BECHAROF NATIONAL WILDLIFE REFUGE
King Salmon, Alaska

ANNUAL NARRATIVE REPORT

CALENDAR YEAR 1982

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U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

2. 3. 1.

Personnel

1.	John Taylor	Refuge Manager	GS-12/04(PFT)	EOD	08/26/79
2.	Randy Arment	Asst. Refuge Manager	GS-09/02(PFT)	EOD	10/03/82
3.	Kelie Swanson	Refuge Assistant	GS-04/01(PFT)	EOD	08/23/82
4.	Chris Dlugokenski (not pictured)	Fishery Biologist	GS-11/04(PFT)	EOD Transferred	05/07/81 10/31/82
5.	Carol Simianer (not pictured)	Refuge Assistant	GS-04/01(PPT)	EOD Resigned	04/19/82 07/17/82

Review and Approvals

John T. Taylor 02/25/83 — Submitted by / date

RC 3/21/83

[signature] 3/29/83 — Regional Office Review / date

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*NTR = Nothing to Report

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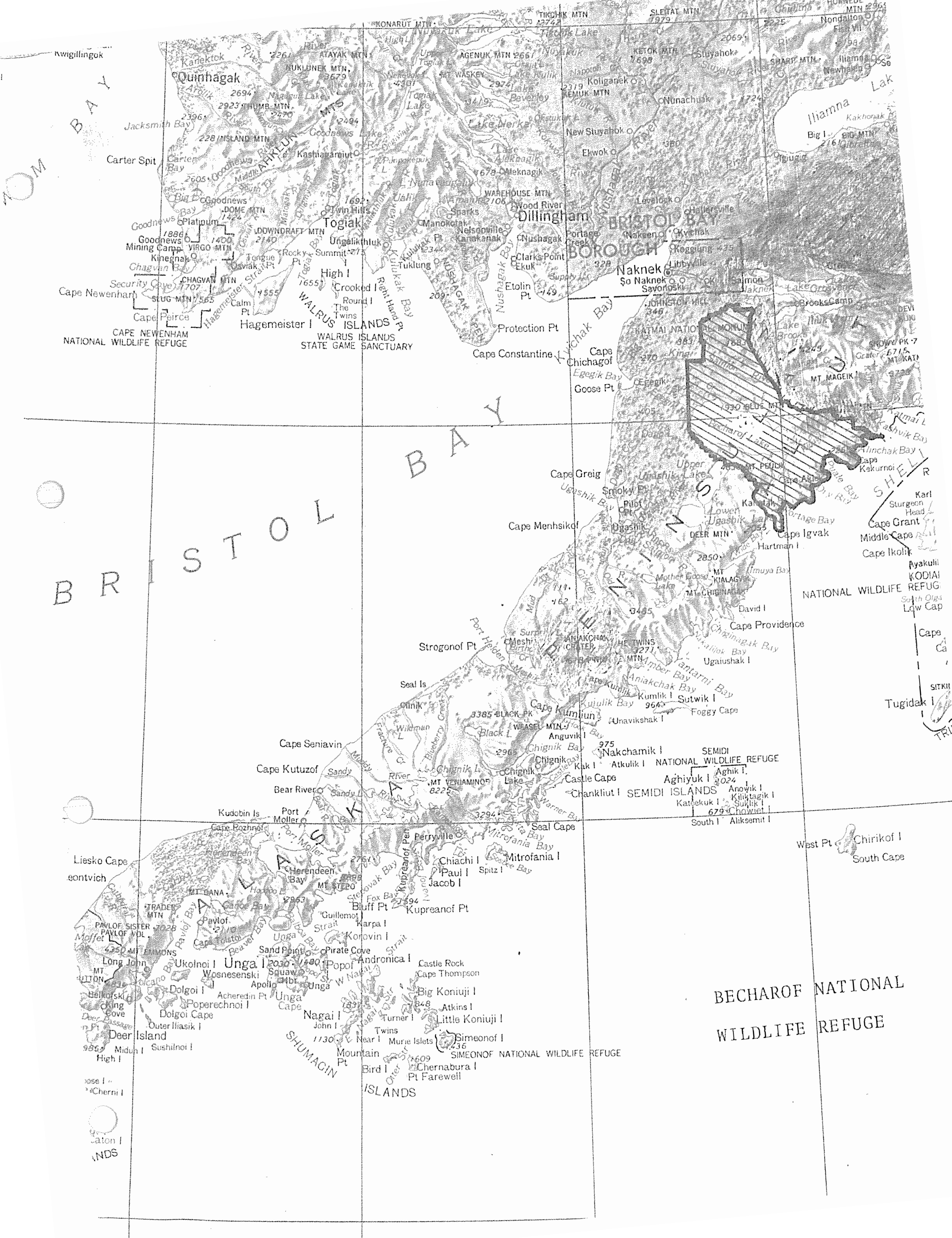
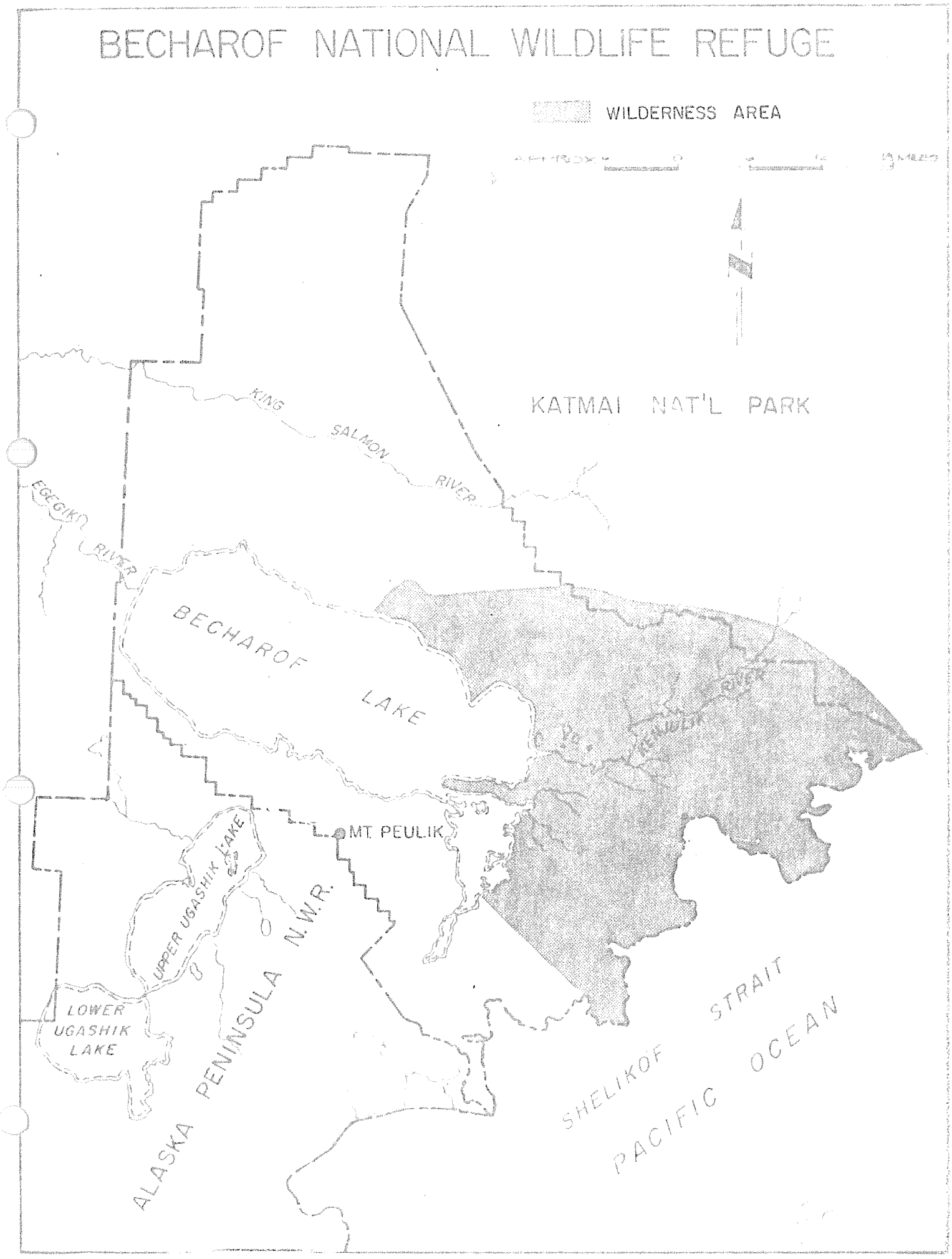


BECHAROF NATIONAL WILDLIFE REFUGE


BECHAROF NATIONAL WILDLIFE REFUGE
WILDERNESS AREA
KATMAI NAT'L PARK
KING SALMON RIVER
EGEGIK RIVER
BECHAROF LAKE
KEMLIDEK RIVER
MT. PEULIK
UPPER UGASHIK LAKE
LOWER UGASHIK LAKE
ALASKA PENINSULA N.W.R.
SHELIKOF STRAIT
PACIFIC OCEAN

A. HIGHLIGHTS

The refuge was heavily involved in Refuge Comprehensive and Bristol Bay Cooperative Management Planning. Several public meetings were held, and many mandays of staff time were spent developing the plans. (Section D.1)

The refuge was a showplace for four groups of visiting Central Office personnel during 1982. The VIP's included Assistant Secretary Ray Arnett, Director Robert Jantzen, and Associate Director of Wildlife Resources Robert Putz. (Section J.2)

Manager Taylor discusses the refuge's new wind generator with Director Jantzen and Regional Director Schreiner.
81-01JT

B. CLIMATIC CONDITIONS

The upper Alaska Peninsula is generally characterized by gusty winds, moderate temperatures, cloud cover and moderate precipitation. Low barometric pressure prevails throughout most of the year. Storms moving in from the Aleutian Islands influence the weather of the area. Weather systems and winds from the south provide atmospheric moisture and precipitation for the refuge. Moderately high winds averaging between 10 and 15 knots are primarily due to large pressure differences between Pacific Ocean and Bristol Bay. Fall is the wettest season while the least precipitation occurs in spring. Topography of the area varies and creates microclimates affecting local temperatures, wind conditions, and precipitation types and levels. Cloud cover prevails 75% of the time with 55 clear days occuring on the average. Annual temperatures range from -46°F to 88°F. The distinction between seasons is not very pronounced due to moderate influence of surrounding oceans.

