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BECHAROF NATIONAL WILDLIFE REFUGE

King Salmon, Alaska

ANNUAL NARRATIVE REPORT

Calendar Year 1983

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

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BECHAROF NATIONAL WILDLIFE REFUGE

King Salmon, Alaska

ANNUAL NARRATIVE REPORT

Calendar year 1983

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



5 2 3 4 1 6

Personnel

1.	John Taylor	Refuge Manager	GS-485-12 EOD 08/26/79
2.	Vernon D. Berns	Assist. Refuge Manager (Pilot)	GS-485-12 EOD 02/18/82
3.	C. Randall Arment	Assist. Refuge Manager (Pilot)	GS-485-11 EOD 10/03/82
4.	John Solberg	Assist. Refuge Manager	GS-485-05 EOD 03/06/83
5.	Randall J. Wilk	Biol. Tech.	GS-404-05 EOD 06/27/83
6.	J. Michael Humerick	Maintenance Worker	WG-4749-8 EOD 05/23/82



Kelie Swanson, Refuge Assistant GS-303-4 EOD 08/22/82 Resigned 07/20/83

Sharon Workman Refuge Assistant GS-303-4 EOD 10/13/83 Resigned 01/06/84

Temporary

Carl Reintsma Biol. Tech. EOD 06/01/83 Term. 08/09/83

Y.C.C.

Denise Reynolds EOD 06/13/83 Term. 07/22/83

Tani Wieber EOD 06/13/83 Term. 07/22/83

Review and Approvals

John D. Taylor 02/29/84
Refuge Manager Date
LC 3/16/84

Adg Asst 4/12/84
Regional Office Review Date

US FISH & WILDLIFE SERVICE--ALASKA
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INTRODUCTION

On December 1, 1978 President Jimmy Carter established the 1.4 million acre Becharof National Wildlife Monument by Proclamation 4613. On December 2, 1980 the monument was redesignated as Becharof National Wildlife Refuge by the Alaska National Interest Lands Conservation Act (ANILCA). During this period, Becharof was one of only two national Wildlife Monuments in the history of the National Wildlife Refuge System.

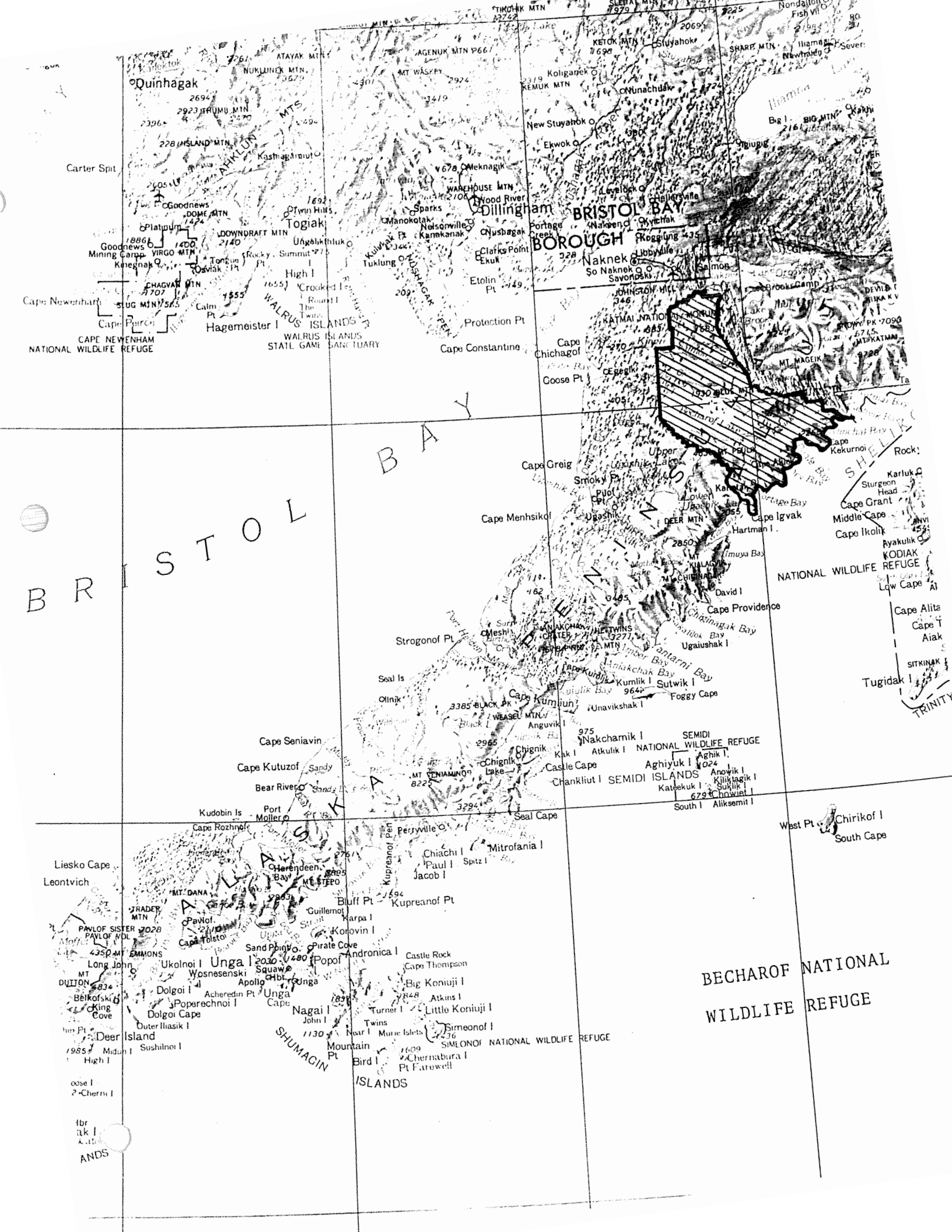
The Becharof Refuge (BNWR) is sandwiched between the Katmai National Park and the Alaska Peninsula NWR (APNWR) on the Alaska Peninsula. It includes volcanic mountains to the east and south, low tundra wetlands to the north and west, and encompasses the 293,000 acre Becharof Lake, second largest lake in Alaska.

The refuge's fauna includes large populations of brown/grizzly bears rivaling the densest known populations. Certain of these bears den on islands in Becharof Lake a few feet above water level, a unique phenomenon among brown bears. Moose inhabit the area in moderate numbers and eight to ten thousand caribou migrate through the area seasonally. Refuge streams support all five species of salmon, rainbow trout, Dolly Varden, grayling and other fish. Tributaries flowing into Becharof Lake sustain world renowned spawing runs of red salmon. Tundra lowlands and coastal estuaries are used by breeding and migrant waterfowl. On the Pacific coast, rocky seacliffs and islands are inhabited by nesting eagles, peregrine falcons and thousands of seabirds and marine mammals.

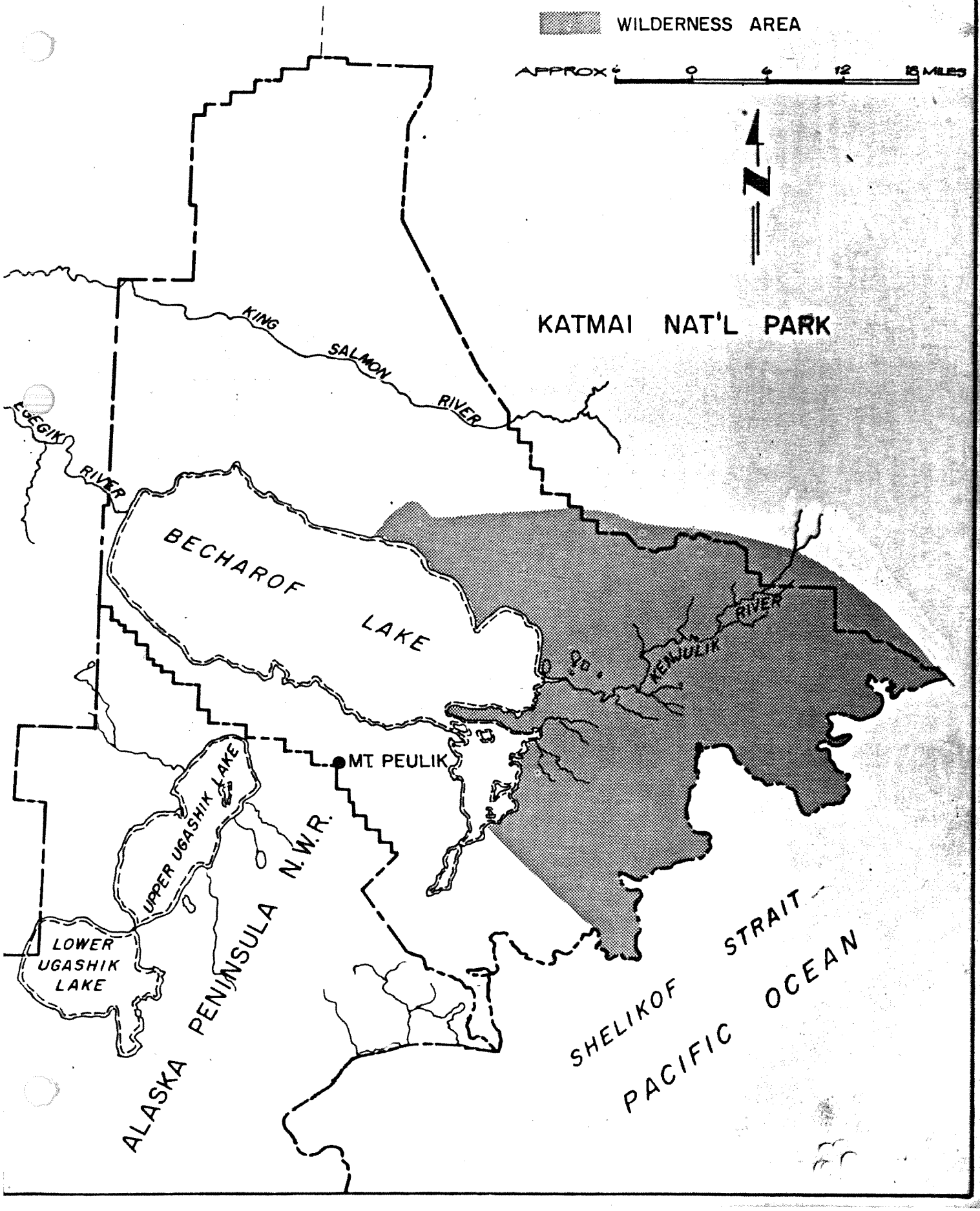
There are no settlements or permanent residences within the refuge. Most people in the nearby area have at least a seasonal cash income, but many also rely on the refuge in varying degrees for subsistence hunting and food-gathering to acquire supplemental food and material.

Approximately one-third, 400,000 acres, of the refuge was established by ANILCA as the Becharof National Wilderness Area.

The refuge is geologically significant as it contains one of Alaska's most recent volcanically active areas, the unique Ukinrek Maars which erupted in April, 1977.


