SELAWIK NATIONAL WILDLIFE REFUGE

Kotzebue, Alaska

Library
U.S. Fish & Wildlife Service
Road
Anchorage, Alaska 99503
ARLIS
ANCHORAGE, ALASKA
Est. 1997

ANNUAL NARRATIVE REPORT

Calendar Year 1983

U.S. Department of the Interior
Fish and Wildlife Service
National Wildlife Refuge System



Fig. 1. - Refuge Manager Kent Hall



Fig. 2. - Assistant Refuge Manager Robert Schulmeister



Fig. 3. - Secretary Donna Koutchak

US FISH & WILDLIFE SERVICE--ALASKA
3 4982 00021218 2

Personnel

1. Kent F. Hall, Refuge Manager, GS-12, PFT

2. Robert P. Schulmeister, Assistant Refuge Manager, GS-11, PFT, Transferred 8/83.

3. Donna K. Koutchak, Secretary (Typing), GS-4, Local Hire EOD 11/83.

Review and Approval

Kent F. Hall 2/28/84
Submitted by date

J E Hunty
Operations Manager, North date

William Todd Acty Asst 4/12/84
Regional Office Review date

TABLE OF CONTENTS

Page

A. HIGHLIGHTS 1

B. CLIMATIC CONDITIONS 1

C. LAND ACQUISITION

1. Fee Title . . . . . Nothing to report
2. Easements . . . . . Nothing to report
3. Other 3

D. PLANNING

1. Master Plan 3
2. Management Plan . . . . . Nothing to report
3. Public Participation . . . . . Nothing to report
4. Compliance with Environmental Mandates . . . . . Nothing to report
5. Research and Investigations . . . . . Nothing to report
6. Other . . . . . Nothing to report

E. ADMINISTRATION

1. Personnel 5
2. Youth Programs 5
3. Other Personpower Programs 5
4. Volunteer Programs 7
5. Funding 7
6. Safety 8
7. Technical Assistance . . . . . Nothing to report
8. Other Items 8

F. HABITAT MANAGEMENT

1. General 10
2. Wetlands 10
3. Forests . . . . . Nothing to report
4. Croplands 10
5. Grasslands . . . . . Nothing to report
6. Other Habitats 14
7. Grazing 14
8. Haying . . . . . Nothing to report
9. Fire Management 15
10. Pest Control . . . . . Nothing to report
11. Water Rights . . . . . Nothing to report
12. Wilderness and Special Areas . . . . . Nothing to report
13. WPA Easement Monitoring . . . . . Nothing to report

Page

G. WILDLIFE

1. Wildlife Diversity 16
2. Endangered and/or Threatened Species 19
3. Waterfowl 19
4. Marsh and Water Birds 28
5. Shorebirds, Gulls, Terns and Allied Species 28
6. Raptors 28
7. Other Migratory Birds 28
8. Game Mammals 33
9. Marine Mammals 35
10. Other Resident Wildlife 35
11. Fisheries Resources 35
12. Wildlife Propagation and Stocking . . . . . Nothing to report
13. Surplus Animal Disposal . . . . . Nothing to report
14. Scientific Collections . . . . . Nothing to report
15. Animal Control . . . . . Nothing to report
16. Marking and Banding . . . . . Nothing to report

H. PUBLIC USE

1. General 37
2. Outdoor Classrooms--Students . . . . . Nothing to report
3. Outdoor Classrooms--Teachers . . . . . Nothing to report
4. Interpretive Foot Trails . . . . . Nothing to report
5. Interpretive Tour Routes . . . . . Nothing to report
6. Interpretive Exhibits/Demonstrations 37
7. Other Interpretive Programs 39
8. Hunting 39
9. Fishing 46
10. Trapping 46
11. Wildlife Observation . . . . . Nothing to report
12. Other Wildlife Oriented Recreation . . . . . Nothing to report
13. Camping . . . . . Nothing to report
14. Picnicking . . . . . Nothing to report
15. Off-Road Vehicling . . . . . Nothing to report
16. Other Non-Wildlife Oriented Recreation . . . . . Nothing to report
17. Law Enforcement . . . . . Nothing to report
18. Cooperating Associations . . . . . Nothing to report
19. Concessions . . . . . Nothing to report
20. Volunteers Programs . . . . . Nothing to report

Page

I. EQUIPMENT AND FACILITIES

1. New Construction 46
2. Rehabilitation . . . . . Nothing to report
3. Major Maintenance . . . . . Nothing to report
4. Equipment Utilization and Replacement 46
5. Communications Systems 49
6. Energy Conservation . . . . . Nothing to report
7. Other . . . . . Nothing to report

J. OTHER ITEMS

1. Cooperative Programs 49
2. Items of Interest 49
3. Credits 49

K. FEEDBACK



A. HIGHLIGHTS

1. An all weather, pre-fab, administrative cabin was put up on the refuge to facilitate fieldwork.

2. Waterfowl production increased dramatically over 1982.

3. U.S. Fish & Wildlife Service Director Robert Jantzen visited the station in July.

4. The Western Arctic Caribou Herd (WAH) continued expansion to approximately 200,000 animals.

5. A station aircraft--wheel, float and wheel-ski equipped, was purchased with delivery expected in early 1984.

B. CLIMATIC CONDITIONS

Specific official weather data for the refuge is not available. The U.S. Weather Service records weather conditions at Kotzebue, where refuge headquarters is located, and acquires limited flight service weather data from a volunteer station near Ambler. Ambler is located approximately 150 miles east of Kotzebue and six miles northeast of the refuge.

At Kotzebue, the mean monthly temperatures for 1983, were above the long term average for eight months of the year. This resulted in a mean annual temperature of 24°F, which is 3.4°F above normal and 0.7°F above 1982. Generally, winter temperatures were above normal and summer temperatures below normal. Spring came early in late April, but was followed by a cool, windy summer.

Although total annual precipitation was about normal, snow melt runoff was low in the Selawik and Kobuk Rivers. Consequently the ice in Kobuk and Selawik Lakes was not "flushed" out by runoff. Instead, persistent westerly winds pushed the ice to the east sides of the lake, blocking the mouth of the Selawik River. This precluded boat travel between Kotzebue and Selawik until June 24, when the ice melted and cleared away.

Table 1 displays a synopsis of weather data from both Kotzebue and Ambler. Overall, refuge weather more closely resembles that of Ambler.

Table 1. Summary of Kotzebue and Ambler Weather, 1983.

MONTH	TEMPERATURES (°F) High		TEMPERATURES (°F) Low		Ave.Mean	Deviation	PRECIPITATION (inches) Total		Deviation
	Kotzebue	Ambler	Kotzebue	Ambler	Kotzebue	(30-yr.mean) Kotzebue	Kotzebue	Ambler	(30-yr.mean) Kotzebue
January	24	24	-33	-57	-5.2	2.2	0.29	0.11	0.0
February	29	25	-31	-41	-4.1	2.0	0.15	0.60	-0.15
March	27	34	-18	-25	7.5	8.1	0.27	0.03	-0.25
April	42	49	-15	-5	22.2	9.9	0.72	2.33	0.39
May	68	76	19	16	37.6	6.0	0.13	0.44	-0.27
June	65	92	27	36	42.3	-1.5	0.55	0.69	0.03
July	72	90	39	36	54.1	1.0	1.63	2.06	0.08
August	59	72	34	26	47.8	-4.1	3.36	5.22	1.33
September	54	56	18	6	38.7	-2.9	1.68	4.77	0.25
October	42	37	-3	-23	19.4	-3.4	0.99	0.84	0.38
November	38	39	-7	-11	15.6	7.5	1.04	0.84	0.63
December	34	32	-23	-32	12.1	16.3	0.15	1.00	-0.18
ANNUAL	72	92	-33	-57	24.0	3.4	11.25	20.31	0.19

C. LAND ACQUISITION

3. Other

The Selawik National Wildlife Refuge (NWR) was established by the Alaska National Interest Lands Conservation Act (ANILCA) on December 2, 1980. The refuge will encompass approximately 2,150,000 acres after conveyance of interim managed lands to regional and village native corporations (Fig.4). The establishing authority of the refuge is specified in ANILCA as follows:

> "The purposes for which the Selawik National Wildlife Refuge is established and shall be managed include--
> (i) to conserve the fish and wildlife populations and habitats in their natural diversity including, but not limited to, the Western Arctic caribou herd (including participation in coordinated ecological studies and management of these caribou), waterfowl, shorebirds and other migratory birds, and salmon, and sheefish;
> (ii) to fulfill international treaty obligations of the United States with respect to fish and wildlife and their habitats;
> (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
> (iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge."

During 1983, approximately 22,515 acres in the vicinity of the village of Kiana, were interim conveyed to the NANA Regional Corporation pursuant to section 14(e) of the Alaska Native Claims Settlement Act (ANCSA). Interim conveyance within the refuge now totals approximately 301,659 acres of surface estate, of which 265,059 acres have concurrent subsurface conveyance.

Approximately 31 townships within the refuge remain encumbered with native corporation selections under various ANCSA authorities. These lands encompass all of the Kobuk and Selawik River deltas. A prioritized list, by township of these deltas, was prepared for Regional Realty office relative to potential acquisition by the "right of first refusal".

D. PLANNING

1. Master Plan

ANILCA mandates that a Comprehensive Conservation Plan (CCP) be developed for each Alaskan refuge, which will serve as the station master plan. The current schedule of the Regional Office Planning staff indicates intensive CCP planning will begin in November, 1984. During 1983, station planning activities involved preplanning data collection and documentation of information sources.



Fig. 4. Selawik NWR land status map. The refuge is conceived as the unshaded portion after all conveyances. Dark blue dots represent approved allotments. Small shaded boxes represent allotments pending approval.

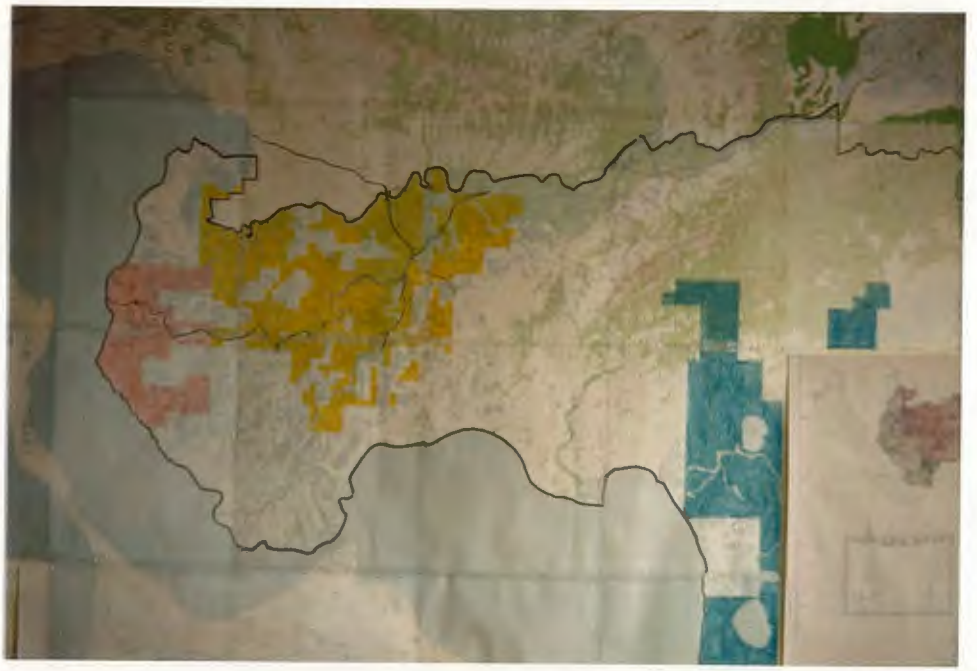

Fig. 5. Highlighted in pink, yellow and blue are interim conveyed lands within the boundaries of Selawik NWR.

