

KANUTI NATIONAL WILDLIFE REFUGE ^{PLS}
Fairbanks, Alaska

US FISH & WILDLIFE SERVICE--ALASKA
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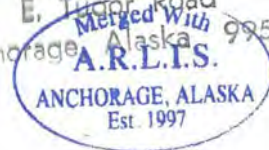


ANNUAL NARRATIVE REPORT
Calendar Year 1984

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

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NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

KANUTI NATIONAL WILDLIFE REFUGE
Fairbanks, Alaska

ANNUAL NARRATIVE REPORT
Calendar Year 1984

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3-29-85
Date

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Refuge Supervisor

4/11/85
Date

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Regional Office Approval

4/15/85
Date



INTRODUCTION

Kanut 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.

Kanut 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 Athapascan 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

Kanutu's Comprehensive Conservation Planning was officially initiated. Public Meetings were held and issues and concerns sought out and compiled. A draft vegetative cover map was completed and corrected using the best knowledge of the area available.

A report on the physical resources of Kanuti was prepared for the CCP as well as other reports of base information needed.

Much effort continued to be placed into documenting the occurrence of the distribution and use of renewable resources within the refuge.

Waterfowl were a major emphasis and efforts were made to improve and refine census techniques, and obtain reliable information on the subsistence use of this resource.

Since beaver seem to play a major role in the control of the hydrology and ecology of wetlands on Kanuti, a cooperative study was begun with the Wildlife Cooperative Unit of UAF concerning beaver influence on waterfowl production and use. This 5-year study is hoped to provide information that will aid management decisions and provide a management tool for this remote area.

The second phase of the cooperative subsistence study of the Upper Koyukuk Region was conducted. This phase, an annual household inventory of resource harvested by local residents, was conducted solely by Kanuti Refuge due to funding and other commitments of the NPS and State ADF&G Subsistence Division. The 1st phase report is yet to be received from the State, who took the lead in that portion of the study.

The Fisheries Unit of the USFWS in Fairbanks began a review of the fishery resources on Kanuti. This year's primary emphasis was on lakes.

Aerial reconnaissance was conducted to review public use activities, search for illegal cabins and for other LE activities periodically throughout the year.

The Seward-Koyukuk Fire Plan was completed and initiated this year. The plan worked well on the Kanuti Refuge with only minor complaints from local residents that wanted work.

The Common Administrative staff was discontinued and each refuge given its own clerical staff. This greatly improved the efficiency and morale of all concerned.

Efforts to gain adequate suitable space for Kanuti Refuge Headquarters failed, but the determination remains.

The Personnel of Kanuti NWR during CY 1984 included three permanent full time employees, two temporary employees, two local hire seasonals and four volunteers.

Several members of the Planning Team assisted refuge personnel in many field activities.

One Congressional Inquiry occurred as the result of a local hunting guide being denied use of a trespass cabin on the refuge.

B. Climatic Conditions

The Federal Aviation Administration at Bettles Airfield, located on the Koyukuk River about three miles above Kanuti NWR's central northern boundary, records weather data for the National Weather Service. These data are the best currently available for the refuge. However, past measurements for other areas in and near the refuge vary substantially from Bettles. For example, unofficial temperatures in Allakaket, located two miles outside the west central refuge boundary and 36 air miles from Bettles, are frequently 10-20° colder than Bettles. Wind, precipitation and other weather conditions also vary as well. Substantial climatic differences within a mountain-ringed interior basin area roughly 50 miles wide and 60 miles long are common and expected. Bettles information is only an indication of overall refuge weather.

In general, the climate at Bettles is typical of interior Alaska areas located near the arctic circle. Winters are long, cold and dark, the summers are short, moderate periods of continuous light. Spring and fall are abrupt transition periods.

Bettles temperature extremes span a range of 162°F, from -70° to 92°. Monthly winter temperatures average zero or below from November through March. Each winter has periods when the lows range in the -45 to -55°F range.

Breakup on the rivers generally occurs from 15 to 25 May, with the lakes beginning to follow in about two weeks. Shallower lakes, which are deep enough to hold a maximum ice depth, yet freeze entire, are the last to thaw. The freeze free growing period begins in late May and averages 89 days, ending in late August. Summers are mild, with temperature maximums ranging from the high 60's to low 70's, and frequently reaching into the 80's during the warmest periods. June and July are the warmest months. Lake freezeup occurs about the final week of October, with rivers following in a week or so.

Winds are generally moderate with very little seasonal variation in direction. North winds prevail for 10 of the 12 months and strong winds are infrequent during any season. Monthly average wind speeds range from 5.8 to 7.6 mph.

The average annual precipitation is 13.26 inches, which falls within the continental category at slightly above most interior Alaska locations. More than half of the annual precipitation falls as rain during the four months, June through September. Monthly precipitation gradually decreases through January and remains low through May. Snowfall depths have ranged from 40 to 130 inches. Snowfall has occurred in all months except July.

Bettles 1984 temperature and precipitation, including snowfall and snow depths on the ground, are compared to the norm in the following table. Noteworthy overall variations from the norms include a later spring thaw than 1983 followed by a very wet summer and dry fall.



Wind and cloud cover from a departing thunderstorm with the sun beginning the upward swing of its circle again in the very early morning. Weather often complicates an already difficult task of logistics. Fish Creek Lake - 6/84 H.H.

Table 1.

1984 TEMPERATURE, TOTAL PRECIPITATION AND SNOWFALL
BETTLES AIRFIELD

Reported in Fahrenheit and Inches

MONTHS

TEMPERATURE	<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>	<u>YEARLY TOTALS AND AVERAGES</u>
HIGH	29	5	37	54	67	78	83	70	65	41	30	28	48.92
LOW	-54	-52	-21	-26	+7	39	40	23	18	-11	-30	-44	-9.25
AVERAGE	-16.2	-24.2	+9.1	+14.8	40.5	60.3	58.2	48.9	46.7	20.9	-5.7	-7.6	20.48
NORMAL	-14.5	-9.7	+0.8	20.3	42.8	56.8	58.6	53.2	40.5	18.9	-0.9	-12.3	21.2
DEPARTURE	-1.7	-14.5	+8.3	-5.5	-2.3	+3.5	-0.4	-4.3	+6.2	+2.0	-4.8	+4.7	-0.72
<hr/>													
PRECIPITATION													
MONTHLY	0.55	0.35	0.10	0.75	0.42	1.65	3.94	3.23	1.16	0.15	0.08	0.76	13.14
NORMAL	0.76	0.68	0.71	0.60	0.50	1.37	1.64	2.34	1.68	1.21	0.95	0.82	13.26
DEPARTURE	-0.21	-0.33	-0.61	+0.15	-0.08	+0.28	+2.30	+0.89	-0.52	-1.06	-0.87	-0.06	-0.12
<hr/>													
SNOW													
MAX. DEPTH ON GROUND	1.80	11.0	3.0	35.0	8.0	0	0	0	0	2.0	2.0	18.0	
MONTHLY SNOWFALL	12.4	22.0	22.0	34.7	2.0	0	0	0	0	E4	E2	E22	121.1

E = Estimate from "snow on ground" measurement

Temperatures recorded during 1984 ranged from 90 to -57°, with a yearly average of 20.5°, 0.7°F below the norm. The table displays monthly temperature averages and extremes. Aside from a cold February, monthly temperatures deviated little from monthly normals.

The breakup day for Koyukuk River ice is not known, but took place sometime during the 20-25 May interval. Thus it was approximately 2+ weeks later than 1983, when the ice went out in Evansville on May 7th. Thaw on the area lakes followed in about two weeks, with some of the deeper, completely frozen lakes retaining some ice into mid June.

Recorded wind data are not available for the Bettles station. However, personnel in the field at Kanuti Lake and mid-refuge areas experienced several prolonged periods of stiff breezes ranging from 15-20+mph for periods of 3 to 7 days during mid summer to early fall. Another 5-6 day period in late November with 15-30 mph winds threatened to eliminate our fall moose surveys. Experience this past year indicates that, in general, most mid-to-southern refuge areas have considerably higher wind velocities than Bettles, a fact worth careful consideration when checking the Bettles weather before flying in.

Total precipitation recorded for 1984 was within 1% of the yearly normal, although monthly totals ranged from 12 to 240% of normal. July was extremely wet, with long periods of cloud cover and rain which brought area rivers to bank-full or flood stage on 20-22 July. Flood or near-flood stage occurred again during the third week of August after heavy rains. Conversely, precipitation was considerably below normal in September and very little snow fell until mid-December. Despite the heavy rainfall in mid summer, the very dry fall caused most lakes and all rivers to freeze at low water levels. During winter flights much over-run water on area streams and lakes was evident.

Snowfall and snow on the ground ranged from 2-4 inches officially in Bettles until the first major snowfall on 16 December left 15 inches on the ground. Prior to that time, actual snow depths on the refuge ranged from a very light dusting on most western and northwestern areas, the remains of 3-6 inches of windblown snow, to 5-8 inches in some southern and northwestern areas. Considerable winds, which piled snow into drifts, left much terrain bare during this period.



Thunderstorm with a rainbow lining while working
conditions deteriorate rapidly. Fish Creek Lake - 6/84
H.H.



There is no feasible access to the Kanuti Refuge, other than
by helicopter, during spring thaw. Kanuti Lake - 5/84 E.M.

C. LAND ACQUISITION

1. Fee Title

Kanuti NWR's boundary encloses about 1,635,000 total acres of which approximately 309,106 acres have been selected by various native interests. The status of these inholdings are summarized in semi-tabular form on page 10 with the areas shown on Figure 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.

Surveys and conveyances have occurred throughout the year on allotments and several townships in the mid-western refuge are in the final process of being conveyed to Doyon Regional Corporation at year's end. At the present rate it will be several years before all selections are settled.

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 responsibility for these easements. This will be an added 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, a high refuge priority is placed on reducing inholdings through land trades, purchase, or other means and in gaining control of adjacent watersheds which flow into the refuge.

During the year adjacent areas were examined for cause and effect upon the refuge and inholdings were examined and priorities assigned. Since the haul road passes only a 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 gaining control of this area the refuge could assure compatible use.



Allotment marker on bank of South Fork,
(T20N, R20W Sec. 3) is one of approximately
80 parcels on the Refuge ranging in size
from only a few acres to 160 acres. 7/84
J.P.

Late in the year, Cathy Berg, RO Realty Staff, and RM McIntosh discussed inholdings and prioritized each parcel. This is being carried out throughout Alaskan Refuges to have the groundwork ready for possible acquisition.

The possibility of land trades has been discussed with one of our major inholders, Doyon Corporation. RM McIntosh found them to be receptive.

STATUS OF INHOLDINGS

Source: BLM Automated Land Records, Printout Dated 12/26/84

ACTIVE CLAIMS

Native Allotments

Individuals with selections	42
Number of land parcels selected	80
Number of land parcels surveyed	32
Acreages	
Selected status	4,080 ac
Surveyed (patented) status	1,120
Total	<u>5,200 ac.</u>

Village Claims

Villages with selections	3
Acreages,	
Selected	17,739 ac.
Interimly Conveyed	71,086
Total	<u>88,825 ac.</u>

Regional Claims

Regions selecting	1
Acreages,	
Selected	122,316 ac.
Interimly Conveyed	173,017
Total	<u>195,333 ac.</u>

Cemetary/Historical Sites

Acreages,	
Selected	12,154 ac.
Conveyed	0
Total	<u>12,154 ac.</u>

ANCSA 14H8 Overselections

Acreages,

Selected	7,594 ac.
Conveyed	0
Total	<u>7,594 ac.</u>

GRAND TOTAL, Active claims and Conveyances, 309,106 acres

STATUS CLOSED, NO CONVEYANCE

Native Allotments

2 cases, 240 ac

Village Selections

1 case, 240 ac

Regional Selections

1 case, 4,307 ac

ANCSA 14H8 Overselections

5 cases, 28,653 ac

Homesites

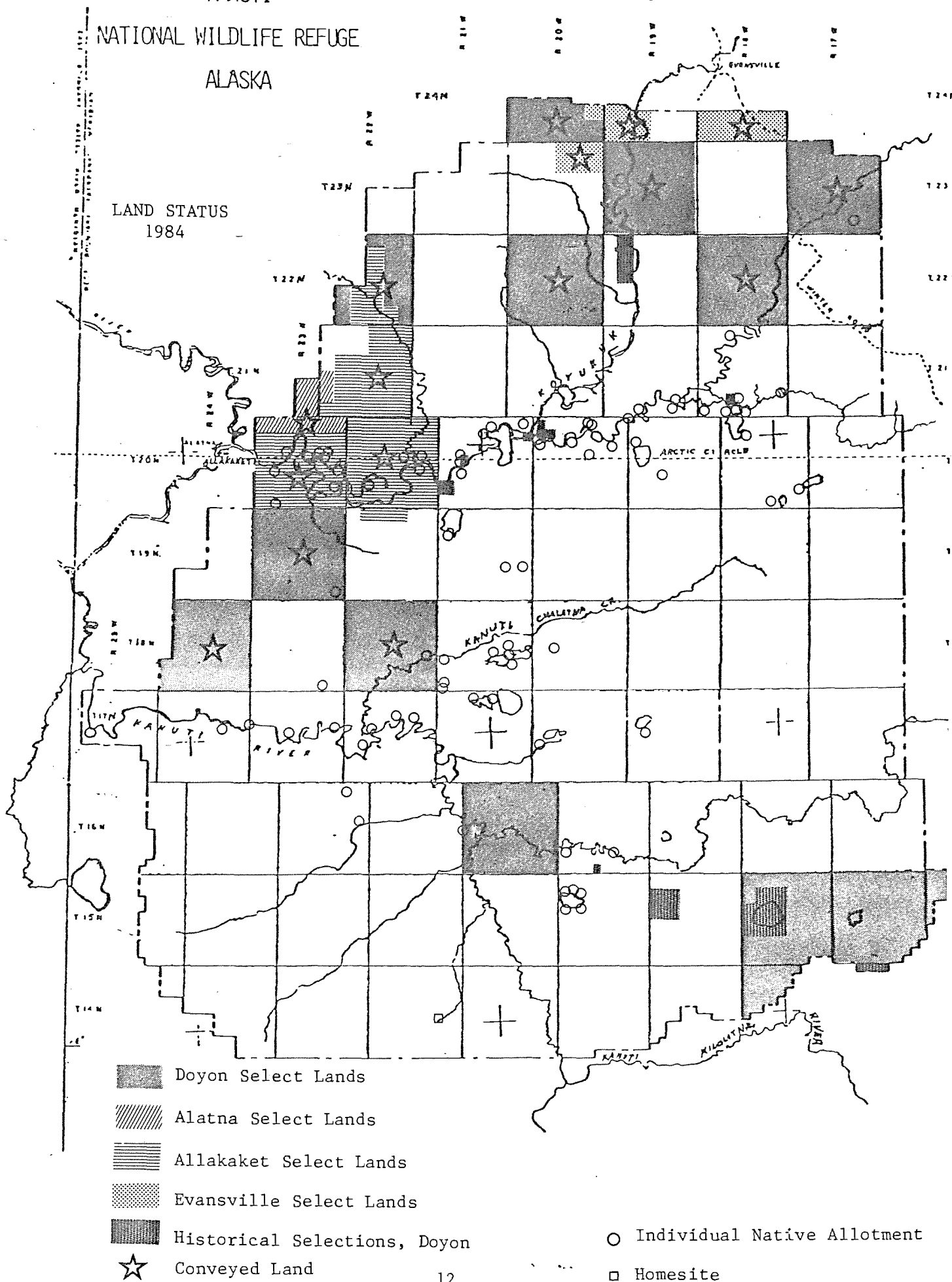
2 cases, 10 ac

GRAND TOTAL, disallowed claims 33,450 Acres

KANUTI

Figure 1

NATIONAL WILDLIFE REFUGE ALASKA





Johnson Moses at Art Williams' trapping cabin - 8/84 L.K.



Lindberg Bergman allotment just off the winter trail at
T18N, R21W, SE 1/4 Sec. 30. Summer walking along the trail
is tough going. 7/84 H.H.

D. Planning

1. Master Plan

The preparation of the Comprehensive Conservation Plan (CCP) required by ANILCA Sec. 304 (a) was initiated in early 1984. Much was accomplished by the very effective planning team that included Leslie Kerr, Team Leader, Jill Parker, Assistant Planner, Pam Wilson, Public Involvement Person and Dr. Vivian Mendenhall, Biologist.

Preliminary planning activities were completed and scoping meetings held in each village in the vicinity of the refuge and in Fairbanks. These scoping meetings allowed the public opportunity to express their concerns and define important issues that must be considered in the management of Kanuti NWR.

An "Issues Compendium" was compiled, published and distributed to all interested persons and organizations to be studied prior to public workshops being held to develop preliminary Management Alternatives for the CCP. These workshops are planned for spring 1985.

The Draft CCP document should be completed and distributed for public comment by November 1985. The final document should be completed by June 1986.

Members of the Planning Team participated actively in the field activities of the refuge during the year. Vivian Mendenhall and Jill Parker participated in the waterfowl inventories and the field critique, while Leslie Kerr and Pam Wilson floated the Koyukuk River with Johnson Moses as guide to visit fish camps to discuss local resident concerns about the refuge and subsistence life style.

2. Management Plans

Various resource management plans are in the making but have been tentatively placed on hold for various reasons e.g. insufficient base data, undetermined objectives until CCP is complete, and, of course, the development of feasible logistics.

3. Public Participation

It has been the policy of Region 7 and of this refuge to include public participation in most all planning.

During calendar year 1984 public participation was sought from various organizations, in particular the Interior Regional Council, Tanana Chiefs Council, the Village Councils of Evansville, Alatna, Allakaket, Hughes and the towns of Bettles and Fairbanks in enlisting their cooperation and participation in the CCP scoping activities and in a continuing subsistence study of the Upper Koyukuk Region.

4. Compliance with Environmental and Cultural Resource Mandates

All environmental and cultural resource mandates are being acted upon. Funds for water quality monitoring has been received for FY 85 and the planning for this activity has been to the most part accomplished.



The Comprehensive Planning Team. Leslie Kerr, Team Leader, Jill Parker, Assistant Planner, Pam Wilson, Public Involvement Person, and Dr. Vivian Mendenhall, Biologist.



Pam Wilson, Planning Team and Volunteer Shirley Kerr on Kanuti River near Canyon Area. 8/84 L.K.