BRISTOL BAY
BRISTOL BAY BOROUGH
Dillingham
Naknek
So Naknek
Quinhagak
Togiak
Goodnews
Platinum
Goodnews Mining Camp
Kanegnak
Tuntutuliak
Oscarville
Twin Hills
Ungalikthluk
Tuklung
Kulukak Pt
Manokotak
Nelsonville
Kanakanak
Nushagak
Clarks Point
Ekuk
Etolin Pt
Protection Pt
Cape Constantine
Cape Chichagof
Coose Pt
Cape Greig
Smoky Pt
Pilot Pt
Ugashik
Cape Menshikof
Strogonof Pt
Seal Is
Olnik
Cape Seniavin
Cape Kutuzof
Bear River
Kudobin Is
Port Moller
Cape Rozhnof
Liesko Cape
Leontvich
Herendeen Bay
Perryville
Chiachi I
Paul I
Jacob I
Spitz I
Mitrofania I
Kupreanof Pt
Kupreanof Pen
Bluff Pt
Guillemot
Karpa I
Pavlof
Cape Tolstoi
Korovin I
Pirate Cove
Popof
Andronica I
Castle Rock
Cape Thompson
Big Koniuji I
Atkins I
Little Koniuji I
Simeonof I
SIMEONOF NATIONAL WILDLIFE REFUGE
Unga I
Unga
Unga Cape
Nagai I
Deer Island
Sushilnoi I
Dolgoi I
Dolgoi Cape
Poperechnoi I
Ukolnoi I
Wosnesenski
Apollo
Squaw
Sand Point
Achseredin Pt
Belkofski
King Cove
Outer Iliasik I
Long John
DUTTON
PAVLOF SISTER
PAVLOF VOL
MT DANA
MT EMMONS
TRADER MTN
Mountain
Bird I
Chernabura I
Pt Farewell
SHUMAGIN ISLANDS
Cape Newenham
CAPE NEWENHAM NATIONAL WILDLIFE REFUGE
Cape Peirce
Hagemeister I
WALRUS ISLANDS
WALRUS ISLANDS STATE GAME SANCTUARY
Carter Spit
Kashegelogamiut
Crooked I
Round I
The Twins
Calm Pt
Rocky Pt
Summit
Tonzona Pt
Osviak
Kinegnak
Togiak Bay
Togiak Lake
Kulukak Bay
Kuskokwim Bay
Etolin Strait
Nunivak I
Goodnews Bay
Platinum
Goodnews
Quinhagak
Kuskokwim Mts
Aniakchak Bay
Amber Bay
Cape Kumlun
Kumlik I
Sutwik I
Foggy Cape
Unavikshak I
Anguvik I
Chignik
Chignik Lake
Chignik Bay
Nakchamik I
Atkulik I
Kak I
Castle Cape
Chankliut I
SEMIDI ISLANDS
SEMIDI NATIONAL WILDLIFE REFUGE
Aghiyuk I
Aghik I
Anowik I
Kiliktagik I
Kateekuk I
Suklik I
Chowiet I
South I
Aliksemit I
Seal Cape
West Pt
Chirikof I
South Cape
Ugaiushak I
Chatanagak Bay
David I
Cape Providence
Hartman I
Cape Igvak
Middle Cape
Cape Ikolik
Cape Grant
Karluk
Sturgeon Head
Rock
Ayakulik
KODIAK NATIONAL WILDLIFE REFUGE
Low Cape
Cape Alitak
Cape T
Aiak
SITKINAK
Tugidak I
TRINITY
BECHAROF NATIONAL WILDLIFE REFUGE
Becharof Lake
Upper Ugashik Lake
Ugashik Bay
Ugashik Narrows
Ugashik Lakes
Kaflia Bay
Kaflia Bay Lagoon
Port Heiden
Meshik
Ilnik
Ilnik Bay
Ilnik Lagoon
Port Hobron
Amber Bay
Aniakchak Bay
Aniakchak Crater
Aniakchak Lake
Aniakchak River
Kukak Bay
Kukak Creek
Katmai National Monument
Katmai Pass
Mageik Creek
Brooks Camp
Brooks River
Brooks Lake
Naknek Lake
Naknek River
Savonoski
Johnston Mtn
Mt Mageik
Mt Katmai
Devils Pk
Mt Griggs
Mt Chiginagak
Mt Kialagvik
Deer Mtn
Peulik
Upper Ugashik Lake
Becharof Lake
Becharof Bay
Becharof Lagoon
Kejulik Bay
Kejulik Lagoon
Kejulik Mtn
Kejulik Pk
Kejulik Creek
Kejulik Lake

BECHAROF NATIONAL WILDLIFE REFUGE



A. HIGHLIGHTS

The draft Becharof Refuge Comprehensive Conservation Plan (RCCP) was reviewed and approved by the Regional and Central Offices. A presentation of the draft plan and its alternatives was made to Assistant Secretary Arnett and Director Jantzen by refuge and planning team staff in November. The draft plan will now go out for public review in March, 1984. (Section D)

In October, the Becharof NWR and Alaska Peninsula NWR staffs were combined under one refuge manager. The changeover should be more cost efficient to the Service since both refuges were adjoining and both staffs shared offices, equipment and housing in the same compound. (Section E)

Phase I of the refuge office rehab was completed on January 21. For the first time since Becharof Refuge was staffed in 1979, the refuge office now has such luxuries as running water, toilets and adequate heat. (Section I)

The refuge was visited by the Wildlife Resources Program Evaluation Team consisting of Skipp Ladd, Acting ARD/ARW; Bob Gilmore, Deputy Associate Director-WR; Curtis Wilson, Refuge Management Coordinator-PDW; and Phyllis Schienberg, OMB Examiner on June 7. (Section D)

B. CLIMATIC CONDITIONS

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 dominant influences on weather. Pacific Ocean and Bering Sea winds with high moisture content blow frequently across the upper peninsula forming fog and clouds which tend to 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, while the Bering Sea side enjoys more clear weather but lower average timperatures. Skies are usually cloudy. From fall to spring, the skies are clear to partly cloudy 40% of the time, while in summer this occurs only 20% of the time. King Salmon averages 55 clear days per year.

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

Temperatures are generally moderate throughout the year. Temperatures above freezing occur during all months with less than one-third of them below freezing. The temperatures at King Salmon average 12°F in December, the coldest month, and 54° F in July, the warmest month. Extremes range from -46° F to 88° F.

Winds average 10 to 15 miles per hour. However, most months have winds from 35 to 70 miles per hour.

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

January-March

The first quarter was mild exhibiting normal to 14°F above normal temperatures. A low of -18°F occurred on January 10 and 13th. Becharof Lake froze completely. After a period of opening and refreezing, the 293,000 acre lake remained frozen throughout February. Becharof Lake began opening up the first part of March as did the Naknek River which became unsafe for vehicle travel. By the end of March the river was completely open while Becharof Lake was only half-frozen. Less than one inch of snow fell during the quarter which was well below normal (Table 1), and which made wildlife surveys difficult.

April-June

The second quarter exhibited mild weather. As a result refuge lakes at the lower elevations began thawing during the first part of April and by the month's end, all of them and most of Becharof Lake were ice free.

July-September

Weather for the quarter was mild. The highest temperature for the year was 76°F occurring on the last day of July. August was the seventh consecutive month with above average temperatures. The effects of near normal precipitation coupled with above average terperatures produced a good (bad!) insect hatch, especially for the mosquitos, white socks and no-see-ums. The wind blew in excess of 60 miles per hour on September 29th.

October-December

Weather was unusually mild. December had only two days with below 0°F temperatures. The lowest temperatures for the quarter occurred in October. The October cold snap coupled with northerly winds, pushed most of the refuge's waterfowl south by the end of the month. The Naknek River occassionally froze, however, due to the light freeze and tidal action it remained unsafe for hunters wanting to cross and hunt caribou. Ten inches of snow fell in October, but total precipitation for the quarter was below normal. Late November winds, in excess of 60 miles per hour, blew into King Salmon wreaking havoc with airplanes parked at the airport. At least two planes including a Grumman Goose and the refuge's Cessna 180 were damaged on the 28th.

TABLE I

1983 Climatological Data

National Weather Service, King Salmon, Alaska

	Temperature (F)				Precipitation (inches)			Max. Snow on ground (inches)	Wind (mph)		Sky Cover [1] (days)		
	High	Low	Avg.	Norm	Total	Norm	Snow		Avg.	Pk:	Clear	Pt. Cldy	Cldy
January	43	-18	12	13	.42	1.04	4.0	2	13	60	11	7	13
February	43	-15	19	14	.25	.88	2.0	1	10	39	2	8	18
March	50	-3	33	19	.22	1.13	T [2]	T	11	39	5	4	22
April	64	13	37	31	2.22	1.05	6.0	2	12	55	1	6	23
May	66	30	47	42	1.37	1.18	T		12	51	1	7	23
June	74	34	54	50	1.18	1.59			11	43	3	6	21
July	76	43	57	55	1.53	2.08			10	35	0	6	25
August	73	35	54	54	2.33	3.13			10	38	1	5	25
September	63	15	46	47	2.36	2.78	T		11	60	3	6	21
October	54	-12	29	33	2.81	1.92	9.9	9	11	46	3	6	22
November	50	-7	30	23	.98	1.40	2.3	6	10	67	4	4	22
December	46	-3	27	12	.48	1.24	2.8	2	10	46	6	3	22
Total					16.15	19.33	27.0				40	68	257

[1]Sky Cover: Clear = 0 to .3 cloud cover; Partly Coudy = .47 to .7 cloud cover; and Cloudy = .8 to 1.0 cloud cover

[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, Legislation which affects land ownership includes the Alaska Statehood Act, the Alaska Native Claims Settlement Act (ANCSA) and the Alaska National Interest Lands Conservation Act (ANILCA). These laws transferred lands from federal to state and native ownership.

The land status of the refuge is constantly changing because the refuge has never been surveyed and because lands within the refuge are in the process of being selected and conveyed to the State, Natives and Native corporations. Of the 1,171,000 acres of land within the refuge boundary, approximately 1,050,000 acres or 90 percent of the land is owned by the Federal government, while State, Native corporations and private interests either own or have selected the remaining 10 percent of the land. The refuge land status as of May, 1983 is summarized in Table 2, and the location of selected and conveyed lands is shown in Figure 1.

TABLE 2

Status of Lands Within the Becharof NWR

May, 1983

	Land Status (acres)	
Category	Selected	Conveyed
Native Corporations	102,640	640[2]
State of Alaska	16,576	156[3]
Private Selections	8	45[3]
Native Allotments	255	
Total	119,479	841

[1]Surface and subsurface rights

[2]Land approved for conveyance to Native corporations must be surveyed before patent is issued. Since there are millions of acres and it will take many years to survey, an interim conveyance is issued. This conveys land subject to survey to determine exact boundaries and acreage.

[3]Potential

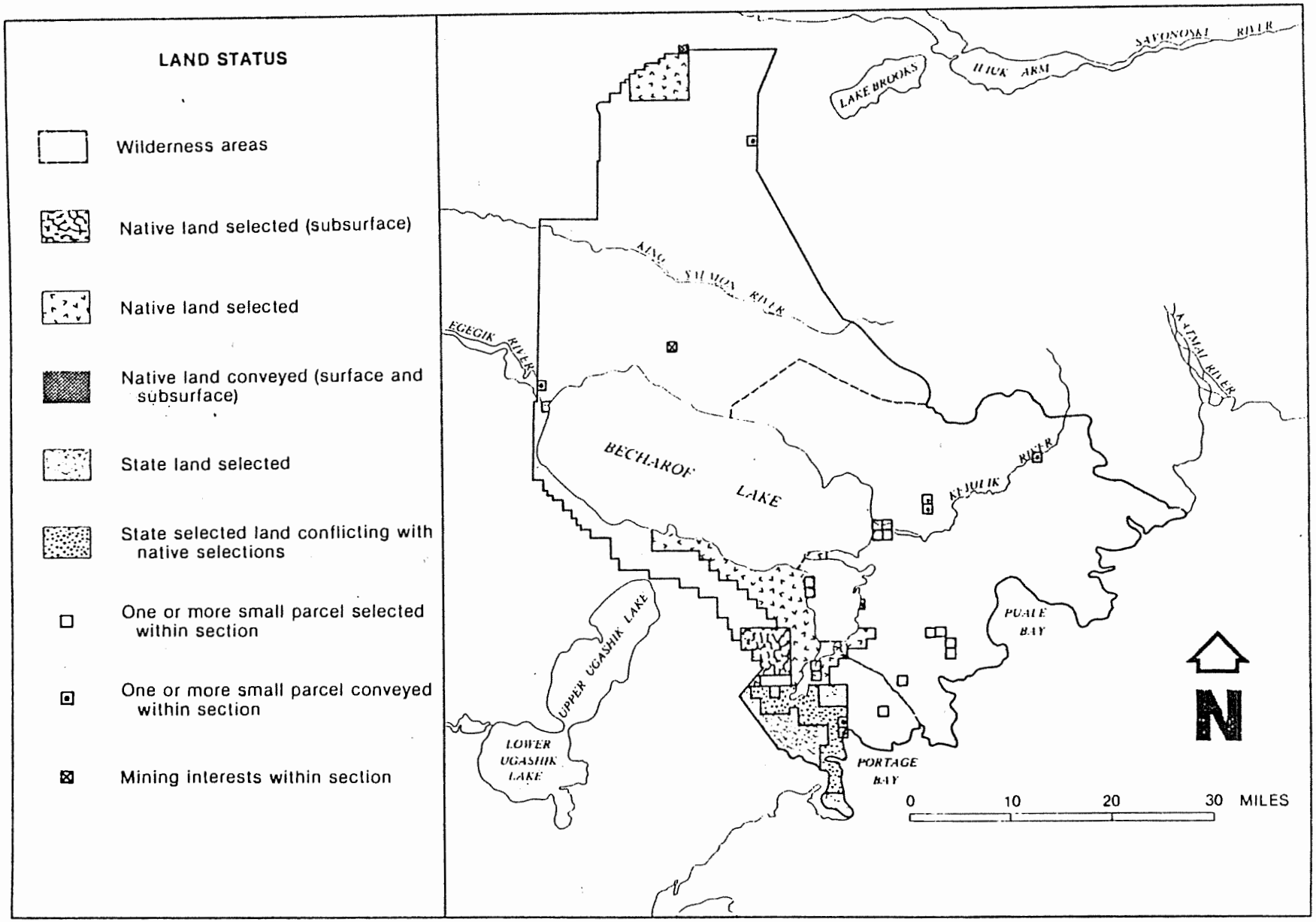


Figure 1. Location of Selected and Conveyed Lands within Becharof NWR as of May, 1983.

