

KANUTI NATIONAL WILDLIFE REFUGE

Fairbanks, Alaska



ANNUAL NARRATIVE REPORT

Calendar Year 1985

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

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1985



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NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

KANUTI NATIONAL WILDLIFE REFUGE  
Fairbanks, Alaska

ANNUAL NARRATIVE REPORT  
Calendar Year 1985

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3-15-86  
Date

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7/1/86  
Date

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7/1/86  
Date



## INTRODUCTION

Kanuti National Wildlife Refuge was established on December 2, 1980 by Public Law 96-487, the Alaska National Interest Lands Conservation Act (ANILCA), as one of nine new refuges. The establishing legislation states Kanuti NWR "shall consist of the approximately one million four hundred and thirty thousand acres of public lands depicted on the map..." incorporated into the legislation. ANILCA requires interim management by the Refuge of Native lands selected under ANSCA that were not yet conveyed. Currently selections are still being conveyed and acreages are constantly changing as conveyances to Native Regional and Village Corporations and Individual Native Allotments take place. At the present rate it will be several years before all lands are conveyed, surveys completed and easements established for access to both refuge and native lands.

Kanuti NWR is located predominantly in a basin, formed by the broad Kanuti and Koyukuk river valleys, slightly north of the central Alaskan land mass in the foothills of the Brooks Range. The Ray Mountains lie to the south and high ground consisting of foothills and mountains to the east and west. The refuge lies on the Arctic Circle between 66 and 67° north latitude and 151 to 153° west longitude, about 150 air miles northwest of Fairbanks. The north slope haul road and pipeline pass a few miles east. Four native villages lie just outside the boundaries, Evansville/Bettles Field to the north and Allakaket/Alatna to the west. The villages, along with other scattered permanent dwellings in the area, have approximately 400 people. Most of these are Athabascan Indians, with some Eskimos and Caucasians. Many of these individuals pursue a subsistence lifestyle on the refuge for at least a portion of their needs.

Historically, mining was fairly widespread in the area. Several settlements existed in the late 1920's along the rivers and "diggings" were fairly widespread. At present no mining nor claims exist in the refuge and no obvious remains exist of the historic activity.

Humans have lived in Alaska for a minimum of 10-20,000 years. The Kanuti Flats and surrounding area are part of this long chain of human occupation, therefore several archeological sites exist in the refuge. Some of these areas have been identified by native groups and selected as cemetery/historical sites, while undoubtedly others remain unknown. Most of the archeological sites are middens of the hunter-gather type.

The climate in this area is characterized as continental, with slightly higher precipitation than average. Summers are short with generally moderate temperatures, winters are very long and cold. Spring and fall are brief, abrupt affairs. Thaw begins in April, with river break-up generally in mid May. During May through September, average daily highs range upwards of 50°F. In September, the cold returns again and for the seven months from November through March the mean temperature is below zero. Each winter, temperatures in the -40° to -50°F range occur from one to several weeks, while summer temperatures range into the 90's. The extreme temperature range here is among the greatest on earth, from -70° to 92°F, over 160°. Little precipitation occurs, with most falling in August. Almost all snow falling during the winter remains, as thaws are very rare. The average precipitation for the area as a whole is perhaps 12-13 inches.

Topographically, the refuge consists of rolling to flat plains, covered with numerous lakes and crisscrossed by streams and rivers. Elevations range from 500 to 700 feet through the central area, to over 3,000 feet in the surrounding mountains, plateaus and foothills.

Most of the refuge consists of boreal forest and taiga. However, these terms are misleading in that the area is a complex of small diverse plant communities existing on numerous types of physiography and formed by many physical, serial and fire factors which form a complex mosaic of plant communities in most areas. Predominant plant communities include closed forests consisting of white spruce, paper birch and balsam poplar on uplands, with stands of large balsam poplar along rivers. Forests of large white spruce and paper birch exist along the Koyukuk. Poorly drained areas support open forests of black spruce with scattered birch, poplar and heath shrubs underlain by sphagnum moss, sedges and grass. Muskegs cover much of the lower lying valley areas. Under extremely wet conditions muskegs grade into treeless bogs dominated by small shrubs. Along watercourses, tall shrub thickets occur, with smaller versions on some upland areas.

At present, habitat types and their acreages are being identified and mapped in the comprehensive planning effort, along with water types and areas. Section F describes these habitat types and gives acreages for each one. The low-lying central refuge area, known as Kanuti Flats, is the most productive area and supports numerous nesting waterfowl, other bird species, furbearers, moose, bear, wolf, and smaller mammals. The overall diversity of the habitat maze provides for an equally diverse wildlife population consisting of approximately 146 bird, 34 mammal and 17 fish species. An abundance of waterfowl nesting habitats exist. Some of the more important nesters include white-fronted geese, Canada geese, pintail, widgeon, scaup and scoters. White-fronted geese produced on the area go mainly to the Central Flyway, while duck production may contribute to all major flyways.

Kanuti NWR was primarily established as a waterfowl breeding area, especially for white-fronted geese. Species referred to in the establishing order (ANILCA Sec. 302 (4) (B) include but are "...not limited to...white-fronted geese and other waterfowl and migratory birds, moose, caribou...and furbearers", with the primary intent "to conserve fish and wildlife populations and habitats in their natural diversity." Also stated in the order are the fulfilling of treaty obligations and furnishing the opportunity for continued subsistence uses for local residents and adequate water quantity and quality for fish and wildlife populations and habitats.

The Refuge headquarters is located in Fairbanks where other land management agencies and organizations that have lands in or adjacent to the refuge are headquartered. Efforts to establish a field sub-headquarters at Bettles Field is well underway. A cooperative effort with NPS and BLM (Alaska Fire Service) for joint facilities is being requested.

Since there are presently no roads to the refuge or to the villages adjacent to the refuge all operations are via air to large lakes and gravel bars, followed by either boat or foot travel.

Current operations are centered around the gathering of base data, documenting

occurrence of refuge resources and their present and historical use. The processes for developing the Kanuti Comprehensive Conservation Plan were initiated in the Spring of 1984. Plan completion is scheduled for fall 1986.

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#### A. Highlights

Kanuti NWR office was moved to the basement of the Federal Building in January for convenience of other expanding FWS offices in Fairbanks.

The Data General Computer terminal was received at long last in January 1985 and as of January 1986 is still not usable!

Kanuti NWR was one of the first to undergo the R-7 Refuge Programmatic Evaluation.

Kanuti NWR had a three-Clerk turnover during calendar year 1985.

An unrealistic travel ceiling played havoc with Refuge operations and planning from February to mid-May.

An inept financial system of the FWS continued to provide nightmares for the Kanuti administrative staff and used up valuable time.

Progress on the Kanuti Comprehensive Conservation Plan continued throughout the year resulting in a draft ready for printing.

Efforts to obtain a Memorandum of Agreement between NPS, BLM (AFS) and the FWS for joint-use facilities in Bettles was initiated. The existing building housing Bettles Trading Post was purchased for the Kanuti NWR bunkhouse and joint office space for NPS, BLM and FWS.

Refuge inholdings were prioritized and reviewed on site by FWS appraisers for potential land trade.

Charges were filed against two individuals from Anchorage that built an illegal cabin on the refuge. Fines were paid.

In cooperation with the Regional Fire Coordinator a radio communication system was planned and a portion purchased for the refuge. Installation remains to be accomplished.

A log-cabin was leased in Allakaket for Administrative purposes and lost due to unexplained loss of payment checks.

Meetings were held with representatives of all land inholders within the refuge to discuss matters of mutual concern and to develop a cooperative relationship.

An unusual wet fire season resulted in only one fire on Kanuti NWR.

The field work for the study of waterfowl use of beaver influenced lakes was completed. A thesis by a UAF graduate student will be completed in CY 1986.

A stratification and census of moose in cooperation with ADF&G, waterfowl production surveys and other general wildlife surveys were completed during this report period.

Black bears harassed field crews throughout the summer. Training and level-headedness prevented personal injuries and any bears from having to be killed.

Fairbanks Fisheries completed several lake surveys and an aerial census of salmon spawning streams on Kanuti NWR.

The household interviews for subsistence use of refuge resources were completed for the third year and averaged, again, better than 80% participation by local residents.

In cooperation with NAES water analysis for placer mining contaminants was accomplished on three streams in the northern portion of the refuge.

## B. Climatic Conditions

The most reliable weather information for Kanuti National Wildlife Refuge is obtainable through the facilities of the FAA flight service station at Bettles Field, located 3 miles outside of the refuge's northern boundary on the Koyukuk River, which records information for the National Weather Service. The refuge covers a large, fairly diverse region, however, and climatic conditions may vary throughout it. For example, unofficial temperatures in Allakaket, two miles outside the west central refuge boundary and 36 air miles from Bettles, are frequently 10°-20° F. colder than Bettles. Wind, precipitation, and other weather conditions may vary across the refuge as well.

Bettles climate is typical of Interior Alaska. Summer days are long and mild, with maximum temperatures usually in the high sixties and low seventies, occasionally in the eighties. Due to its location, north of the Arctic Circle, the sun does not set from June 2 until July 9. Spring and fall are short, dramatic transition periods. River breakup usually occurs from mid-to late-May. Freeze up takes place in October or early November. Winters are long and cold, minimum temperatures averaging below zero from November through March, with occasional lows each year of -45°F. to -55°F.

Average annual precipitation is 13.26 inches, categorizing the Bettles area as a continental climate region. The greater amount of precipitation falls as rain from June through October. Average precipitation then tapers off through the rest of the year to a low in May. Total snowfall for a year has ranged from less than 40 inches to more than 130 inches.

Winds are generally moderate, averaging 6.7 mph and steady, blowing from north by northwest all months except July and August. Strong winds occur infrequently.

1985 temperatures, as recorded in the accompanying chart, were somewhat erratic as compared to normals. January and December of 1985 recorded average temperatures approximately 20 degrees higher than normal. February, April, October and November were slightly colder than normal. Temperatures through the year ranged from a low of -56°F. in February to a high of 80°F. in June.

Precipitation figures show 1985 to have been a slightly wetter year than normal, with a total of 15.81 inches, 1.83 inches above normal. September recorded the greatest amount of precipitation, two and one half times that normally expected that month. May, usually the month with the lowest amount of precipitation, received twice as much rainfall as usual.

Snowfall for the entire year was approximately 120 inches. January, April, November, and December recorded the greatest monthly snowfalls. The first snows for winter 1985-86 fell early in October, but did not accumulate in large amounts until mid-November.

TABLE 1.

1985 TEMPERATURE, TOTAL PRECIPITATION AND SNOWFALL  
Bettles Airfield  
Reported in Fahrenheit and Inches

<u>TEMPERATURE</u>	<u>MONTHS</u>												<u>YEARLY TOTALS AND AVERAGES</u>
	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	
HIGH	32	26	31	42	73	80	79	59	46	59	28	34	51
LOW	-14	-56	-35	-26	16	37	41	33	12	-22	-35	-33	-6.83
AVERAGE	10.3	-14.4	6.9	10.7	41.2	56.2	60.3	53.5	38.7	14.7	-5.9	7.2	23.28
NORMAL	-14.5	-9.7	.8	20.3	42.8	56.8	58.6	53.2	40.5	18.9	-0.8	-12.2	21.22
DEPARTURE	24.8	-4.7	6.1	-9.6	-1.6	-.6	1.7	.3	-1.8	-4.2	-5.1	19.4	2.05
<hr/>													
<u>PRECIPITATION</u>													
4 MONTHLY	.87	.27	.96	.12	1.01	1.56	1.45	2.4	4.24	.82	0.87	1.24	15.81
NORMAL	.76	.68	.71	.60	.50	1.37	1.64	2.34	1.68	1.21	0.95	.82	13.26
DEPARTURE	.11	-.41	.25	-.48	.51	.19	-.19	.06	2.56	-.39	-.08	.42	1.83
<hr/>													
<u>SNOW</u>													
MAX. DEPTH ON GROUND	22	27	38	31	15	0	0	0	0	6	17	21	
MONTHLY SNOWFALL	20.9	9.9	21.8	2.8	3.7	0	0	0	0	10*	20.9*	29.8*	120

\* Estimate from "monthly precipitation" measurement.



Lenticular ice layers such as this one on Fish Creek  
are often seen throughout the refuge on streams and  
some lakes.                      July 1985                      H.H.

## C. LAND ACQUISITION

### 1. Fee Title

Kanutu NWR's boundary encloses about 1,635,000 total acres of which approximately 408,961 acres have been selected by various native interests. The status of these inholdings are summarized in semi-tabular form on Page 7 with the areas shown on Fig. 1. Since selections exclude navigable water and the refuge acreage includes these waters, roughly 1/4 of the land area within the refuge's borders is, or will be, private lands.

### 2. Easements

Refuge recommendations on easements across inholdings have apparently been successful in that they are still in the draft documents, although final easements have not been designated at this time. As the adjacent land managing agency, the refuge will have management burden of some proportions, especially for easements permitting large vehicles. Needless to say, we have a preference for recommending 25 foot trail easements, which limit traffic to less than 3,000 pounds GVW. Hopefully, the easements will be used as most trails are at present, for snowmobile and sled traffic.

Existing traditional trail routes could also be a management problem of large proportions, depending on how the RS 2477 Easement question is finally settled. If the RS 2477 Easement issue is decided in favor of unlimited vehicle access the effect upon refuge lands could be major indeed. Large crawler tractor traffic along a traditional sled trail will be very damaging.

### 3. Other

The Land Bank, Cooperative Management Agreements and other strategies exist which can make management of the refuge as a whole possible with the large, scattered inholdings. However, these makeshift arrangements will never permit management in full. Therefore, high refuge priority is placed on reducing potential conflicts of inholdings through land trades or purchase.

Since the haul road passes only few miles to the east, we have a major interest in the final disposition of the haul road corridor, which the state has requested. If ownership is passed on to the state, it will undoubtedly have a major effect on the refuge. Opening this area to settlement would create a myriad of problems ranging from increased public use, causing conflicts with subsistence users, to trespass and increased water pollution. By Cooperative Management of this area through agreements the refuge could reasonably assure a reduction of adverse impacts.



TABLE 2.

STATUS OF INHOLDINGS

Source: BLM Automated Land Records, Printout Dated 1/23/86

## ACTIVE CLAIMS

Native Allotments

Individuals with Selections	42
Number of Land Parcels Selected	80
Number of Parcels Surveyed	33
Acreages	
Selected Status	3,500 ac.
Surveyed (Patented) Status	1,740
	<hr/>
TOTAL	5,240 ac.

Village Claims

Villages with Selections	3
Acreages	
Selected Status	17,749 ac.
Interimly Conveyed	71,086
	<hr/>
TOTAL	88,635 ac.

Regional Claims

Regions Selecting	1
Acreages	
Selected Status	122,316 ac.
Interimly Conveyed	173,017 ac.
	<hr/>
TOTAL	295,333 ac.

Cemetery/Historical Sites

Number of Sites	12
Acreages	
Selected	12,154 ac.
Conveyed	0
	<hr/>
TOTAL	12,154 ac.

ANCSA 14H8 Overselections

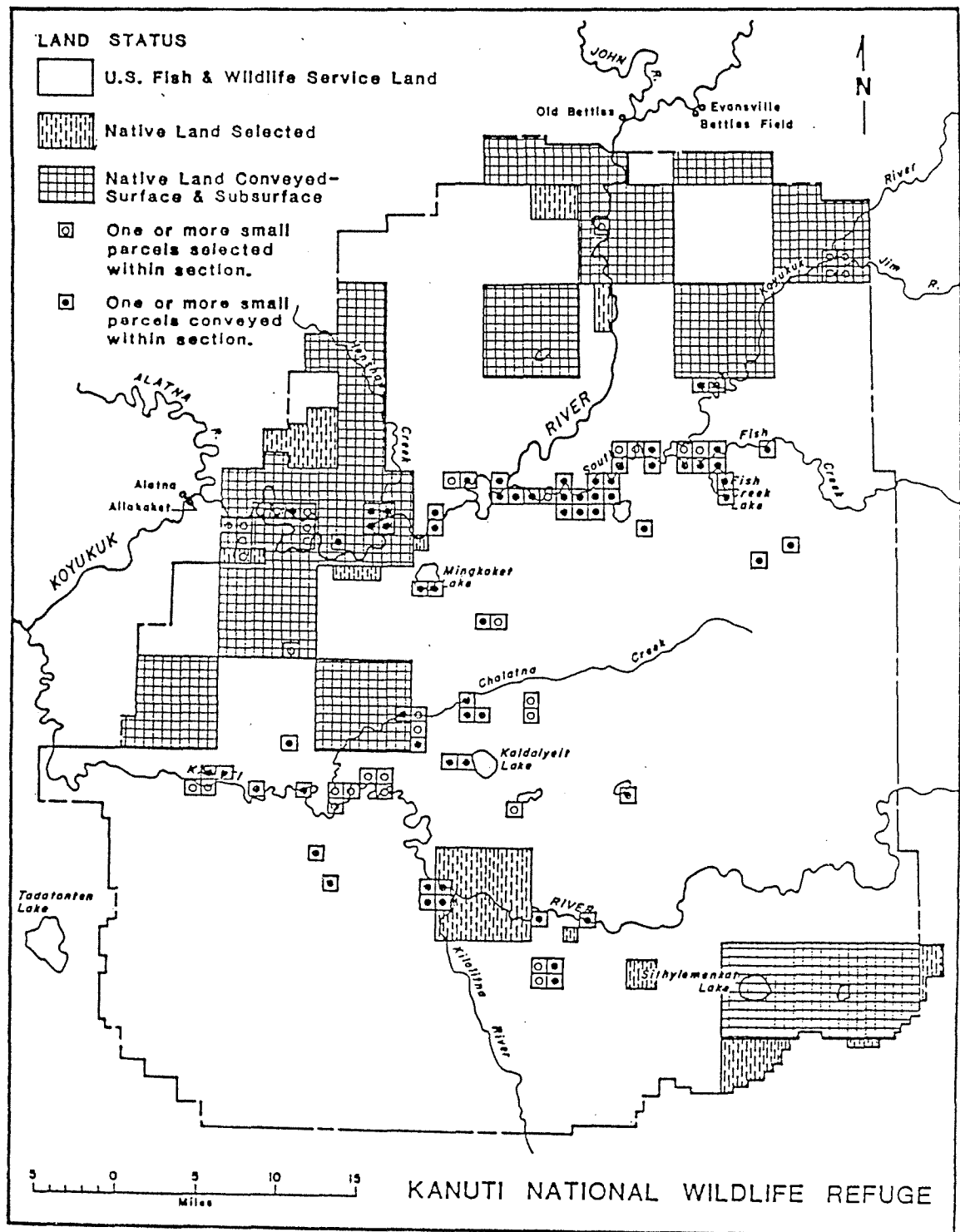
Acreages	
Selected	7,594 ac.
Conveyed	0
	<hr/>
TOTAL	7,594 ac.