E. ADMINISTRATION

1. Personnel

Assistant Refuge Manager Robert P. Schulmeister accepted a Maintenance position and transferred to the Aleutian Islands Unit of the Alaska Maritime National Wildlife Refuge in August. The position was reclassified and advertised as a Refuge Manager/Pilot in October. No suitable applicants made the selection certificate. The position was re-classified and re-advertised in December as a Refuge Manager/Pilot in training. A selection certificate had not been received by the end of the year.

A local hire Secretary (Typing) position was advertised and filled in November by Donna Koutchak of Kotzebue. She's a most welcome addition to the staff.

Table 2 . Refuge Personnel.

Fiscal Year	Full-time Equivalent	Local Hire (Full-time)
1984	2.0	1.0
1983	2.0	-
1982	1.5	-
1981	1.0 (assigned in RO)	-
1980	NA	-

2. Youth Programs

An attempt was made to hire several local youths during the summer under the Young Adult Conservation Corps (YACC) program. Recruitment procedures involved contacting the Kotzebue High School Counselor and posting notices in strategic locations. Interest was minimal at best. Only one 15-year old male applied and was hired. After missing two unreported workdays the first week, he decided he wasn't ready to accept the responsibility of a full time job and resigned. According to the counselor, interest was high until wages were discussed. Those interested opted to bag groceries for $7.50 an hour over the $4.13 per hour earnings as a YACC.

3. Other Person Power Programs

Selawik residents George Sheldon and Wilbur Skin were hired periodically throughout the year on a day-to-day basis. Sheldon assisted in hauling refuge cabin materials via snowmobile (Fig. 6). Skin assisted in waterfowl production surveys and guiding VIP visitors (Fig. 7).



Fig. 6. George Sheldon, a Selawik resident, assisted in hauling refuge cabin materials in early April.



Fig. 7. Wilbur Skin, a Selawik resident, assisted in waterfowl production surveys.

4. Volunteer Programs

Several people from outside Alaska expressed an interest in volunteering services to the station. But apparently, vivid descriptions of insects or hummocks encouraged them to look elsewhere. Two individuals did provide valuable services. Leigh McDougall was terminated at Alaska Maritime NWR, and volunteered at Selawik NWR to extend her stay in Alaska. Her tasks included assisting an Alaska Department of Fish & Game biologist on a refuge beaver cache survey, winterizing our field station, and summarizing tundra swan survey data. She arrived on August 19 and departed on September 26.

Beverly Minn signed on as a volunteer in October and will remain indefinitely. She assists in surveys, summarizing data, public relations and assorted administrative tasks.

5. Funding

The acquisition of a station aircraft and the Accelerated Refuge Maintenance Management (ARMM) program provide renewed optimism in meeting basic refuge management responsibilities. Funds for the aircraft were obligated at the end of fiscal year 1983. The ARMM funds will be available during FY 84. The following table displays budget breakdowns.

Table 3 . Funding by program (in thousands).

Fiscal Year	1210	1220	1260	1994	ARMM	Other	Total
1984			155	-	100	-	255
1983	60	70		7	-	72 (aircraft)	209
1982	65	85		-	-	5 (cabin)	155
1981							75
1980	NA						

During FY 83 fixed expenses accounted for $87,500 of the budget in salaries, housing and utility costs. Office rental costs totalled $8,904 but was paid for by Wildlife Assistance (Anchorage), who supported a subsistence position in the refuge office. This person resigned September 30, and the position will not be refilled so this will become an additional refuge fixed cost in future years.

The base funding for FY 84 provides for local hire clerical and technician personnel which could inflate fixed costs to as much as $130,000. That leaves about $25,000 for supplies and surveys. During 1983, $16,000 were expended for 97 hours of local aircraft charter, which provided very basic waterfowl and caribou use data and a small sample of intensive tundra swan productivity information.

The combination of a station aircraft with dual function refuge manager/ pilot and supplemental ARMM funding has potential to improve the quality and diversity of biological surveys at least for FY 84. But ARMM funding now appears to be uncertain. A personnel/funding dilemma seems imminent, in a "Catch 22". The situation could boil down to personnel with limited or no operating funds, or a small staff with clerical, maintenance and administrative duties resulting in a substandard biological program.

6. Safety

Assistant Refuge Manager Schulmeister was designated as station safety officer. Most safety meetings involved informal discussions of pertinent matters as necessary. Several films and/or video tapes supplied by the Regional Office were viewed and discussed.

Our administrative cabin is located on an overlook of the Selawik River. To reach the cabin from the river a "near" vertical climb of several hundred feet is necessary. All visitors were informed of the potential hazards prior to climbing "coronary hill".

A one-day lost time accident occurred during the field season. ARM Schulmeister sprained an ankle on a descent of a river bank during waterfowl surveys.

8. Other Items

Special Use Permits. Two special use permits were issued during the year for the following purposes:

SEL-01-83, Bureau of Land Management (BLM). Field processing of Native Allotment claims. This work completed BLM's field investigations relative to processing native allotments within the refuge. To date, 50 of the 148 allotments within the refuge (exclusive of selected and interim conveyed lands) have been legislatively approved.

SEL-02-83, Sohio Alaska Petroleum Company. Surficial Geology. Sohio was interested in rock outcrops of the Waring Mountains and Hockley Hills relative to predicting oil potential offshore in the Hope Basin. Special conditions precluded the landing of helicopters in the Waring Mountains due to Wilderness designation. Consequently, Sohio geologists did not visit the Waring Mountains. Rock samples were collected from a coal deposit along the Singauruk River and the east side of Hotham Peak. A final report of proprietary interpretive data, due in the Regional Office on January 16, 1984, has not yet been received.

Another permit, exactly the same as SEL-02-83, was applied for by Exxon Company, USA, of Houston, Texas. However, Exxon refused to sign the permit with the Special Condition that the final report include interpretive data of samples collected such as geochemical techniques. Exxon attorneys contested the condition at the Regional Office level and the Washington Office Solicitor. The Service stance remained firm and was internally supported by the Alaska Special Assistant to the Secretary. This apparently set a precedent regionwide with the Service's intent to build a data base relative to ANILCA section 1008, as well as other considerations.



Fig. 8. Sohio personnel collecting surficial geological rock samples.



Fig. 9. Sohio-Alaska Co. used this helicopter to land near Hotham Peak and the Singauruk River for surficial geological purposes.

F. HABITAT MANAGEMENT

1. General

No specific habitat management techniques were conducted on refuge lands, with the intent to maintain the existing character. Weather conditions are the principal managers and 1983 produced nothing extraordinary, other than a general warming trend explained in section B. Climatic Conditions.

C. Lensink, in the Regional Research Office, found a direct relationship between percent snow melt and waterfowl production in studies on what is now the Yukon Delta NWR. To see if this relationship can also be applied here, a survey was initiated to document snow cover during the spring bird migration. Figure 10 on the refuge gives a rough idea of snow and ice cover estimated (during three aerial flights.) Figures 11 & 12 compare the difference in snow cover in an interior and coastal wetland, on April 29, (1983).

2. Wetlands

A water sample was collected from the Selawik River, just upriver from the refuge cabin, to determine water quality. The sample was submitted to the Environmental Contaminant Supervisor in the Regional Office. Lack of funding precluded testing of the sample this year.

Wetlands and rivers appeared "normal" with average spring runoff. This was followed by a drop in water level during summer and a refilling by late summer and fall precipitation.

Waterfowl staging concentrations in 1983 were far below those documented in 1982, which undoubtedly has some relationships to food production and/or availability. To find out more about aquatic plant production on the Kobuk and Selawik River deltas a procedure to measure aquatics will be implemented in 1984.

4. Cropland

Selawik Farm Project. This "farm" operation is restricted to conveyed land within the refuge boundary, and is developing into a successful and highly visible enterprise (Fig. 13 and 14). The project remains in an experimental phase with funding acquired from the State of Alaska and consultant services from Rural Ventures Alaska, a subsidiary of Control Data Corporation. The primary objectives are to establish agriculture in the region, to produce better quality and variety of food, and to provide local employment opportunities.

Major developments and accomplishments for 1983 were:

1) Completion of a 3,000 foot gravel runway.
2) Hiring of a bona fide horticulturist and marketing specialist.
3) Receipt and application of most of 17 tons of lime and 7 tons of fertilizer.
4) Refinement of horticultural techniques including soil preparation, seed germination, variety selection and harvesting.



Fig. 10 . Snow cover on Selawik NWR on April 29, 1983.

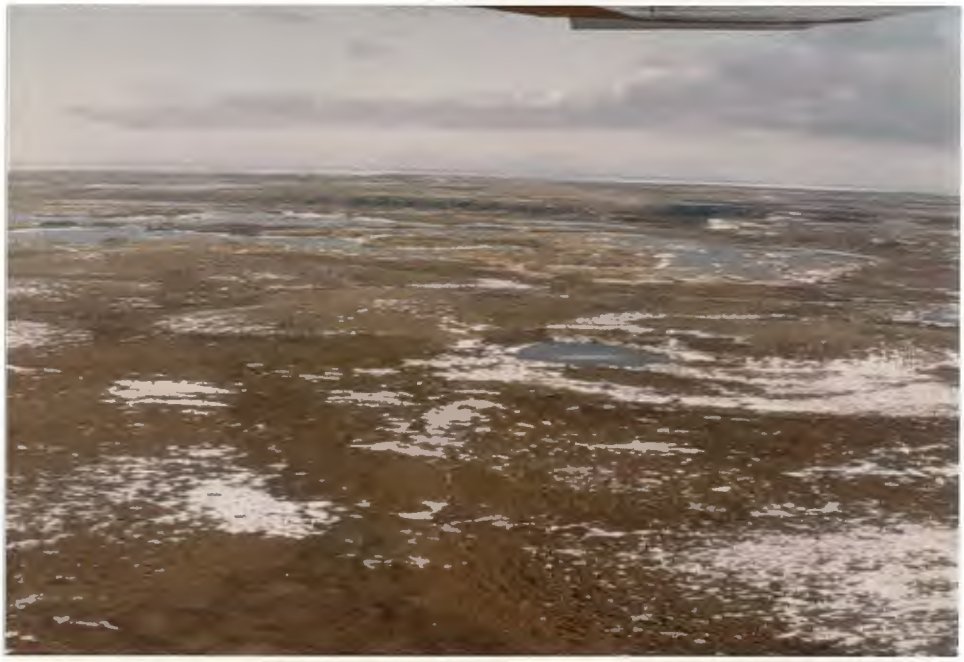

Fig. 11. Snow cover was less than 20 percent on some interior refuge wetland habitat on April 29, 1983.



Fig. 12. Snow covered most of coastal wetland habitat on April 29, 1983.



Fig. 13. A look at the garden site at the Selawik Farm Project.



Fig. 14. Chickens were raised from eggs in one experiment conducted by the Selawik Farm Project.

5) Assurance that air transportation and a local market can be developed.
6) Good production of potatoes, turnips, cabbage, broccoli, radishes and carrots. (Envision maximum production of 10 tons per acre of potatoes).
7) Preliminary determination that grain production may not be feasible. A first year cost of $10,000 per acre to bring the land into production cannot be justified to produce oat or barley hay for animal feed.
8) Up to 25 people from Selawik were employed during the season.

6. Other Habitats

The refuge was delineated into three broad habitat types for general waterfowl production survey purposes. These include river delta, lowland tundra and upland tundra.