3. Other

The draft Bristol Bay Cooperative Management Plan (BBCMP) contains several proposals that would affect the boundaries of the refuge. The BBCMP recommends that lands in the upper Kejulik drainage, presently with Katmai NP, be redesignated by Congress as part of the refuge. This boundary change would place virtually the entire drainage in the refuge. The proposal would provide visitors with additional opportunities for recreational hunting, and would simplify management by placing the area under one administrative agency.

The Alaska Department of Natural Resources (DNR) and this Service (FWS) have agreed as part of the BBCMP to resolve the status of ANSCA section 11(a) (3) lands selected by the state in Becharof as part of this agreement, 42,400 acres in the Puale/Portage Bay area that straddles both refuges.

Finally, the BBCMP recommends that the three Alaska Peninsula refuges (Becharof, Alaska Peninsula and Izembek) be reorganized into two refuges to provide better management of fish and wildlife resources. This is presently being administratively conducted. If Congress agrees to this recommendation Becharof NWR would no longer exist as a separate refuge. The "Upper Peninsula" Refuge would include what is now Becharof NWR and the Ugashik and Chignik Units of the present Alaska Peninsula NWR. The Pavlof Unit of APNWR would become part of Izembek NWR. All of the management directions, facilities and other recommendations proposed in the Becharof NWR Comprehensive Conservation Plan (RCCP) would be incorporated into the Alaska Peninsula RCCP.

It is important to note that all of the above proposals are draft. The proposals will be studied and discussed with the concerned parties as to the resource values, management needs and requirements, potential impacts and the feasibility of the proposals.

D. PLANNING

1. Master Plan

Alaska refuges do not utilize master planning as it exists for the refuges in the lower 48 states, but rather comply with Public Law 96-487, ANILCA. Section 304 authorizes the Secretary of Interior to enter into cooperative management agreements and to prepare comprehensive conservation plans. The Bristol Bay was an area chosen for a cooperative management plan. The Bristol Bay Cooperative Management Plan (BBCMP) area encompasses 31 million acres. Members of the Study Group include the Fish and Wildlife Service, Bureau of Land Management, Alaska Department of Fish and Game, Alaska Department of Natural Resources, Native interests, and the private sector. The plan is in part derived from the Refuge Comprehensive Conservation Plan (RCCP). The draft BBCMP was completed in June, while the draft Becharof RCCP was completed in November. They both will be available for public review soon.

A tremendous amount of staff time and travel was spent on writing, mapping and providing resource information for the plans. Some of the major commitments included but were not limited to:

February - RM Taylor and ARM Arment attended BBCMP meetings held in South Naknek, Naknek, Pilot Point and Egegik.

March - RM Taylor reviewed the latest drafts of both the BBCMP and RCCP and submitted comments and rewrites to the FWS regional office.

May - During the week of the 9th, RM Taylor worked with Pete Jerome and Mike Reese of the RO Planning Team in gathering information for rewriting the draft RCCP. During the week of the 23rd Taylor was back in Anchorage to rewrite parts of the RCCP.

June - During the first week of the month the refuge staff worked with Regional Office Planner, Ron Thuma, who visited the refuge on a fact-finding mission for both the BBCMP and RCCP. As part of the follow-up, ARM Arment interpreted the accumulated field data and conveyed the results to the RO throughout the month. ON the 7th Taylor laid out and discussed an overview of the BBCMP and RCCP to the Wildlife Resources Program Evaluation Team in King Salmon. Team members consisted of Acting ARD/ARW, Skip Ladd; Deputy Associated Director-WR, Bob Gilmore; Refuge Management Coordinator-PDW Curtis Wilson; and OMB Examiner Phyllis Schienberg. RM Taylor's discussion was followed by an aerial tour of the refuge and Bristol Bay Study Area on the 8th.

August - On the 13th, ARM Arment and BT Wilk attended a BBCMP meeting in Naknek along with a representative from the APNWR. On the 15th ARM Arment attended a BBCMP meeting in South Naknek. On the 20th RM Taylor and ARM Arment attended the BBCMP meeting at Pilot Point.

September - RM Taylor worked with RO Planners Ron Thuma and Dave Patterson at King Salmon on the RCCP.

October - The updated draft of the RCCP was distributed throughout the RO. As a result, RM Taylor and the staff were fielding questions pertaining to the plan throughout the month.

November - On the 9th RM Taylor was in Anchorage to attend RCCP and BBCMP meetings. During the week of the 28th, RM Taylor traveled to Washington D.C. to present the draft RCCP to Assistant Secretary Arnett and Director Jantzen. They concurred with the plan as presented and at year's end the plan was being printed for public review in the Spring of 1984.

2. Management Plan

In 1982 individual wildlife inventory procedures, developed in 1981, were given test runs and checked for validity. In 1983, the individual procedures were revamped and new inventory procedures were added to product the refuge's Wildlife Inventory Plan. The plan currently contains ten individual procedures including: Brown Bear Population and Composition, Caribou Wintering Population, Moose Composition and Population, Marine Mammals Survey, Tundra Swan (Nesting Census), Tundra Swan (Production Census), Waterfowl (Spring and Fall Migration Survey), Raptor Survey, Seabird Survey and Public Use Survey. Such inventory procedures

as the Brown Bear Composition and Population Survey include more precise survey standards which, if maintained, will provide more consistent population and composition data year to year. As better information becomes available, individual procedures will be modified.

In 1984 the Becharof Wildlife Inventory Plan and the individual inventory procedures of the APNWR will be incorporated into one plan.

3. Public Participation

Public participation in the form of meetings and written comments were used during the preparation of both the draft BBCMP and RCCP. Meetings were held in Naknek, South Naknek, Egegik and Pilot Point. During the meetings personnel representing the FWS, the refuge, Native corporations and Alaska Department of Natural Resources were on hand to answer questions pertaining to their area of expertise. Relatively few people attended the meeings conducted during the day, as compared to the higher turn out for those meetings held in the evenings. Major issues centered around the oil and gas development and the contingent pipeline corridor plans. Most villagers expressed mixed and generally negative feelings toward the pipeline corridors. The attitudes could generally be grouped into one of three catagories: those opposing pipeline corridors completely; those for energy development but against a pipeline corridor in their area; and those for energy development and a pipeline corridor in their area but against access roads.

4. Compliance With Environmental Mandates

Both the BBCMP and RCCP are considered major federal actions and include Environmental Impact Statements within the plans. As previously discussed, the refuge management and staff worked extensively in the preparation of the plans and their associated Environmental Impact Statements.

D. ADMINISTRATION

1. Personnel

In July, Randy Wilk arrived in King Salmon to fill the Biological Technician's position for Becharof NWR. Randy came to us from North Bend, Oregon. Randy had worked permanent status for the BLM in Wyoming, the Wisconsin Dept. of Natural Resources and temporary assignments for the BLM in Wyoming and Oregon and for the FWS at Kodiak NWR.

In September, Glenn Elison, refuge manager for the Alaska Peninsula NWR transferred to the Arctic NWR. After his departure, responsibilities for APNWR were combined with Becharof's to be managed by the remaining manager, John Taylor. The decision to combine the two refuges had been made by the RO in FY-82. This appears to be a logical action since the two refuges have shared the same headquarters site, facilities, and administrative needs. Additionally, due to lack

of funding and personnel ceilings, the refuges also had shared certain positions, e.g., the refuge assistant and maintenance worker. This created an administrative nightmare concerning budget tracking, FTE's, payroll and supervision. The state of personnel affairs is shown in Table 3.

TABLE 3

Personnel Status of BNWR

FY	PFT	TEMP.
84	4	-
83	3	.2
82	3	-
81	2	-
80	1	-

Refuge Assistant Kelie Swanson resigned on 7/20/83 after eleven months of clerical duty, a record for the refuge. Upon advertising the position, administering the OPM examination, and making a selection, it was October 13 before Sharon Workman reported as the new Refuge Assistant. Sherry worked for only two months at which time she and her husband decided to leave the King Salmon/Naknek area and head for Idaho.

The ability to retain clerical help continues to be a problem in King Salmon. Motives for frequent turnover vary but quite often involve wages in the private sector approaching as much as three times those available in federal employment.

The maintenance worker position currently held by Mike Humerick was originally established as a temporary appointment. The position was advertised as a permanent full-time appointment and selection will be made in CY-1984.

2. Youth Programs

Two YCC emrollees completed an eight week work session this summer. The young women were hired locally (our only two applicants) and worked on numerous maintenance projects for both BNWR and APNWR. Some projects included: filling sandbags for dock bulkhead, painting (overhead doors, building trim, foundation skirting, and boardwalks with anti-slip grit), shingle siding, grounds "fix-up" (litter/junk patrol, raking, fertilizer-grass seeding), vehicle cleaning-washing-waxing and office cleaning duties. In addition to maintenance jobs the YCC's helped with clerical duties during interim periods between refuge assistants.

A problem exists on recruiting enrollees for our youth programs. The YCC work sessions occur (generally) at the height of the salmon processing period. Consequently, teenagers can usually find more lucrative summer employment with local canneries. There are five canneries in Naknek located fifteen miles west of King Salmon.

3. Other Manpower Programs

From June 1 until August 9, Carl Reintsma was detailed from the Washington Office to work jointly for BNWR and APNWR. Washington paid all salary, per diem and travel costs. Carl spent most of his time in the headquarters compound. He assisted the maintenance worker and worked with the YCC crew at jobs including: siding and skirting the cabins, installing vents in cabin roofs, painting, assorted light carpentry, lawn mowing and vehicle cleaning.



Carl Reintsma, biological technician appointee from Washington D.C., was a great help to both the maintenance worker and the crew. Here he is assisting MW Humerick (in mind if not body) install a fan on one of our quarters.
83 - 1 GE

5. Funding

TABLE 4

BNWR Funding FY81-84

FY	1210	1220	1260	1300	1360	Total
84			$320 K[1]		$10 K[2]	$330 K
83	$96 K	$164 K[3]				$260 K
82	$64 K	$119 K		$104 K		$287 K
81		$ 82 K		$124 K		$206 K
80	No budget - operated off RO funds					

[1]Includes 80K earmarked for two ARMM projects.

[2]Earmarked to assist King Salmon Fisheries Resource Station in developing a Fisheries Management Plan.

[3]Inlcudes $56K spent on BBCMP mapping.

It should be noted that excluding "other" monies actual O & M funds for the refuge increased slightly from $206K in FY-81 to $260K in FY-83, and then decreased to $240K in FY-84. An increase in staff from 2 FTE's in FY-81 to 4 FTE's in FY-84 has further reduced funds for field activities.

6. Safety

Field operations in bush Alaska are inherently hazardous. A number of small aircraft accidents on and around the refuge reinforced the obvious fact that the primary means of transportation is not without peril. Unpredictable weather, operation in remote areas and a healthy population of brown bears all add to the need for constant attention to safety.

Flight helmets were purchased for all refuge personnel involved in survey operations. Hopefully they'll never be needed, but in the event that one of our aircraft go down, the bruise from a panel knob might be lessened.

The facilities occupied by BNWR and APNWR were acquired from the National Marine Fishery Service (NMFS). Much headway was gained this year in correcting many unsafe conditions relating mainly to facilities (Section I).

A lost time accident involving a YCC enrollee occurred in June. Tani Weiber cut her finger with a utility knife while trimming siding shingles for one of the cabins. The laceration required a trip to the doctor and four stitches. The accident could have been prevented (or at least reduced) had she been wearing her gloves.

Three flamable liquid storage cabinets were purchased for the shop. We have utilized the cabinets for storage of various paints and solvents.

Ginny Hyatt, Safety Officer (RO) visited King Salmon the week of 2/21. In addition to conducting a refuge safety inspection, Ginny presented courses in: CPR, Multimedia First Aid and Defensive Driving.

Safety meetings were conducted monthly in conjunction with staff meetings. Safety topics were presented by all personnel on a rotating basis.

8. Other Items

An administrative inspection was conducted by Winston Jacobson, CGS (RO) in late September. The inspection was helpful in smoothing out refuge administrative procedures.

Administrative Assistant, Ruth Johnson (RO), traveled to King Salmon in December to give our new clerk Sherry Workman some "on the job training" regarding administrative procedures. Much to our dismay, Ruth arrived the day Ms. Workman announced her resignation. Ruth spent her time "polishing up" the administrative skills of those refuge persons who handle administrative affairs in (yet another) clerkless period.



Safety Officer Ginny Hyatt (RO) visited King Salmon to conduct training sessions in defensive driving, first aid and CPR. Here Arment and Swanson study while Elison and Humerick take their turn on "Annie" 83 - 2 JT

F. HABITAT MANAGEMENT

1. General

The refuge lies in a transition zone between forest/tundra plant communities to the north and the generally treeless grass/sedge/low-shrub tundra typical of the peninsula to the south. The transition occurs between the King Salmon River and a line running east-west of the lower arm of Naknek Lake.