January - March

During this period seven days passed with the daily minimum temperature not dipping below freezing and precipitation averaged within one inch of normal. With the average monthly temperatures within four °F of normal and snowcover averaging one to two inches, area wildlife populations were not adversely affected. The Naknek River began opening up about mid-March.

April - June

Naknek River became mostly open by late April, however most lakes remained frozen. As a result thousands of swans, geese and ducks were observed using the river. By the end of May most lakes were thawed allowing waterfowl to disperse from the rivers. The daily maximum temperature hit the 70's once during the quarter when on June 18 a temperature of 73°F was recorded.

July - September

This quarter can best be described as warm and wet. Only three days passed with the daily minimum temperature dipping below freezing, and a locally rare thunderstorm occured on August 6, during which ¼ inch of rain fell. As a result, insects, expecially white sox gnats brought off a good (bad!) hatch.

October - December

Though the Naknek River in front of refuge headquarters was frozen completely across by late October, it had become relatively ice free by late November and then refrozen again in early December due to fluctuating temperatures. This made the river unsafe for crossing thus hunting pressure on the refuge varied accordingly. December was unseasonably mild with the monthly temperature averaging 12°F above normal. The strongest winds of the year came on December 28th when 60 mile per hour winds whipped through King Salmon causing minor property damage.

Table I - 1982 Climatological Data

Month	Temp. (°F) High	Low	Ave.	Precipitation (inches) Rain	Snow	Greatest Snowcover (inches)	Windspeed mph Ave.	Pk.	Cloud Cover[1] (days) Clr.	Pt.Cldy	Cldy.
Jan	39	-28	17	1.5	5.7	4	11	49	7	4	20
Feb	51	-17	13	.2	T[2]	T	10	58	18	4	6
Mar	44	-7	24	1.4	8.3	4	13	49	6	3	22
Apr	50	-6	26	1.2	8.3	3	11	40	7	7	16
May	57	20	40	1.6	T	T	11	41	2	6	23
Jun	73	32	49	3.0			11	53	1	3	26
Jul	71	36	52	2.0			13	43	0	4	27
Aug	74	35	52	2.0			9	35	2	6	23
Sep	60	31	46	5.1			11	51	0	8	22
Oct	48	5	28	1.4	2.8	1	12	53	6	6	19
Nov	45	-5	26	.8	2.0	1	11	46	7	4	19
Dec	44	-13	24	1.4	2.9	1	11	60	5	7	19
Average			33				11.2	52	17%	17%	66%
Total				21.6	30.0				61	62	242
Norm				20.2			11				

[1] Clear = 0 - .3 cloud cover, partly cloudy = .4 - .7, and cloudy = .8 - 1.0

[2] T = Trace

C. LAND ACQUISITION

1. Fee Title

On December 1, 1978, President Carter established the Becharof National Wildlife Monument by Proclamation 4613. The Monument was set aside entirely from public domain. At that time there were 112,312 acres of State selected lands, 115,419 acres of Native selected land and 1,327 acres of privately claimed lands within the 1.2 million acre monument.

Since the Monument's redesignation as a refuge, the United States Solicitor has determined all State selected lands to be invalid. Approximately 23,000 acres of Native selections have been conveyed and 89,312 acres are presently involved in a land exchange with the Koniag Native Corporation. The private claims include, but are not limited to, six Native allotments, three trade and manufacturing sites, two headquarters sites, one soldier's additional homestead and one mission site. There were no claimed homesteads or homesites within the refuge. These areas remain in litigation.

3. Other

The areas encompassing the headwaters of both Kejulik River and Big Creek are being looked at for possible inclusion into the refuge by way of a land exchange with the Katmai National Park. The areas are located along the northeast boundary of the refuge. Headwaters of Kejulik River provide excellent moose and brown bear habitat. Several bear dens have been recorded in the area, and it exhibits high scenic value. The headwaters of Big Creek is an important wintering ground for a portion of the Alaska Peninsula caribou herd. The Granite Peak area lying along the north side of the upper Big Creek watershed supports a substantial brown bear and moose population, and several bear dens were located there during the year. It was thought by the public that these areas together would be designated as a Park Preserve under the passage on Alaska National Interest Land Conservation Act (ANILCA). However, the area was established as a Park addition which does not allow subsistence hunting and trapping. This eliminated a popular hunting and trapping area near Granite Peak for many subsistence users of Naknek/King Salmon. Since one objective of boundary selection for the areas was to encompass entire watersheds, we are hoping the aforementioned exchange will proceed.

D. PLANNING

1. Master Plan

Alaska refuges do not utilize Master Planning as exists in the Lower 48, but comply with Public Law 96-487, ANILCA. Section 304 authorizes the Secretary of Interior to enter into cooperative management agreements and to prepare comprehensive conservation plans. Bristol Bay was an area chosen for a cooperative management plan. This Bristol Bay Cooperative Management Plan (BBCMP) is in part derived from the Refuge Comprehensive Conservation Plan (RCCM). The RCCM is scheduled for completion by the end of calander year 1983 so both plans are in actuality being worked up together.

Much staff time and travel was spent on writing, mapping and providing resource information for the plan. The following were some of the major commitments:

During March, Regional Office planning staff, Refuge Operations Manager Calvert and Togiak NWR staff met at refuge headquarters to discuss wildlife resources mapping for BBCMP and RCCP. At that time three maps were completed and submitted to R.O.

In April, Regional Office planners spent two days at the refuge discussing outputs and gathering BBCMP/RCCP information. Refuge Fishery Biologist Dlugokenski spent one week in R.O. providing Fisheries input for the initial phases of the Plans which involved species selection by habitat and preliminary modeling.

During one week in June, most of the R.O. BBCMP/RCCP Team visited the refuge to gather resource and management information.

For another week in July, the R.O. Refuge Comprehensive Planning team spent time at the refuge reviewing species distribution lists and maps of the area.

Manager Taylor traveled to Anchorage twice in August to review refuge species distribution and potential habitat maps, and to take part in a RCCP Workshop.

Again in October, Taylor flew to Anchorage twice to take part in BBCMP/RCCP planning. At that time a presentation of RCCP alternatives was given to the R.O. Directorate.

In December, Manager Taylor spent one week working on the RCCP for the Alaska Peninsula NWR.

2. Management Plan

Last year the initial phase of the refuge's wildlife inventory plan was developed for brown bear, caribou and moose. This year the individual inventory procedures were given a test run and checked for validity. Next year the inventory plan is being revamped and expanded to also include raptors, waterfowl, marine mammals and marine birds. The plan will be used for incorporation into the RCCP.

All other management plans are awaiting the finalization of the RCCP.

3. Public Participation

Workshops on BBCMP were conducted in November. On the 19th a workshop was held at Naknek and attended by refuge staff. The workshop was held to consult with the Bristol Bay Borough Coastal Management Board and local public about the alternatives developed for the Plan. Consideration is given to how the plan will fit with local plans for the region. Although, approximately 20 people were present, only five or so represented the general public.

4. Compliance with Environmental Mandates

An Environmental Assessment on a right-of-way permit request for an airport lease where Becharof Lake drains into Egegik River was completed by RM Taylor. It is the applicant's intention to construct a bush air terminal facility which will include one hanger/garage/shop, one power generator shed with freezer, one gasoline and oil storage buildling, and one meat house for hanging and processing fish and game. The refuge recommended denial of the permit because of the environmental impacts and since like facilities are located nearby.

E. ADMINISTRATION

1. Personnel

After being delayed by a hiring freeze since October 1981, the station's Refuge Assistant position was filled by Carol Simianer on April 19, 1982. The position was vacated on July 17 by resignation and refilled by Kelie Swanson on August 23. This position is on Becharof rolls but is shared with Alaska Peninsula NWR which is also headquartered in King Salmon.

The refuge's Fishery Biologist position was transferred to the newly established King Salmon Fishery Assistance Station in FY-83. Chris Dlugokenski only changed hats on October 1, since the new Fisheries Assistance Station is also headquartered within the refuge compound.

The station's Assistant Refuge Manager/Pilot position was advertised in January, readvertised as a Wildlife Biologist/Pilot, readvertised again as an Assistant Manager/Pilot in September and filled by Randy Arment on October 3, 1982. Randy came to us from Fort Niobrara NWR in Nebraska. No applicants qualified during the first two attempts to fill the position.

A temporary Maintenanceman, Mike Humerick, is employed by the Alaska Peninsula NWR, but is shared with Becharof Refuge in the maintenance of the refuge compound.