Although several habitat analysis projects were conceived that would have included refuge lands, none came to fruition due to economic and other factors. Hopefully, the comprehensive planning effort will be able to provide a usable product.

7. Grazing

The Selawik Farm Project is investigating ways to diversify and expand its economic base. One obvious possibility which has been contemplated since inception of the farm is reindeer herding. Rural Ventures Incorporated contracted Andrew Karter to do a feasibility study of reindeer herding for the farm project. He contacted this office to determine the potential of herding on refuge lands, quoting the provision for reindeer grazing in ANILCA.

Karter has over 13 years of experience in herding reindeer in several Scandinavian countries, and described the lichen beds in and near the farm site as the best and most luxurious he had ever seen (Fig. 15). He proposed a plan of intensive herding which would involve the use of people, dogs and fences to control the herd. During winter months the herd would be enclosed to "eliminate" conflict with caribou. Herding would be open-intensive only during summer months. The herd would begin with a minimum of 200 head of reindeer. The objectives of herding were not well defined but described by Karter as creating employment opportunities and making a profit. He suggested production of a specialty meat (smoked) which is in apparent high demand. Unofficial responses to this proposal and feasibility study on refuge land were negative for the following reasons:

1) The provision for reindeer grazing in ANILCA applies to land south and east of the village of Selawik only, not on lands as proposed.
2) Based on historical records, reindeer herding and caribou migrations in this area have always conflicted. Reindeer tend to follow the caribou. While fencing could minimize loss of reindeer, fencing would be considered incompatible with the purposes for which the refuge was established (specifically caribou wintering habitat).
3) It would seem possible that intensive reindeer herding would at a minimum displace existing wildlife resources. The impact on subsistence would have to be investigated.

9. Fire Management

During 1983, Selawik refuge lands received full fire suppression protection from the Bureau of Land Management (BLM) fire station in Galena. Six fires were reported within the refuge of which one could not be found and was recorded as a false alarm.

Table 4. Fires occurring on Selawik NWR in 1983.

BLM Fire No.	Date	Location	Cause	Suppression Activity	Acres Burned
8493	5/21-24	Sec.20,T.14N.,R.2W	Campfire	16 jumpers 2 drops retardent (2,000 gals. each)	300
8766	7/7	Sec.19,T.14N.R.2E	Lightning	2 jumpers	½
8780	7/7-8	Sec.28,T.18N.,R.5W.	Lightning	6 jumpers	30
8788	7/7	Sec.13T.14N.,R.4E	Lightning	2 jumpers	15
8802	7/8	Sec.26,T.16N.,R.10W.	False Alarm		0
8803	7/8	Sec.6,T.17N.,R.3W.	Lightning	Rained Out	1

Fire 8493 burned to within approximately ½ mile west of the refuge cabin (Fig. 16, 17). When first reported by the BLM fire boss it appeared that our cabin materials were either the source of the fire or in jeopardy of being consumed by flames. Skies were clear; it was a Saturday; and arson was suspected. As it turned out, the fire began from a runaway camfire approximately one mile from the cabin and was suppressed within one-half mile. Ironically, the total cost to the government would have been far less to let the fire run its course and even burn the cabin ($10,000) than to dispatch 6 smokejumpers and 2 aircrafts with 4,000 gallons of retardant from Galena. BLM is obligated to protect critical sites (life and property), essentially, at all cost. In this case and probably most others, life was never in danger.

October marked the beginning of an intensive interagency fire planning effort for Northwestern Alaska lands. The plan is part of a statewide fire management process under the direction of the Alaska Interagency Fire Management Council (AIFMC). Selawik refuge lands will be encompassed entirely within the Kobuk Interagency Fire Management Plan. In addition to this station, other major landowners and active participants of the planning team include the National Park Service, Bureau of Land Management, Bureau of Indian Affairs, Alaska Department of Natural Resources, NANA Regional Corporation, Arctic Slope Regional Corporation, Tigara Corporation and Kikiktagruk Inupiat Corporation. The essence of this fire management plan will be to provide landowners with options to full suppression activities, primarily in the interest of economics.

The options include:

1. Critical Protection Management Option
   This option was created to protect human life and inhabited property. Unquestioned priority over all other fires is automatically given to sites (areas) identified in this option.

2. Full Protection Management Option
   All fires in these areas will receive aggressive initial attack and aggressive suppression efforts. This option was designed for the protection of valuable resources, such as commercial timber stands or historic structures, which require fire protection but do not involve the protection of human life and habitation.

3. Limited Action Management Option
   This category is for those areas where natural fire is desirable or the loss due to fire is not as great as the cost of fighting the fire. Firefighting efforts will be limited to keeping a fire within the management unit or to protect critical sites within the area.

4. Modified Action Management Option
   This option provides a level of protection between "full" and "limited". The intent is to provide landowners and managers with an alternative for those lands that require a high level of protection during critical burning months, but a lower level of protection when the risks of large, damaging fires are less.

At the present time, draft options for all unselected refuge lands are limited or modified. The planning process provides for public meetings and comment. A final plan will be presented to the Alaska Interagency Fire Management Council by April 15, 1984, to allow implementation during the 1984 fire season.

G. WILDLIFE

1. Wildlife Diversity

The refuge consists of a mixture of natural wetland and upland habitats which support a diversity of avian and mammalian species. Of the 142 species of birds recorded for the area, 127 species are documented nesters. Intensive field work may expand this list. Twenty-eight mammalian species have been recorded on refuge lands, with another 13 species of marine mammals inhabiting nearby ocean waters. Refuge activities are aimed at preserving this natural diversity.

During the year, species and numbers of wildlife were generally documented on all field trips. The potential to add the trumpeter swan to the bird list exists, based on aerial nest observations made during tundra swan surveys (Fig. 18). A ground truthing could not be accomplished due to lack of a float plane.



Fig. 15. Lichen beds in the upland areas of the refuge continue for miles.



Fig. 16. This burn was left by Fire 8493, and came within a mile of the refuge cabin.



Fig. 17. Plot stake of Fire 8493, near cabin.

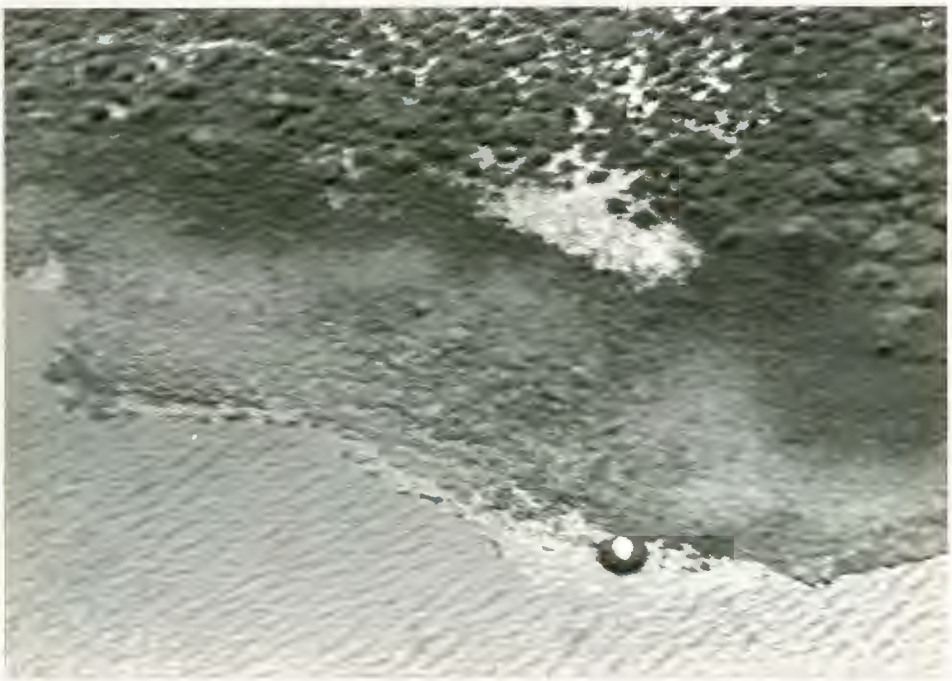

Fig. 18. A potential trumpeter swan nest was observed in Section 19, T.16 N., R.3 E., in an upland tundra wetland. Nest is over water, unlike most tundra swan nests which were found as far as a half mile from water.

2. Endangered Species

Nesting activity of arctic peregrine falcons has been documented along rivers to the north and south of the refuge. No nests have been located on refuge land, and it seems doubtful any will be found, due to lack of suitable nesting habitat.

A single falcon species in flight was observed from an aircraft during a waterfowl survey on April 29.

Eskimo curlews were formerly found in their greatest numbers throughout this area. None have been seen in recent times, but the possibility of locating an isolated population on the refuge has not been completely ruled out.

3. Waterfowl

Based on weather, habitat conditions, breeding populations and surveys, waterfowl production was above 1982. It has been documented elsewhere in Alaska that swan productivity has the potential of being used as an accurate indicator of general waterfowl production. Intensive swan surveys initiated on the refuge this year lacks comparative data, but does indicate that swan production was good.

Habitat appeared to be in excellent condition from a human perspective. Wetlands and nesting habitat appeared "normal". Migrant waterfowl were first reported and observed in late April when portions of the refuge were as much as 75 percent snow free. By May 17, the entire refuge was 90% snow free. Some spring indicators were as much as 3 weeks ahead of 1982.

Stratum 11 of the Alaska Waterfowl Breeding Pair Survey has most of its 12 survey segments located on refuge lands. As part of the annual Continental Waterfowl Breeding Ground Survey it provides an excellent long term indication of waterfowl breeding populations. It is conducted by USFWS Wildlife Assistance Biologists Jim King and Bruce Conant of Juneau. The results of this year's survey conducted on June 9, are shown in Table 5.

In addition, within the 5,350 square miles of habitat, the survey indicated a total of 97,000 ponds or 18.1 ponds per square mile. The refuge, including selected and conveyed lands, encompasses about 3,052 square miles of this habitat with an estimated 55,335 ponds. With an overall average breeding population of 62 ducks per square mile, this breaks down to 3.4 ducks per pond.

The decline in the duck breeding population since 1981 is attributed to improving habitat conditions on the prairies. Dry years on the prairies inflate local duck breeding populations, due to overflights. This year is considered closer to normal.

Table 5 . Adjusted migratory bird breeding population estimates for Kotzebue Sound (in thousands).

Ducks	1981	1982	1983
Mallard	20.4	11.9	19.0
American wigeon	78.2	63.2	87.9
Green-winged teal	36.1	12.7	17.0
Shoveler	52.2	5.9	8.6
Northern pintail	126.1	93.2	89.8
Canvasback	12.7	11.6	3.2
Scaup	72.5	76.1	57.5
Goldeneye	1.2	2.4	0
Bufflehead	1.8	1.2	1.2
Oldsquaw	53.6	49.3	30.4
Scoter	15.5	29.8	16.7
Total ducks:	470.3	349.2	331.3
Canada geese	10.7	21.0	6.1
Sandhill crane	2.5	4.0	6.4
Tundra swan	2.5	8.2	4.7

There is no apparent explanation for the variation in the goose, crane and swan indexes. Hopefully a sound biological program will provide some answers.

SWANS. Tundra swan production surveys were initiated on refuge lands this year. The procedures were patterned after those developed for trumpeter swans by J. King.

Lack of funding precluded surveys of the entire refuge. Thus wetland habitat was stratified into three broad categories. The stratification is based on gross determinations of casual overflights and reference to 1:250,000 and 1:63,360 USGS topographic maps. Categories were as follows: 1) River deltas (Kobuk and Selawik) - 625 sq. mi.; 2) Upland tundra wetlands - 599 sq. mi.; 3) Lowland tundra wetlands - 1,828 sq. mi.

