

REVIEW AND APPROVALS

SELAWIK NATIONAL WILDLIFE REFUGE

Kotzebue, Alaska

Annual Narrative Report

Calendar Year 1991

Michael B. Peard 4/30/92
Refuge Manager Date

Gye M. Anderson 12/17/93
Associate Manager Date

Rowan W. Gould 3/23/93
Regional Office Approval Date



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INTRODUCTION

The Selawik National Wildlife Refuge boundary encompasses 3.1 million acres in northwest Alaska on the coast of the Chukchi Sea. The refuge was established by the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) which withdrew 2.15 million acres of land from the public domain. The remaining lands within the refuge boundary have been selected by Alaska Native corporations and are in the process of being conveyed to private ownership by the Bureau of Land Management (BLM). In the interim, these lands are managed by the refuge in cooperation with the Native corporations.

The purposes for which the refuge was established include conservation of fish and wildlife populations and their habitats, specifically including caribou, waterfowl, shorebirds and other migratory birds, salmon and sheefish; the opportunity for continued subsistence uses by local residents; ensuring water quality and necessary water quantity within the refuge; and allowing continued reindeer grazing in the southwest part of the refuge. There currently is no reindeer grazing on the refuge but local residents use the refuge year around extensively for hunting, fishing, firewood and house log cutting, and berry picking and gathering greens.

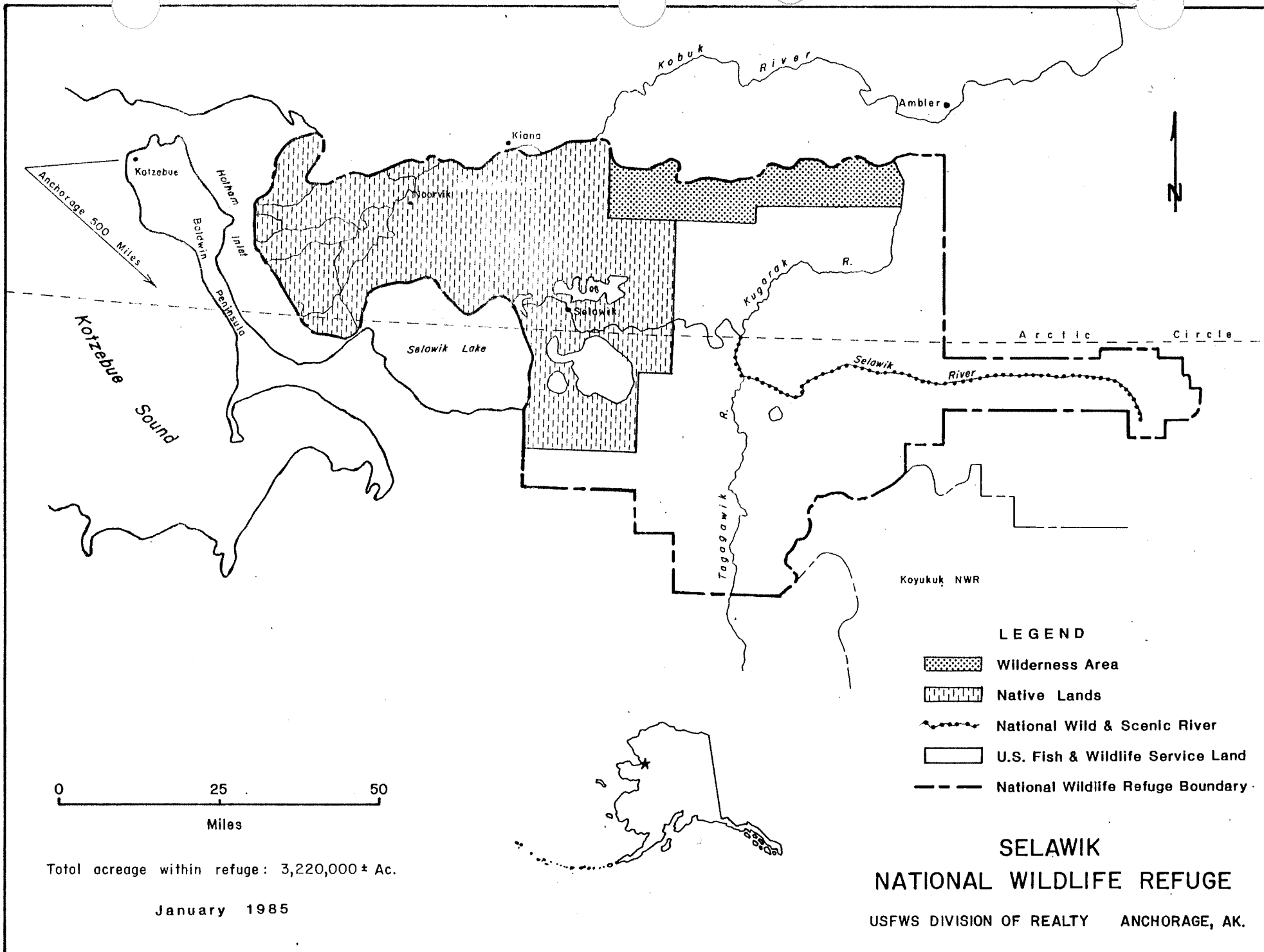
The refuge habitat includes extensive tundra, foothill spruce forests and large river deltas. The northern boundary follows the divide of the east-west oriented Waring Mountains. Here it shares a common boundary with the Kobuk Valley National Park. The Waring Mountains contain the 240,000 acre Selawik Wilderness. The southern boundary is formed by the Selawik Hills and the Purcell Mountains. For a while this boundary follows the Continental Divide and shares a common boundary with the Koyukuk National Wildlife Refuge. Between these mountain boundaries lies the long, broad westward flowing Selawik River valley. The Selawik River flows into Selawik Lake, which is actually a slightly brackish estuary. The larger Kobuk River delta is the western edge of the refuge. The Selawik River valley and the river deltas contain most of the refuge's 22,000 lakes and wetlands.

Two Inupiaq Eskimo villages, Selawik and Noorvik, are within the refuge boundary. Four other Inupiaq villages, Kiana, Ambler, Shungnak and Kobuk, and the City of Kotzebue, are located within 25 miles of the refuge. Approximately 2500 people live in the six villages and 3600 live in Kotzebue. Many of the people of these villages, and from the more distant villages of Deering, Buckland, Shishmaref, and the interior Athabascan Indian village of Huslia, have traditionally used refuge resources for their subsistence lifestyle. The refuge is neither fenced nor are the boundaries marked. Subsistence use by local residents is more encouraged than constrained by refuge management.

Transportation methods in this region include aircraft, boats, all-terrain vehicles and snowmachines. Dog teams are still used a little for transportation but mostly for racing. There are short gravel roads within most of the villages but there are no roads between any villages and there are none to, on, or near refuge lands. Established winter trails between villages are extensively used during the winter months. All villages have gravel runways and daily commercial air service, weather permitting. During the short summer, boats are the most commonly used form of transportation between villages and to subsistence camps. The refuge owns and the staff uses extensively all of the vehicles mentioned above.

The refuge is bisected by the Arctic Circle and lies mostly within the Northwest Arctic Borough, which is analogous to a Lower 48 county but is the size of the State of Indiana. The Selawik River and Refuge take their name from the Inupiaq word "siilivik," which means "place of" (vik) "sheefish" (sii). The sheefish is a member of the whitefish family and attains weights up to 60 lbs on the refuge. It is eagerly sought after as a subsistence food and for sport-fishing.

The Refuge address is: Selawik National Wildlife Refuge
PO Box 270
Kotzebue, AK 99752
(907) 442-3799



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A. HIGHLIGHTS

Refuge staff nearly reaches full force in 1991 (Section E.1).

The winter of 1990-1991 had record snowfall and was associated to a winter die-off of moose (Section G.8).

The refuge was involved in the process of taking responsibility for subsistence management on federal lands (Section H.8).

Materials were purchased for rehabilitation of a new office building. Construction is planned for the summer of 1992 (Section I.2).



Strong prevailing east winds pile the snow deep in Kotzebue. Average annual snowfall is approx. 22" and total precipitation is equal to 8" of water. (FWS)

B. CLIMATIC CONDITIONS

Weather for the Selawik National Wildlife Refuge is obtained from the National Weather Service in Kotzebue. Kotzebue weather is typical of the arctic coast, characterized by wind. Much of the

refuge is typical of subarctic interior Alaska, complete with hot summer days.



Strong high altitude winds cause lenticular clouds over the Igichuk Mtns. north of Kotzebue. (FWS)



The snow lies deep in sheltered areas of the refuge - most of the refuge is sculpted and scoured by persistent winter winds. (FWS)

Breakup occurred on the Selawik river, on May 15, 1991 at Upingivik, our field camp about 80 miles east of Kotzebue, and on May 23 in the village of Selawik. In Kotzebue, the ice began to move on May 25 (in the Noatak river channel). At the end of May ice from Hotham Inlet was running.

Freeze-up occurred in early October.

Table 1. Monthly weather data for Kotzebue, 1991. Data from National Weather Service office in Kotzebue.

MONTH	TEMP MIN	DATE	DEG F MAX	DATE	WIND MAX	DATE	TOTAL PRECIP.
JANUARY	-45	15,16	34	24,25	49	02	1.01"*
FEBRUARY	-49	06	29	24	56	28	6.20"*
MARCH	-36	16	26	24,25	53	17	13.4"*
APRIL	-23	09	41	16	35	12	6.90"*
MAY	16	01	47	09	39	08	0.64"
JUNE	31	11	85	22	29	22	0.12"
JULY	40	20	73	09	30	28	1.99"
AUGUST	39	08,26	68	03	32	24	1.95"
SEPTEMBER	33	09	68	03	37	09	1.07"
OCTOBER	16	17	48	01	48	12	4.30"*
NOVEMBER	-12	22,23	32	05	54	28	1.22"*
DECEMBER	-26	30	19	27	49	02	4.40"*
EXTREME	-49		85		56	TOTAL	43.2"*

* Includes snowfall.