Temporary Biological Technician Dan Yparraguirre was hired for eight weeks during the spring and summer to assist with refuge field work. He was employed by Alaska Peninsula NWR the remainder of the summer and early fall until October 3.

Two temporary laborers were employed by the Central Office and detailed to the refuge for the summer. Bill Rashid and Glen Miller spent June 6 until September 23 helping the refuge maintain and rehabilitate facilities. Bill also acted as "leader" for the 4 enrollee YCC camp the refuge hosted.

Refuge Manpower

	Permanent		Temporary
	Full time	Part Time	
FY-1979	1		
FY-1980	1		

	Permanent		Temporary
	Full Time	Part Time	
FY-1981	2		
FY-1982	3		
FY-1983	3		.2

2. Youth Programs

Two YACC enrollees began work at the refuge headquarters on October 11, 1981 and were terminated in March. They both did a fine job in upgrading facilities a little closer to Service standards. Work accomplished during this year included:

-Rehabilitating a seasonal cabin into a year around housing unit. Included stripping interior, insulating, lowering a ceiling, rewiring, drywalling, building cabinets, etc.

-Cleaned and organized the refuge auto shop and two warehouses.

-Other miscellaneous maintenance and clean up.

A four enrollee YCC camp was also hosted by the refuge from June 21 until August 13. Two enrollees quit after one month.. Work they accomplished included:

-Preparing ground and sowing grass seed around refuge mobile homes.

-Labeling and organizing all refuge tools.

-Painting refuge gas sheds, arctic entrances to mobile homes, and residence #8's bathroom.

-Erect two 40 foot towers and antenna wires for the refuge's new HF radio.

-Repair refuge bulkhead with discarded 55 gallon drums filled with rocks or scrap metal.

-Delineate refuge boundaries on topographical maps.

-Assist with clerical tasks in office.

-General maintenance and clean up.

YCC painted the storage rooms and arctic entrances of the compound's mobile homes.

81-02RA

YCC's "erector set" project. Enrollees assembled two 40 foot antenna towers and assisted in their erection.

81-03RA

5. Funding

Refuge funding for the report year and previous fiscal years was as follows:

	Annual Appropriations O&M Budget				
Fiscal Year	1210	1220	1300	Total	
1979	No Budget - Operated off R.O. funds				
1980	" "	" "	" "	" "	
1981		$82K	$124K	$206K	
1982	$64K	$119K	$104K	$287K	(Includes $56K earmarked for Bristol Bay mapping.)
1983	$96K	$164K		$260K	(Includes $22K earmarked for Refuge Comprehensive Plan printing.)

6. Safety

Alaska Peninsula Refuge's Temporary Maintenanceman Mike Humerick suffered a serious accident on June 15. Mike was working alone, cutting tops out of discarded 55 gallon drums with a cutting torch. After removing the tops from several drums, he carelessly failed to vent and check for fumes in the drum he was cutting. Needless to say, the drum exploded, blew its bottom out and shot the drum up into Mike. Fortunately, he only suffered a broken arm and cut on the forehead. Goggles probably saved injury to his eyes, and Mike is well aware that he was a very lucky man.

It was not Mike's year whereas his small two room home burned to the ground in October. He and his roommate barely escaped with their lives after being awakened by their dog at 2:00am. The adjacent room was engulfed in flames and both had to break and dive through windows to escape. Each received severe cuts from broken glass, and his roommate was hospitalized for nine days from 2nd degree burns. They lost all of their possessions in the fire. Refuge staff, Regional Office personnel and local friends and neighbors donated clothes, household goods and money to help them back on their feet.

In seperate accidents, two airplanes cracked up on the refuge during September. The accidents were apparently due to the high winds and poor pilot judgement. No one was injured in the mishaps and both planes were removed by helicopter on October 9.

Another airplane broke a nose gear on takeoff in November. Before the pilot could return to repair the plane, the wind flipped it and did substantial damage to the plane. The plane remains on the refuge at this reporting, but is planned to be removed when weather permits.

8. Other Items

After two issue papers and several telephone and face-to-face discussions, the refuge's Fishery Biologist position was transferred to a newly established Fishery Assistance Station (FAS) on October 1, 1982. The FAS is also headquartered within the refuge compound in King Salmon.

In October, it was learned that the Regional Office had decided to combine the Becharof and Alaska Peninsula Refuges under one staff. Although believed by both managers to be a wise move, the decision caught us by surprise. It was negotiated and agreed upon that two years of limbo be granted during which one manager would hopefully transfer of his own accord.

F. HABITAT MANAGEMENT

1. General

Wet, moist and alpine tundra communities dominate Becharof NWR while only a few wooded areas occur. Extensive areas of high brush and a few bottomland spruce-popular forests are also important communities, but together cover much less acreage than do the three tundra types. The plant species which make up the tundra are those which have adapted to persistent high winds, low temperatures and acidic soils. They are generally slow growing and small in size. Five primary habitat types are found within the refuge:

Wet tundra -- Wet tundra covers portions of the coastal plain below elevations of about 200 feet. It is located in areas of little or no topographic relief, where drainage is poor and where standing water is present most of the year. Peaty soils are located beneath this tundra type.

Moist tundra -- Moist tundra occurs in areas of somewhat greater relief and better drainage than does wet tundra and is located in the lowlands. The community is less pronounced on the Pacific side of the refuge.

Alpine tundra -- Alpine tundra exists on slopes and ridges of the Aleutian Range up to approximately 2,000 feet elevation. On most alpine slopes and ridges xeric conditions often prevail due to rapid drainage, porous volcanic soils and high evaporation resulting from strong winds.

High brush -- This community exists on both sides of the refuge, on a few mountain slopes and ridges, in protected draws, along river and stream drainages and along lake banks. High brush grows primarily at elevations between 200 and 900 feet on the Bristol Bay side and from sea level to about 1,000 feet on Pacific slopes of the Aleutian Range.

In its upper reaches, "B" creek exhibits both Alpine Tundra and High Bush habitat.

81-04JT

Strand vegetation -- Strand vegetation is found along the shoreline of Becharof NWR, however its percentage composition is small compared to the four principal habitat types.

Habitat management of this diverse and pristine area has been basically that of protection by regulation of use and development, and the preclusion of new entry. Aided by the RCCP we will direct our efforts toward determining what the resources are, what they are doing and then determine what is needed to maintain these resources in a healthy, natural condition while allowing compatible uses.

2. Wetlands

Becharof NWR has been determined to have 173 lakes of 25 surface acres (s.a.) or larger totalling 269,700 s.a. (Table II).

Table II - Becharof NWR Lake Summary

Lake Class	Size, Surface Acreage	Quantity Number	Quantity Percent	Class Total Surface Acreage
1	25 to 100	138	79.8	8,600
2	101 to 500	32	18.5	9,600
3	501 to 1,000	2	1.2	1,500
4	1,001 to 5,000			
5	5,001 plus	1	.5	250,000
TOTALS		173		269,000

Several hundred smaller lakes and the King Salmon and Kejulik Rivers are also found within the refuge. Thus, approximately one-third of the refuge is covered by water. Considering accessibility relevant to active management, 55 or 31.8 percent of the lakes have ocean access.

12. Wilderness and Special Areas

Approximately 400,000 acres or one-third of the refuge was established under ANILCA as the Becharof National Wilderness Area. The values of the wilderness area are several fold. The area represents a variety of superlative pristine habitats with a complete compliment of plant and animal associations still in tact. It will help to insure that representative samples of these inter-dependent 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 investigations 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 associations within will be the last place on the refuge subject to irreversible development. Though protected, several uses are permitted within the wilderness area which include:

a. The use of snowmachines, motorboats, airplanes and non-motorized surface transportation methods for traditional activities and for travel to and from villages and homesites, the latter of which are not located within the wilderness area.

b. The use and replacement of previous existing public use cabins.

c. The construction and maintenance of a limited number or new public use cabins and shelters if such cabins are necessary for the protection of the public health and safety.

The abandoned Kanatak village and the Kanatak Portage Trail are being studied as possible historical sites. The portage trail traversed the land on which

the refuge now lies, connecting east and west coasts of Alaska Peninsula. Oral history tells of year around use of the portage in the early 1900's. In 1922 a post office was established in the village and mail was transported over the trail to villages in the Bristol Bay area. However, in 1945, Kanatak village was abruptly and mysteriously abandoned. Native villagers moved on down the peninsula to Perryville and across Shelikof Strait to Kodiak Island, leaving all personal belongings behind. Stories have it that the natives suddenly abandoned the village because of a shamon or medicine man. To escape his influence, the people had to disown all personal belongings and move. On June 24, 1981, a fisherman's bon fire got out of control and distroyed all but two of the village's buildings.

Evidence of the 1981 fire which burned all but two of Kanatak's buildings can still be seen along the beach.

81-05JT

One of the survivors. 81-06JT

G. WILDLIFE

1. Wildlife Diversity

At least six species of marine mammals, 29 species of land mammals, over 137 species of birds, five species of salmon and several species of freshwater fish have been recorded on Becharof NWR.

2. Endangered and/or Threatened Species

The only endangered species believed to be indigenous to the refuge is the peregrine falcon, Falco peregrinus. Although two endangered and/or threatened subspecies of the peregrine falcons, the Arctic and American, occur in Alaska, only an occasional American peregrine migrates over on the refuge.

3. Waterfowl

In comparison to other areas of the Alaska Peninsula, Becharof NWR has low to moderate quality habitat for waterfowl. This is mainly confined to the northwest portion and eastern Becharof Lake areas.