All lands within the current refuge boundary are included even though at least half of the river deltas have been conveyed and the remainder have been selected and will likely be conveyed in the near future. This would leave no river delta habitat under refuge jurisdiction.

Sample areas that were surveyed were selected by gross visual observations, availability of 1:63,360 maps, amount of habitat per map and habitat type. Table 6 and Fig. 19 show areas surveyed and summarize results.

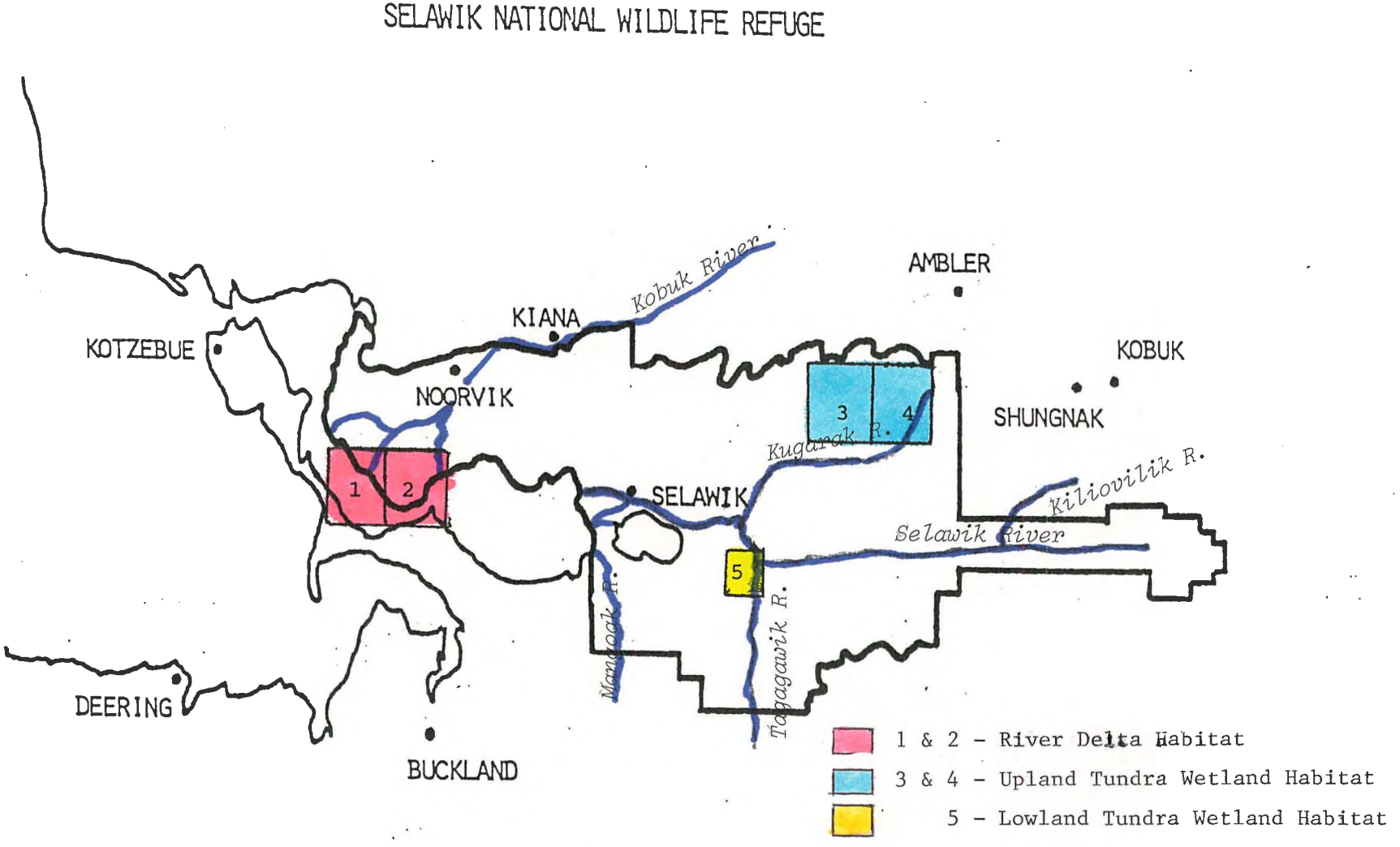

Fig. 19 . Locations of areas sampled for Tundra Swan production surveys.

Table 6. Results from tundra swan production surveys, 1983.

Quadrangle	Survey Data: USGS Map Number/Sample Area	Sq.Mi. Habitat	Year	Dates Surveyed	Mileage	% Habt. Covered	Spring Observations: Singles	Paired Birds	Flocked Birds	Nests	Eggs	TOTAL SWAN	Fall Observations: Primary: Singles	Paired Birds	Flocked Birds	Young	TOTAL SWAN	Secondary: Broods	Pairs	Flocks	1 Ad.+ Brood	0 Ad.+ Brood	TOTAL OBSVTNS.
Selawik	C-6/1	81	83	6/15 8/22	128 115	90	76	46	117	49	188	140	15	130	54	149	348	42	65	11	1	0	91
Shungnak	D-6/3	82	83	6/16 8/12	110 72	50	6	8	0	3	18	14	0	16	0	1	17	1	8	0	0	0	8
Shungnak	D-5/4	118	83	6/16 8/12	143 127	70 50	11	20	0	6	22	31	0	32	6	21	59	7	16	1	0	0	17
Selawik	C-5/2	171	83	6/17 8/15	183 221	95	38	34	0	25	0	67	6	84	69	92	251	25	42	9	1	0	57
Tagagawik	-/5	118	83	6/17 8/29	109 100	100	27	88	31	24	44	146	7	34	0	46	87	17	34	0	2	0	41
Notes on egg counts:																							
Selawik	C-6/1	Eggs counted from 39 nests.																					
Shungnak	D-6/3	Eggs counted from 3 nests.																					
Shungnak	D-5/4	Eggs counted from 5 nests.																					
Selawik	C-5/2	No eggs counted.																					
Tagagawik	-/5	Eggs counted from 11 nests.																					

The survey procedure involves aerial survey of all tundra swan habitat on any given 1:63,360 USGS topographic map. Maps are carried in the aircraft. Information recorded on the map includes the track of the aircraft and all swan observations as singles, pairs, cygnets, nests, and eggs per nest, as feasible.

Each sample area was surveyed twice, once in June and once in August. A PA-18 Piper Supercub was chartered for the June surveys, while a Cessna 185 or 206 was used for August surveys. Without a doubt the supercub is the superior aircraft for the June survey since it is capable of slower flight, provides better visibility to the primary observer/recorder and has better capability for close-up nest observations. The Cessna 185 and 206, however, fly faster and cover more country for the money which is the primary reason they were used for the August survey.

To get a feel for doing this survey, we started with map Selawik C-6 because it was the closest to Kotzebue and had the smallest amount of habitat to survey. Except for nest checks, the first spring flights were flown at 500 feet above ground level (AGL), and tended to track along wetlands. All nests observed were flown over once, at less than 50 feet elevation, to flush the adult and record clutch size. The total number of eggs listed in the table is based on only those nests where the adult flushed.

The abundance of swans and nests observed in this area resulted in the use of more flight time than expected. Thus, several modifications were made for economic reasons, to insure other habitats could be sampled. The last spring and all fall flights were made at 800-1,200 feet AGL, on one mile grids. Swans were still highly visible, but binoculars were also used to aid in locating swans and counting cygnets at the same elevation while circling. This procedure conserved considerable flight time, that at 500 feet, would have been used in diving and recovering to altitude. In addition, swans with broods were easier to enumerate since they apparently seemed oblivious to the aircraft and remained in the open and less tightly flocked as opposed to heading for cover at lower flight elevations.

All told this year's effort provided a wealth of data and an insight into refining a procedure for tundra swans. A refuge biological/pilot and readily available station aircraft will undoubtedly improve the efficiency and quality of the effort.

GEESE. No specific productivity surveys for geese were initiated. Records of nests and broods were recorded in conjunction with other activities. Both white-fronted geese (western mid-continental population) and Canada geese (Taverner's) breed on the refuge.

Weekly waterfowl surveys during spring and fall indicated a decline from 1982, in numbers of geese using the river deltas. Random surveys of logical inland areas also failed to produce numbers comparable to 1982. Peak fall goose populations on the same survey route were 1,510 birds on September 23, 1983, and 8,180 birds on September 6, 1982.

The essence of these surveys when tempered with swan data generates more questions than answers. The Continental Breeding Ground Count indicated a decline in the breeding population, but what is the relationship of refuge breeding birds and staging locations and concentrations? Was food presence and availability a factor in either year? Was goose production a bust in 1983? Is it possible that a portion of the geese present in 1982, were nonbreeders from another population? Did birds "dribble" south in 1983? Only more intensive surveys as well as banding and marking will provide answers to the dynamics of refuge goose populations. A proposal was submitted to the Regional Office early in the year, but other regional priorities have delayed a response.

DUCKS. As with geese, refuge duck production and movements are not well understood. However, several intensive brood surveys were conducted which provide at least some insight.

Again as with geese, duck staging concentrations did not develop in the same areas as 1982, nor in any other logical areas surveyed. Peak populations occurred on Sept. 30, 1983, with 1,560 ducks compared to 11,765 ducks on Sept. 6, 1982. These figures prompt the same questions identified with geese.

However, duck brood surveys indicated that duck production was not a bust. The Selawik Waterfowl Production Study Area was surveyed during July and August. Aerial photos with numbered wetlands and boundary lines were obtained, which allowed replication of at least the same area as P. Shepherd's and K. Hughes' efforts from 1955-58. Exact procedures were not well documented in their summary reports, and conclusions drawn between our results and theirs must be qualified.

The general intent of the survey is to provide an indication of waterfowl production on approximately 25 square miles of waterfowl habitat near the village of Selawik. Some wetlands are accessible by boat, others only on foot. Records indicate procedures in the 1950's varied from year to year. We used our own judgement in selecting strategic viewing points, shoreline walks, and dealing with emergent vegetation. Survey times usually began between 6 a.m. and 8 a.m. and ended between 6 p.m and 9 p.m.

The following table summarizes data from 1983 and provides a general comparison with similar surveys during the mid-1950's. All figures are actual broods observed, no correction factors are applied. Two counts were made in 1955 and 1983. The first is initiated about July 15 to cover dabblers. The second count begins about 3 weeks later to pick up late nesting species, such as scaup and scoters. Duplicates are eliminated. Only one census was made in 1956-58.

Table 7 . Waterfowl brood survey results on the Selawik Waterfowl Production Area, for 1955-58.

	Number of Broods				
Species	1955[1]	1956	1957	1958	1983
Scaup	47	52	25	14	39
American Wigeon	27	38	13	6	30
Northern Pintail	28	41	14	1	5
Scoter Spp.	8	10	5	2	9
Mallard	2	2			
Oldsquaw	3	1	1	-	2
Shoveler	3	2		1	6
Green-winged Teal	7	10	7	3	7
Unidentified (Adult not seen)	-			-	3
Total	152	156	65	27	101
Duck Broods/sq.mi.	7.5	6.1	2.6	1.1	4.0
Swan					1
Canada Geese		1			3

[1]Survey Area was 20 sq. mi. in 1955, and 25 sq. mi. in 1956-58, and 1983.