C. LAND ACQUISITION

1. Fee Title

The NANA Regional Corporation (NANA) is the major Alaska Native corporation which has selected lands within the refuge boundary in accordance with the provisions of the Alaska Native Claims Settlement Act of 1971 (ANCSA). The Kikiktagruk Inupiat Corporation (KIC, the village corporation of the City of Kotzebue) and Doyon, Inc. have also selected lands within the refuge boundary. ANCSA allowed Native corporations to over select their entitled acreage by 20 percent to identify adequate lands for final selection. At NANA's request no lands have been conveyed since 1988 so the current tally remains at 360,000 acres conveyed and 734,800 acres selected but not conveyed within the refuge boundary.

Since statewide about 80 per cent of Native lands have been conveyed, the regional refuge policy on management of selected but not conveyed lands changed during 1990 to the following: As before, they are managed as refuge lands. If any party requests a special use permit to use selected lands in a manner compatible with the purposes for which the refuge was established and in accordance with existing regional policies, the selecting Native corporation is notified and their comments requested. The manager waits thirty days and issues or denies a permit in accordance with applicable policies. The manager may or may not follow recommendations of the Native corporation.

3. Other

The Service is still on hold for purchasing Jerry Olive's house in Selawik. At year's end questions remain unanswered about Olive's quit claim deed to City land. The property is being considered for replacement of the leased trailer (ex-jail) we maintain in Selawik for a bunkhouse/office.

D. PLANNING

1. Master Plan

The Selawik NWR Comprehensive Conservation Plan was completed in 1987.

2. Management Plans

The second draft of the Selawik NWR Fisheries Management Plan was provided to the Alaska Department of Fish and Game for review and comment by the Regional Office, Fish and Wildlife Enhancement in 1990, but no action was taken by either refuge staff or Fairbanks Fishery Assistance. The public review copy, originally due out in late Spring, 1990 still has not been dispersed for comment.

3. Public Participation

Refuge staff presented or participated in several public meetings in Kotzebue and most villages in the region discussing the Service's subsistence waterfowl closed season enforcement policy and the federal takeover of management of subsistence hunting on federal public lands.

5. Research and Investigations

Three research projects were conducted on the refuge during 1991:
1) "Demography and Movement of Wolves in relation to Western Arctic

Caribou Herd in Northwest Alaska" (conducted by ADFG, NPS, with USFWS personnel assistance), 2) "Northern pintail and other waterfowl production as related to wetland bathymetry of tundra habitat at Selawik NWR" (conducted by refuge staff), and 3) "The effects of wildfire on wintering caribou on Selawik National Wildlife Refuge" (conducted by a Co-op student from UAF).

"Demography and Movement of Wolves in Relation to Western Arctic Caribou Herd in Northwestern Alaska":

Principle Investigator: Warren Ballard, National Park Service, Anchorage, AK.

The project objectives were to determine the status of the wolf population, test the feasibility of different survey techniques, and examine ecological relationships between wolves, caribou, and moose during the winter months.

This project was funded by the National Park Service, The Alaska Department of Fish & Game, and The U.S. Fish & Wildlife Service.

The project was finalized in 1991. Between April, 1989 and April, 1991, a total of 48 wolves had been captured and radio collared within 13 packs. Three weeks of daily monitoring to document prey type and predation rates for four packs was completed in April, 1990. A census of the Kobuk Valley portion of the study area was conducted which tested a new methodology. Complete coverage of the study area was not possible due to snow conditions in 1990 and 1991. An outbreak of rabies was documented in five of thirteen packs.

Sex ratios of pups was skewed in favor of females while other ages were not different from 50:50. Territory size of four packs ranged from 950 km² to 2,358 km². During the first year of the study packs maintained year-around territories. During the second year of the study at least two of the six packs migrated 170-230 kms south. Caribou and moose were the major prey species. When caribou were present within pack areas they were the primary species killed. When few were present moose were the primary species at kill sites. Wolf densities ranged from 2.71/1,000 km² in the spring of 1987 to a high of 6.3/1,000 km² during the autumn of 1988. Dispersal of young males has been documented to have occurred between the Noatak and Selawik drainages.

During the spring of 1990, two collared wolves were found dead, and their carcasses retrieved. The carcasses were tested for rabies and the results were positive. Three other wolves died before summer, from suspected rabies. This lead to another investigation:

"The occurrence of Rabies in Northwest Alaskan Wolf Population":

Principle Investigator: Warren Ballard, National Park Service, Anchorage, AK.

The project was initiated in January, of 1991 and is to be finalized in 1992.

The project objectives are to determine the survival rates of radio-collared wolves during a rabies epizootic, and to monitor the spread and status of rabies in the wolf population.

The project was funded by the National Park Service, the Alaska Department of Fish & Game, and the U.S. Fish & Wildlife Service.

In April, 1991, an additional 11 collars were added to packs known or suspected of having rabies outbreaks. Serum samples were collected and submitted for testing. Packs were relocated an average of eight times each. During the year 1990-'91 field season four additional carcasses were collected and tested for rabies.

From the beginning of the study, five laboratory confirmed and seven probable cases of rabies occurred in radio-collared wolves in four of the eleven study packs. Monitoring of the movements of eleven packs revealed various patterns of range use. Long range dispersal by young males was documented as well as overlapping use of range by established packs. Two cases of starvation were documented. A major cause of mortality was human harvest.

A final report still remains to be written. The expected completion date is October, 1992. The above information is still considered preliminary, and in no way may be used for publication, or citation without the prior written consent of the principle investigator.

Two immediate publications are now in preparation: 1. "Use of Line-intercept Transects for Censusing Wolves"; and 2. "Accuracy, Precision, and Performance of Satellite Transmitters for Wolves".

"Northern pintail and other waterfowl production as related to wetland bathymetry of tundra habitat at Selawik NWR":

Principle Investigator: Rachel Brubaker, U.S. Fish & Wildlife Service, Selawik NWR, Kotzebue, AK.

The primary objective of this study was to establish a correlation between a habitat variable that can be remotely sensed and duck production, especially for pintail.

This study was conducted in a portion of the Kotzebue Sound waterfowl production area, in Northwest Alaska. The production area is characterized by arctic tundra interspersed with numerous thermokarst lakes with strands of trees along rivers and on south-facing slopes. Permafrost is about 95% continuous. Approximately 2 million acres of the Selawik NWR is considered waterfowl production area.

The main results of the study are summarized below. A complete report is currently in preparation.

- All dabbling species (including pintails) showed a preference for shallow (less than two foot deep) water and avoided deep (depths greater than four feet) water.
- The predominant diver species on the refuge is scaup sp. Scaup showed a weaker preference for shallow water, and showed an avoidance of depths over eight feet.
- Sea duck species showed no preference based on water depth.
- Bathymetry and ice-melt patterns in the spring were related. Ice melt patterns were photographed on 24 randomly selected one mile square plots. The area of ice-free water during ice-melt was positively correlated with waterfowl use throughout the season for dabblers and divers, but not for sea ducks.
- Use of a ratio estimator with area of ice-free water resulted in an improvement in the bound error estimates for waterfowl production surveys, as compared to using total land area, total water area, wetland count, or shoreline length as the extrapolation factors.
- The lakes on the refuge are much deeper than previously expected. Much of the water on the refuge is deeper than can be effectively utilized by ducks.
- Possibilities of remote sensing were explored, but cloud cover prevented testing of the feasibility in 1991.

"The effects of wildfire on wintering caribou on Selawik National Wildlife Refuge":

Investigator: Lisa Saperstein, Alaska Cooperative Fish & Wildlife Research Unit, student, University of Alaska-Fairbanks.

The objective of this study is to determine caribou feeding patterns in burned versus, unburned habitat by assessing snow and vegetation characteristics in craters and adjacent undisturbed sites.

Funding for this project is provided by the U.S. Fish & Wildlife Service, the Alaska Department of Fish & Game, and the National Parks Service.

In June and July of 1988, the Waring Mountains fire burned approximately 84,615 hectares of the Selawik NWR. The burned area lies in a portion of the refuge which is used as a migratory route by portions of the Western Arctic Caribou Herd (WACH). There has been concern over the potential impact the fire may have on caribou use. There is uncertainty over how fire effects caribou. Some researchers claim that fire in wintering areas is detrimental to caribou because it destroys lichen. Others claim that caribou can survive without lichens, and fire may be an important factor in the regeneration of old growth lichen stands that may stagnate if left undisturbed.

Winter sampling was conducted between 8 April - 5 March, 1991. Sixteen plots were established in each of the burned and unburned habitats. Snow depth and hardness measurements were recorded for each plot. Four transects, approximately 60 km each, were flown and caribou feeding areas were counted. The summer field effort was conducted during the month of June, 1991. During this period vegetation work was performed on plots within the study area.

Preliminary data analysis supports the hypothesis that caribou tend to crater in shallow snow, and they appear able to distinguish differences in depth on a relatively small scale. In addition, lichen were found more frequently in unburned plots and in cratered quadrants, which supports a previous hypothesis that fire on caribou winter range may be detrimental.

The complete progress report by graduate student Lisa Saperstein is available from the refuge, or from the UAF coop unit.

6. Other

Volunteers Beringer and Ferraro spent most of February and March interviewing local residents and leaders as part of their thesis research which is an effort at defining and developing an environmental education plan for the Selawik NWR. They also traveled to Selawik to talk to teachers and residents there.

E. ADMINISTRATION

1. Personnel

This was a year of major personnel changes for the Selawik NWR. Refuge manager Jerry Stroebele accepted a job as Deputy Associate Manager in the Anchorage regional office just prior to the beginning of the year. His position was eventually filled in July

by Mike Rearden who transferred from the Yukon Delta NWR. The assistant (refuge operation specialist) position had been vacant since February, 1990 when Mike Spindler transferred to Koyukuk/Nowitna NWR and was filled in September, 1991 when Mark Koepsel transferred from Matagorda Is. NWR. Rachel Brubaker, Biologist transferred to Kanuti NWR in November and her husband, Dennis Witmer, Refuge Information Technician, resigned and also moved to Fairbanks. Eugene Peltola, Jr. filled the Biologist position in November after transferring from the Yukon Delta NWR. Biological Technician, (Selawik NWR) Bonnie Shaw applied for and got the Secretary job at the refuge, then resigned in December, 1991. At year's end there was no replacement for the secretary. In May, 1991 maintenance man Bob Hommon, hired by the Park Service and shared with the refuge was terminated. In September, the refuge hired local hire maintenance worker William Johnson. In June, Tommy Ongtooguk, Biological Technician, who worked for us in the NPS/FWS/BLM visitor center resigned for health reasons. He was not replaced. In March, 1991 the Refuge Information Technician position at Selawik was filled with Grant Ballot.