The northwestern portion has significant whistling swan nesting and low to moderate duck nesting. Nesting species include common and white-winged scoter, pintail and greater scaup, but also include low numbers of mallard, American wigeon, green-winged teal, shoveler, goldeneye, common and red-breasted merganser, old squaw and occasionally Canada geese. The area serves the fall staging of approximately 15,000 pintail, mallard, American wigeon and green-winged teal. Several hundred whistling swan and Canada, white-fronted and

and snow geese are also present.

The eastern Becharof Lake area has waterfowl nesting comparable to the northwest area. Fall staging of 10,000 pintail, mallard, green-winged teal, greater scaup and Canada and white-fronted geese also occurs. Spring migration includes common and white-winged scoter, greater scaup, pintail, mallard, green-winged teal, American wigeon, common goldeneye, common and red-breasted mergansers and whistling swan.

Total waterfowl use for the year was 2,316,905 use-days (Table III). Waterfowl started moving in the first of April, while the spring migration peaked the last week of May at 8,000. The fall migration peaked in mid-September at 39,000, and most birds had departed by the first of November. Total waterfowl production for the year was 10,200.

Table III - Waterfowl Use and Production

Species	Use-Days		Pairs		Production
	Total	% Composition	Total	% Composition	
Whistling Swan	113,000	4.8	400	7.8	600
White-fronted goose	45,875	2.0			
Canada goose	6,050	.3			
Mallard	145,150	6.3	500	9.8	1,000
Pintail	511,800	22.1	800	15.6	1,600
Green-winged teal	144,850	6.2	400	7.8	800
American Wigeon	169,100	7.3	500	9.8	1,000
Shoveler	2,480	.1	10	.2	20
Red-breasted Merganser	417,100	8.0	1,000	19.6	2,000
Greater Scaup	477500	20.6	1,000	19.6	2,000
Common Scoter	284,000	12.3	500	9.8	1,000
TOTAL	2,316,905	100.0	5,110	100.0	10,020

In April, five yellow collared white-fronted geese were observed by visiting Izembek Biologist, Chris Dau and ADF&G personnel. Numbers read were tracked down and it was determined the birds were collared in the central valley of California and nest on the Yukon-Kuskokwim delta of Alaska.

On September 29, 175 emperor geese were observed in Alinchak Bay. Although suspected, this is the first known documented occurance of the birds on the refuge.

4. Marsh and Water Birds

Common and red-throated loons nest in several lakes north of Becharof Lake, while arctic loon nesting is less abundant. Although non-nesters, yellow-billed loons occur in small numbers during migration. Red-necked grebes are common migrants and breeders, while horned grebes occur mainly as migrants only. Sandhill cranes are frequently observed in large flocks except during the breeding season, and are believed to nest on the refuge wetlands in small numbers.

Although not yet documented, sandhill cranes are strongly believed to nest within the refuge.

81-07JT

5. Shorebirds, Gulls, Terns and Allied Species

Thirteen seabird colonies are located on the refuge. The two largest colonies, 11,000 and 80,000 birds, found on the mainland of Alaska Peninsula are located on the refuge in Paule Bay. For the first time in three years, an aerial survey was made of the refuge's entire Pacific coast on August 20. During the survey several seabird colonies were observed, primarily common and thick-billed murres. Besides the murres, other refuge nesting seabirds include: pelagic and red-faced cormorants, glaucous-winged and bonaparte's gulls, horned and tufted puffins, harlequin ducks, pigeon guillemots and black-legged kittiwakes. In August, an estimated 75 glaucous-winged gulls were documented nesting on an island in the southeast portion of Becharof Lake. Although earlier suspected, this was the first known documentation of the gulls nesting in that area.

Common murres are not "common" but rather abundant on breeding cliffs along the refuge's Pacific coastline. 81-08JT

Becharof NWR also plays host to some of the millions of shorebirds which move along the Alaska Peninsula during migration in the spring and fall. Peak populations of most of the twenty species present occur in August and September. The three major species include dunlins, western sandpipers and bar-tailed godwits. Although not as common rock sandpipers inhabit the area year round. Species which are believed to nest on the refuge, but winter elsewhere include least sandpiper, black turnstone, common snipe, greater yellowlegs, dunlins, short-billed dowitcher, northern phalarope and wandering tattler.

As with other shorebirds, dowitchers are a common sight on the refuge during spring and fall migration. 81-09JT

6. Raptors

Northern bald eagles are closely tied to habitats along the land/water interface. Bald eagles are most numerous along the Shelikof Strait coast with fewer occurring along the major Bristol Bay drainages. Nearly all nests occur within several hundred yards of the coastline and, less frequently, on streams, rivers and Becharof Lake. Likewise, the eagles feed primarily in these areas, concentrating on fish, specifically salmon during the spawning runs, and water birds during breeding season and migration. Rabbits and big game carrion provide winter food. This year eagles were first observed around headquarters during mid-March, at which time ten were reported.

Besides bald eagles, Peale's peregrine falcons also nest on Shelikof Strait cliffs and offshore islands. One peregrine falcon was observed adjacent the Kejulik River on May 11.

Other raptors historically observed at various times on the refuge include gyrfalcon, goshawk, sharp-shinned hawk, marsh hawk, rough-legged hawk, pigeon hawk, osprey, hawk-owl, boreal owl, short-eared owl, snowy owl, great horned owl and great gray owl.

7. Other Migratory Birds

During summer, the most abundant passerine on the tundra is the lapland longspur. Water pipits are also abundant, but nest chiefly at higher elevations. During winter, flocks of both resident and migratory gray-crowned rosy finches and snow buntings feed along the beaches. In severe winters the relatively rare McKay's bunting also appears. Common throughout the year is the northern raven, gray jay, black-billed magpie, black-capped chickadee, dipper and common redpoll. The tundra's scrub vegetation and abundant summer insect populations provide suitable nesting habitat for warblers-yellow and Wilson's being the most common, sparrows-mainly savannah and white crowned, thrushes, swallows and others.

8. Game Mammals

Game mammals found on the refuge include moose, barrenland caribou, brown bear, wolves, wolverine, red fox, tundra and snowshoe hare, and lynx. Moose, caribou and brown bear are generally the only animals actually pursued on the refuge, while other mammals are usually harvested incidentally during moose, caribou or bear hunts and while trapping furbearers.

Brown Bear. Present information indicates that about 300 brown bear utilize the refuge. The remoteness of the refuge, coupled with the proximity of key bear denning areas to salmon streams and other food sources, has helped to maintain this large population. The other food sources of the bears include sedge meadows, berry patches, beach carcasses and ground squirrels. Bears which den on the refuge may travel extensively north and south or as far as the Bristol Bay coast in the summer.

Key areas of bear denning and habitat within the refuge include: the upper Kejulik River watershed, Mount Peulik, the Island Arm area of Becharof Lake, and Paule and Alinchak Bays. The Island Arm is of particular importance due to its unique island denning by the bears.

Although bears were regularly seen in all spring, summer and fall months of 1982, a comprehensive bear survey of the refuge was flown throughout the month of August and the first week of September. It is during this period that the animals are concentrated on the salmon spawning streams. A total of 21 creeks and rivers were surveyed. Thirteen of the streams were flown three or more times. A total of 260 bears were classified (Table IV). The composition of the population surveyed was 65 cubs (25%), 25 yearlings (9%), 49 sows with young (19%), and 121 single bears (47%). The average litter size for cubs was 1.8 and 1.9 for yearlings. The largest number of bears seen on a single day's survey was 84 seen on August 18, when eleven streams were inventoried.

The newly acquired refuge supercub takes off from the Becharof Lake field camp to conduct another bear survey. 81-10JT

1982

TABLE IV- COMPOSITION AND NUMBERS OF BEARS CENSUSED IN BECHAROF NATIONAL WILDLIFE REFUGE

STREAM	DATE	SOWS WITH CUBS ♀+1C	♀+2C	♀+3C	SOWS WITH YEARLINGS ♀+1Y	♀+2Y	♀+3Y	SINGLES S	M	L	TOTAL	SALMON RUN
Albert Cr.	08/19	1						3	2		7	poor
Alinchak Bay Cr.	08/20							1			1	good - pinks
'B' Cr.	08/02										0	poor
	08/19								1		1	poor
	09/07					1					3	poor
Bear Cr.	08/02	1						6			8	good
	08/17							1			1	good
	08/18		4			3		7	3	1	32	excellent
	08/19		2	1		1		6	2		21	excellent
	09/07				1						2	poor
Becharof Cr.	08/02	1						5			7	good
	08/16							1			1	good
	08/18		1			1	1	7	2	1	20	excellent
	08/19		1					7	4		14	excellent
	09/07					1		1	2		6	poor
Big Cr.	08/02	1	1					1			6	good - chum
Burls Cr.	08/02							1	2		3	good
	08/18							1			1	fair
	08/19							3			3	fair
	09/07	1									2	poor
Cleo Cr.	08/02	1						2			4	good
	08/16	1	1						1		6	good
	08/17		2						1		7	good
	08/18		1						1		4	good
	08/19							5	2	1	8	good
	09/07										0	poor
Featherly Cr.	08/02								1		1	good
	08/18	1	1					2	1		8	excellent
	08/19	1									2	excellent
	09/07										0	poor

STREAM	DATE	SOWS WITH CUBS ♀1C	♀2C	♀3C	SOWS WITH YEARLINGS ♀1Y	♀2Y	♀3Y	SINGLES S	M	L	TOTAL	SALMON RUN
Franks Cr.	08/02										0	good
	08/18							1	1		2	excellent
	08/19							4	1		5	excellent
	09/07		1					1			4	poor
Gertrude Cr.	08/02				1			1			3	good
Katrine Cr.	08/19							1			1	poor
	09/07	1	1								5	
Kejulik R.	08/19	1						3	2		7	good
	09/07							1			1	
Margaret Cr.	08/19										0	poor
	09/07										0	poor
Otter Cr.	08/02								1		1	poor
	08/18										0	fair
	08/19			1				1			5	fair
Rex Cr.	08/20	1									2	fair - pinks
Ruth R.	08/02										0	good
	08/18							2			2	good
	08/19							2	1		3	excellent
	09/07										0	good
Salmon Cr.	08/02							1	1		2	good
	08/18		2	1		1		2	2		17	fair
	08/19		1	1		1			1		11	fair
Teresa Cr.	08/20			1							4	good - pinks
Trail Cr.	08/20					1					3	poor - pinks
#86.0	08/18							1	1		2	fair
GRAND TOTAL		12	19	5	2	10	1	82	36	3	260	

COMPOSITION: 39% sows with cubs; 14% sows with yearlings; 47% single bears; 25% cubs; 9% yearlings

Brush, such as this along Cleo Creek, makes aerial and ground observations of brown bears difficult.