Little documentation exists on the vegetation of the upper Alaska Peninsula. Most available data are from isolated studies or from local descriptions for military needs. The most recent study is the 1981 Bristol Bay Land Cover Cooperative Mapping Project. The study used Landsat satellite imagery and computer technology to provide more accurate and detailed information than previously existed. Ten main cover types were identified on the refuge in this study. Acreage of the cover types are listed in Table 5.

TABLE 5

Major Cover Types and Percentage of Total Cover on Becharof NWR[1]

Cover Type	Approximate Area (acres)	Approximate Percentage Total Cover
Deep clear water	299,169	20.5
Shallow sedimented water	17,054	1.2
Snow/cloud/light barren	21,799	1.5
Barren	119,585	8.2
Open low shrub/heath tundra	69,066	4.7
Marsh/very wet bog	22,171	1.5
Closed shrub/grass	89,618	6.1
Miscellaneous deciduous	70,905	4.9
Wet bog/wet meadow	17,363	1.2
Open low shrub/grass tundra	459,252	31.5
All other	273,304	18.7
Total	1,459,286	100.0%

[1]Data from Bristol Bay Land Cover Cooperative Mapping Project

Vegetation on the refuge is generally limited to low-growing species that can resist cool summer temperatures, strong winds, limited moisture, shallow soils and a short growing season. About 90 terrestrial species are known to occur on the refuge. At least 20 freshwater plant species (mostly algae) are found on the refuge, while more than 70 marine plant species (mostly algae) inhabit salt water adjacent to the refuge.



1983 was an excellent year for berries. Low bush cranberries. such as these pictured, provided a tasty treat for wildlife and local residents alike. 83 - 03 VB

2. Wetlands

The refuge has four significant drainage basins: a tributary of the Naknek River, the King Salmon River, the Egegik River and east slope coastal streams. The first three basins drain the western slopes of the mountains on the refuge and the Bristol Bay lowlands in the north and west. The estimated mean annual runoff for the refuge west of the mountains is 2 cubic feet per second per square mile (cfs/mi^2). Freeze up for the western part of the refuge usually begins between November 30 and December 15; breakup occurs between March 25 and April 5.

The refuge east of the Aleutian Range, along the coast of the Shelikof Straits, contains many named and unnamed streams. The mountain streams range from 2 to 5 miles in length and flow east into the Pacific Ocean. Mean annual runoff varies from 25 to 50 cfs/mi^2 and the mean annual low monthly runoff is one cfs/mi^2. The refuge contains 173 lakes of over 25 acres, as well as numerous ponds and potholes (Table 6). Only 35 lakes are larger than 100 acres and few lakes are glacially fed. Most of these lakes (79%) are located below 500 feet elevation, while approximately 35 percent of the lakes have inlets or outlets and 35 percent have ocean access.

TABLE 6

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	293,000
Totals		173		312,700

There are two major lakes in the refuge. Becharof Lake, approximately 293,000 acres, is the second largest lake in Alaska. The discharge from Becharof Lake is unknown, but its large size stabilized the discharge of the Egegik River. Ruth Lake, about 1,000 acres is located a few miles south of Becharof Lake and feeds the Ruth River which flows into Becharof Lake.

3. Forest

The refuge has no major forested areas. Small stands of cottonwoods are found along the Kejulik River and scattered open stands of spruce are found in the northernmost portion of the refuge.

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 intact. It will help to insure that representative samples of these inter-dependent associations, some of which are unique, will be perpetuated for this and furture 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 used 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 of new public use cabins and shelters if such cabins are necessary for the protection of the public health and safety.



The Kejulik River Valley is part of the Becharof National Wilderness Area - only one of two such areas now designated on the Alaska Peninsula. 83-014 RW



The Ukiurek Marrs erupted in 1977 - just one indication of Alaska Peninsula's constant geothermal and volcanic activity. 83-025 RW

The abandoned Kanatak village and the Kanatak portage trail are being studied as possible historical sites. The native settlement was located at the head of Portage Bay and first appeared on a Russian map of 1849. The portage trail ran from Kanatak to Egegik, traversing the land on which the refuge now lies and connecting the east and west coasts of the Alaska Peninsula. As a result of an oil boom, the village population increased to nearly two hundred people between 1920 and 1922. From 1922 to 1943 and 1946 to 1954, the village had a post office and was a port of call for local mail steamers. The portage trail was used to transport mail between Kanatak and villages in the Bristol Bay area and Kanatak villagers used the portage to travel to Egegik to work in the local cannery. In the 1950's the village was all but abandoned when oil activities ceased. Native villagers moved down the peninsula to Perryville and across Chelikof Straits to Kodiak Island. On June 24, 1981, a fishermen's bonfire got out of control and destroyed all but two of the village's buildings.

G. WILDLIFE

1. Wildlife Diversity

The Becharof National Wildlife Refuge has a rich wildlife diversity of marine mammals, land mammals, birds, salmon and freshwater fish. Species of birds from Europe and Asia caught in jet stream air currents are rare visitors found on the Alaska Peninsula.

At lease 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 or adjacent to Becharof NWR.

2. Endangered and/or Threatened Species

The endangered peregrine falcon Falco peregrinus anatum may be a migrant passing through the refuge on rare occasions. The Peale's peregrine falcon (F.p. pealii) is found nesting along the Pacific Coast on cliffs and offshore islands.

3. Waterfowl

Waterfowl migrate through the Becharof Refuge in the spring and fall, but the refuge does not have the large shallow protected bays to attract and hold the number of birds found on the Bristol Bay coast and other parts of the Alaska Peninsula.

The first white-fronted goose sighting of the year was on April 2 along the Naknek River, and soon after, they were commonly seen in the King Salmon area. In early fall, small flocks of white-fronted geese are seen feeding on berries in the heathlands east of Becharof Lake. These birds are some of the first geese seen staging and migrating in the upper part of the peninsula. White-fronted geese are rarely found below Port Heiden.

Ducks that are common migrants include pintail, wigeon, mallard, greater scaup and green-winged teal. The above species also nest on the refuge as well as common goldeneye, old squaw, gadwall, harlequin, scoters and mergansers. An estimated 6,200 waterfowl were produced within the refuge in 1983.

A tundra swan nesting census was conducted using the refuge supercub to survey all swan habitat from June 13-15, and then plotted on USGS maps (scale 1:63,360). Birds recorded during the survey were; 74 pairs without nests, 28 pairs with nests, 22 single birds and five flocks of 29 birds for a total of 255 adult swans. Also, five broods consisting of 19 cygnets were observed. These observations are located on detailed maps that will have recurring value in future years when land management decisions are made.



Swans, ducks and geese use the Naknek River as a resting area until the pot-holes and small lakes become ice free for nesting. 83-06 JT

To enhance the manipulation and quick retrieval of data, Information Resource Management and Waterfowl Investigations within the RO are developing a computerized data storage system which will serve as a depository for all swan data gathered in Alaska. The Alaska Peninsula from King Salmon to Unimak Pass is being well-covered with Becharof, Alaska Peninsula, and Izembek Refuges participating.

Production surveys were flown in July. Observed were 28 pairs with cygnets, 55 pairs, 13 singles, 98 birds in flocks (3 or more birds) and 91 cygnets for a total of 368 swans. The average brood was 3.25 birds/brood.

Swans began staging on lakes in late August but did not start migrating until late September. By November 1, a cygnet that had been banded below Becharof Lake by APNWR staff was reported at Surry, British Columbia and two other sightings of refuge-banded swans were reported at Whatcom, Washington and Summer Lake, Oregon.

A few swans are known to overwinter on the Peninsula, using the open water streams and coastal lagoons. It is unknown if this is a small local population or if there was a deterrent that kept a few small groups from migrating southward. On January 6, tundra swans were observed at Ugashik Lake Outlet and on March 23 a flock of seven was seen at the head of Naknek River indicating that they were migrating back to the area.

4. Marsh and Water Birds

Loons (common, red-throated and arctic) are found on many lakes within the refuge, however, the arctic loon is the most common nester on Becharof. Red-necked and horned grebes are migrants while a few of the latter are winter residents to the Peninsula.

Lesser sandhill cranes began showing at King Salmon by mid-April. They start their migration from the Central Valley of California in late February with a major stopover in Oregon. After leaving Oregon the migration progresses rapidly through Washington, north into British Columbia and SE Alaska. The cranes apparently follow the coast to the Kenai Peninsula and upper Cook Inlet then spread out west to the breeding areas. On April 26, 200 lesser sandhill cranes were counted while making a general survey on the refuge. During the nesting period they are very secretive, but by early August sightings and their calls are common throughout the marshlands.

5. Shorebirds, Gulls, Terns and Allied Species

Paule Bay has two large colonies of sea birds with an additional eleven colonies found on the refuge along the Selikof Straits. A survey on June 30 tallied an estimated 75,000 to 85,000 murres, both common and thick-billed; 4,000 black-legged kittiwakes; 2,000 glaucous-winged gulls; 600 puffins; 160 double-crested cormorants and 240 pelagic cormorants. Other birds nesting or found on the refuge include Bonaparte's gulls, pigeon guillemots, sandpipers, snipes, yellowlegs, dunlins, northern phalaropes, bar-tailed godwits, wondering tattlers and black oystercatchers. The osytercatchers and rock sandpipers are the only shorebirds that are year-round residents.

6. Raptors

Raptors that are observed on the refuge include gyrfalcon, merlin, osprey, marsh hawk, rough-legged hawk, bald eagle, peregrine falcon, short-eared owl, snowy owl, hawk owl and great horned owl. Becharof is near the fringe of the forested area where the hawk owl and great horned owl are found. During some winters the snowy owl may be common. The peregrine falcons usually nest near sea bird colonies and are most common on the Shelikof Straits' cliffs and offshore islands.

Bald eagles are year round residents of the refuge. They prefer nesting on the cliffs and offshore islands along the coastline. During the late summer and fall they feed along the streams on spawned salmon and during the winter they depend primarily on carrion and waterfowl.



Most of the bald eagle nesting occurs on the sea stacks and islets alone the Pacific coastline. The one pictured is located in Alinchak Bay 83-7 RW

A mature bald eagle, accidently caught by a trapper, was brought to the refuge headquarters in March. First aid was administered and the bird was force-fed salmon for several days. It was put in a large outside enclosure so it could exercise its wings and within a week began eating by itself. The bird was released on the Naknek River and was observed flying several minutes before it landed and perched in a tree. It is believed to be one of the eagles which nests each year on the Naknek river.



Assistant Refuge Manager Solberg and Berms force-feeding salmon to the crippled bald eagle. 83-8 GE

7. Other Migratory Birds

Forty-one species of passerines have been identified on the refuge. The common raven, black-billed magpie, gray jay, boreal and black-capped chickadees are common throughout the year. They are especially noticeable near the headquarters during the winter when bird feeders and suet balls have been placed near scrub vegetation. Wilson's and yellow warblers are seen all summer flitting through the alders and willows feeding on insects. The Lapland longspur is the most abundant passerine found in the heathlands.

8. Game Mammals

Brown Bear:

Although bears are most common along streams flowing into Becharof Lake from the mountains, they range over the entire refuge. In late June and July they concentrate in the alpine areas feeding on sedges and forbs before moving to salmon spawning streams in late summer. By fall most of the bears move to the higher elevations for feeding on berries and then for denning in late October.

The Island Arm is especially important to brown bears. An estimated 200 bears, concentrate in this small area during the summer to feed on spawning salmon. Also there have been 14 dens identified on these islands in Becharof Lake during a survey in 1974. The island dens are a unique phenomenom in that bears generally den between the 500 and 1,300 foot elevations, but here on the lake they den only a few feet above sea level. Several aerial flights were made over the islands in the springs, but only three dens were observed. Ground checks were impossible until later in the summer.



This big fellow was found fishing in Cleo Creek. 83-9 JT

Bear surveys were flown during late July and through August from the field camp at Becharof Lake. During this time most of the bears were along the streams feeding on spawning salmon. Surveys on the short steep streams of the Pacific resulted in few bear observations. See Table 7 for a breakdown of the surveys which classified a total of 345 bears.

TABLE 7

Becharof Lake Brown Bear Stream Survey

Date Started	7/19		8/17		8/19	
Survey Time (min)	262		200		215	
Breakdown	#	%	#	%	#	%
Female and young (all ages)	62	61.4	72	54.5	64	57.1
Avg Litter Size						
cubs	1.4		1.8		1.8	
yearlings	1.9		1.6		2.2	
all young/female	1.9		1.7		1.9	
Single Bears						
small	16	41.0	8	13.3	14	29.1
medium	2	5.1	6	10.0	8	16.7
Composite Summary						
Females w/young	22	21.8	26	19.7	22	19.6
Cubs	7	6.9	28	21.2	29	25.9
yearlings	33	32.7	18	13.6	13	11.6
single bears	39	38.6	60	45.5	48	42.9
Total	101		132		112	

Table 8 compares the four years of bear data compiled since the refuge began these surveys. One will notice that the litter size remains constant regardless of the sample size. The same is true when comparing cub litter to yearling litter size. However, when one compares the number of females with cubs to females with yearlings, there are more females with cubs. This may indicate a high mortality of cubs during their first year and/or that females with yearlings move further from the streams and are not counted, and/or the yearlings have strayed from the sow and are not counted during the survey.