	<u>Homesites</u>	
Number of Sites		1
Acreages		
Selected		5
Conveyed		0
	TOTAL	<u>5</u>
GRAND TOTAL, Active Claims and Conveyances:		<u>408,961 acres</u>

STATUS CLOSED, NO CONVEYANCE

	<u>Native Allotments</u>	
2 cases		240 ac.
	<u>Village Selections</u>	
1 case		420 ac.
	<u>Regional Sections</u>	
1 case		4,307 ac.
	<u>ANCSA 14H8 Overselections</u>	
5 cases		28,653 ac.
	<u>Homesites</u>	
1 case		5 ac.
GRAND TOTAL, Disallowed Claims:		<u>33,625 ac.</u>

Figure 1. Land status



## D. Planning

### 1. Master Plan

The preparation of the Comprehensive Conservation Plan (CCP) required by ANILCA Sec. 304 (a) and initiated in early 1984 continued to progress toward a draft form ready to be printed in early CY 1986.

Management Alternatives Development Workshops were held in Bettles/Evansville, Allakaket/Alatna, Hughes, Fairbanks and Anchorage. The Planning Team lead by Leslie Kerr continued to compile and develop the available information into reasonable management alternatives. A preferred alternative was selected which included minimum and moderate management areas.

### 2. Management Plans

Various resource management plans are in the making, but have been tentatively placed on hold until the CCP is complete.

### 3. Compliance with Environmental and Cultural Resource Mandates

All environmental and cultural resource mandates are being acted upon. Water quality monitoring was initiated on three streams in the northern portion of the Refuge to detect potential placer mining contaminates. Rod Simmons of NAES and RM McIntosh sampled water, sediment and tissue from Koyukuk River, South Fork and Fish Creek during the summer of CY 1985. The analysis has not yet been received.

Local hire Johnson Moses and Eliza Jones of UAF worked diligently upon local place names of areas within and adjacent to Kanuti NWR. Since the USGS maps have few names for lakes and areas within the refuge and to keep employees from continuing to make up names for places that may eventually create a conflict with local residents it was decided to obtain the long standing local native names and inset them on a map with the English pronunciations and meanings.

The descriptive names of the places given by local Athabascan Indians provides a wealth of knowledge concerning the history of their use of the refuge as well as past wildlife use.

### 5. Research and Investigations

#### Cooperative Subsistence Study

The Cooperative Subsistence Study, "Contemporary Resource Use Patterns in the Upper Koyukuk Region", was finally received from the ADF&G. The report was good and provided the base that the second phase could easily follow. The second phase, consisting of monitoring of resources harvested by local residents on an annual basis in order to detect changes and impacts various development and socio-economic conditions have on the local residents utilization of the resources, was initiated in CY 1984 and

continued in CY 1985. The CY 1984 progress report was revised following receipts of ADF&G's report in order that the presentation of information was uniform. The CY 1985 progress report is presently nearing completion.

Kanuti NR 85 "Effects of Beaver Activity on Kanuti National Wildlife Refuge Waterfowl and Ecology" 75610-01

This Study is a five year cooperative effort between Alaska Cooperative Wildlife Research Unit of UAF and Kanuti NWR to lay the ground work for understanding the Kanuti wetland dynamics, including the interrelationships of hydrology, vegetation, waterfowl, furbearers, big game, fish and other wildlife. Beaver are particularly important in the Kanuti wetlands because their damming and other activities are probably the most dynamic process influencing refuge hydrology. Any change in physical or chemical limnologic characteristics could exert profound effects on waterfowl habitat, it is highly desirable to establish a basic understanding of Kanuti NWR wetland dynamics. An investigation of beaver activity is a logical starting place to begin an understanding of Kanuti ecosystem.

The first phase of the Study was to determine waterfowl use of beaver influenced lakes with a thesis being prepared by graduate student Donna Kafka entitled Waterfowl Use of Various Stages of Beaver - Influenced Wetlands of the Kanuti National Wildlife Refuge.

This two year phase had the objectives of: (1) Quantitatively define the vegetative conditions that make up various stages of beaver-influenced wetlands. (2) Classify the various lakes of the Study according to the stages defined in Objective 1. (3) Document waterfowl use by type and quantity of use of each lake stage. (4) Compare waterfowl use of each stage statistically to determine if significantly different.

All the field work was completed in CY 1985 and a draft thesis will be completed by the spring of 1986. Donna Kafka was assisted by volunteers Derek Sundquist and Bernd Moser in accomplishing the CY 1985 field work.

Unfortunately, funds are not available during FY86 to continue another phase of the Study. The second phase would have been involved in the production of preferred waterfowl foods in beaver influenced lakes.

6. Other - Nothing to report.



Beaver damming activities on this lake  
kills a large area of willow and  
other shrubs that moose depend upon  
for browse.      June 1985      B.M.

E. Administration

1. Personnel

Kanuti Staff: CY 1985

McIntosh, Ervin W.	Refuge Manager GS-485-12/4 EOD 11/15/81 PFT
Heffernan, Harvey H.	Asst. Refuge Manager GS-485-11/2 EOD 11/13/83 PFT
Hudson, Gayle	Refuge Clerk GS-322-4/2 EOD 8/7/83 PFT Resigned 6/7/85
Wilson, Charolette	Refuge Clerk GS-322-4/5 EOD 6/23/85, PFT Transferred: 8/14/85
Callender, Lena	Secretary GS-318-5/1 EOD 12/08/85 PFT
Moses, Johnson	Bio-Tech. GS-404-5/1 EOD 6/3/85 Local Hire Intermittent
Strong, B.J.	Bio-Tech. GS-404-5/1 EOD 7/1/85 Local Hire Temporary. Appointment extended: 1/31/86
Ned, Stanley	Bio-Tech. GS 404-5/1 EOD 6/10/85 Local Hire Temporary. Terminated: 8/23/85
Williams, Valerie	Bio-Tech. GS-404-5/1 EOD 6/7/85 Local Hire Temporary. Terminated: 8/31/85.
Troyer, Kenneth	Bio-Tech. GS-404-5/1 EOD 6/17/85, Temporary Terminated: 9/6/85.

2. Youth Programs - Nothing to report.

3. Other Manpower Programs

Each year an effort is made to increase the use of "local hire" where feasible. In CY 1985 four local residents were hired for various field projects accomplished during the summer season. In general, this Refuge has had good success with the individuals hired, which in turn has improved our relationship with the communities.

4. Volunteer Programs

If there is one program that has benefited Kanuti NWR more than another, it would be the volunteer program. The time and energy donated by individuals participating in this program on Kanuti NWR has been a tremendous help to its small PFT staff. The caliber of persons volunteering has been outstanding.

The only drawback encountered is the fact that Kanuti's PFT staff is so small that adequately training and supervising seasonal workers are difficult.



Ervin W. McIntosh, Project Leader. June 1985 M.R.



Harvey Heffernan  
Assistant Refuge Manager  
Sept. 1985 M.R.





Gayle Hudson, Refuge Clerk

June 1985

H.H.



Johnson Moses  
Local Hire from Allakaket  
July 1985

E.W.M.



B.J. Strong, Local Hire Seasonal from Bettles, Aug.1985 M.R.



Kenneth Troyer, Seasonal from Maryland. July 1985 E.W.M.





Stanley Ned, Local Hire Seasonal from Allakaket. July 1985  
K.T.



Mary Rogers, Volunteer from Massachusetts. Sept 1985 H.H.



Derek Sundquist  
Volunteer from Minnesota  
July 1985 E.W.M.



Bernd Moser, Volunteer from Hamburg, West Germany  
July 1985 M.R.





Fred Stein, Volunteer from New York  
July 1985 H.H.

1985 Volunteers	Length of Service	Primary Duty Project
Rogers, Mary	20 weeks	I&E Specialist: Interpretives Programs/Subsistence
Moser, Bernd	18 weeks	Botanist: Waterfowl/Beaver Study
Sundquist, Derek	17 weeks	Biologist: Waterfowl/Beaver Study
Stein, Fred	18 weeks	Biologist: Waterfowl Brood Surveys

## 5. Funding

### Funding levels: 1982-86

FY	Total	1210	1220	1260	ARMM	RPRP
1982	75K	55K	20K	-	-	-
1983	166K	140K	20K	-	-	-
1984	225K	-- Deleted --	--	130K	95K	-
1985	275K	-- Deleted --	--	150K	110K	15K
1986	290K	-- Deleted --	--	205K	70K	15K

From the figures in the table above, the information seems to indicate continuous improvement in the funding requirements of Kanuti NWR. However, most funds are tied up in increased fixed costs or earmarked for special projects. Discretionary funds are basically non-existent. Therefore, any unplanned costs, that always occur each year, naturally upsets other refuge activities.

## 6. Safety

Special emphasis is placed upon safety awareness on Kanuti NWR. Small, seemingly insignificant, accidents can turn into major life threatening situations and potential failure of field projects.

Many of the projects are conducted by volunteers some of which are experiencing their first wilderness trip in Alaska. An attempt is made to train and familiarize these individuals with the conditions and hazards they may or will face for extended periods of time. Training begins in Fairbanks through reading materials, discussions, familiarization of equipment and supervised training in the use of firearms, radios and other miscellaneous equipment. Information is provided on bear safety, boating and water safety, cold weather and wilderness survival.

A one week trip is scheduled to gather basic information about an unfamiliar area of the Refuge. This trip is a closely supervised hands-on safety training project that also provides valuable base data for Planning and Management.

A dependable radio communication system can be a most valuable piece of safety equipment. Such a system is presently being worked out through the Fire Coordinator and will be installed supposedly in the spring of 1986.



The NPS provide Kanuti's summer field crew a guided tour of Denali NP during the July 4th holidays. The educational trip was highly successful. July 1985 E.W.M.



The field crew explores Old Bettles during a weekend of free time. Aug. 1985





The field crew on training trip at Minnkokut Lake.

June 1985 E.W.M.



RM McIntosh explaining radio set-up and use to Stanley Ned while on training trip to Minnkokut Lake.

June 1985 M.R.





Small float planes are the main source of transportation  
to and within the refuge.      June 1985      B.M.

The first case of Girardia contracted by refuge personnel since the refuge was established occurred during the summer field season. Since there is strict adherence to the refuge policy to purify all water used for drinking and cooking, it is speculated that the illness was contracted while taking baths in Kanuti Lake. Efforts to prevent re-occurrence and the loss time that often results include reducing time individuals have to spend in the field without a break and establishing a refuge policy to keep heads above water at all times.

No other lost-time accidents occurred during CY 1985.

7. Technical Assistance - Nothing to report.

8. Other Items

A Classification Review was conducted of the Kanuti NWR by the personnel office February 4, 1985 through February 8, 1985. The results indicated RM McIntosh was still classified as a "Primary Assistant" in a "refuge complex" that never materialized.

ARM Heffernan needed an update on his position description. The position of Clerk-Typist held by Gayle Hudson would support a classification of GS-5 through accretion of duties.

A Wildlife Resources Program Evaluation of Kanuti NWR was conducted February 11 - 14th. The evaluation team was made up of Joe Mazzoni, John Kurtz, Ken Chalk, and Steve Breezer with Lynn Fisher as team leader.

The purpose of the evaluation were to foster communication among various organizational work and to improve the efficiency and effectiveness of service activities. For the Manager, the objectives were (1) Familiarize the Regional Office with the refuge, its resources, public use, programs, problems and unique conditions, (2) A meeting of the minds as to direction of programs and requirements of funds and personnel for this new refuge, (3) A Preliminary Action Plan prior to Master Planning or CCP completion.

The results of the evaluation were favorable and indicated that Kanuti's priorities were where they should be and the current direction and emphasis of the Wildlife Management Program is correct. However, by the year-end it was obvious that more management decisions were transferred to the Regional Office and increased Regional Office involvement created more paperwork and lost management efficiency,



The program evaluation team visited Kanuti NWR in February 1985 to discuss and evaluate the management programs on Kanuti. Left to right: Lynn Fisher, Joe Mazzoni, Steve Breezer and Erv McIntosh explaining a point to John Kurtz. February 1985 H.H.

## F. HABITAT MANAGEMENT

### 1. General

Kanutu NWR is located in the northern portion of the Koyukuk River valley and includes numerous tributaries e.g. Kanuti River, Henshaw Creek, Peavey Creek, South Fork, Fish Creek, Nolitna Creek, Kodosin Nolitna Creek, and Kanuti Chalatna Creek to mention a few. One of the best descriptions of this area is included in "Tracks in the Wildland: A Portrayal of Koyukuk and Nunamiut Subsistence: by Richard K. Nelson, Kathleen J. Mautner, and G. Ray Bane: "Like other large interior rivers, the Koyukuk follows a twisted, meandering course, especially where it flows across the flats. Tracings of its geologic history are revealed by innumerable sloughs, oxbow lakes, meadows, timbered ridges, and meander scars scattered everywhere along its flanks. The riverbed is continually shifting today, restructuring the environment and creating an important dynamic element in riverine ecology."

"Besides the river itself, the Koyukuk valley contains innumerable tributaries, ranging from major watercourses hundreds of miles long to insignificant creeks that trickle down over the banks. The large flats are a veritable scrambling of streams, wandering sinuously through a landscape of swamps, muskeg, ponds, and lakes of every size and shape."

"In some areas there is more water than land, and when the river floods there may be no land at all. These periodic floods, which occur in the springtime, are apparently essential to prevent many of the lakes from drying up." "...Vegetation of the Koyukuk River drainage is broadly classified as boreal forest or taiga, but this characterization gives a deceptive impression of homogeneity. Rather than a vast expanse of timber, the land is covered by diverse plant communities, patterned according to differences in elevation, drainage, permafrost development, soil type, fire history, and climate. In the low country, closed forest, open forest (muskegs), bogs, and shrub thickets intermingle in a complex pattern worthy of a divine abstractionist. Mountain slopes and valleys create another mosaic, this one of forest and thicket in the lower elevations, fingering into moist tundra higher up, and finally uniform alpine tundra above 3,000 feet or so...". "...Despite its apparent disarray, this complexity sorts itself into a few identifiable plant community types. First of these is the closed forest of white spruce, paper birch, balsam poplar, which occurs in well-drained places along rivers and hillsides. Beneath the forest canopy is a scattering of shrubs (such as willows and heaths) growing from a carpet of moss. Where fires have occurred, forests of quaking aspen or birch predominate, with shrubs and young spruce comprising of understory. Along the rivers, stands of large balsam poplar are quite common. Forests containing very large white spruce and paper birch occur frequently along the Koyukuk River, providing an excellent source of building materials and firewood."

"Areas that are poorly drained, north facing, high altitude, and/or high latitude often support open forests of black spruce, with scatterings of birch or white spruce. Thick sphagnum moss usually covers the ground,





Polygonum Sp., a smartweed detected in several lakes along Kanuti River during the 1985 summer field season. 16N, 20W, Sec 33 July 1985 B.M.



Sedges (Carex sp.) and horsetail (Equisetum sp.) make up many of the wetter marshes bordering lake shores. July 1985 H.H.

with sedges, grasses, and heath shrubs growing in association. Muskegs of this sort are very common in the Koyukuk valley and Brooks Range. In extremely wet situations, muskegs are replaced by treeless bogs, dominated by small shrubs such as resin birch and a variety of heaths (e.g. blueberry, cranberry, Labrador tea)."

"Shrub thickets are another very common plant community throughout this region. Along the rivers, they contain tall stands of willow and alder, and are especially common on periodic flooded alluvial deposits."

"Elsewhere, on the flats and mountain slopes, they are made up of scrubby alder, willow, and resin birch thickets. These communities often provide excellent habitat for moose, snowshoe hare, ruffed grouse and other game species."

"At higher elevations throughout the Koyukuk and Brooks Range, alpine tundra vegetation hugs the windswept terrain. This plant community includes various lichens, forbs, grasses, and shrubs, growing in a dense mat. In many areas patches of barren, rocky ground disrupts the continuity of living cover. The alpine tundra provides habitat for important game species such as caribou, brown bears, and Dall sheep, and it makes excellent walking terrain for man."

## 2. Wetlands

Refuge wetlands total 59,921.4 acres, a figure arrived at by totaling the Graninoid Marsh, Aquatic Forb and water vegetation classes in Tablot et al's. Landsat vegetation analysis (Table 3). Due to the resolution this should probably be viewed as minimum figure. Small ponds and other divided wetlands were possibly included in other classes by the Landsat effort.

Wetlands management consists of protection from conflicting uses. Plans were completed for Water Quality monitoring and the refuge was budgeted \$15,000 to begin a monitoring program for water quality. Water testing began during the 1985 field season and is expected to document and furnish evidence for curtailing current sediment and possible chemical contaminant problems occurring upstream from the refuge. Water sediment and tissue samples were collected at eight sites at strategic locations on three major streams in the northern portion of the refuge. The Koyukuk River, South Fork and Fish Creek were the most sensitive areas and were sampled first. The results have not yet been received from the lab contracted to do the analysis.