Volunteer to the Planning Team Shirley Kerr and Jenny Williams of Allakaket at Jenny's fish camp. 8/84 L.K.



Valerie Bergman cutting up salmon on the beach at Allakaket. 8/84 L.K.



Ron Thuma, Socio-economic Specialist and ARM Heffernan
in Allakaket for CCP Scoping Meetings. 3/21/84 E.M.

In cultural resources, ANILCA section 810 determinations are being accomplished for most management activities. Other activities and some administrative decisions are being postponed until the CCP has been completed and sufficient public input has been received.

5. Research and Investigations

The second phase of the Cooperative Subsistence Study "Contemporary Resource Use Patterns in the Upper Koyukuk Region" was initiated. The Subsistence Division of ADF&G and the NPS could not participate in it, however, except in an advisory capacity due to funding problems. The base report of field work completed in CY 1983 is not yet completed or distributed for review by the lead agency, ADF&G. The second phase consisted of the monitoring of resources harvested by local residents on an annual basis in order to detect changes and impacts of various development and socio-economic conditions on the local resident utilization of the resources. Efforts were made to insure data comparability with the base study. The findings of the 1984 study and comparisons to 1983 data are included in H. Public Use.

Kanuti NWR 84 "Effects of Beaver Activity on Kanuti National Wildlife Refuge Waterfowl and Ecology" (75610-01)

This study is a 5-year cooperative effort between the 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. Since even subtle changes in hydrology, or 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's ecosystem.

Accomplishments the first year of study included: (1) Literature Search, (2) Aerial and ground surveys of wetlands to determine study areas and logistics (3) Collect biological and physical data on pertinent parameters of streams and lake systems influenced by beaver (4) Evaluate data and procedures to determine need and improvements to study.

Donna Kafka, graduate student at UAF is working on the study under Dr. Phil Gipson of the Wildlife Unit. Donna initiated the study in May 1984 following delays in the bureaucracy. A volunteer biologist, Cathy Heffley, assisted Donna from May through September, and volunteer Biologist Ken Troyer assisted in August and September. Dr. Gipson transferred to Arkansas in November and Dr. Robert Weeden, Professor of Wildlife Management, took over as principal investigator

6. Other

The Alaska Regional Resource Plan Draft was received by this station. Though Kanuti does not play a major role at this time with any of the



Beaver study team loading up for a reconnaissance flight to select preliminary study areas. Left to right: Volunteer Cathy Heffley, Research Assistant, Donna Kafka, Assistant UAF Coop Leader Phil Gipson, UAF Professor Dr. Bob Weeden and pilot. Fairbanks 6/84 E.M.



Beaver (center) on a dam almost flooded by another beaver dam down stream. T15N, R18W, Sec. 4. 7/84 D.K.



Beaver dam on Old Dummy Lake is effective in holding 4 to 5 ft. of water back on the approximately 400 acre lake. 8/84 D.K.



Flooding along the shoreline of Old Dummy Lake resulting from the beaver dam above. Note dead trees as result of flooding. 8/84 D.K.



Rising waters of Old Dummy have almost innundated
this nest. 8/84 D.K.



Mud flats remaining after beaver dam washout. Swans
nested here and plane landing took place in this lake
in 1983. T17N, R23W, N 1/2 Sec. 13 7/11/84 K.T.



Beaver scent mound on lake shore at T20N, R18W, NE 1/4 Sec. 6. This was one of the largest ones seen, almost 3 1/2 feet to the top from the lake bottom. 6/84 C.H.



Beaver reception for all intruders. Some beavers are very persistent, and the reception continues into the wee hours at an ill chosen campsite. 7/84 D.K.



Beaver study graduate student Kafka (R) and adviser Dr. Gipson doing one of the easy portages. Old Dummy Lake - 9/84. E.M.



Volunteers Ken Troyer and Cathy Heffley plotting lake depths for the beaver study. Beaver study area. 8/84 D.K.



Volunteer Cathy Heffley and others on the Beaver Study observed activity around lodges for hours to determine numbers of beaver at each lodge. 6/84 H.H.



Beaver lodge with food cache to left. Beaver study area. 9/84 D.K.



Water retention by beaver dam (center) on slough
during breakup. Fish Creek area. 5/84 E.M.

National Species of Special Emphasis, there are at least 10 of the species that utilize the refuge to some extent. Those are as follows:

<u>Species</u>	<u>Activity</u>
Chinook Salmon	Spawning
Coho Salmon	Spawning
White-fronted Goose	Nesting, rearing, migration
Trumpeter Swan	Nesting, rearing, migration
Tundra Swan	Nesting, rearing, migration
Mallard	Nesting, rearing, migration
Canvasback Duck	Nesting, rearing, migration
Lesser Sandhill Crane	Nesting, rearing, migration
Bald Eagle	Nesting, rearing, migration
Arctic Peregrine Falcon	Nesting, rearing, migration

It is presently assumed that Kanuti lies on the margin of the ranges of most of the species listed, therefore, no great numbers exist on the refuge at any time. Some staggering may occur with waterfowl that may boost their numbers significantly.

Emphasis will be placed upon these species in the refuge planning and management activities.

E. Administration

1. Personnel

The "Common Administrative Staff" consisting of 5 clerical personnel under the Kanuti Refuge Manager's supervision was disbanded in the spring and the system returned to a more efficient and less controversial organization. Each refuge manager now supervises his own clerical staff which increases his ability to accomplish refuge needs without conflicting with the operation of other refuges.

Kanuti Refuge was allotted one clerical position which made the third PFT employee for the refuge. FTE's granted to the refuge in 1984 was 3.6. Temporary employees made up the remaining FTE.

Kanuti Staff CY 1984

McIntosh, Ervin W.	Refuge Manager GS 485 12/4 EOD 11-15-81 PFT
Heffernan, Harvey	Asst. Refuge Manager GS 485 11/1 EOD 11-13-83 PFT
Liedburg, Paul	Administrative Asst. GS 341 9/4 EOD 8-22-82 PFT Transferred to Arctic NWR 4-15-84
Aucoin, Elizabeth	Financial Assistant GS 503 5/3 EOD 11-28-82 PFT Transferred to Arctic NWR 4-15-84
Hudson, Gayle	Clerk Typist GS 322 3/2 EOD 8-7-83 PFT Promoted to Refuge Clerk GS 322 4/1 4-15-84 PFT
Tate, Carol	Clerk Typist GS 322 3/1 EOD 2-20-83 PFT Transferred to Arctic NWR 4-15-84
Ramirez Rittie	Clerk Typist GS 322 3/1 EOD 11-14-82 PFT Terminated 3-31-84

Note: The underscored personnel make up the PFT staff of Kanuti NWR at the end of CY 1984.



Kanuti permanent staff. Left to right: Ervin McIntosh,
Refuge Manager, Gayle Hudson, Clerk Typist, Harvey Heffernan,
Assistant Refuge Manager 1/85



Research Assistant Donna Kafka enjoys a successful fishing break at Fish Creek Lake. Volunteer Cathy Heffley in background, tying on what Donna used. 6/84
H.H.



Planning team member Biologist Vivian Mendenhall assisting in 1984 brood surveys. "Skipper" Mendenhall is garbed in the eminently fashionable and practical, Hefty Bag/"Hundred-Mile-an-Hour" tape raingear for the July monsoon season on the Kanuti River. 7/84
K.T.



Planning team member Biologist Jill Parker at Kanuti Lake. Jill also assisted in the summer Waterfowl Brood Counts along the Fish Creek/Koyukuk River area. 9/84 E.M.



Johnson Moses, Village Elder in Allakaket and lifelong resident of the Kanuti Flats, has been very helpful in sharing facts of the area and its people. Areas covered include historic areas, subsistence use and many other tasks while employed by the refuge and while participating in CC Planning. Here, he guides the Planning Team on a river trip down the Koyukuk. 8/84 D.K.



Volunteer Ken Troyer ready for brood counts
and enjoying the rarest of days - mosquito
free, warm sunshine - during the 1984
field work (shotgun is unbreeched and goes
across the canoe after loading). T18N, R22W,
SE 1/4, Sec. 25. 7/84 H.H.



Volunteer Cathy Heffley enjoying an excursion to Nenana on one of her escapes from the field. 7/84 D.K.



RM McIntosh (L) accompanied by Dr. Phil Gipson (R), UAF WL Coop Beaver Study Leader with ARM Heffernan center. T18N, R22W, SE 1/4 Sec. 25 7/84 K.T.

Tobuk, Homer	Biological Technician GS 404-5/1 EOD 5-23-83 (Temporary Local Hire) Converted to Intermittent 11-1-83 Terminated 10-17-84
McGee, Rebecca	Biological Technician GS 404-5/1 EOD 6-15-84 Temporary Seasonal Terminated 9-7-84
Williams, Valerie	Biological Technician GS-404-5/1 EOD 7-15-84 Temporary Local Hire Terminated 8-15-84

2. Youth Programs - Nothing to report.

3. Other Manpower Programs

Two individuals were utilized during CY 1984 under the "Local Hire" provisions of ANILCA. These individuals participated in the subsistence study in Allakaket and Bettles.

4. Volunteer Programs

Without the volunteer program on the Kanuti, the accomplishments would have been extremely limited. This refuge has been fortunate to have had the quality of individuals that have participated in its programs.

<u>1984 Volunteers</u>	<u>Length of Service</u>	
Ken Troyer	7 mos.	(2nd year)
Matthew Golden	2 mos.	
Mike Matz	1 week	(2nd year)
Cathy Heffley	6 mos.	

5. Funding

Funding levels for Kanuti NWR has steadily risen since FY 1982. In FY 1982 there was a base funding of 75K, in FY 1983, 160K, but in FY 1984 the program management system changed and base funding dropped to 130K and rose to 165K in FY 85. However, in FY 84 and 85 ARMM Funding was used to cover portions of the needed base funding of Kanuti NWR.

Table 2.

<u>Funding of Kanuti NWR</u>					
<u>FY</u>	<u>Total</u>	<u>1210</u>	<u>1220</u>	<u>1260</u>	<u>ARMM</u>
1982	75K	55K	20K		
1983	166K	140K	20K		
1984	225K	----deleted----		130K	95K
1985	275K	----deleted----		165K	110K

A Budget Analysis was accomplished during this fiscal year that indicated Kanuti NWR base funding is still far below that which is necessary to staff and conduct minimum required management operations on the refuge.

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.



Volunteer Cathy Heffley firing riot gun at Fairbanks Public range with ARM Heffernan. Bear safety, firearms training and wilderness survival were thoroughly covered with all Kanuti volunteers prior to going into the field. 6/84 K.T.



Research Assistant Donna Kafka maintaining generator. Proper maintenance of equipment is important to the safety of personnel and successful accomplishment of the project. 7/84 K.T.



Volunteer Ken Troyer enjoying a somewhat mosquito flavored lunch during brood surveys. Being properly outfitted and eating the right foods help in accomplishment of field activities. T16N, R20W, SE 1/4, Sec. 28. V.M.



RM McIntosh (R) and Dr. Phil Gipson (C) checking on brood count field camp with ARM Heffernan (L). Radio contact was non-existent through much of the season. T18N, R22W, SE 1/4. NE Sec. 36 7/84 K.T.



A week long critique and a field condition survey takes place in early September whereby all personnel assisting in the summer field activities on Kanuti NWR gather to discuss the summer's work and how we might improve it next time. We all learned from the experience. Discussing the day's work over supper at Kanuti Lake Camp are left to right: Volunteer Mike Matz, Research Assistant Donna Kafka, Temporary Biological Aide Rebecca McGee, ARM Heffernan and Volunteer Ken Troyer 9/84 E.M.

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 1985.

Accidents - A re-injury occurred to the Refuge Manager's back in January 1984. An operation took place in June whereby an injection of an enzyme was made into the ruptured disk of Mac's back. The injection reduced the pressure acting upon the nerve enabling him to return to work within a week. He has fortunately regained much of his normal capacity.

No other lost time accidents occurred during CY 1984.

7. Technical Assistance - Nothing to report.

8. Other Items

Refuge Supervisor - North, John Kurtz, performed an Annual Inspection of Kanuti NWR on October 3, 4 and 5. No written report has been received concerning the results of that inspection. However, the supervisor verbally expressed his satisfaction that things were in good shape and going fine at Kanuti NWR.

Jo Gorder of CGS performed a Procurement and property review of the Kanuti NWR on May 21 and 22, 1984. The inspection results were received and were favorable in all counts.

F. HABITAT MANAGEMENT

1. General

Kanutí NWR is located in the northern portion of the Koyukuk River valley and includes numerous tributaries e.g. Kanutí River, Henshaw Creek, Peavy Creek, South Fork, Fish Creek, Nolitna Creek, Kodosin Nolitna Creek, and Kanutí 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 shrub (such as willows and heaths) growing from a carpet of moss. Where fires have occurred, forests of quaking aspen or birch predominate, with shrub and young spruce comprising of understory. Forests containing very large white spruce and paper birch occur frequently along the Koyukuk River, provides 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, with sedges, grasses, and heath shrubs growing in association. Muskegs of this sort are very common at 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)."



South Fork Koyukuk looking northwest. The
Meandering streams of water and ice create
a dynamic system of diverse habitat types.
T21N, R18W. 8/84 D.K.

"Shrub thickets are another very common plant community through 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."

Vegetation Typing

Cover mapping based primarily on Landsat imagery has recently been completed for the Refuge. Working at the 1:250,000 scale for CCP purposes, the first intermediate scale vegetation map of the area was produced by Steven Talbot, USFWS, Region 7 Resource Support, Michael Fleming and Carl Markson, Technicolor Government Services, Inc., Anchorage. The effort is an attempt to "reveal as many vegetation types as possible with Landsat at scale 1:250,000." Ancillary data such as elevation, aspect and limited ground truthing were used in an effort to establish more "ecologically meaningful vegetation units" than those possible from spectral reflectance data alone.

Talbot et al. recognized seven major classes and fifteen subclasses on Kanuti NWR. The classes were: "forest (open needleleaf, needleleaf woodland, mixed, broadleaf), broadleaf scrub (closed, open), dwarf scrub (prostrate dwarf shrub tundra, dwarf shrub-graninoid tundra, dwarf shrub-graninoid tussock peatland), herbaceous (graninoid marsh, aquatic forb), scarcely vegetated areas (scree, floodplain), water (clear, turbid/shallow), and other (snow)." At present the vegetative map is not available for inclusion here. The following table presents relative abundance of the various vegetation types and the illustration gives a schematic profile of the vegetation zoning. The acreages given in the table will be used for all refuge purposes until such time as altered or improved habitat types are available.

The present habitat management on Kanuti consists of protecting the land from incompatible uses. Active habitat management through affective mechanisms, for example altering beaver populations to bring about changes in some wetlands, may be possible in the future. However, at present our efforts are directed toward the basic knowledge, that is, establishing base data and cause and effect relationships. Fire probably has the greatest potential for habitat management.

2. Wetlands

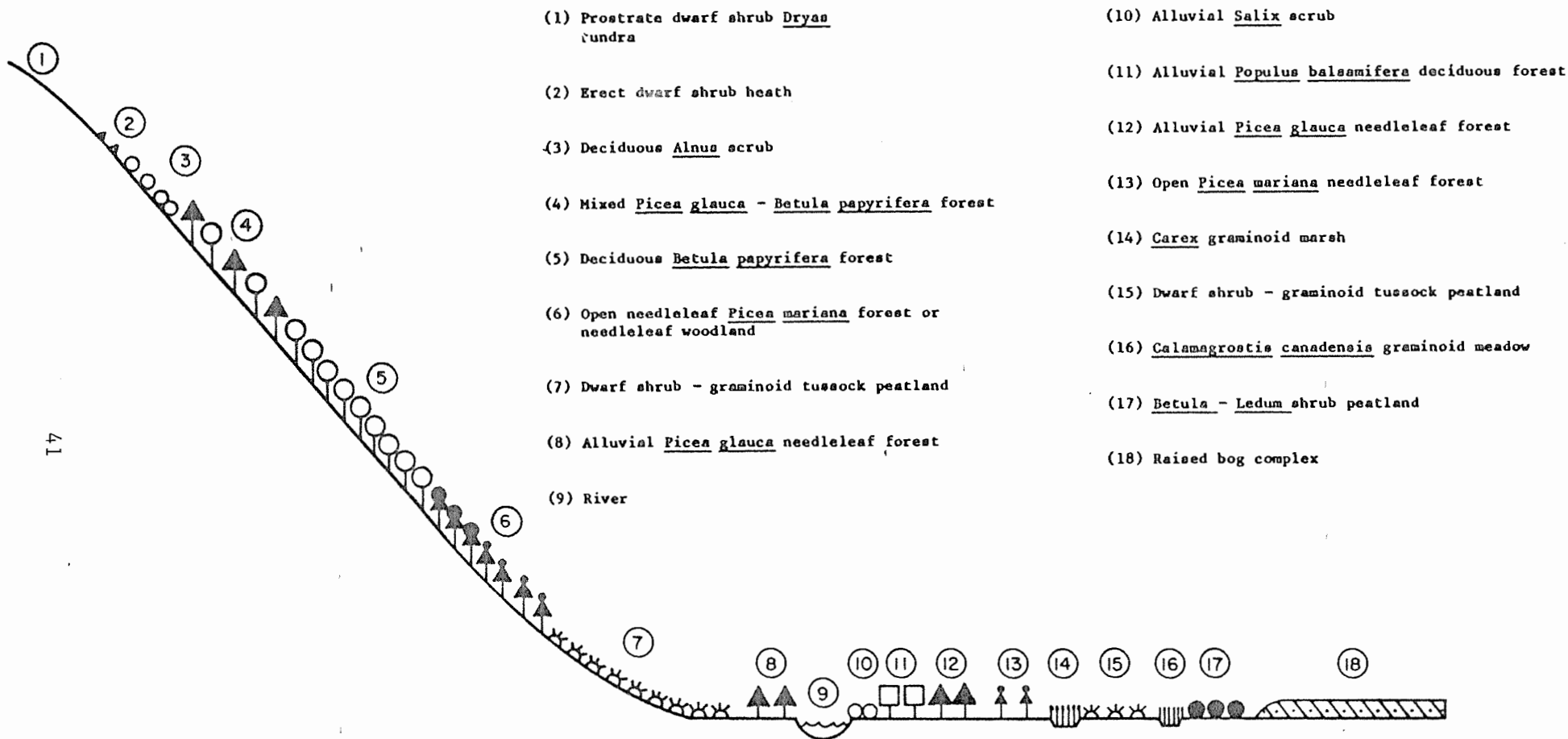
Refuge wetlands total 59,921.4 acres, a figure arrived at by totaling the Graninoid Marsh, Aquatic Forb and water vegetation classes in Tablot

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.



