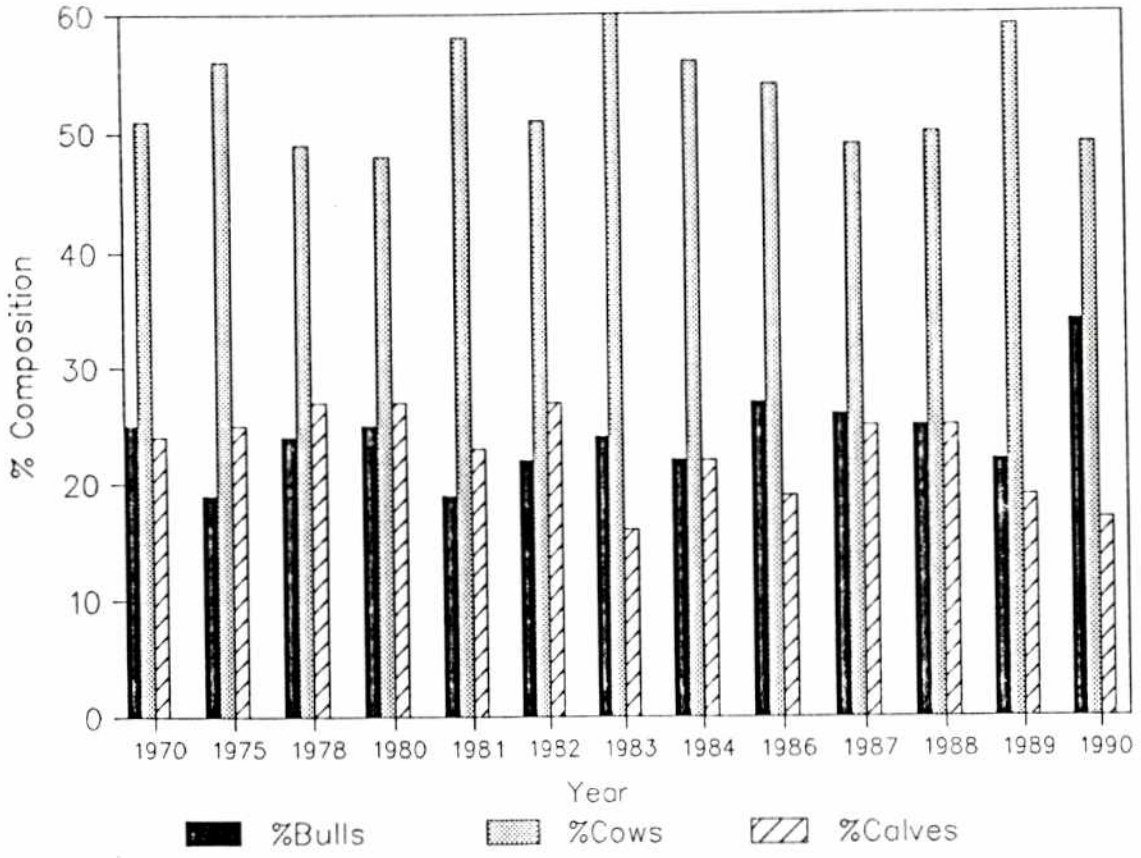


Figure 10. Composition changes of the Northern Peninsula caribou herd, 1970 -1990.

The northern herd's primary calving grounds are in the Bering Sea flats between Cinder River and Sandy River. In recent years the post calving migration north has progressed earlier, with most of the herd moving north of the Egegik River by August 1. Traditionally this herd wintered between the Egegik and Naknek Rivers. However, starting in 1986, the northern herd expanded their winter range across the Naknek River northward to the Alagnak River, eventually overlapping with the Mulchatna herd. During the mid-winter months, the Northern Peninsula herd intermingles with virtually the entire Mulchatna herd between the Naknek River and Lake Iliamna. Radio collared caribou from both herds confirmed to be associated in the large groups. The presence of perhaps 40,000-50,000 caribou of both herds within this area represented a major shift in winter distribution. A combination of deteriorating range conditions and deep snow are speculated to have caused the shift in distribution. Radio tracking in the spring, revealed that the caribou apparently sort themselves out, back into the original herds prior to migration back to the calving areas.

Mountain snow patches provide summer relief from biting insects for this bull caribou herd on Mt. Peulik.
8/10/90, REH

Historically there had been no caribou spending the summer in the Alagnak/Big Mountain area, but in recent years several groups of mostly bulls have been seen. During 1989, for the first time, calving was documented in the hills between King Salmon Creek and the Alagnak River; however, it is not known if these caribou were originally from the Mulchatna or Northern Peninsula herd.

Moose

Moose did not become abundant on the Alaska Peninsula until the 1940's to 1950's. Range expansion from the Lake Clarke/Lake Iliamna area boosted the Peninsula populations allowing for the first sport moose hunting in the mid 1950's. However, the Peninsula's population declined in the mid-1960's to the early 1970's, attributed to poor browse situations. Beginning in the early 1970's, ADF&G liberalized the moose hunting season to bring the population in line with the carrying capacity of the range. The liberalized seasons resulted in a composition disparity of many older animals with fewer younger animals. This was attributed to younger animals being more susceptible to the gun. As a result the population decline continued, compounded by loss of recruitment animals to predation by brown bear, especially on moose calves. In the late 1970's, ADF&G trophy only (bulls with greater then 50 inch antler spread or three brow tines) restrictions on hunter take. As a result, the percentage of cows was allowed to increase helping stabilize the population. In 1986, the management goal of 40 bulls per 100 cows was reached, and current efforts are to maintain the population at this level.

Raising twin moose calves can be a challenge among the high densities of brown bears on the Alaska Peninsula.
6/2/90, REH

The annual moose survey of Bible Creek and Kejulik River on the Becharof Refuge was conducted in December 1990 for the first time since 1987 (Table 13). The combination of lack of adequate snowfall, high winds, and fog have prevented completion of this survey for two out of the past four years.

Table 13. Moose sex and age ratios for the Bible Creek and Kejulik River drainage of Becharof Refuge.

Year	Total Bulls /100 Cows	Yrlg. Bulls % of herd	Calves /100 Cows	Calf % of herd	Total Count
1986[a]	--	--	--	--	264[b]
1987	89.3	16.0	8.1	8.0	148
1990	58.1	6.9	11.0	6.4	231

[a]Poor 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.

[b]Total count was high due to a severe winter storm that moved animals from higher elevations into the Kejulik drainage.

Annual aerial moose surveys, by the Refuge are conducted to supplement similar surveys done since 1981 by ADF&G. The ADF&G surveys are done at the extreme northern boundary of the Refuge, partially within Katmai National Park. Composition (bull/cow/calf) of the boundary moose population has remained relatively stable since 1981 (Figure 11); however, population recruitment, as indicated by relative percent of yearling bulls (Figure 12), has declined, possibly due to continued high predation by brown bears in this area of relatively high bear concentrations.

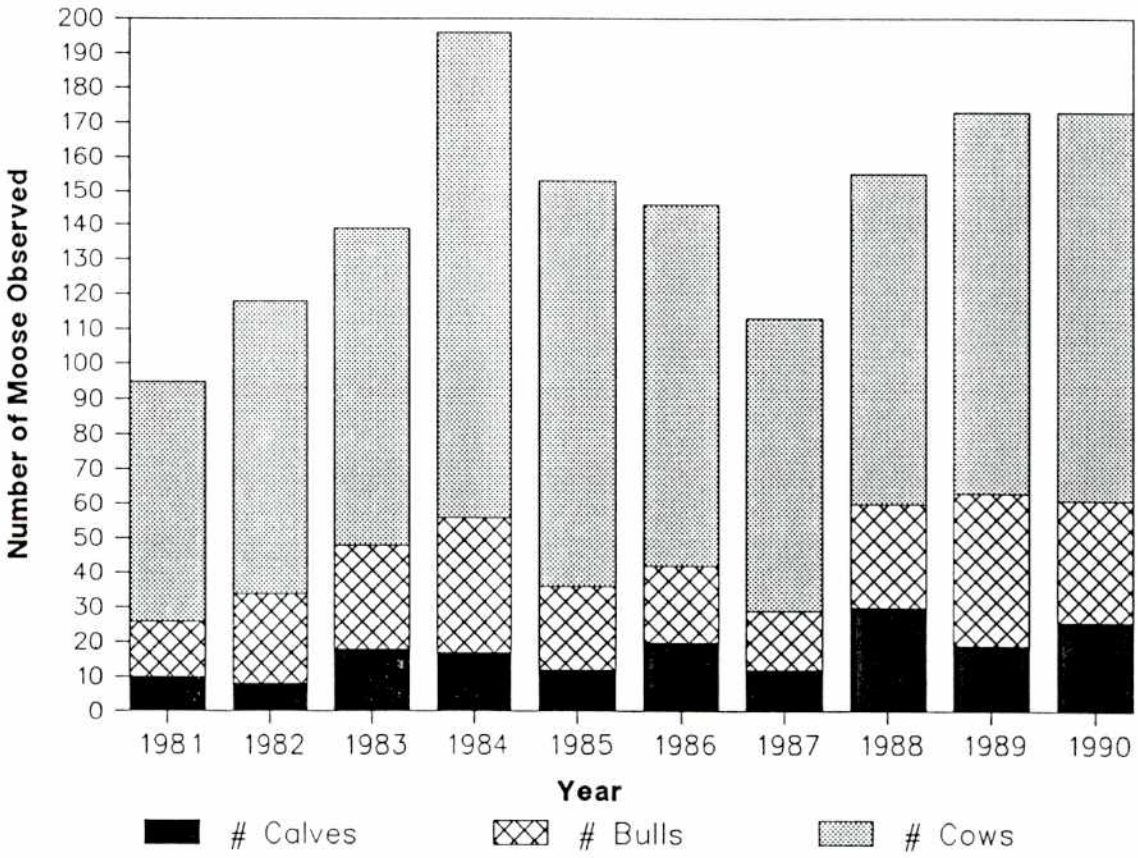


Figure 11. Composition changes in the moose population surveyed along the boundary between Becharof Refuge and Katmai National Park, 1981-1990.