## 3. Forests

Various classes of forest vegetation cover 952,820 acres (58.4%) of the 1,634,819 acres within the Refuge's outer borders. Forest classifications include burned areas which are regeneration, but do not include 142,967 acres (8.7%) of scrub.





Cotton grass turns an old burn area white.  
15N, 20W, Sec. 4.      June 1985      B.M.



Spaghnum bogs are abundant throughout the refuge.  
July 1985      B.M.

TABLE 3.

Relative abundance of vegetation classes and subclasses within Kanuti National Wildlife Refuge\*

VEGETATION CLASS	SURFACE AREA	
	Acres	Percent
FOREST		
Open Needleleaf Forest	10,912.5	.7
Needleleaf Woodland	751,003.0	46.0
Broadleaf Forest	173,634.9	10.6
Mixed Forest	17,269.7	1.1
SCRUB		
Closed Broadleaf Scrub	48,559.9	3.0
Open Broadleaf Scrub	94,407.4	5.8
DWARF SCRUB		
Prostrate Dwarf Shrub Tundra	6,136.0	.4
Dwarf Shrub-Graminoid Tundra	27,292.1	1.7
Dwarf Shrub-Graminoid Tussock Peatland	434,970.9	26.6
HERBACEOUS		
Graminoid Marsh	14,771.6	.9
Aquatic Forb	30,933.1	1.9
WATER		
Clear	11,248.5	.7
Turbid/Shallow	2,968.2	.2
SCARCELY VEGETATED		
Scree	317.5	.0
Floodplain	7,496.9	.5
SNOW	1,225.6	.1
CLOUD SHADOW	1,671.0	.1
TOTAL	1,634,819.0	100.0

\*Taken from the Landsat-facilitated vegetation map and Vegetation Reconnaissance of Kanuti National Wildlife Refuge, Alaska. by Stephen S. Talbot, Michael D. Fleming and Carl J. Markon.



Forests are an important habitat for several Refuge species, including the most important furbearer, marten.

The demands upon riverine spruce forests for house logs continued. If these demands continue, larger timber along streams could become very scarce within a relatively short time. At present we do not know what timber supplies are on the refuge. Inventory and studies have been proposed. However, funding has not been available and a Study Proposal submitted to a newly formed Review Panel in the Regional Office was rejected since they "considered the Study to be of limited importance to management overall and does not provide information that is essential to obtain at this time".

4. Croplands - Nothing to Report.

5. Grasslands - Nothing to report.

6. Other Habitats

As with other habitats, no active management is done other than protection. Tundra covers, 33,428 acres (2.8%) and a similar habitat type, tussock peatland covers 434,971 acres (26.6%) within Kanuti's exterior borders. Scarcely vegetated areas constitute about 10,711 acres (0.7%) with 7,497 acres of that floodplain.

7. Grazing - Nothing to report.

8. Haying - Nothing to report.

9. Fire Management

Kanuti NWR lies within an area that has had active fire suppression effort on all fires from about 1940 through 1983. In common with much of the Alaskan interior, with its low precipitation, high summer temperature and frequent lightning strikes, most of the area was probably a fire dependent ecosystem prior to suppression activities. Through years of successful suppression on most fires, the large uncontrollable wildfires probably also assumed the well known characteristics associated with greater fuel load, much greater burn severity and extent, along with consequent vegetation changes after the burn which did not occur under the original fire dependent ecology.

Obviously, with the great number of "maybe" words in the preceding paragraph, very little is specifically known at present about the refuge's fire history and even less about the original vegetation. Post-burn vegetation is currently present on several extensive areas where large uncontrollable fires burned 10-20 years ago. Fire history is available, at least in part, since about the mid 1950's. Unfortunately, personnel with time and expertise have not been available to examine this information.

Large changes in Alaska Fire Management have recently taken place. Suppression activities have been reduced, mainly to lower costs and a

more balanced attitude toward fire management has prevailed. These actions have made prescribed burning available as a management tool--in refuge areas not encumbered with inholdings--after we have done our homework. When thorough plans and all the ground work is in place, controlled burns can then be used to return vegetation to earlier serial stages, or re-establish the original fire dependent ecology. In any case, controlled burns are the most powerful - and in many cases the only habitat tool available. Overall, the more balanced approach to fire management should bring about numerous habitat benefits as well as reduced suppression costs. In many cases past suppression efforts resulted in more resource damage than the fire itself.

Some of the recent changes in Fire Management and further needed actions are discussed below. The Alaska Interagency Fire Management Council (AIFMC) functions to develop fire management solutions through guidance in cost-effective fire protection and in coordinating regional interagency fire management plans. Working through the cooperation of all landowners, the Seward/Koyukuk Fire Plan became final in April 1984. RM McIntosh served on the fire planning team. This fire plan establishes the refuge's general fire plan by setting Limited, Modified and Full protection areas shown in Fig. 2.

The refuge fire plan, which will describe in detail objectives and guidelines for planned and natural fires has not yet been completed. The Yukon Flats Fire Plan, which will lay much of the general and some specific groundwork for Kanuti's plan, currently exists but not yet approved. Kanuti's Fire Plan will follow. However, some specific information, such as fuel loading, vegetation analysis and other necessary data will not be available for some time on Yukon Flats since it requires either analysis, studies or both. These aspects have not been scheduled for Kanuti.

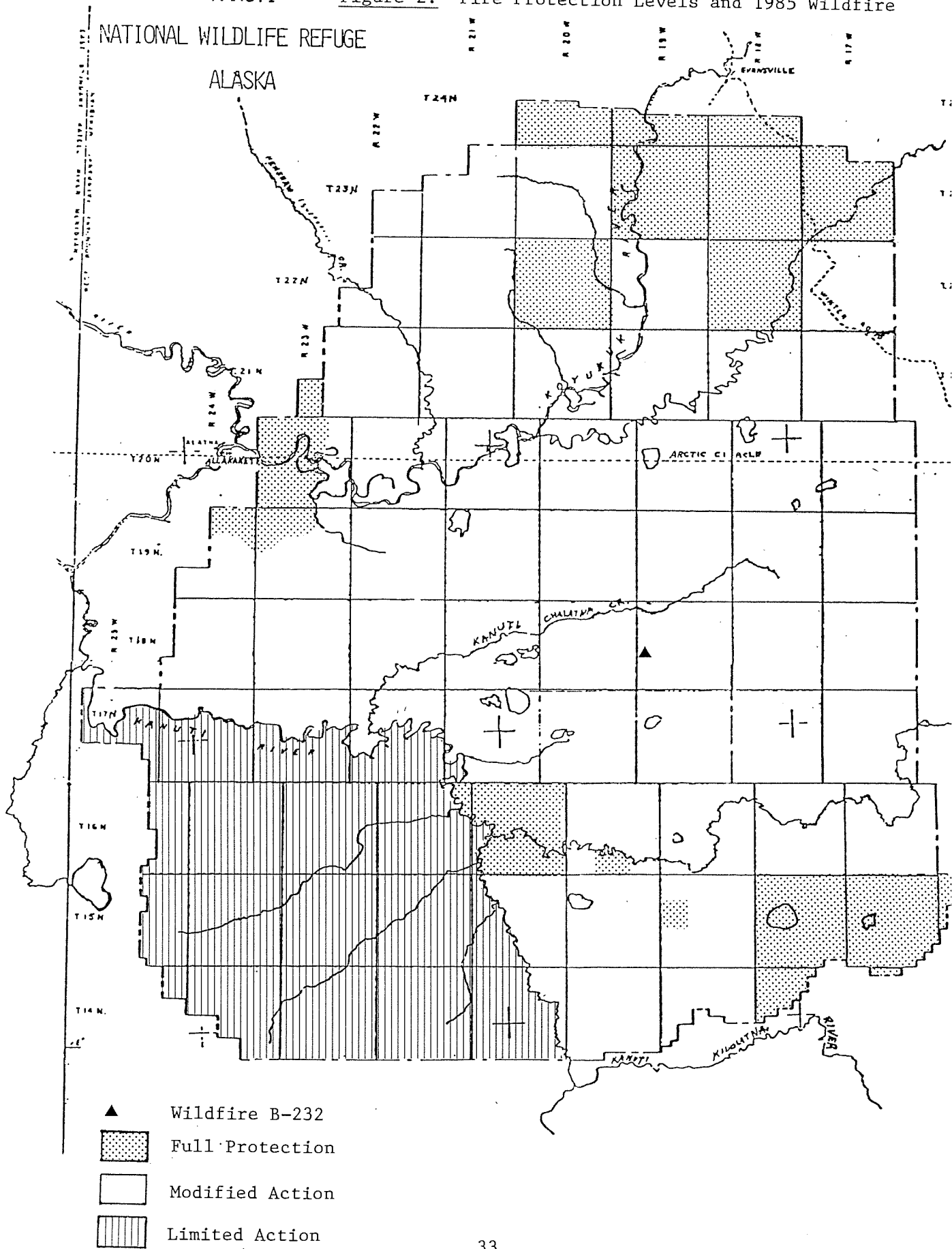
After Kanuti NWR has a refuge fire plan in place, a prescribed burn plan can be written, provided enough information is available to make it meaningful. The Comprehensive Conservation Plan will be used to guide development of the burn plan. At present it appears that it will be desirable to return some vegetation to earlier stages and to reduce the possibilities for large scale "mineral soil" wildfires by controlled burns to reduce fuel loading. Through the wise use of controlled burns we should be able to benefit wildlife habitat and reduce the fire risk to our numerous inholdings, if they choose to remain under full protection.

This year's fire season started out in a very wet condition, then dried out in late July to the point that the fuel condition presented an extremely hazardous fire condition. Fortunately, only one wildfire occurred. This fire number B232, discovered on August 7, 1985 starting under potentially dangerous conditions in a "modified" area, burned a little over 1,000 acres prior to being declared out on August 19, 1985 by AFS. From that point on rain created wet conditions that prevented further fire starts.

The relatively large amount of time requiring a Fire Management Officer's expertise to manage controlled burns, establish vegetation data, research and write plans, coordinate with AFS, be on the ground at fires in

KANUTI

Figure 2. Fire Protection Levels and 1985 Wildfire



progress and a multitude of other duties points to our need for an FMO/Forester position. It is apparent that the current, shared FMO is busy full time with either fire duties or other work for the refuge that pays his salary. As a final comment, Kanuti has more than enough work to keep an FMO/Forester, or FMO/Biologist busy on fire and other essential refuge management duties.



Rod Simmons of NAES conducting water analysis and collecting samples of water, sediment and tissue in an effort to detect possible contaminants from up-stream placer mines. June 1985 E.W.M.

10. Pest Control - Nothing to report.

11. Water Rights

The Regional Office is currently proceeding with a plan to establish water rights. A prioritized list of streams was furnished in the latter part of 1984. Projects have been proposed to monitor waterflow and levels within the refuge to establish base data to support the Kanuti Water Rights. To date no funding has been made available.

Interest is currently high on the water quality of streams flowing into the refuge. Villages, local residents, Alaska Department of Fish and Game and the Interior Regional Council have all expressed concern and performed varying degrees of action aimed toward remedying the sediment problem seen in area rivers. Kanuti was granted \$15,000 in 1985 and another \$15,000 in 1986. Data was collected on three streams in 1985 and plans have been established to collect data on three other streams in 1986.

A major cause for concern is the potential re-designation of the upper drainages of refuge inflow streams to industrial quality. This classification enables miners and other users to dump much larger quantities of sediment and other pollution into these streams. Presently the RM is attempting to coordinate remedial action with other land managers in the area.

12. Wilderness and Other Special Areas

Wilderness classification was considered for Kanuti as part of an alternative for management in the CCP. Prior to the CCP no areas were being considered.

A number of historical, archeological and paleontological sites exist within the Kanuti NWR, or just outside its boundaries. Only a few are obvious while others have no visible recognition. Some sites have been investigated on Doyon selections. Most investigations have indicated insufficient evidence while a few may someday become registered sites.

13. WPA Easement Monitoring - Nothing to report.

G. WILDLIFE

1. Wildlife Diversity

Information on wildlife diversity is still being gathered for Kanuti. Prior to the establishment of the refuge, little biological work had been done in the area. Therefore, each year new species are confirmed present in sightings made incidental to waterfowl brood counts and other on-going field work.

During the year, an additional seven birds, no mammals and no fish species were confirmed present by the Kanuti Staff and the Fairbanks Fisheries Station crews, making the total confirmed at 104, 20 and 14 respectively. The literature lists a total of 148 birds, 34 mammals and 16 fish species as probable for the area. A species list follows, with the asterisk indicating confirmed sightings on the area.

## Birds

Common loon (Gavia immer)\*  
Yellow-billed Loon (Gavia adamsii)\*  
Arctic loon (Gavia arctica)\*  
Red-throated loon (Gavia stellate)\*  
Horned grebe (Podiceps auratus)\*  
Red-necked grebe (Podiceps grisogena)\*  
Whistling swan (Olor columbianus)\*  
Trumpeter swan (Olor buccinator)  
Canada goose (Branta canadensis)\*  
Snow goose (Chen hyperboreus)  
Black brant (Branta nigricans)  
White-fronted goose (Anser albifrons)\*  
Mallard (Anas platyrhynchos)\*  
Gadwall (Anas strepera)\*  
Pintail (Anas acute)\*  
Green-winged teal (Anas carolinensis)\*  
Blue-winged teal (Anas discors)  
America wigeon (Mareca americana)\*  
Shoveler (Spatula clypeata)\*  
Redhead (Aythya americana)  
Ring-necked duck (Aythya collaris)\*  
Canvasback (Aythya valisineria)\*  
Greater scaup (Aythya marila)\*  
Lesser scaup (Aythya affinis)\*  
Common goldeneye (Bucephala islandica)\*  
Barrow's goldeneye (Bucephala islandica)  
Bufflehead (Bucephala albeola)\*  
Oldsquaw (Clanula hyemalis)\*  
Harlequin (Histrionicus histrionicus)\*  
Common scoter (Oidemia nigra)  
White-winged scoter (Melanitta deglandi)\*  
Surf scoter (Melanitta perspicillata)\*  
Common merganser (Mergus merganser)  
Red-breasted merganser (Mergus serrator)\*  
Goshawk (Accipiter gentilis)  
Sharp-shinned hawk (Accipiter striatus)  
Red-tailed hawk (Buteo jamaicensis)\*  
Harlan's hawk (Buteo harlani)\*  
Swainson's hawk (Buteo swainsoni)\*  
Rough-legged hawk (Buteo lagopus)\*  
Golden eagle (Aquila chrysaetos)\*  
Bald eagle (Haliaeetus leucocephalus)\*  
Marsh hawk (Circus cyaneus)\*  
Osprey (Pandion haliaetus)\*  
Peregrine falcon (Falco peregrinus)\*  
Pigeon hawk (Falco columbarius)\*  
Kestrel (Falco sparverius)\*  
Gyr Falcon (Falco rusticolus)  
Spruce grouse (Canachites canadensis)\*  
Ruffed grouse (Bonasa umbellus)  
Willow ptarmigan (Lagopus lagopus)\*

Sharp-tailed grouse (Pedioecetes phasianellus)  
 Lesser sandhill crane (Crus canadensis)\*  
 American coot (Fulica americana)  
 Semipalmated plover (Charadrius semipalmatus)\*  
 American golden plover (Pluvialis dominica)\*  
 Black-bellied plover (Pluvialis squatarola)  
 Common snipe (Capella gallinago)\*  
 Whimbrel (Numenius phaeopus)\*  
 Marbled godwit (Limosa fedoa)  
 Hudsonian godwit (Limosa haemastica)\*  
 Upland plover (Bartramia longicauda)  
 Spotted sandpiper (Actitus macularia)\*  
 Least sandpiper (Erolia minutilla)\*  
 Solitary sandpiper (Tringa solitaria)\*  
 Willet (Catoptrophorus semipalmatus)  
 Greater yellowlegs (Tringa melanoleuca)  
 Lesser yellowlegs (Tringa flauipes)\*  
 Pectorial sandpiper (Calidris melanotos)\*  
 Baird's sandpiper (Calidris bairdii)\*  
 Dunlin (Calidris alpina)  
 Long-billed dowitcher (Limnodromus scolopaceus)\*  
 Semipalmated sandpiper (Calidris pusilla)\*  
 Western sandpiper (Calidris mauri)  
 Sanderling (Calidris alba)\*  
 Red-Necked phalarope (Phalaropus fulicarius)\*  
 Northern phalarope (Lobipes labatus)\*  
 Parasitic jaeger (Stercorarius parasiticus)  
 Long-tailed jaeger (Stercorarius longicaudus)\*  
 Glaucous gull (Larus hyperboreus)\*  
 Glaucous-winged gull (Larus glaucescens)\*  
 Herring Gull (Larus argentatus)\*  
 Mew gull (Larus canus)\*  
 Bonaparte gull (Larus philadelphia)\*  
 Arctic tern (Sterna paradisaea)\*  
 Great horned owl (Bubo virginianus)\*  
 Snowy owl (Surnia ulula)  
 Great gray owl (Strix nebulosa)  
 Short-eared owl (Asio flammeus)\*  
 Boreal owl (Aegolius funereus)  
 Saw-whet owl (Aegolius acadicus)  
 Hawk Owl (Surnia ulula)\*  
 Belted king fisher (Megaceryl alcyon)\*  
 Yellow-shafted flicker (Colaptes auratus)\*  
 Hairy woodpecker (Picoides villosus)  
 Downy woodpecker (Picoides pubescens)  
 Northern three-toed woodpecker (Picoides tridactylus)\*  
 Say's phoebe (Sayornis saya)  
 Olive-sided flycatcher (Nuttallornis borealis)\*  
 Alder flycatcher (Empidonax alnorum)\*  
 Horned lark (Eremophila alpestris)  
 Violet-green swallow (Tachycineto thalassina)\*  
 Tree swallow (Iridoprocne bicolor)\*  
 Bank swallow (Riparia riparia)\*