TABLE 8

Comparison of Annual Brown Bear Surveys 1980 - 1983

Class	1980		1981		1982		1983	
	No	%	No	%	No	%	No	%
Cubs	90	26	89	16	65	25	64	19
Yearlings	55	16	48	9	25	9	64	19
Sows/cubs	48	14	47	9	36	14	36	10
Sows/yearlings	30	8	29	5	13	5	34	9
Single bears	124	36	329	61	121	47	147	43
Sample Total	347		542		260		345	
Avg Litter size (cubs)	1.9		1.9		1.8		1.8	
Avg Litter size (yearlings)	1.8		1.7		1.9		1.9	

During one aerial tour along Becharof Lake two bears were observed with red paint on their heads. A couple of months later the cabin in which they had discovered the paint was found. It looked like a 500 lb. bomb had made a direct hit.

A female brown bear at the Naknek dump was darted late one evening by two Canadian biologists for radio telemetry. The sow bear with two cubs made her way into the thich brush before the drugs took effect and could not be found. She was found dead the next day; apparently she got to a pond, collapsed from the drugs and drowned. The two cubs were later captured by the Alaska Department of Fish and Game (ADF&G) and sent to a zoo in Rumania that had a standing request for brown bears.

In early September a family group of three brown bears visited the refuge compound late one evening. At least one bear or group of bears has been seen within the refuge compound each year since personnel arrived in 1979. Perhaps we should use this data as a population indicator.

Moose:

A few moose inhabit the Pacific drainages of the refuge, while they are common in Becharof Lake drainages. Some of the willow and shrub communities preferred by moose are in the foothills of the Kejulik River watershed, in the foothills adjacent to Becharof Lake, the Becharof Lake Island Arm and the coastal valleys of the Pacific. The Kejulik River drainage is the most important wintering for moose on the refuge. The daily record for moose tallied in this area was 151 animals in 2.4 hours flying time on February 9th.

The Alaska Peninsula moose population has declined rapidly since the early 1970's. Poor calf recruitment is blamed for the decline. State biologists suggest that bear predation on moose calves is the main cause and that a change in vegetation is a factor in the reduced production and calf survival. However, ADF&G surveys show the calf production was up slightly this year. In the early 1970's there was 30.4 calves/100 cows. By 1982 the sample showed 8.7 calves/100 cows, but the 1983 sample was 13.8 calves/100 cows. To determine how significaltly vegetation has changed, the refuge and ADF&G are setting up study plots in key moose habitat to evaluate nutritional values and utilization of some of the preferred browse species.



Moose on the refuge must have at least a 50" antler spread or three brow tines on one antler to be legally harvested during the September season. This young bull is legal.
83-10 JT

Caribou:

A majority of the 17,000 plus Alaska Peninsula caribou herd use the lowlands between Becharof Lake and the Naknek River as wintering grounds. Approximately 10,000 animals moved into the hills north of Becharof Lake in early August. By mid-September local hunters were harvesting caribou as they moved adjacent to the Naknek River which is as far north as this herd migrates.



Every fall approximately 10,000 caribou migrate to the north of Becherof Lake for winter range. 83-11 UB

The caribou herd on the refuge is stable or increasing slightly in size, but is probably nearing the carrying capacity of the range. During February the caribou begin migrating south to the calving grounds between Port Heiden and Ilnik.

Refuge personnel assisted ADF&G during the year by providing a pilot and aircraft, when available, to monitor radio collared caribou for migration patterns and composition counts.

Other Game Mammals

Small numbers of wolves range over the refuge feeding on carrion, caribou, moose and small game. Wolverines and lynx are also found, but are scarce. One wolverine was observed on 10/26 near Becherof Lake. Red fox and showshoe hare populations fluctuate greatly by year and area. Population data are very limited for all of the above species.

9. Marine Mammals

There is a stable population of sea otters along the Pacific coast where they are seen from a single animal to pods of 200 plus animals. Stellar's sea lions and harbor seals migrate along the coast and haul out on the refuge. It is estimated that 5,000 to 10,000 sea sions haul out in Puale Bay. A few walrus are seen on the Pacific side. However, most are found along the Bristol Bay coast, including a haulout of over 3,000 animals at Cape Seniavin. Several



Assistant Refuge Manager Arment collecting otoliths from spawned red salmon. 83-12 JT

species of whales are observed in the offshore waters. During the spring, beluga whales are visitors in the Egegik, Naknek and Kvichak rivers when they are feeding on smelt and salmon smolt. We have made no attempt to inventory these species except to note them while conducting other surveys.

10. Other Resident Wildlife

Spruce grouse, willow ptarmigan and rock ptarmigan are cyclic and their refuge populations fluctuate widely between areas and years. Resident mammals include beaver, river otter, mink, weasel and ground squirrels. No population data is available on any of these species.

11. Fisheries Resources

Very little data are available about the sport fisheries within the Becharof National Wildlife Refuge. Salmon species, char and grayling are plentiful in each of the drainages. Other species found on the refuge are rainbow trout, northern pike, whitefish and smelt. Becharof's Gertrude Creek is the southern most range of rainbow trout found on the Alaska Peninsula.

The second largest run of sockeye salmon on record, 43,284,000 fish, returned to Bristol Bay in 1983. Commercial fishermen harvested 35,376,000 (82%). A record run of 7,261,000 sockeye of Becharof NWR origin returned this year of which 90% were harvested in the Egegik district.

Data on age composition, size and numbers of Egegik river sockeye salmon smolt migrating to the sea are used by ADF&G in forecasting part of the age composition and number of subsequent adult returns to the Bristol Bay fisheries. These data are obtained by utilizing hydroacoustic gear and sonar arrays anchored to the river bottom to derive an estimate of smolt out-migration and tyke nets to obtain composition. For the second year, the refuge has cooperated with ADF&G in the operation of this Egegik River Project on the refuge.

The project was conducted between May 18 and June 20 with smolt peaking on June 1. The total out-migration was 17.9 million sockey in 1983, down from 50.4 million in 1982. Coho smolts began their out-migration on June 9 and were observed in all fyke net samples until the project was terminated on June 20.

Becharof Lake is the second largest lake in the state. It provides spawning habitat in the two large rivers and 14 major creeks that feed the lake, as well as being a nursery for sockeye, coho, grayling, whitefish and blackfish.

The refuge staff provided assistance to the King Salmon Fisheries Resource Station by collecting otoliths (middle ear bones) from spawned sockey for age class determination. A random sample of 50 otoliths were collected from Ruth River and 55 samples were taken from Featherly Creek.

16. Marking and Banding

The refuge has received approval for a bear telemetry study at Becharof Lake in 1984. The plan is to capture twenty-five bears and put on radio fitted collars to:

A. Determine the extent and characteristics of island denning of brown bear on the refuge.

B. Determine the seasonal movement of brown bear within and into and out of the refuge.

C. Locate and describe winter denning sites.

D. Increase knowledge and establish baseline data of brown bear use of the refuge.

Materials and supplies have been purchased and arrangements made to begin field work this spring.

RM Taylor spent a week in July assisting Kodiak NWR with their bear telemetry study. The opportunity to participate was greatly appreciated and should put Becharof's study a year ahead by the techniques and hands-on experience gained.

H. PUBLIC USE

1. General

The majority of the users of Becharof NWR are nonlocal Alaskan and nonresident sportsmen. Residents from the Bristol Bay Borough, Egegik and the U.S. Air Force Station (King Salmon) are more frequent users of the refuge, but fewer in number. The local population consists of approximately 1,100 year-round residents.

Recreational use of the refuge is difficult to distinguish from susbistance use since local residents have combined the two activities for years. However, recreational use by nonlocals can be distinguished and is definitely increasing. Although past recreational data are scarce, this trend is obvious from the increase in air-taxi operations, outfitters and the activity of commercial guides. Figure 2 shows popular access areas of the refuge.

The major subsistence food in the region is salmon, with caribou and moose the major red meat subsistence resources. See Figures 3 and 4 for areas of subsistence harvest for moose and caribou.

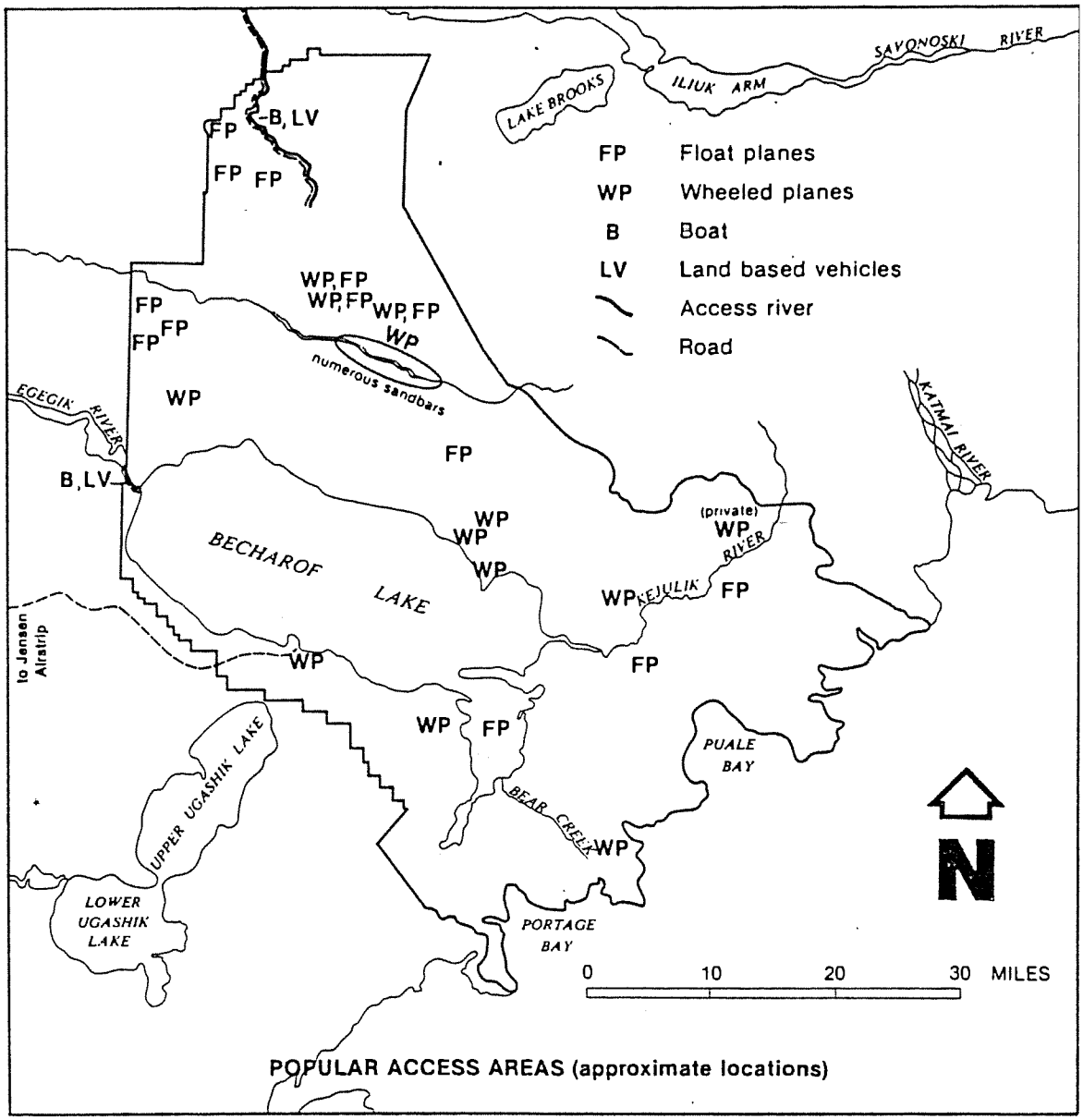

FP Float planes
WP Wheeled planes
B Boat
LV Land based vehicles
Access river
Road
SAVONOSKI RIVER
ILIUK ARM
LAKE BROOKS
KATMAI RIVER
EGEGIK RIVER
numerous sandbars
BECHAROF LAKE
KEJULIK RIVER
(private)
to Jensen Airstrip
UPPER UGASHIK LAKE
LOWER UGASHIK LAKE
PUALE BAY
BEAR CREEK
PORTAGE BAY
N
0 10 20 30 MILES
POPULAR ACCESS AREAS (approximate locations)

Figure 2.