81-11JT

This sow with cubs was spooked out of the creek only minutes after the previous picture was taken.

81-12JT

Table V compares the three years of bear data compiled since staffing of the refuge in 1979.

Table V - Comparison of Annual Aerial Brown Bear Surveys, 1980 - 1982.

Class	1980		1981		1982	
	Number	Percent	Number	Percent	Number	Percent
Cubs	90	26	89	16	65	25
Yearlings	55	16	48	9	25	9
Sows w/ Cubs	48	14	47	9	36	14
Sows w/ Yearlings	30	8	29	5	13	5
Single Bears	124	36	329	61	121	47
TOTAL	347		542		260	
Av. Litter Size (cubs)	1.9		1.9		1.8	
Av. Litter Size (yearlings)	1.8		1.7		1.9	

A young 2½ - 3 year old bear was commonly seen in around the refuge compound during the summer and early fall. A bear resembling his/her description was shot and wounded on the other end of town in September and the bear was not seen since.

Moose. The refuge supports small numbers of moose in the Pacific drainages and more substantial numbers in the lake drainages. The willow shrub communities preferred by the moose occur in the foothills of the Kejulik River watershed, the foothills adjacent to Becharof Lake, the Becharof Lake Island Arm and in the short Pacific coastal valleys.

Moose were present on the Alaska Peninsula early in the 1900's, but their numbers were low and their distribution localized. Population levels increased and the first moose season opened in 1952. Aerial surveys conducted by the ADF&G documented a further increase in moose numbers with a peak in the late 1960's - early 1970's.

Since the early 1970's the Peninsula moose population east of Port Moller has declined. More restrictive seasons and bag limits were implemented when the decline became apparent in the survey data. Moose harvest in the area in 1978 was only 28% of that in 1973, the peak harvest year. By 1976, State biolobists estimated the Alaska Peninsula moose herd population to number half of its level of the late 1960's - early 1970's.

ADF&G review and analysis of aerial survey data indicated the decline was the result of poor calf recruitment and reduced bull longevity. Poor calf recruitment has been considered the main factor in the decline. The surveys show significant differences in calf recruitment between the two periods 1962-69

and 1970-79, when mean calf : 100 cow ratios were 30.4 and 14.14, respectively. The data for 1982 was incomplete, but indications are a ratio of approximately 13-15 calves : 100 cows on the refuge. Nutritional status of cows prior to and during the rut has been adequate and the low calf : cow ratios have not resulted from reduced ovulation rates.

Little concrete data is available on the specific causes of the poor calf recruitment. It could conceivably be the result of poor production and/or calf mortality. ADF&G correspondence from past years revealed two major lines of thought on the ultimate factors in the Peninsula moose decline. One suggested that bear predation on moose calves was the moving force behind the decline. The other, that the decline closely followed a change in vegetation which resulted in reduced production and calf survival.

As was the case in the past, the refuge continued to assist the State in whatever way possible to find the management answers to this problem. Poor snow conditions precluded refuge staff from flying surveys during the winter months of 1982, but two surveys were flown on March 3 and 30th. Totals of 89 and 99 moose were respectively recorded with 73 moose found along the Kejulik River on the 3rd. Percent calves recorded were 16 and 22% respectively.

Caribou. The Alaska Peninsula caribou herd is one of thirteen major herds in Alaska, and is one of the few that has not experienced a dramatic decline during the last decade. It is made up of three distinct subherds. The largest subherd, which ranges between King Salmon and Port Moller, was censused by ADF&G at ± 17,000 animals in the spring of 1982. It is this subherd that utilizes and winters on the refuge. The fall migration arrived on the refuge in August and was about 5,000 animals by the end of the month. A peak was reached in October when approximately 8,000 caribou were on the refuge. The migration south to their calving grounds usually occurs in February.

Although the caribou herd is apparently remaining stable, or increasing in size, it is probably near the carrying capacity of its range and the reproductive rate of part of the herd may be decreasing. To confirm this, ADF&G radio collared eight cow caribou on the refuge in 1982, bringing the total to 33 animals collared in the past three years. This has assisted in locating the herd during calving, thus allowing better monitoring of the reproductive rate.

ADF&G also conducts animal sex and age composition counts of caribou wintering on and near the refuge. Results of the 1982 counts were 22.1% bulls, 51.4% cows and 26.5% calves. Sample size was 1,392 animals.

A nice bull, still in velvet, along the shore of Becharof Lake.

81-13JT

Wolf. Wolves inhabit the entire refuge, but are not abundant anywhere. One wolf was observed by refuge personnel in May just south of the Egegik River. State bounties of $50.00 were paid on wolves killed prior to 1970, and aerial hunting was permitted in the area until 1972.

Wolverine. Wolverines occur in moderate numbers throughout the refuge, although none were observed on the refuge in 1982. State bounties of $15.00 were paid on wolverines until 1969.

Red Fox. Red foxes are abundant throughout the refuge. Population levels are highly variable from year to year, and widespread outbreaks of rabies have been common. Olaus Marie postulates that the fox formerly occurred in both the red and black phase, but selective killing of the dark phase because of its higher value has eliminated the black fox from the Alaska Peninsula.

Lynx. Although this cat is cyclically abundant, generally following the cycle of the hares on which it prefers to feed, it has historically been uncommon within the refuge. None were observed in 1982.

Tundra and Snowshoe Hare. Numbers and population status of both hares are unknown at this time.

9. Marine Mammals

Major marine mammal utilization occurs along the refuge's Pacific coast. Included are Stellar sea lion, spotted seal, beluga whale and sea otter.

General observations indicate that Stellar sea lions are abundant along the refuge's Pacific coastline. A major haul out site occurs on Paule Bay where 5-10 thousand animals are frequently observed. The sea lions feed primarily

upon capelin, sand lance rockfishes, sculpins and flatfishes. Most feeding occurs in less than 100 fathoms of water and usually not more than fifteen miles from shore.

Spotted seal occur on the refuge's Pacific coastline, but are more abundant adjacent to the refuge along the Bristol Bay coast. One spotted seal was recorded in the Island Arm of Becharof Lake on August 19. The spotted seal is not a deep diver and stays within the confines of the continental shelf. Food items include capelin, pollock, smelts, cod, sand lance, sculpin, herring, shrimp, octupus and small crabs.

The Bristol Bay herd of beluga whales seem to remain in the area year around, primarily feeding in shallow waters of 20 to 40 feet in depth. In spring and summer the whales frequent estuarine areas, such as Egegik Bay, to feed on salmon smolts migrating to sea. Belugas enter fresh water while feeding. One to 26 of the whales were daily observed from the headquarters in the Naknek River from April 25 until May 5. In winter the species is generally associated with the ice-edge. Besides salmon smolts, the belugas' food, which is swallowed whole, consists of invertebrates and fish such as capelin, cod, herring, salmon, char, smelt and flounder in spring, summer and fall. Fish larger than 9 pounds are rarely eaten. In winter their mainstay appears to be polar cod.

Just the tip of the iceburg. Belugas, which enter the Naknek River in spring to feed, are the only all-white whales and weigh up to 3,500 pounds.

81-14JT

The sea otter occurs in low densities on the Pacific coast of the refuge. The otters' numbers fluctuate depending on how many ice free years the coast enjoys. When ice moves into the area, sea otter numbers are severely reduced. The otters are not migratory with home ranges being about five to ten miles

of coastline, however, storms cause otter movement into sheltered bays. They usually stay within a few feet of the water but, occasionally move as far as 100 yards inland. Locals report migrations across the Peninsula during years when ice chokes one side of the Peninsula.

10. Other Resident Wildlife

Other resident wildlife found on the refuge include river otters, beaver, short-tailed and least weasels, muskrat, mink, arctic ground squirrel, porcupine, spruce grouse, willow and rock ptarmigan. Little information is available on the status of these species.

15. Animal Control

On June 20, RM Taylor took a call from a concerned Naknek resident who had attempted to scare off three bears from her home near Leader Creek. It turned out that the bears were a sow with cubs, and the sow promptly chased the lady back into the house and took a swipe at her through one of the windows. The bear left after denting the aluminum window frame. The information was forwarded to ADF&G who had at the time been responding to a too friendly bear at the Naknek/King Salmon dump near the woman's home.