Cliff swallow (Petrochelidon pyrrhonota)\*  
 Gray jay (Perisoreus canadensis)\*  
 Steller's jay (Cyanocitta stelleri)  
 Common raven (Corvus corax)\*  
 Black-capped chickadee (Parus atricapillus)\*  
 Boreal Chickadee (Parus hudsonicus)\*  
 Gray-headed chickadees (Parus cinctus)  
 Winter wren (Troglodytes troglodytes)  
 Dipper (Cinclus mexicanus)  
 Robin (Turdus migratorius)\*  
 Varied thrush (Ixoreus naevius)\*  
 Hermit thrush (Catharus guttatus)  
 Swainson's thrush (Catharus ustalatus)\*  
 Gray-checked thrush (Catharus minimus)\*  
 Wheatear (Oenanthe oenanthe)  
 Water pipit (Anthus spinolleta)\*  
 Bohemian waxwing (Bombyailla garrula)\*  
 Northern shrike (Lanius excubitor)  
 Ruby-crowned Kinglet (Regulus calendula)\*  
 Orange-crowned warbler (Vermivora celata)\*  
 Yellow warbler (Dendroica petechia)\*  
 Myrtle warbler (Dendroica coronato)\*  
 Wilson's Warbler (Wilsonia pusilla)\*  
 Blackpoll warbler (Dendroica striata)\*  
 Ovenbird (Seiurus aurocapillus)  
 Northern waterthrush (Seiurus noveboracensis)\*  
 Rusty blackbird (Euphagus carolinus)\*  
 Western tanager (Piranga ludoviciana)  
 Pine grosbeak (Pinicola enucleator)\*  
 Gray-crowned rosy finch (Leucosticte tephrocotis)  
 Pine siskin (Spinus pinus)\*  
 Common redpoll (Acanthus flammea)\*  
 Hoary redpoll (Carduelis hornemanni)  
 White-winged cross-bill (Loxia leucoptera)\*  
 Savannah sparrow (Passerculus sandwichensis)\*  
 Slate-colored junco (Junco hyemalis)\*  
 Tree sparrow (Spizelloa arborea)  
 White-crowned sparrow (Zonotrichia leucophrys)\*  
 Fox sparrow (Passerella iliaca)\*  
 Lincoln's sparrow (Melospiza lincolnii)\*  
 Snow bunting (Plectrophenax nivalis)  
 Alaska longspur (Lapland longspur) (Calcarius lapponicus)  
 Golden-Crowned Sparrow (Zonotrichia atricapilla)\*  
 Song Sparrow (Melospiza melodia)\*

#### Mammals

Dusky shrew (Sorex obscurus)  
 Masked shrew (Sorex cinereus)\*  
 Tundra shrew (Sorex tundrensis)  
 Pigmy shrew (Microsorex hoyi)  
 Little brown bat (Myotis lucifugus)  
 Big brown bat (Eptesicus fuscus)



Bohemian waxwings are abundant along the Kanuti River in late July and August. 16N, 21W, Sec 25 Central.  
July 1985 K.T.



A varied thrush uses the bank of Kanuti River at 16N, 20W, Sec. 28. July 1985 B.M.



• A white-winged crossbill observed on Kanuti River near  
Kanuti Lake in August 1985. E.W.M.



• A song sparrow observed at Minnkokut Lake. June 1985  
E.W.M.





An olive-sided flycatcher observed in Sec 28 of 16N, 20W.  
 July 1985 E.W.M.



A three-toed woodpecker observed at Kanuti Lake  
 (16N, 20W, Sec 28) July 1985 E.W.M.



A spruce grouse observed at Kanuti Lake (16N, 20W, Sec 26).  
This resident bird is common throughout the refuge.

July 1985

E.W.M.





A young glaucus-winged gull observed on a lake of  
Sec 24 of 17N, 22W.      July 19, 1985      K.T.



A young mew gull observed in a lake of  
Sec 15 of 16N, 19W.      July 13, 1985      K.T.

Black bear (Ursus americanus)\*  
Grizzly bear (Ursus horribilis)\*  
Marten (Martes americana)\*  
Short-tailed weasel (Mustela erminea)  
Least weasel (Mustela rixosa)  
Mink (Mustela vison)\*  
Wolverine (Gulo luscus)\*  
River otter (Lutra canadensis)\*  
Red fox (Vulpes fulva)\*  
Coyote (Canis latrans)\*  
Wolf (Canis lupus)\*  
Lynx (Lynx canadensis)\*  
Ground squirrel (Spermophilus undulatus)\*  
Red squirrel (Tamiasciurus hudsonicus)\*  
Flying squirrel (Glaucomys sabrinus)  
Beaver (Castor canadensis)\*  
Northern bog lemming (Synaptomys borealis)  
Brown lemming (Lemmus trimucronatus)  
Collard lemming (Dicrostonyx groenlandicus)\*  
Red-backed mouse (Clenthrionomys rutilis)\*  
Meadow mouse (Microtus pennsylvanicus)  
Yellow-cheeked vole (Microtus xanthognathus)  
Tundra vole (Microtus oeconomus)  
Muskrat (Ondatra zibethica)\*  
Porcupine (Erethizon dorsatum)  
Snowshoe hare (Lepus americanus)\*  
Moose (Alces gigas)\*  
Caribou (Rangifer arcticus)\*

#### Fish

Dolly varden Char (Salvelinus malma)  
Arctic grayling (Thymallus arcticus)\*  
Broad whitefish (Coregonus nasus)\*  
Humpback whitefish (Coregonus pidschian)\*  
Bering cisco (Coregonus laurettae)\*  
Least cisco (Coregonus sardinella)\*  
Round whitefish (Prosopium cylindraceum)\*  
Burbot (Lota lota)\*  
Chum salmon (Oncorhynchus keta)\*  
King salmon (Oncorhynchus tshawytscha)\*  
Longnose sucker (Catostomus catostomus)\*  
Ninespine stickleback (Pungitus pungitius)  
Northern pike (Esox luscus)\*  
Sheefish (Stenodus leucichthys)\*  
Slimy sculpin (Cottus cognatus)\*  
Alaskan blackfish (Dallia pectoralis)\*





Beaver are abundant within the refuge and make heavy use of the banks of Kanuti River and adjacent lakes.  
 July 1985 E.W.M.



Moose, the major subsistence big game animal, had a population of only .29 animals per square mile based on a census conducted in cooperation with ADF&G in November, 1985.  
 July 1985 B.M.



## 2. Endangered Species

Only one endangered species, the peregrine falcon, is currently known to utilize Kanuti. The Falcons are thought to nest in the cliffs of Kanuti Canyon and in the vicinity of Sithylemenkat Lake, based on reports by local residents. In 1983, one falcon was observed on several occasions in the Bridge Creek area (T20N, R23W, Sec. 34). No sightings have been made since.

## 3. Waterfowl

Inventory procedures on waterfowl have steadily improved on Kanuti NWR as experience and knowledge is gained of this remote wilderness type area. Better information has lead to improved waterfowl habitat acreage figures and, therefore, better estimates of Refuge waterfowl populations. Enough information is finally available to draft a feasible waterfowl inventory plan that can be adhered to annually, thereby providing more reliable and uniform data. The comparison of yearly waterfowl data has much bias but, nevertheless, provides a reasonable picture of waterfowl production and population fluctuations. The greatest bias, and probably the most difficult to correct is the necessity of having to utilize different surveyors each year that have widely varying degrees of skill identifying and aging waterfowl.

Information thus far collected on our waterfowl tend to indicate that various waterfowl populations and production on Kanuti NWR may vary greatly from year to year. Part of this variance is due to what, when and how areas are surveyed and the varying skill of the surveyors. With the inventory routes and procedures being firmly established in the inventory plan many of the discrepancies will be overcome.

### Geese

Based upon data collected in 1983, '84 and '85 the waterfowl populations have been in a continuing decline within the refuge. Geese production increased 1.1% between 1983 and 1984 but dropped 67% in 1985. The minor increase in 1984 reflected a 12% increase in Canada geese while the White-fronted geese dropped 21.3%. In 1985 Canada geese production dropped 56.6% while the White-fronted geese continued to drop at an even greater amount, 84.9%. The estimated refuge production of White-fronted geese in 1983 was 1,207 young and in 1985 it was 143. From the scant information from years past this downward trend of White-fronted geese production on the Refuge has been significant. For how long the decline has continued, we do not know. In 1966 a number of White-fronted geese were trapped and banded on Kanuti River. That event resulted in 44 returns. To day it would be extremely difficult to even trap 44 White-fronted geese. In 1978, a team of biologist floated Kanuti River investigating its potential for proposal as a National Wildlife Refuge. The team stated that they were never out of site of White-fronted broods, while today our surveyors may travel many miles before observing a single brood.

The EIS covering the Kanuti NWR proposal estimated a breeding population of 34,000 White-fronted geese. The estimated population of adults and sub-adults together is only 1,034 in 1985!

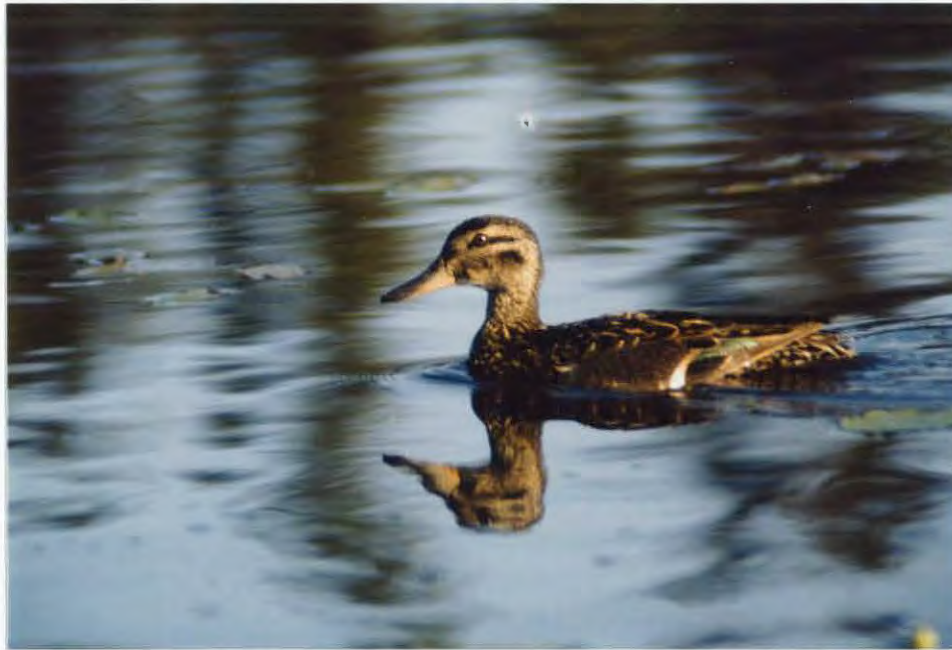


White-fronted geese, observed here on Kanuti River,  
had a production drop from .05 young/ac. in 1984 to  
.01 young/ac. in 1985 in the Kanuti River area.  
July 1985 K.T.



A brood of Canada geese in class Ic observed in Kanuti  
River at 16N, 21W, Sec 18. July 18, 1985 K.T.





A female green-wing teal observed in a lake located in  
17N, 22W, Sec 24. July 19, 1985 K.T.



A brood of class IIb green-winged teal observed in  
a lake of 16N, 21W, Sec 22. July 19, 1985 K.T.

## Ducks

In reference to the table on the next page 1984 was obvious as a bad year for production of ducks on Kanuti NWR. The estimated total production was down 51.1% from the previous year. Only mallards and surf scoters seemed to escape the decline. Mallards production in 1984 showed an increase of 360.8% over 1983 and surf scoters 282.4%. Why mallard and surf scoter production increased so drastically in 1984 while all other species declined from 31.4% (G.W. teal) to 76.9% (lesser scaup) is not known.

In 1985 all species but the mallard, shoveler and goldeneye demonstrated some increase in production. The total estimated refuge duck production increased 24.5%. The estimated mallard production was down 79.9% and the shoveler production continued a downward trend with a 34.6% loss in 1984 and 6.2% in 1985. The goldeneye has had an even greater decline with production down 54.3% in 1984 and 57.1% in 1985.

Wigeon replaced lesser scaup as the most abundant species of waterfowl on the refuge in 1984 and remained so in 1985. The lesser scaup, however, is the second most abundant species.

TABLE 4.

### Total Estimated Refuge Waterfowl Production

	1983	1984	% Change	1985	% Change
Geese	2,904	2,937	+1.1	968	-67.0
Ducks	24,639	12,060	-51.1	15,010	+24.5

TABLE 5.

Percent Change of Young Produced  
per Waterfowl Species

	1984	1985
Swan	(-)	(-)
Canada Geese	+12.0	-56.6
White-Fronted Geese	-21.3	-84.9
Mallard	+360.8	-79.9
Wigeon	-51.1	+107.5
G-W Teal	+31.4	+18.3
Shoveler	-34.6	-6.2
Pintail	-66.9	+6.3
Ring-Necked Duck	(-)	(-)
Canvasback	(-)	(-)
Scaup	-76.9	+29.9
Goldeneye	-54.3	-57.1
Bufflehead	-67.7	+23.4
W-W Scoter	(-)	(-)
Surf Scoter	+282.4	+15.5
Old Squaw	(-)	(-)

Note: Insufficient data is represented by (-).



Local Hire, Stanley Ned, on waterfowl brood survey of  
Kanuti River area. July 1985 K.T.





A wigeon brood of age class Ic located in a lake  
of 16N, 20W, Sec 34. July 1985 K.T.



Ducks often make use of sand and gravel bars, as do  
geese, for loafing sites. June 1985 E.W.M.





A ring-necked female duck with an age class Ib  
brood located in a lake of 17N, 22W, Sec 24.  
July 19, 1985 K.T.



A female bufflehead with age class Icbrood located  
in 16N, 19W, Sec 27. July 13, 1985 K.T.

TABLE 6

Kanuti NWR Waterfowl Population Estimates  
(Including Production)

	1983	1984	1985
Swan	142	53	22
Canada Geese	3,074	3,060	2,107
White-Fronted Geese	5,510	1,706	1,177
Mallard	3,204	2,888	799
Wigeon	8,850	8,401	12,835
Green-Winged Teal	3,076	2,870	2,721
Shoveler	3,753	2,783	2,655
Pintail	5,063	2,573	2,364
Ring-Necked Duck	0	0	101
Canvasback	1,328	0	179
Scaup	11,612	4,656	7,168
Goldeneye	602	350	135
Bufflehead	2,920	1,051	1,109
White-Winged Scoter	18	53	179
Surf Scoter	602	858	1,478
Old Squaw	0	0	380
Other	0	158	0
Unidentified Goose	0	129	0
Unidentified Ducks	407	3,238	358

NOTE: Estimates expanded from data collected on sample acreage each year to the best available habitat acreage figures for geese (27,492 acres) and ducks (68,816 acres).

#### 4. Marsh and Waterbirds

Current work on these species consists of observations incidental to waterfowl surveys and other activities. Loons, grebes and sandhill cranes inhabit the area and are commonly observed. Red-necked grebes are the most common species and both nests and young are apparent throughout the refuge.

Four loon species have been observed in the area. The Arctic and Common loons are the most often observed.

Lesser Sandhill cranes are observed throughout the refuge lakes and wetlands. Unfortunately, no records were kept of all sightings. Nest building and young have been observed and recorded on occasions. As yet, there is no estimated refuge population for the species.

#### 5. Shorebirds, Gulls, Terns and Allied Species

Lesser yellowlegs are probably the most widespread and abundant shorebird. Each lake and puddle has its resident yellowlegs, ready to protect its area from any intrusion by flying forever in front of the brood count crew tirelessly shrieking protests. Bonaparte's, mew and glaucous-winged gulls commonly nest in the refuge, as do Arctic terns. (See Wildlife list for other species present).

#### 6. Raptors

Raptors have been observed throughout the refuge. Bald eagles, golden eagles and osprey are occasionally seen perched at the top of tall spruce trees or soaring overhead while refuge field personnel travel the rivers and streams.

Hawks and Owls are more often observed and nests with young hawks occasionally spotted by alert field personnel.

No estimates of raptor populations have been attempted to date. There are approximately 14 species thought to be present. Eleven species have been confirmed. (See Wildlife list for species present.)

#### 7. Other Migratory Birds

Fifty six species of passerine birds are thought to occur on the refuge. Some 38 species have thus far been confirmed. The birds observed most frequently are those that utilize the river banks, since the rivers are about the only travel lanes within the refuge during the summer field season.

#### 8. Game Mammals

##### Moose

Moose are very important and extremely popular on Kanuti NWR as the subsistence meat animal of choice. Both through state regulation (a limited use area) and actual hunter occurrence, most moose are harvested in the area by local rural residents, i.e., subsistence users.





A hudsonian godwit are observed occasionally in the lakes surveyed during the waterfowl brood counts. 16N, 20W, Sec 34.  
July 1985 B.M.



A semipalmated plover feeds on a mudflat in Sec 22 of 16N, 21W. These birds breed throughout much of the wetland areas of the refuge.  
July 18, 1985 K.T.



A least sandpiper observed in Sec 34 of 16N, 20W.  
July 1985 B.M.



Semipalmated sandpipers are common throughout the  
refuge. 16N, 20W, Sec 34. July 1985 B.M.





Sandhill cranes on a Lake in 18N, 21W, Sec 26.  
July 25, 1985 K.T.



A young sandhill crane observed on a lake of 18N, 21W, Sec 22.  
July 24, 1985 K.T.



A bald eagle soars over Fish Creek. A rough estimate of 6-8 pairs use the refuge.

August 1985

E.W.M.