Schematic profile of the vegetational zonation in Kanuti NWR.

Figure 2



Typical habitat of center refuge areas.
Muskegs, lakes and bogs intersperced with spruce.
8/84 E.M.



Floating vegetation mats and marsh on shore of Fish
Creek Lake (main portion of lake in background) 7/84
H.H.



Kanuti Canyon looking upstream (south) T17N, R25W,
central Sec. 17. 7/13 K.T.



Kanuti River entrance of stream connecting to Kanuti
Lake. Note low water level. T16N, R20W, central
Sec. 27. 7/8/84 K.T.



River influenced oxbow showing surrounding
vegetation zones at low water.
Fish Creek Lake - 7/84

H.H.



Iris on south side of Kanuti Canyon. T17N, R25W,
N Central Sec. 16. 7/13/84

K.T.



Melting permafrost enlarging 200+acre unnamed lake at T18N, R22W, Sec. 25. Note spruce in water. Depth 30-40 ft. offshore is 15-20+ft., with occasional upright spruce tops visible in the very clear (unstained) water. Floating vegetation mat with bog birch on higher parts in foreground. 6/84 H.H.



Recent land slump of dwarf spruce in a bog offshoot on SE side of lake above. Subsiding areas appear to go almost directly to bog, with only a few inches of water around actively subsiding tundra. T18N, R20W, Sec. 30. 7/84 H.H.



Sundew (Drosera sp.) growing in muskeg bog shown above.
T18N, R21W, Sec. 30 6/84 H.H.

et al's. Landsat vegetation analysis. Due to the resolution this should probably be viewed as a 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. During the year, Region 7 began efforts to measure water flows for water rights establishment. Preliminary plans for Water Quality monitoring were also developed and the refuge was budgeted \$15,000 to begin a monitoring program for water quality. Water testing will begin 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.

In general the status quo was maintained on wetlands this year. The only exception was several reports of upstream pollution (sediment) occurring in area streams. (see H. Water Rights)

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 regenerating, but do not include 142,967 acres (8.7%) of scrub.

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

The demands upon riverine spruce forests for house logs also continued this year as Allakaket's housing and village improvement program continued (see Public Use, Subsistence). If these expanded 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. An inventory is badly needed.

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 being 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



Stumps from houselog cutting. Nine trees were taken on the bank of the South Fork Koyukuk at T20N, R20W, SE 1/4, Sec. 11. Municipal housing projects and allotment owners have created a heavy harvest of logs on the Koyukuk and tributaries upstream of Allakaket/Alatna communities.
8/11/84 H.H.

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 preceeding 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 groundwork is in place, controlled burns can now 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 figure 3.

The refuge fire plan, which describes 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 as a draft scheduled for completion by spring, 1985. Kanuti's fire plan will follow. However, some specific information, such as fuel loading, vegetation anlaysis 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



Birch regrowth in old burned area. T18N, R22W, NW 1/4,
Sec. 25. 6/84 K.T.



Regrowth in old spruce burn along Kanuti
River. T16N, R22W, E 1/2 Sec. 13. 7/10/84
K.T.

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 was delayed by breakup, which was 2-3 weeks later than 1983, and was cut short by a very wet July. High fire risk dry conditions prevailed only through part of June and a few days in July. Heavy lightning activity occurred during this short period however, and Kanuti had two more AFS fires this year than last. Eleven fires were listed by the Alaska Fire Service (AFS) on Kanuti during the period 6/17 - 7/3. The 1984 fire season is summarized in tabular form in Table 4. AFS has initial attack responsibility through ANILCA for fire suppression on FWS lands, through guidelines supplied by FWS in a cooperative agreement.

Two fires this year, which occurred one-half mile apart in the Limited protection area, were allowed to burn after an attack was made in an effort to protect an unimproved native allotment inholding. The effort was unsuccessful and about 50 acres of full protection area was burned over. After losing the allotment, AFS removed the fire crew and monitored the fire while it burned itself out. During the next 15 days fire A128 alternately smoldered and burned, joining the second fire (A-129). A total of 1,415 acres were burned over. The photo on page , taken in August, shows most of the burn which took place 6/18 - 7/3.

The nine other AFS listed fires all occurred in the Modified protection class. AFS attacked and put out all of these by the various methods shown in table 4. All of these fires were small. One fire reached 15 acres, another 4 and the remainder were all one acre or under in size. Thus a total of 1,438 acres were burned this year. All fire locations are mapped in figure 3.

Modified protection was extended this year, with refuge concurrence, past the dates set forth in the fire plan to cover the high risk period. An improved method for extending dates has been added to the fire plan which automatically extends Modified protection unless all landowners agree to discontinue suppression in a meeting--rather than the other way around. Getting all parties together to extend suppression this past year was cumbersome to say the least, and did not fit with exigent circumstances.

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 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.



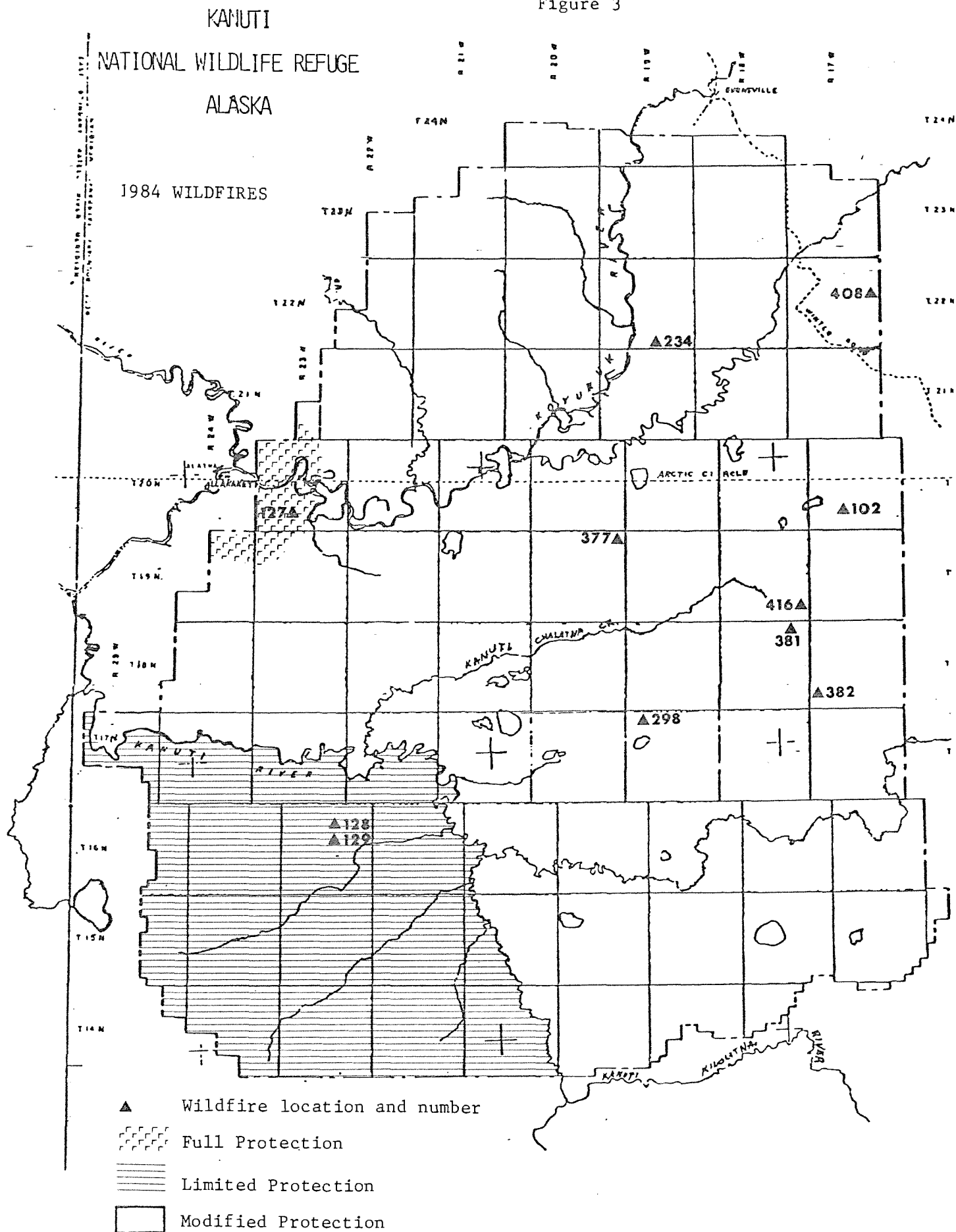
Part of the 1500 acre wildfire burn A128 in our "limited" category, looking NNW with Section 12 and 13 of T16N, R23W in foreground. Burn occurred 6/18 - 6/24. Photographed 8/8/84. H.H.

Table 4.

1984 Fires on Kanuti NWR

BLM Fire Number	1983 Month/Day	Time	Days/Hours Duration	Cause	Protection Class/Acreage		Action Attack Method	Fire Fighters	Explanation of other Information
					Refuge	Inholdings			
A102	6/17	1312	53 hrs.	Lightning	Modified 15 ac.	-	Jumpers Retardant	8	
A127	6/18	2020	16 hrs.	Lightning	Modified 1/4 ac.		Firefighters	3	
A128	6/18	2020	15 days	Lightning	Limited 1415 ac.	Full (50 ac.)	Jumpers Retardant Firefighters	13	Fire attacked in an unsuccessful attempt to protect an unimproved native allotment. Fire A128 burned into A129.
A129	6/18	2109	13 hrs.	Lightning	Limited 1/2 ac.	-	None		
A234	6/15	1330	2.5 hrs.	Lightning	Modified 1 ac.	-	Jumpers	4	
A298	6/26	2005	1 hr.	Lightning	Modified 4 ac.	-	None	-	Rained out.
A377	7/2	2020	14 hrs.	Lightning	Modified 1/2 ac.	-	Firefighters	3	
A381	7/2	2130	14 hrs.	Lightning	Modified 3/4 ac.	-	Jumpers	4	
A382	7/2	2115	1 hr.	Lightning	Modified Spot	-	None		Rained out.
A408	7/3	1900	13 hrs.	Lightning	Modified 1 ac.	-	Firefighters	3	
A416	7/3	2000	14 hrs.	Lightning	Modified Spot	-	Jumpers	2	
Totals					1438 acres				

Figure 3



Note: Modified area contains many inholdings that receive full protection, see Land Status Map

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 the year for work scheduled to begin during the field season.

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 NWR has been budgeted \$15,000 to set up a sampling plan and have analyses run. Because of logistics and costs for analysis, only one or two of the ten streams that need monitoring can be accomplished.

A major cause for concern is the potential re-designation 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 will be considered for Kanuti as an alternative of the CCP. This alternative has not been developed at this time. 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 with most having been rejected as result of insufficient evidence while a few may someday become registered sites.

13. WPA Easement Monitoring - Nothing to report.



Mouth of South Fork into mainstem Koyukuk at left foreground. Channel at right, mid-photo, is a flood channel/oxbow. Note difference in water color, the Southfork is clear with staining and the mainstem Koyukuk is almost opaque with sediment. T20N, R21W. 7/84

J.P.



Old Bettles, mostly abandoned, is located on the right bank of the Koyukuk about 1 1/2 miles above the refuge. Currently two families live here. Evansville residents want the area listed as a historic place. T23N, R19W, Sec. 16. 8/84 L.K.



Old engine where Union City, a mining town of the late 1800's, stood on the left bank of South Fork Koyukuk at T20N, R20W, NE 1/4 of NE 1/4 Sec. 7. 8/84 L.K.

G. WILDLIFE

1. Wildlife Diversity

Information on wildlife diversity is still being gathered for Kanuti. Prior to refuge establishment, 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 ongoing field work.

During the year, an additional 37 bird, 6 mammal and 3 fish species were confirmed present by Kanuti NWR staff and USFWS Fisheries crews, making the total confirmed at 97, 20 and 14 respectively. The literature lists another 45 bird, 15 mammal and 3 fish species as probable for the area. Species lists follow, with the asterik 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 auritus)*
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 acuta)*
Green-winged teal (Anas carolinensis)*
Blue-winged teal (Anas discors)
America widgeon (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 (Bufo 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)*
 Gyrfalcon (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 (Actitis 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 lincolni)*
 Snow bunting (Plectrophenax nivalis)
 Alaska longspur (Lapland longspur)(Calcarius lapponicus)

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)
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 (Clenthionomys rutilus)*
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 (Pungitius pungitius)
Northern pike (Esox luscus)*
Sheefish (Stenodus leucichthys)*
Slimy sculpin (Cottus cognatus)*
Alaskan blackfish (Dallia pectoralis)*
Silver (coho) salmon (Oncorhynchus kisutch)

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. Last year, one bird was seen on several occasions in the Bridge Creek area (T20N, R23W, Sec. 34). This year no sightings were made.

3. Waterfowl

Waterfowl are the number one priority on Kanuti NWR. Base data, surveys and supporting information are the most pressing needs at present.

After careful consideration of needs and available funds, it was decided to place effort in brood surveys and habitat (the Beaver Study), with lesser efforts in nesting, staging and other waterfowl investigations this year. The sixteen aerial pair transects funded by the refuge and flown by Waterfowl Investigations in 1983 were dropped and the funds used in brood counts. A very cursory nesting investigation was done during the general survey in mid June and incidental observations during the Beaver Study.

Nesting this year, based on the very limited number of nests seen and the ages of 126 duck broods, was 2-3 weeks later than 1983. This apparently resulted from the later spring, as shown by river breakup and lake thaw times.

Brood surveys were conducted from 2-14 July on waters and lakes adjacent to Fish Creek, South Fork and Kanuti Rivers by 2 crews of two persons each using a canoe for access. One crew continued surveys on a group of unnamed thaw lakes for an additional 6 days. During the July 2 through July 30 period the Beaver Study group did repeat brood counts on each of the 8 lakes in the Beaver Study Area. Only brood count data from the period July 1 through July 22 were used in the refuge compilation in an effort to standardize the count period.

The logistics and methodology used worked quite well, with some exceptions which could only be learned through experience. For instance, water levels of the streams fluctuate radically and cannot be predicted in planning logistics for a trip.

Other complications worth mentioning were an almost total lack of radio communications and constant rain - which complicated bird counts and eliminated much photography. In a more positive vein we are well along toward standardizing our routes and establishing which lakes to include in each year's count.

With two years of canoe access surveys we know how much area can be covered. One item which emerged was the need to exactly define how counts are to be accomplished on each individual lake, depending on local conditions, so the survey technique can be rigorously set and consequent counts will be valid for trend information. Standardization is made more difficult by having different people on the surveys each year due to our small staff. This year one person, Volunteer Ken Troyer, participated in his second year of surveys, but it was the first year for the other 5 persons participating. We were fortunate in having two biologists from the Kanuti CCP Planning Team to assist during the surveys. Vivian Mendenhall and Jill Parker's assistance and expertise were appreciated.



The Bell Jet Ranger and pilot ferried both Kanuti and Fish Creek brood count crews equipment, and canoes to the starting point on their respective streams from Old Man. The first leg of the logistics journey, the drive from Fairbanks up the haul road, has no photos, just pictures of a lot of dust. Fish Creek drop off point, T20N, R16W, NW 1/4 Sec. 6. 7/84

H.H.



Biologist Parker looking for birds on one of the many ponds and lakes of the 1984 Fish Creek brood survey.

7/84

H.H.



Volunteer Troyer pointing to pintail nest found in the
general survey/training trip to Fish Creek Lake vicinity.
T20N, R18W, SE 1.4, NW 1/4 Sec. 6. 6/12 H.H.



Close up of pintail nest referred to above. 6/84 H.H.

Overall, four areas were covered by this year's brood count effort, as shown on the attached map, back cover. A total of 6,315 water acres were covered which included 41 ponds and lakes along Fish Creek and South Fork, 29 lakes along the Kanuti River, 8 lakes on the Beaver Study Area and 14 predominantly thaw lakes near Kanuti-Chalatna Creek. Total acreages for these survey areas, along with total estimated broods are shown in table 5, which summarizes the 1984 survey results. Table 5 also shows estimated waterfowl numbers for the refuge, based on a simple expansion of survey results to estimated water acres of duck and goose habitat. These water acres vary considerably from Talbot et al's. figures, however since we lack the full data necessary to revise estimates for duck and goose brood habitat at this time, the older estimates are used. During 1985 we should receive full information and all habitat figures will be revised.

Indications are that waterfowl numbers and production on the Refuge was down considerably from last year. This is generally borne out when comparing the refuge population estimates for 1983 and 1984 (table 6). However, it must be kept in mind that the estimates are not strictly comparable, in that they do not cover precisely the same areas, therefore all comparisons should be considered rough approximations only. Further indications that production was down from 1983 is shown by comparing brood sizes, which should be less biased than the overall refuge population estimate. Almost without exception brood sizes were smaller this year than last.

Several year's data will be necessary before we can begin to get valid trend directions from the brood surveys. All of the area is unstratified and production appears to vary widely, even among similar appearing lakes. Two-year's of data will furnish enough information to standardize survey routes on the two river-access brood counts so valid trend data can be collected. Logistics, always a painfully expensive and complicated process, have been accomplished for 2 years now, and we are reasonably confident that methods will work in future surveys. At this point inventory plans are being finalized. Repeat waterfowl counts done in connection with the beaver study should reveal waterfowl movement among lakes and general base chronology for the year, as spin-off benefits from the actual study.

Individual field reports were written for each major survey containing brood results, habitat conditions, wildlife observations, criticisms and notes on logistics and methods. Standardized methods and knowing how to get there, what to take and what to do --and what not to do--are as important to continuing surveys as the data gathered.

In general, the highest waterfowl production areas were located in association with the Kanuti River. Both the Kanuti River Lakes and the Beaver Study area had higher productivity than the lakes associated with Fish Creek and South Fork Koyukuk. Last in production was the group of thaw lakes, which contained few waterfowl of any kind.