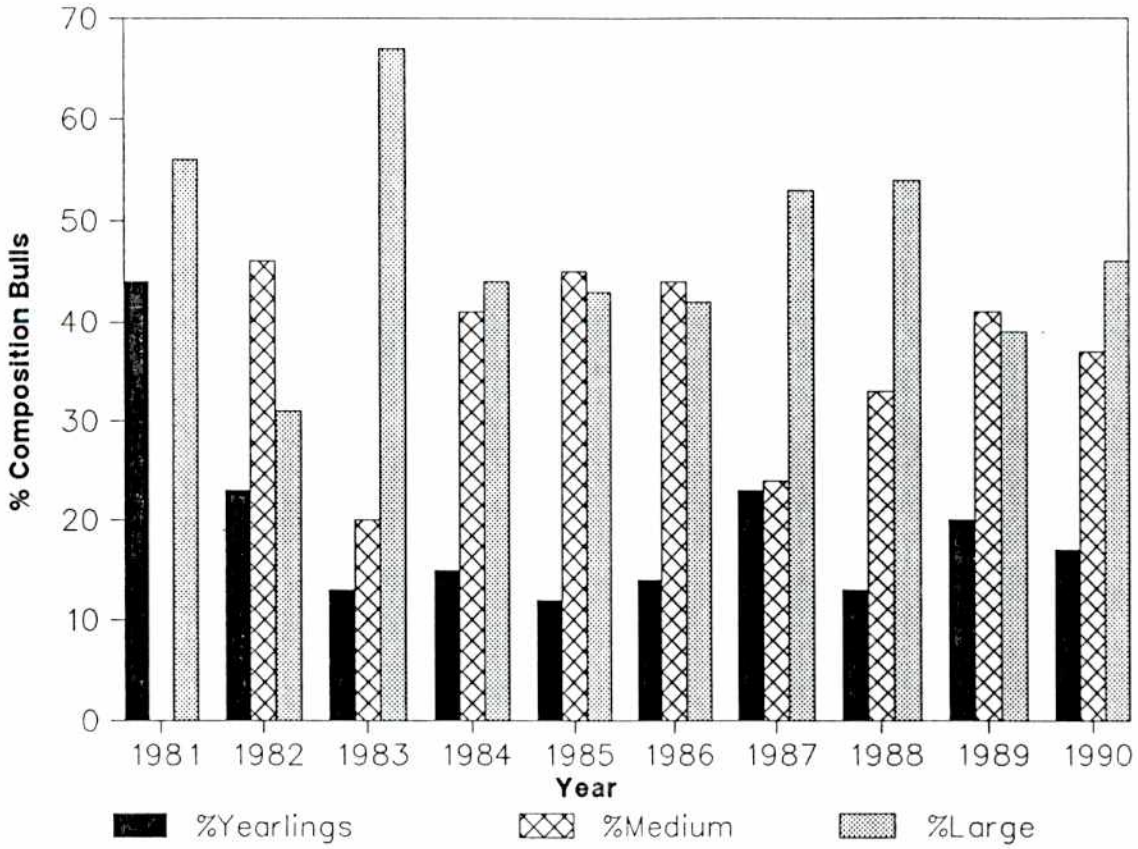


Figure 12. Size class trends of bull moose surveyed along the boundary between Becharof Refuge and Katmai National Park, 1981-1990.

ADF&G also monitors moose populations on the Ugashik Unit of Alaska Peninsula Refuge. The area around the Dog Salmon River drainage has been surveyed since 1962, but weather conditions prevented this year's completion of the survey. Composition of the Dog Salmon River population has demonstrated a decline in bulls with a relative increase in cows, attributed to the change in harvest regulations (trophy-only restrictions).

9. Marine Mammals

Walrus

On May 1st - 14th, a walrus research camp was set up at Cape Seniavin, along the Bristol Bay coast of the Alaska Peninsula. Led by Biologist Sue Hills, the four-person team attempted to fit radio-transmitters on 30 male walruses using this winter haul-out. The walrus only partially cooperated in visiting the haul-out. Only eight transmitters were fitted due to the low numbers of walrus. Transmitters were placed on the tusks to monitor the walrus' movement in Bristol Bay and the Bering Sea.

Two aerial surveys of beached marine mammals were conducted along the Bristol Bay coastline, from Naknek south to the Muddy River, on May 21st and June 1st. The carcass count included 36 headless walrus, one beached gray whale, and one large unidentified baleen whale. Of the walrus carcasses, 22 were located within a four mile radius of the haul-out at Cape Seniavin. These are very disturbing numbers...Are we seeing the transfer from elephant ivory to walrus ivory?

On August 29th, ARM/P Arment and BT (Research) Janet Warburton conducted an early fall walrus survey along the Bristol Bay coast, from Naknek to cape Seniavin. Approximately 2,000 walrus were hauled-out at Cape Seniavin, with no walrus or carcasses sighted north of the Cape.

Cape Seniavin provides a winter haul-out area for this bachelor group. Unfortunately, poachers and ivory hunters have also discovered the spot. 4/5/89, REH

Cetaceans

An adult gray whale reported 15 miles up the Naknek River on May 5th. RM Hood confirmed the sighting of the 35-ft whale and was able to get some good photographs, one of which was used in the local paper. The Anchorage media tried to create another national news event. After a three-week stay, the whale shipped out back down the river.

11. Fisheries Resources

King Salmon Fishery Assistance Office Activities

Southwest Alaska Rainbow Trout Investigations: Gertrude Creek, King Salmon-Egegik River Drainage. Based on information gathered in 1988 and 1989, the

rainbow trout population of Gertrude Creek consists of old fish that are vulnerable to over-exploitation. To provide additional information for management of this population, the investigation was expanded in 1990. Sampling frequency was increased, sampling for juvenile rainbow trout was intensified, and a tagging study was begun. One hundred seventy-four rainbow trout were captured. Fork lengths ranged from 35 mm to 641 mm. Weights ranged from 2 to 2,650 g. Fifty-nine of these fish were sacrificed for age verification, and the remainder were marked with individually numbered Floy t-tags.

Associated with the Gertrude Creek study, 53 rainbow trout were captured from three smaller clear water tributaries of the King Salmon River. Fork lengths ranged from 282 to 551 mm. Weights ranged from 300 to 2,225 g. None of these fish were sacrificed, and all were fitted with t-tags.

Fishery Biologist Jeff Adams weighs a Gertrude Creek rainbow trout.
7/90, FWS

Recaptures of rainbow trout tagged in Gertrude Creek showed considerable movement within the stream. Also, two fish that were tagged in one of the tributaries were recaptured in Gertrude Creek. Another recapture indicated movement between two of the smaller tributaries themselves. The movement of

fish between streams suggests that rainbow trout in the tributaries of the King Salmon River are one population. The rainbow trout in the smaller tributaries may act as a reservoir for maintenance of the Gertrude Creek fishery. Further analysis of the data will provide a basis for management of rainbow trout in the entire drainage.

Analysis of special use permits as an index of fish catch and harvest continues. These permits appear too general to provide information for meaningful regulation of the fisheries on the refuge. It is suggested that special use permits require stream or lake specific information for each species captured as well as documentation of the effort expended.

Genetic Stock Identification of Dolly Varden. To assist with the genetic stock identification of dolly varden from southwest Alaska, tissue samples from 26 fish were collected from Gertrude Creek. Fork lengths ranged from 74 to 461 mm. Tissue samples from 60 dolly varden were also collected from the Ugashik lakes system. Fork lengths for these fish ranged from 50 to 250 mm. Tissue samples were shipped to the genetic stock identification laboratory at the regional office in Anchorage for analysis by gel electrophoresis. This analysis will help to distinguish the different stocks of dolly varden in southwest Alaska. It will also aid in resolving the difficulties of distinguishing dolly varden from Arctic char.

Cooperative Arctic Grayling Management Activities

The Alaska Peninsula/Becharof refuges have assisted ADF&G with management inventories of arctic grayling of the Ugashik lakes since 1987. Based on data gathered 1987 to 1989, ADF&G has clearly demonstrated that a significant problem with severely depressed grayling stocks exists. Therefore, they prepared a proposal to the Alaska Board of Fisheries to establish a "catch and release" fishery for arctic grayling in the Ugashik lakes drainage. The Board acted on this proposal in February, 1990. They closed the Ugashik lakes drainage to the take of arctic grayling. See Sections H.9. and H.17. for additional comments.

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 on the Alaska Peninsula for commercial jet service from Anchorage. Access to refuge lands is primarily by aircraft; however, Big Creek, and 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.

The Alaska Peninsula/Becharof refuges offer many outdoor recreation opportunities such as wilderness camping near Becharof Lake at the Gas Rocks. 8/90, WRS

Public use inquiries continued to increase again this year. There were inquiries from 31 states and three foreign countries.

The development of the Public Use Management Plan (PUMP), which will guide the future development of recreation within the Alaska Peninsula/Becharof refuges, is continuing (see Section D.2. and D.3.).

6. Interpretive Exhibits/Demonstrations

The King Salmon interagency kiosk [National Park Service (NPS), Alaska Department of Fish and Game (ADF&G), & Fish and Wildlife Service (FWS)] was relocated to a site more accessible to the visiting public. It was moved to a location just north of the terminals, along the route followed by travelers heading to the food stores and mini-mall (containing the NPS headquarters). This is the third location since it was constructed approximately three years ago. It was originally next to the MarkAir terminal. Terminal expansion plans required it to be moved a half city block, away from visitor traffic, near the NPS maintenance area. That site was a very poor location. Many more people are now utilizing the display! Outdoor Recreation Planner (ORP) Rodriguez spearheaded the effort which has turned out to be an excellent move for the under-utilized facility. Our thanks go to Regional Construction Team (see Section I.2.) for doing the actual physical work in relocating the kiosk, in June.

The cooperative kiosk display sitting in its newest location. 06/90, REH

In May, two 3'x 5' display panels were delivered to the MarkAir terminal (newly remodeled) for mounting on their walls. These panels are spares to the kiosk. One of the panels is an artistic drawing that depicts an aerial

view of the local area and points out the locations of the various State, Federal and local offices that may be of help to travelers. The other panel is a map of the Bristol Bay area and Alaska Peninsula which depicts the location of the Refuges, National Parks and Monuments, and State Parks. The panels were hung on the walls near the baggage pick-up area and have received significant use.

7. Other Interpretive Programs

Advantage was made of the village visits (PUMP public meetings) to conduct interpretive presentations for some of the schools. In Perryville, a slide talk dealing with the Alaska Peninsula/Becharof refuges was given by ORP Rodriguez. A slide talk on fishes of the Alaska Peninsula was given by King Salmon, Fisheries Assistance Office (KSFAO) Project Leader Jim Larson. Approximately 35 students were in attendance, ranging from grades K thru 11.

A request for a presentation to be made at Chignik Bay School, for "Sea Week," (first week of May) was received in March. ORP Rodriguez ordered (from the Regional Office) and sent out two 16 mm films and two VHS tapes to be of assistance. His duties prevented his personal appearance.

8. Hunting

Hunting is a major public use on the refuges. Commercial guiding includes hunts for world-class trophy moose, brown bear, and caribou. Some hunters take advantage of overlapping seasons of the three species. However, brown bear seasons occur on an 18 month rotation; spring (even years) and fall (odd years) hunt.