During the period when there was no manager there were several acting managers from several different refuges in the state: Ed Merritt, Innoko NWR, Mike Rearden, Yukon Delta NWR, Phil Garrett, Arctic NWR and Mike Granger, Koyukuk/Nowitna NWR.

A former Service employee and local resident of Selawik, Lloyd Davis passed away on February 03, 1991 at the age of 70. Lloyd was a lifelong resident of the Selawik area and spent his childhood in the southeast section of what is now the Selawik NWR. During the 1950's Lloyd assisted Jim King and Pete Shephard with waterfowl surveys and banding in the Selawik area and other areas of the state. In 1988 he assisted the refuge staff with goose banding. Lloyd was very concerned about wildlife and supported many aspects of the Service's work.



L-R: Koepsel, Johnson, Rearden, Peltola, Karmun

1. Grant Ballot , Refuge Information Technician, GS-5, Intermittent, Term (4 year), EOD 03/04/91
2. Rachel A. Brubaker, Wildlife Biologist, GS-11, PFT EOD 5/26/87. Transferred to Kanuti NWR 11/04/91
3. Johnson, William, Maintenance Worker, WG-8, FT Term (1 year) EOD 9/09/91
4. Victor R. Karmun, Inupiaq Interpreter, GS-11, FT term (4 year). EOD 6/20/88.
5. Mark A. Koepsel, Refuge Operation Specialist, GS-07, PFT, EOD 09/22/91, transferred from Matagorda Island NWR.
6. Tommy M. Ongtooguk, Biological Technician, GS-5, temporary intermittent, EOD 7/27/87, resigned 06/16/91.
7. Eugene R. Peltola, Wildlife Biologist, GS-5, PFT, EOD 11/16/92 transferred from Yukon Delta NWR.
8. Michael B. Rearden, Refuge Manager, GS-12, PFT, EOD 07/22/91, transferred from Yukon Delta NWR.
9. Bonnie I. Shaw, Biological Technician, GS-5, TPT, EOD 09/10/89. Hired as PFT Secretary 06/16/91, resigned 12/20/91.
10. Dennis Witmer, Refuge Information Technician, GS-5, FT, EOD June 6, 1988, resigned 11/04/91.

2. Youth Programs

Due to the continued vacancy of the refuge manager and assistant manager positions the staff decided there was not sufficient supervisory capability to handle a youth program in 1991.

RM Rearden met with the Kotzebue High School Principal to discuss student involvement in the Resource Apprenticeship and Youth Conservation Corps. Programs during the summer of 1992.

4. Volunteer Programs

Volunteers Beth Beringer and Theresa Ferraro arrived on January 14, 1991 and left in mid-March. While here, they developed an environmental education plan for the refuge as part of their thesis research.

Volunteer Marcus Bradley helped the refuge prepare equipment and facilities for the advent of winter during the month of September. Earlier he had helped Lisa Saperstein with her research on caribou habitat (D.5).

Volunteer Susan Bucknell assisted graduate student Lisa Saperstein with field operations.

5. Funding

Table 2. Selawik NWR Funding, FY 85 through FY 91 (thousands).

Fiscal Year	Funding Source					Station Total
	1260	ARMM	1520/1210 1230	8610	1100	
85	226.0	109.0	2.4	9.6	0	346.4
86	233.6	66.4	3.1	6.9	0	310.0
87	305.5	50.0	1.5	10.0	17.0	384.0
88	442.0	0	0	12.0	18.0	472.0
89	540.0	0	0	13.0	0	553.0
90	540.0	0	16.0(1)	20.5	0	556.5
91	655.0	0	11.0(2)	15.0	0	681.0

(1) 1240 Fire funds to purchase Remote Area Weather Station

(2) Arctic nesting geese I&E

6. Safety

Interpreter (INT) Victor Karmun conducted gun safety classes at the Sivunniugvik youth camp during the weeks of July 15-20 and July 29-August 3, 1991. Chuck Hunt, Yukon Delta NWR, assisted with the second week of the program. A total of 92 kids attended the two sessions, ranging from ages 11-14. A case and one-half of shotgun shells, eight cases of clay birds, and two and one-half bricks of .22 shells were put to good use.

Victor also gave several one-hour courses in gun safety in local and village schools.

New heavy-duty sleeping bags were purchased and stowed in the refuge airplane to replace the old, light bags.

RIT Witmer and WB Brubaker attended Arctic Survival Training at Eilson AFB during late February. WB Brubaker put her training to the test in early March when she traveled from Fairbanks to Kotzebue via dog team.

Mike Vivion, Yukon Flats NWR came to Kotzebue on April 29, 1991 to present an aircraft safety course for federal employees. FWS and NPS employees attended.

On June 5, and 6, 1991 all refuge staff were certified, or recertified in First Aid and CPR.

On October 11-13 INT Victor Karmun took a Firearms Instructor Course given by the state Firearms Safety Coordinator in Anchorage and became a certified gun safety instructor. Our intent is to couple the gun safety course with discussions on hunting ethics and conservation.

7. Technical Assistance

During May, 1991 WB Brubaker and RIT Witmer assisted the National Park Service, Northwest Areas biologists in a grizzly bear collaring operation in the Noatak River drainage, in the vicinity of the Red Dog Mine site.

Later that month, Brubaker and Witmer also assisted NPS and ADFG biologists in a sheep survey in the Noatak River area.

Refuge staff spent several days during the month of June, 1991 assisting the Alaska Maritime refuge field crew prepare for the field season.

8. Other Items

The refuge issued 14 special use permits in 1991. Five were to air taxi operators: Ambler Air Service, Tundra Air Service, Northwest Aviation, K-2 Aviation, and Buck Maxon Air Service. Two were to game guides: Jake Jacobsen, and Nelson Walker. One permit was issued to an outfitter: Sourdough Outfitters. The Kotzebue Dog Musher's Association and the Kotzebue Lion's Club were issued permits to conduct races on refuge lands. One permit was issued to a Selawik resident for cutting house logs. A permit was issued to the city of Noorvik to extract 1,000 yards of gravel, via an ice road, from a site five miles southeast of the village. Knik Construction was issued a permit to dredge 200,000 yards of gravel from the mouth of the Selawik River to use on a new crosswind runway at Selawik. They found the channel to the village too shallow and planned on acquiring the gravel via an ice road northwest of the village of Selawik early in 1992. A permit was issued to the Alaska National Guard for exercises in September.

A five year permit was issued to the Upper Kobuk Elders Council to permit cabins and use at the Purcell Mt. hot springs.

Pacific walrus follow the ice floes and so generally get no closer than 30 miles from Kotzebue. Occasionally a young one swims right to town. Ocean currents deposit walrus carcasses on the beaches in town and south along the Baldwin Peninsula. Due to the cold water and long ice season, walrus carcasses last two or three years. There are only a few traditional walrus hunters in Kotzebue but many in the nearby villages of Wales, Shishmaref, Kivalina and Point Hope. Frequently, wounded walrus escape and die later, or sink after being shot. They also die of old age and by crushing and fighting. The dead ones with their ivory tusks intact are eagerly sought by airplane pilots and ATV riders who cruise the beaches after the fall storms looking for fresh carcasses. The Marine Mammal Act allows possession of beach found walrus ivory by non-Natives, but it must be registered within 30 days of being found. Native hunters must register their ivory and polar bear hides also.

In 1991 Interpreter Victor Karmun registered 5 pairs of tusks for Native hunters and none for non-Native beach found ivory. No polar bears were sealed in Kotzebue in 1991.

Cynthia Wentworth, MBM worked with the refuge staff and local government entities in February to establish a spring waterfowl harvest survey in this region. There was frequently concern raised that the data collected would be used for law enforcement, purposes but generally there was consensus that it would be acceptable to have a survey. It was felt though that the process had started too late for the 1991 spring waterfowl harvest and

eventually the idea was set aside for later consideration. No monies were obligated for the survey in the spring of 1992.

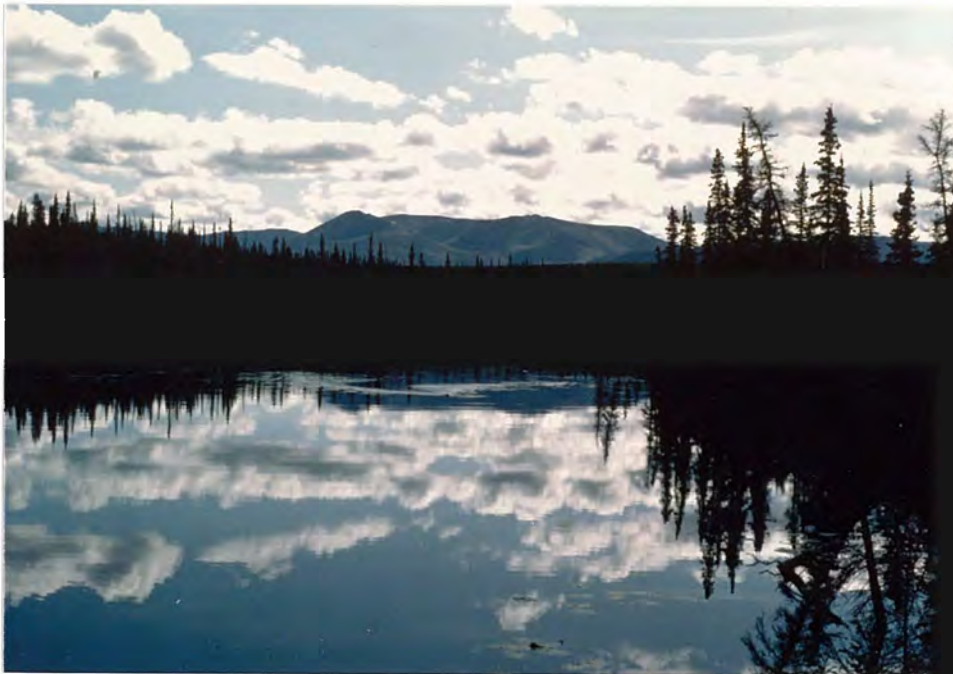
The refuge Annual Review was conducted October 24 and 25 by Associate Manager George Constantino. ARD John Rogers was scheduled to assist but had to cancel at the last minute. All in all it was a good review considering the newness of most of the staff.