TABLE 5

Waterfowl Survey Summary - Kanuti NWR - Summer 1984

Species	Group of Unnamed Lakes Group (Not river associated) 775.6 acres					Kanuti River 1,909 acres					Lakes Associated with Kanuti River .574.4 acres					Beaver/Waterfowl Study Lakes 858.9 acres				
	No. Young	Young/ Acre	No. Broods	Young/ Brood	No. Adults and/or Subadults	No. Young	Young/Acre	No. Broods	Young/Brood	No. Adults and/or Subadults	No. Young	Young/ Acre	No. Broods	Young/ Brood	No. Adults and/or Subadults	No. Young	Young/ Acre	No. Broods	Young/Brood	No. Adults and/or Subadults
Swan																				
Canada Goose						112	.0587	32	3.50	72	22	.0383	5	4.40	20					
W-F Goose						92	.0482	24	3.83	78	31	.0540	7	4.43	17	5	.0058	1	5.00	4
Mallard	5	.0064	1	5.0	3						26	.0453	4	5.00	16	34	.0326	9	3.50	39
Widgeon	7	.0090	1	7.0	6						50	.0870	10	4.89	84	60	.0629	12	4.91	59
G-W Teal	15	.0193	3	4.0	6					1	38	.0662	7	4.80	32	16	.0105	3	4.50	12
Shoveler						2	.0005	1	2.00	6	19	.0331	3	6.00	12	48	.0326	7	7.00	30
Pintail	6	.0077	1	6.0	2					10	51	.0888	12	4.25	47	33	.0384	8	4.13	20
Canvasback															0					
Scaup	30	.0387	3	10.0	6					1	14	.0244	2	7.00	41	45	.0361	8	5.16	101
Goldeneye															3					
Bufflehead					3	13	.0068	2	6.50	8	6	.0104	1	6.00	11	6		1		3
W-W Scoter															2					1
Surf Scoter	31	.0400	4	7.75	10										0					8
Gadwall																7		1		2
Other					1															
Unidentified Goose						12	.0063	3	4.00	6										
Unidentified Duck	2	.0026	1	2.0	3										4	15	.0012	7	3.75	122

TABLE 5 continued

Waterfowl Survey Summary - Kanuti NWR - Summer 1984

*This figure is based on actual complete broods seen - not on the Total No. of young shown in table

Species	Fish Creek, South Fork, Koyukuk River 1,631 Acres					Lakes Associated with Fish Creek South Fork Koyukuk 566.1					Total Survey Area 6,315 acres				Estimated open water, Refuge (River & Stream) 184,000 ac. Duck brood habitat, est. 147,200 ac Goose brood habitat, Est. 58,800 ac. Swan brood habitat 128,800 ac.			
	No. Young	Young/ Acre	No. Broods	Young/ Brood	No Adults and/or Subadults	No. Young	Young/ Acre	No. Broods	Young/ Brood	No. Adults and/or Subadults	Total Young	Average Young/Acre	Total No. Broods	Average Young/ Brood	Total Adults and/or Subadults	Total No. Young	Total Adults Subadults	Total Birds
Swan										2					3		139	139
Canada Geese	87	.0533	13	4.62	52	43	.0760	7	4.62	17	264	.071351	57	4.63	161	4,195	2,559	6,754
W-F Geese	4	.0025	1	4.00	4					2	132	.035675	33	4.00	105	2,098	1,669	3,767
Mallard	5	.0031	1	5.00	4	14	.0247	2	7.00	19	84	.021483	17	4.94	81	3,162	3,049	6,211
Widgeon	6	.0037	1	6.00	3	50	.0883	10	4.89	155	173	.044245	34	5.09	307	6,513	11,558	17,873
G-W Teal					3	17	.0300	5	3.40	30	86	.021994	18	4.78	78	3,238	2,936	6,174
Shoveler						15	.0265	3	4.00	27	84	.021483	14	6.00	75	3,162	2,824	5,986
Pintail						13	.0230	2	6.50	6	62	.015856	23	5.70	85	2,334	3,200	5,534
Canvasback																		
Scaup					2	8	.0141	1	8.00	19	97	.024808	14	6.93	169	3,652	6,362	10,014
Goldeneye	7	.0043	1	7.00	3	5	.0088	1	5.00	2	12	.003069	2	6.00	8	452	301	753
Bufflehead						4	.0071	2	2.00	6	29	.007416	6	4.80	31	1,092	1,167	2,259
W-W Scoter															3		113	113
Surf Scoter											31	.007928	4	7.75	18	1,167	678	1,845
Gadwall											7	.001790	1	7.00	2	264	75	339
Other											1	.000255			1 ^a 1 ^b		38 ^a 38 ^b	38 ^a 38 ^b
Unidentified Goose											12	.003069	3	4.00	6	452	226	678
Unidentified Ducks						7	.0124	2	3.50	36	24	.006138	9	2.67	161	904	6,601	6,965

a = harlequin
b = oldsquaw

TABLE 6

Comparison of 1983 and 1984 Brood Surveys

Species	1983 Brood Count								1984 Brood Count							
	Total Survey Count (6,147 water acres)					Estimated Refuge Population			Total Survey Count (6,315 water acres)					Estimated Refuge Population		
	Total Young	Young/Acre	Total No. Broods	Average Young/Brood	Total No. Adults and/or Subadults	Total No. Young	Total No. Adults/Sub-Adults	Total Birds	Total Young	Young/Acre	Total No. Broods	Average Young/Brood	Total No. Adults and/or Subadults	Total No. Young	Total No. Adults/Sub-Adults	Total Birds
Swan	3	.0005	1	3.00	5	177	295	472					3	1	139	139
Canada Geese	239	.0389	44	4.88	194	3,253	2,641	5,894	264	.071351	57	4.63	161	4,195	2,559	6,754
W-F Geese	170	.0277	32	5.18	606	2,314	8,249	10,563	132	.035675	33	4.00	105	2,098	2,669	3,767
Mallard	18	.0023	2	6.50	163	1,061	9,609	10,670	84	.021483	17	4.94	81	3,162	3,049	6,211
Widgeon	350	.0569	60	5.10	150	20,632	8,842	29,474	173	.044245	34	5.09	307	6,513	11,558	17,873
G-W Teal	124	.0202	15	5.73	50	7,310	7,948	10,258	86	.021994	18	4.78	78	3,238	2,936	6,174
Shoveler	127	.0207	21	5.81	85	7,487	5,011	12,498	84	.021483	14	6.00	75	3,162	2,824	5,986
Pintail	185	.0301	30	5.20	101	10,906	5,954	16,860	62	.015856	23	5.70	85	2,334	3,200	5,534
Canvasback	58	.0094	5	6.60	17	3,419	1,002	4,421								
Scaup	398	.0647	47	6.85	258	23,462	15,209	38,671	97	.024808	14	6.93	169	3,652	6,362	10,014
Goldeneye	26	.0042	5	5.20	8	1,533	472	2,005	12	.003069	2	6.00	8	452	301	753
Bufflehead	89	.0145	10	5.00	76	5,247	4,480	9,727	29	.007416	6	4.80	31	1,092	1,167	2,259
W-W Scoter					1		59	58					3		113	113
Surf Scoter	8	.0013	2	4.00	26	472	1,533	2,005	31	.007928	4	7.75	18	1,167	678	1,845
Gadwall									7	.001790	1	7.00	2	264	75	339
Unidentified Geese									12	.003069	3	4.00	6	452	226	678
Unidentified Ducks	9	.0015	4	2.30	14	531	825	1,356	24	.006138	9	2.67	161	904	6,601	6,965

*This figure is based on actual complete broods seen, not on the total number of young shown in the table.



Bufflehead hen with brood. T16N, R20W, Sec. 34. 7/84
E.M.



Surf scoter hen with part of her brood. T18N, R22W,
SW 1/4, Sec. 30. 7/84 H.H.



Canada goose with 1c goslings in Kanuti Canyon.
T17N, R25W, Central Sec. 16. 7/13/84 K.T.



Red-necked phalarope searching for insect larvae on
the lily pads. T18N, R17W, SW 1/4, Sec. 30. 7/84 H.H.

Only four adult swans were encountered on the surveys this year, versus 5 adults with one brood of three seen last year. Later in the summer, on August 8th, several hours were spent flying the refuge to locate waterfowl concentrations and swans. Only 2 pairs and one single swan were found during the flight. Due to weather the flight covered only about 70% of the refuge water areas. Duck and goose concentrations were located mainly on the lakes east of Kanuti Kilolitna River in the Kanuti River drainage. Smaller concentrations were found on lakes west along the Kanuti drainage, between Kanuti Kilolitna and Nolitna creeks.

4. Marsh and Waterbirds

Current work on these species consists of observations incidental to waterfowl and other work. Loons, grebes and sandhill cranes inhabit the area and were commonly recorded. Red-necked grebes are the most common species, and both nests and young were apparent throughout the areas surveyed. A total of 46 red-necked and 24 horned grebes were seen during surveys. Several grebe chick mortalities were observed by the student and volunteers in the beaver study area. The cause of the mortality could not be determined in the field and due to logistics, they could not bring the carcasses in for analysis.

Four loon species are found in the area. Loons were especially prevalent in the group of thaw lakes surveyed. These lakes had 11 common and 5 arctic loons present. Altogether, a total of 14 arctic, 9 red-throated and 14 common loons were seen during brood surveys. Although generally paired, no chicks were found. Cranes are found throughout the refuge on lakes and wetlands. We also had 13 sandhill crane sightings in the thaw lake area, compared to 8 on the Fish Creek Survey, 3 during the General Survey and none on the Kanuti River Survey. Total sandhill "sightings" include 7 vocalizations and 17 birds seen. Although these birds generally appeared paired, no chicks were seen.

5. Shorebirds, Gulls, Terns and Allied Species

Lesser yellowlegs are probably the most widespread shorebird. Each lake, pond 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 and Mew gulls commonly nest in the refuge, as do arctic terns (see wildlife list for other species present).

6. Raptors

Seven raptor species were confirmed on the refuge this year. The Hawk Owl, short-eared owl, Harlan's Hawk, Swainson's hawk, Golden Eagle, Kestrel and Red-tailed Hawk were observed during field work. The red-tailed hawk was most often seen and several nests were observed. Bald eagles are found throughout the area. Raptors seen during surveys are summarized in the following table.



Spotted sandpiper chick - near Fish Creek. 7/84
J.P.



Red-necked grebe mortality - cause undetermined. Beaver
study area. 7/84 D.K.



Young great horned owl on Kanuti River shore.
T16N, R19W, NE Central Sec. 15. K.T.



"Trained" gray jay outside Kanuti Lake cabin. Any
food that is out of hand and small enough is instantly
gone. T16N, R20W, SW Sec. 26. 7/7/84 K.T.

Table 7.

INCIDENTAL RAPTOR SIGHTINGS
From 1984 Waterfowl Surveys

	<u>Immature</u>	<u>Mature</u>
<u>Eagles</u>		
Bald	2	3
Golden	-	2
<u>Hawks</u>		
Red-tailed	2+(in nest)	14
Rough-legged	-	2
Swainsons	-	2
Marsh	-	6
Kestrel	-	2
Merlin	-	1
Unidentified	-	7
<u>Owls</u>		
Great Horned	-	9
Short-eared	-	3
Hawk	-	1
Unidentified	-	1

7. Other Migratory Birds

Fifty one passerine species have been identified from the literature for the area, with thirty-five confirmed to date. During the past year we were fortunate to have several ardent birders on field crews, which resulted in 19 species confirmations.

8. Game Mammals

Moose

The most important game species, to both local subsistence users and sport hunters, is the moose. Placed in extremely high regard by local inhabitants, moose populations are always a subject of paramount interest. Accordingly, moose is the second priority for refuge management, coming only after waterfowl.

This year ADF&G proposed flying cooperative moose trend areas. We pooled resources and split the trend counts 50:50. The funds for a full scale census were not available.

Trend counts were beset by several problems which resulted in less-than-optimum to better-than-nothing surveys in several areas. Trend areas are basically small area surveys based on the excellent ADF&G moose census method, which relies on adequate snow cover and a rigorous aerial search. Unfortunately the weather did not cooperate and extensive areas were without adequate snow cover when surveys had to be flown. Ever-shortening daylight and compatibility with other trend surveys flown earlier were important factors considered while waiting for adequate snowfall. Persistent high winds complicated the problems and prevented flying one mountain trend area.



Cliff swallow nests on north wall of Kanuti Canyon.
Other swallows observed on Kanuti NWR include Bank
Swallow, Tree Swallow and Violet-green Swallow.
T17N, R25W, Central Sec. 16. K.T.



Cow and calf moose moving toward less crowded marshes.
T20N, R18W, SW Sec. 5. 6/84 C.H.



Yearling bull moose on Kanuti River bank. T16N, R19W,
Sec. 33. 7/15 K.T.



Linked fairy shrimp from one of 2 sizeable concentrations
seen in the 200+ acre unnamed lake. T18N, R22W, NE Sec. 25.
7/84 H.H.

Trend counts were conducted on nine areas totaling 321.7 square miles at an average search intensity of 4.85 minutes per square mile. A total of 148 moose were counted for an average of 0.46 moose per square mile. Bull/cow ratios were 80:100 and calf/cow ratios were 27:100. Each area fell within the low to medium population range, with large variability both within the 3-5 count units making up a trend area and between trend areas themselves. Obviously, moose concentrate in certain areas during this period. Our sampling revealed several units with very few animals (0.1 moose/sq. mi.) and a few with concentrations (1.2 moose/sq. mi.).

Overall, about all that is apparent from these intital trend counts is that both the moose population and production appear low. A number of trend count years should give some indication which direction the population is headed.

For obvious reasons, trend counts furnish a rather poor basis for estimating the refuge moose population. Therefore, next year we hope to expand moose surveys, again in cooperation with the state, to include refuge-wide stratification flights, which will enable us to pick more representative trend areas and arrive at a much better population estimate.

Several moose population studies currently underway in the state including a study on nearby Yukon Flats NWR, should furnish useful information for Kanuti. Sources of mortality identified through radio tagging and investigation of similar moose habitat will lend insight into refuge moose management. Currently, specific studies for Kanuti are not within our budget or personnel limits.

Black Bear

Sightings through the year indicate black bear are common, especially in the lowlands along the Kanuti River. During the early fall they were concentrated along the openings on and near the River, feeding primarily on rose fruit. During early morning and late evening up to 3 bears per river mile were seen while traveling in a motor driven canoe, although average bear sightings were below 1 bear in 4 river miles. Chances for human/bear encounters are high, but since travel is mostly by canoe, few direct confrontations occur.

However, at 2:10 a.m. on 5 June the Waterfowl/Beaver study team had to kill a blackbear in self defense. Donna Kafka and Cathy Heffley were sleeping in a tent near the Kanuti Lake Administrative cabin when they were awakened by a bear at their tent window. Dr. Phil Gipson, who was sleeping in the cabin about 200 ft. away, was awakened by Kafka and Heffley's shouts. After vigorous shouts by Kafka and Heffley (who had a shotgun in the tent), the bear moved away from the tent and approached the cabin. There, despite repeated shouting by Gipson, who was standing at the door, the bear continued to approach him. Gipson shot and killed the bear when it was about 10 feet away.

As required, by state law the skin, plus skull and meat were turned over to Alaska F&WP. The meat was given to the village of Evansville. The large male bear may have been visiting the cabin for some years, since the cabin had repeatedly been broken into and ransacked.



Now he's smiling! Dr. Phil Gipson shown with
the skin of the Black bear that intruded upon
the sleeping girls and charged Phil as he was
investigating the reason for the screams.
Kanutl Lake Cabin 6/84 D.K.

Grizzly Bear

Grizzlies are much less common than blackbears in the area. Although sign was noted on Fish Creek and several other areas, no grizzlies were seen during the year. One typical grizzly den was noted in mid-November while flying moose surveys in the mountains near the South-central refuge border, although no bear was seen. Most grizzly sightings in past years have been in the Sitheylemenkat Lake area and in the mountainous northwestern refuge area.

Caribou

Three caribou, seen southeast of lake Tokusatatquaten in early September, were the only ones seen during the year. Although it is possible a few animals from two distinct herds may enter the refuge, large numbers of animals do not cross the area as they did in years past.

Wolf

Single wolves were seen on the South Fork, midway between the mouth of Fish Creek and the Mainstem Koyukuk, and at Kanuti Lake cabin. The wolf at Kanuti Lake approached upwind, during a stiff breeze, to within a few feet of Donna Kafka, graduate student conducting the beaver study. After Donna announced herself, the wolf stared for a few seconds, turned and walked away as it had come.

During the first week of September a wolf pack was heard almost nightly near Kanuti cabin. From the vocalizations we estimated 5-8 wolves were present. Tracks from this pack were apparent through the end of the year in the mid and upper Kanuti Flats area. Wolf sign was also noted during the winter along the South Fork in mid-refuge and along Fish Creek.

Furbearers

Marten, Lynx, otter, beaver, red fox, wolverine, muskrat, mink and weasel occur in the area. Marten is the most common furbearer, judging from trapping reports (see Public Use-Subsistence). Harvest reports constitute almost all the information available at present on all species except beaver. Incidental track sightings show both wolverine and otter to be present in fair numbers in the mid and southern Kanuti Flats areas.

Beaver activity is found throughout lowland areas and the overall population appears high. The Beaver Study team conducted aerial food cache surveys along portions of the Kanuti and Koyukuk Rivers on 25-26 September. The technique used a 185 Cessna to fly overlapping downriver spirals which encompassed approximately 3 miles on either side of the river. A total of 87 active lodges were recorded on the Koyukuk and 132 on the Kanuti River. The figure of 4.3 average beaver per colony, which Boyce (1974) arrived at for interior Alaska populations, gives a population of 787 beaver for the 183 active lodges counted in the two sample areas.