For both the Alaska Peninsula and Becharof refuges, King Salmon has been the airline hub for commercial air service. Near the end of this year, MarkAir included an Anchorage to Port Heiden run that will give competition to the other carrier, Reeves Aleutian Airlines, in that area. This should slightly reduce the number of hunters going through King Salmon.

Once a hunting party arrives in King Salmon/Port Heiden, air taxi and charter service is available to most areas on the refuges. King Salmon is the base of operation for numerous guide/lodge businesses operating on the Alaska Peninsula. Those hunters wishing to hire the services of a guide will generally find that fees can be 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.

Individuals wishing to go-it on their own will have to be much more prepared, but can save some dollars. If you are a non-resident hunter you will have to be "guided" to hunt brown bears. The fees set by ADF&G for resident and non-resident licenses and tags are listed in Table 14. Once the proper licenses and tags are obtained, the cost of a charter flight can range from $150 to $625 per hour of flight time. An average round-trip flight to a hunting location will take three or more hours.

A local resident hunter with an "average" size caribou he shot next to Big Creek on Becharof Refuge.
09/90, DAD

Table 14. Alaska resident and non-resident license and tag fees for 1990.

Type of License	Non-resident	Resident
Hunting	$ 60.00	12.00
Sport fishing and hunting	$ 96.00	22.00
Caribou or moose tag	$300.00	0
Brown bear tag	$350.00	25.00

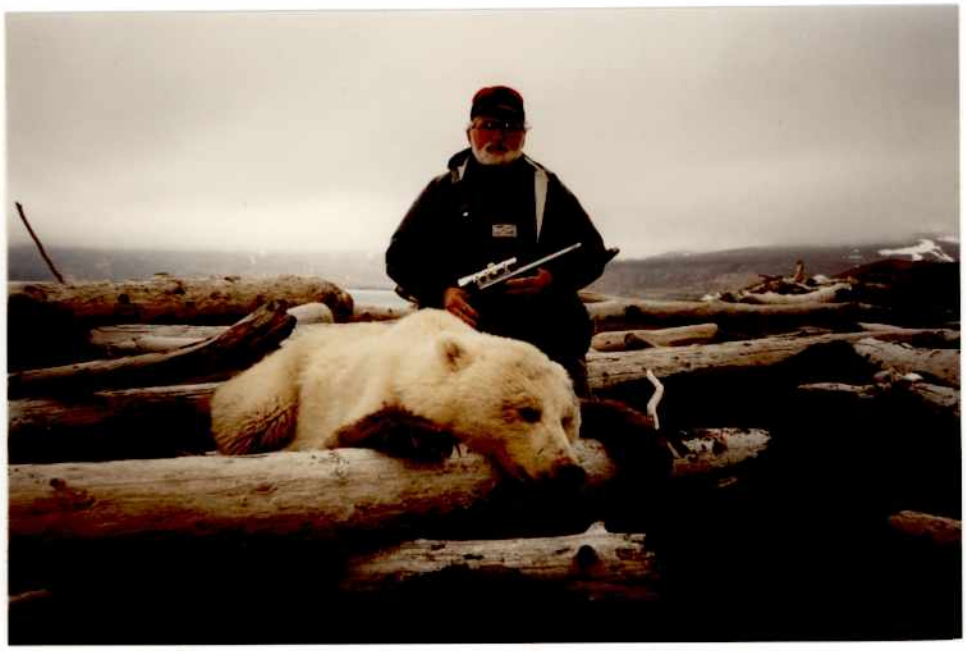
Hunters are required to submit a hunt report to ADF&G at the close of the hunting season. The report includes information on harvest success. Due to the long hunting seasons, ADF&G lags behind one year in processing of the harvest reports, thus hunter success in calendar year 1989 is shown in Tables 15 and 16.

Table 15. Caribou and moose reported harvest for Alaska Peninsula Game Management Units (GMU) 9C and 9E, 1989 (ADF&G data).[a]

Species	Bulls	Cows	Total
Caribou	766	137	903[b]
Moose	139	7	146

[a]Harvest reports include both Alaska Peninsula and Becharof refuges. (Reporting dates for caribou are from August 1989 to March 1990. Moose are for the 1989 season only.)

[b]Other Alaska Residents (not local) took 345 caribou, non-resident hunters took 358 caribou and local resident hunters reported 49 caribou taken (this number is considered to be way low as the majority of local hunters do not report their success to ADF&G.



This unusually blonde boar brown bear was killed by this King Salmon resident in the Puale Bay area of Becharof Refuge. The .375 caliber single-shot Thompson Center "Contender" type handguns are quite popular on the Peninsula. 5/13/90, RKR

Table 16. Brown bear harvest for the Alaska Peninsula, 1975-1989, GMUs 9C and 9E (ADF&G data).

Date[b]	Total Bears	Percent Boar	Mean Age Boar	Mean Age Sow	Percent Harvest[a] Boar	Percent Harvest[a] 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
1987-88[d]	398	62	6	6	69	29
1988-89	347	66	-	-	66	34

[a] Figure represents bears 5 years of age or older.
[b] Brown 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.
[c] Includes seven bears of unknown age and/or sex. Drainages listed on harvest reports indicate 144 (55 percent) of the total harvest was taken either on Alaska Peninsula or Becharof refuges.
[d] Includes 12 bears of unknown age and/or sex.

April was a month of mail outs for this office. Information was mailed to every box holder in our area concerning: (1) Law Enforcement Plan For 1990 Walrus Season (boxholders on Bering Sea side), (2) Information for Subsistence Waterfowl Hunters, and (3) Bulletin requesting input on subsistence issue. "We Want Waterfowl for Our Children" posters/tearouts were mailed to each post office. Also, information was provided to all ten schools on the harvest of migratory birds during the closed season.

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. Flowing-water areas most utilized for sport fishing are: King Salmon rivers (Becharof Refuge and Chignik Unit, Alaska Peninsula Refuge); Big, Gertrude, Featherly and Painter creeks; and Upper and Lower Ugashik lakes, including the Narrows. In 1981, the Alaska record arctic grayling was caught in the Narrows.

Based on studies done by ADF&G, the State Board of Fisheries issued a regulation closing the Ugashik lakes drainage to the taking of arctic grayling. The study showed that the arctic grayling stock at the Narrows decreased significantly from 1,200 fish in 1988 to approximately 500 in 1989 (see Section H.17).

Over 20 guides/lodges and transporters/air taxis, offering fishing packages, are permitted on the refuges. Most operators of these lodges promote catch and release angling for resident fish species. A variety of package programs, that include lodging and air transportation to the fishing areas, are available. 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.

A flown-in group of refuge visitors enjoying some of the fantastic fishing opportunities found on the Alaska Peninsula (Upper Ugashik Lake). 8/90, WRS

Ugashik Narrows Public Use Study

The Ugashik Narrows, located in the Alaska Peninsula Refuge, has been a favorite area of use by sport fishermen. The Ugashik Narrows fishery is widely known to provide world class sport fishing opportunities for arctic grayling, coho (silver) salmon, sockeye (red) salmon, arctic char, dolly varden and lake trout.

The Ugashik Narrows is a short river connecting the Upper and Lower Ugashik lakes, with the waters flowing from north to south. Within the river is an island creating a west and east branch. On the eastern side of the Narrows is a riffle at the north end of the island where the water slows and is in excess of three meters in depth near the southeastern bank. This area also has a small sedge dominated lagoon. On the west side of the island the river is more shallow and generally more swift. At the south end of the Narrows, two gravel bars constrict the flow of water causing two, ever changing, sand and gravel spits to extend some distance into Lower Ugashik Lake.

The Ugashik Narrows public use camp, first established in the summer of 1987, continued a seasonal site specific collection of public use data during the summer of 1990. The camp survey period was from June 16th to September 22nd. Collection of public use data and dissemination of Refuge information were the camp's primary missions.

This year's location of the field camp was on the east side of the Narrows, on the Upper Ugashik Lake shoreline, approximately 200 yards south of the old Myers' lodge property. Two 10'x20' and one 10'x15' weatherports served as the camp structures. Wooden floors were provided for each tent. One weatherport was used for sleeping quarters, one for office/equipment storage and the smaller for cooking/food storage.

Bill Struble was this Station's first seasonal Park Ranger and he was assigned the duties of camp leader. Student Conservation Association (SCA) Volunteers Jeff Morales and Aily Zirkle, and FWS Volunteer Mary Auburn filled out the rest of the camp crew. Jeff also assisted the KSFAO on Gertrude Creek (see Section E.3.). Aily spent two different weeks assisting the Youth Conservation Corps enrollees in remote field work (see Section E.2.). Mary spent a several days assisting with the oil spill assessment crew (see Section F.14.). FWS Volunteer Cynthia Suchman, assigned to the Togiak River fisheries project with the KSFAO, assisted the Ugashik Narrows field camp August 6th - 23rd.

When a party of refuge visitors arrived at the Narrows they were greeted by the field crew, offered refuge/fishing brochures, a handout (provided by ADF&G) on the arctic grayling closure (see Section H.17.), 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." The crew also served as primary information sources to visitors concerning the Alaska Peninsula and Becharof refuges. Many visitors were unaware they were utilizing refuge resources and, this year, of the closure to the taking of arctic grayling.

Survey entries were grouped into three general use categories: 1. Day Use Fishermen; 2. Overnight Fishermen; 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 Lakes/Narrows area (eg. aircraft or boat).

Visitation during June was slow in coming and the first users were not contacted until the 21st. The first guided fishermen arrived by plane on the June 28th. There were 25 client use days and 10 guide use days comprised of 122.2 use hours and 51.3 use hours respectively. The average length of stay was 4.8 hours. Of the 169.2 use hours only 37.5 of these hours (22.2 percent) were spent at the Narrows with the remaining 131.7 hours being spent in Lower Ugashik Lake (77.3 percent), primarily in the southeast bay.

In July, public use data on clients indicated 188 use days comprised of 2305 use hours resulting in an average length of stay of 6.8 hours. August brought 371 use days and 6,370.6 use hours. In September 223 use

days and 3,195 use hours were recorded by the crew. They also interviewed eight hunting parties.

Total use days for 1990 were 807 made up of 11,992.8 use hours, and 82 parties of visitors were interviewed or observed. In 1988, a total of 582 use days were recorded and 565 use days were totalled for 1987. Expanding the survey to include fishermen, recreating away from the Narrows on the Ugashik lakes, and including hunters, accounts for a large portion of the increased numbers.

10. Trapping

Historically, the trapping of fur bearing mammals was a full-time winter endeavor on the Alaska Peninsula. Today, trapping is highly variable due to the price fluctuation of raw hides. Fox, mink, ermine and beaver are commonly trapped. To a lessor extent, coyote, wolf, wolverine, lynx and land otter are caught. ADF&G requires, as a method of monitoring take, a sealing tag be placed on the untanned skin of wolverine, wolf, lynx, land otter and beaver. Data from the sealing records is listed in Table 17. No records are available on fox, mink, ermine or coyote.