F. HABITAT MANAGEMENT

1. General

The refuge contains a variety of habitats, including alpine tundra, subarctic tundra and taiga, extensive wetlands and lake complexes, meadows, mountains, glacial valleys, and sand and gravel beaches. There are no roads to speak of on the refuge.

The refuge received record snow fall this year, with snow conditions in northwest Alaska causing problems for wildlife and humans alike.



Placid water on the refuge reflect the Purcell mountains on the southeast edge of the refuge. (FWS)

With the exception of fire management, there are no active habitat management programs on the refuge.



Much of the refuge is waterfowl habitat.(FWS)

2. Wetlands

Habitat conditions for nesting waterfowl appeared to be more favorable this year as compared to 1990, with an early breakup and a mostly warm, dry summer. The Selawik River broke up on May 15-16 at Upingivik, and May 9th found the lower one-third of the refuge to be snow free.

3. Forest

Much of the refuge is forested. The type of cover varies from the boreal black spruce forest, which belts the Waring Mountains and Kiana Hills on the northern border, to the riparian corridors which consist of a mixture of hardwood and coniferous species. These corridors are characterized by white and black spruce, birch, aspen, and various willow species.



The headwaters of the Selawik River are bordered by boreal black spruce forest. (FWS)

4. Croplands

The Spud Farm was active again in 1991. The Spud Farm is a 20 acre farm located inside the refuge boundary, but on Native corporation lands. The farm is accessible during the summer by its own airstrip or by boat and ATV. Broccoli, cabbage, cauliflower and tomatoes were planted. The crops were planted late in the season. This coupled with marauding moose, lead to little produce making it to local markets.

9. Fire Management

Several wildfires occurred on the refuge during June, 1990. These fires started after snowmelt, but before full green-up. Only one of these fires was actively suppressed.

Smoke from major fires in other portions of the state and the refuge often obscured the skies of Northwest Alaska, at times limiting visibility to two miles, or less.

Table 3. Wildfires occurring on Selawik NWR in 1991.

BLM No.	Date	Location	Cause	Management Category	Size (Acres)
B215	06/06/91	Purcell Mtn.	Lightning	Limited	863
B213	06/06/91	Purcell Mtn.	Lightning	Limited	5337
B360	06/22/91	Kugurak R.	Lightning	Suppressed	100
B365	06/22/91	Selawik R.	Lightning	Limited	8
B366	06/22/91	Purcell Mtn.	Lightning	Limited	1
B367	06/22/91	Selawik R.	Lightning	Limited	220



There are days when we marvel that we get paid to work in this country (FWS)

G. WILDLIFE

1. Wildlife Diversity.

The major purpose of Selawik NWR, as set forth by congress, in ANILCA, is to conserve fish and wildlife populations in their natural diversity and to maintain the environment of the refuge in a condition that will perpetuate total fish and wildlife values.

As seen in Table 4, bird arrival dates in Kotzebue were early this year as compared with the last ten years.

3. Waterfowl

Historically, the Selawik River basin and Kobuk Delta areas of the Kotzebue Sound have been reported to support large waterfowl populations. The Selawik NWR was established in 1980, with one of the objectives being to preserve and manage waterfowl habitat in this wetlands area. 1991 appeared to be a good year for waterfowl production.

The first waterfowl broods were observed on June 23, when three canada goose broods were observed on the Selawik River.



Spring has sprung, the grass has riz,
here is where the geeses is... (FWS)

There are numerous waterfowl nest predators in Northwest Alaska, including jaegers, gulls, ravens, red foxes, black bears, mink, and weasels. Unfortunately, we have no quantitative estimates of any of these predator populations.

B. Geese

Two species of geese breed on the refuge: Greater white-fronted geese and lesser Canada geese (subsp. taverneri). Emperor geese are seen occasionally along the coast, with the nearest known nesting areas at Cape Espenberg on the Seward Peninsula. Black brant are a common spring migrant, and summer resident of coastal areas, while the nearest breeding colony is located at the mouth of the Nugnugaluktuk River, on the northern Seward Peninsula.

Table 4 First and average arrival dates for 12 common bird species at Kotzebue and a 10 mile radius, 1982-1991. All dates are in May except as noted.

Species	'82	'83	'84	'85	'86	'87	'88	'89	'90	'91	'82-'91 Avg.
Tundra swan	N/A	N/A	N/A	7	7	12	3	4*	14	2	7
W-F goose	10	8	16	17	2	8	5	30*	N/A	1	7
Canada goose	10	16	13	11	2	8	3	28*	6	1	7
Mallard	24	12*	23	17	9	15	29*	17	9	11	17
No. pintail	8	28*	23	16	2	9	29*	18	7	3	8
Am. wigeon	16	12	23	17	2	9	7	18	10	15	13
Gr. Scaup	24	10	23	19	18	13	5	21	17	11	16
Sandhill crane	6	3	13	10	1	3	29	6	4	4	8
R-N phalarope	19	14*	28	18	22*	16*	12*	24*	17	18	19*
Gl. gull	5	23*	7	8	30*	27*	24*	23*	5	1	29*
Am. robin	17	6	14	23	9	6	5	6	12	3	10
Lapland longspur	18	8	8	17	3	10	5	18	14	21	12

* Observation recorded in the month of April.

C. Ducks

Waterfowl brood survey:

This year, Selawik NWR continued participation in a standardized duck production survey, which covered most of the waterfowl habitat in Alaska.

During early spring, refuge staff conducted over-flights of brood survey plots to assess melt patterns and to plan summer schedules.

The brood survey was conducted between July 25th and July 30th. A total of 35 one square mile plots were surveyed by helicopter (Table 5). Only two of the 35 plots were ground truthed. Weather, man-power, and aircraft availability problems precluded any further effort.

Table 5. Waterfowl production estimates. The extrapolated number of young produced is based on refuge brood surveys on Selawik NWR, 1985-1991. (All estimates X 1000.) The 1985-88 average is based on a 60 random wetland survey, the 1989 survey is based on 23 plots selected based on a subset of the 60 wetlands, and the 1990 and 1991 surveys are based on a new random selection of one square mile plots.

Year:	85-88 avg	89	90	91	1991 % chg from 85-90 avg	1991 % chg from 85-90 avg
Survey method:	(single wetlands)	(23 plots)	(random plots)	(random plots)		
SPECIES						
Mallard	4.0	1.2	3.6	6.8	+94	+89
Am. wigeon	15.5	7.1	27.8	20.0	+24	-28
G-W teal	8.9	2.5	18.7	12.0	+26	-36
No. shoveler	7.2	0.2	10.0	2.5	-62	-75
No. pintail	13.5	2.0	10.1	28.2	+156	+179
Dabbler total	46.6	13.8	69.5	69.4	+54	< 1
Gr. scaup	12.8	3.9	20.6	39.1	+210	+90
Oldsquaw	11.4	0.3	5.3	7.0	-16	+32
Black scoter	3.7	1.6	4.2	8.3	+144	+97
Diver total	27.8	5.8	30.6	39.1	+59	+28
Canada goose	2.9	0.6	0.1	0.0	-100	-100
Tundra swan	1.6	0.7	0.4	0.9	-31	+125
Total Waterfowl	79.3	23.3	107.4	128.0	+71	+19

4. Marsh and Water Birds

The most common waterbirds on Selawik NWR are Pacific loons, red-necked grebes, and sandhill cranes. The 1991 breeding season was characterized by an apparent decrease in most species in both breeding population and production, as compared to the six year average (Table 6). However, this change may be due, either in whole or in part, to the change in survey method used during the last two brood surveys.

Table 6. The most common marsh and water birds at Selawik NWR: their breeding population and production estimates. (Estimates x 1000.)

	Breeders		Production	
	85-90 x	1991	85-90 x	1991
Pacific loon	4.3	5.6	.75	0.6
Red-necked grebe	9.8	15.1	2.6	1.7
Sandhill crane	2.1	1.7	0.2	0.1

5. SHOREBIRDS, GULLS, TERNS AND ALLIED SPECIES.

Many shorebirds, gulls and terns use the refuge throughout the summer. A complete list and the relative abundance of each species is included in the appended bird checklist.



The pigeon-like grace of an ivory gull is remarkable - they are uncommon migrants on the peripheral areas of the refuge. (FWS)

6. Raptors

Many raptors use the refuge as a migratory corridor during the spring and fall, while the gyrfalcon is a year around resident.

A goshawk has nested in a tree stand, two drainages down from the Upingivik field camp. They have fledged young in three of the last five years.

8. Game Mammals

A. Caribou

The Western Arctic Caribou Herd (WACH) is the largest caribou herd in Alaska, containing approximately 400,000 individuals, and is one of the largest in North America. Historically, the herd has calved north of the refuge on the western part of the North Slope, in the Utukok drainage, and wintered south of the Brooks Range, including some parts of the refuge, and south to the Seward Peninsula. Wintering distribution and migration routes are characteristically highly variable; primary use of the refuge occurs during migration, and in some years a substantial portion of the herd winters on the refuge.



The 400,000 strong Western Arctic Caribou Herd utilizes the refuge as a migratory corridor and wintering range.(FWS)

ADFG is responsible for management and monitoring of the herd, but because of the enormous size of the range, they rely on assistance from federal agencies including the Service, the National Park Service and the Bureau of Land Management. Monitoring the herd consists of a biennial photo census, annual cow/calf ratio surveys, and aerial radio-telemetry (distribution) surveys.

The State conducted the short yearling (calves born the previous spring) survey during May, 1991. This survey indicated that the recruitment rate was 19 short yearlings:100 adults. This was within the range of recruitment during recent years. Since 1986, recruitment has ranged from 19-27 short yearlings:100 adults.

Heavy snow cover in northwest Alaska during the winter of 1990 and spring of 1991, resulted in the WACH moving south further than they have in over 50 years. Very few caribou wintered on the refuge, as compared to previous years. The first major wave of caribou moving northward occurred in late February. Selawik residents reported large herds, just east of the village.

The spring northward movement continued across the refuge until late May, or early June, with the majority of the animals continuing to use a route near the village of Selawik. During, mid-May, some moderately large groups migrated past the field station at Upingivik, but few animals were observed east of that point. The upriver villages of Ambler, Shungnak, and Kobuk saw few caribou this spring, so these village residents traveled onto the refuge to harvest their caribou.