Literature Cited

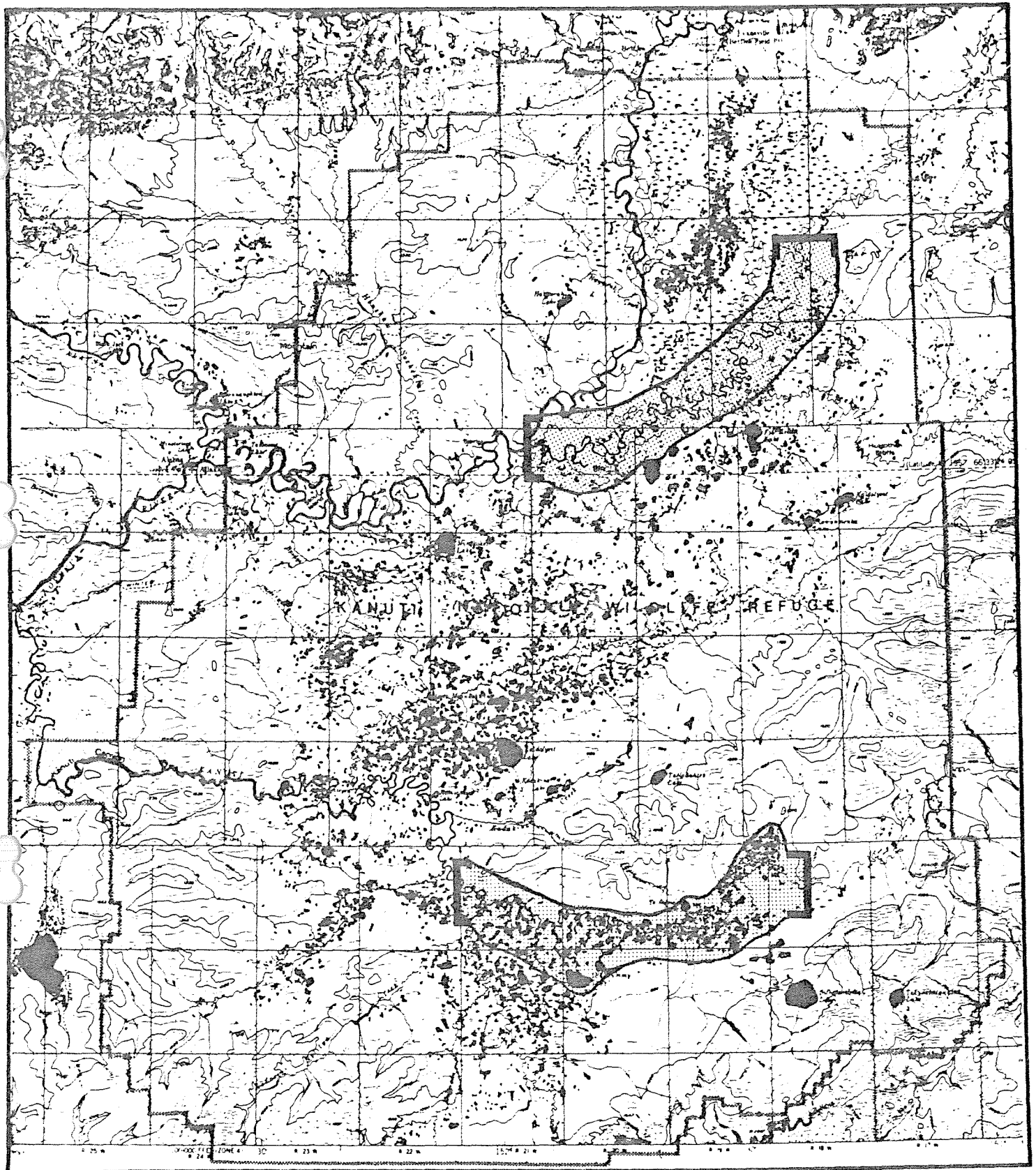
- Boyce, M.S. 1974. Habitat ecology of an unexploited population of beavers in interior Alaska. Proc. Worldwide Furbearer Conf. Vol. I. J.A. Cahpman and D. Pursley Editors.

Table 8. Koyukuk River Beaver Cache Counts for 1984

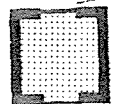
Shape of Cache	Number of River Caches	Number of Lake Caches
Circular	9	52
Kidney	3	7
Other	2	1
Total active lodges	14	60
Old Lodges	0	13
Total Lodges	14	73 = 87

Table 9. Kanuti River Beaver Cache Counts for 1984

Shape of Cache	Number of River Caches	Number of Lake Caches
Circular	22	78
Kidney	0	6
Other	3	0
Total active lodges	25	84
Old Lodges	1	22
Total Lodges	26	106 = 132



1984 Beaver Cache Count Survey Area



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

Small mammal populations form a vital part of the food web and are important to many subsistence and other species of high interest. In line with their importance, an initial effort was undertaken to assess small mammal populations. The objective was to gather base data on species occurrence and relative abundance, as the opportunity presented itself while we were in areas performing other field work. Little data exists on species and population levels for the region and none for the refuge.

Accordingly, during the week of September 3, areas in the vicinity of Kanuti Lake were trapped with 24 to 63 traps for 1-2 days. Results ranged from 16.7% to 50.8% success per trap night. Sixty-four of the sixty-five animals taken were red-backed voles and the remaining specimen was a masked shrew. A complete report of the effort is located in station files.

Small mammal populations were conspicuously high in several of the other areas encountered during field work.

11. Fisheries Resources

Refuge rivers, streams and lakes support chinook, coho, and Chum salmon, sheefish, several smaller whitefish, grayling, northern pike, burbot and several other species of less direct importance to man. (see species list under Species Diversity). Historically, fishery resources furnished much of the base for subsistence and is still an important subsistence resource (see Public Use-Subsistence). Chum salmon is probably the most important subsistence fish species.

USFWS Fishery Resources, Fairbanks, is currently engaged in a study of refuge fish resources which will furnish data for the fishery management program in the CCP. At present, lake studies and aerial surveys to determine salmon spawning and escapement are in progress and will continue for the next 2 years.

Chum salmon spawning has been observed in several refuge streams, including Fish Creek below Hulgothen Bluffs, Henshaw Creek and South Fork Koyukuk. Chinooks have been identified on Henshaw Creek and South Fork Koyukuk. Silver salmon remain somewhat in limbo, pending further in-hand identification. The confusion arises from the local name for fall chums, which are called "silvers". Therefore, subsistence take may be either fall chums, silvers, or a mixture of both.

Sheefish are found in larger rivers on the refuge. Pike are ubiquitous throughout the area in slow streams and lakes. Grayling are found in all clear streams and many of the lakes, along with the various species of whitefish.



Red-backed voles, favorite food for many predators, is by far the most common small mammal taken during a sample trapping effort. This one is getting his bearings after being released from a box trap.
T16N, R20W, SE 1/4, Sec. 27 9/84 H.H.







Volunteer Heffley describing vegetation/habitat on small mammal trapline. T16N, R20W, SE 1/4 Sec. 27 9/84



Masked shrew taken during small mammal trapping.
9/84 E.M.



RM McIntosh and graduate student Kafka share a
lighter moment at the end of the small mammal
trapline. T16N, R20W, Sec. 27. 9/84

- 
- 
- 
- 
12. Wildlife Propagation and Stocking - Nothing to Report.
 13. Surplus Animal Disposal - Nothing to Report.
 14. Scientific Collections - Nothing to Report.
 15. Animal Control - Nothing to Report.
 16. Marking and Banding - Nothing to Report.
 17. Disease Prevention and Control - Nothing to Report.



Kanuti's turn at staffing the "Duck Stamp Booth" at the Tanana Valley Fair. 8/84
J.C.

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 some Eskimos reside in Alatna.

About 100 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.

As mentioned in the Highlights section of this report, 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 delayed for various causes and is not expected to be completed by the time this narrative is due. 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.

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. Only two

major communities, Alatna/Allakaket and Bettles/Evensville were included since it was learned from the 1983 study that Hughes residents had very little effect upon the refuge that would warrant extra expenditure of funds and manpower.

Participation in this monitoring was strictly voluntary by the local residents, and therefore, not all households consented to be interviewed. In addition, a few families were out of the villages during the entire span of the project.

For all communities combined, 66 of the 77 households or 86% were surveyed during the summer of 1984. The number of households had increased by 13 over the summer of 1983.

Table 10.

	<u>Households Surveyed</u>		
	<u>1984</u>		<u>1983</u>
Bettles/Evensville	21 of 26	81%	20 of 25 80%
Alatna	9 of 10	90%	8 of 8 100%
Allakaket	36 of 41	88%	27 of 31 87%

Compilation of the information obtained during the study revealed the actual periods of harvest of each species of wildlife utilized. The periods may or may not conform to the legal periods of harvest, but rather indicate harvest periods where need or tradition was the ruling factor. Present regulations do not always fit the life style of rural residents or follow the traditions of natives. Examples: 1) the requirement of fresh meat for potlaches, 2) an individual out of the village on temporary employment during the short moose season but requires meat for his family during the winter 3) Waterfowl seasons and the availability of waterfowl to local residents do not coincide.

There is an overall effort by local residents to conform to the present legal periods of harvest. However, the need to adjust some regulations to align them more with the actual needs of the local residents is evident. This can be accomplished and still remain biologically sound.



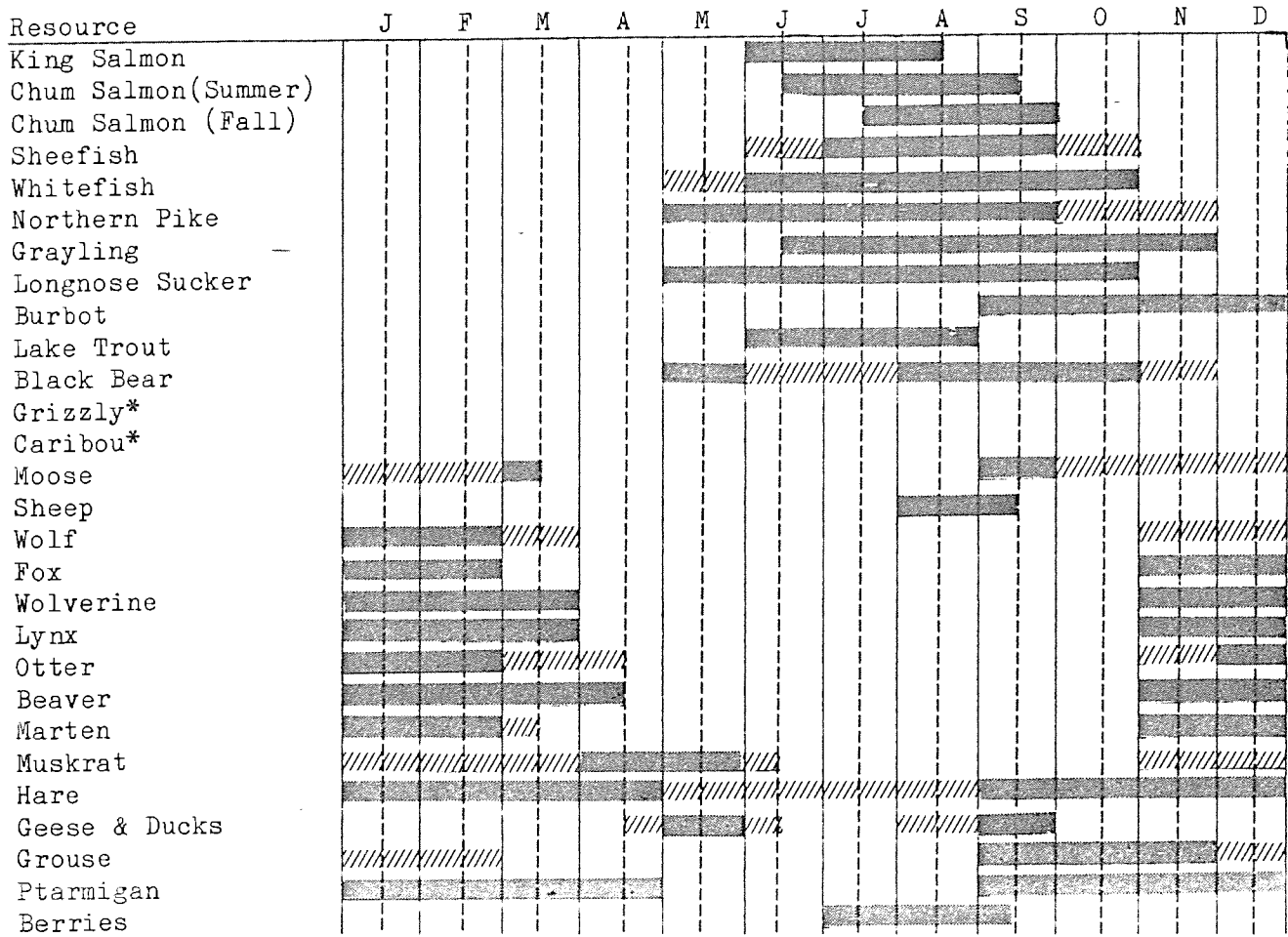
Salmon drying on the beach in Allakaket. 8/17/84.
L.K.



Waterfowl identification posters used in the 1984
Subsistence Harvest surveys received excellent response
from local residents..
E.M.

Figure 5

Seasonal Periods of Resource Harvest
by local residents of Upper Koyukuk Region



Major Harvest Period
Intermittent Harvest Period

*insufficient information

Household composition and employment status is shown in the following table.

Table 11.
Household Composition

	<u>Age* of Household Members</u>		
	Allakaket/Alatna		Bettles/Evansville
Head of Household	x=43.87		x=45.62
	N=40	s=15.81	N=21 s=13.67
Spouse/Partner	x=38.88		x=42.13
	N=26	s=17.13	N=15 s=15.29
Male offspring	x=10.94		x=12.00
	N=48	s=9.41	N=14 s=6.79
Female offspring	x=11.37		x=11.82
	N=30	s=7.93	N=11 s=5.08
Others**	x=83.5		x=81.00
	N=2	s=	N=1 s=N/A

*x=average age; N=sample size; s=standard deviation

**Others=Grandparent or Parent

Table 12.
Wage Employment Status of Family Members in 1983

	<u>Amount of time and percent of population employed</u>					
	Allakaket/Alatna			Bettles/Evansville		
	Weeks/yr	Hrs/week	%Employed	Weeks/yr	Hrs/week	%Employed
Male (adult)	15.32	38.60	94.74%	39.28	43.25	88.88%
Female (adult)	39.44	25.25	80.00%	37.28	30.32	61.11%
Male (offspring)	5.92	40.00	20.83%	44.00	33.33	21.43%
Female (offspring)	7.32	33.33	10.00%	0.27	40.00	9.09%

Table 13.
Age Structure of Dependent Population in
Allakaket/Alatna in 1983.

Age	<u>Number of Children in Various Age Classes</u>					
	Males		Females		Males+Females	
	Number	Percent	Number	Percent	Number	Percent
0-5	7	44%	9	56%	16	22%
5-10	13	72%	5	28%	18	25%
11-15	5	63%	3	37%	8	11%
16-20	7	50%	7	50%	14	19%
21	12	75%	4	25%	16	22%
TOTAL	44	61%	28	39%	72	

Household composition and employment status are shown in Table 11. In all villages except Alatna, the majority of households surveyed consisted of two parent families. In Alatna, most households consisted of either a single parent and children, or one or more adults and no children. Elderly parents or grandparents lived with their adult progeny in two households in Allakaket/Alatna and in one household in Bettles/Evansville.

In Allakaket/Alatna, most adult males who were employed worked seasonally in construction related jobs and on BLM fire crews (Table 12). An average male worked 40 hours per week for about 15.5 weeks during 1983. Most females who worked were employed in clerical or service-oriented jobs (i.e. health aides, teachers, teacher aides, etc.). Although women tended to work more total hours than did men in 1983, they generally worked more weeks (approximately 39.5) and fewer hours per week (25.25).

In Bettles/Evansville, most men who worked were employed year round in full time jobs (Table 12). The majority were either self-employed or worked for a State or Federal agency. A smaller percentage of women in Bettles/Evansville were employed than in Allakaket/Alatna. As with their male counterparts, they generally were self-employed and worked nearly full time for 12 months.

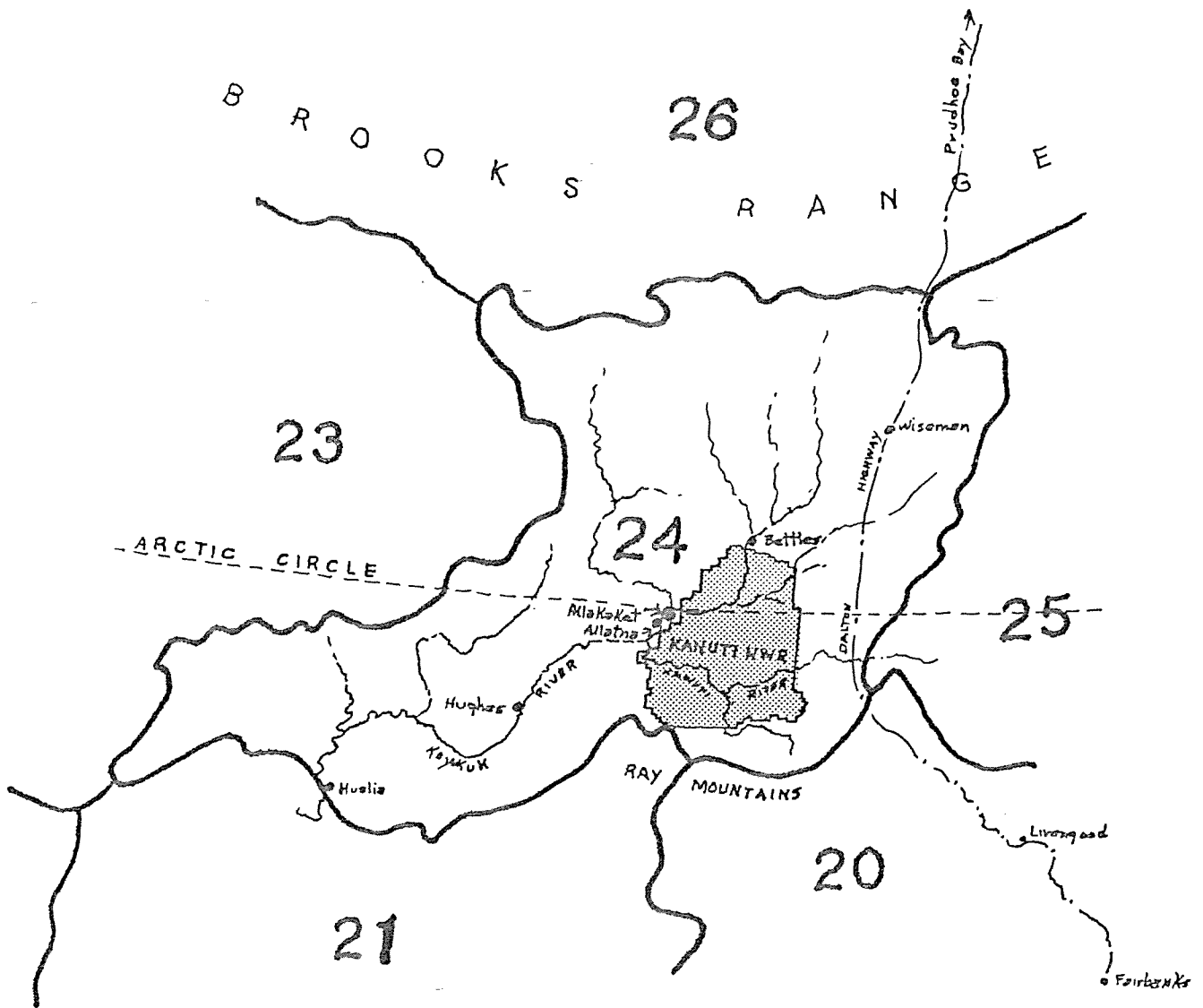
In Allakaket/Alatna there was a distinct skewing of sex ratios among the children (Table 13). Sixty-one percent of all children were male, and thirty-nine percent female.