A great-horned owl sits nervously in a tree eyeing the wildlife surveyors in Kanuti River.

16N, 19W, Sec 1.

July 10, 1985

E.W.M.





Rough-legged hawks on nest in tree overhanging  
 Kanuti River in Sec 11 of 16N, 19W. July 21, 1985  
 K.T.



Rough-legged hawks are observed often along the rivers  
 of the refuge. August 1985 E.W.M.

Prior and subsequent to refuge establishment moose populations in the area have been categorized as low by ADF&G. Prior to 1983 few surveys had been performed in the area and very little was known about Kanuti NWR moose populations specifically.

In 1983 ADF&G area Biologist Tim Osborne flew limited "trend area" surveys on Kanuti. The following year, 1984, Kanuti NRW and ADF&G combined efforts in cooperative, expanded moose trend surveys.

Results confirmed the limited earlier knowledge: very low to low moose populations with few calves were found in the nine cooperative trend areas flown in 1984. Further, moose concentrations were pronounced. Trend areas selected on the basis of earlier season distributions or general knowledge revealed we were flying several areas of very low populations and a few moose concentrations.

Working within the always limited budgets for moose surveys, this hit-or-miss effort was very inefficient and unsatisfactory for both of us. The state's main objective was to sample hunted populations to assess sex and age distribution for trend management, while we wanted more complete information on the refuge wide populations as well.

Obviously the best solution was a population census, but funds were not available for this option. The second best option appeared to be stratifying the refuge, followed by individual trend surveys and to investigate the population.

The state agreed to this plan as a cooperative effort. Consequently, stratification flights began on 27 October via charter Cessna 185 from Bettles sub-headquarters. ADF&G Biologist Tim Osborne and John Dubois, ARM Heffernan and experienced survey pilot Kim Sibbett made up the stratification team. The ADF&G "Moose Survey Manual", Estimating Moose Demography from Aerial Surveys, Gasaway et al, 1985, was used for all procedures during the stratification and insofar as possible during the following count unit surveys.

Stratification went very well. An area slightly larger ( $2,671 \text{ mi}^2$ ) than the refuge ( $2,555 \text{ mi}^2$ ) was completed in two days, rather than the three to three and one-half days planned for. Very good weather, good snow cover and large areas of low moose density contributed to the speed.

With everything going so well, we decided to proceed as far into the survey as possible with two exceptions: first, Biologist Osborne needed to fly one permanent trend area near Kanuti Canyon and second, due to the overnight change in plans, we were unable to get two survey aircraft and proceed while the weather lasted and moose remained in the same location. The compromise was for Osborne to complete his trend area, then Heffernan and Osborne to continue flying randomized count areas within each strata. With luck this could have resulted in a complete census within our budget.

Unfortunately, this was not to be. The weather went bad with fog, snow and low ceilings on the 31st and several areas did not "count-out" as they were stratified. This combination of factors eliminated a statistically valid survey when the sample size increased beyond our budget.

Nonetheless, the stratification and subsequent counts gave good information on moose distribution; both stratification and surveys in 17 of the 196 units gave a much better picture of moose distribution, population structure and abundance than we had before. It was a very worthwhile effort. The only disappointing thing was that we were so close to accomplishing a census at one point - only \$2-3,000 and three to four days of good weather. In our draft moose census procedure the 4 - 6 year census is the cornerstone of our inventory procedure, followed by intervening "trend censuses" to monitor the population for gross changes and catastrophic events. It was disappointing not to accomplish this goal while the rare conditons of good snow and weather existed.

Results for the 1985 moose population effort are summarized in Fig.3 and Table 7. Prior to stratification the refuge was divided into 193 areas. During stratification several areas were redrawn and the final result was the 196 areas shown in Fig. 3. Original stratification results were 16 (8.2%) high, 20 (10.2%) medium and 160 (81.2%) low subunits of 196 total count units. Subunits averaged 13.6 mi<sup>2</sup> in size.

Moose population density ranges used for classification in each subunit were:

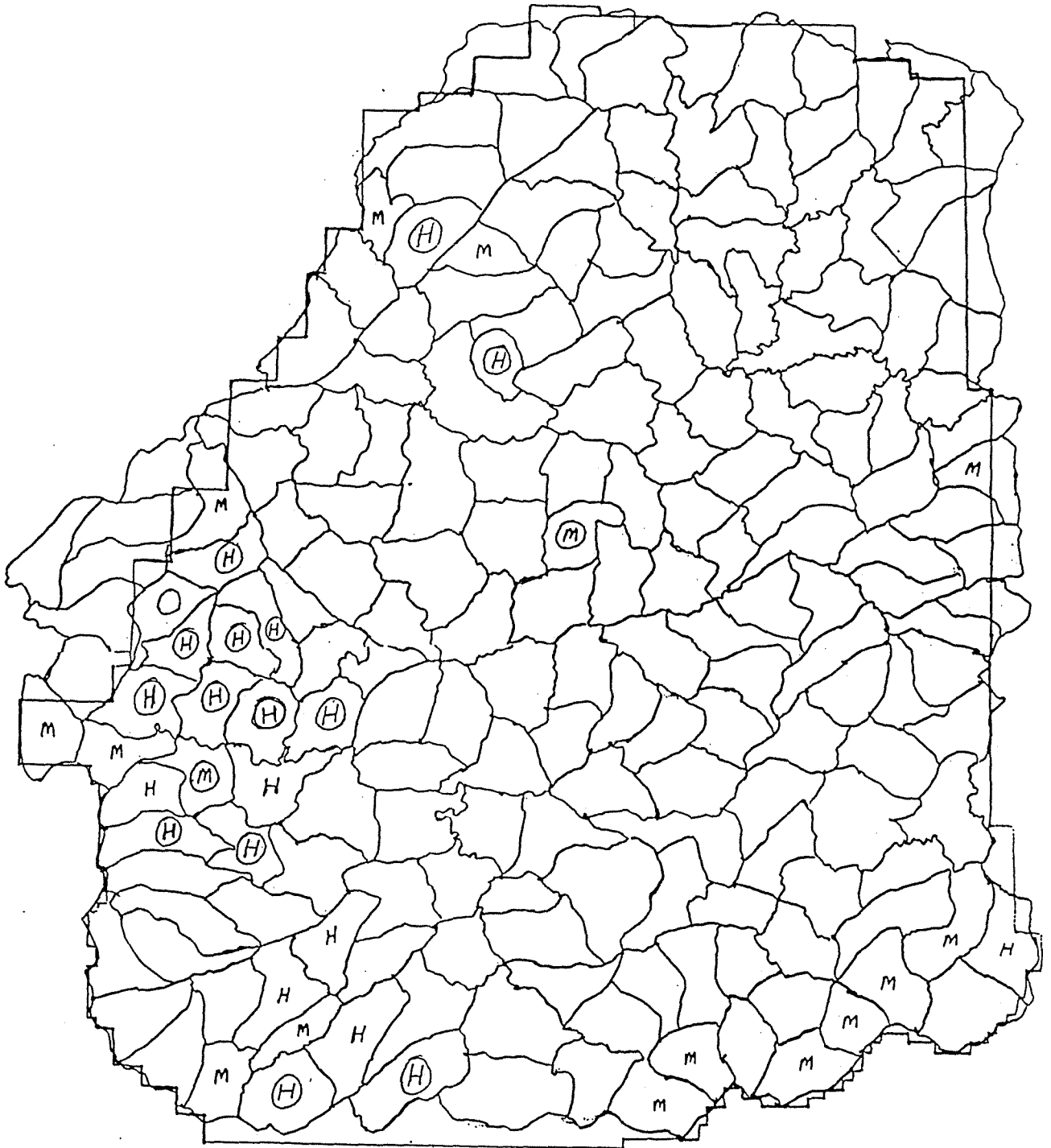
Low	-	0 to 5 animals
Medium	-	3 to 10 animals
High	-	8 to 20 animals

Subunits were separated on the number of moose seen. Further, fresh tracks and overall habitat quality were used to separate borderline or overlap subunits.

Survey counts of the units were preceded by counting a trend area of seven continuous high density units just north of Kanuti Canyon. Remaining subunits in the high and medium categories were randomized and sampling flights begin. Unfortunately, luck deserted us about this time. Bad weather slowed surveys and increased costs, causing our budget and "our turn" for the charter survey aircraft to end at about the same time on Sunday, 3 November. Unfortunately, other appropriate charter survey aircraft were not available earlier during the good weather. Like many other field activities in Alaska everyone must do the same thing at the same time and there are not enough charter aircraft available when needed in the "feast or famine" operation. Perfect weather prediction would permit long range plans to eliminate this problem, and station aircraft are a good second-best answer.



Fig. 3. Moose Stratification and Trend Surveys, 1985



H - High density, 8-20 moose per unit (greater than  $.73 \text{ Moose/M}^2$ ).  
M - Medium density, 3-10 moose per unit ( $.37$  to  $.73 \text{ moose/mi}^2$ ).  
O - Indicates units surveyed after stratification.  
(Unmarked) - Low density, 0-5 moose per unit (less than  $.37 \text{ moose/mi}^2$ ).

As earlier mentioned, the moose densities assigned from stratification changed in four of the six medium density units surveyed. All 11 of the high units remained high and none of the low units were sampled due to bad weather. Table 7 shows the units counted and resulting changes.

Obviously, no statistical significance can be attached to population estimates resulting from this effort, since sampling criteria and underlying assumptions were violated. However, when comparing this year's effort with those trend areas surveyed during the past two years, moose densities in various areas are very similar, lending credibility to a population estimate using 1985 work. Changes in the 1985 stratification caused by counts were due, in three out of four cases, to burned areas smaller than count unit. Stratification flights did not take into consideration the concentration of moose in the burned areas - by not flying enough in the burned areas in these cases. During future efforts small but productive burned areas in areas of otherwise poor habitat will have to be carefully delineated out and more intensively sampled while stratifying. The fourth and remaining change, from medium to low during unit counts resulted when a group of moose moved into an adjoining area, probably due to weather changes.

Basing the population estimate on the stratification, current counts and on previous year's counts (which found similar population distribution in all areas for which we have prior information), a resulting low, average and high estimate was figured on the basis of average moose per count unit Fig. 8. Our feeling is the mid-range population estimate is probably best and lies somewhere in the ball park.

Sex and age ratios for the 1985 survey is presented in Table 9. As in past years the calf percentage is low, indicating low reproduction, calf survival or both. Observations throughout the year for the past three years give the impression that many more calves are seen in the early spring and summer than later in the season. Discussions with village residents also indicate they see more calves in the early spring.

Table 7  
Partial Moose Survey - Trend Count 1985

196 Count Units  
(Mean Size, 13.62 Mi<sup>2</sup>, Total Stratification area 2,671 Mi<sup>2</sup>)

	Original Strati- fication	Units Counted	Reclassification (Changes after Counts)	Final Strati- fication	Corrected Units Counted per Strata
High	16	11	0	19	14
Medium	20	6	4 (3 up & 1 down)	16	2
Low	160	0	0	161	1
TOTALS	196	17	4	196	17

TABLE 8.

Refuge Moose Population Range  
(No Statistical Validity, count unit area of 2,671 Mi<sup>2</sup>  
reduced to 2,555 Mi<sup>2</sup> refuge area by  
subtracting 4.34% of total estimate)

Low Density Count Units

Low estimate, 1 moose per/61 count units,    1 x 161 = 161  
Mid-range estimate                                    2.5 x 161 = 403  
High estimate    5 x 161 = 805

Medium Density Count Units

Low estimate    3 x 16 = 48  
Mid-range estimate                                    5 x 16 = 80  
High range    10 x 16 = 160

High Density Count Units

(Actual Count, 14 of 19 total Units = 15.79 moose per unit)

Low Estimate    10 x 19 = 190  
Mid-range estimate                                    15 x 19 = 285  
High estimate    20 x 19 = 380

	<u>Survey Area</u>	<u>Refuge Area</u>
Low pop. estimate	399	382
Medium pop. estimate	768	735
High pop. estimate	1,345	1,287

Table 9.

Moose Sex and age Ratios

Date	Sample Size	Total Density Moose/Mi <sup>2</sup>	Total Males Per/100 Females	Small Males Per/100 Females	Small Male % in Herd	Calves per 100 Female	Incidence of Twins per 100 Females with Calves	Calf Percentage in Herd
Oct. 27 thru Nov. 3	240	.8951	100	31	14.2	20	10%	9.2%



Since habitat does not seem to be limiting during the summer and fall up until survey time, it appears that calf mortality may be the major factor in the low calf percentage seen.

Habitat on the refuge may also be a limiting factor on the overall moose population, judging from aerial surveys and incidental observations made in lowland areas during waterfowl surveys. Few of the upland areas have been examined to date. Currently, we have a cooperative effort planned to establish moose browse transects by snowmobile in mid-March to mid-April of 1986 if spring weather and administrative duties permit.

Some over winter mortality occurred during March and April of 1985. Allakaket residents reported finding 2-3 animals which had died in the unusually deep snow near Allakaket.

## Caribou

For the first time in 12 years a portion of the Arctic Caribou herd moved through the refuge. The caribou's changed movement pattern a dozen years ago coincided with a major fire in the area (about 40% of the refuge, plus some surrounding area), pipeline construction activities and decreased herd size. The reason for the route change in 1974 was not determined, nor has the reason for their returning this year. Perhaps the most significant change has been gradually increasing numbers, up to the levels existing before 1973.

Whatever the reasons, caribou were first seen moving down the Wild River north of Bettles on October 15th. Most of the animals followed the river to Nine Mile Hills and then moved into the refuge, many coming directly through or just outside of Bettles. After entering the refuge most continued moving south, while a few groups split off laterally in several directions.

Since the approximate peak of the somewhat drawn-out (20-25 day) caribou movement through Kanuti concided with moose stratification on October 28 and 29th a good estimate of their numbers was obtained at this time. Overall 1,500 to 2,500 carbiou were present. In addition, other caribou monitoring flights were done which tracked different segments as they arrived from the north and moved through the refuge. Most major groups tended to break into segments on the refuge, then move in several directions. Major group movements were noted to the southeast toward caribou mountain, south-southeast into the Ray Mountains and across the Alatna River above Allakaket and on towards Hughes to the southwest. Smaller groups also moved due east about 20 miles south of Bettles and other groups crossed the western refuge boundary in the area south of Kanuti Canyon.

During this period most of the refuge area was covered in meandering caribou tracks with animal groupings of all sizes apparent through much of the area. By early November migration into the refuge from the north had slowed to a trickle, although a few animals continued to arrive until about the end of the month.

During the first week in November several hundred caribou remained on the refuge in the southern and southeastern areas. High winds and poor flying weather prevented a better estimate. Another flight made in early December located widely scattered small groups in the southern one-third of the refuge, under flying conditions similar to the November flight.

In summary, the bulk of the estimated 1,500 to 3,000 caribou who arrived on Kanuti spent one to three weeks on the refuge before venturing into the surrounding hills. Few remained in the southern refuge areas at year's end. A sizeable number of the animals moved off the extreme southeastern refuge corner into the area occupied by the Ray Mountain herd.

Caribou harvest in the area was light according to all reports. Around 50 were taken in Allakaket and 15 or so in the Bettles-Evansville area.

### Grizzly Bear

Only one of the large bears was seen this year, although sign was seen in several locations in the mid and upper Fish Creek Drainage. Sign in the Fish Creek and lower South Fork drainage was noted last year also.

Johnson Moses, Allakaket Village Elder currently working for us as a Bio-Tech, reports that the "big bear" are much more common on the flats area now than they were previously. In the past they were usually found only in the surrounding uplands and mountains.

Two dens were located during moose surveys in the last week of October. One den was in almost exactly the same place as the den noted last year on the southcentral refuge boundary. The other was three miles south-southwest of the only (legal) cabin site on the refuge, Mike Stevenson's homesite on Holonada Creek. The bear was lying just inside the den.

No reported subsistence or sport kills occurred on the refuge this year.

### Black Bear

The black bear population appeared to be high throughout the lowlands area, especially along the Kanuti River. Members of the Beaver/Waterfowl Study team repeatedly had tents torn or shredded and gear destroyed during the field season, but there were no direct life-threatening situations.

### Wolf

Wolves were seen on several occasions in the Kanuti drainage by field crews. Tracks were apparent throughout all areas visited by survey teams and over most of the refuge during fall and winter flights.

Two aerial wolf kills were found in the southeast refuge, in an area with many small lakes. This area, with the heaviest sign on the refuge and numerous landing sites on the small lakes, is an "ideal" aerial wolf hunt area.

The wolf population remains unknown as funds for the wolf survey planned for last spring were not available. From chance observations we currently estimate these are about five wolf packs consisting of 30-60 animals inhabiting the refuge.

9. Marine Mammals - Nothing to report.

10. Other Resident Wildlife

### Reptiles and Amphibians

Our one representative of the reptile and amphibian group, the wood frog, was seen infrequently during summer field work. Although seen throughout lowland areas, the frog doesn't seem populous in any area.

### Small Mammals

No investigations were conducted of the small mammals during 1985.

### 11. Fisheries Resources

The Fairbanks Fishery Resources Station conducted aerial surveys on Kanuti National Wildlife Refuge during the summer and fall of 1985. Objectives of the aerial survey project were to identify anadromous fish spawning streams; identify migration routes and upper limits of spawning. Survey dates were coordinated with the Alaska Department of Fish and Game to coincide with peak spawning. Surveys were flown during summer chum and chinook salmon migration and the fall chum salmon run. The Kanuti River and some its tributaries were flown as well as the Koyukuk and Jim Rivers. Surveys were conducted with a supercub. Drainages were followed until salmon were no longer observed. The sightings for each section surveyed are shown in Table 10. Chinook salmon were documented for the first time in the Kanuti-Kilolitna River. Chum salmon were located in the Jim and Koyukuk Rivers during the fall surveys.