Table 17. Fur bearer harvest in GMUs 9C and 9E (ADF&G 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
1988-89	57	53	4[c]	36	23
1989-90	108	52	2	31	23

[a] No data available.
[b] Indicative of increasing prices for short-hair furs.
[c] All taken from Unit 9E.

15. Off-Road Vehicling

The Alaska 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 snowmachines, motorboats, off-road vehicles and other means of surface transportation traditionally employed. 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 36.1). Three special use permits have been issued to guides for use of tracked all-terrain vehicles.

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 Alaska Peninsula residents.

17. Law Enforcement

The 1990 Spring brown bear hunting season opened on May 10th and closed on May 25th for most of the Alaska Peninsula. The coast of Becharof Refuge and the drainage area of Becharof Lake was closed on the 17th (by ADF&G emergency order). Due to reports of a significant increase in probable illegal activities (guiding related), an intensive law enforcement effort ("Spring Brown Bear Task Force") was mounted by the FWS, NPS, ADF&G and Alaska Department of Public Safety (DPS). Officers and staff from all over Alaska and the "lower 48" were brought in to assist with the effort. A command center was set up in the Refuge office and was staffed primarily by DPS Lt. Tom Schwantes, NPS (Katmai) Chief Ranger Steve Hurd, FWS Refuge Manager (RM) Hood (also spent time at the Port Heiden airfield as an information collector and bear sealer) and NPS Joan Sanders (as data compiler). All hunting camps located, were contacted (where possible), airports were watched (baggage inspection), and stake-out/surveillance camps were established.

The effort included eight stake-out operations with 60 staff days being logged, 68 staff days of airport watches, 57 staff days of fixed backcountry station assignments, 69 staff days of backcountry patrolling, 94 staff days of Command Center duties, 408.5 hours of fixed wing aircraft patrol and 10.2 hours of helicopter patrol. A field camp, staffed by ORP Rodriguez and one to two NPS personnel, was set up at the Yantarni Airstrip (Ugashik Unit on Pacific coast) to monitor hunting activities in that area. Assistant Manager/Pilot (ARM/P) Arment and Deputy Refuge Manager (DRM) Poetter worked as a team in the NPS PA-18 and were based out of the Yantarni Airstrip field camp. Biological Technician (BT) Mumma participated as an observer in stake-outs with Kenai Refuge Park Ranger Steve Hudson. Kodiak RM Jay Bellinger and Pilot Butch Patterson used Kenai's PA-18 on floats to base out of the Mother Goose Lake administrative cabin on the Ugashik Unit. Arctic Refuge ARM Phil Garrett and Pilot Dave Sowards patrolled in their PA-18 on wheels around the Becharof Refuge.

Wildlife Biologist (WB) Dewhurst utilized the helicopter, while conducting oil spill shoreline assessments, to drop in on camps that were hard to reach or out of the way for fixed-wing aircraft. The helicopter turned out to be a very valuable tool during this effort. Its use provided the basis for most of the violations discovered. The helicopter provided a method to easily/safely "get at" the violators and did not result in large scale complaints (disturbance to hunts, etc.) as was expected.

Activities accounted for: 367 individuals contacted in airports or in hunting camps and 439 plane observations; two individuals were arrested; one plane seized; two bear hides seized; 12 violation notices issued (more to possibly come); numerous warnings issued; and several cases will be "followed-up" based on the information gathered during the operation. A big thanks goes to all refuge personnel whom provided their assistance and to

the Special Agents (SA) that provided their expertise --- Roger Parker, Wally Soroka and Jerry Cegelske.

Interagency cooperation was at its best during this special effort; but cross deputizing officers with State and Federal authority would be of significant benefit. Working agreements between the NPS and FWS would assist in making a case, on the spot, when observed off the officers home ground. There were many instances of officers of another agency spotting possible "wrong-doers" and having to get word back to the proper agency officer have them do a follow-up. By that time the bad guys had departed.

RM Hood and NPS Ranger Harvey Sorensen inspecting and sealing a brown bear hide and skull in Port Heiden during the task force law enforcement effort.
05/90, GLB

As a spin-off of the above enforcement effort, a local air taxi business was issued three separate citations, on June 18th, for operating on the Alaska Peninsula Refuge without a special use permit. The business was caught operating an air-taxi service on Birthday Creek, West Fork of Chignik River and Lorraine Lake. In another case, two individuals were cited, on June 16th, for leaving the campsite they occupied during the hunting season littered with old sleeping pads, sheets of plastic, cans and plastic bottles and miscellaneous other trash items. One of the men was from Ohio and claimed to only be along to assist the resident hunter and not hunting himself. That story has been heard before, but as usual it could not be proven the bear was taken by the non-resident with no license. Still another case of leaving a hunting campsite littered with garbage was

discovered by the crew conducting eagle surveys via helicopter. The campsite, located in Yantarni Bay, had been occupied by a resident hunter and left littered with garbage. The case has been turned over to State enforcement officers, since the campsite was not on refuge lands. If it had not been for the intensive law enforcement effort we would not have known exactly who had occupied these camps and not been able to make the cases.

A total of eleven Violation Notices were issued from this office, totaling $2,000 in fines, as a result of the intensive effort. It doesn't seem like a lot but it is very substantial at this station. Other citations issued were for unlawful occupation of a Service cabin, guiding without a permit and permit violations (not notifying RM of staff changes).

A case or two are still pending based on the results of violations issued by State Officers. One "large" bust made by Alaska DPS Officers on refuge lands involved two individuals that obtained resident licenses but were non-residents from California. They had taken one bear during the hunt. Several weeks later a search warrant was issued to search their residences. State and Federal wildlife officers confiscated a variety (bear, sheep, etc.) and number of mounted wildlife taken illegally in Alaska over many years.

On May 11th, DRM Poetter and ARM/P Arment flew to Kujulik Bay to check on the status of the Service cabin. There was none -- only ashes remained. Apparently someone had torched it sometime between last fall and this spring.

While conducting bald eagle surveys on June 21st, the remanents of two field camps, left over from the recent brown bear season in May, were discovered by Refuge Officer/WB Dewhurst on Sutwik Island. The island is located about seven miles off the Pacific coast of the Alaska Peninsula and administered by the Alaska Maritime Refuge. Since the Alaska Maritime Refuge had issued no permits for that area, and names were identified on some of the items left behind, an affidavit and photographs were turned over to the their Refuge Officers for investigation. The offenders were contacted and issued a citation of $250 for conducting a commercial enterprise on a refuge without a permit. The fine was paid and a clean up of the site was to follow.

On April 29th, RM Hood discovered a 12 ft. aluminum jon boat, 6-gallon boat-gas can and two small raft oars hidden in a stand of willows on the north side of the King Salmon River about 1/2 mile west of the mouth of Gertrude Creek. It had obviously been in this location over a year (requirement for abandoned property) as evidenced by the dead tundra underneath. On June 6th, the boat was seized by DRM Poetter, when Jack Gordon (pilot of Trans Alaska Bell 206 helicopter) was instructed to sling the boat out of the Becharof Refuge and deliver it to Refuge Headquarters in King Salmon. The mission took 1.9 hours of flight time. Multiplied by Trans Alaska's charter rate of $500/hour, and adding in the cost of fuel at $88, the total cost of the retrieval of the boat was $1,038. On the side of the boat was stenciled "Becharof Lodge." This lodge does not have a special use permit to operate on the refuge; therefore, a letter was sent to the lodge owner in Egegik, Alaska indicating that if they wanted to claim the seized items they would have to contact the refuge office and pay the impoundment costs. The letter

was issued on June 12th. By October 1st the grace period had well expired, no effort to claim the boat had been made by the lodge owners and the items became U.S. Government property.

Jon boat abandoned by Becharof Lodge near the King Salmon River later seized and delivered (by helo) to Refuge Headquarters. 04/29/90, REH

The U.S. Coast Guard has been in King Salmon and Naknek conducting law enforcement boardings. On June 10th, the 81 ft. tender Chichigoff, out of Ketchikan, was discovered to have on board two walrus heads and tusks. The vessel's log indicated, on June 4th, a dozen walrus carcasses were found floating some 40 miles south of Nome in Norton Sound. The captain and crew were non-native and were illegally possessing the marine mammal parts. The walrus parts were seized and delivered to Refuge Headquarters for custody. Senior Resident Agent Wally Soroka, in Anchorage, took charge of the investigation. On the 13th of June, the tender Maverick was boarded and a walrus head with tusks was found hanging alongside the vessel in the water. Again, the marine mammal parts were confiscated and delivered to DRM Poetter. Numerous news articles in local and Anchorage newspapers have become the most positive aspect of these seizures. The articles have been spelling out the laws with the do's and don't's of taking walrus by natives and non-natives. There "appears" to be an increase in the number of walrus found floating in Bristol Bay, most of which are highly suspect of being shot.

The public use camp at Ugashik Narrows paying dividends this year. The field crew gathered information that revealed several fishing guides were targeting grayling for their clients. The Alaska Board of Fisheries, at its winter meeting, passed a regulation closing the Ugashik drainage to the taking of grayling. We passed this data on to ADF&G Sport Fish Biologist Mac Minard. Mac then wrote a letter to the fishing guides that clarified the regulation. He states, "It was the expressed intent of the Board members and is the interpretation of the Attorney General's office that this regulation closes those waters to targeted grayling fishing. Specifically, it is not legal to intentionally catch and release grayling in these waters." We continued to monitor the grayling take and passed this information on to ADF&G and Alaska Fish and Wildlife Protection (AFWP).

In July, Mr. Jack Fisher of the Alaska Fish & Wildlife Safeguard program was contacted by ORP Rodriguez seeking information on ways for the public to alert proper authorities in case they witnessed a game violation. Mr. Fisher proved very helpful and provided brochures and stickers to this station. He also indicated that a slide show is also being worked on by his office that might be of use to us in the future.

Monitoring connected with the Exxon Valdez oil spill on the Pacific coastline, of the Alaska Peninsula/Becharof refuges, has been beneficial in discovering a variety of non-spill activities that are occurring in these remote areas. One such activity is that their appears to be a substantial amount of commercial fishing within close proximity of seabird colonies. The fishermen are utilizing purse seines to catch fish that are located directly below the nesting cliffs. The activity of the fishing vessels and aircraft used for spotting fish is causing the colonial nesting seabirds to evacuate their nesting sites on each disturbance. This is suspected to be causing substantial undue hardship on the reproduction of each species involved. Some of this disturbance has been documented by the field camp crews. The FWS has no substantial evidence or documentation as to just how much of this disturbance is occurring. The disturbance causes the occupants of the colony to take flight causing eggs to be destroyed, young to be exposed to avian predators and puts undue hardship on the nesting birds. The Migratory Bird Treaty Act prohibits the harassment of these species. The question arises as to whether the fishermen are intentionally "harassing" the colonies or are they merely going about their business in a legal manner as prescribed by law. If it is legal for this activity to occur then documentation of any disturbance and its effect needs to be collected as well as identifying the fishermen. Once achieved, there may be evidence and cause for the Service and/or State of Alaska to institute limits as to how close to these colonies that the fishermen can conduct their activities. The baseline enforcement information needs to be collected to establish the direction to proceed.