The ratio of males to females was greater among 6-10 year olds and among the adult offspring (21 years old) living with their parents. This imbalance was not evident in Bettles/Evansville.

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 - Kanuti NWR joined with the Arctic NWR and Yukon Flats NWR to provide and man an exhibit at the 1984 Tanana Valley State Fair in Fairbanks.
7. Other Interpretive Programs - The planning team, while eliciting input of the local residents of their concerns relating to the management of Kanuti NWR, provided interpretive programs to the schools of each village. These programs were well accepted and supported other indications that there is a need for more.
8. Hunting

Subsistence and sport hunting are major public use activities of Kanuti NWR. The refuge lies entirely within the States Game Management Unit 24, and all regulations pertaining to the Unit apply to the refuge as well.

Table 14 gives seasons and bag limits for refuge species during 1984-85.



ALASKA GAME MANAGEMENT UNITS IN VICINITY OF KANUTI NWR

Figure 6

Table 14.
1984 Seasons and Bag Limits

<u>Species</u>	<u>Open Season</u>	<u>Bag Limit</u>
Black Bear	No closed season	3 bears
Grizzly	(Southern half of refuge) Sept. 1 - Dec. 31 May 10 - May 25	1 bear every 4 years
	(Northern half of refuge) Sept. 1 - Oct. 31 May 10 - May 31	1 bear every four years by drawing permit only 30 permits issued
Caribou	(Southern half of refuge) Aug. 10 - Sept. 30 (Northern half of refuge) Jul. 1 - Apr. 30	1 Bull 5 caribou/day (5 caribou/year transported from unit.)
Moose	Aug. 25 - Sept. 25	1 bull
Coyote	Sept. 1 - Apr. 30	2 coyotes
Red Fox	Nov. 1 - Feb. 15	2 foxes
Lynx	Nov. 1 - Mar. 31	2 Lynx
Red Squirrel	No closed season	No limit
Wolf	Aug. 10 - Apr. 30	No limit
Wolverine	Sept. 1 - Mar. 31	1 wolverine
Grouse	Aug. 10 - Apr. 30	15/day
Hare & Rabbit (snow- shoe and Arctic)	No closed season	No limit
Ptarmigan (willow, rock whitetail)	Aug. 10 - Apr. 30	20/day
Ducks(except Sea Ducks)	Sept. 1 - Dec. 16	10/day
Sea Ducks (eiders, scoters, oldsquaw, harlequin & mersangers)	Sept. 1 - Dec. 16	15/day
Geese (except Emperors	Sept. 1 - Dec. 16	6/day*
Brant	Sept. 1 - Dec. 16	4/day
Snipe	Sept. 1 - Dec. 16	8/day
Cranes	Sept. 1 - Dec. 16	2/day
Emperor Geese	Sept. 1 - Dec. 16	6/day
Ravens	No open season	

*No more than 4 daily, or 8 in possession may be any combination of Canada or White-fronted geese.

Specific State and Federal restrictions, requirements and other information concerning hunting of the above animals are established and apply to the refuge.

A great effort is being made by the State to obtain subsistence and sport harvest information. The manager of Kanuti NWR will cooperate with the State in gathering valid data without duplication or conflicts. This information must be known and be reasonably accurate in order to provide justifiable recommendations concerning the management of the various game animals on Kanuti NWR.

Willard D. Lambert and Ronald K. Lambert hold a State exclusive guide permit for an area that encompasses most of Kanuti NWR. In 1984 they requested a Special Use Permit with incidental use of the Kanuti Lake Cabin. The request for the use of the cabin was denied since this refuge administrative cabin was in use by a research team doing studies on beaver in the near vicinity. As a result of the denial, a Congressional inquiry occurred and formal reply by the R.D. was required. The Refuge Manager's decision of denial held.

The guides decided against further request for a guiding permit from the refuge and did not take hunters into the area during the 1984-1985 season to our knowledge.

A few other hunting parties were contacted and checked during the season. No violations were observed.

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

As described in the General section, the harvest levels were monitored in each of two communities Bettles/Evansville and Allakaket/Alatna. For large game mammals, the following comparative table is provided. This year, however, a distinction is made between the total harvest and those harvested within the boundaries of Kanuti NWR. Of a total of 35 moose reported only 15 or 43% were harvested within the refuge. Three of the total of nine black bear and the one and only grizzly were killed within the refuge.

Table 15.
Terrestrial Mammal Harvest Levels
in 1973, 1982, 1983.

	Number of Animals Harvested					
	Bettles/ 1973*	Evansville 1982**	1983***	Allakaket/ 1972*	Alatna 1982**	1983***
Moose	25	10	12/3	48	28	23/12
Black Bear	5	4	2/0	20	21	7/03
Grizzly	0	1	0/0	10	0	1/01
Caribou	50	11	4/0	300	1	0/00
Sheep	5	2	0/0	10	5	0/00

*Nelson, Mautner and Bane, 1982.

**Marcotte and Haynes, 1984

***Data is: Total Number Harvested/Number Harvested on KNWR.

Map of Kanuti National Wildlife Refuge showing a controlled use area. The map includes a grid with latitude and longitude markings. Key features include Double Point Mt., Fish Creek Lake, and Old Dummy Lake. A shaded area indicates the controlled use zone.

Map details:

- Latitude markings: 124N, 123N, 122N, 121N, 120N, 119N, 118N, 117N, 116N, 115N, 114N.
- Longitude markings: 150W, 149W, 148W, 147W, 146W, 145W, 144W, 143W, 142W, 141W, 140W.
- Geographic features: Double Point Mt., Fish Creek Lake, Old Dummy Lake, River, Hills, Road.
- Controlled Use Area: Shaded region covering a large portion of the refuge.

-CONTROLLED USE AREA WITHIN THE KANUTI NWR AND VICINITY

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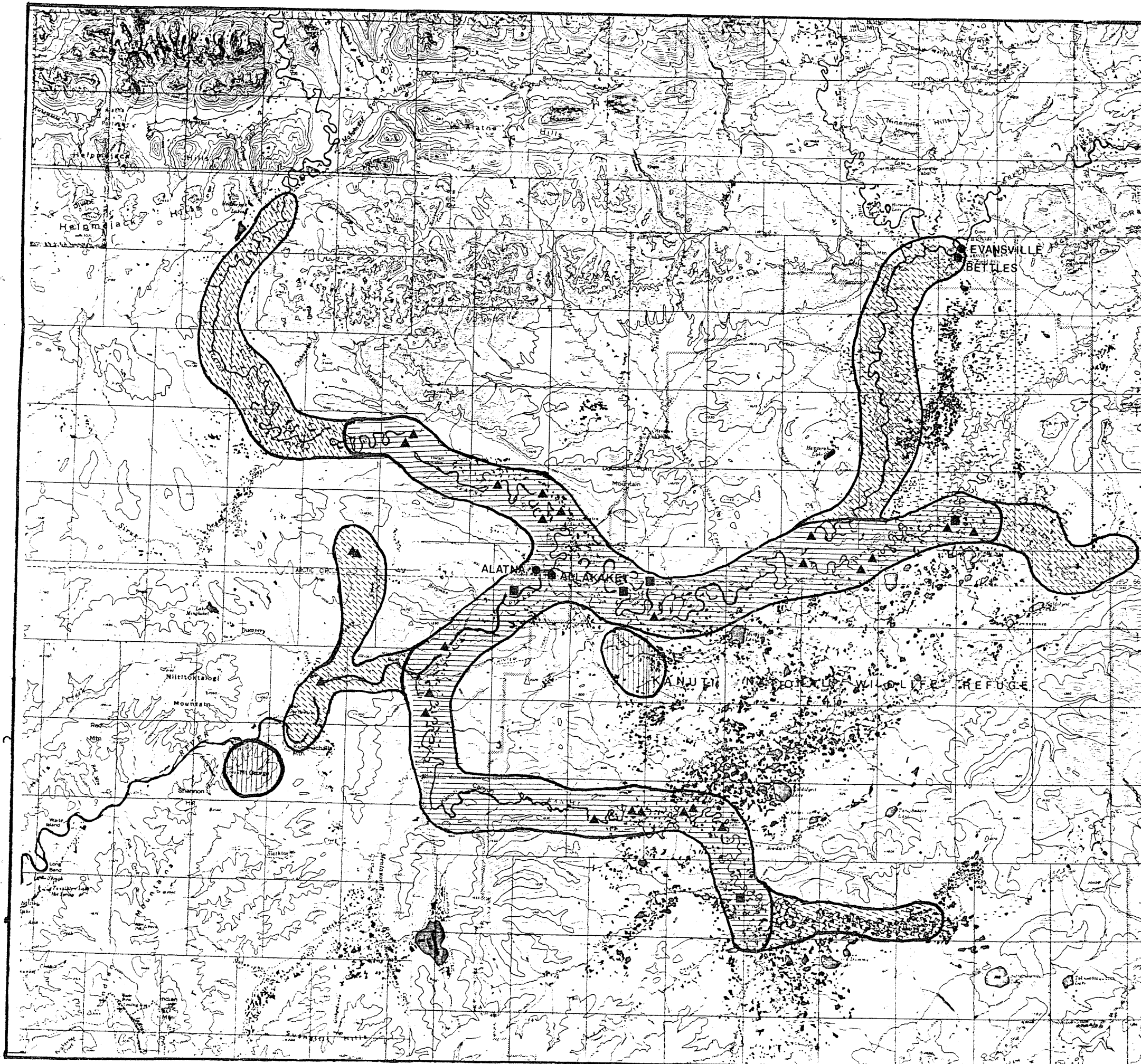





FIG 8 AREAS USED FOR MOOSE AND BLACK BEAR HUNTING BY RESIDENTS OF ALLAKAKET AND ALATNA, JANUARY 1983 THRU DECEMBER 1983

-  **MOOSE AND BEAR HUNTING AREA THREE OR MORE HOUSEHOLDS**
-  **MOOSE AND BEAR HUNTING AREA FEWER THAN THREE HOUSEHOLDS**
-  **SPECIFIC BLACK BEAR HUNTING AREA**

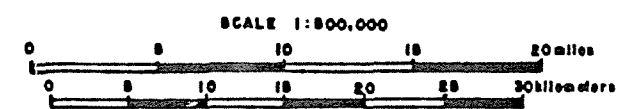
 **MOOSE KILL SITE**

 **BEAR KILL SITE**

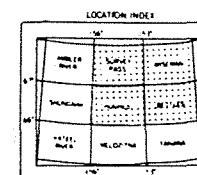
INFORMATION COLLECTED FROM 45 OF 51 HOUSEHOLDS IN ALLAKAKET AND ALATNA BY REBECCA MCGEE, MATHEW GOLDEN AND VALERIE WILLIAMS FOR THE KANUTI NATIONAL WILDLIFE REFUGE IN JULY 1984

SURVEY SUPERVISED BY ERVIN W. MCINTOSH, REFUGE MANAGER.

BASE MAP ADAPTED FROM USGS HUGHES, BETTLES, SURVEY PASS AND WISEMAN 1:250,000 QUADS



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FIG. 9 BIG GAME HUNTING AREAS USED BY LOCAL RESIDENTS OF BETTLES AND EVANSVILLE, JANUARY 1983 THRU DECEMBER 1983

MOOSE AND BEAR HUNTING AREAS



SHEEP HUNTING AREA



MOOSE KILL SITE



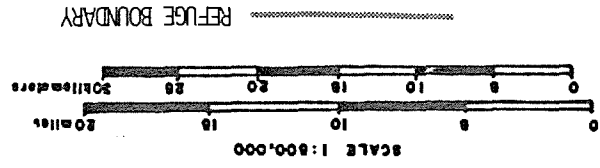
BEAR KILL SITE



NO SHEEP REPORTED KILLED

INFORMATION COLLECTED FROM 21 OF 26 HOUSEHOLDS IN BETTLES AND EVANSVILLE BY REBECCA MCGEE, MATHEW GOLDEN AND VALERIE WILLIAMS FOR THE KANUTI NATIONAL WILDLIFE REFUGE IN JULY 1984. SURVEY SUPERVISED BY ERVIN W. MCINTOSH, REFUGE MANAGER.

BASE MAP ADAPTED FROM USGS HUGHES, BETTLES, SURVEY PASS AND WISEMAN 1:250,000 QUADS



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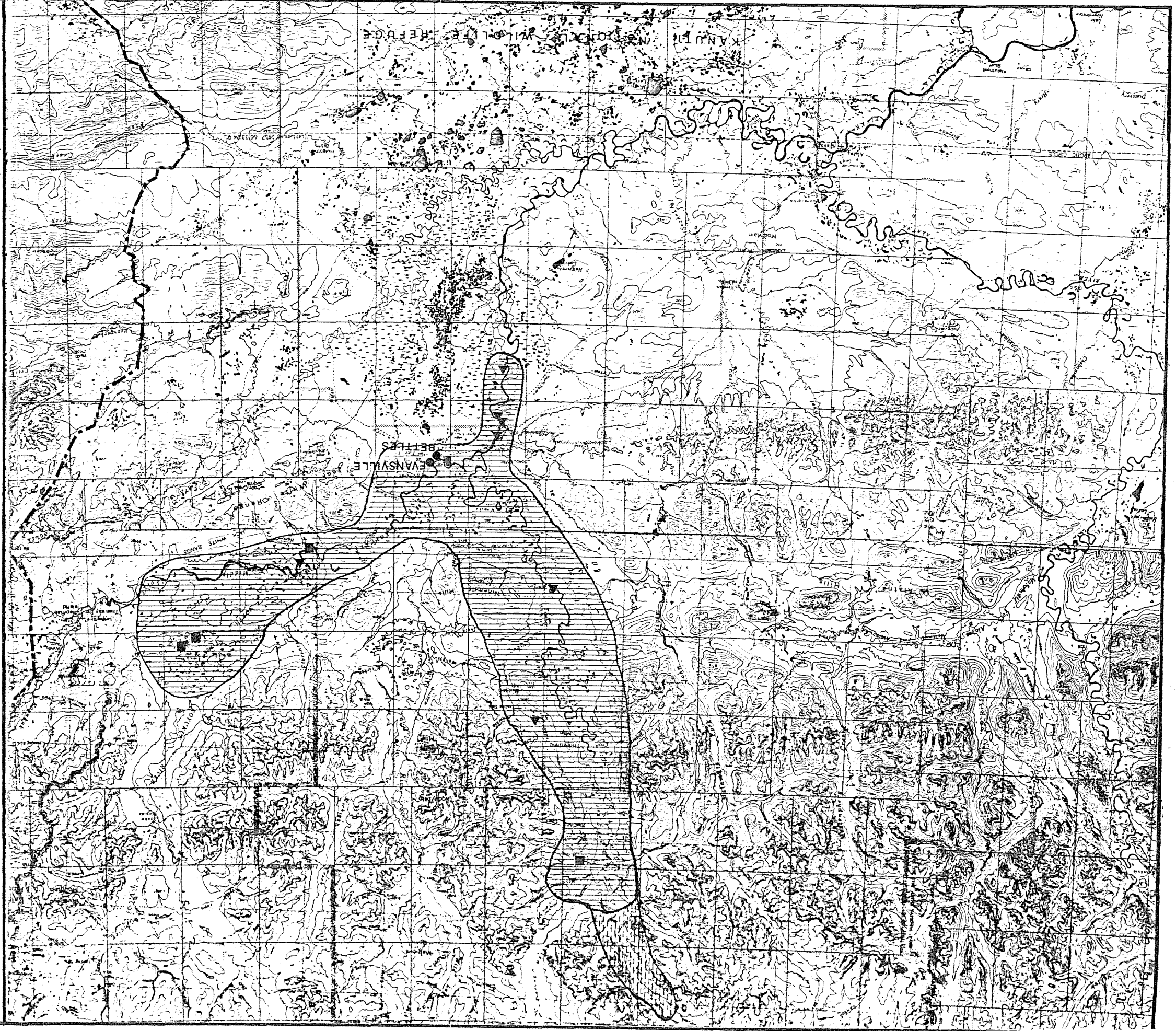


Table 16.
Birds Harvested in 1973, 1982, 1983.

	Numbers Harvested					
	Allakaket/Alatna			Bettles/Evansville		
	1973*	1982**	1983	1973*	1982**	1983
Ducks	4000	858	1131	20	34	26
Geese	300	395	302	20	10	3
Grouse	150	81	72	10	5	14
Ptarmigan	500	154	74	100	14	36
Cranes	-	-	5	-	-	0
Swan	-	-	0	-	-	0

*Nelson, Mautner and Bane, 1982.

**Marcotte and Haynes, 1984.

- No data available.

New insight into the harvest of waterfowl by local residents was significant. In order to support a change in the Migratory Bird Treaties and thus a change in the regulations to meet the needs of subsistence users and the resources this information is invaluable. It is also representative of a breakthrough in cooperation and a trust between the local residents and the USFWS. Callousness towards the needs (perceived or real) of the local residents has always been a stumbling block in determining the use of resources by local residents in remote areas. It has taken much courage and trust for these local residents to provide the following information. Callous use of the information will benefit no one nor the resource.

In 1983 the total waterfowl harvest reported by all local residents was 1,462 birds (Lesser sandhill cranes are included in with the waterfowl data for convenience). Of this total harvest 65.5% were harvested in the spring and 34.5% in the fall.