RM McIntosh removes northern pike from experimental  
gillnet during general wildlife survey of  
Minnkokut Lake. June 1985 M.R.



Information was recorded from all fish caught during the  
general wildlife survey of Minnkokut Lake. June 1985  
M.R.

TABLE 10.

Salmon Counts and Locations from 1985  
Reconnaissance Flights Conducted by USFWS

STREAM NAME	LIVE KINGS	KING CARCASS	KING REDD	LIVE CHUM	CHUM CARCASS
Nolitna Creek					
7-26-85	0	0	0	0	0
Kanuti River					
7-26-85	0	0	0	0	0
9-26-85	0	0	0	0	0
Jim River					
9-25-85	0	0	0	14	1
South Fork- Koyukuk River					
9-26-85	0	0	0	954	0
Kanuti Kilolitna River					
7-26-85	8	0	0	0	0
9-25-85	0	0	0	0	0
Kodosin Nolitna Creek					
7-26-85	0	0	0	0	0

Fairbanks Fishery Resources personnel surveyed six lakes on Kanuti NWR during the first two weeks of August 1985 (Table 11). These surveys were in conjunction with a larger study focusing on characterization of lake fisheries habitat for all Interior Alaska Refuges.

The lakes surveyed included Minnkokwin Konedsin, Minnkokwin Kodosin, Mingkoket, Minnkokut and two unnamed lakes (one located near Old Dummy Lake and one located in the Minnkokwin Lake group). The lakes ranged in maximum depth from 1.2 to 12.8 meters, and fish were found in all lakes except for the shallowest. Northern pike were collected from five lakes and Alaska blackfish were collected in one lake. Gillnet catch-per-unit-effort data and water chemistry information indicate that these lakes exhibit low productivity.

More detailed information will be available in the April 1986 Fishery Resources Project Report on the Lake Study.

TABLE 11

Kanuti Lake Surveys - 1985

Name	Latitude	Longitude	Elevation (Ft./Ms/)	Area (Hectares)	Maximum Depth (M)	Mean Depth (M)	Conductivity (umhos/cm)	Total Alkalinity (Mg/l)	Ph	Total Fish Catch/Hour (Gillnets)	Species Collected
Konedsin	66°22'	151°58'	520	139	3.7	1.9	72	51.3	9.0	0.333	17 Northern Pike
Unnamed	66°22'	151°59'	515	37	5.8	2.5	92	68.4	7.5	0.308	12 Northern Pike
Kodosin	66°22'	152°00'	512	157	5.5	2.0	62	51.3	7.5	0.442	19 Northern Pike 1 Alaska Blackfish
Unnamed	66°08'	151°56'	560	68	1.5	0.8	34	34.2	7.0	0.00	No Fish Collected
Mingkoket	66°30'	152°08'	555	364	12.8	1.8	23	34.2	6.5	0.266	12 Northern Pike
Winnkokut	66°34'	151°40'	510	275	1.2	0.6	34	34.2	6.0	0.021	1 Northern Pike





Johnson Moses, Fred Stein and Stanley Ned record water  
depths to develop contour map of Minnkokut Lake during  
training trip.                  June 1985                  E.W.M.

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

An effort was made to initiate a trapping and banding program as time permitted between other field programs. There is a need to determine to what flyway populations this refuge contributes waterfowl and where the mortality occurs that effects the breeding population of waterfowl on Kanuti NWR. Since funds and manpower are not adequate to conduct a major trapping and banding program on Kanuti Refuge at this time, only a cursory effort was made. The main thrust of the activity was to determine what trapping methods and procedures were most effective under the habitat conditions and the distribution of locally produced birds. By trapping in late July and early August we could be sure that most all birds would be of local hatch, but the broods are still widely distributed and feeding habits may not be conducive to baiting, making trapping of reasonable numbers difficult. Mid-to-late August trapping effort, when the birds are larger and more concentrated, may yield a relative high percentage of non-local birds.

Trapping in two lakes in T16N, R20W, Sec 35 and 36 near Kanuti River, where a relatively high number of young were known to use, was attempted in late July. Five trapping sites were established by placing open funneled 6'x10' wire traps stabilized in the soft muck bottom by small poles. They were baited with cracked corn and visited every other day for one week. Several of the trap sites were actively used by ducks and baiting was continued. The others were only seldomly used. It was noticed that visiting the isolated sites in a small canoe every other day disturbed the birds enough that the use of some sites declined noticeably. Only the last trap site on the route was effective in maintaining active usage. The trap funnels were set on July 29 and checked on July 30. Only the last trap contained birds. This trap had contained a large number of ducks but their activity had washed the soft muck sufficiently below the bottom of the wire trap that most had escaped and others were lost upon our approach to the trap. Only three ducks remained in the trap. After correcting the problem and rebaiting another check was made the following day. A large number of ducks were in the lake but only two were in the trap. Evidently, the majority of the ducks that had been spooked from the trap site would not return. The traps were closed down until mid-August when another effort was made which yielded only 28 ducks. All birds trapped were pintails except for one lesser scaup.

17. Disease Prevention and Control - Nothing to report.



Rm McIntosh adjusts funnel of duck trap during trial effort to determine best methods for trapping ducks for banding in late July. July 1985 B.M.





Photo demonstrates feather development  
on a young pintail duck. July 1985 B.M.



Photo demonstrates the immature tail-feathers of a young  
pintail duck. July 1985 B.M.

## H. PUBLIC USE

### 1. General

The majority of public use on Kanuti is derived from local residents, most of whom live off the resources within the refuge and surrounding lands. There are three local villages adjacent or near to the western side of the refuge; Alatna, Allakaket and Hughes with a total populations of 314 people, 96 percent of whom are natives. Most are Athapascan Indians although Eskimos reside in Alatna and some in other villages.

About 84 people, about half being non-native, live in Bettles/Evansville located on the northern boundary of the refuge. Most other users of the refuge come from Fairbanks, but the number is small.

Many meetings and contacts were participated in during this calendar year. These meetings and contacts have resulted in a better understanding of the resources and their use, as well as the opportunity to inform these various groups and individuals of the Service's mission and purposes of the refuge.

Public relations with all villages and various organizations are good, but much more immediate contact with local residents is desirable. Time spent with these people will be invaluable later as management of the refuge progresses.

Under Title VIII of the Alaska National Interest Lands Conservation Act, Congress has declared that Federal public land in Alaska shall be managed to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so, and further, that public utilization of such lands is to cause the least adverse impact possible on rural residents dependent on subsistence uses. This, however, is to be provided in a manner consistent with the purposes for which the conservation units were established under other sections of the Act.

Since most all of management phases of the Kanuti NWR will be evaluated in relation to subsistence use, it is necessary to understand its history and the resources it affects. It also requires monitoring present activities and being in position to detect changes that would effect management policies.

A Cooperative Agreement was initiated between the Kanuti NWR, Gates of the Arctic National Park and the Subsistence Division of ADF&G to conduct a study of the subsistence uses in the Upper Koyukuk River Region. The state took the lead in the study which was initiated and phase one completed in 1983. However, the final report was not received until this year. Phase II, initiated in the summer of 1984, was to annually monitor the local harvest of resources. The NPS and the ADF&G could not participate other than in an advisory capacity. Therefore, the monitoring was accomplished solely by the Kanuti staff in 1984 and 1985.

Rebecca McGee, a highly qualified seasonal employee, along with Valerie Williams, a local hire and Matthew Golden, a volunteer, accomplished the household to household monitoring of the 1983 use of resources. The 1984



use of resources were inventoried by Local Hire Biologist B.J. Strong, Local Hire Biologist Aide, Valerie Williams and volunteer Mary Rogers during July and August 1985.

The respondents from the Villages of Bettles, Evansville, Allakaket, and Alatna are to be commended for their willingness to take part in the harvest surveys the past three years. The first survey, taken by Alaska Department Fish and Game, took an average of 1 1/2 hours for each household to complete. The 1983 survey, taken by Kanuti NWR, took an average of about 35 minutes for each household to complete. The 1984 survey, almost identical in form to the 1983 questionnaire, took less time (20 minutes), both due to interviewees' familiarity and unwillingness to spend much time. Due to the Villages' situations, impacted by Federal mandate (NPS, BLM. and USFWS), Village Corporations, and the State as well as other private interest, many different studies and surveys have been taken in the past few years. Some interviewees, when approached, showed irritation and grudging willingness to take part. Most did express surprise afterwards how little time the actual questioning took. Future surveyors will probably face similar reactions. Unfortunately, much of the information needed to understand resource use is available only through such surveying. Perhaps different methodology or timing of the survey will alleviate some of the complaints.

The use of an interviewer from Allakaket and another familiar to the residents of Bettles/Evansville was very helpful in breaking down some of the barriers to communication. It is safe to say that some households were willing to be interviewed that otherwise would not. Even so, in some cases, especially concerning trapping, respondents were unwilling to give exact harvest numbers. Such problems in data collection are noted in the text. Other inaccuracies are possible, especially due to the amount of time passed between actual harvest and the survey. These inaccuracies are difficult to combat or calculate. It is hoped that by interviewing as many households as possible such problems are lessened.

#### Local User Community and Household Profiles

Each year of the survey, successively greater number of households have been counted and surveyed. Yet the estimated populations for the last two years of survey have remained remarkably stable. In Allakaket/Alatna, this may be explained by the splitting up of extended households into separate residences. Quite a bit of house construction has taken place in the village the past few years. As new houses are built and occupied, older residences are left to others, often adult children, to occupy. In Bettles/Evansville, two of the larger families have moved away since the 1983 survey and new households have tended to consist of single individuals. The increase in number of households also relates to the interviewers' familiarity with the residents and back roads of Bettles. The actual number of households has not increased greatly, rather, previously unknown households were simply included.

The splitting of households in Allakaket/Alatna and increase in the count of small households are reflected in the drop in mean household size since last year, from 3.65 to 3.12. The split up of households in Allakaket also impacts the age of household heads, helping to explain the drop from 1983's 45.3 years to 1984's 39.9 years. The Bettles/Evansville mean age of household heads dropped also from 45.6 years down to 43.0 years, probably reflecting the



Elsie Bergman explains fish drying methods to Bio-Tech,  
B.J. Strong, during resource harvest survey.

August 1985

M.R.



The number of dogs have increased in Allakaket as  
noted by the number of pups observed in this photo.  
The interest in sled-dog racing is the primary cause.

July 1985

M.R.

increase survey of single households. Alatna household heads increased in age one year from last year, as might be expected in a somewhat stable community (McGee, McIntosh and Strong 1984).

#### Local User Employment Patterns

The nature of Bettles/Evensville as a state DOT/PF airstrip, FAA FSS, and important starting and ending point for trips into the Brooks Range, molds the types and duration of employment available there. More permanent fulltime employment is available in Bettles/Evensville than in Allakaket/Alatna. Because of the nature of the community and employment in Bettles/Evensville, there is a greater turnover in population as people come and go to work for the FAA, Park Service and various private enterprises. The turnover in population may at least partially explain the drop in average duration of employment from 9 months in 1983 to 8.2 months in 1984.

The percent of household heads employed in Allakaket/Alatna decreased from 86.5% in 1983 to 75% in 1984, while average duration of employment for household heads and the general populace increased slightly. The drop in percent of household heads employed may relate to the split up of households with new house construction. More young people are now household heads, yet are not employed. Quite a bit of construction took place in the village during the summer of 1984, perhaps explaining the increase in duration of employment - even though there was little available fire fighting work with BLM.

2. Outdoor Classrooms - Students -- Nothing to report.
3. Outdoor Classrooms - Teachers -- Nothing to report.
4. Interpretive Foottrails - Nothing to report.
5. Interpretive Tour Routes -- Nothing to report.
6. Interpretive Exhibits/Demonstrations -- Nothing to report.
7. Other Interpretive Programs

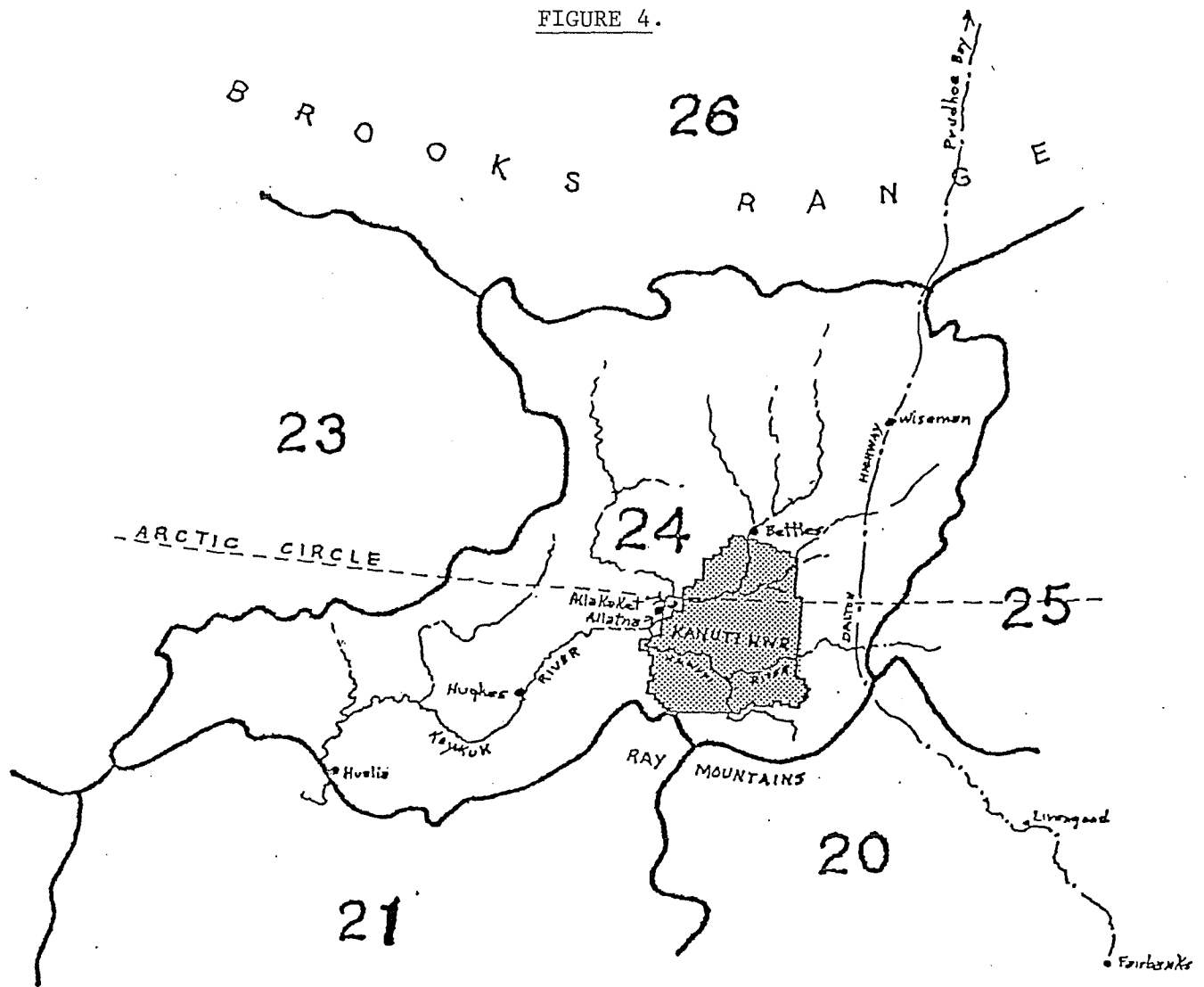
Volunteer, Mary Rogers, provided interpretive programs to the residents of each village in July and August while the Subsistence Harvest Inventory team visited the villages. Unfortunately, due to other village activities, the presentations were cancelled and rescheduled several times and then rather poorly attended. Summers are difficult times to provide such programs within the villages.

#### 8. Hunting

Subsistence and sport hunting are major public use activities on Kanuti NWR. The refuge lies entirely within the State's Games Management Unit 24, and all regulations pertaining to the Unit apply to the refuge as well.

A Controlled Use Area was established by the State in 1981 to prevent fly-in hunting of moose to ease conflict between sport hunters and local

FIGURE 4.