Conflict? These two commercial vessels are fishing at the base of the Jute Peak nesting colony of 15,000 common & thick-billed murres and 2,000 black-legged kittiwakes during the height of the nesting period. This disturbance and that of the spotter aircraft may be the cause of significant mortalities. 07/90, GLT

Prior to this year, refuge boundary signs have been non-existent. That changed with the installation of the first boundary sign installed on August 29. ORP Rodriguez, Maintenance Worker (MW) Terry and DRM Poetter traveled up Big Creek to the Becharof Refuge boundary and completed the installation using standard highway posts, due to their ease of installation and durability. This waterway is the only boat access onto the refuge from the King Salmon area. During certain periods it is heavily used for recreation. Plans had been made to install several other signs on other main water access points but will have to be completed next summer. The boundary signs are to be placed at selected river access points on the Becharof Refuge and Ugashik Unit of the Alaska Peninsula Refuge. Once installed, the visiting public traveling these river highways will know when they have entered the refuges.

MW Terry (left) and ORP Rodriguez proudly display the newly installed boundary sign on Big Creek. Surprisingly enough, it made it through the hunting season without a single bullet hole in it!

08/29/90, RDP

The State moose hunting season opened September 5th and closed on September 15th for GMUs 9C and 9E, in which the refuges are located. The federal subsistence season ran from September 5th-20th. SA Pat Bosco from Boston, Massachusetts and Rich McDonald from Bellevue, Washington, were given assignments to assist Refuges Officers with patrol efforts during the hunting season. SA/Pilot Roger Parker brought the agents out in a C-185 on floats. Roger assisted with the effort until he had to leave on the 11th and was replaced by Senior Resident Agent/Pilot Wally Soroka. An extensive effort was placed on the patrol of Big Creek, which is accessible from King Salmon via jet-boat. Daily patrols up the creek and on to the Becharof Refuge provided substantial contacts with caribou, moose, ptarmigan and duck hunters, plus an occasional fisherman. This area of Unit 9C was under a special regulation that required "Federal Subsistence Hunt Permits" for local moose hunters. These permits were required to hunt on the Refuge during the Federal subsistence hunting period of the 16th - 20th. Each local hunter contacted, especially prior to the 16th, was asked if they were intending to hunt moose during this special subsistence period, and if so, was issued a permit. A total of 18 permits were issued. It appears that two moose were taken. During this law enforcement effort some suspicious activities were observed but no actual violations discovered. The efforts of the agents is greatly appreciated and it was a pleasure to have Pat and Rich up from the "lower 48".

DRM Poetter (left) issuing a "Federal Subsistence Hunt Permit" for the Becharof Refuge special moose season, while making law enforcement contacts. 09/90, DAD

20. Cabins

It is the policy of the FWS 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 are compatible with the purposes for which the refuge was established (Alaska Lands Act 304(d), 1303(b), 1315 and 1316). Service policy is to limit new cabins to those essential for the continuation of an "ongoing activity" or use allowed within the refuge (Alaska Lands Act 304(d), 1303(b)).

ARM/P Arment developed a data base of all cabins located within the refuge exclusive of those on private inholdings. The data base includes: 55 cabins by Refuge Unit, Township, Range and Section(s); a description of each structure in terms of construction material; square footage of floor space; and type of use pattern.

The Becharof Refuge currently has six cabin sites with usable structures. Current status of these cabins are: three have been permitted; one is pending and being handled in conjunction with BLM as part of a Trade and Manufacturing site application; and two are designated for administrative purposes. The Becharof Refuge has six private inholdings with associated cabins.

On October 12th, RM Hood signed a "Certificate of Inspection and Possession" for the Hammond property on the Kejulik River. The 17-acre parcel contains a cabin that will be used for administrative purposes (see Section C.1.).

The Ugashik Unit of the Alaska Peninsula Refuge currently has 13 cabin sites with usable structures. Current status of these cabins is: ten have been permitted; two applications are pending with one being on a 14(h)(1) historic site; and one is designated for administrative purposes. The Ugashik Unit has ten inholdings with associated cabins.

The Chignik Unit of Alaska Peninsula Refuge 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 four inholdings with associated cabins.

21. Guides and Outfitters

The Alaska State Supreme Court ruled on October 21, 1988 (Owsichek vs. State of Alaska, Guide Licensing and Control Board) that exclusive guide areas are unconstitutional. Therefore, the need for and use of "guide areas" has been thrown open for evaluation. As a result of the Owsichek decision, the Fish and Wildlife Service in Alaska decided to manage commercial big game hunting operations on National Wildlife Refuges under an interim policy. The policy was designed to minimize impacts on wildlife refuges while allowing the State of Alaska adequate time to develop a legal system for managing commercial trophy hunting. The interim policy essentially freezes commercial hunting operations (guides and outfitters) at the 1988 level and limits them to the same areas as in 1988.

The FWS preferred solution is for the State to develop an allocation system that will resolve the issue. The Service intends to work with the State, other Federal agencies, Alaska Professional Hunters Association, and interested organizations and individuals to assist in developing a new system under the State's authority and in compliance with State and Federal laws, regulations and policies.

In March, RM Hood developed and provided recommendations to ADF&G for Big Game Guide/Outfitter Use Areas on the Alaska Peninsula and Becharof refuges. ADF&G provided "side-boards" that use areas had to be developed using uniform geographic coding units (UCUs). It is clear to us that on the Alaska Peninsula adjustments will have to be made. Therefore, we did not allow the UCU guidelines to limit our recommendations. Some use areas were proposed that followed political boundaries while other proposals subdivided UCUs into multiple use areas.

Applications for Big Game/Outfitter, Fishing Guide, and Transporter special use permits were updated and revised in January to reflect the latest status of the interim management policy.

A total of 60 special use permits were issued for commercial guiding, outfitting and transporting activities occurring within the refuges (Table 18).

Table 18. Special use permits issued for Guides/Outfitters and Transporters 1982-1990.

Year	Number
1982	33
1983	30
1984	35
1985	40
1986	42
1987	53
1988	61
1989	58
1990	60

A total of 47 commercial guiding/outfitting permittees recorded approximately 5,743 total client use days within the refuges last year (Table 19). Fishing clients represented approximately 71 percent of the total clients. However, big game hunters represented approximately 53 percent of the total client use days.

Table 19. Permittees and total associated client use within the refuges - 1989.

	Big Game Hunting		Fishing		Total	
Permittee	Clients	Days	Clients	Days	Clients	Days
Aldridge						
Broady			52	210	52	210
Branham			72	72	72	72
Brod			16	136	16	136
Cerami						
Christensen	3	21			3	21
Cusack, M.			125	125	125	125
Flynn, D.	20	170	2	20	22	190
Flynn, H.	12	120	7	14	19	134
Gaudet						
Gillis	17	120			17	120
Grasser	10	92	110	770	120	862
Hammond	1	11			1	11
Hancock	13	65			13	65
Harms			17	119	17	119
Hautanen	7	50			7	50
Hayes			21	21	21	21
Hendricks	7	38	7	38	14	76
Holman			64	98	64	98
Johnson, B.			20	20	20	20
Johnson, K.	28	136			28	136

Table 19. Continued.

Permittee	Big Game Hunting Clients	Big Game Hunting Days	Fishing Clients	Fishing Days	Total Clients	Total Days
Jones, B.	23	242	12	80	35	322
Jones, E.	6	73			6	73
King	6	30	8	50	14	80
Kirstein	22	169	16	64	38	233
Klutch	41	330	12	40	53	370
Lamoureux	13	124	5	30	18	154
Langvardt	9	90	8	80	17	170
Lazer	7	46	6	42	13	88
Loesche			47	94	47	94
Martin			62	212	62	212
Matthews			40	40	40	40
McNutt	3	42			3	42
Meredith	6	54			6	54
Munsey	10	120			10	120
Myers, R.	6	60			6	60
Owsichek			24	24	24	24
Pederson, H.	8	72	6	12	14	84
Runyan	4	44	1	1	5	45
Shoemaker	28	270	15	150	43	420
Sims			5	5	5	5
Speer						
Sugimato			35	35	35	35
Suiter			35	35	35	35
Swiss	12	96			12	96
Vrem	38	349	18	72	56	421
Wooden						
Totals (47)	360	3,034	868	2,709	1,228	5,743

A total of 28 big game guide/outfitter permittees were responsible for harvesting 77 brown bears, 54 moose and 152 caribou last year (Table 20). Sows represented approximately 26 percent of the bear harvest, while no cow moose and one cow caribou was harvested.

A total of 31 fish guide/outfitter permittees were responsible for the harvest of approximately 1,859 fish (Table 21). Approximately 78 percent salmon, 19 percent arctic char, 1 percent arctic grayling and 2 percent rainbow trout made up the total reported harvest.

Table 20. Permittees, client use and big game harvested within the refuges - 1989.

Permittee	Bear					Moose					Caribou					Harvest Unit(s)
	Clients	Client Days	Harvest M	F	T	Clients	Client Days	Harvest M	F	T	Clients	Client Days	Harvest M	F	T	
Christensen	3	21	2	1	3											Chignik
Flynn, D.						3	30	3		3	17	140	14		14	Ugashik
Flynn, H.	3	30	1	1	2	3	30	3		3	6	60	6		6	Ugashik
Gillis	5	40	5		5	2	10	2		2	10	70	10		10	Chignik
Grasser	3	30	2	1	3	2	15	2		2	5	47	5		5	Ugashik
Hammond	1	11	1		1											Becharof
Hancock	6	38	3		3	3	11	1		1	4	16	4		4	Ugashik
Hautanen	1	10				3	16	1		1	3	24	1		1	Ugashik
Hendricks	5	30				2	8	2		2						Ugashik
Johnson, K.	16	88	11	2	13	6	30	3		3	6	18	6		6	Chignik
Jones, B.	9	121	5	1	6	5	40	3		3	9	81	9		9	Ugashik
Jones, E.	4	47	1	1	2						2	26	1		1	Chignik
King	3	24		3	3	2	2	2		2	1	4	1		1	Chignik
Kirstein	3	42	1	2	3	6	36	5		5	13	91	11		11	Ugashik
Klutch	14	130	4	1	5	6	60	6		6	21	140	19	1	20	Bch/Chig
Lamoureux	5	60	1		1	4	44	3		3	4	20	4		4	Ugashik
Langvardt	3	30	2	1	3	3	30	3		3	3	30	3		3	Ugashik
Lazer											7	46	6		6	Bch/Ugas
McNutt	2	28	2	1	2						1	14	1		1	Ugashik
Meredith	4	36	1		1						2	18	1		1	Becharof
Munsey	5	60	2	2	4						5	60	4		4	Becharof
Myers, R.	4	40	3	1	4	1	10	1		1	1	10	1		1	Becharof
Pederson, H.						5	50	4		4	3	22	1		1	Ugashik
Runyan	2	28	1		1						2	16	2		2	Ugashik
Shoemaker	6	65	2	1	3	6	60	4		4	16	145	16		16	Becharof
Swiss	5	50	3	1	4	1	10	1		1	6	36	6		6	Chignik
Vrem	8	80	4	1	5	5	55	5		5	25	214	18		18	Bech/Ugas
Totals	28 120	1,139	57	20	77	68	547	54		54	172	1,348	151	1	152	

M = Male; F = Female; T = Total

Table 21. Permittees, client use and fish harvested within the refuges - 1989.