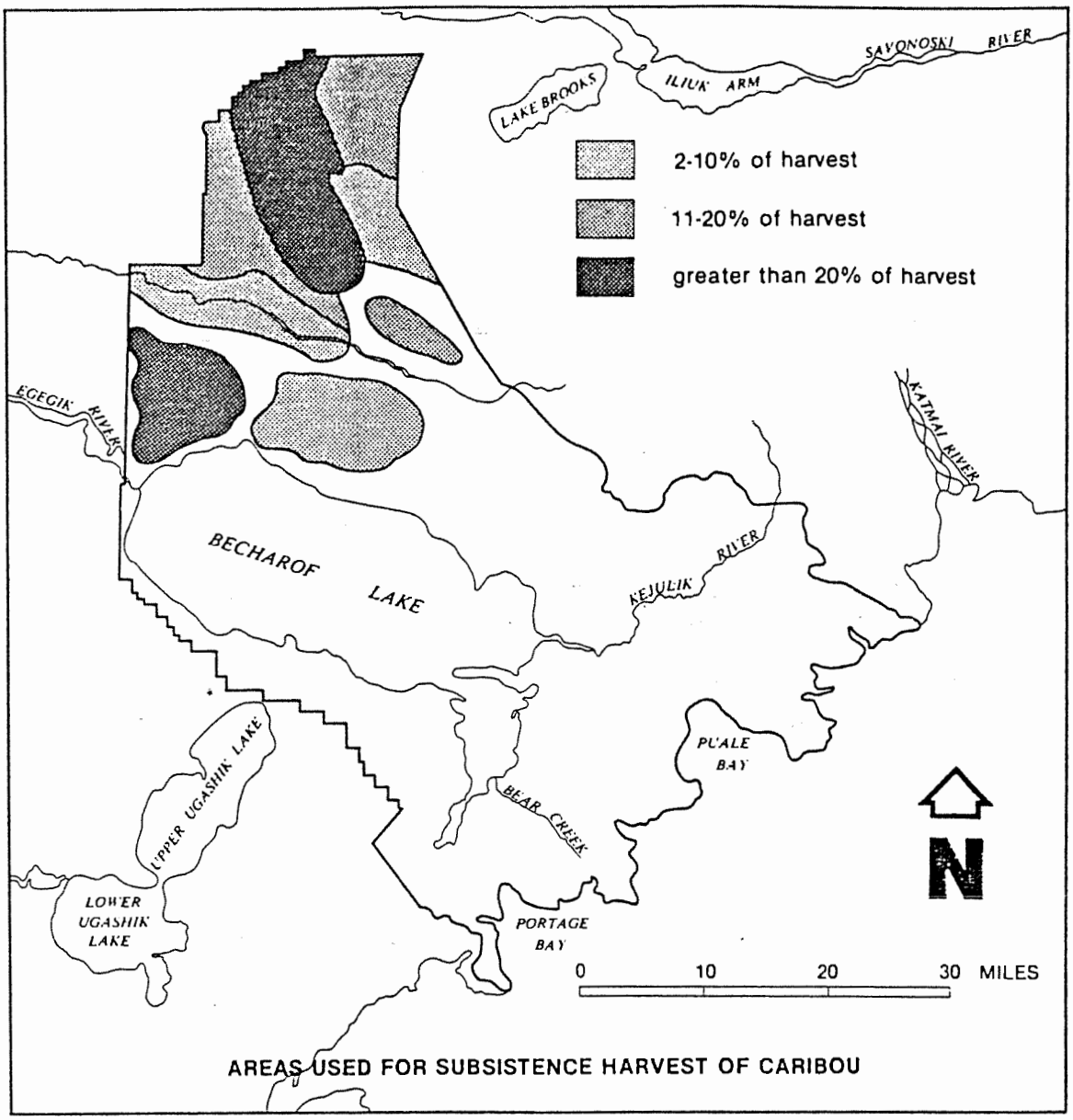

SAVONOSKI RIVER
LAKE BROOKS
ILIUK ARM
2-10% of harvest
11-20% of harvest
greater than 20% of harvest
EGEGIK RIVERS
KATMAI RIVER
BECHAROF LAKE
KEJULIK RIVER
PU'ALE BAY
BEAR CREEK
UPPER UGASHIK LAKE
LOWER UGASHIK LAKE
PORTAGE BAY
N
0 10 20 30 MILES
AREAS USED FOR SUBSISTENCE HARVEST OF CARIBOU

Figure 3.

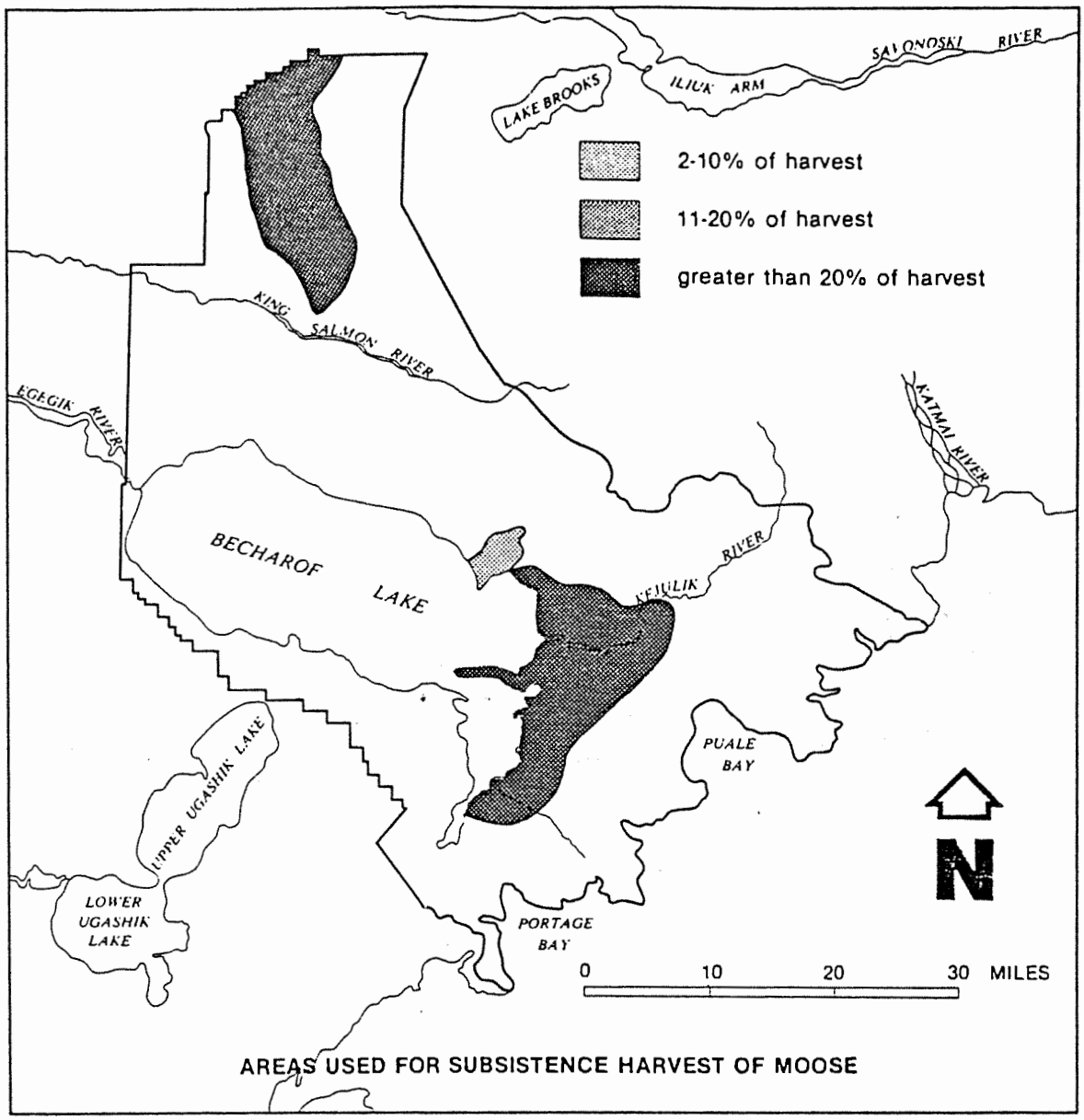

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ILIUK ARM
2-10% of harvest
11-20% of harvest
greater than 20% of harvest
KING SALMON RIVER
EGEGIK RIVER
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KEFILILIK RIVER
PUALE BAY
UPPER UGASHIK LAKE
LOWER UGASHIK LAKE
PORTAGE BAY
N
0 10 20 30 MILES
AREAS USED FOR SUBSISTENCE HARVEST OF MOOSE

Figure 4.

6. Interpretive Exhibits/Demonstrations

The recent completion of Phase II construction, which effectively doubled the space in the main office, left vacant the excellent potential for refuge displays near the office's main entrance/reception area. Proposals for the development of three exhibits were submitted in the FY-84 budget planning process, but were not approved. A construction project work sheet was submitted to the Regional Office in fall for the proposed construction of a small National Park Service/Fish and Wildlife Service visitor center across from the local airport terminal.

8. Hunting

Hunting is the major public use of Becharof NWR. Commercial guiding enterprises include hunts for world-class brown bear, moose and caribou. Eleven exclusive guiding areas have been designated on the refuge by the state guide board. Some hunters partake in overlapping seasons of the three species, however, brown bear hunting occurs only one season every year in either the spring or fall.

Refuge waterfowl and ptarmigan hunting usually occurs incidental to big game hunting. Total hunting activity for 1983 was estimated at 632 visits and 17,961 activity hours. This 12% decrease from FY-82 may be attributable, in part, to the relatively mild winter that limited local access to the refuge (too much ice for boat use and too little ice for crossing with land vehicles).

Harvest data for 1983 are unavailable. The ADF&G in King Salmon has provided data for the 1982 ungulate harvest, which is listed in Table 9.

TABLE 9

Summary of Caribou and Moose Harvest on the Alaska Peninsula

Species	Harvest Data Sex M	F	?	Total
Caribou				
BNWR	175(73.5)	60(25.2)	3(1.3)	238
GMU 9	758(73)	270(25)	10(1)	1038
Moose				
BCHNWR	8(80)	1(10)	1(10)	10

Species	Hunter Data Resident +	Resident o	Non-resident +	Non-resident o	? +	? o	Total
Caribou	416(59.2)	62(8.8)	144(2.3)	16(2.3)	60(8.5)	5(0.7)	703[1]
Moose	58(19)	137(45)	35(11.5)	31(10.1)	25(8.2)	18(5.9)	304

+ = successful o = unsuccessful ( ) = % of harvest

[1] 12% unsuccessful, 59% killed 1, 10.5% killed 2, 8% killed 3, 10.5% killed 4

Caribou

Approximately 52% of the caribou harvested on the refuge are taken by nonlocal hunters. Most hunters charter float planes to lakes located near the migrating herd during the August 15 - October 30, one-caribou per hunter season. At that time most animals taken are bulls - many with trophy characteristics. After November 1st hunters are allowed three more caribou or four if none were taken previously. Generally animals taken after this date are for subsistence purposes.

Hunting pressure of this herd on and off the refuge is expected to increase due to the herd's high population and its liberal bag limit.



Nonresident hunter with an early season caribou. 83-13 JT

Figure 5 shows areas of recreational caribou harvest on the refuge.