By the end of August, the WACH had started moving south and animals were showing up on the refuge.

By the month of September, several thousand caribou were utilizing a crossing on the Kobuk River, near the village of Kiana.

During the winter of 1990-91, caribou continued to utilize the refuge for wintering habitat. The main aggregate areas on the refuge were centered around the village of Selawik, the Selawik Hills, the Waring Mountains, the Purcell Mountains, and the upper Kobuk and Selawik River drainages. With about 3/4 of the herd over-wintering midway between Buckland and Koyuk in the Buckland River valley, with some of the herd to the south.

B. Moose

About 2000 moose inhabit the refuge, based on a refuge-wide census conducted in 1984 and 1985. Moose are used by both local subsistence hunters and non-local sports hunters.

In the recent past, two annual trend count areas have been used to monitor survival and mortality including the effects of hunting. In addition, aerial trend counts have been conducted by USFWS in a 91 mi² area near the Tagagawik river since 1984; in an adjacent 103 mi² area of the Selawik Hills managed by the BLM. ADFG has conducted trend surveys since 1986. Results of the pooled Tagagawik River and Selawik Hills trend count areas have been discontinued. It is felt that as delineated, the trend count areas are too small and are more indicative of snow-induced movements, rather than reflecting actual changes in the population. Thus making interpretation of the data unacceptable for use in management decisions.



A fine example of one of the approx. 2,000 moose which inhabit the refuge. (FWS)

ADFG biologist conducted a moose survey on the Tagagawik River, during the month of April, 1991. There were 30 calves/100 adults (15-35 calves/adult has been the norm), 3 carcasses (2-4 is the norm), and moose in this area appeared healthier than those in the rest of the NW Alaska. This corresponds well with anecdotal observations provided by Selawik residents.

During the winter of 1990 and the spring of 1991, moose in NW Alaska experience severe winter kill. This mortality was attributed to severe snow depth, and increased predation. The deep snow made movement difficult, forage was not as available,

thus making movement not cost-effective. Wolves targeted moose as a prey species, due to the majority of the Western Arctic Caribou Herd wintering further south than it normally does.



Grizzly bears, although not abundant on the refuge, are considered common. Local residents often hunt grizzlies for food.
(FWS)

9. Marine Mammals

Spotted seals and beluga whales are sometimes seen using refuge rivers; beluga whale, and spotted, bearded, ringed, and occasionally ribbon seals occur in the marine waters of Hotham Inlet, which forms the western boundary of the refuge.

During March, 1991, research biologist Gerald Garner and his crew worked out of Kotzebue monitoring polar bears, as a part of a continuing project.

10. Other Resident Wildlife

A. Furbearers

Furbearers present on the refuge include red fox, arctic fox, wolverine, wolf, beaver, muskrat, lynx, mink, marten, least weasel, short-tailed weasel, and river otter. Although not classified as furbearers, arctic ground and red squirrels are also present on the refuge.

B. Red Fox

Although we have no quantitative means to monitor red fox populations, all anecdotal evidence points to an increase in numbers of fox this year, compared to previous years accounts.



Willow ptarmigan, one of the few avian species which are year-around residents of the refuge. (FWS)

C. Otter

The winter of 1991 has lead to many more reports of otter than any previous year. Local residents from Selawik, Kotzebue, and Kiana substantiate these reports.

11. Fisheries Resources

The refuge's many lakes and rivers support both anadromous and freshwater fisheries, and include spawning grounds for sheefish, northern pike, whitefish, and grayling. Arctic char and chum salmon are also present. Herring spawn in the coastal waters of Kotzebue Sound and Hotham Inlet, which are adjacent to the refuge.

Concern for the local sheefish population remains an issue at the refuge. During the winter and spring, NW Alaska residents utilize this species of fish as a subsistence food source. The population is also exploited as a commercial product. There is presently a 25,000 lbs. limit on this commercial fishery. The subsistence fishery far exceeds this limit. Although, it is felt that current subsistence harvest does not exceed the historical level of harvest.



The Selawik River valley looking south.
(FWS)

16. Marking and Banding

In 1991 the Selawik NWR staff participated in the region-wide effort to band and collar greater white-fronted geese. Dave Rue, from Ambler Air Service, assisted the refuge staff in the effort. This year the refuge banded geese with only limited success. Poor weather conditions and an inability to locate large flocks of molting geese hampered our efforts.

A total of 24 greater white-fronted geese were banded in two successful drives (17 were neck collared). The total effort required one day, using two airplanes and a crew of five people.

Band returns from Greater white-fronted geese banded in 1988, 1989 and 1990 have come from SE Alberta, SW Saskatchewan, and from the Gulf Coast of eastern Texas and western Louisiana. While, 1991 returns have come from Alaska, SE Alberta and northern Mexico.

Two tons of barley, a rocket net, and welded wire was purchased in preparation of duck banding in 1992. All of this was stored in the Selawik bunkhouse.



Labrador tea leaves are often used by local residents to make a pungent tea (FWS)

H. PUBLIC USE

1. General

Selawik NWR is used primarily by local residents for subsistence activities. Hunting, fishing, berry picking, greens gathering, and firewood cutting occur on refuge lands year round. Non-resident sport hunters are the primary non-local users of the refuge.

2. Outdoor Classroom--Students

The refuge staff worked cooperatively on a challenge grant proposal with Maniilaq Association to provide for environmental education at Suvinnigvik, a local summer camp where youngsters are taught Inupiaq values. It was agreed that a meld of scientific principles and traditional values could be beneficial for students learning land management and use responsibilities. At year's end we had not yet been informed as to the status of the grant monies.

7. Other Interpretive Programs

Interpreter Karmun and Interpreter Hunt (Yukon Delta NWR) participated in a firearms training class for youths at Sivunniugvik this year. The participants were allowed to handle and fire a variety of firearms, including shotguns, .22 caliber rifles with different actions, and a 7mm08 center fire rifle (most didn't care for the recoil). This training class is very popular with the kids, and generates some good PR for the Service.

Interpreter Karmun also gave several presentations to local schools and groups in the area on gun safety.

A steel shot seminar scheduled for June 7-8 had to be canceled due to lack of local interest and problems with access to the shooting range due to large snow drifts.

8. Hunting

In 1991 we saw a continuation of the process of change as the federal takeover of subsistence management on federal lands became organized. This transition was smooth, as the regulations adopted by the Federal Government initially were the same as those in place as state subsistence regulations, except for retaining the rural preference overturned by the Alaska State Supreme Court.

A meeting was held by Subsistence staff members Bill Knauer, Steve Kovach and Steve Zemke on November 13, to solicit public opinion and testimony on the EIS for Subsistence Hunting on

Federal Lands. The meeting was well attended and considerable input was received from local subsistence users on management recommendations. There were major concerns with the lack of time to review and make comments, the seasons didn't match use, regulations were considered complicated and enforcement too arbitrary. KOTZ, the local radio station broadcast the meeting. The majority of hunting by people from out of the region is on the Tagagawik River, which flows north into the Selawik River. Anecdotal reports indicate that use is increasing in this area, and is most likely the spillover from areas to the east that have become very popular and therefore crowded. This information has spawned interest by the refuge staff to attempt to quantify the use to determine if there is potential for overharvest or conflict with subsistence uses. Local residents are concerned that the sport take is in conflict with subsistence needs.

9. Fishing

There is currently little sport fishing and much subsistence fishing in refuge waters. Most of the "hooking" is through the ice. This year, a pike fishing derby sponsored by the AC Company in the summer created a surge in interest in sport fishing, and many local people traveled to favorite fishing holes to try to catch a big one.

10. Trapping

Trapping is a historic and present facet of the subsistence economy of the region. Many of the furbearers harvested in northwest Alaska are used locally for clothing and many of the animals harvested are not reported to ADF&G. Wolves and wolverine are the most sought after furbearers and most are used domestically for ruffs on parkas. Lesser numbers of fox, beaver, otter, mink, and other furbearers are taken.

11. Wildlife Observation

We are a bit off of the beaten path here and there are no organized wildlife tours on the refuge. Local residents and refuge staff observe wildlife from casually to zealously during pursuit of other activities. The local Christmas Bird Count occurs off of refuge land for reasons of shelter, access, weather and hospitality.

13. Camping

Camping is allowed anywhere on refuge lands and occurs regularly by subsistence users of the refuge. The extremely remote Selawik Hot Springs enjoys crowds (50 people at a time) of campers during the prime winter traveling months of March and April. Dog mushers traversing the refuge are probably the next most common campers. Because of the very remote nature of the refuge most

non-local hunters from out of the region camp here for a week while hunting.

The Selawik Hot springs are located near the eastern-most extreme of the refuge. These Hot Springs have been used for thousands of years by residents of northwest Alaska, and continue to attract the most heavy public use of any part of the refuge. Two cabins and a bathhouse were built at the springs by special use permits in 1986. Responsibility for the hot springs is shared by the refuge and the villages of Shungnak and Huslia.

Because of the heavy public use, several problems have developed at the hot springs. Wood stoves are used for heating and cooking in each of the three cabins, and heavy cutting of firewood is occurring close to the hot springs. Trash has been accumulating at the site for years, hidden by snow in the winter, but visits during the summer reveal heaps of trash. Also, toilet facilities are inadequate to handle the heavy traffic.

We are working on developing a safe, efficient toilet facility for the area and have met with several members of the Upper Kobuk Elders Council to discuss how to alleviate the trash problem.

15. Off-Road Vehicle Use

We are not aware of any specific use of refuge lands by all terrain vehicles (ATV's) during summer months, however, these machines are becoming very popular in villages and we intend to begin educational activities aimed at responsible use of these potentially destructive machines to head off a law enforcement issue.

Snowmachine use during the winter months is very common.

By special use permit again in 1991, the Archie Ferguson/Willie Goodwin Memorial Snowmachine Race was held in April. The 220 mile route follows intervillage trails from Kotzebue to Noorvik to Kiana to Selawik, back through Noorvik and return to Kotzebue. The winner made it in less than three hours. The local radio warns everyone else to stay off the trails, for good reason. About 20 miles of the route crosses refuge lands.

16. Other Non-Wildlife Oriented Recreation

The Kobuk 440 Sled Dog Race was held in late March under special use permit. The route is Kotzebue-Noorvik-Kiana-Ambler-Selawik-Noorvik-Kotzebue. Three quarters of the route is within the refuge boundary and about 80 miles of the route cross refuge lands.