Permittee	Clients	Client Days	Fish					Harvest Unit(s)
			Salmon	Char	Grayling	Trout	Total	
Aldridge								Ugashik
Broady	52	210	365				365	Becharof
Branham	72	72	49	2	2		53	Bech/Ugas
Brod	16	136	98	29	8	35	170	Ugashik
Cusack, M.	125	125	45	4			49	Bech/Ugas
Flynn, D.	2	20						Ugashik
Flynn, H.	7	14	6				6	Ugashik
Grasser	110	770	220	24			250	Bech/Ugas
Harms	17	119	34	10			44	Ugashik
Hayes	21	21						Becharof
Hendricks	7	38	8				8	Ugashik
Holman	64	98						Ugashik
Johnson, B.	20	20	37				37	Bech/Ugas/ Chig
Jones, B.	12	80	25	80			105	Ugashik
King	8	50	50	3			53	Chignik
Kirstein	16	64	100	80	6		186	Ugashik
Klutch	12	40	20	30	2		52	Bech/Chig
Lamoureux	5	30		12			12	Ugashik
Langvardt	8	80	10	20			30	Ugashik
Lazer	6	42						Bech/Ugas
Loesche	47	94						Bech/Ugas
Martin	62	212	154	25			179	Ugashik
Matthews	40	40						Bech/Ugas
Owsicheks	24	24	42				42	Becharof
Pederson, H.	6	12	5	1			6	Ugashik
Runyan	1	1	3				3	Ugashik
Shoemaker	15	150	4				4	Becharof
Sims	5	5						Ugashik
Sugimato	35	35	80	25			105	Ugashik
Suiter	35	35	30				30	Bech/Ugas
Vrem	18	72	60	10			70	Bech/Ugas
Totals (31)	868	2,709	1,445	355	18	41	1,859	

A total of 18 permittees were responsible for the harvest of approximately 1,136 game birds (Table 22). Game bird harvest was incidental to big game hunting.

Table 22. Permittees and game birds harvested within the refuges - 1989.

Permittee	Ptarmigan	Ducks	Harvest Unit(s)
Brod	8		Ugashik
Grasser	37		Ugashik
Harms	170	255	Ugashik
Hautanen		18	Ugashik
Jones, B.	6		Ugashik
Jones, E.	10		Chignik
Kirstein	130	140	Ugashik
Klutch	30	2	Bech/Chig
Lamoureux	3	12	Ugashik
Langvardt	20		Ugashik
Lazer	30		Bech/Ugas
Martin		22	Ugashik
Munsey	5		Becharof
Myers, J.	10		Becharof
Runyan	2		Ugashik
Shoemaker	43	8	Becharof
Swiss	25		Chignik
Vrem	150		Bech/Ugas
Totals (18)	679	457	

22. Take Pride in America/Alaska

The "Take Pride in America/Alaska" program was very successful this year. Two major projects were undertaken (see below). Refer to Section E.2. for Youth Conservation Corps activities.

Myers property clean up.

The public use field camp crew at Ugashik Narrows and local fish guiding permittees put in excess of 100 hours cleaning of the "Myers property" which was acquired by the Service in 1989. The work included dismantling a quonset hut, which was the last of several lodge structures to be removed. A total of six Grumman Goose loads of garbage were hauled out on July 30th and 31st. Multiple other loads were removed on backhauls using station and charter aircraft.

This is the mess left to cleanup on the recently acquired Myers property. 7/90, WRS

Ugashik Narrows seasonal volunteers and local fish guiding permittee "Taking Pride" in their cleanup effort. 7/90, WRS

An Office of Aircraft Service Grumman Goose was contracted to haul six loads of junk from the Myers property to be disposed of in King Salmon.
7/31/90, WRS

Bear Creek No. 1 Cleanup.

The Alaska Peninsula has attracted prospectors for oil and gas since the early 1900's. Ten exploratory wells have been drilled within the area that is now Becharof Refuge. In the late 1950's, a consortium of oil companies led by Humble Oil and Refining Co. (Exxon Company, U.S.A.) and General Petroleum Corp. (Mobil Oil Company) conducted oil exploration on and across refuge lands. A docking installation was constructed at Jute Bay (Island Bay). Humble then constructed a heavy duty access road to a drilling site located on Bear Creek. The infrastructure at Bear Creek Unit No. 1 included a well pad, a base camp, a maintenance area and an air strip [Note: The access road and all facilities at Bear Creek are now in the Becharof Wilderness Area.] General Petroleum utilized the docking facilities and access road. They continued the access road down Bear Creek, across the "Little Narrows" on Becharof Lake then southwest along Becharof Lake to two well sites west of the refuge boundary (Great Basins No. 1 and No. 2). There are approximately 50 miles of access road. Humble completed Bear Creek No. 1 on March 4, 1959. General Petroleum completed Great Basins No. 1 on Sept. 14, 1959 and Great Basins No. 2 on Nov. 12, 1959. All three wells were abandoned shortly after completion.

Access road to Bear Creek No. 1 oil exploration well site. The road was constructed in 1958.
6/25/88, REH

In 1988, the Service funded a "contaminants" project with the objective: "To determine if any contaminants have entered the refuge environment from abandoned oil exploration activities at selected locations on Alaska Peninsula and Becharof refuges." At Bear Creek No. 1, a land fill was discovered. Drill mud components, 55-gallon drums and other trash were eroding out the banks of a small stream on the east side of the drill site. Composite sediment samples for organic and metals analyses were collected. At the same time abandoned physical remains were documented for cleanup targets in the "Take Pride in America" thrust. Results of the contaminants samples analyses were received in April 1989. However, data interpretation and reports have been delayed due to the work load impacts of the Exxon Valdez Oil spill. A cache of 500-1000 rusting 55-gallon drums was discovered at Island Bay subsequent to this study.

Exxon officials discussing cleanup of cache of 55-gallon drums. 6/6/90, REH

In early 1990, RM Hood proposed to Exxon officials, involved in the oil spill cleanup, that Exxon clean up the Island Bay barrel cache, old culverts in the access road and the physical remains left at the Bear Creek No. 1 well site. Several onsite visits followed. A background review conducted by Exxon revealed that the barrel cache was not left by Humble and they declined to clean up the cache. (Concern was expressed over the possibility of unknown contaminants problems existing in buried portions of the cache.) However, they did agree to clean up the well site and the culverts (over 50 20-foot segments of 24" to 48" culvert were documented.) Exxon began this work on August 21st. They stopped work on August 24th. Exxon removed 26 culvert sections. A large amount of miscellaneous metal from the well site was stacked in preparation for removal. Two piles of wood debris were collected at the well site. Attempts to burn the wood failed because it was water soaked. Exxon estimated that they spent $150,000 on the cleanup. Time constraints prevented the removal of the remaining culverts and the metal debris.

Some of the 50-plus sections of culvert that Exxon agreed to remove. 6/25/88, REH

Exxon cleanup crew working on a culvert section preparing it for removal by helicopter.
8/23/90, KKH

Exxon has been approached about returning to finish the cleanup in 1991. Early indications from company representatives are favorable.

RM Hood represented Region 7 at the Fourth Annual Take Pride in America National Awards Ceremony held in Washington D.C. on September 18th. The Alaska Peninsula/Becharof refuges received a Certificate of Merit award for an aggressive "Take Pride" program. Shirley Hood accompanied Ron and represented the Bristol Bay Lions Club which was recognized for their Naknek River Cleanup campaign. Shirley accepted the "Director's Award" on behalf of the Lions Club at a ceremony in Director John Turner's office, also on the 18th.

RM Hood at the "Take Pride" awards ceremony in Washington, D.C. 9/18/90, SJH

I. EQUIPMENT AND FACILITIES

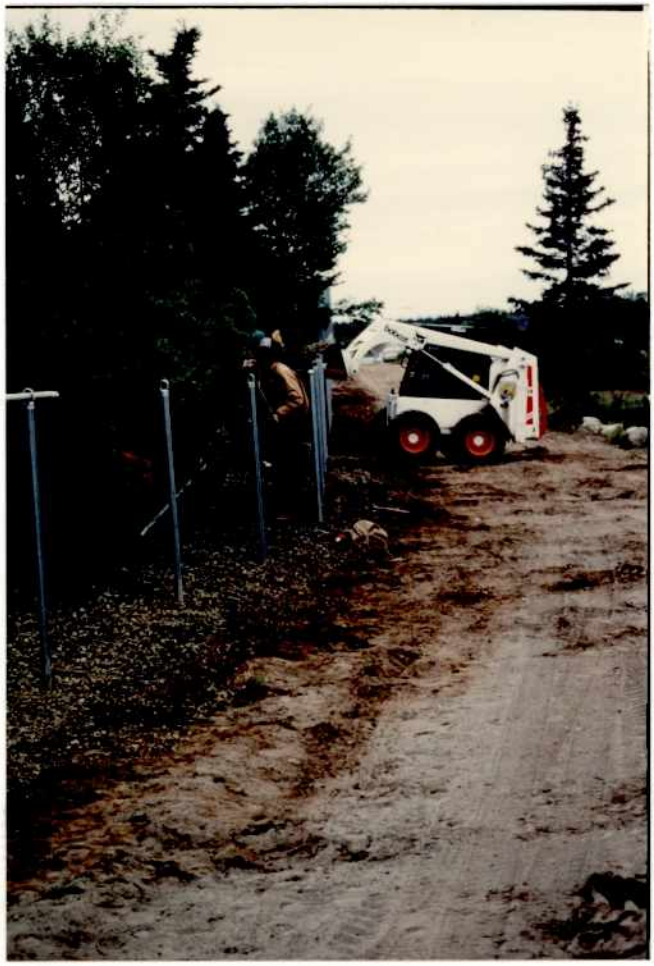
1. New Construction

June 5th-13th, the Regional Construction Team consisting of Construction Representative Walt Szelag, Carpenters Harold Shippley and William Fluegel and Electrician Ray Gauthier spent some of their summer completing a variety of construction projects (see Section I.2.) at the King Salmon Headquarters. The only new construction project was the construction of an 18 ft. x 100 ft chain-link fence around the septic system leach field. The field actually lies underneath Alaska Department of Fish and Game (ADF&G) property and permission was granted for the construction of the fence. Prior to fencing, people were parking vehicles and heavy equipment on top of the leach field which could have damaged it.