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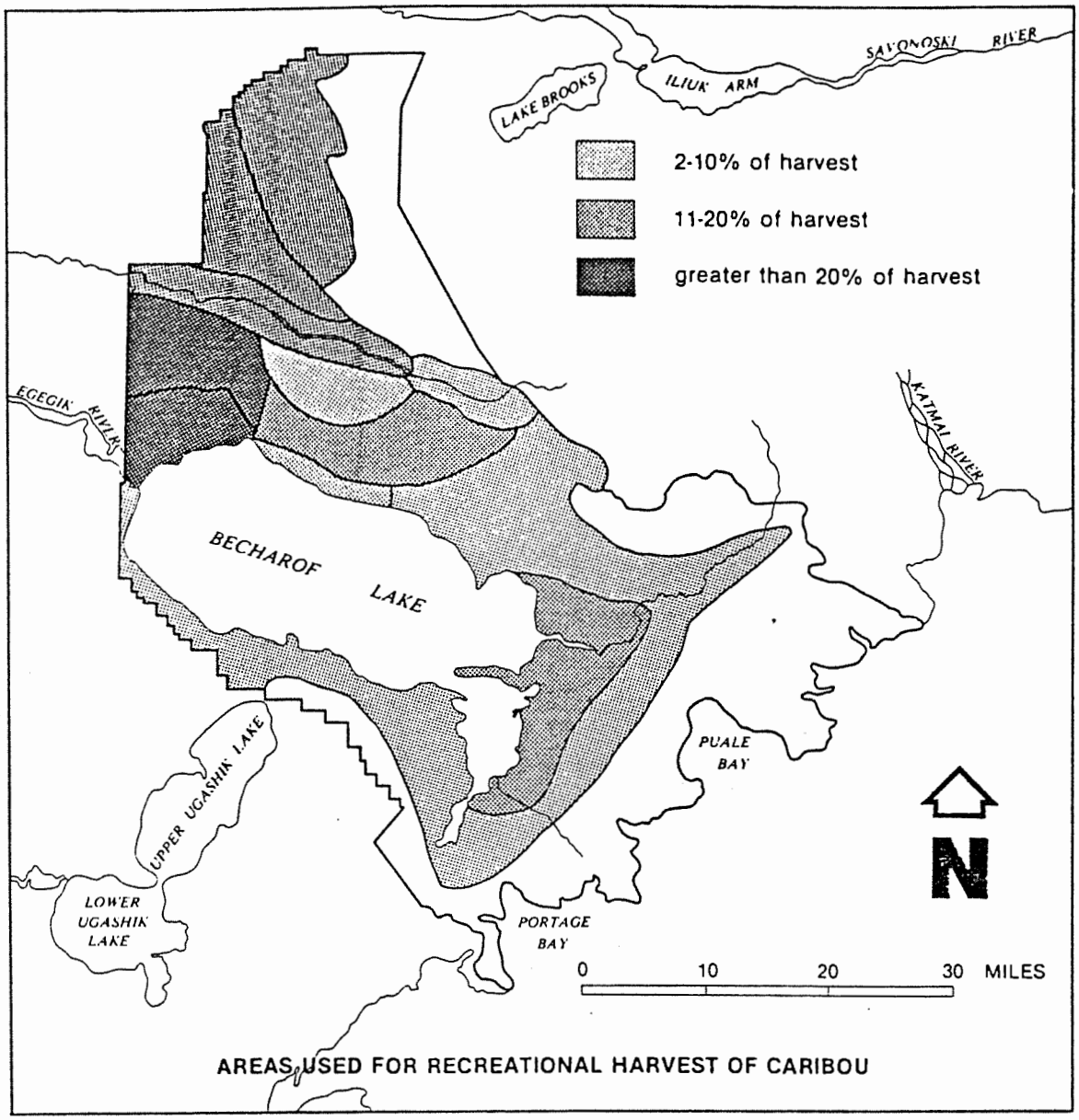

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N
0 10 20 30 MILES
AREAS USED FOR RECREATIONAL HARVEST OF CARIBOU

Figure 5.

Moose

Trophy moose hunting is popular on the peninsula. Harvest ticket data for 1982 showed 304 moose hunters used the Alaska Peninsula. At least 22% were nonresidents. (Table 9).

The reduced moose season in 1975 and further restricted in 1976 was imposed to bolster a declining population. Hunting was restricted to an early bull season and a late (either sex) season. Antlered moose required a minimum 50" antler spread or three brow tines on one side. These changes showed a 66% drop in total harvest, with drops of 64% and 20% in number of hunters and hunter success respectively (calculated on three year means - before and after changes were imposed).

Figure 6 shows area of recreational moose harvest on the refuge.

Brown Bear

Brown bear hunting took hold on the Alaska Peninsula in the early 1960's. Since then about one-third of the brown bears harvested in Alaska have come from the area. Most harvest occurs during the fall season by commercially-guided nonresident hunters. Data for the bear harvest on the Alaska Peninsula are listed in Table 10, and refuge areas of recreational harvest in Figure 7.

TABLE 10

Brown Bear Harvest for Alaska Peninsula 1975 - 1982

Date	Total	% by non-res	% male	$\bar{x}$ age M	$\bar{x}$ age F	% 5 yr old M	% 5 yr old F
1975-76	261	67	62	6.4	6.8	48.7	51.3
1977-78	311	72	64	5.9	7.1	45.3	54.7
1979-80	316	77	68	6.1	6.2	46.7	53.3
1981-82	339	76	59	5.9	6.4	47.0	53.0
$\bar{x}$	307	73	63	6.1	6.6	46.9	53.1

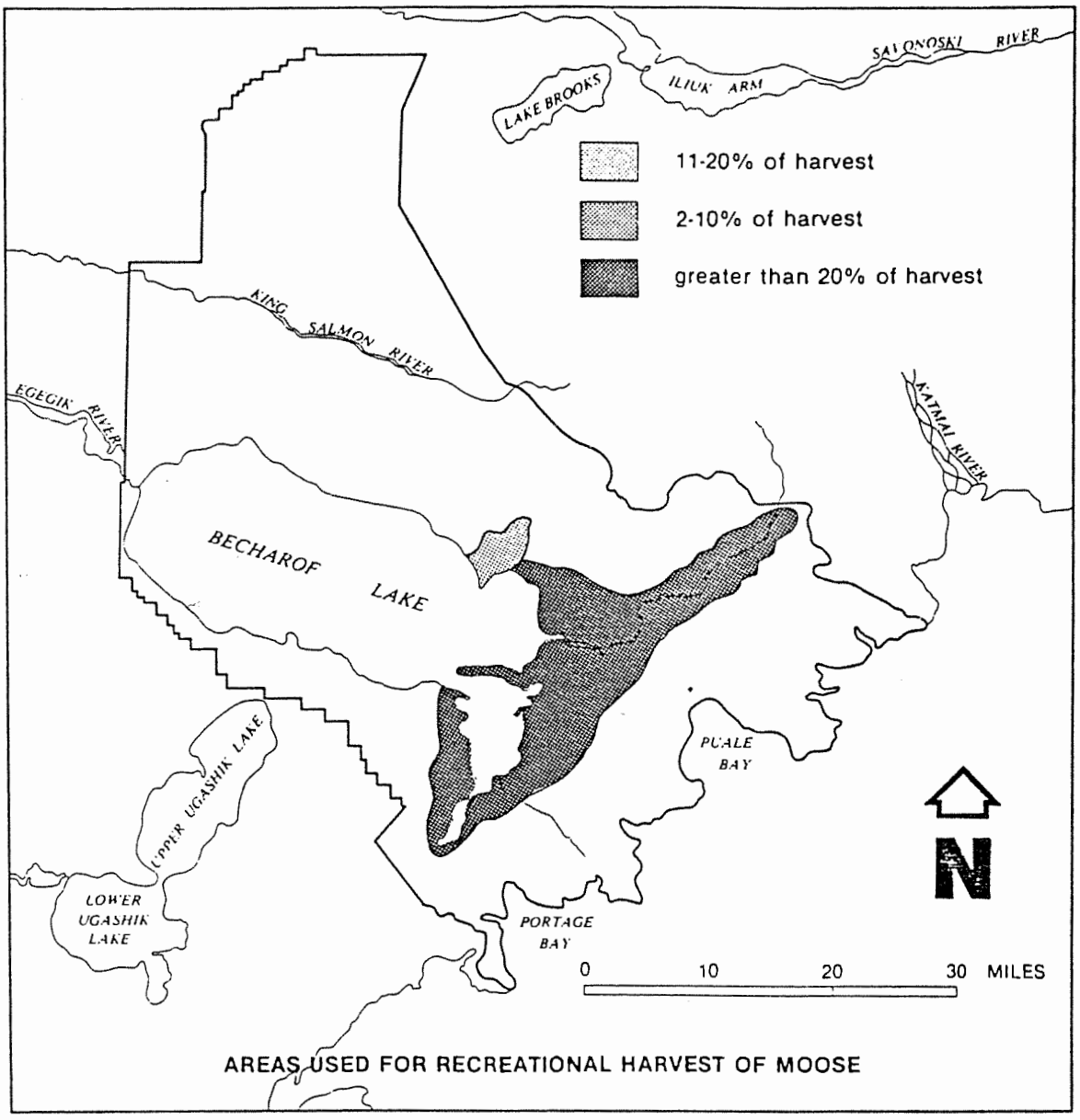

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AREAS USED FOR RECREATIONAL HARVEST OF MOOSE

Figure 6.

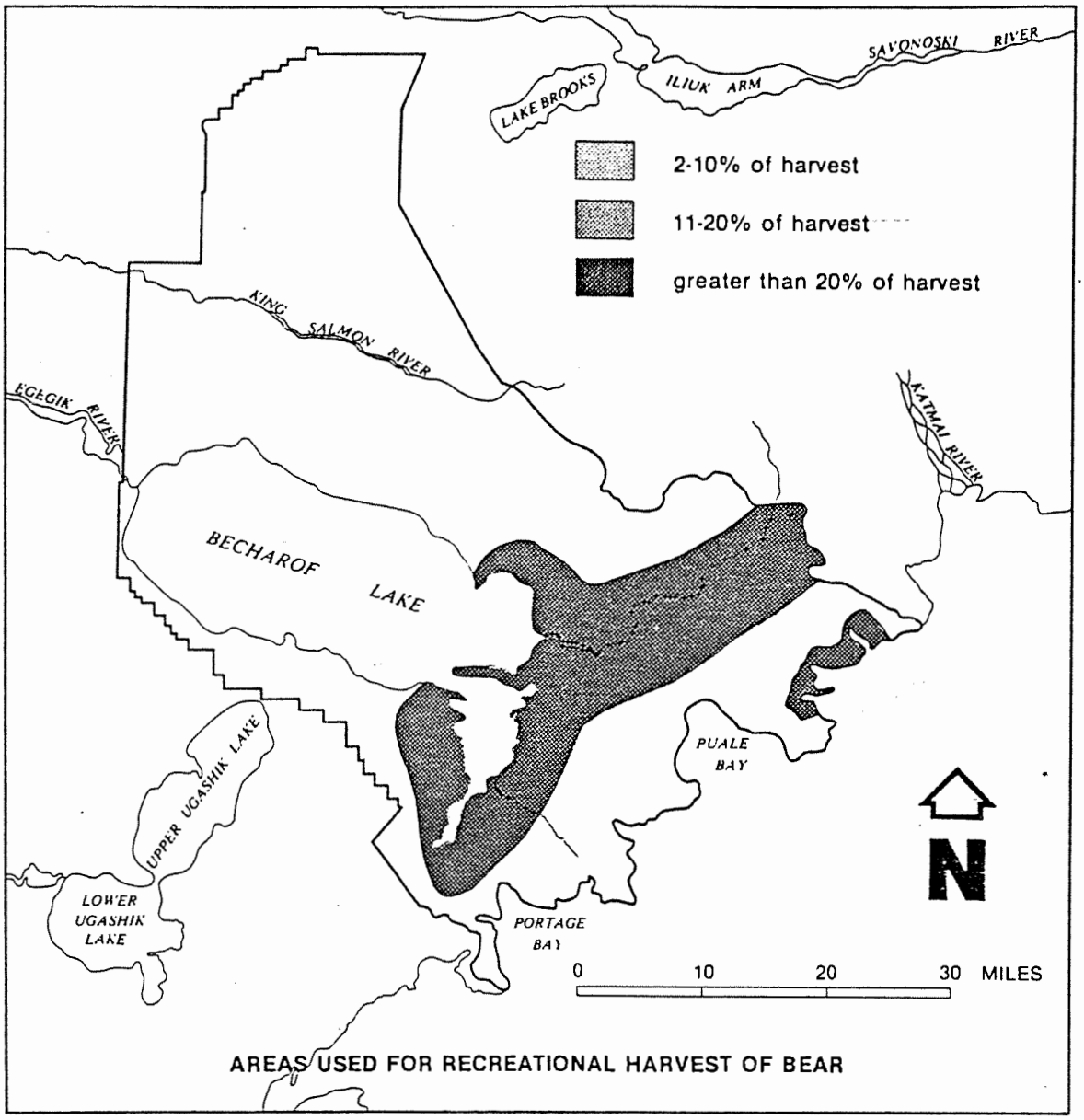

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N
0 10 20 30 MILES
AREAS USED FOR RECREATIONAL HARVEST OF BEAR

Figure 7.

Records indicate that at lease 400 bears have been taken from the refuge since 1961. Harvest levels increased until the mid-1960's, then declined slightly to the current level of 5-25/year. Current seasons for the refuge are every year either in the spring or fall. Data from ADF&G show at least 15 brown bear were harvested from Becharof Refuge during the fall, 1983.

Alaska allows the taking of wolf and wolverine by firearm with a hunting or trapping license. Animals harvested on the refuge are listed in Table 11. At least one wolverine was illegally shot during the bear season. The violator was cited by state wildlife protection officers.

TABLE 11

Wolf/Wolverine Harvest on Becharof Refuge, 1982 - 83

Species	date	sex	method	location
Wolf	1/83	M	shot	Big Creek
Wolf	1/83	F	shot	N. Refuge
Wolf	9/4/82	F	shot	Becharof Lake
Wolverine	?	pup	shot	Kejulik River
Wolverine	1/28/83	M	snare	Big Creek

Wolf/wolverine laws also apply to fox and lynx. Fox data is lacking. No lynx were reported taken on the refuge in 1982-83.