17. Law Enforcement

There were no staff members with law enforcement authority for the majority of the year. There was no enforcement activity by refuge staff in 1991. The local Fish and Wildlife Protection Officer (state) was very active in adjacent park land as well as the refuge.

A letter was sent to the commanding officer of the National Guard in Kotzebue explaining the provisions of the Marine Mammal Act. After Acting refuge manager Rearden received a report of some non-Native employees hunting seals off of Kotzebue.

Agent Kim Speckman investigated allegations that Soviets visiting Kotzebue in July had illegally smuggled ivory carvings into Kotzebue and then sold them (see J.3).

18. Cooperative Associations

The National Park Service Visitor Center operates an Alaska Natural History Association sales outlet at their Visitor Center and carries items which we recommend. BT Tommy Ongtooguk was the accountant for the sales program until his resignation.

Interpreter Karmun and RIT Witmer worked shifts in the visitor center with the NPS personnel, meeting the public. Nearly 8,000 visitors passed through Kotzebue in 1991 and most of them stopped by the visitor center. The attraction for the mostly elderly tourists is being north of the Arctic circle and seeing the "midnight" sun. With daylight savings time and recent changes in time zones, solar midnight is actually at 3 a.m.

The refuge cooperates as a member of the NANA Regional Search and Rescue (SAR) Organization. This is an umbrella organization which coordinates village SAR teams. The program receives state funds from the Department of Public Safety for actual searches, and also receives grants directly from the state legislature. Interpreter Karmun and/or Manager Rearden attend all organizational meetings and occasionally participate in searches when the refuge aircraft is available and there is a need.

In September, RM Rearden participated in a search for an elderly man that wandered from a caribou hunting camp. He was eventually found dead after a massive search involving over 200 local people, several airplanes and a helicopter.

I. EQUIPMENT AND FACILITIES

1. New Construction

There was no new construction in 1990.

In December of 1990 the refuge staff was notified that Congress had appropriated \$1,635,000 to the Service for construction of an aircraft hangar at Kotzebue. The hangar will be constructed and operated by the Service and shared with the National Park Service and Bureau of Land Management. Construction of the hangar will begin in the summer of 1992 at the existing Service lease at the Kotzebue Noel Wein Memorial Airport.

2. Rehabilitation

Materials were purchased for the rehabilitation of the joint use facility that was purchased in 1987. The original intent was for the Park Service to acquire money to convert the old hardware store into an office for the NPS, FWS and BLM. The money was never appropriated and the present refuge office is very small and difficult for the public to find. A construction crew, financed by monies still held by the BLM, will begin construction on a portion of the building in the spring of 1992 and the refuge staff plans on moving in prior to the summer of 1992.

3. Major Maintenance

A broken waterline in residence 482 completely soaked the insulation in the floor of the house. Maintenance worker Johnson and volunteer Bradley replaced all of the water-soaked fiberglass insulation and plywood prior to freezeup.

The Arctic piping, a foam insulated culvert-like aluminum pipe, with the water and sewer line for residence 482 froze in March and was not thawed. This required that the entire pipe and the enclosed water and sewer line be replaced in September. Some \$20,000 dollars later the job was complete.

The boiler in ill-fated residence 482 was replaced in September when it was found that a freeze-up in the previous winter had cracked it.

Two Monitor oil heaters were installed in the two refuge residences in November with MMS funds. The heaters were taken from two trailers that we have listed for survey. These heaters should keep the houses warm enough to eliminate water pipe damage if the boiler quits in cold weather.

The field camp at Upingivik on the Selawik River was prepared for a move. The glu-lam foundation was bolstered for towing. The cabin is immediately adjacent to a Native allotment and we want to move it to an area that is not abutting private lands. It is hoped, if snow conditions allow that we can drag it with a dozer during heavy snow cover.

Eleven gallon gas tanks we installed on the refuge's four Polaris 440 GT snowmachines. The larger gas tank reduces the chances of running out of fuel between villages.

All carpets in the apartments above the new office were replaced in November.

4. Equipment Utilization and Replacement

Four old ski-doo snowmachines were sold in February at a small-lot, closed bid sale in Kotzebue. The sale of those machines gave us room for the 4 new Polaris snowmachines received in February.

A new 24 foot welded aluminum "Sea Dory" was received during the spring along with two new 70Hp outboard motors.

A spare 70 HP motor for the above boat was also received along with a 120 HP motor to replace the 90 HP motor on the Selawik riverboat.

A GIS system, including a digitizer, a plotter, and a new PC, was received in April and we entered the modern age of GIS analysis. The system will be used extensively to organize data collected for several years on the Selawik NWR.

Four sets of Leitz Trinovid binoculars were purchased for use by field crews.



The refuge's supercub serves the same purpose as a pick-up on many lower '48 refuges. We haul people, freight, groceries, and fly surveys with it - its fitted with floats in the summer and wheel/skis in the winter. (FWS)

Eight handheld King radios were purchased in August to replace old, worn out handhelds.

A new HP Laserjet printer was received in June.

New camp stoves, lanterns, sleeping bags, tents, and other camping equipment was purchased during the year.

5. Communications systems

Our radio repeater system did not survive the winter intact, and had to be repaired by Ted Collins from Fairbanks. The antenna was broken, apparently destroyed by the severe winds and icing on Hotham Peak. In September the Antenna system was repaired and the batteries were replaced in November.

Selawik NWR was introduced to the FTS phone system in March. After some incompatibility problems were resolved the system worked fine and saves the station a lot of money on long distance phone bills.

On May 25 the Kotzebue phone system burned up. All phone service to Kotzebue was interrupted for several days until some temporary phones were set up for emergency use. It was nearly two weeks before the phones were operable again. It was almost a welcome occurrence.

A remote atmospheric weather station (RAWS) was installed on the refuge near the field cabin at Upingivik in June. This was installed with fire money and reports continuous weather for fire management purposes. Some problems with the solar cells in August resulted in an over-voltage to the electronic system. It was sent to Fairbanks for repair and put back in service in September.

6. Energy Conservation

The new Monitor oil heaters that were installed in the residences are very efficient and contribute substantially to the protection of the homes from freezeup.

New door panels were ordered to replace the ones on house 482 which leak a lot of cold air during the prevailing east winds during winter.

All three refuge vehicles were given extensive tune-ups and repairs in August at a local garage in an attempt to make them more fuel efficient and reliable.

7. Other

The two mobile home residences in Kotzebue which served to house the original and some of the following staff of the Selawik NWR were found to be not up to par for government quarters following an inspection by the regional engineer and the safety officer on March 6. The wiring was unsafe, the plumbing was all but destroyed by repeat freezing and rehabilitation would have cost more than the value of the building. At years end they were in the process of being surveyed.



These two trailers were the original housing for refuge staff in 1981 and later. Serious deficiencies in electrical systems, plumbing, and insulation caused us to declare them unsafe and surplus to our needs. (FWS)

J. OTHER ITEMS

1. Cooperative Programs

Our cooperation with the National Park Service and the Bureau of Land Management continued this year. A joint facilities agreement between the three federal agencies defines the roles and responsibilities of each organization in an attempt to stretch facilities and dollars in this remote location.

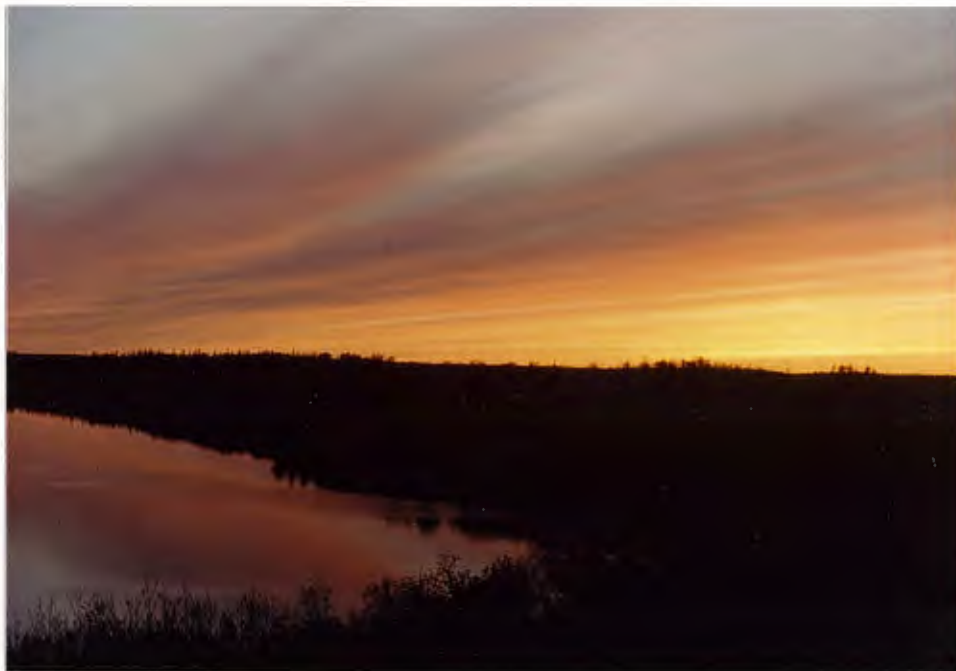
3. Items of Interest

A group of 45 Soviets arrived in Kotzebue on July 8, by boat. Their visit marked the first time in about 60 years that travel by small boat occurred between the Russian mainland and the Kotzebue area. The plan was for the visitors to be in Kotzebue over the 4th of July to participate in the annual trade fair, but weather held them up. The trade fair was extended to allow the Soviets to sell their crafts. Unfortunately, some of the Soviets allegedly smuggled ivory carvings through customs and sold them in Kotzebue. There have been numerous friendships rekindled and

relatives rediscovered by residents of both sides of the Bering Straits since the thawing of relations with the Soviets.

4. Credits

WB Peltola wrote the Habitat Management and Wildlife Sections, and D. 5, RM Rearden wrote the remaining sections. ROS Koepsel reviewed and edited the final draft. Photos were taken by several past employees of the refuge and were taken from the refuge slide file. Narratives were put together by Secretary Robin Houck, Int. Karmun, and ROS Koepsel.