Emphasis during the 1950's surveys generally shifted from brood counts to breeding pair and drake/hen desertion ratios. Current emphasis from regional and flyway perspectives is directed to providing long term duck brood information from established study areas. Breeding pair counts were not conducted in 1983 due to logistical problems involving weather.

Several items will help in keeping the table in proper perspective. The summary from 1955 indicates that an effort was made to "beat out" broods from lakeshores and adjacent grassy areas. This was not done in 1983. Windy and rainy weather are listed as possible reasons for low numbers of broods observed during survey and/or low waterfowl production in 1957 and 1958. The records emphasize that no geese were observed on the study area in the 1950s. All factors considered, it appears that duck production on the study area is at least favorable to that documented in the 1950s. In fact, the presence of both tundra swan and Canada goose broods is encouraging.

The survey area has been interim conveyed to the NANA Regional Corporation and is now under the jurisdiction of the Selawik IRA Council. Written permission to conduct our survey was requested of and granted by the council, who stated they welcomed the effort to monitor and preserve local waterfowl production.

An area near the refuge cabin involving only refuge lands was investigated as an additional or replacement intensive waterfowl study area. The habitat is lowland tundra wetlands. A small tributary or slough of the Selawik River provides boat access. Wetlands adjacent to the slough and Selawik River were observed on foot from strategic points. The area encompassed 9 square miles and included all or portions of 28 wetlands. Only one count was made on August 2 and 3 - (essentially between the counts made on the Selawik study area.) Pintails and white-fronted geese (family groups) were already flying. No flight capable young were included in the survey.

The following table summarizes data obtained from this area.

Table 8 . Waterfowl Brood Survey near refuge cabin in 1983.

Species	No. of Broods
Northern pintail	6
Scaup	5
American wigeon	17
Shoveler	2
Green-winged teal	1
Unidentified dabbler*	5
Unidentified diver*	2
Total Ducks	38
Tundra swan	2
Canada goose	9

*Either adults were not observed with broods or could not be identified due to distance, wind or glare.

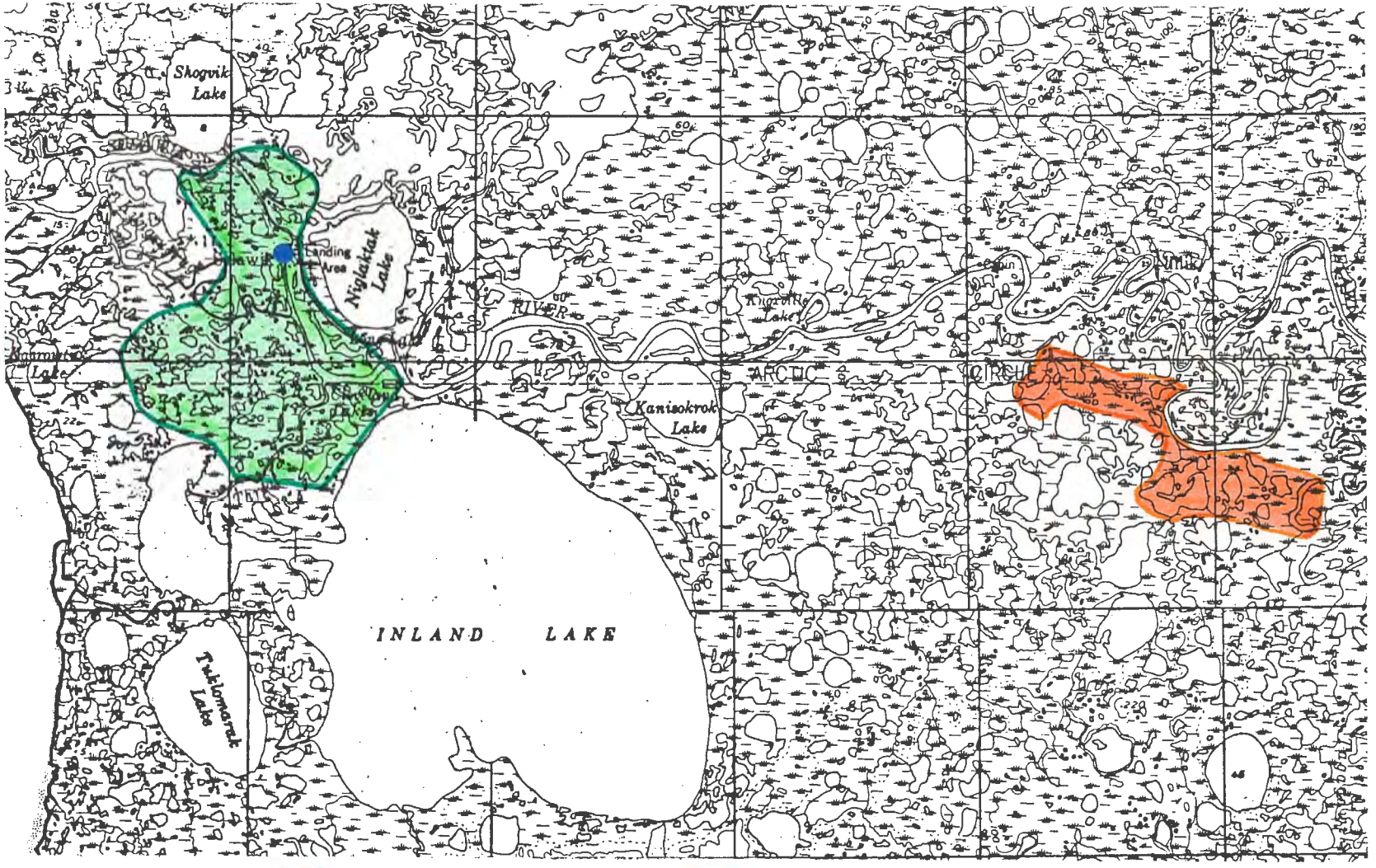

Fig. 20 . Intensive ground waterfowl study area, 1983.

This study area also encompasses swan and goose molting areas, and a goose staging area identified by Shepherd's work and local people. Forty-seven molting swans were observed on three wetlands. A single horseshoe lake hosted all of the Canada goose broods. In addition, another 53 adult Canadas were present and over 350 white-fronted geese. The white-fronted geese included five family groups with brood sizes of 3, 3, 4, 5 and 5. All were flight capable, and field (berry) feeding. With this in mind, hindsight indicates that perhaps most white-fronted geese may have migrated by the time weekly waterfowl surveys began in mid-August.

4. Marsh and Waterbirds

5. Shorebirds, Gulls, Terns and Allied Species

All birds were recorded during the waterfowl production surveys near Selawik and the cabin. Table 9 displays results at respective sites, and are assumed to be breeding populations.

6. Raptors

The most common raptors seen are northern harriers. An immature golden eagle was observed near Selawik during a waterfowl production survey.

7. Other Migratory Birds

In August, a report was received in Kotzebue Office of numerous dead gulls along the beach of Kotzebue Sound between Kotzebue and Buckland. The same day, another private citizen reported dead and dying black-legged kittiwakes and slender-billed shearwaters at Sisualik, just northwest of Kotzebue. Specimens were collected and sent to the National Fish & Wildlife Health Lab in Madison, Wisconsin, for diagnosis. In addition, and in cooperation with the Alaska Maritime NWR and the Regional Marine Bird office, an aerial survey was made of Kotzebue Sound to determine the extent and/or magnitude of the die-off. A total of 595 dead black-legged kittiwakes, 34 slender-billed shearwaters, 4 murre species and 2 gull species were recorded. Some live kittiwakes were observed near the breeding colonies at Chamisso Island NWR, and Cape Deceit, near Deering, but the huge (± 500,000) colony of murres at Cape Thompson was empty.

The final diagnosis of all dead birds that were analyzed is death by starvation. Pathological and toxicological tests were negative and all birds were severely emaciated. The big question is why?

Dave Roseneau, a consultant biologist, who has been studying seabirds in the Chukchi Sea for several years offers this explanation for the kittiwakes. Apparently kittiwakes are highly dependent on sand lances for food, at a particular time in summer. This year colder than normal surface water temperatures caused sand lances to go deeper and thus were unavailable to the surface-feeding kittiwakes. The phenomenon known as "El Nino" is suggested as the cause of this and other seabird die offs that occurred throughout the state this year. A final report is being prepared by the Marine Bird Section of the Regional Office.

Table 9 . Number of miscellaneous birds seen during waterfowl production surveys, 1983.

	Selawik Study Area		Cabin Study Area
Species	July 15, 1983	August 5, 1983	August 2, 1983
Arctic loon	19	35	20
	1 egg	4 chicks	
	1 chick		
Red-throated loon	3	3	2
		1 chick	
Loon species	3	1	2 chicks
Red-necked grebe	48	77	37 + 5 chicks
	5 chicks	3 chicks	
Grebe species	3	3	
	1 chick	3 chicks	
Red-breasted merganser	-	1	
Arctic tern	6	13	5
Tern species	-	9	1
Glaucous gull	-	4	1
Mew gull	2	1	
Sabine's gull	-	2	
Long-tailed jaeger	7	2	5
Parasitic jaeger	-	2	
Jaeger species	1	10	8
Sandhill cranes	65	59	41
	4 broody	1 chick	
	1 chick		
Unidentified shorebirds	-	2	
Whimbrel	-	2 broody	2
Phalarope species	1	-	
Common snipe	1	-	
Lesser golden-plover			2
Bristle-thighed curlew			2
Godwit species			26
Hawk species			1
Northern harrier	-	1	1
Golden eagle	1 im.	-	
Songbirds	-	33	

In cooperation with the Migratory Bird Office and the Alaska Department of Fish & Game, Nongame Division, two Breeding Birds Surveys were established and conducted in and near Kotzebue. A survey was also planned for the refuge, but due to weather and logistics we were unable to do a survey within the established time frame.

The Kotzebue survey, #6671, was conducted June 15, from a vehicle along the longest possible existing road--8.25 miles. A total of 371 individual birds, representing 28 species were recorded.

The Noatak survey, #6771, was conducted from a boat on June 20, along several channels of the Noatak River delta. Easy to identify topographic features were used as stopping and listening points. A total of 259 individual birds, representing 43 species were recorded on the 11.5 mile route.

Under the midnight sun, both surveys were begun at 2:30 a.m. A summary of species and numbers follows.

Table 10 . Birds recorded during Breeding Bird Surveys in and near Kotzebue, 1983.

	Survey Name	
Species	Kotzebue #6671	Noatak #6771
Arctic Loon	2	10
Red-throated Loon	-	1
Red-necked Grebe	-	2
Tundra Swan	-	7
Canada Goose	-	9
White-fronted Goose	-	3
Northern Pintail	3	6
Green-winged Teal	2	3
Shoveler	2	-
American Wigeon	2	13
Greater Scaup	38	11
Oldsquaw	20	4
Canvasback	-	2
Surf Scoter	-	1
Red-breasted Merganser	2	1
Willow Ptarmigan	-	4
Sandhill Crane	-	6
Semipalmated Plover	-	1
Lesser Yellowlegs	-	1
Northern Phalarope	21	1
Black Turnstone	2	6
Common Snipe	2	24
Semipalmated Sandpiper	9	28
Unidentified Sandpiper	1	-
Hudsonian Godwit	-	17

cont.

Table 10. Continued.