Well don't blame me - I didn't do it! 81-15JT

11. Fisheries

Straddling Alaska Peninsula, Becharof Refuge provides spawning and rearing areas for salmon, trout, char, grayling, pike, whitefish, smelt, and others. The Alaska Range divides the refuge with westerly flowing streams emptying into Bristol Bay and easterly flowing streams entering Shelikof Strait.

The pacific streams entering Shelikof Strait are characterized by short, steep drainages. They provide a limited amount of rearing area for coho salmon, trout, chars, and grayling, but contain excellent quality gravels in their lower reaches. These lower reaches provide spawning habitat for chum and pink salmon, which migrate directly to salt water following emergence from the gravel.

The Bristol Bay drainages are basically tundra streams. They are for the most part shallow, meandering, spring and lake fed creeks and rivers. Big Creek, a tributary of the Naknek River, drains the northern portion of the refuge and provides suitable spawning and rearing habitat for chinook, coho, chum, char, rainbow trout, grayling, whitefish, and blackfish. The King Salmon River, a tributary to the Egegik, is glacier fed and consequently discolored during spring and summer. Its spring fed tributaries, primarily Gertrude and Granite Creeks, are clear, cold and support trophy rainbow trout populations, as well as spawning and rearing areas for chinook, coho, chum, and pink salmon. The mainstem King Salmon River also supports these salmon species.

The dominant geographic feature of the refuge is Becharof Lake. It is fed by 14 major creeks and two rivers that provide spawning area for sockeye salmon and spawning and rearing areas for coho, char, and grayling. At 250,000 + acres the lake is a nursery area for the second largest run of sockeye salmon in the world. Eighty-five percent of the juvenile sockeye are reared in the Island Arm area, the southeast portion of the lake. Due to high winds, the lake remains ice-free during most winters.

The Island Arm of Becharof Lake provided rearing habitat for 60 million juvenile sockeye salmon during 1982. Mt. Peulik is cloud-capped in the background.

81-16JT

Calendar year 1982 provided strong returns to all Bristol Bay systems except the Kvichak River. Escapements to all systems, except the Kvichak, exceeded the escapement goals. This was primarily due to a bitter, protracted strike by commercial fishermen. The harvest of Becharof Refuge origin salmon (Table VI) was 2,413,900 sockeye; 2,000 pink; 5,000 chinook; 71,600 coho, the largest recorded harvest; and 82,000 chum salmon. The escapement of 960,000 Becharof sockeye exceeded the escapement goal of 600,000 by better than 50%.

Sockeye salmon in the Ruth River. 81-16JT

Table VI - Escapement, Catch, and Value of 1982 Becharof NWR Origin Salmon

Drainage	Sockeye	Pink	Chinook	Coho	Chum
Egegik					
Escapement	960,000	15,000	1,900	24,000	31,000
Catch	2,413,900	2,000	5,000	71,600	82,000
Pounds	14,966,000	8,400	95,000	501,200	574,000
Fresh/frozen value[1]	$26,203,500				
Canned value	$6,764,000				
Roe value	$3,318,000				
Total Value	$36,285,500	$2,800	$262,700	$831,400	$533,200
Shelikof Straits					
Escapement					
Catch		241,900			63,300
Pounds		1,016,000			443,100
Total Value		$516,900			$308,700

[1] F.O.B. Seattle prices

ADF&G manages the harvest of the refuge salmon resources. This harvest occurs in the Bristol Bay near the mouth on the Egegik River and in various bays in the Shelikof Strait. Fishery Biologist Dlugokenski participated in the daily harvest strategy sessions at ADF&G headquarters in King Salmon where regulations were promulagated for harvesting individual stocks.

Five thermographs were set near sockeye spawning areas to gather winter temperature data and survival. Unfortunately ice conditions crushed, buried, or removed all but the one on Featherly Creek. The data recovered from this stream is interesting in the fact that super-cold water, below 0°C was encountered during February and March. These temperatures may be limiting to egg survival.

Also during 1982, the refuge conducted aerial spawning ground surveys in conjunction with brown bear surveys. These surveys indicated that streams in the Island Arm area of the lake contain 82 percent of the spawning sockeye population with the Ruth River, Becharof Creek, Frank's Creek, Bear Creek, and Featherly Creek being the most important. In addition, we removed otoliths (middle ear bones) from spawned out sockeye salmon on two tributaries to determine age class composition. All spawning ground data was distributed to ADF&G personnel to aid in predictive modeling and harvest management.

H. PUBLIC USE

1. General

Six villages with a total population of approximately 1,000 are located adjacent to the refuge. Several of these residents utilize the refuge's resources for subsistence. Although salmon is the most important subsistence food in the region, caribou (and moose to a lesser extent) is the primary resource harvested from the refuge. Some fur trapping is also done during the fishing off-season. Berries are the primary plant food used for subsistence.

The recently passed Alaska Lands Act defines subsistence as:

> "The customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family comsumption, and for customary trade."

The act also states that "nonwasteful subsistence uses of fish and wildlife and other renewable resources shall be the priority consumptive uses of all such resources." In other words, if a refuge wildlife population decreases to a level where the harvest must be reduced, the "sport hunters and fishermen" would be the first to be curtailed and the subsistence users the last. We hope to never reach such a position.

Needless to say, the question of subsistence is a burning issue in Alaska. The provisions of ANILCA requests the State to manage subsistence, and the State government has accepted the responsibility. An ADF&G subsistence

position was stationed in King Salmon in 1981. The refuge will continue to work closely with this person to determine refuge subsistence use and future subsistence management of the refuge.

Drying salmon in the village of Igiugig. 81-18JT

7. Other Interpretive Programs

Becharof has no formal Interpretation or Environmental Education programs. Actual visitors to the refuge headquarters for 1982 numbered less than a dozen. On-refuge visitors, almost entirely hunters and fishermen, are contacted whenever possible, but available aircraft landing areas often does not even permit this. Total public use of the refuge for 1982 was estimated at 1,450 visitors.

The only alternative is to sell our program wherever and whenever anyone will listen. To faciltate this and improve community relations, Manager Taylor joined the local Lions Club and all refuge staff attempted to join in community functions.

8. Hunting

By far the majority of public use on the refuge is from hunting. A large guiding industry, which is primarily for brown bear, moose and caribou, operates on the

refuge. Eleven exclusive guiding areas on the refuge have been designated by the State Guiding Board. Overlapping seasons for moose, caribou, and every other year, brown bear, makes multi-species hunts possible and serves to attract many hunters to the refuge.

Some waterfowl and ptarmigan hunting during big game hunts also takes place on the refuge. Total hunting pressure for 1982 was estimated at 715 visits and 15,828 activity hours. This is a 64% increase from CY 1981 and due primarily to a spring bear season which spreads hunting pressure over more months.

The gathering of refuge harvest information is very difficult with a three-man staff on a 1.2 million acre refuge. Our best source of information is the State harvest reports which are required of each big game hunter after the end of the season. However, because harvest data from the State is not available until after the Annual Narrative Report is submitted, caribou and moose harvest data for CY 1981 is shown in Table VII.

Table VII - Caribou and Moose Fall/Winter Harvest 1981

				Hunter Information					
	Sex			Resident		Non-resident		Unknown Residence	
Specie	Male	Female	Unknown	S*	U*	S	U	S	U
Caribou	105	20	2	131	27	71	3	10	2
Moose	11			7	3	2	5	2	

S* Successful; U* Unsuccessful

Caribou. The availability and abundance of Peninsula caribou has contributed to the increase in hunting pressure, mostly by non-locals. As good hunting areas near Alaskan cities become more difficult to find, unguided residents also are coming to the refuge in increasing numbers because of the bag limit of four animals and the high hunter success. Harvest ticket records for CY 1981 reveal that 898 caribou hunters came to the Alaska Peninsula. Of this total 32% were non-residents of the state. An estimated 75% of the caribou are taken by non-local hunters. This is most often a bull and is predominantly during August-October when only one caribou may be taken. From November-March the remainder of the four bag limit may be harvested. In 1981, 91% bulls were harvested in the early part of the season compared to 56% bulls in the later part.

Given the depleted condition of many interior Alaskan herds and the healthy condition of the Peninsula herd, it is unlikely that caribou hunting pressure on the refuge will decrease in the near future.

Moose. Trophy moose hunting by residents and nonresidents also has become popular on the Peninsula. Harvest ticket data for 1981 showed 707 moose hunters using the Alaska Peninsula, 41% of which were non-residents of the state. Many hunters also travel from other parts of Alaska to hunt in the area.

Due to a declining population in the area, the ADF&G reduced the moose season in 1975. Further restrictions on hunting were put into effect in 1976. Hunting was restricted to an early (bull) season and a late (either sex) season, and

antlered moose must have a minimum antler spread of 50" or 3 brow tines on one side. With these restrictions, total harvest dropped by 66%, number of hunters dropped by 64%, and hunter success dropped by 20%, based on three year means immediately before and after the change in regulations.

As with caribou, hunting in the late season in primarily done by local residents interested in obtaining winter meat. The early season attracts mostly guided, non-residents.

Brown Bear. Little brown bear hunting was done on the Alaska Peninsula until the early 1960's, but since that time, about one-third of the brown bears harvested in Alaska have come from the area. The majority of the kill has been by guided non-residents and has occurred during the fall season. In the fall season of 1981, 150 bear hunters stalked the Peninsula. Of this total, 57% of the hunters were non-residents of Alaska and commercially guided. (State law requires all non-resident bear hunters to be guided.)