The short Arctic summer draws to a close
in August... (FWS)

K. FEEDBACK

When the Service took over responsibility for management of subsistence activities on federal lands in Alaska, they took on a responsibility that will have far-reaching effects on almost every refuge in Alaska.

We are now required to make wildlife management decisions that may pit subsistence users against sport hunters, state agencies against federal agencies, and neighbor against neighbor. Nobody in Alaska rides the fence on the issue of subsistence.

We have, I believe, just begun to see the tip of the iceberg. Native groups and other rural people will soon begin to fully understand the complex regulatory system and subsistence compatibility assessment responsibilities of the Service. They will require us to toe the line when it comes to subsistence priority. Sportsmen groups are going to question every decision we make that reduces opportunity for them. Subsistence users are going to question every allowed "sport" harvest, when there is even a perception of possible affect on subsistence.

We are going to have to make some tough decisions and we need to have good, sound biological data to insure we protect the resources, regardless of the political mayhem that may occur. This is going to be very expensive to obtain. A straightforward census to determine how many moose are on the Selawik NWR will cost about \$20,000. The annual composition/trend counts needed to set season and bag limits will cost nearly \$5,000 annually. And that is just for moose. We also have caribou, brown and black bears and a variety of furbearers we must manage responsibly in an environment wherein user groups seem to want to take more every year.

Selawik is a small refuge, by Alaska standards and other refuges have even greater needs for information. In my mind, obtaining credible baseline data on federal lands in Alaska, as soon as reasonable, is imperative. If we do not, then some resources will suffer irreparably.

Another aspect of the subsistence equation that we need, in order to balance the issue, is Native involvement. Most of the "true" subsistence users in Alaska are Native people. If we are going to manage subsistence uses for subsistence users we must understand our public. That is easier said than done, as each Native group is different. An Athapaskan Indian does not have the same perspective on life as a Yup'ik Eskimo. Aleut people's cultural perception is different from an Inupiaq Eskimo. The typical Service employee comes from the western culture and that person cannot be expected to understand all of the diverse ethnic groups in Alaska.

Most refuges in rural Alaska employ Native Liasons, or Interpreters to minimize these problems. These are people that have an understanding of both cultures and are able to translate both cultural differences and language. They have become indispensable positions.

Currently the Service handles the majority of subsistence related programs and activities in the regional office in the Subsistence Division. There are over 25 people working in that division and not one Native person employed there, that I'm aware of. Don't get me wrong. I'm not questioning the abilities of any of the employees there and as a matter of record some of them are the most dedicated, hard working employees that I know. The fact remains though that no matter how hard these people listen to what the subsistence users are saying, they don't always understand what they are hearing. If that division made an effort to employ people with the same diverse, ethnic Native backgrounds that they need to deal with it would minimize confusion, maximize cooperation and ultimately benefit the valuable resources we are all responsible for.

Library
U.S. Fish & Wildlife Service
1011 E. Tudor Road
Anchorage, Alaska 99503

BIRDS OF THE SELAWIK NATIONAL WILDLIFE REFUGE.

UB	Red-throated loon	CS	Northern harrier	RV+	Ruff	CB	Bank swallow
CB	Pacific loon	RS	Sharp-shinned hawk	UB	Long-billed dowitcher	RV	Cliff swallow
RS	Common loon	UB	Northern goshawk	CB	Common snipe	CV+	Barn swallow
RS	Yellow-billed loon	RS	Rough-legged hawk	CB	Red-necked phalarope	CR	Gray jay
RB	Horned grebe	RS	Golden eagle	CM/RB	Red phalarope	UR	Raven
CB	Red-necked grebe	RV	Americam kestrel	UM	Pomerine jaeger	UR	Black-capped chickadee
UM+	Short-tailed shearwater	RS	Merlin	US	Parasitic jaeger	UM+	Siberian tit
UM+	Pelagic cormorant	RV	Peregrine falcon	CB	Long-tailed jaeger	CS	Boreal chickadee
CB	Tundra swan	RS	Gyr Falcon	UB	Bonaparte's gull	RB	American dipper
RV	Whooper swan	RR	Spruce grouse	CB	Mew gull	RB	Arctic warbler
RV	Trumpeter swan	CR	Willow ptarmigan	US	Herring gull (smithsonienses)	RS	Ruby-crowned kinglet
CB	Graeter white-fronted goose	UR	Rock ptarmigan	RV+	Herring gull (vega)	RV	Bluethroat
CM	Snow goose	CB	Sandhill crane	RV	Thayer's gull	UB	Northern wheatear
RV	Snow goose (blue morph.)	UM	Black-bellied plover	RV	Slaty-backed gull	CB	Gray-cheeked thrush
UV	Emperor goose	CB	Lesser-golden plover (dom.)	RV+	Glaucous-winged gull	US	Swainson's thrush
UB+	Brant	US	Lesser-golden plover (fulva)	CB	Glaucous gull	CB	American robin
CB	Canada goose (taverneri)	H	Mongolian plover	RV	Black-legged kittiwake	CB	Varied thrush
H	Canada goose (minima)	UB	Semipalmated plover	RM	Ross's gull	CB	Yellow wagtail
CB	Green-winged teal (carol)	US	Greater yellowlegs	RM	Sabine's gull	RV	White wagtail
RV+	Green-winged teal (nimia)	UB	Lesser yellowlegs	RM	Ivory gull	US	Water pipit
UB	Mallard	RB	Solitary sandpiper	CB	Arctic tern	UB	Bohemian waxwing
CB	Northern pintail	RS	Wandering tattler	UB+	Aleutian tern	UB	Northern shrike
RV	Blue-winged teal	UB	Spotted sandpiper	RV	Common murre	H	European starling
CB	Northern shoveler	RS	Upland sandpiper	RV	Thick-billed murre	US	Orange-crowned warbler
RV	Gadwall	H	Eskimo curlew	RR	Black guillemot	CB	Yellow warbler
RV	Eurasian wigeon	CB	Whimbrel	RB+	Kitlitz's murrelet	UV	Yellow-rumped warbler
CB	American wigeon	H/V+	Bristle-thighed curlew	RV	Tufted puffin	CB	Blackpoll warbler
RB	Canvasback	RS	Hudsonian godwit	RV	Horned puffin	CB	Northern waterthrush
H	Redhead	CM	Bar-tailed godwit	UB	Great horned owl	UB	Wilson's wabler
CB	Greater scaup	CM/RB	Ruddy turnstone	UW	Snowy owl	CB	American tree sparrow
RB	Lesser scaup	CS	Black turnstone	UR	Northern hawk-owl	UB	Savannah sparrow
RB	Common eider	UB	Surfbird	RR	Great grey owl	CB	Fox sparrow
UM+	King eider	CM	Red knot	UB	Short-eared owl	US	Lincoln's sparrow
RM+	Spectacled eider	UM	Sanderling	RR	Boreal owl	UM	Golden-crowned sparrow
H	Steller's eider	UB	Semipalmated sandpiper	RV+	Common nighthawk	CB	White-crowned sparrow
RS	Harlequin duck	UB	Western sandpiper	UB	Belted kingfisher	US	Dark-eyed junco
CB	Oldsquaw	CB	Least sandpiper	RV	Downy woodpecker	UB/CM	Lapland longspur
CB	Black scoter	RM	White-rumped sandpiper	RV	Hairy woodpecker	UB+	Smith's longspur
UB	Surf scoter	RB	Baird's sandpiper	UR	Three-toed woodpecker	CM	Snow bunting
UV	White-winged scoter	CM/RB	Pectoral sandpiper	RS	Northern flicker	UW+	McKay's bunting
RB	Common goldeneye	UM	Sharp-tailed sandpiper	US	Olive-sided flycatcher	CB	Rusty blackbird
RB	Bufflehead	H	Rock sandpiper	CS	Alder flycatcher	RV	Common grackle
RV	Common merganser	RV+	Curlew sandpiper	RV	Say's phoebe	H	Rosy finch
UB	Red-breasted merganser	RB	Dunlin	US	Horned lark	UR	Pine grosbeak
RV	Osprey	RM+	Stilt sandpiper	RV+	Purple martin	UR	White-winged crossbill
RV	Bald eagle	RM	Buff-breasted sandpiper	CB	Tree swallow	CB	Common redpoll
						CB	Hoary redpoll

ABUNDANCE CODES

C = Common
 U = Uncommon
 R = Rare
 + = Observed in the Northwest
 Arctic Borough, not on
 refuge.

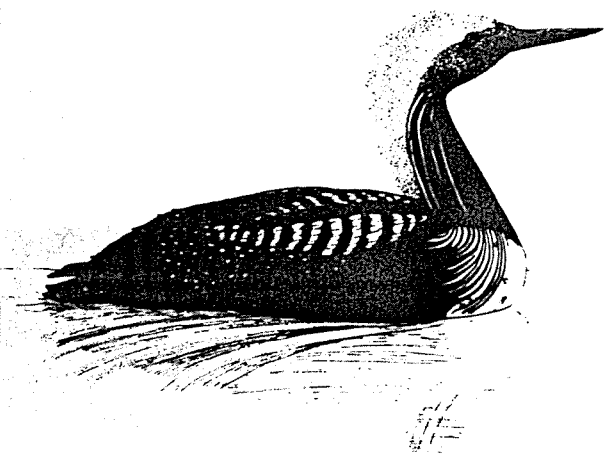
STATUS CODES

B = Breeding in summer.
 R = Resident year-round, breeding.
 W = Wintering resident, non-breeding.
 S = Summer resident, breeding status
 unknown.

M = Migrant
 V = Vagrant, casual,
 accidental.
 H = Historical
 observation -- based
 on literature source.

Selawik National Wildlife Refuge

Visitor Information



A refuge is a dynamic living landscape. Life cycles continue as all things in nature renew themselves. Come explore with us! Watch animals and their activities on Selawik Refuge in north-western Alaska.



A DYNAMIC PLACE OF BEAUTY

January, February, March

Selawik's lands are locked in winter's fragile silence. Moose are scattered throughout the refuge browsing on twigs and branches in the willow and birch thickets. Caribou paw through the crusty snow searching for lichens and grass in the frozen tundra. Furbearers scurry through the ice-encrusted brush. Sheefish winter under the frozen coastal lakes and inlets. Burbot spawn under the ice of inland rivers. The winds are bone-chilling. Temperatures may drop to -60°F .