	<u>April</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Nov-Mar</u>
Total Kill = 1,462	3.1%	59.1%	3.3%	0	2.9%	31.6%	0

Waterfowl constitute an important component of the diet of the Upper Koyukuk residents. There are two main times of concerted duck and geese hunting. These are in the early spring when the birds are at or near the end of their northward migration and again in the autumn, after the young of the year have fledged and the birds are heading south. There is also a certain, but smaller, amount of hunting in late summer when the adults are molting and unable to fly. The springtime arrival of the waterfowl coincides with a time when the food reserves of the village are at a seasonal low, trapping has ended and there is little hunting activity. Usually, there is little meat available, the protein intake has been restricted to dried fish and "store food" and the prospect of hunting is welcomed. The demand for fresh meat is high and renewed hunting activity is anticipated with pleasure. During August and September, when the other burst of waterfowl hunting occurs, there are many other activities in the villages that demand the attention of the residents. When the moose season is officially open, many individuals may be occupied with wage employment and fishing may still be good. Additionally, although ducks are plentiful until mid-to-late September, only a few straggling geese remain when the legal fall waterfowl season opens. The great number of

possible activities, coupled with ready availability of fish and moose and scarcity of ducks and geese, probably accounts for the smaller number of birds taken in the fall than in the spring. As opposed to much of the spring waterfowl hunting activity, autumn hunting is usually in conjunction with and secondary to big game hunting.

Table 17.
Seasonal Distribution of Waterfowl Hunting

	Number of Birds Harvested in 1983															
	Allakaket/Alatna								Bettles/Evansville							
	A	M	J	J	A	S	O	N-M	A	M	J	J	A	S	O	N-M
Crane	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Swan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada goose	0	113	4	0	14	96	0	0	0	2	0	0	0	0	0	0
Snow goose	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black brant	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White-fronted goose	0	49	2	0	1	16	0	0	0	1	0	0	0	0	0	0
Mallard	18	111	5	0	5	95	0	0	0	4	0	0	0	3	0	0
Pintail	12	141	8	0	0	98	0	0	0	6	0	0	0	3	0	0
Green-winged teal	0	25	0	0	1	6	0	0	0	0	0	0	0	0	0	0
Blue-winged teal	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amer. wigeon	15	82	0	0	7	90	0	0	0	0	0	0	0	0	0	0
Shoveler	0	27	0	0	2	2	0	0	0	0	0	0	0	0	0	0
Redhead	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ring-necked duck	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Canvasback	0	24	8	0	0	14	0	0	0	0	0	0	0	0	0	0
Scaup	0	55	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Goldeneye	0	7	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Bufflehead	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oldsquaw	0	93	17	0	0	13	0	0	0	2	0	0	0	0	0	0
Harlequin	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common scoter	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Surf scoter	0	64	3	0	5	20	0	0	0	0	0	0	0	0	0	0
White-winged scoter	0	5	0	0	1	3	0	0	0	4	0	0	4	0	0	0
Redbreasted merganser	0	4	0	0	1	1	0	0	0	0	0	0	0	0	0	0

Ninety-eight percent of all reported waterfowl harvested were taken by Allakaket/Alatna residents. Only 31% of the total were harvested within Kanuti NWR boundaries and 98% of these were also taken by local residents of Allakaket. There were no indications that any particular species was hunted solely on the refuge.

Most of the waterfowl harvest seems to occur up the Alatna River and adjacent lakes, the Koyukuk River and up the mouth of Kanuti River and adjacent lakes, just off the refuge which are close to villages having easy access for the residents of Allakaket/Alatna.

The Allakaket/Alatna harvest levels for the broad category of geese and, especially, ducks appear to have decreased since 1973. Although many of the respondents remarked on lower waterfowl populations in 1983 than in the past, the nature of the data from 1973 precludes determining whether the decrease in the numbers harvested was due to reduced hunting efforts (in spring, fall or both), or reduced population levels, or a combination of factors.

Thirty-one (69%) of the forty-five households of Allakaket/Alatna surveyed reported harvesting some waterfowl during 1983. The average of 9.74 geese and an average of 36.48 ducks were taken for those of Allakaket/Alatna that reported hunting waterfowl.

Two (10%) of the 21 households of Bettles/Evansville surveyed reported harvesting some waterfowl during 1983. An average of 1.5 geese and an average of 13 ducks were taken for those households of Bettles/Evansville that reported hunting waterfowl.

The most harvested waterfowl reported by local residents included:

Pintail	18.33%
*Mallard	16.48%
Canada Geese	15.66%
Widgeon	13.27%
Oldsquaw	8.55%
Surfscoter	6.22%

Other Significant birds included:

*White-fronted geese	4.72%
Scaup	3.83%
*Canvasback	3.15%
G=W Teal	2.19%
Shoveler	1.98%
W-W Scoter	1.16%

The remaining birds reported harvested by local residents and making up less than 5% of the total harvest included:

G-W Teal
Redhead
Goldeneye
Ring-necked duck
Harlequin
*Sandhill crane
Common Scoter
*Snow goose (incidental occurrence)
*Black Brant (incidental occurrence)

*National and Regional Species of Special Emphasis

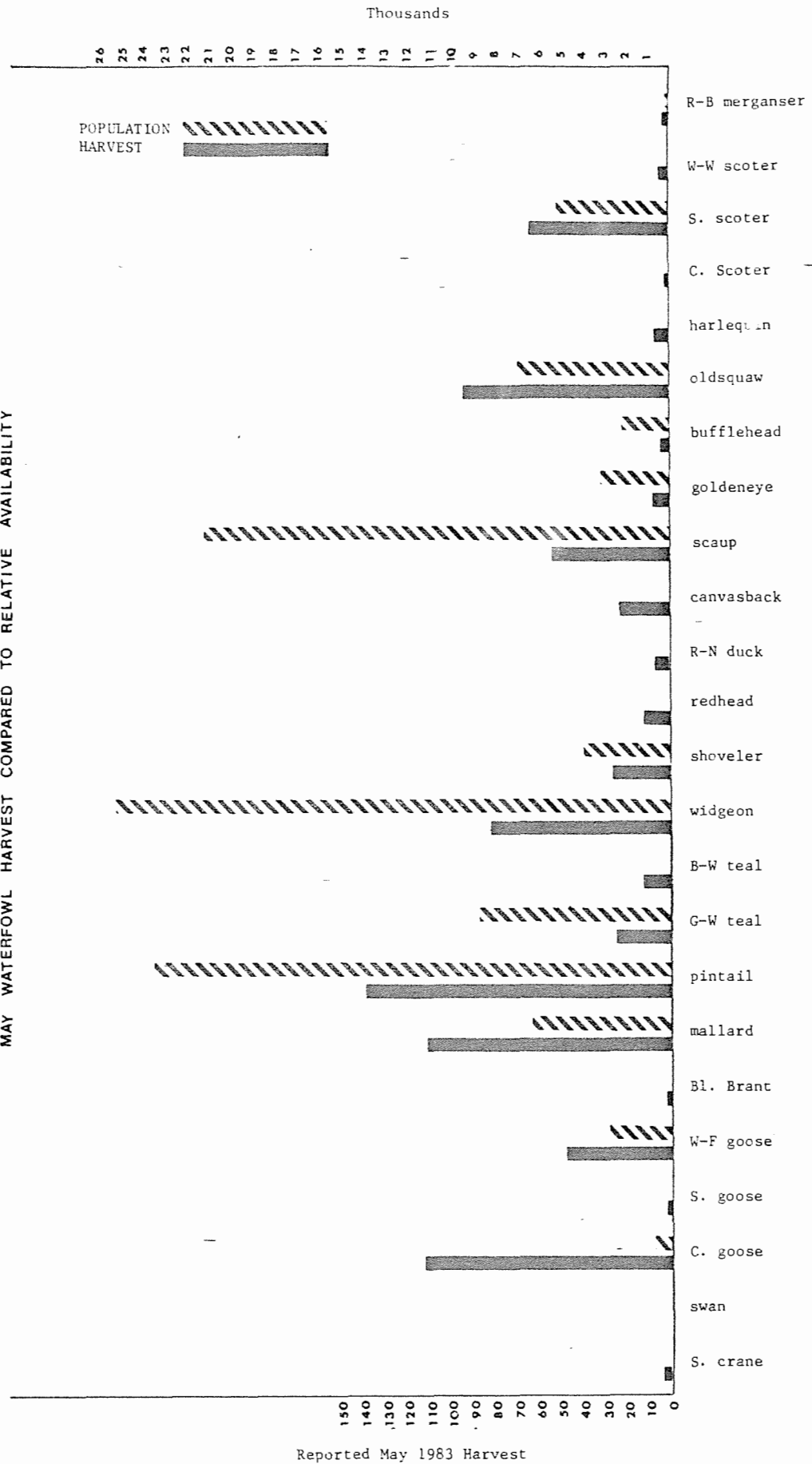
Local subsistence hunters are somewhat selective of some species as may be indicated in the following graph.

Though pintail, widgeon, and scaup are the most abundant birds, they are not necessarily the most harvested in relation to availability. (Figure 10)

Canada geese, Whitefronted geese, mallard, oldsquaw, and surf scoters are harvested much more in relation to their availability and have been indicated by local natives as preferred species.

There were several species harvested in May 1983 that were not identified during the May 25th aerial survey. There may be misidentification of some reported species even though picture charts (page 89) were utilized to help natives identify species harvested.

Figure 10.
MAY WATERFOWL HARVEST COMPARED TO RELATIVE AVAILABILITY



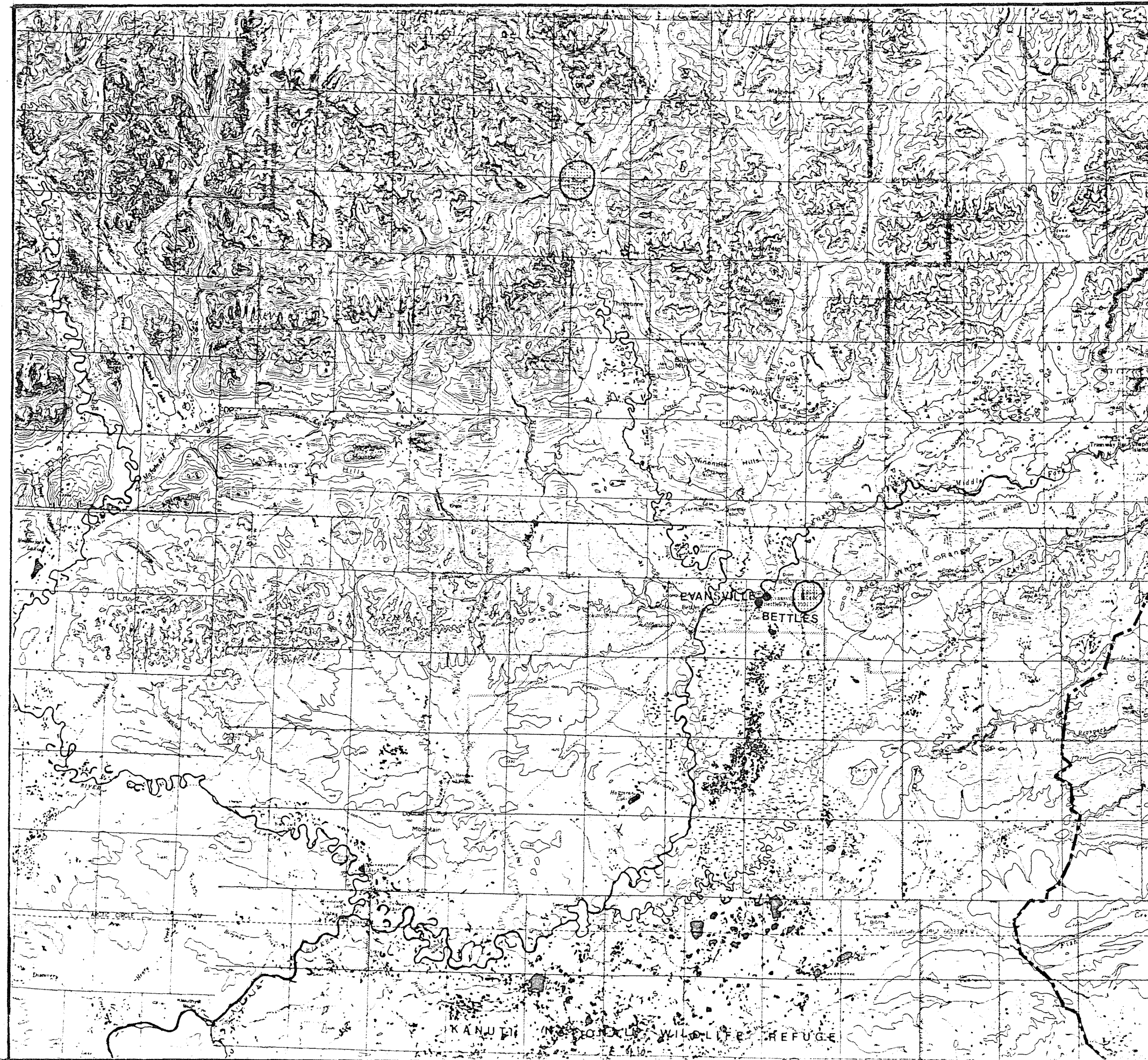


FIG.11 AREAS USED FOR WATERFOWL HUNTING BY LOCAL RESIDENTS OF BETTLES AND EVANSVILLE, JANUARY 1983 THRU DECEMBER 1983.



AREAS WHERE WATERFOWL HUNTING OCCURRED

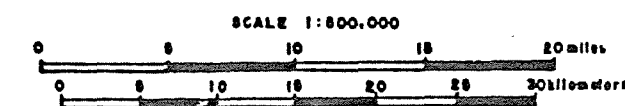


THE MORE IMPORTANT WATERFOWL HUNTING AREAS

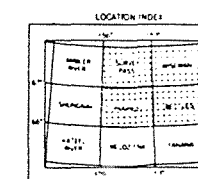
INFORMATION COLLECTED FROM 21 OF 26 HOUSEHOLDS IN BETTLES AND EVANSVILLE BY REBECCA MCGEE, MATHEW GOLDEN AND VALERIE WILLIAMS FOR THE KANUTI NATIONAL WILDLIFE REFUGE IN JULY 1984.

SURVEY SUPERVISED BY ERVIN W. MCINTOSH, REFUGE MANAGER.

BASE MAP ADAPTED FROM USGS HUGHES, BETTLES, SURVEY PASS AND WISEMAN 1:250,000 QUADS



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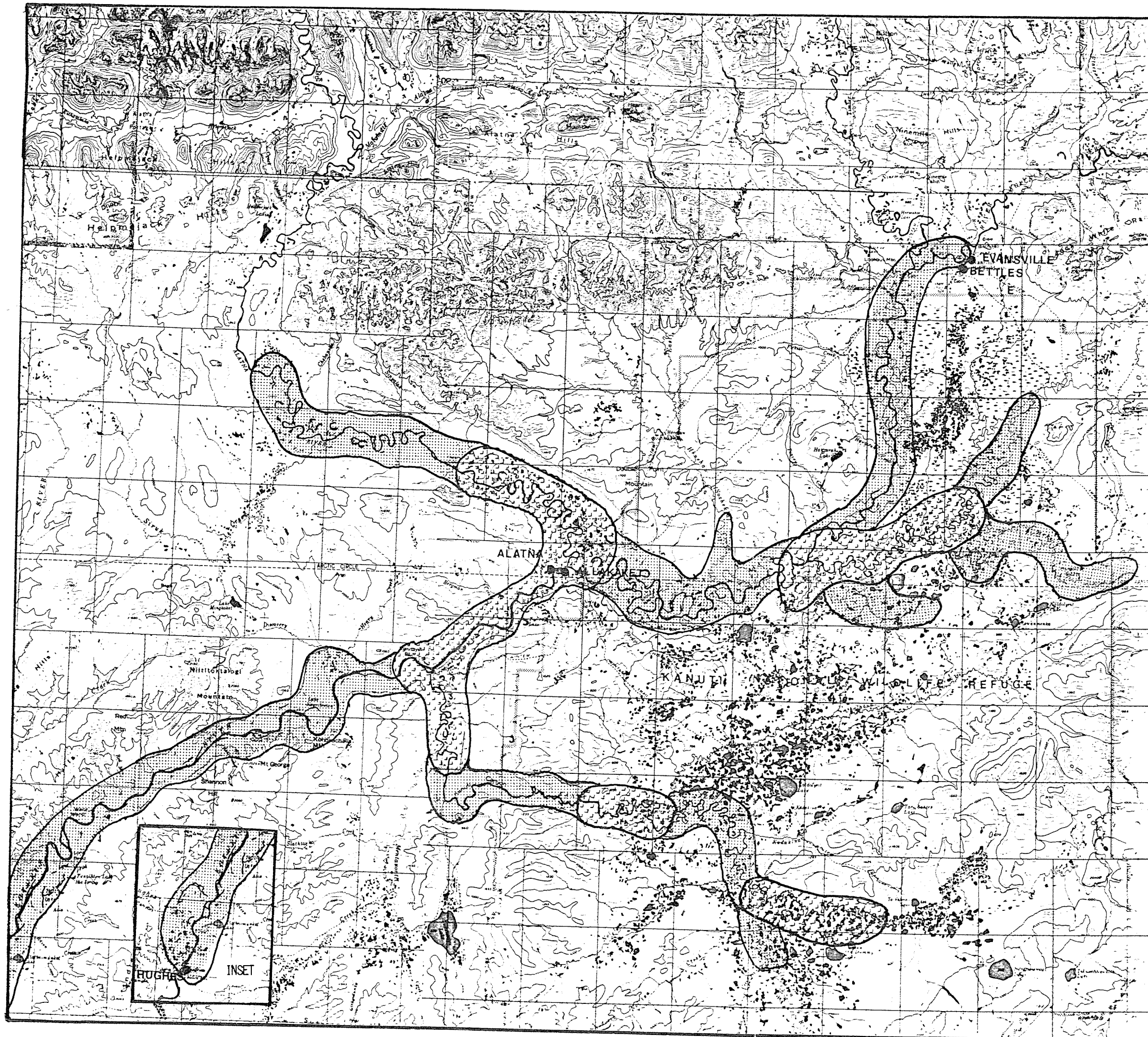




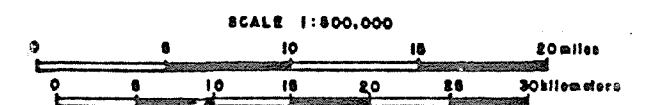
FIG. 12 AREAS USED FOR WATERFOWL HUNTING BY LOCAL RESIDENTS OF ALLAKAKET AND ALATNA, JANUARY 1983 THRU DECEMBER 1983

-  AREAS WHERE WATERFOWL HUNTING OCCURRED
-  THE MORE IMPORTANT WATERFOWL HUNTING AREAS

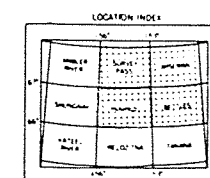
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SURVEY SUPERVISED BY ERVIN W. MCINTOSH, REFUGE MANAGER.