Records indicate that at least 400 bears have been taken on the refuge since 1961. Harvest levels increased until the mid-60's and then declined slightly to the current level of harvest (5-25 per year). Current seasons for the refuge are a spring and fall season every other year. A spring season was held in 1982, and 3 bear were known to have been harvested on the refuge.

As hunting pressure has increased in the area, regulations have necessarily become more restrictive. Seasons have been shortened and the use of aircraft for hunting curtailed. Despite restrictions, a gradual decrease in the size and age of bears killed indicates that the large, old bears are becoming increasingly scarce although the total bear population is apparently not changing in number.

Little bear hunting pressure actually exists locally, but three bears were killed in defense of life and property in nearby Naknek and two were killed in King Salmon during the summer/early fall of 1982. Upon taking a bear in defense of life or property the individual must surrender the hide and skull to ADF&G.

Wolf/Wolverine. Under Alaska law, wolves and wolverine may be shot with either a hunting or trapping license. All animals shot will be reported under this section while those trapped will be reported under Section 10 - Trapping.

No wolverines were known to have been shot on the refuge during the year. Wolf harvest on the refuge for 1982 was as follows:

Sex	Date Harvested	Location Harvested
M	01/28/82	Big Creek
M	01/28/82	Big Creek
M	09/22/82	Big Creek
F	11/21/82	King Salmon River
F	11/22/82	King Salmon River

Fox/Lynx. Fox and lynx may also be shot with either a hunting or trapping license. Few fox are hunted and are usually taken incidental to big game hunting activities. Numbers harvested in 1982 are unknown, while no lynx were known to have been hunted or taken on the refuge.

9. Fishing

The Becharof Refuge receives only light sport fishing pressure because of its distance from population centers. The major sport fishing areas are the King Salmon River near Gertrude Creek, Big Creek and Featherly Creek. The primary sport fish sought by anglers are rainbow trout, Dolly Varden, trout, arctic grayling, and salmon. Three commercial sport fishing guides operate on the refuge and are responsible for approximately 30% of the pressure. Sport angling incidental to hunting and short stays by local anglers with aircraft accounts for the remainder of the sport fishing activity. Anglers utilize artificial flies and lures exclusively.

The Gertrude Creek area is accessible by wheel plane near its mouth, by float plane at its source, Gertrude Lake, and by jet boat from Egegik. The commercial guide operating in this area books approximately 120 clients per season and their average stay is 4 days. The target species are rainbow trout, chinook, and coho. Catch and release is generally practiced, but each client is allowed to retain, ostensibly for mounting, a rainbow trout above 22". These fish are from the spawning population. The refuge hopes to conduct spawning ground surveys and tagging studies with ADF&G and the Cooperative Fishery Unit of the University of Alaska at Fairbanks in order to establish harvest levels. (There are no permanent structures in the area, and all activities are conducted from tent camps.)

Big Creek and Featherly Creek receive only light sport fishing pressure usually in conjunction with fall hunting.

Sport fishing on the refuge is predicted to increase, but probably will not exceed light pressure unless significant development activities occur nearby to increase local populations. Estimated fishing use for 1982 was 638 visits and 1,914 activity hours, down slightly from CY 1981.

10. Trapping

No special use permit (SUP) is required to trap on Becharof NWR. Nevertheless, eight individuals are known to trap on the refuge. Their harvest for 1982 was three male and one female wolverine (all trapped around Becharof Lake), one wolf (trapped along the King Salmon River), and an unknown number of otter, mink, beaver and fox. No lynx were known to have been trapped on the refuge this year.

11. Wildlife Observation

Virtually all wildlife observation on the refuge is done via aircraft. This activity was estimated at 515 visits and 1,230 activity hours for 1982.

12. Other Wildlife Oriented Recreation

Photography is the only activity within this category which takes place on the refuge. It is usually done in conjunction with hunting, fishing, or wildlife observation. As estimated 475 visits and 945 activity hours were expended in this activity.

13. Camping

Virtually all camping done on the refuge is in direct support of hunting or fishing. Overnight trips are usually 3-4 nights, but sometimes last a week or two. Uncooperative weather often makes trips longer than planned.

Most commercial guides have cabins on the refuge, but some do operate out of base camps. Those who obey the law must often set up an overnight camp when an animal is located by air (State law prohibits shooting a big game animal on the same day airborne).

Camping on the refuge in 1982 was estimated at 115 visits and 5,136 activity hours.

15. Off-Road Vehicling

ANILCA allows traditional means of surface transportation for subsistence purposes. This is generally limited on the refuge to three-wheelers and 4-wheel drive vehicles on Big Creek when frozen during the winter. (Snowmobiles are also used, but are allowed throughout the refuge). As many as 50 visitors may have entered the refuge in January and December of 1982 when the creek and Naknek River were frozen and caribou were wintering near town. No evidence of traffic off the creek or harm to vegetation has been discovered.

Two commercial hunting guides are allowed under SUP to utilize vehicles along a short segment of an old oil exploration road which enters the refuge. It is not believed that they used this portion of the road in 1982.

17. Law Enforcement

Becharof does, and will probably continue for some time, have law enforcement (LE) problems. A 1.2 million acre refuge does not lend itself to easy and effective patrol, especially with a staff of two. Until the refuge received its own plane in April, contacting people of the refuge was next to impossible. Local air charter operations are usually not willing to sit on the ground while you investigate a situation or contact a visitor. They can make more by flying other folks on a seat rate during these busy times of the year. They are also reluctant to be associated with bringing the "law" in on a customer.

The Alaska Peninsula is notorious for illegal hunting activity, especially by guides. With three to ten thousand dollars per client on the line, it is worth the guide's while to take chances by shooting the same day airborne or herding animals with aircraft to awaiting hunters, often using explosives and shotguns with birdshot. The best success in pinching illegal guides has been through the use of undercover agents posing as clients. Realizing this, most illegal guides have gone to guiding only foreign or previously guided clients. This, of course, makes it much more difficult for the LE agents. Most illegal guides also keep an assistant guide between them and the illegal activity to buffer him from prosecution. "I didn't know anything about it!", is often heard when the assistant guide is caught.

The refuge supercub greatly enhanced our ability to contact visitors in the field during 1982. Several more contacts and one case was made during the year. In September, Manager Taylor and APNWR Asst. Manager/Pilot Verns apprehended

two individuals who had "borrowed" the refuge Boston Whaler at Becharof Lake. They were charged with tampering with government property and paid a $100 fine each.

In October, Manager Taylor received a report of a local non-native attempting to sell walrus ivory in the area. After contacting LE in Anchorage and locating the individual, an attempt was made to purchase the ivory from the individual. APNWR Assistant Manager Vern Berns approached the subject and attempted to make small talk, but Vern's smile didn't win him over. The individual left town before another attempt could be made. Alledged illegal waterfowl hunting in May was also investigated by Manager Taylor and APNWR Asst. Manager Berns. No hunting was observed. Routine waterfowl patrol was also conducted in the Naknek river by refuge personnel during the fall season.

20. Cabins

The refuge has ten cabins which were built and are presently used by the public. The cabins were all built before the establishment of the refuge and are almost entirely used for commercial guiding of hunters.

In July the regional policy concerning cabin management on refuges in Alaska was finalized. Besides a policy statement, the paper also includes general guidelines for implementation. Basically cabins for commercial and subsistence uses which were constructed before the refuge was established will be issued a 5-year, renewable permit. No permits will be issued for private recreational cabins. After questions were cleared up on the definition of trespass cabins, cabins in designated wilderness areas, etc., a letter and application were sent to every known and suspected refuge cabin user on December 14 via certified mail. We expect replies to begin trickling in after the holiday season.

I. EQUIPMENT AND FACILITIES

2. Rehabilitation

When the three residential mobile homes were initially put in place on the refuge complex, each was connected to a small sewage holding tank. In February, the local contractor who pumped the tanks each month notified us that he was getting out of the business in March, thus we would have to do the job ourselves. Upon procuring a pump, hose and portable tank, we commenced pumping out the holding tanks at two to three week intervals. This lasted seven lucky months until a contract bid of $52,440 was awarded in August to Moorcroft Construction of King Salmon for the construction of a septic system. The contract included collector tanks, lift station, leach field and underground tap water lines to the three seasonal cabins. Work commenced in September and progressed slowly due to weather until its completion in November.

On September 10, bids were opened for the office/warehouse insulating/remodeling contract. It was determined that the run down NMFS office/warehouse should be upgraded as it was uninsulated, without a permanent heating system, and lacking running water and bathroom facilities. The lowest bid put in by Titan Construction, Anchorage, AK, was $145,650 - approximately $45,650 higher than Engineering's estimate. The building was vacated on October 15 and construction commenced

on October 18. A temporary office was set up in the bunkhouse after wiring and installing a furnace. It ain't home but at least it's warmer than the old office.

The refuge bunkhouse served as the refuge office during rehab of the NMFS office/warehouse.

81-19RA

Except for installation of floor covering and some minor details, the ground floor was nearly finished by year's end. Now for act II - the upper floor, which will be contracted out sometime next year.

Contractors plumb the radiators in the rehabilitated office/warehouse.

81-20RA

At year's end a floating dock was ordered by Contracting and General Services (CGS) to accommodate the supercub while on floats. Meeco Marinas Inc., OK, will be suppling the dock for $11,999. Upon its delivery, next year, the dock will be set up in the Naknek River. The dock will be 60 feet long with two 24 foot wings extending down stream and spaced 16 feet apart. The dock should be long enough to facilitate refuge boats as well as the airplane.