ALASKA GAME MANAGEMENT UNITS IN VICINITY OF KANUTI NWR

FIGURE 5. Controlled Use Area

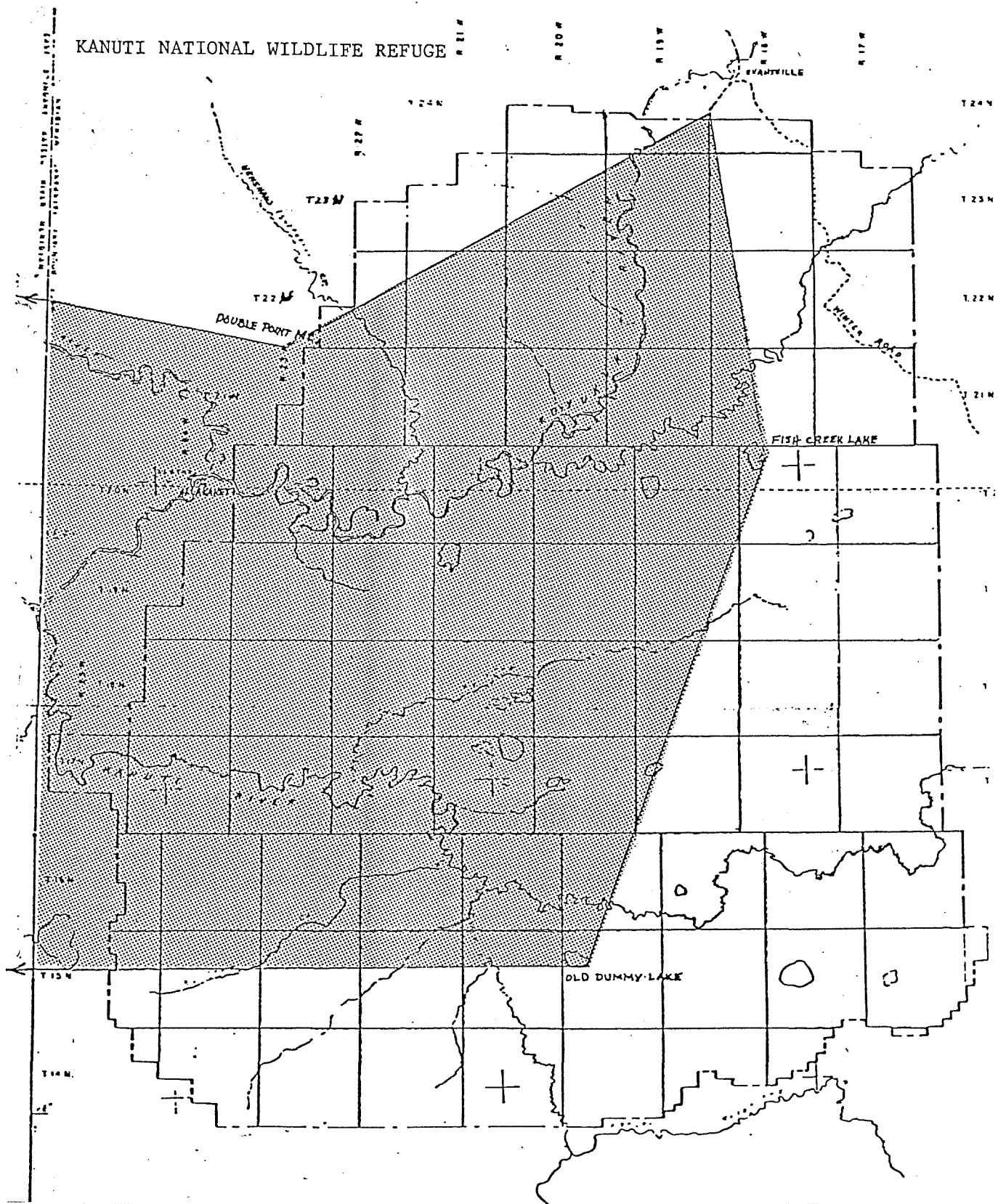




TABLE 12. 1973, 1982, 1983, 1984 Big Game Harvests

Bettles/Evansville N=32								
Resource	1973*		1982**		1983***		1984	
	Total	Mean	Total	Mean	Total	Mean	Total	Mean
	Comm. Hvst.	Hsld. Hvst.	Comm. Hvst.	Hsld. Hvst.	Comm. Hvst.	Hsld. Hvst.	Comm. Hvst.	Hsld. Hvst.
Moose	25	(a)	10	0.5	12	0.6	12	0.4
Caribou	50	(a)	11	0.6	4	0.2	3	0.1
Sheep	5	(a)	2	0.1	0	NA	1	0.03
Black Bear	5	(a)	5	0.3	2	0.1	1	0.03
Brown Bear	0	(a)	1	0.1	0	NA	0	NA

Allakaket/Alatna N=48								
Resource	1973*		1982**		1983***		1984	
	Total	Mean	Total	Mean	Total	Mean	Total	Mean
	Comm. Hvst.	Hsld. Hvst.	Comm. Hvst.	Hsld. Hvst.	Comm. Hvst.	Hsld. Hvst.	Comm. Hvst.	Hsld. Hvst.
Moose	48	(a)	28	0.8	23	0.5	32	0.7
Caribou	300	(a)	5	0.1	0	NA	3	0.06
Sheep	10	(a)	5	0.1	0	NA	2	0.04
Black bear	20	(a)	21	0.6	7	0.2	17	0.4
Brown bear	10	(a)	0	NA	1	0.02	1	0.02

\* Nelson, Mautner and Bane 1982.

\*\* Marcotte and Haynes 1985.

\*\*\* McGee, McIntosh and Strong 1984.

(a) Data not available.

subsistence hunters. The area encompasses approximately two-thirds of the Kanuti NWR. (See map on following page).

Willard D. Lambert and Ronald K. Lambert hold a State exclusive guide permit for an area that encompasses most of Kanuti NWR. They did not request a permit in 1984 nor in 1985 and to our knowledge did not take hunters into the area.

Other hunters made fair use of the refuge outside the Controlled Use Area during the moose hunting season. Several parties were known to fly into Kanuti Lake area and others floated the Kanuti, Koyukuk and South Fork Rivers from the Dalton highway and Bettles. Sport hunting yielded only about six moose in 1985.

As described in the General Section, the 1984 subsistence harvest levels were monitored in the communities of Bettles/Evensville and Allakaket/Alatna.

The general big game hunting areas for Allakaket/Alatna and Bettles/Evensville have remained fairly consistent the three years surveyed. Allakaket/Alatna hunters make far greater use of Kanuti NWR for their hunting and actual harvesting of moose and bear. The Kanuti and South Fork of the Koyukuk rivers are particularly used by Allakaket/Alatna hunters, while the North and Middle Forks of the Koyukuk and the John River continue to be well-used by Bettles/Evensville household hunters.

Allakaket/Alatna harvest of moose and black bear increased in 1984 (see Table 12). Both the total community harvest and the mean household harvest increased noticeably. On the other hand, while the Bettles/Evensville total community harvest of moose and black bear remained about the same as 1983, the mean household harvest dropped considerably. The drop in harvest, particularly moose, may relate to the aforementioned "busyness" of Bettles/Evensville households during the summer of 1984. Also, many of the new households interviewed for 1984 consisted of single adults not usually involved in the harvest of resources, i.e., teachers and FAA flight service specialists.

Sheep were harvested in small numbers (one by Bettles/Evensville and two by Allakaket/Alatna) during 1984. No sheep were harvested by surveyed households in either village during 1983. A few caribou were harvested by traveling long distances from the villages by snow machines or aircraft. Caribou and sheep are prized game as evidenced by the distances traveled and difficulties involved in hunting.

#### Waterfowl and Other Birds

The refuge remains an important waterfowl hunting area for Allakaket/Alatna households. The survey results shows over 2/3 of geese and ducks harvested to have come from within the refuge, in particular, from the Kanuti and South Fork Rivers. This is a great increase from 1983 results which showed approximately 1/4 of waterfowl to be taken within the Refuge. The results for 1984 may be falsely high due to ambiguous answers given by respondents. The lower



B.J.Strong records information while Ben Bergman and Valerie Williams identify waterfowl harvested during the past year. Ben's daughter find interest in the maps. July 1985 M.R.



Subsistence Resource Harvest information is collected by B.J. Strong, Valerie Williams and Elsie Bergman in Alatna. July 1985 M.R.

Alatna River, north of the refuge, is another well used hunting area from year to year, especially for Alatna households. Few Bettles households (3) harvested waterfowl and only one harvested waterfowl on the refuge. As in 1983, ducks from the refuge were harvested on the Koyukuk below Old Bettles to the confluence of the South Fork. Some limited hunting took place at Fish Creek Lake, but no waterfowl were harvested there.

Springtime is the primary waterfowl hunting time for both Bettles/Evansville and Allakaket/Alatna households as evidenced by the 1983 and 1984 survey results. The results for both years show May to be the primary month for waterfowl hunting, followed by September. In 1984, 73% of the waterfowl were taken in May while about 14% were taken in September. This is a significant change from 1983's levels - 59% in May and 32% in September. Few ducks and geese remain in the area for the fall hunt. Those that remain, according to respondents, are skittish and hard to shoot.

In 1984 the total waterfowl harvest reported by all surveyed residents was 1,794 birds (Lesser sandhill cranes are included in with the waterfowl data for convenience).

	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct-Mar</u>
Total Kill = 1,794	1.8%	73.0%	1.4%	1.1%	8.9%	13.8%	0

The harvest of ducks and geese increased in both Bettles/Evansville and Allakaket/Alatna during 1984 as compared to 1983 (see Table 13). 1984 provided the greatest harvest of ducks for Bettles/Evansville of any of the years surveyed. The duck harvest in Allakaket/Alatna was the highest since 1973, while geese were taken in more numbers than any year surveyed.

A comparison of 1983 and 1984 species harvests in Allakaket/Alatna shows an increase in harvest numbers and household participation for Canada goose, snow goose, white-fronted goose, scaup, oldsquaw, and surf scoter during 1984. The mallard harvest decreased by approximately one third, though the number of households participating remained the same. The canvasback harvest and hunting participation dropped from 1983 levels, but part of the decrease may be explained by the interviewees lessened confusion in differentiating canvasbacks from scaups. Scaups are generally called "canvasbacks" by Allakaket/Alatna residents.

Approximately, 95.7% of the total reported waterfowl were harvested by Allakaket/Alatna while 4.3% were harvested by Bettles/Evansville.

Table 13.

A Percentage Comparison  
of the 1983 and 1984  
Harvested Waterfowl Species  
Reported by Local Residents

	<u>1983</u>	<u>1984</u>
Sandhill Crane	.34	.67
Swan	0	.56
Canada Goose	15.63	14.49
Snow Goose	.06	1.56
Black Brant	.06	.06
White-Fronted Goose	4.71	8.92
Mallard	16.45	8.97
Pintail	18.29	16.00
Green-Winged Teal	2.18	1.34
Blue-Winged Teal	.89	1.73
Wigeon	13.24	10.20
Shoveler	2.12	1.23
Redhead	.82	.39
Ring-Necked Duck	.55	1.00
Canvasback	3.14	.78
Scaup	3.82	6.58
Goldeneye	.61	0
Bufflehead	.20	.06
Oldsquaw	8.53	16.56
Harlequin	.41	.11
Common Scoter	.06	.06
Surf Scoter	6.28	7.58
White-Winged Scoter	1.16	.84
Red Breasted Merganser	.41	.33



TABLE 14. Waterfowl Species Harvest, 1984

Bird	Bettles/Evansville N=32 Households			Allakaket/Alatna N=48 Households		
	# of Hslds. Part.	Total Hvst.	On KNWR	# of Hslds. Part.	Total Hvst.	On KNWR
Crane	0	0	0	6	12	11
Swan	0	0	0	1	10	10
Canada Goose	3	11	4	29	249	180
Snow Goose	0	0	0	3	28	7
Black Brant	0	0	0	1	1	1
White-fronted Goose	1	2	0	23	158	108
Mallard	2	14	0	24	147	110
Pintail	2	35	0	31	252	202
Green-winged Teal	0	0	0	7	24	7
Blue-winged Teal	0	0	0	5	31	14
American Wigeon	0	0	0	22	183	140
Shoveler	0	0	0	9	22	17
Redhead	0	0	0	1	7	5
Ring-necked Duck	0	0	0	2	18	12
Canvasback	0	0	0	3	14	14
Scaup	0	0	0	21	118	79
Goldeneye	0	0	0	0	0	0
Bufflehead	0	0	0	1	1	0
Oldsquaw	2	14	2	28	283	207
Harlequin	0	0	0	1	2	1
Common Scoter	0	0	0	1	1	1
Surf Scoter	1	2	0	20	134	104
White-winged Scoter	0	0	0	6	15	11
Red-breasted Merganser	0	0	0	2	6	4

TABLE 15. 1973, 1982, 1983, 1984 Waterfowl and Other Bird Harvests

Bettles/Evansville N=32								
Resource	1973*		1982**		1983***		1984	
	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.
Swans	(a)	(a)	(a)	(a)	0	NA	0	NA
Geese	20	(a)	12	0.6	3	0.1	13	0.4
Ducks	20	(a)	36	1.8	26	1.2	67	2.1
Cranes	(a)	(a)	(a)	(a)	0	NA	0	NA
Grouse	10	(a)	7	0.4	14	0.7	32	1.0
Ptarmigan	100	(a)	20	1.0	36	1.7	26	0.8
Allakaket/Alatna N=48								
Resource	1973*		1982**		1983***		1984	
	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.
Swans	(a)	(a)	(a)	(a)	0	NA	10	0.2
Geese	300	(a)	395	11.3	297	6.6	436	9.1
Ducks	4000	(a)	858	24.5	1123	25.0	1258	26.2
Cranes	(a)	(a)	(a)	(a)	5	0.1	12	0.3
Grouse	150	(a)	81	2.3	72	1.6	76	1.6
Ptarmigan	500	(a)	154	4.4	74	1.6	33	0.7

\* Nelson, Mautner and Bane 1982.

\*\* Marcotte and Haynes 1985.

\*\*\* McGee, McIntosh and Strong 1984.

(a) Data not available.

Ptarmigan were harvested in lower numbers during 1984 than 1983 in both Allakaket/Alatna and Bettles/Evensville. The lower harvest numbers coincide with the observations made by local hunters and trappers that ptarmigan populations were low. Ptarmigan tend to be harvested during trapping season along trapline trails. Grouse harvests were up in Bettles/Evensville and stable in Allakaket/Alatna as compared to 1983. Grouse tend to be taken incidentally during big game hunting or other activities.

#### 9. Fishing

Fishing is an important activity in both Bettles/Evensville (56.3% of households surveyed participating) and Allakaket/Alatna (75% of surveyed households). The percent involved in fishing decreased in Bettles/Evensville and increased in Allakaket/Alatna since 1983. The areas used for fishing by both villages have remained somewhat stable through all 3 years of the survey. Some variation is to be expected because of different households being included in the questioning from year to year. The fishing area for Bettles/Evensville seems to have decreased in 1984. Little fishing activity took place below Old Bettles on the Koyukuk in 1984. Fewer areas were accessed by airplane due to at least two families with airplanes moving out of Bettles/Evensville and what was described as a "busy" summer for residents. A number of respondents mentioned that they would have liked to do more fishing that summer, but just didn't have the time.

Bettles/Evensville fishing harvest decreased quite drastically in all species except king salmon and burbot in 1984 from 1983, reflecting the decreased participation and time devoted to fishing. Allakaket/Alatna harvest of king salmon, chum, whitefish and suckers dropped in 1984 from 1983, while harvest of sheefish, pike, grayling and burbot increased. Comparing the figures in Table 16, the harvest of salmon and whitefish among surveyed households hit a noticeable low in 1984. Whitefish harvest figures may be artificially low, as described elsewhere in the text. Actual efforts (days spent fishing) for whitefish harvest exceeded that for 1983. The days spent attempting to harvest salmon were down from 1983, almost 100 days less for both chum and kings. It is, therefore, difficult to pinpoint whether the decrease in harvest is due to a lessening of effort or lower populations of fish. Whether or not setnetting was a less important activity in Allakaket/Alatna during 1984, rod and reel fishing increased noticeably - 547 grayling were harvested 83 days of "hooking" during 1983, while 836 grayling were harvested in 307 days of rod and reel fishing during 1984. It must be noted that "days fished" contains a high probability of error in all types of fishing. A net may be put out for two months to purposefully catch salmonoids, and also catch grayling or pike. The interviewee may respond that he fished for grayling or pike two months.

#### 10. Trapping

Trapping continues to be an important winter activity among the households of the Upper Koyukuk. Thirty-one of 48 surveyed Allakaket/Alatna

TABLE 16. 1973, 1982, 1983, 1984 Fishing Harvests

Bettles/Evansville N=32								
Resource	1973*		1982**		1983****		1984	
	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.
King Salmon	0	(a)	9	0.5	0	NA	13	0.4
Chum Salmon	0	(a)	532	26.6	426	20.3	128	4.0
Sheefish	0	(a)	212	10.6	23	1.1	14	0.4
Whitefish	50	(a)	210	10.5	0	NA	0	NA
Pike	50	(a)	10	0.7	115	5.5	25	0.8
Grayling	200	(a)	491	24.6	807	38.4	355	11.1
Suckers	100	(a)	0	NA	0	NA	0	NA
Burbot	(a)	(a)	0	NA	0	NA	7	0.2
Blackfish	(a)	(a)	0	NA	0	NA	0	NA
Arctic Char	(a)	(a)			145	6.9	9	0.3
Lake Trout	0	(a)	61***	3.1***	254	12.1	24	0.8

Allakaket/Alatna N=48								
Resource	1973*		1982**		1983****		1984	
	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.
King Salmon	300	(a)	322	9.2	396	8.8	243	5.1
Chum Salmon	12600	(a)	11497	328.5	10765	239.2	8524	177.6
Sheefish	1600	(a)	2451	70.0	1540	34.2	1786	37.2
Whitefish	24000	(a)	4858	138.8	11610	258.0	3282	68.4
Pike	500	(a)	401	11.5	248	5.5	416	8.7
Grayling	1000	(a)	1639	46.8	631	14.0	836	17.4
Suckers	400	(a)	480	13.7	780	17.3	377	7.9
Burbot	(a)	(a)	58	1.7	0	NA	42	0.9
Blackfish	(a)	(a)	(a)	(a)	0	NA	0	NA
Arctic Char	(a)	(a)			0	NA	0	NA
Lake Trout	(a)	(a)	0***	NA***	0	NA	0	NA

\* Nelson, Mautner and Bane 1982.

\*\* Marcotte and Haynes 1985.

\*\*\* Lake trout and arctic char harvest figures combined for 1982.

\*\*\*\* McGee, McIntosh and Strong 1984.

(a) Data not available.

households did at least some trapping during the 1983-84 season. Eleven of 32 surveyed Bettles/Evensville households at least attempted some trapping. As during the 1983-84 trapping season, Bettles/Evensville trappers tend to have larger traplines, setting more snares and/or traps than the average Allakaket/Alatna trapper. The average number of snares and traps set per trapping household in both Allakaket/Alatna and Bettles/Evensville dropped in 1984-85 from 1983-84. The number of traps per household in Bettles/Evensville dropped drastically, from 242 traps per household to 88 traps per household.

Marten is the species trapped in the greatest numbers during the 1980's in the villages, according to the surveys (see Table 17). (This does not take into account hare, which is not trapped primarily as a furbearer but rather as food or bait for other furbearers.) The total community harvest and mean household harvest of marten in Allakaket/Alatna, as well as the mean household harvest in Bettles/Evensville, was down from 1983-84. One Bettles/Evensville trapper observed that the marten population seemed to be low.