April, May

Everything is bright and the land is vibrantly alive. By the end of April, there will be $17\frac{1}{2}$ hours of sunlight. Birds are arriving from the Lower 49, Mexico, and South America. Owls, ravens, geese, cranes, swans, and some ducks begin nesting. Caribou band together to migrate to their calving grounds north of the Brooks Range two hundred miles away. Brown bear emerge from their dens, some with newborn cubs. Furbearers birth and moose calving begins. Sheefish migrate upstream as the ice begins to break. When the ice is completely gone the pike will spawn. By mid-May the sunlight melts the snow and temperatures reach the 40°Fs .

June

Summer solstice! Temperatures reach the 50°Fs and 60°Fs as the sun stays high. By the end of the month temperature peaks in the 70°Fs . Fox pups emerge from their dens. Crane, geese, and raptor eggs are hatching; songbirds are nesting. Insects are noticeable and bothersome by the end of the month. An integral part of the ecosystem, insects are vital food for fish and birds. Lightning from thunderstorms sometimes sparks tundra fires. In less than two weeks the vegetation turns from brown to green from the 24 hours of sunshine.

July

Portions of tundra blaze with color as wildflowers bloom. Afternoon temperatures rise above the 80°Fs. Geese, cranes, and ducks forage as they nurture their broods. A wolverine and her kits feed on a winter-starved caribou carcass. One of nature's most famous scavengers — it seems to sense a change in the the season.

August

Blueberry bushes turn patches of tundra to glowing burgundy. Birch trees are crowned with autumn's orange colors. The brilliant colors of dying leaves add temporary warmth to the landscape soon to be dim and frozen. Sheefish, salmon, and whitefish are spawning. Geese and ducks put on weight — staging for migration. The days are shorter. The air is chilly on windy days. At night the temperature drops to the 30°Fs. By the end of the month stars twinkle in the night sky.

September & October

Caribou herds return to the refuge. The white-throated bulls, sleek from summer grazing, brandish four-foot long antlers. They snort and spar seeking the attention of a potential mate. Their rutting sounds ring through the woods and tundra. Furbearers put on a heavy coat. A faraway skein of geese fills the air with an anxious chorus. Most birds fly southeast with the first northwest wind and cloudless day. A thin sheet of ice forms on the ponds. Winter comes quickly as the temperatures fall, reaching the 20°Fs by October.

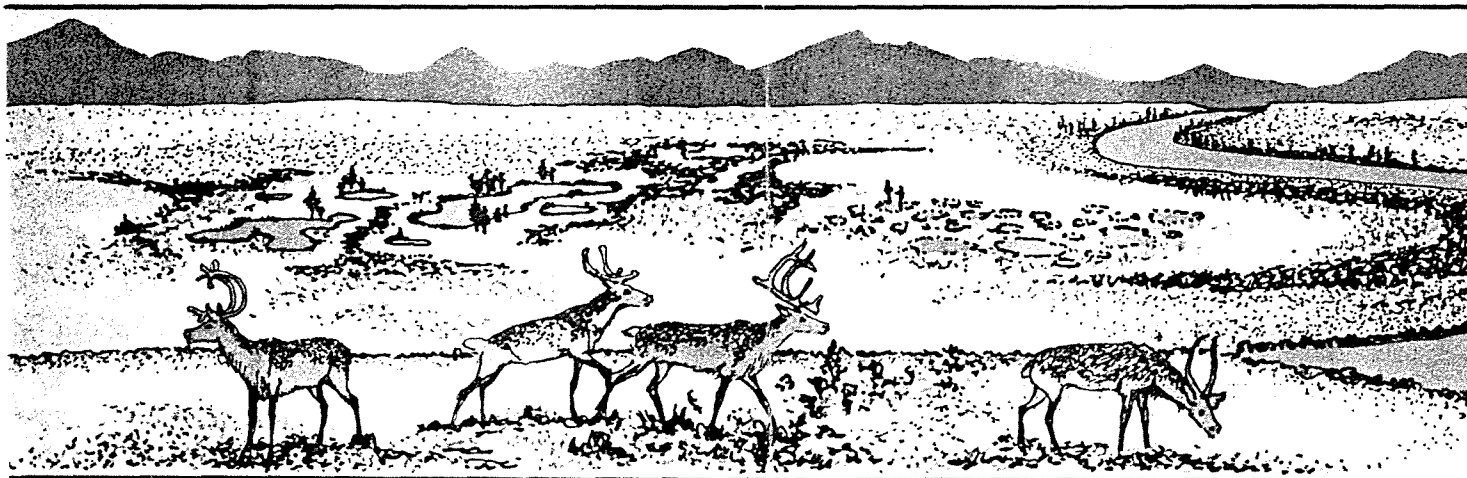
November & December

The snow-shrouded streams and lakes sparkle in the moonlight. Mink, wolverine, fox, and marten leave tracks in the powdered snow. Their prints are soon smooth and hardened by a relentless wind. Moose and caribou shed their antlers. Bears semi-hibernate although they may emerge on an unusually mild day. Cold, dry and windy days alternate with mild, overcast, and snowy days. An occasional blizzard blows in as arctic and maritime air masses seem to battle for supremacy. The average temperature remains below 0°F. By winter solstice the sunlight diminishes to one hour and 43 minutes.



TUNDRA WETLANDS PROVIDE HABITAT

Selawik Refuge — a showcase of estuaries, river deltas, and tundra hills — straddles the Arctic Circle. The most prominent feature is the tundra wetlands nestled between the Waring Mountains and the Selawik Hills. These wetlands support an abundance of wildlife — waterbirds, waterfowl, and mammals. The northeastern part of the refuge (240,000 acres) is designated wilderness. The upper portion of the Selawik River is a nationally designated Wild River.

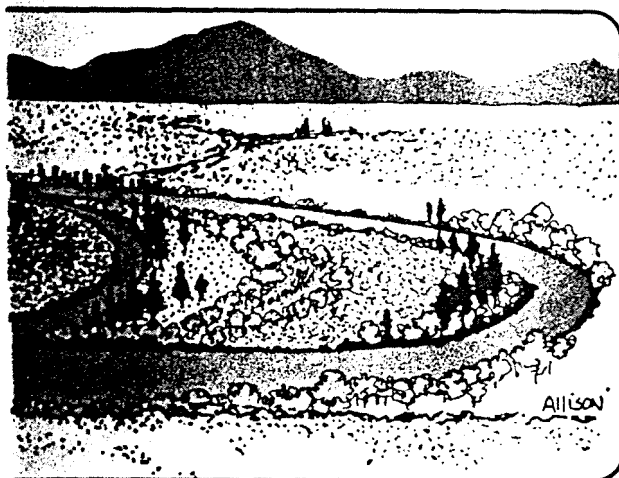


Selawik Refuge was established by the Alaska National Interest Lands Conservation Act (ANILCA) of 1980. The 2.15 million acre refuge was set aside to conserve wildlife and habitats, fulfill international migratory bird treaty obligations, and provide opportunity for continued subsistence by local residents.



A SENSE OF HISTORY

Selawik's lands are a national treasure because of its role in human and wildlife history. The refuge is located near the Bering land bridge that once existed between Asia and North America. Many years ago animals and humans migrated across these lands connecting the continents. In later years prospectors searched these lands seeking gold. The refuge retains evidence of these ancient and recent migrations.



Selawik National Wildlife Refuge is part of a nationwide system of wildlife refuges under the administration of the Fish and Wildlife Service of the U.S. Department of the Interior.

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation.



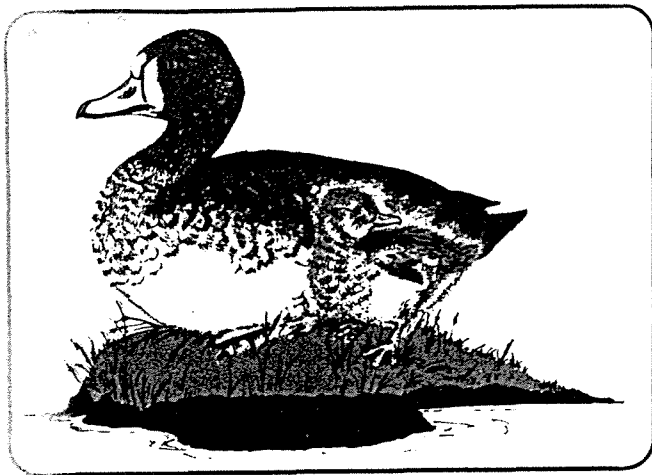
Information on hunting and fishing: Alaska Department of Fish and Game, Box 686, Kotzebue, Alaska 99752 (Tele: 907-442-3420). Information on topographic maps: U.S. Geological Survey — telephone: (907) 271-4307 (Anchorage) or (907) 456-0244 (Fairbanks). The refuge is mapped on the Selawik and Shungnak 1:250,000 USGS maps.

For more information:

Refuge Manager
Selawik National Wildlife Refuge
Box 270
Kotzebue, Alaska 99752 Telephone: (907) 442-3799



BUY DUCK STAMPS. SAVE WETLANDS FOR WILDLIFE. UNITED STATES DEPARTMENT OF INTERIOR FISH AND WILDLIFE SERVICE.



VISITOR INFORMATION

- Recreation on the refuge may include hiking, boating, camping, hunting, trapping, and fishing in accordance with state and federal regulations. It is advisable to check with refuge personnel prior to a visit to determine which activities are allowed and what regulations apply.
- The refuge is accessible by boat, aircraft, snowmobile, dog team, foot, and cross-country skiing depending on season and weather. There are no roads. Scheduled air service is available to Kotzebue from Anchorage — and to Selawik, Kiana, and Noorvik from Kotzebue. Charter air taxi service is available at Kiana, Ambler, and Kotzebue to anywhere on the refuge. Lodging is available only in Kotzebue.
- Selawik Refuge like most places in Alaska has changeable weather with extreme temperatures. You must be self-sufficient and prepared for emergencies. Be prepared for inclement weather with quality equipment.
- Large acreages within the refuge boundaries have been conveyed to Native corporations and individuals, thus becoming private land. Cabins and tent camps may look abandoned but they may be used seasonally. Generally, Native land holdings are most extensive along the coast and surrounding the villages. Two Native villages lie on the refuge. If you are uncertain as to land status — contact refuge personnel
- You may gather berries, mushrooms, and other plant materials for personal use. You may use dead or downed trees as long as usage is non-