Is this a large dog kennel? No, it's the new fence around the septic system leach field, installed by the Regional Construction Team. 06/90, REH

2. Rehabilitation

During the week of June 4th, a new water well was drilled at Residence No. 28. Water was hit within 70 feet of the surface. The old well was using an aquifer in excess of 100 feet deep. The depth of the new well is more consistent with wells in the area producing water within all standards established by Department of Environmental Conservation. The old well water fell outside those standards.



RO Construction Team of Walt, Harold and Bill in the process of installing the new chain-link fence on the west compound boundary.
06/90, REH

On June 5th, a Regional Construction Team consisting of Construction Representative Walt Szelag, Carpenters Harold Shippley and William Fluegel and Electrician Ray Gauthier arrived to complete funded Maintenance Management System (MMS) projects and other miscellaneous work. The following projects were accomplished prior to their departure on June 13th:

- Replaced approximately 80 feet of 2x4 wood fencing surrounding the sewage pumping system with new wood split-rail fencing (see photo, this section).
- Constructed new chain-link fence around septic drain field (see photo, Section I.1.).
- Replaced west chain-link boundary fence with new chain-link (only partially completed due to incomplete shipment of materials). The old fence looked like a snake and the property boundary was eroded. The

new fence was placed on a leveled and river gravel surface (see photo, this section).

- Installed outside thermostats to control the boiler circulating pumps on Residences 26, 27, 28 and 29 during the summer, when water doesn't need to be circulated throughout the baseboard system wasting energy.
- Modified hot water plumbing at Residence No. 28. A "Y" valve was allowing cold water to enter the hot water system.
- Moved airport kiosk to a new location (Section H.6.).
- Other miscellaneous electrical projects.

The Regional Construction Team, consisting of Construction Representative Walt Szelag and Carpenter Harold Shipley, returned to King Salmon on September 19th to complete another construction project. This project was to replace the chain-link fencing on the north boundary of the headquarters compound. All the late season bugs and the swamp did not deter these two diligent workers from their appointed duties. The work was completed by the 22nd and they were off to other projects in the Region.

This new split-rail fence adorns the compound while surrounding the sewage pumping system. 06/90, REH

In October, strips of 90 degree-angle metal were installed on the corrugated metal roofing of the office warehouse (Bldg. No. 4) and Quarters Nos. 26 and 27. These strips were installed in the area above the garage doors and entryway. The snow that accumulates on the roofs would always start to melt and then slide off the roof and land on the driveways and walkways, making a hard icy mound. The metal strips will hold the snow on the roof so it can melt in place and the water will flow into the gutter and not end up

where it is a hazard. This modification was so effective that it has been installed on Quarters Nos. 28 and 29. The icy mounds have been eliminated and it is now much safer to enter/exit the houses and garages, by foot or vehicle.

4. Equipment Utilization and Replacement

The new 1990 half-ton Dodge Power Ram 4 x 4 pickup was delivered by barge on May 1st. It had missed the last fall barge and spent the winter in Seattle. Nice vacation! It replaces the 1979 Dodge 4 x 4 pickup.

In September, the old 1979 Dodge 4x4 went up on the auction blocks when GSA advertized for sealed bids. The inspection period ran from the 17th thru the 28th with the bid opening held on October 3rd at the GSA Center in Auburn, Washington. The vehicle went for $419.91 to a "local" resident who is taking good care of it. The truck was in need of engine and brake repairs, upholstery was torn and the tailgate was missing.

The new 1990 Dodge 4x4 pickup was fitted with some new accessories in October. Side storage bins, an overhead ladder rack and a protective metal screen for the rear window were part of the items. A new eight foot wide snow plow was also installed and used for the first time. A rear window protector was also purchased and installed on the 1985 Chevy S-10 pickup.

Three dust collectors that were excess to the Kenai Refuge were offered to the station. Kenai has installed a new centralized dust collection unit. The units sit atop 55-gallon drums and collect the saw dust that is generated by the shop's power equipment. Many thanks!!

Several items, purchased with year-end monies, received in October, include: parts washer; push lawn mower; electric and gas power lawn trimmers; pneumatic tire changer; miscellaneous small storage bins for nuts and bolts, etc.; and a small assortment of needed miscellaneous hand and power tools.

A new Monitor 41 heater was purchased for Residence No. 9 and was installed in November. The old Monitor 21 heater was continually going on the fritz and, during the colder weather, had a hard time providing the needed heat. The new furnace is more powerful and is doing the job.

The office and bunkhouse fire alarm systems were repaired November 14th by Alaska General Alarm of Anchorage. The repairman spent several hours going over the alarm systems located in the main office and bunkhouse. One smoke detector in the office (Bldg. No. 4) was replaced; one smoke detector in the bunkhouse (Bldg. No. 3) needed repairs and the remaining detectors needed cleaning. The repairman suggested cleaning the smoke detectors every few months with compressed, moisture free, non-abrasive, air spray. This is required because of their sensitivity to dust.

In last year's Annual Narrative we reported on Maintenance Worker (MW) Terry's new invention, the 5-gallon Can Crusher. In October, of that year, a working model had been assembled and put to use during the clean-up of the old Myers' lodge at the Ugashik Narrows. In April, of this year, all the paperwork (Report of Invention, Job Hazard Analysis, drawings of the invention and components list) was assembled and submitted to the RO for

review and submission to the Solicitor's Office to obtain a government patent. The need for the patent is not only for the protection of the invention (created with government materials during government work hours), but more importantly, an invention/cash award to the employee may be processed upon notification that the Solicitor has filed a patent application. The invention has gone through safety and engineer reviews. In October, the process advanced to the point of, "solicitation for legal services necessary to conduct an art search and to prepare the patent application, if warranted." Should the art search result in an unfavorable report the costs will not exceed $500.00, but if favorable, the preparation of the patent application and processing fee should cost no more than an additional $1,450.00. Thankfully, the RO indicated they would cover any costs. No news yet, but as a final bit of information, a patent application must be filed within a year of the first disclosure of the invention outside the government and/or within a year of the date the invention was first placed in practical use in or outside the government.

5. Communications Systems

On April 28th-29th, servicing and annual maintenance checks were conducted on the Very High Frequency (VHF) Radio System. Ted Collins of Alaska Radio, Fairbanks, Alaska inspected, tuned and made necessary repairs on the base station at King Salmon, the remote base/repeater atop Whale Mountain and the repeater atop Mother Goose Lake Mountain. The voltage regulator at the Whale Mountain repeater had failed (making the Mother Goose Lake unit non-functional for contacting the office) which in turn caused several batteries to fail. A temporary repair was completed with two 12-volt wet cell batteries that kept the system operational until permanent repairs could be completed. Access to the mountain top station was provided by a Trans Alaska Bell 206 helicopter piloted by Jack Gordon. The necessary replacement parts were ordered and finally received in August. On September 22th, Ted Collins returned to install the new parts and brought the system up to standards.

A Telecommunications Service Plan for the Alaska Peninsula/Becharof refuges was prepared and sent to the Regional Office for review in October. This plan describes telecommunications functions required through Fiscal Year (FY) 1995. The plan also identifies telecommunications capability as it now exists and the schedule for acquiring additional services. This document is intended as a guide for preparation of Annual Work Plans.

6. Computer Systems

Budget constraints prohibited the purchase of any new hardware in FY 1990. Funding for FY 1991 is much improved for hardware and software. Before any purchases could be made an Office Automation Plan had to be prepared. It was finally completed in October and sent in for RO review. To date, there has been no feedback as to good, bad or indifferent. The plan is to provide a tool for planning the acquisition and use of automated data processing equipment (ADP) and services by this Station. It is also intended to assist the Division of Information Resources Management (IRM) in assessing the Regional ADP needs and trends.

7. Energy Conservation

In December, the outside security lights at Quarters Nos. 8, 26, 27, 28 and 29 were rewired eliminating the light switches. This was accomplished to ensure the lights were not inadvertently turned off. A quarters deduction is now being received for the nightly operation of these lights for protection of government property. A light photo cell was installed in Quarters No. 8, and replaced the recently burnt-out ones in Quarters Nos. 26 and 29.

8. Other

January - Basic maintenance work for the month involved two things: repairing heating plants and motor vehicles so as to maintain their functional status. Approximately one-third of the MW's time was spent pushing snow as a result of the repeated snow falls.

February - MW Terry had his hands full this month with the extended cold weather causing freeze-up problems of residence water lines and drains. The continuous snowfall kept him busy trying to keep the drives, parking areas and walkways clear.

March - New racks and shelving, for the field camp supplies storage area, were constructed by Gary this month, between interruptions.

April - The Refuge and King Salmon Fisheries Assistance Office staff celebrated an early Earth Day by conducting a headquarters compound clean-up of the winter's trash and debris the afternoon of the 20th. The time was well spent, as exhibited by the large amount of debris pick up and the resulting improved aesthetics.

May - Projects included: installation of venetian blinds (replacing pull shades) in the mass sleeping area of the bunkhouse; installation of legs for the ping-pong table; construction of two 55-gallon drum incinerators for the field camps to burn their garbage; serviced a variety of boat motors and generators; and repaired the dryer in bunkhouse.

June - Wooden safety strips were installed on the incline walkway leading to the boat dock, to prevent someone slipping especially while carrying a load of supplies/gear to the float-planes or boats.

The YCC crew accomplished many tasks during this June and July, under the supervision of MW Terry. These accomplishments, of the enrollees, are listed in Section E.2.

July - Biological Technician Mumma gave a good house cleaning to the field camp gear storage area, which produced a variety of junk not known to exist. There is considerably more room now.

Several inoperable boat motors were returned from the Puale Bay field camp and put back into service. A generator for the Ugashik Narrows camp was serviced and sent out to replace their non-functioning one. The parts were received and the work completed on the extension of the shaft of the Puale Bay Camp 30 hp boat motor, which was too short to function on the large inflatable boat.

September - One of the walls of the outdoor informational kiosk became detached from the upright supports; possibly due to high winds. Outdoor Planner Rodriguez quickly impersonated a maintenance worker and made some temporary repairs. MW Terry made more permanent repairs upon his return.