Beaver harvesting, non-existent in Bettles/Evensville in 1984-85, was again down in the Allakaket/Alatna, continuing a downward trend since 1973. Beaver prices are low in comparison to other fur, and beaver are very hard to skin. They are a food resource valued by native people, however.

The lynx harvest, as shown in the mean household harvests since 1982-83, has declined somewhat for trappers in both villages. The fox harvest, from a high in 1982-83, continues low in Bettles/Evensville and has shown a progressive drop in Allakaket/Alatna. These two populations and harvests may be related to the observed lows in ptarmigan and hare populations.

The numbers of furbearers shown harvested by both Allakaket/Alatna and Bettles/Evensville households are lower than the actual take. Two surveyed trappers in Allakaket/Alatna and one in Bettles/Evensville declined to give numbers of fur taken. One very active and successful trapper in Bettles/Evensville declined to be interviewed at all.

#### 11. Wildlife Observation

Wildlife observations are a coherent part of most public use activities of Kanuti NWR. However, it is not known whether wildlife observations has been the primary interest of any public visitor use.

#### 12. Other Wildlife Oriented Recreation

An occasional boater or stream floater travels the Koyukuk River, stopping occasionally to fish, observe wildlife or camp. Visitors of this type are few on Kanuti NWR, but are expected to increase somewhat as the public learns of the area and attempts to explore this new NWR.



TABLE 17. 1973, 1982, 1983, 1984-85 Trapping Harvests

Allakaket/Alatna N=48								
Resource	1973*		1982-83**		1983-84****		1984-85	
	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.
Wolf	5	(a)	2	0.1	0	NA	1	0.02
Fox	20	(a)	89	2.5	48	1.1	20	0.4
Wolverine	6	(a)	4	0.1	10	0.2	1	0.02
Lynx	20	(a)	135	3.9	62	1.4	53	1.1
Otter	10	(a)	4	0.1	2	0.04	2	0.04
Beaver	300	(a)	230	6.6	198	4.1	130	2.7
Marten	150	(a)	1072	30.6	915	20.3	724	15.1
Mink	100	(a)	0	NA	4	0.1	6	0.1
Muskrat	400	(a)	126	3.6	3	0.1	30	0.6
Hare	200	(a)	818	23.4	269***	6.0***	145	3.0
Bettles/Evansville N=32								
Resource	1973*		1982-83**		1983-84****		1984-85	
	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.
Wolf	10	(a)	0	NA	3	0.1	0	NA
Fox	5	(a)	20	1.0	4	0.2	9	0.3
Wolverine	2	(a)	7	0.4	4	0.2	2	0.1
Lynx	12	(a)	30	1.5	30	1.4	35	1.1
Otter	0	(a)	0	NA	0	NA	0	NA
Beaver	43	(a)	11	0.6	1	0.1	0	NA
Marten	100	(a)	154	7.7	160	7.6	206	6.4
Mink	6	(a)	0	NA	0	NA	2	0.1
Muskrat	20	(a)	13	0.7	0	NA	0	NA
Hare	100	(a)	231	11.6	0***	NA	98	3.1

\* Nelson, Mautner and Bane 1982.

\*\* Marcotte and Haynes 1985.

\*\*\* Data may be inaccurate due to interviewing error.

\*\*\*\* McGee, McIntosh and Strong 1984.

(a) Data not available.

13. Camping

Camping is associated only with wildlife oriented activities as far as is presently known.

14. Picnicking - Nothing to report.

15. Off-Road Vehicles

Almost all off-road vehicle on Kanuti NWR is directly associated with wildlife oriented activities. Snowmobiles, three wheelers, and dog sleds in winter and outboard boats in summer are major ground transportation means within the refuge. They have caused little or no problems on the refuge to the knowledge of this refuge manager. There are trails established that carry the primary use of off-road vehicles.

Small planes utilize the slower streams, lakes, ponds, and gravel bars to land in transporting public users into and out of the refuge. Such activity has been light with little effect upon the refuge or its resources. Some areas, where major waterfowl nesting occurs, may need control of air traffic and some boating activity in the future.

16. Other Non-Wildlife Oriented Recreation

According to 50 CFR Part 36.31(b) "Surface collection, by hand (including handheld gold pans) and for personal recreational use only, of rocks and minerals, is authorized." This activity, with its special restrictions on precious metals and gem stones and their collection methods, has a few participants.

The Allakaket/Alatna harvest of plant materials, much like the other resources, continues to make greater use of the Kanuti NWR than Bettles/Evensville. Little of the surveyed Bettles/Evensville household harvest of berries, firewood, houselogs and poles comes from the refuge from year to year, mainly because other areas are more accessible.

1984 was considered a poor berry year by Bettles/Evensville households who tend to prize blueberries. The total berry and blueberry harvest was down greatly from 1983 (see Table 18). The lowbush cranberry and highbush cranberry harvest increased in the absence of blueberries. The Allakaket/Alatna total berry harvest increased by about 50% over the previous year. The harvest of blueberries and lowbush cranberries, particularly, increased in 1984 from 1983.

Bettles/Evensville surveyed firewood harvest in 1984 showed a substantial decline from 1983. Lack of areas to cut firewood continues to be a common complaint. As locations near the village continue to be over harvested and firewood is harder to come by, more driftwood is being utilized from the river banks.

Allakaket/Alatna has harvested a high percent of its firewood and houselogs from within the refuge during 1983 and 1984. The total amount of house

TABLE 18. 1973, 1982, 1983, 1984 Berry and Firewood Harvests

Bettles/Evansville N=32								
Resource	1973*		1982**		1983***		1984	
	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.
Berries	(a)	(a)	94.2 gal	4.7 gal	183.8 gal	8.8 gal	115 gal	3.6 gal
Firewood	50 cords	(a)	89 cords	4.5 cords	96.5 cords	4.6 cords	78.5 cords	2.5 cord
Allakaket/Alatna N/48								
Resource	1973*		1982**		1983***		1984	
	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.	Total Comm. Hvst.	Mean Hsld. Hvst.
Berries	(a)	(a)	251.5 gal	7.2 gal	160.5 gal	3.6 gal	328 gal	6.8 gal
Firewood	300 cords	(a)	274 cords	7.3 cords	300.8 cords	6.7 cords	347.5 cords	7.2 cords

\* Nelson, Mautner and Bane 1982.

\*\* Marcotte and Haynes 1985.

\*\*\* McGee, McIntosh and Strong 1984.

(a) Data not available.

logs harvested was down in 1984 from 1983, but the harvest within Kanuti NWR was increased. Many logs were needed for the construction of houses and the community hall.

The firewood harvest of Allakaket/Alatna increased in 1984, as did the percent harvested within the refuge (30% in 1983, 50% in 1984). Dry spruce continues to be the type of firewood most harvested by households in both communities.

17. Law Enforcement

Law enforcement activities are practically non-existent on this refuge due to lack of funds, personnel and necessary equipment. Though there are only a small number of violations that exist presently, the number will increase unless we can demonstrate our presence and ability to actively enforce the regulations that protect the resources and dignity of this refuge.

Only two cases were made during 1985. These were made against two men from Anchorage that built an illegal cabin upon the refuge. The cases were prosecuted and fines paid.

Out-of-season moose kills, aerial wolf hunting and the cutting of houselogs without a permit are major areas of concern.

18. Cooperative Associations - Nothing to report.

19. Concessions - Nothing to report.



Two gentlemen from Anchorage paid their fines after conviction of illegally construction of a cabin on the refuge in the fall of 1984. The cabin has been dismantled and logs made available for subsistence use. January 1985 E.W.M.



## I. EQUIPMENT AND FACILITIES

### 1. New Construction

No new construction occurred during CY 1985. However, funds appropriated by Congress in CY 84 to construct bunkhouse, office and storage facilities in Bettles was used to purchase an existing building. That purchase was made in July. Congress also intended that, where feasible, joint-use of facilities be made with the National Park Service. Therefore, Cooperative Agreements were worked on during the year to accomplish that end. BLM would also participate in the joint-use where feasible.

During CY 1985 several lots were leased from the Alaska Department of Transportation at Bettles Airfield and planning initiated for construction of the needs for the three agencies. Plans have not yet been completed sufficiently for inclusion in this report.

### 2. Rehabilitation - Nothing to report.

### 3. Major Maintenance - Nothing significant to report.

### 4. Equipment Utilization and Replacement

Since Kanuti is still a relatively new refuge much of the equipment is new and equipment acquired is to furnish offices in Bettles and Fairbanks and to adequately equip our employees for safely accomplishing various field programs being initiated. The only actual replacement equipment obtained was the trade-in of the old Bronco for a new one with the Fairbanks GSA motor pool.

### 5. Communication Systems

The new radio communication system purchased with fire funds has as yet not been installed on the refuge. Certain parts of the system arrived too late to begin installation prior to freeze-up. The system base hook-up is planned for March 1986.

### 6. Computer Systems

The Data General Computer at this station continued to be non-functional throughout CY 1985. Many problems plagued the system and when we finally thought we had the problems solved and could begin using the system it was unplugged from the central unit in the Arctic Refuge office for installation of more equipment for their office without notification. As result, this refuge began a campaign to obtain a totally separate computer system. We are still waiting for the final approval from Washington.

### 7. Energy Conservation

Since the Kanuti office is in the Federal Building in Fairbanks, there is no direct responsibility with the energy system. It is controlled by GSA maintenance staff.



The new "Old Towne" pack canoes worked quite well in accomplishing the waterfowl broodcounts and other wildlife surveys. July 1985 H.H.



Radio communication is critical to efficient management and employee safety. The new radio system includes small portables and repeater stations. July 1985 B.M.





This facility located in Bettles was purchased by FWS in July and will contain an exclusive-use bunkhouse upstairs and joint-use administrative offices downstairs for the FWS and NPS. July 1985 M.R.



Looking down toward St. John's in the Wilderness Church from the front of the FWS leased cabin in Allakaket reveals the summer water system of Allakaket. July 1985 M.R.

The new bunkhouse-office facility in Bettles is scheduled for modification in CY 1986 which should improve the energy consumption of that facility.

8. Other - Nothing to report.

J. OTHER ITEMS

1. Cooperative Programs

An effort was begun to establish a cooperative relationship with the land inholders of Kanuti NWR. These include Doyon, Ltd., Evansville Inc., K'Oyitl'Ots'Ina, Ltd. and some 42 native allotment owners represented by Bureau of Indian Affairs. Monthly informal meetings were established to discuss mutual concerns and develop a flow of communication. The interest has remained high and a better understanding of each others concerns has developed. Future cooperation in projects of mutual concern is evident.

The Kanuti NWR, the Gates of the Arctic National Park and the Alaska Fire Service (BLM) are developing a Cooperative Agreement for the joint-use of facilities in Bettles.

Cooperation with ADF&G took place with Subsistence Resource Harvest Studies and in Moose Surveys during CY 1985.

Refuge Manager McIntosh also met with ADF&G personnel to discuss management programs in an Annual Forum designed to improve cooperation with that Agency.

1985 Permits

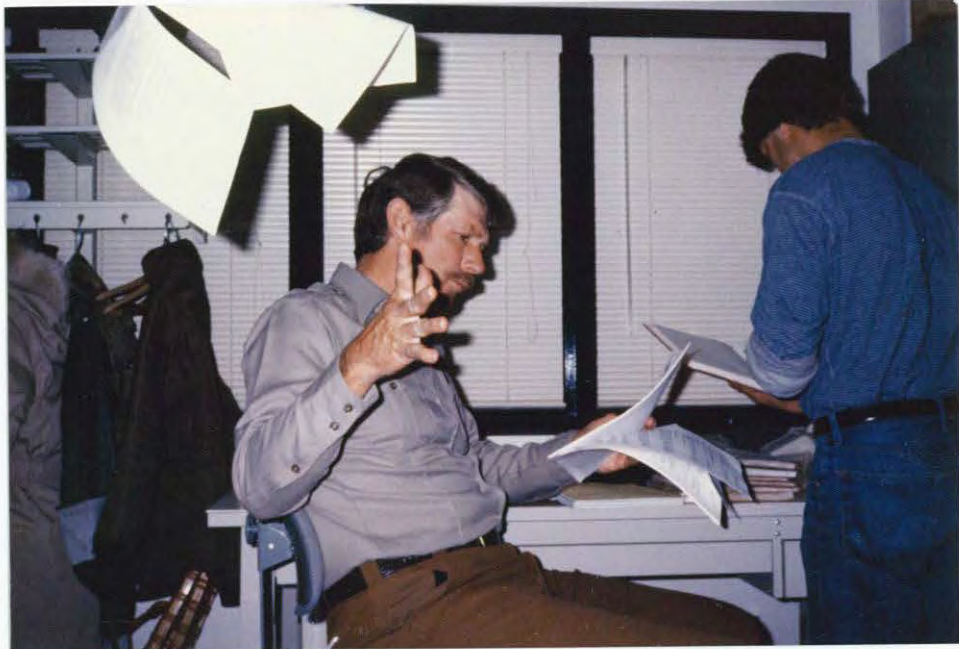
Only three Special Use Permits were issued in CY 1985.

KN-85-1 Gerald Zambar, BLM - Conduct aerial (helicopter) vegetation surveys along navigable waters to determine upland acreages, including verification landings.

KN-85-2 Dr. Thomas Hamilton, U.S.G.S. - Conduct superficial geologic mapping, including sampling surface mineral soil.

KN-85-3 Steve Bergman, Allotment Owner - Cutting 50 logs for a subsistence trapping cabin to be erected on his allotment.

NOTE: No SUP was issued to Willard D. or Ronald K. Lambert for commercial guiding of hunting parties within the Refuge during CY 1985.



Junk mail and request for information from the R.O., other agencies and organizations that is "nice to know but non-essential" floods the daily mail and ties up many hours of this small staff's time.

RM McIntosh is seen here "weeding" out the day's mail.

August 1985

M.R.



2. Other Economic Uses - Nothing to report.
3. Items of Interest - Nothing to report.
4. Credits

This narrative was written by Ervin McIntosh, Harvey Heffernan and B. J. Strong. It was typed and edited by Lena Callender.

Photo Credits

E.M. --- Ervin McIntosh  
H.H. --- Harvey Heffernan  
K.T. --- Ken Troyer  
M.R. --- Mary Rogers  
B.M. --- Bernd Moser

## FEEDBACK

### A Refuge Manager's Concern

We often see and experience things happening to or within the refuge system that seems adverse to the purposes of the system or restricts or prevents us as managers from effectively managing the resources or carrying out our responsibilities to the resources and the public.

We see oil exploration and development being allowed on our wildlife refuges before those areas outside the system have been developed; we see our waterfowl populations continue to decline and yet cannot enforce the laws preventing spring hunting on refuges of Alaska or at least control the take. We look at our organization and find that more and more management authority has shifted to the Regional Office and Washington demonstrating that our leadership cannot provide general policy and guidance alone but must also make many decisions that should be the responsibility of the refuge managers and project leaders.

We look at our management system and find it difficult for refuges to operate effectively within it. Each program coordinator striving to make his program produce and become important enough to attract more funds and manpower, while refuges, having all programs and then some, are left with the dilemma of how to operate the refuge on funds that are earmarked for specific programs. Managers are forced to scavenge some of these funds to cover their operational costs because adequate funds are not available. The system has merely created an extreme amount of paperwork and an imbalance of funding. We look at our inept financial system and wonder what "mad-hatter" institution was contracted to design it. It certainly wasn't designed with logic or efficiency in mind. Expecting project leaders to keep track of their finances is almost ridiculous. We not only have Denver's books to keep straight but now we attempt to keep the regional offices books straight while maintaining our own set of books. And, we are not even sure what our budget is until half the year is over.

We have a procurement system and personnel system with so many regulations and restrictions that a top rank lawyer would have difficulty determining whether he could or could not legally buy a particular item or from a particular company. It has become so complex in personnel that it takes months to fill a single position and the costs to refuge operations is enormous not to mention the wear and tear on the remaining refuge staff.

There are many, many more examples some probably better than those given, but without going further I think you can appreciate this refuge manager's concern. The demand upon our natural resources has become intense and the pace of change is faster and more complex than ever before. We need strong leadership in Washington and the Regional Offices; one that does not merely react to day to day issues but one that can establish a positive direction for the FWS and refuges, and can develop an efficient organization that is streamlined and responsive, not only to politicians and the public, but to its people in the field and the operational and resource problems they face.

The present system and organization seems much too reactionary and managerial. Each attempt to solve a problem either complicates an already overburdened operational system or creates new problems that, in turn create stress on the system and its people.

#### Refuges as part of a Community

Many refuges in Alaska are as much a part of the surrounding communities as a factory is to a company town. A good portion of the residents of nearby communities are highly dependent upon the areas now designated as National Wildlife Refuges for their particular economic lifestyles. There is no other choice at present for many. Our failure to recognize their dependency can only complicate our ability to effectively manage these remote refuges. We need to know what resources and the extent of their dependence or "real need". We need to know what other economic and social factors cause change in their dependence upon the resources within the refuges and be as responsive to their needs as wise management of the resources will allow. Their understanding of the mission and purpose of the FWS and refuges is important. We gain their trust and support from this knowledge and how we react to them and their real or perceived needs.

We also need to be in a position to provide technical advice to them on the management of resources on their own lands adjacent to the refuges in order to insure their dependency does not fall entirely upon the refuges.

#### A Program Well Worth a Compliment

I can only have praise for the "volunteer" program and those that participate. I have always been skeptical of such programs prior to coming to Alaska. But, over the last four years of dependence upon such a workforce due to the lack of adequate employees to conduct this refuge's operations, I have but total respect for those that contribute their time, resources and skills to assist this organization in the accomplishment of its objectives. The overall quality and enthusiasm of those, thus far selected for work at the refuge, has been outstanding.