The gasoline shed was also rehabilitated during the year. A new pump and hose was bought, shed was rewired, and the underground tank was checked out. We can now fill vehicles and boat gas cans without hand pumping out of a 55 gal. drum.

3. Major Maintenance

During the week of December 20th contract personnel assembled two 12 foot by 12 foot overhead doors. One replaced the sliding and "binding" office/warehouse door while the other replaced the sliding and "binding" shop door. The combined cost of the two doors was $7,089.

Maintenanceman Humerick finishes the framing in of one of the new warehouse doors.

81-21RA

It was hoped an "add-on" to insulate/remodel two of the 450 square foot cabins could be negotiated through the same contractors responsible for the office/warehouse rehab project. Such was not to be, as Titan Construction bid $44,000 per unit. As a result we are doing the work via force account in conjunction with small contracts. In November refuge personnel commenced work on the two seasonal cabins to convert them to year around residences for staff hopefully assigned to the complex next year. Regional Office EN blueprints were used for each unit allowing for some approved modifications.

The refuge's two seasonal cabins are in the process of being converted into year around residences. Here Maintenanceman Humerick puts up the sheetrock after insulating.

81-22RA

After a year and a half, the residential mobile homes are still settling in their new environment and will probably remain in such status as long as periodic frost heaving occurs. As a result, window leaks are prevalent and culprit windows will continue to need replacing. This will cut down energy losses as well as solving leaks.

4. Equipment Utilization and Replacement

In June the Boston Whaler, which was procured last year, arrived and was run up Egegik River to Becharof Lake. The Whaler was later navigated across the lake to the Island Arm where it is to remain based and utilized for field work in the area.

A 180 hp supercub was acquired in April. The plane is exceptional when it comes to power, but is constantly plagued with a succession of equipment failures which preclude its safe operation. This results in several no-go and/or delayed flight activities. Though King Salmon has a fixed base operator, labor costs are extremely high to say the least and they are unable to address half of the safety discrepancies, e.g. radio/navigational equipment problems. Anchorage Office of Aircraft Services (OAS) is a long way away.

A new furnace was purchased for the shop. No heat had been available in the building.

A Chevrolet Suburban and Case 550 front-end loader/backhoe tractor were obtained surplus from the YACC located in Fairbanks, AK.

A trailer and tank were purchased for refueling aircraft during the year. The trailer is due to arrive on next year's barge.

Miscellaneous equipment was purchased for the headquarters complex including shop tools, portable generator, steam cleaner, vacuum cleaner, paint sprayer, electric drain snake, safety jacks, barrel stands, office supplies, etc.

5. Communications Systems

The Sunair Electronics radio antenna acquired last year was erected in the headquarters complex adjacent to the wind generator. The work was accomplished with the aid of YCC enrollees, and consisted of erecting two 40 foot towers with a web of antenna wire strung between. A coax feed of several hundred feet was then run to the new office. The Sunair base station is awaiting connection when we move into our new office. The system should make us an important link in communications for all State and Federal agencies of Alaska as the system should receive hundreds of frequencies from great distances.

The refuge base radio antenna was erected with the aid of YCC enrollees. When fully operational the HF radio system should be capable of providing communications with field camps set up on the Alaska Peninsula.

81-23RA

6. Energy Conservation

Installers for the four kilowatt Enertech wind generator, acquired for the headquarters last year, arrived in May and put the system on the line. However, the system's erection and operation was not without its difficulties. First, the Federal Aviation Administration (FAA) attempted to halt the 60 foot tower's erection for lack of a required permit. We informed the individual that indeed we did have a permit and that he had signed it! The local electric association then attempted to require excessive insurance and unfair "buy back" cost of us. The association wanted to buy all excess power we generated at x 9¢/watt, and then resell it to us at x 30¢/watt. Both the FAA and electric association's efforts failed, but then the generator itself

failed in July after just two months of operation. The Enertech installers returned again, fixed the generator and left. Three days later the machine quit again. Although still on warranty, they refuse to return until a voltage drop in the line is solved. Engineering and CGS have been working to resolve whether the company, the electric association, the refuge, or all parties are responsible and what the solution is. Since the machine cut our electric bill by almost half when it was working, we hope the problem is solved soon.

The refuge's 4 kw Enertech wind generator was erected just north of the seasonal cabins under rehab. Standing 60 feet tall in "downtown" King Salmon, the generator is quite a landmark.
81-24RA

J. OTHER ITEMS

1. Cooperative Programs

A cooperative smolt enumeration project for the Egegik River on and adjacent to the refuge was agreed upon by the refuge and ADF&G in 1982. The May through June project provided population estimates of seaward migrating sockeye salmon. The results will enable the refuge and ADF&G to improve the accuracy in predicting adult returns, thus ensuring that correct exploitation rates will be applied to maximize the harvest, but also to ensure adequate escapement back into the refuge for spawning and utilization by brown bear, eagles and other species.

The project was operated 24 hours/day from May 15 to June 16. Sockeye smolts began migrating in significant numbers following ice-out. The majority of the fish left the lake between May 28 and June 10 with a peak of 13,600,000 smolts on June 2. The total outmigration was 60.4 million sockeye: 83% of these fish were 1 year old, 1980 brood; 16% 2 years old, 1979 brood; and .2% were 3 years old, 1978 brood. Coho smolts began their outmigration

on June 10 and were observed in all fyke net samples until the project was terminated.

Manager Taylor, Fishery Biologist Dlugokenski and State Fishery Biologist Brian Bue lower a sonar array into the Egegik River.
81-25DY

The "blips" from the sonar were then counted in this wall tent. The dormant volcano, Mr. Peulik, is again in the background.
81-26CD

Other fishery related cooperation with ADF&G involved the refuge Fisheries Biologist participating in the daily salmon harvest strategy sessions at ADF&G headquarters, and collection of refuge spawning grounds data for use by ADF&G.

Cooperative ventures such as sharing air support, joint wildlife surveys, joint public meetings and coordinated law enforcement are also carried out with the State and National Park Service.

Manager Taylor assisted the local ADF&G subsistence person in developing maps of subsistence use in the area. She, in turn, assisted the refuge with information for Bristol Bay Planning.

Under an agreement with NMFS, Ole Mathieson from the University of Washington, spent two months living within the compound and working on sockeye salmon in the area.

The refuge also houses and changes the tapes in a computer designed to record seismographic activity in the area. The computer is operated by the Geophysical Institute of the University of Alaska.

The refuge authorizes a local church organization to conduct a two to three week bible camp on the shore of Becharof Lake each summer.

2. Items of Interest

A Reeve Aleutian Airways YS-11 passenger airplane had to make a forced landing approximately ¼ mile short of the King Salmon airport on February 16. One engine was lost early due to mechanical problems and the other caught fire on approach to the airport. The pilot chose to land on the frozen Naknek River just short of the runway. It was probably a wise decision as nobody was injured in the emergency landing. The plane was later towed off the river to the airport, and two weeks later flown away.

The pilot deserves a pat on the back for this landing. The control tower of the airport can be seen just off the nose of the plane, indicating just how close they came to making the airport.

81-27JT

The refuge was a showplace for four visiting groups of Central Office personnel. On June 24-25 Director Robert Jantzen, Regional Director Schreiner, Asst. Regional Director Riffe and others visited the refuge. It was a welcomed opportunity to show and discuss Becharof's problems and values to the Director firsthand.

On July 22, Assistant Secretary Arnett, Special Assistant to the Secretary Vern Wiggins and Regional Director Schreiner made a visit to the refuge headquarters. Also in July, John Brown, Joe Webster and Brian Kinnear of the Central Office Fisheries Office, accompanied by Asst. Regional Director Nelson reviewed the fisheries program of the refuge.

Dr. Robert Putz (Associate Director of Wildlife Resources), John Carlsen (MNB Program Coordinator, CO), Asst. Regional Director Riffe, and other R.O. staff conducted a Wildlife Resources Program Review of the station on August 9 and 10th.

3. Credits

Sections B,C,D,F,I, and G, 1-7, 9,10 and 15 were written by Assistant Manager Arment. Sections A,E,H,J,K, and G, 8 and 11 were written by Manager Taylor.

The entire report was typed and assembled by Refuge Assistant Swanson.

K. FEEDBACK

The Fisheries Resources Program (FR) in Anchorage stopped FR funding to Becharof Refuge in FY-83 and established a Fishery Assistant Station (FAS) in the King Salmon compound. This eliminated the Fishery Biologist from the refuge staff. Not only does FR admit that the Fishery Biologist on Becharof worked out "better than expected", but that 90% of the future fishery work in the Bristol Bay will occur on refuges. It is this manager's contention that you leave well enough alone and that the land managing arm of the Service, refuges, is the most efficient and logical place for such positions.

It also concerns this manager that the FAS will be competing with future refuge staffs for available housing, office and storage space within the King Salmon compound. The FAS will also share the refuges' support staff, i.e. the refuge pilot and maintenanceman.

In addition, this manager was never called once about his thoughts on the proposal to eliminate the refuge biologist and establish a FAS. We heard about the proposal through rumors and hearsay, and had to finally ask FR ourselves if it was true. One would think you would ask the refuge for their comments on an issue which directly affects them and of which they have had working experience. This is especially ironic because the refuge has received such praise from FR for our fishery work under a refuge biologist. This kind of "end run" does not promote a cooperative working relationship between divisions.