Species	Survey Name	
	Kotzebue #6671	Noatak #6771
Bar-tailed Godwit	-	5
Dunlin	-	1
Parasitic Jaeger	2	-
Long-tailed Jaeger	3	4
Glaucous Gull	50	23
Mew Gull	25	2
Black-legged Kittiwake	96	-
Arctic Tern	44	5
Short-eared Owl	-	1
Alder Flycatcher	-	3
Bank Swallow	-	2
Common Raven	2	-
American Robin	4	4
Gray-cheeked Thrush	-	1
Yellow Warbler	1	6
Yellow Wagtail	3	1
Rusty Blackbird	-	1
Common Redpoll	7	3
Savannah Sparrow	3	4
American Tree Sparrow	-	4
White-crowned Sparrow	15	11
Fox Sparrow	4	13
Lapland Longspur	4	5
Total Species/Individuals	28/371	43/259

A Christmas Bird Count was also established near Kotzebue. The count center is located about 15 miles northwest of Kotzebue at a place known locally as Saaningaruq. The habitat is upland tundra with scattered white spruce groves. The count circle also includes a portion of Kotzebue Sound. The count was made on December 27, and only 5 species were recorded by 2 participants. Species tallied were Gray Jay - 8, Common Raven - 3, Boreal Chickadee - 9, White-winged Crossbill - 143, Hoary Redpoll - 2.

The species count could likely have been much higher with a few more participants. Spruce cones were abundant which could have attracted more wintering passerines (Fig. 21). In addition, unidentified birds had been reported being observed along a lead which existed along the portion of Kotzebue Sound. Other local species that were not observed include— snowy owl, willow and rock ptarmigan, hawk owl and goshawk.



Fig. 21. There was a notably heavy spruce cone crop in 1983, throughout the region.



Fig. 22. These tracks near the refuge cabin on the Selawik River were left by caribou migrating north in April. The river is nearly ¼ mile wide.

8. Game Mammals

CARIBOU. A significant portion of the Western Arctic Caribou Herd either winter on or migrate through refuge lands each year. During early 1983, approximately 50,000 caribou (ADF&G estimate) wintered to the south and west of refuge lands. Due to budget constraints very little caribou fieldwork was accomplished by either refuge personnel or local ADF&G biologists. Telemetry equipment purchased by this station was unused until FY 84. By the end of April, most of the herd had migrated through the refuge on their way to the calving grounds.

According to ADF&G surveys and estimates, calving was about "normal," peaking in early June. Fall migration and further ADF&G surveys now estimate the WAH at post-calving time to be close to 200,000 animals.

ADF&G biologists set an objective to maintain a minimum of 30 active radio collars on the WAH. Collaring caribou is a relatively easy task during the fall migration. The caribou are restrained and collared while crossing the Kobuk River. A large boat and motor (20 foot, 70 hp.) is needed to keep the animals in deep water. A cooperative effort was planned with ADF&G where we would each buy 10 collars. Some end-of-year funds were scrounged, but contract procurement problems developed and we didn't live up to our part of the bargain. ADF&G did "install" their 10 collars during September, as the caribou were heading south.

The peak of the fall migration occurred about the second week of September. During a single flight south of Ambler, on Sept. 7, over 8,000 caribou were observed on the refuge in small bands between the Selawik and Kobuk Rivers.

With the start of FY 84, telemetry surveys were initiated. As in the past several years, most caribou continued through the refuge. Primary refuge objectives are to assist in documenting local distribution, abundance and movements. As the field station becomes established and personnel available, more intensive ground surveys can be coordinated. Snow depth, compaction, and various vegetative surveys are but a few of the details necessary to help understand caribou movements and dynamics.

Regional and local ADF&G biologists drafted a management plan for the WAH. The plan was widely distributed, including local and regional Game and Fish Advisory Committees, for public and agency comment. It is presently being reviewed and comments addressed , and will be considered by the Alaska Board of Game in spring 1984.

The original document sets an optimum herd size of 200,000 caribou. With the intent of preventing an excessive population explosion followed by a crash, the plan also addresses potential methods of "controlling" the herd. The two most controversial will be commercialization and prohibiting harvest of predators, specifically wolves, to increase natural predation.

WOLVES: Without specific information and documentation, it is assumed that wolf populations are increasing concurrent with the caribou population. An ADF&G wolf research project was initiated during 1983. The objectives were not well defined but involved pack dynamics and movements. After a week rental of a helicopter and fixedwing aircraft to radio collar some wolves, the project was dropped. The difficulty locating wolves and the fact that the only one collared was killed two days later by a local hunter were primary considerations.



Fig. 23. Caribou crossing the Kobuk River in September.



Fig. 24. A group of caribou bulls "taking 5" after crossing the Kobuk River.

MOOSE. Neither the refuge nor ADF&G had the funds to conduct the 1983 refuge spring moose composition counts. However, moose were commonly observed during other field and aerial activities.

9. Marine Mammals

Probably the only marine mammal that wanders into the refuge boundary are spotted seals following chum salmon runs up the Kobuk River. However, having our office in Kotzebue, and the fact that marine mammal management remains the responsibility of the federal government, subjects us to almost monthly visits, complaints or inquires about marine mammals (Fig.25). Six sets of beachfound walrus ivory were engraved and registered (Fig.26). One CITES (Convention on International Trade of Endangered Species) permit was issued to export a set of walrus tusks to Australia. A set of walrus tusks was acquired by the station after authorizing a non-native to put to death a female walrus, beached and unable to move, near Cape Lisburne.

10. Other Resident Wildlife

MOSQUITOES. The NANA Regional Corporation requested and received cooperation from the Alaska Department of Environmental Conservation, for local testing of a biological agent, B.t.i. (Bacillus thuringiensis variety israeliensis) to control mosquitos (Culicidae) and blackflies (Simulidae) for the benefit of their reindeer herd. The test was conducted in July, on a small pond within Kotzebue's city limits. Neither ADF&G nor FWS were aware of the test until after the fact. Simply put, the B.t.i. is a lethal toxin to larval stages of mosquitoes and blackflies. It was found to be very effective in this test, and is registered and widely used throughout the United States. The label states it is also effective in controlling midges (Chironimidae). A larger scale test (maximum 2,000 acres) is scheduled for 1984.

This project has potential for grave environmental consequences. Questions concerning persistence and transportability could not be answered and the indirect side effects of eliminating a food base for fish and birds was not even considered.

An official response was submitted to the Alaska Department of Environmental Conservation recommending that B.t.i. not be registered for use in Alaska until the above questions are answered.

While there seem to be obvious advantages to people in the use of a biological agent instead of chemicals, and in the removal of a potential disease vector, the trade-offs in Alaska hopefully weigh on the side of wildlife.

11. Fishery Resources

Late in the year, State of Alaska grant funds were appropriated to conduct a feasibility study of constructing a fish processing plant in the village of Selawik. The plant would be capable of processing 260,000 pounds of whitefish, pike and lingcod into patties, sausage, imitation crab meat and other products. A new commercial fishery would be developed which could involve both conveyed and refuge lands.



Fig. 25. A gray whale carcass washed ashore in Kotzebue in September. It was courteously towed out to sea by a lighterage company, to float ashore somewhere else.



Fig. 26. It really isn't much fun beheading a beached walrus carcass.

Very little information is available on the fishery resource of refuge and adjacent lands. ADF&G fishery biologists purport that a harvestable surplus does exist. Other issues that must be addressed are local productivity, potential effects on refuge resources, navigability, the effect on subsistence as well as ANILCA section 304, which does not obligate the Secretary to issue a permit allowing commercial fishing activity significantly above the 1979 level. The intent of this endeavor is to expand the local economic base and provide suitable long-term employment opportunities. Hopefully, we'll begin building a base of biological information in 1984, with which to become involved in the decision-making process.

16. Marking and Banding

A bird marking and banding proposal was submitted to the Regional Office for comment and approval. It was given low priority by the Migratory Bird Office and consequently, no banding was accomplished during the year.

A band, from a sandhill crane taken on the Kobuk River delta, was turned in during the subsistence waterfowl harvest survey. The bird was banded in Brownfield, Texas, and adds credence to the theory that the refuge sandhill cranes contribute primarily to the mid-continental population.

H. PUBLIC USE

1. General

The major users of the refuge are subsistence oriented. Westernization of villages has forced new definitions of the word subsistence. In local terms, the issue becomes cultural. Eskimo perspectives evolved from living off the migrating/seasonal resources of the arctic. Western ethics of non-consumptive and consumptive use oftentimes clash with local ideas. Maintaining the integrity of the refuge will require the careful balances of both perspectives.

6. Interpretive Exhibits

The National Park Service Northwest Areas Office is located in Kotzebue and once again encouraged placement of a refuge display in their interpretive center. FWS literature is also made available. The center is located in the NANA museum and is a regular tourbus stop. It is open about 12-hours a day from June through August. The park service estimates approximately 4,900 people visited the center in 1983, which is a decrease of 3,500 people from 1982. The explanation relates to more accurate record keeping, than a true decrease in visitation. Most visitors are tourists associated with arctic circle tours.



Fig. 27. Director Robert Jantzen let this sheefish go, but not before the camera snapped.



Fig. 28. A superb example of a hand sewn fur parka made from ground squirrels, wolverine, wolf, otter, calf, seal, caribou sinew, and a willow dye.

7. Other Interpretive Programs

Programs were given at area schools during January and March. Emphasis was placed on increasing the understanding of migratory bird, mammal and refuge management.

The major thrust occurred during National Wildlife Week in March. The theme centered on relating local waterfowl banding data to the importance of public lands (refuges) here and in wintering areas. An interpretive talk, movie and hands-on demonstration were presented. Over 1,200 students viewed the programs.

8. Hunting

The entire refuge is encompassed within Alaska Game Management Unit 23. As shown in Table 11 seasons and bag limits are quite liberal. No major changes were made from 1982.

Harvest rates for large game animals are monitored by ADF&G harvest tickets. ADF&G has indicated that harvest tickets for moose closely resemble true harvest, while those for caribou and bear generally underestimate the actual harvest. Reported refuge harvest for 1983 follows:

	No. Harvest Tickets Reported	
Species	1982	1983
Moose	12	
Caribou	77	(season closes April 30, 1984)
Brown Bear	2	1

During the fall migration, caribou hunters were traveling by boat from Selawik to Rabbit Creek, a distance of over 100 river miles.

Spring and summer subsistence waterfowl hunting occurs on refuge lands. Current FWS "policy" allows for valid subsistence uses, even though taking between March 11 and September 1 is technically illegal. An attempt to document the magnitude and means of the spring harvest was initiated. A survey looking at the spring harvest of waterfowl was conducted in the villages of Noorvik and Selawik as part of a larger study looking at seven villages in the Kotzebue Sound region. A community resident was asked to gather information from May 1 to July 16, and mail in weekly reports to the refuge office in Kotzebue. Inspite of some problems (e.g. Selawik's harvest was only collected for May because of the lack of participating hunters), the report highlighted several species of waterfowl and the importance of a spring harvest to local users (Table 12, 13 and Fig. 29, 30).

Weather permitting, snowmobiles are initially used in hunting. There is a one to two week halt in hunting while the Kobuk and Selawik Rivers clear of ice. This year breakup occurred around May 15. An increase in hunting effort then occurs with the use of boats for transportation. Harvest of birds decreases during the nesting period as the birds become thinner and less palatable. Egging and harvest of molted birds occurs, but more and more attention has been switching to fishing and summer employment.

Alaska Game Management - Unit 23

Hunting & Trapping Seasons 1983/4

Regulations effective July 1, 1983-June 30, 1984

Department of Fish and Game, Box 686, Kotzebue, Alaska 99752

UNIT 23: KOTZEBUE SOUND: The area drained by all streams flowing into the Arctic Ocean and Kotzebue sound from Cape Lisburne on the north to, and including, the drainage into the Goodhope River on the south.