9. Fishing

Becharof Refuge receives only light fishing due to its distance from inhabited areas. The King Salmon River, Gertrude Creek, Big Creek and Featherly Creek are the primary sport fishing areas. Rainbow trout, Dolly Varden, arctic char, arctic grayling and salmon are the angler's quarry.

Reports submitted from guides using the refuge show that approximately 519 man-days of commercial fishing occurred on the refuge in 1983. This is an approximate estimate since not all data have been submitted and percentages of these man-days include off-refuge fishing. Incidental fishing during hunting trips and short visits from locals with boat and/or aircraft account for the remainder of the sportfishing on the refuge.

Gertrude Creek is accessible by wheel (gravel bar) or float plane (Gertrude Lake) and by boat from Egegik. The commercial guide operating in this area books approximately 120 clients per season with an average stay of 4 days. Catch and release angling ethics is generally practiced but clients are allowed to retain a trophy rainbow over 22".

Estimated refuge fishing use for 1983 was 450 visits and 1350 activity hours.



Big Creek is a major year-round public use area. In summer it is an excellent sport fishing stream, and when frozen in winter it becomes a major transportation corridor for hunters seeking caribou on their winter range. 83-14 RW

10. Trapping

No special use permit is required to trap on Becharof NWR. Eight individuals are known to trap on the refuge. Section 8 lists harvest data for furbearers.

11. Wildlife Observation

Most wildlife observation on the refuge is done via aircraft. This activity was estimated at 500 visits and 1075 activity hours for 1983.

12. Other Wildlife Oriental Recreation

Nature photography usually occurs during hunts, while angling or while viewing wildlife. An estimated 430 visits and 2455 activity hours were spent in this catagory.

13. Camping

Most refuge camping is associated with hunting and fishing. The average trip is usually 3 - 4 nights. Most commercial guides maintain cabins on the refuge, but also operate out of spike camps. Estimated for 1983 were 18 camping visits for 615 activity hours.

15. Off-Road Vehicles

The ANILCA allows traditional means of surface transportation for subsistence purposes. All terrain vehicles, 4 x 4's and snowmobiles are the primary means used on Big Creek when frozen in winter. Major use periods are January, February and December, but use during the latter month was precluded by a late river freeze this year.

17. Law Enforcement

Law enforcement activities focused on the fall brown bear season. Refuge personnel flew patrol flights over and into hunting camps. An observation post was set along a major hunting area near Becharof Lake during the entire nine-day season. Observations aided ADF&G in one citation issued for same-day airborne hunting.

Several days were spent by refuge staff in an effort to apprehend out-of-season waterfowl hunters in April, but no cases were made.

In July, the refuge manager greeted the new air base commander with a smile and a warning on the Naknek River. The commander began the salmon egg bait season one day early, but gratefully released his catch back to the river.

20. Cabins

ANILCA mandates the FWS to require permits of all people who currently own or use cabins on the refuge.

The purpose of the permit is twofold. First, it gives legal status to use the cabin(s) for traditional and customary purposes such as commercial fishing, guiding, trapping and subsistence activities. ANILCA prohibits the use of cabins on National Wildlife Refuges for private recreational purposes. Secondly, the permit protects refuge wildlife, habitat and other resources, ensuring that the cabin(s) and associated uses will not be detrimental to the refuge through its special conditions.

The permits are issued for five-year periods and may be renewed provided the continued use is found to be compatible with the purposes for which the refuge was established. Renewal may be authorized until the death of the last immediate faimly member using the cabin.

The refuge currently has eight cabin sites which were built prior to refuge establishment. Most of the cabins are used by commercial guides, however, one is used for administrative purposes and at least two are used for subsistence.

I. EQUIPMENT AND FACILITIES

1. New Construction

In June a contract was awarded to Kreuger Construction for $156K for Phase II of the Office construction.

With two refuge staffs and the Fishery Resource Station staff occupying the same floor we're a bit crowded at times. Phase II will provide an additional 2000 ft^2 to be utilized as office space, conference room and location for a small resource center (reference library, study skins, herbarium, etc.). Additionally, a visitors interpretive display will be developed in the room vacated on the first floor by fisheries.

Construction for Phase II began September 19th with completion expected in January or February, 1984. The project involves the construction of the new offices on the second floor above the existing office, housed in one of the warehouses acquired from the National Marine Fisheries Service (NMFS). Additional construction in the contract included: 2 stairwells connecting the floors, a boardwalk in front of the building, parking barriers (with vehicle engine heater outlets), and a wooden fence separating Trailer 12 from the office building. At this time, the project is nearly complete.

Throughout the Phase II project, various inspections were conducted by personnel from Engineering (RO).

2. Rehabilitation

On January 21, 1983 the refuge took beneficial occupancy of the rehabbed office (Phase I). A few items remained for completion, but the job was basically finished and in good order. The refuge now has such luxuries as heat, water and toilets and the separate office should enhance efficiency. In general, the new office is a quantum leap over what was available in the past. When the Phase II portion is completed (see previous section) King Salmon's facilities should rival those found at most other refuge headquarters in Region 7.

Quarters 10's "facelift" was completed in late June. The job was started in November 1982 with work performed by a combination of force account and small contracts. The cabin was 1940 vintage with wiring and decor reflecting that era. In the past, the cabin was used to house temporary summer help and as a result insulation and facilities were minimal.

The rehabilitation consisted of gutting the cabin and installing all new insulation, thermopane window, wiring, flooring, cabinets, appliances and heaters. In addition, the front porch was enclosed to provide an arctic entry and insulating/siding the foundation. The YCC enrollees and our Washington appointee assisted the maintenance worker with the exterior work.



Quarters (cabins) 9, 10 and 11 (1940's vintage) in early rehabilitation. 83-15 UB



Quarters 9 and 10 complete with bedroom additions, new enclosed porches. 83-16 RW

In September, a contract was awarded to Star Construction Co. for $22K to add on a 12' x 16' bedroom to Quarters 10. The project was completed in December and added another 192 ft^2 to the existing 450 ft^2. For those of you who are interested in the "price of doing business" in bush Alaska, that construction cost is a shade over $114.50/$ft^2$! The additional room makes the "cozy" cabin a bit more comfortable.



One of the cabins getting its $22,000 contracted bedroom addition. 83-17 RW

Accelerated Refuge Maintenance Management (ARMM) funding approved for FY-84 identifies $50K for rehabilitation of the old NMFS bunkhouse. The money will be combined with $130K ARMM funds from APNWR. The bunkhouse will be used to house summer temporary help and other FWS personnel passing through and conducting business in King Salmon. Also funded in the FY-84 ARMM package is $30K for rehabilitation of our automotive building. Engineering is presently in the drafting stage of both projects.

In May, ARM Berns and MW Humerick planted spruce and birch trees near the trailers. The trees not only improve the landscape but will provide some windbreak and privacy.

Various painting projects were undertaken this summer on Quarters 8, 9, 12, office exterior trim and an overhead door on one of the warehouses. Painting crews consisted of different combinations of: YCC's, Washington appointee and two separate contracts with local individuals.



The dilapidated porch on Quarters 8 was in dire need of replacement. 83-18 RA



Quarters 8 with fresh paint and new porch constructed by YCC and Biological Technician Reinstma. 83-19 RW

3. Major Maintenance

Our new float plane/boat dock arrived on the spring barge. The dock was purchased from MEECO Marina's Inc. of Oaklahoma. The structure is 60' long with two 30' wings extending downstream. The dock raises and lowers with the tidal influence on steel collars that surround pipes set into the river bottom. A wheeled ramp, bolted to the bulkhead, ensures safe access to the dock regardless of the tide. Dock sections were placed (and removed this fall) in the river with the help of a crane supplied by the Air Force.



The new float plane/boat dock arrived on the spring barge and was assembled by refuge personnel. 83-20 JT



The finished product on the Naknek River. The dock rides steel pipes with the fluctuating tide. The wheeled ramp allows safe access regardless of dock height. 83-21 VB

Highwinds, tides, ice and dilapidating bulkhead have caused a rapid deterioration of our riverfront. To temporarily rectify the problem, the YCC's filled sandbags and MW Humerick placed them and filled with the backhoe. While on an inspection for ARMM projects, RO Engineers and the Refuge Supervisor looked at the bulkhead and took measurements to begin repair work in the (hopefully) near future.

4. Equipment Utilization and Replacement

Much effort was devoted this year to cleaning up the headquarters compound. Along with the building, the refuges inherited from NMFS a tremendous quantity of equipment and supplies. An inventory was conducted by refuge personnel and a list of items unuseable by the refuge was submitted to Contracting and General Services (RO) during the summer. CGS is working through GSA on disposal of the property (e.g., excess property lists, inter-agency trading, public sales, etc.), but little progress has been made.

A variety of needed equipment was procured in 1983. For the refuge trailer and Quarters 8, new furnaces were purchased and installed. Quarters 10, which was completely rehabilitated in 1983, received all new appliances.

An assortment of camping/survival gear was obtained for field operations.

The cost of an 18' aluminum boat and trailer was shared by Becharof NWR and Alaska Peninsula NWR. A 40 hp motor supplied by fisheries will power the craft. The rig will be used primarily for the several VIP trips which the refuge head-

quarters each year. In the past, sight seeing trips of the Naknek River have had to be conducted with personal boats of the refuge staff.

Various hand/power tools and equipment were acquired for the shop and use around the headquarters. They include a table saw, drill press, airless paint-sprayer, high pressure cleaner, fork lift tires, fuel filter system and an electric fuel pump for dispensing fuel from 55 gallon drums into vehicles.

5. Communication Systems

With the help of communications technicians from the King Salmon Air Force Station, we completed the installation of our Sunair HF base station and antenna in May of 1983.

Communications with field camps was accomplished, with limited success, with a new Spilsbury SBX-11A. The old Harris RF-2200 still works much better.

6. Energy Conservation

The Enertech wind generator was not operational until September 30th. High electrical resistance between the generator and the office and 3-phase power was the suspected problem. In August, Naknek Electric Association (NEA) installed new lines and single phase power to remedy the problem. Enertech sent a technician from Anchorage to install generator monitoring devices (anemometer, electrical output, etc.) and complete new wiring to the single phase panel. The generator appeared to be working, but was not producing adequate wattage. In mid-December NEA representatives were at refuge headquarters to inspect the operation of the wind generator. Upon examination, it was determined that the generator was wired improperly (by Enertech). NEA rewired the system at no charge and the system is now generating electricity at maximum potential (4.5 KW).



The 4 KW Enertech wind generator is again producing electricity for use at the refuge headquarters.83-22 JS

J. OTHER ITEMS

1. Cooperative Programs

Cooperative efforts like sharing air support, joint wildlife surveys, attendance at public meetings and coordinated law enforcement are carried out with the ADF&G and NPS.

A computer operated by the Geophysical Institute of the University of Alaska monitors seismographic activity from our field office.

The Bible Camp located on the east shore of Becharof Lake is a refuge-authorized venture that takes place during the summer.

In the summer, an Amoco Corporation geologist was issued a special use permit to collect a seep sample from Oil Creek on the refuge's Pacific side.

2. Items of Interest

February:	RM Taylor gave presentation to the Bristol Bay High School on FWS career opportunities.
April:	RM Taylor and NPS Supt. Morris gave presentation at the Bristol Bay High School on educational and experience requirements for various federal resource management positions.
May:	ARM Arment gave a wildlife presentation to 12 children of the Levelock School.
October:	A 30 year old Ft. Richardson man plunged into the Egegik River in a Cessna 206 during the caribou season and drowned.
November:	Wilk presented a wildlife ecology and survey methods presentation to the Bristol Bay School sophmore class. Also shown was the movie, "Chain of LIfe".
November:	Retiring Regional Director Schriener and newly appointed Regional Director Bob Putz visited the refuge to examine the facilities and have an informal staff meeting - a sort of "hail" and "farewell" gathering.

3. Credits

Arment	sections B, C, D, F
Berns	sections A, G
Solberg	sections E, I
Taylor	sections K, editing
Wilk	sections H, J, photo organization

K. FEEDBACK

We have to stop the turnover of clerical positions within the FWS. This refuge alone has had four refuge assistants in the past two years. Other Region 7 refuges and the Regional Office also have a high turnover of these positions. After working in three regions, I realize the magnitude of the problem is most often related to the availability and salaries of like jobs within the area. If there are several higher paying positions in the area, you can bet we aren't going to keep a good clerk around long.

The solution is simple - make these positions Wage Grade. That way we could compete locally with other jobs based on the local wage rate. The savings in time spent training new employees and improved efficiency of having an employee who has been around a while will more than compensate for any additional costs for salaries.

Think about it!



Sunset at Refuge Headquarters. 83-23 JT