October - The cement pad of the front entryway doors, to the garage of Quarter Nos. 26 and 27, were pulled up and then replaced after three inches of dirt were removed. This lowering was required due to frost heaving the pad to a height that would keep the storm door from opening. By the end of the year, and substantial heaving, the doors were still functional.

November - Preventative maintenance on all the vehicles was completed this month. Most of the furnaces were given a thorough servicing prior to the big cold snap.

December - Numerous problems with furnaces plagued MW Terry this month, even after the previous month's servicing. The office and three of the older residence boilers kept shutting down. It appears that all the various problems have been remedied and no freeze damages occurred thanks to Gary.

Fifty-six mile per hour winds (the highest of the year) blew the hood off the disfunctional wind generator and the furnace chimney on Residence No. 8 on the 12th. Fortunately they both landed in safe areas creating no significant damage.

The same high winds also removed a couple boards from the two small privacy fences at Quarter Nos. 26 and 27. Gary had them repaired quickly and no damage resulted.

J. OTHER ITEMS

1. Cooperative Programs

Assistant Refuge Manager/Pilot (ARM/P) Arment provided assistance to Katmai National Park (NP) by ferrying Superintendent Bane, Ranger/Pilot Speckman, and Resource Specialist Meldrum to the Mt. Martin volcano on February 1st. Earlier in the day, the volcano could be seen from King Salmon putting up a plume to approximately 15,000 feet. Due to lowering conditions resulting from a nearby weather system and possibility of ash, the mountain was not approached. However, while flying along the Aleutian Range away from Mt. Martin, steam vents were observed to be approximately 10 miles southeast of Mt. Martin.

ARM/P Arment ferried Chief of Maintenance, Ed Stonedall of Katmai NP to Brooks Lodge on February 15th. While there, Arment assisted Ed with several mid-winter check-up projects. One project included going from building to building recording brown bear damages. One quickly notices that the bears exhibit a strong affinity towards the corners of wood structures, rubber and plastic products, and cans full of paint.

The Cinder Lagoon spring field camp gear was assembled and checked over by Biological Technician (BT) Mumma, with assistance in servicing the motors and generator by Maintenance Worker Terry. This bi-annual field camp is run by Research personnel studying the movements of emperor geese. This year Biologist Joel Schmutz was in charge of conducting the field work. The camp was established around April 11th and was in operation for approximately one month.

On July 20th (a Friday evening), the Alaska Fire Service contacted Refuge Manager (RM) Hood. They had a fire team enroute to King Salmon to fight a fire on State lands north of town and had requested to use the Refuge hanger to stage their efforts out of. The hanger was utilized the 20th - 26th. The Refuge also provided assistance by loaning them the use of the waterfowl brood count helicopter and the oil spill helicopter for demobilization on the 25th and 26th.

In August, in a co-operative effort with the National Park Service, Wildlife Biologist (WB) Dewhurst and BT Hankins assisted in water quality testing of lake inlet streams along the upper portion of Katmai NP. Much of this effort was volunteered and performed on weekends in the spirit of gaining overall background information on the Alaska Peninsula natural resources.

The Cinder Lagoon emperor goose fall field camp was flown out on September 8th, with WB Karen Bollinger and Volunteer Francis Bussuyt as the camp crew. On September 29th, Karen was replaced by WB Neil Barten. WB Barten and Volunteer Bussuyt returned to King Salmon on October 29th. The refuge issued camp gear was returned well organized, clean and was efficiently put back into storage. Thanks, for a job well done, go to Neil and Francis, this is the way field camp gear should be taken care of. They were a pleasant camp crew to provide support to.

2. Other Economic Uses

In addition to 60 special use permits issued for cabins, guides, outfitters and transporters, nine permits were issued for other uses (Table 23). Three of the nine permits were issued for other economic uses.

Table 23. Special use permits issued for other economic use and non-economic uses.

	Other Economic Uses		Sub	Non-Economic Uses			Sub	
Year	Oil/Gas	Mineral	Total	Federal	State	Other	Total	Total
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
1989		1	1	4	1		5	6
1990	2	2	3	2	2	2	9	9

3. Items of Interest

Station visits

Associate Manger (AM) George Constantino visited the refuge on January 16th to 18th to attend Public Use Management Plan village workshops held at Chignik Lake and Chignik Lagoon.

National Quarters Coordinator Peter O. Langer and Regional Quarters Coordinator Dee Butler visited King Salmon on May 18th. They toured the area, inspected rental units and interviewed staff members in an effort to familiarize Mr. Langer with the differences encountered in living in bush Alaska.

Assistant Regional Director (ARD) John Rogers and AM Constantino conducted a station inspection on July 10th to 12th. We took advantage of the great weather they brought with them, and the oil spill helicopter to visit a number of locations on Becharof Refuge and the Ugashik Unit of the Alaska Peninsula Refuge. Stops were made at the Island Arm administrative cabin, Bear Creek oil exploration site, Puale Bay field camp, Ukinrek Maars, Gas Rocks, Ugashik Narrows field camp, Mother Goose Lake administrative cabin, and Yantarni air strip. George seemed to be impressed by our brown bear resource.

AM Constantino and ARD Rogers inspect the Ukinrek Maars.
7/11/90, REH

On July 16th to 18th, Construction Coordinator Art Wemmerus visited King Salmon. His purpose was to familiarize himself with stations's facilities

and proposed Resource Needs Information System (RNIS) projects. Wemmerus and RM Hood toured the headquarters facilities and took advantage of the oil spill helicopter to visit existing and proposed administrative sites on the refuges. A visit to the Bear Creek oil well site was made and samples taken of a drill mud deposit discovered last month.

Art Wemmerus taking contaminant sample. This "river of slime" turned out to be drill mud (bentonite) with no detected pollutants.
8/16/90, REH

Service Director John Turner, Special Assistant Mike Brennan and Regional Director Walt Stieglitz arrived via Grumman Goose (N789) in King Salmon on August 19th. RM Hood traveled with them on a flight-seeing visit to Becharof Refuge with stops at several streams on the Becharof Lake Island Arm to inspect/observe spawning red salmon. They over-nighted at the Island Arm administrative cabin with BT Mumma providing his culinary magic. On the 20th, they were transported by supercub (borrowed from the NPS), piloted by ARM/P Arment, to a small sandbar on the King Salmon River. They were met by King Salmon Fishery Assistance Office (KSFAO) Project Leader Jim Larson and escorted a short distance to Gertrude Creek. Fishery Biologist Jeff Adams then briefed them on the management study being conducted on rainbow trout

in the King Salmon River Drainage. They were then invited to participate in the study by collecting samples. An enthusiastic effort followed. Inclement weather precluded scheduled plans for the 21st. Deputy Refuge Manager Poetter jumped into the void and provided a guided tour of the Naknek River in the Refuge 18-foot jet boat. The party departed King Salmon via commercial air in the afternoon.

On August 21st, Deputy Assistant Secretary for Fish, Wildlife and Parks Scott Sewell accompanied by Special Assistant to the Secretary Lucy Salazar and White House Special Assistant Griffith arrived in King Salmon via Grumman Goose N644R. RM Hood provided them with a quick tour of King Salmon and Refuge facilities. This was followed by a flight-seeing tour of the Becharof Refuge. High winds and cloud cover limited the amount of refuge that they were able to view. The group ended the tour at Brooks Camp, Katmai NP.

Refuge User Accidents

On June 2nd, a C185 (H53046) operated by Tucker Aviation of Dillingham, AK with two Alaska Department of Fish and Game Biologist on board, crash landed and flipped adjacent Big Creek in Becharof Refuge. Minor injuries were received.

On July 27th, shortly after ARM/P Arment put three KSFAO personnel on a King Salmon River gravel bar near Gertrude Creek, a DeHavilland Beaver, operating on an adjacent gravel bar, flipped over in the river on take off. The Beaver (H1507L), operated by refuge permit holder King Salmon Lodge, came to rest inverted in the water. No major injuries were reported.

Fortunately for this DeHavilland Beaver pilot and clients of the world renown King Salmon Lodge, the King Salmon River was not running deep, as it occasionally does after a good rain. 7/90, DAD

On September 6th, a death occurred near Mother Goose Lake. A 46 year old man died of a heart attack while moose hunting with his 69 year old father. The two were hunting the area at the southeast end of the lake. The victim was not overweight and was in good physical condition, but did have a history of heart disease according to the Alaska State Trooper report. (Refer to Section E.6.).

Between September 20th and 22nd, four aircraft accidents occurred on Becharof Refuge within an 18 mile radius. The accidents all occurred between Big Creek and Bible Camp. No major injuries were reported. The first of the four aircraft accidents was a Cessna 180 that flipped over on the same gravel bar adjacent Gertrude Creek that Service Director John Turner and RD Stieglitz were flown into earlier. The second accident was a Piper Supercub that flipped over near Granite Peak. According to Federal Aviation Administration (FAA) there were three people on board. The third accident occurred on the 21st when a Cessna 206 on floats operated by Branch River Air Service had an engine failure on take off. The fourth accident occurred on the 22nd involving an Office of Aircraft Service (OAS) approved DeHavilland Otter on wheels operated by Alaska Cargo Service (details in Section E.6.).

According to the FAA, there were three aboard this Supercub. 9/20/90, DAD

On October 12th, a Piper Pacer wrecked while attempting to land near the outlet of Gertrude Creek. The damage was substantial, with collapsed landing gear, wing lift struts and a bent propeller. No injuries were reported. This was the third accident in as many months at Gertrude Creek.

4. Credits

Without the efforts of the following people, this annual narrative would not be possible. Thanks and appreciation go to everyone.

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

Photograph credits are listed in the order in which they appear in the narrative.

RDP	Richard Poetter	Staff
REH	Ronald Hood	Staff
DAD	Donna Dewhurst	Staff
JLR	Jose Rodriguez	Staff
JPL	James Larson	KSFAO staff
CS	Cristina Simoniello	FWS Volunteer
GLT	Gregory Thomson	Seasonal staff
JAS	Joel Schmutz	Research staff
LLS	Lynn Schultz	SCA Volunteer
FWS	File photograph	Unknown
WRS	William Struble	Seasonal staff
RKR	Randy Rogers	Hunter
GLB	Gary Bishop	Air taxi operator
KKH	Kent Hankins	Seasonal staff
SJH	Shirley Hood	FWS Volunteer

K. FEEDBACK

The future of national wildlife refuges in Alaska lies with reaching the children. Through utilization of all our resources, we must overcome the language and cultural barriers in dealing with the people of local native villages. However, the issues are becoming more and more complex -- federal take-over of subsistence, managing commercial big game hunting, dealing with increasing demands for oil, gas and mineral exploration. Good environmental education and communication, to both local kids and adults, is perhaps our greatest tool available to ensure the success of management programs.

Perryville, an Aleut village in the Chignik Unit of the Alaska Peninsula Refuge. 2/14/90, REH