HUNTING SEASONS and BAG LIMITS

SPECIES	OPEN SEASON	BAG LIMIT
Black Bear	No closed season	Three bears, however the taking of cubs or females accompanied by cubs is prohibited.
Grizzly Bear	Resident: Sept 1-Oct. 10 April 15-May 25	One bear every four regulatory years; taking of cubs and females accompanied by cubs is prohibited.
Grizzly Bear	Nonresident: Sept 1-Oct. 10 April 15-May 25	One bear every four regulatory years by drawing permit only; The taking of cubs and females accompanied by cubs is prohibited. 25 permits will be issued. See separate permit hunt supplement.
Caribou Units 22A, 22B, 23, 24 and 26A	July 1-April 30	Five caribou; additional caribou may be taken by registration permit.
Moose (That portion on the Seward Peninsula west of and including the Kiwalik drainage.)	Aug. 1-Mar. 31	One moose; cow moose may be taken only from Sept. 15-Mar. 31.
Moose (Buckland Drainage.)	Aug. 1-Dec. 31	One bull
Moose (Remainder of Unit 23)	Aug. 1-Dec. 31	One moose; antlerless moose may be taken only from Sept. 15-Oct. 31.
Musk oxen	No open season	
Mt. Sheep	Residents of GMU 23 who permanently reside north and west of the Noatak River: Aug. 1-Apr. 30	One Sheep, by registration permit only; 50 sheep may be taken.
	All other hunters: Aug 10-Sept. 20	One ram with 7/8 curl or larger.
Wolf	Aug. 10-Apr. 30	No limit
Wolverine	Sept. 1-Mar. 31	One Wolverine
Beaver	No open season	
Coyote	Sept. 1-Apr. 30	Two coyotes
Arctic Fox	Sept. 1- Apr. 30	Two foxes
Red Fox	Nov. 1-Feb. 15	Two foxes
Lynx	Nov. 1-Mar. 31	Two lynx
Red Squirrel & Parka Squirrel	No closed season	No limit
Grouse	Aug. 10-Apr. 30	15 per day, 30 in possession
Ptarmigan	Aug. 10-Apr. 30	20 per day, 40 in possession
Snowy Owls	No closed season when utilized for food	No limit
Snowshoe Hare & Jack Rabbit	No closed season	No limit

TRAPPING SEASONS and BAG LIMITS

SPECIES	OPEN SEASON	BAG LIMIT
Beaver	Nov. 1-June 10	30 per season
Muskrat	Nov. 1-June 10	No limit
Coyote	Nov. 1-Apr. 15	No limit
White Fox	Nov. 1-Apr. 15	No limit
Red Fox	Nov. 1-Apr. 15	No limit
Lynx	Nov. 1-Apr. 15	No limit
Marten	Nov.1-Apr. 15	No limit
Mink & Weasel	Nov. 1-Jan. 31	No limit
Otter, Land	Nov. 1-Apr. 15	No limit
Squirrel and Marmot	No closed season	No limit
Wolf	Nov. 1-Apr. 15	No limit
Wolverine	Nov. 1-Apr. 15	No limit

LICENSES, TAGS and PERMITS

All individuals over 16 and under 60 must purchase a hunting and/or a trapping license. In addition a harvest tag is required for caribou, moose, and sheep. If more than 5 caribou are wanted a special registration permit is required. A 25 dollar tag is required before killing a grizzly bear.

Nonresidents and aliens must purchase a big game tag for each big game animal to be taken. Nonresident tags are available at license vendors. Nonresident grizzly hunters must apply for a special 5 dollar permit. Application deadlines:

Spring hunt-Jan 20
Fall hunt-June 24

SEALING REQUIREMENTS

All of the following animals shot or trapped in GMU 23 must be sealed:
Grizzly bears, lynx, land otter, wolf, wolverine and beaver.

GAME BIOLOGIST - DAVID JOHNSON, ROLAND QUIMBY, phone 442-3420
and DAVID JAMES - AMBLER - 445-2175
GAME WARDEN - ROLLIN YOUNG -phone 442-3925

Table 11. Hunting & trapping seasons and bag limits for unit 23.

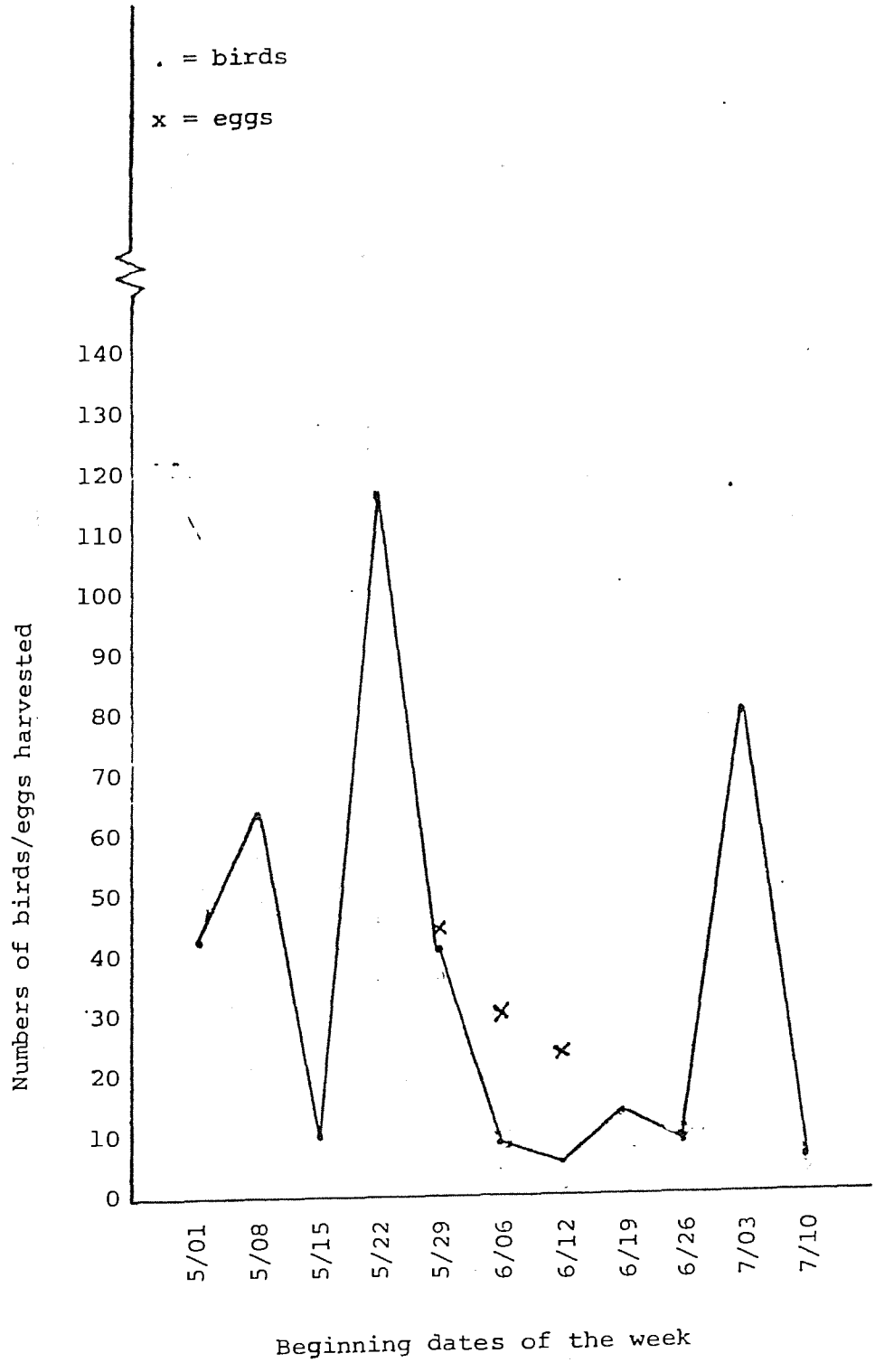

Figure 29. Harvest of birds and eggs in Noorvik, 1983.

Table 12. Weekly harvest of birds/eggs by species in Noorvik, 1983.

Date	Canada gse/ iqsragutilik	Wh-frt. gse/ kigiyuk	Snow gse/ kanuq	Black brant/ nigliqnak	Tundra swan/ qugruk	Sdhill crane/ tattirgak	Mallards/ kurugasugruk	Wigeons/ ugiihiq	Pintails/ kurugaq	Oldsquaws/ ahaaliq	Arctic loon/ qaksrauq	Red-th.loon/ qaqsrauchauraq	Common eider/ mitiq	Scoter spp./ tuungaagruq	Murre spp./ aqpak	Gull spp./ nauyaq	B-l.kittiwake/ tiqitigaq	N. shoveler/ alluutaq	Greater scaup/ qaqluktuuk	R-b. merganser/ paisugruk	Grn-w. teal/ qaingngiq	Others
5/01	33/0						1/0		9/0													
5/08	28/0	2/0				2/0	4/0	3/0	22/0		1/0							2/0				
5/15	5/0						1/0	1/0	1/0	2/0												3/0[a]
5/22	1/0						3/0	37/0	30/0	10/0			2/0	18/0				2/0	3/0		3/0	8/0[a]
5/29	0/25			3/0	0/12	0/7		7/0	4/0	11/0	2/0			9/0				1/0		1/0		3/0[a]
6/06	0/24				0/6	2/0		4/0						1/0							2/0	
6/12	0/8								2/0		2/0	0/16				0/6		2/0				
6/19	6/0							3/0	5/0													
6/26								2/0	7/0													
7/03	4/0				1/0			34/0	32/0		1/0			4/0				2/0				3/0[a]
7/10	6/0																					
TOTAL	83/57	2	0	3	1/18	4/7	9	91	112	23	6	0/16	2	32	0	0/6	0	9	3	1	5	17[a]

[a] canvasbacks.

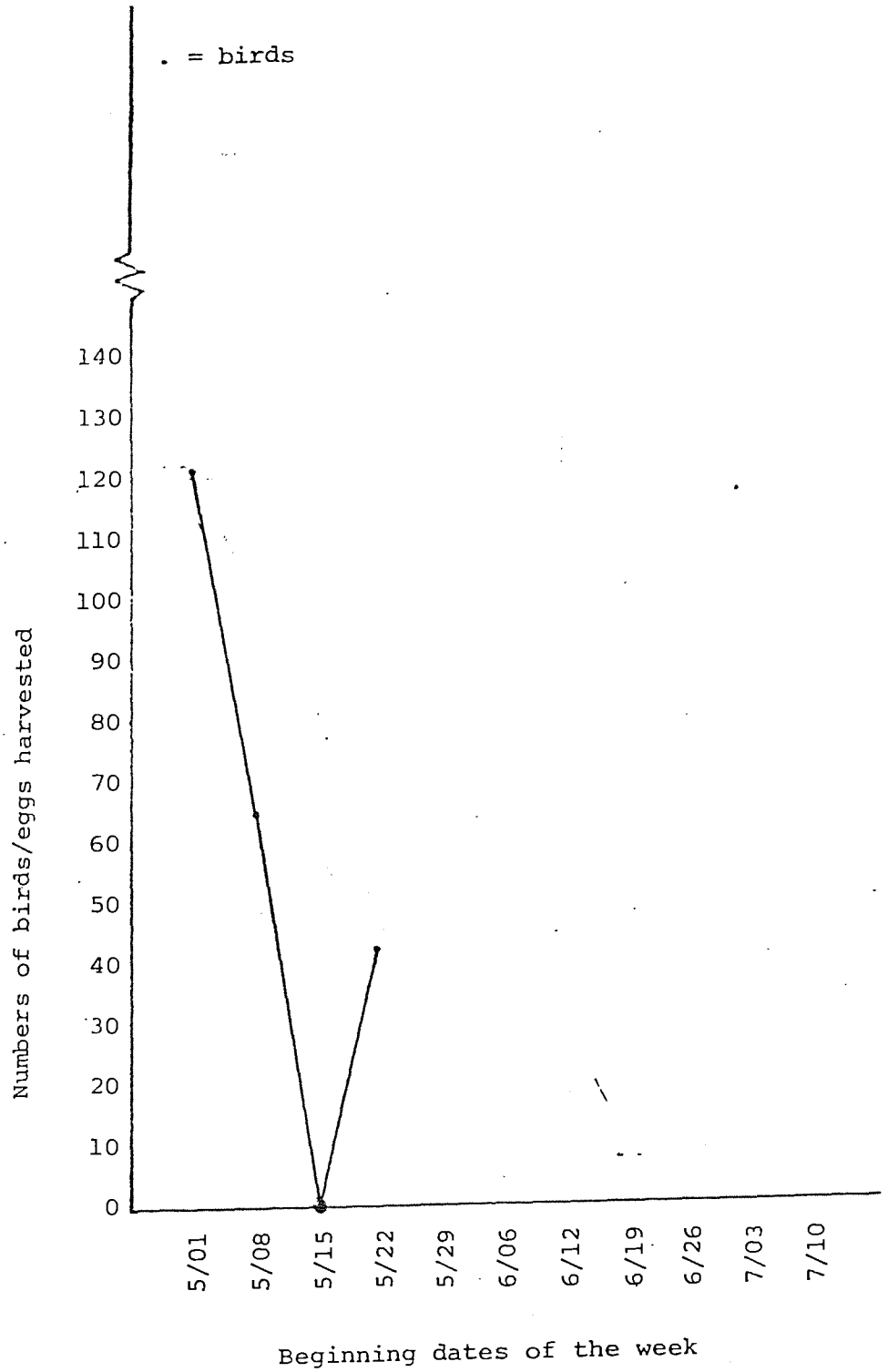

Figure 30. Harvest of birds and eggs in Selawik, 1983. Reporting from Selawik ended on May 28, 1983.

Table 13. Weekly harvest of birds/eggs by species in Selawik, 1983.

Date	Canada gse/ iqsraġutilik	Wh-frt. gse/ kigiyuk	Snow gse/ kanjuq	Black brant/ niġliġnak	Tundra swan/ qugruk	Sdhill crane/ tattirgak	Mallards/ kuruġasugruk	Wigeons/ uġiihiq	Pintails/ kurugaq	Oldsquaws/ ahaaliq	Arctic loon/ qaksrauq	Red-th.loon/ qaqsrauchauraq	Common eider/ mitiq	Scoter spp./ tuunġaaġruq	Murre spp./ aqpak	Gull spp./ nauyaq	B-l.kittiwake/ tiqitiġaq	N. shoveler/ alluutaq	Greater scaup/ qaqƛuktuuk	R-b. merganser/ paisugruk	Grn-w. teal/ qaingngiq	Others
5/01	42/0	17/0			3/0	2/0	22/0		36/0													
5/08	21/0	6/0				1/0	3/0	11/0	23/0													
5/15																						
5/22	3/0		2/0	1/0				8/0	9/0					19/0								
5/29[a]																						
6/06																						
6/12																						
6/19																						
6/26																						
7/03																						
7/10																						
TOTAL	66	23	2	1	3	3	25	19	68	0	0	0	0	19	0	0	0	0	0	0	0	0

[a]Reporting from Selawik ended on May 28, 1983.

For Noorvik, Canada geese, wigeon, pintails, and scoters are important species harvested by the residents. In Selawik, the major species harvested are Canada and white-fronted geese, mallards and pintails. Unlike the five other villages studied, the fall harvest level in Noorvik and Selawik are reportedly equal instead of below the intensity of a spring harvest.



Fig. 31. A traditional Eskimo summer fish camp igloo on the Selawik River.



Fig. 32. This igloo was used during September beaver cache survey.

9. Fishing

Sport and subsistence fishing fall under considerably different state regulatory authorities. Refuge use is primarily subsistence fishing. Many villagers spend considerable time at spring, summer or fall fish camps.

Subsistence fishing allows for the use of gill nets up to 300 feet long, fishwheels, hand operated jigs or spears and hand traps. Thousands of pounds of fish are taken each year for human and sled dog consumption from both the Selawik and Kobuk Rivers. Northern pike, sheefish and whitefish are the primary species taken.

Very little sport fishing (with rod & reel) is done on the refuge.

10. Trapping

Trapping is authorized on refuge lands in accordance with state regulations (Table 11). The following Fig.33 provides a general picture of the take represented by Alaska Department of Fish and Game (ADF&G) sealing, export, and fur dealer reports. Arctic fox and martens are uncommon in the Selawik River drainage. Data is missing for muskrats in 1981-83, mink in 1981-82, and red fox in 1981-82. ADF&G believes the reported harvest closely represents the actual harvest, except for otter, wolverine and wolves which are underreported. The local demand for these furs results in selling without sealing.

I. EQUIPMENT AND FACILITIES

1. New Construction

An administrative superinsulated cabin was erected about 35 air miles east of Selawik (Fig. 34). The location is known to Eskimos as Upiinganiigvik- "place to spend the summer". The site is accessible by boat and air during winter and summer.

The materials were transported by snowmobile during April. The cabin was not erected until late June, due to ice in Selawik Lake preventing boat access up the Selawik River.

The shell was erected in about 8 hours and the building completed in about 3 days, by 2 people. An arctic entrance, solar panel and radio antenna post were added later.

4. Equipment Utilization and Replacement

The old city police building, 10'x50' trailer, is being leased from the city of Selawik for $300 per month. It is being used to store snowmobiles, sleds and inflatable boats, as well as sleeping quarters during periodic visits to the village.

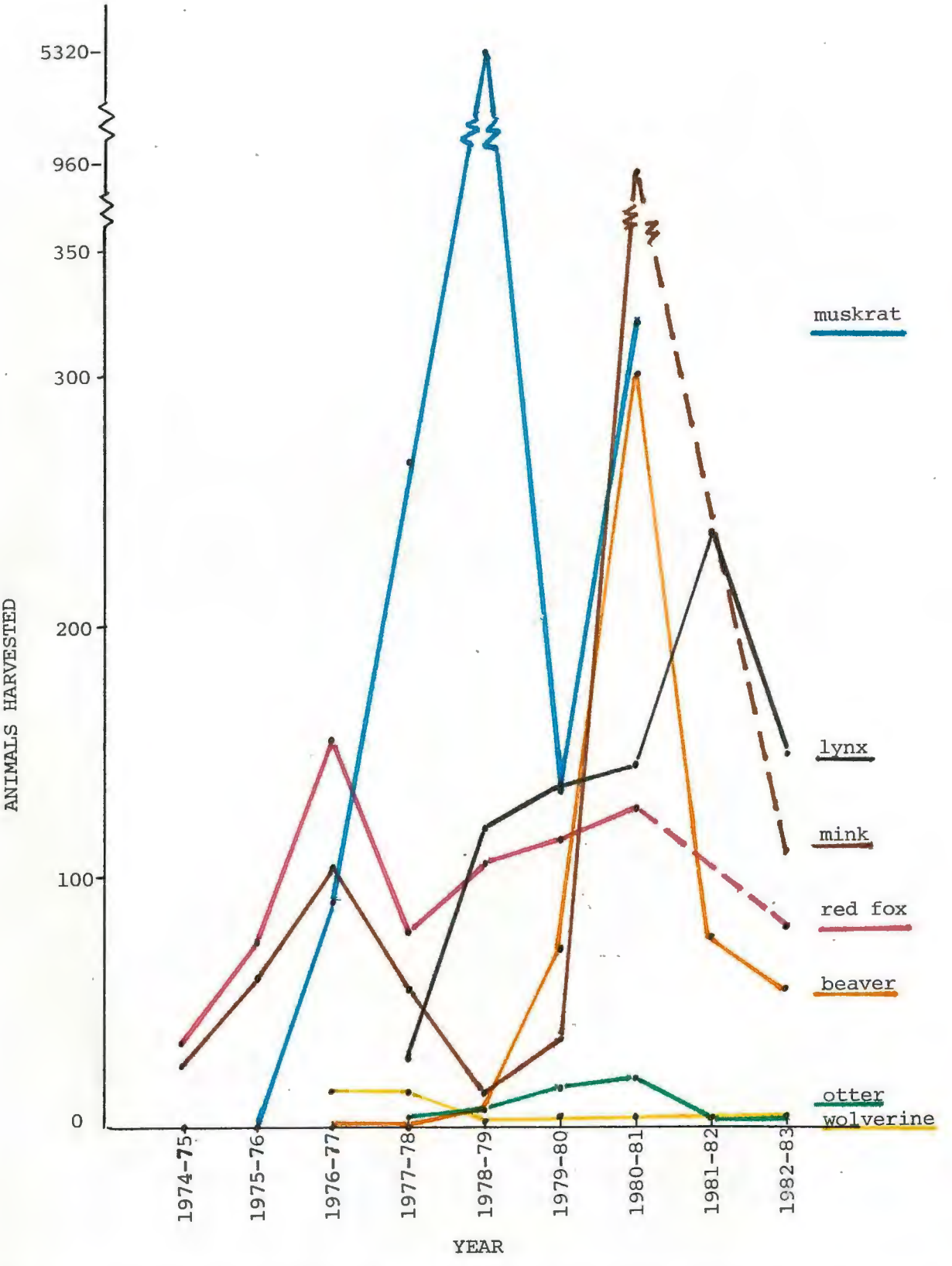

Fig. 33 . Furbearer harvest on Selawik River drainage based on Alaska Dept. of Fish and Game sealing, export and fur dealer reports.



Fig. 34. The refuge's adminstrative, superinsulated cabin is accessible year-around, by boat and air.



Fig. 35. Chuck Diters making an archeological dig near the "Paniksigvik" shelter cabin.

A Piper Super-cub, equipped with floats, wheels and wheel-skis was purchased with Regional Office FY 83 end-of-year funds. Delivery is expected in early 1984.

5. Communication Systems

Motorola Micom SSB radios and antennas were installed in the Kotzebue residence, administrative cabin, Selawik storage building and the 18' Valco boat.

J. OTHER ITEMS

1. Cooperative Programs

Regional archeologist, Charles Diters, conducted two site specific investigations during a visit to the refuge this year. Both involved cabins.

In 1983, a special use permit was issued to Selawik Search and Rescue, to erect an emergency shelter cabin at a traditional river crossing on the Kugarak River at a place called Paniksigvik. It was discovered after the cabin was erected that Paniksigvik has been designated a historical site.

The other site is the refuge cabin. It was also discovered after the fact that this site was designated as having very high potential as an archeological site.

No excavation was involved with either cabin. Since the Paniksigvik site had already been designated as a historical site, a site investigation was requested to insure the cabin's presence would not alter the character or attract attention to the site. Random digs were made of both sites. Diters determined that both cabins are in compliance with the intent of the law.

2. Items of Interest

Robert Jantzen, Director of the Fish & Wildlife Service visited the field station from July 22-24. He was accompanied by Alaska Regional Director Keith Schreiner, Deputy Regional Director Jan Riffe, and Vern Wiggins of the Alaska Land Use Council.

James Gillette, Chief of Refuges, visited the field station on August 3 and 4. He was accompanied by John Kurtz, Alaska Refuge Supervisor - North, and John Martin, Acting Refuge Manager of Arctic National Wildlife Refuge.

3. Credits

Hall - writing, editing

Koutchak - typing, assembly