BASE MAP ADAPTED FROM USGS HUGHES, BETTLES, SURVEY PASS AND WISEMAN 1:250,000 QUADS



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9. Fishing

Subsistence and sport fishing occur within the refuge. Subsistence fishing areas within the refuge are mapped on the following page. To our knowledge, there is no commercial fishing in the upper Koyukuk Region.

Gill nets, seines, traps and hook and lines are the major devices utilized for subsistence fishing. Though fishing may occur some distance from the village, fewer fish camps are being utilized than in the past due to several causes: 1) availability of employment in the village; 2) certain household members not wanting to be gone and miss being called for fire duty by AFS; 3) employment elsewhere during summer months; 4) larger outboards allow shorter travel times between village and net site; 5) other reasons may include how family members cooperate on subsistence activities. Example: Teenagers not wanting to miss village activities so parents make daily trips to net sites from the villages.

Table 18.
Fishing Harvest Levels in 1973, 1982 and 1983

	<u>Number of Fish Caught</u>					
	Bettles/Evensville			Allakaket/Alatna		
	1973*	1982**	1983	1973*	1982**	1983
Burbot	****	0	0	****	58	0
Grayling	200	491	807	1000	1639	631
Pike	50	10	115	500	401	248
Kings	0	9	0	300	322	347
Silvers	****	****	0	****	****	2650
Dogs***	****	532	426	12600	11497	4482
Sheefish	0	212	23	1600	2451	1340
Sucker	100	0	0	400	480	780
Trout	****	61	254	****	****	0
Arctic Char	****	****	145	****	****	0
Whitefish	50	210	0	24000	4858	11141

*Nelson, Mautner and Bane, 1982.

**Marcotte and Haynes, 1984.

***Includes all non-King and non-silver salmon (i.e. summer chum, fall chum, dogs).

****Data not available.

A comparison of the 1973, 1982 and 1983 fishing harvests is presented in the table above. Figure 13 shows the locations of the 1983 fishing effort by residents of Allakaket/Alatna. The greatest numbers of fish they caught were whitefish and dog salmon. Residents caught most of the whitefish in a few days of seining and took the salmon over a period of several weeks using setnets (Table 19). Most of the setnet fishing activity took place on the Koyukuk River within 20 river miles of the village. Salmon, which were neither Kings nor Silvers, were classified as dogs in this study as the residents did not consistently differentiate any further.

The Bettles/Evensville fishing harvests (1973, 1982 and 1983 comparisons) and locations are shown in Table 18 and Figure 14 and 14a respectively. The most frequently caught fish was grayling taken with rod and reel. Only three households in Bettles/Evensville put out setnets during 1983. Fishing

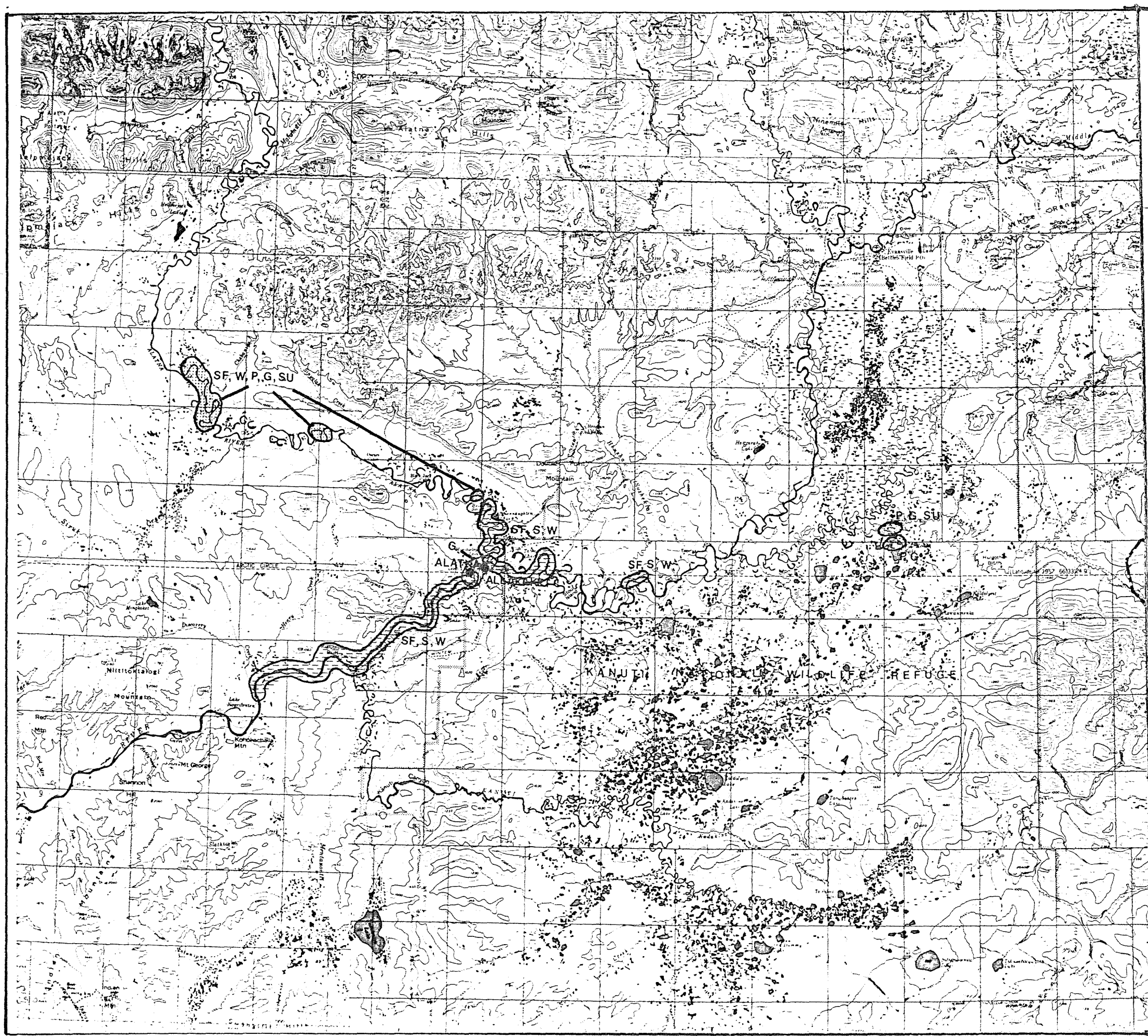





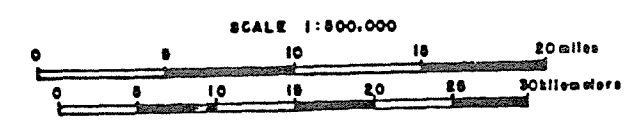
FIG.13 FISHING AREAS USED BY LOCAL RESIDENTS OF ALLAKAKET AND ALATNA, JANUARY 1983 THRU DECEMBER 1983.

- | | |
|---|--------------------|
|  | SEINE NET AREA |
|  | SET NET AREA |
|  | HOOK AND LINE AREA |
-
- | | |
|---------------|------------------|
| G - GRAYLING | SU - SUCKERS |
| P - PIKE | T - TROUT |
| SF - SHEEFISH | W - WHITEFISH |
| S - SALMON | AC - ARCTIC CHAR |

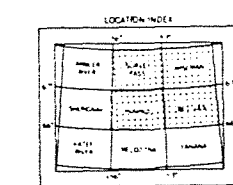
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SURVEY SUPERVISED BY ERVIN W. MCINTOSH, REFUGE MANAGER.

BASE MAP ADAPTED FROM USGS HUGHES, BETTLES, SURVEY PASS AND WISEMAN 1:250,000 QUADS



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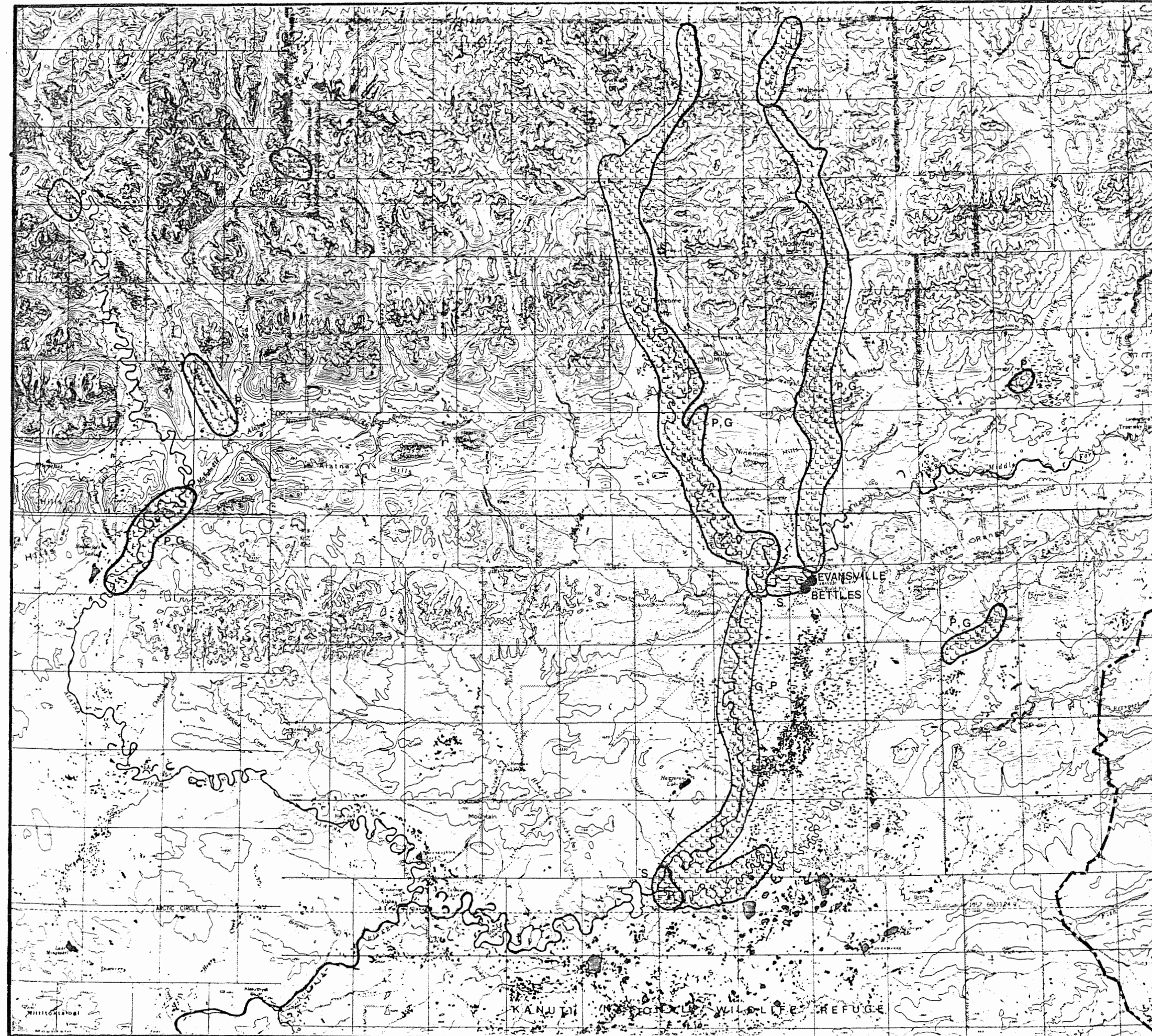
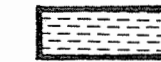


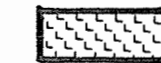
FIG. 14 FISHING AREAS USED BY LOCAL RESIDENTS OF BETTLES AND EVANSVILLE, JANUARY 1983 THRU DECEMBER 1983.



SEINE NET AREA



SET NET AREA



HOOK AND LINE AREA

G - GRAYLING

SU - SUCKERS

P - PIKE

T - TROUT

SF - SHEEFISH

W - WHITEFISH

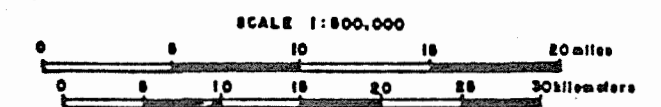
S - SALMON

AC - ARCTIC CHAR

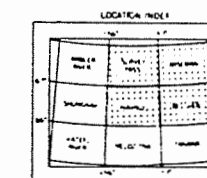
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SURVEY SUPERVISED BY ERVIN W. MCINTOSH, REFUGE MANAGER.

BASE MAP ADAPTED FROM USGS HUGHES, BETTLES, SURVEY PASS AND WISEMAN 1:250,000 QUADS



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FIG.14a FISHING AREAS USED BY LOCAL RESIDENTS OF BETTLES AND EVANSVILLE, JANUARY 1983 THRU DECEMBER 1983.



SEINE NET AREA



SET NET AREA



HOOK AND LINE AREA

G - GRAYLING

SU - SUCKERS

P - PIKE

T - TROUT

SF - SHEEFISH

W - WHITEFISH

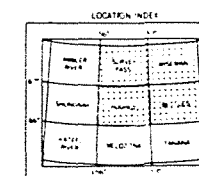
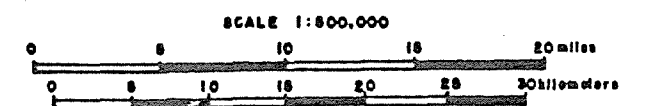
S - SALMON

AC - ARCTIC CHAR

INFORMATION COLLECTED FROM 21 OF 26 HOUSEHOLDS IN BETTLES AND EVANSVILLE BY REBECCA MCGEE, MATHEW GOLDEN AND VALERIE WILLIAMS FOR THE KANUTI NATIONAL WILDLIFE REFUGE IN JULY 1984.

SURVEY SUPERVISED BY ERVIN W. MCINTOSH, REFUGE MANAGER.

BASE MAP ADAPTED FROM USGS HUGHES, BETTLES, SURVEY PASS AND WISEMAN 1:250,000 QUADS



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with rod and reel accounted for the greatest percentage of take and effort for all species (Table 19). Lake Trout and Arctic Char were generally taken recreationally in lakes in Gates of the Arctic National Park and Preserve. Most of the other fishing activity centered on the Koyukuk and John Rivers within 5 river miles of the refuge.

Table 19.
Fishing Methods, Efforts and Catch

	Number of Fish Caught/Number of Days Fished**							
	Allakaket/Alatna				Bettles/Evansville			
	Icenet	Seine	Rod/Reel	Setnet	Icenet	Seine	Rod/Reel	Setnet
Sheefish	*	500/7	55/50	785/583	*	*	22/4	1/7
Dog Salmon	*	20/1	*	6302/801	*	*	*	362/47
King Salmon	*	*	*	337/734	*	*	*	*
Silver Salmon	*	*	*	2650/492	*	*	*	*
Whitefish	196/24	9400/8	154/32	1481/571	*	*	*	*
Pike	*	*	11/3	237/240	*	*	115/88	*
Grayling	*	*	547/34	84/82	*	*	707/160	100/7
Suckers	*	*	*	780/52	*	*	*	*
Burbot	*	*	*	*	*	*	*	*
Blackfish	*	*	*	*	*	*	*	*
Lake Trout	*	*	*	*	*	*	254/109	*
Arctic Char	*	*	*	*	*	*	145/100	*

*No fishing effort utilizing this method for given species.

**Total # fish caught/total # of days fished using each method for each spp.

Although essentially equal proportions of residents surveyed in Allakaket/Alatna and Bettles/Evansville engaged in fishing; methods, amount of effort and numbers of fish caught were vastly different. In Bettles/Evansville, 62% of the families surveyed spent some amount of time in 1983 fishing. More families spent more time "hooking" (rod and reel) for grayling than any other method of fishing for any other kind of fish (Table 14). Three households used setnets for salmon, grayling and sheefish. Five households fished 'recreationally' for arctic char and lake trout in Gates of the Arctic National Park and Preserve. In comparison, 64% of the families surveyed in Allakaket/Alatna engaged in some form of fishing during 1983. The majority of the fishing effort in Allakaket/Alatna was directed toward operating summer setnets which caught large proportions, if not all, of the total take of sheefish, king salmon, dog salmon (including summer chum, fall chum and dogs), silver salmon, whitefish, pike and grayling (Table 19). The differences in numbers harvested in 1983 between the villages can be explained in part by the very different levels of effort put into fishing by village residents. Additionally, the populations of many species, especially salmon, are greater in the Koyukuk River near Allakaket/Alatna than near Bettles/Evansville. The people of Allakaket/Alatna appear to depend upon the fisheries resources of the area to a greater extent than do the Bettles/Evansville residents. The need to harvest large numbers of fish surpasses getting enough to meet the demands of human consumption. Fish are also an important portion of the diet of the village dogs. In Allakaket/Alatna, there are at least six households who have teams of at least 10 dogs and two with as many as 20. It takes a lot of fish to feed that many dogs all winter.

10. Trapping

The portion of households in Bettles/Evensville that were involved in trapping in 1983-1984 was much less than in Allakaket/Alatna (Table 20). This is probably a reflection of the differences in the employment situations between the two villages. Additionally, suitable and productive trapping areas are much more accessible to residents of Allakaket/Alatna. Individuals who were active trappers in Bettles/Evensville generally were very active and had extensive traplines. Although there were many trappers in Allakaket/Alatna who were equally active, there were a significant number who had short lines (less than 5 miles) with few traps or snares. In all villages, men usually went trapping by themselves or with other men; women only occasionally accompanied their spouses or partners. In Bettles/Evensville two women and in Allakaket/Alatna at least three women maintained their own traplines. Women usually trapped close to home and concentrated on rabbits. Traplines were generally active during the prescribed ADF&G seasons. The frequency with which an individual checked his/her traplines was dependent upon the weather. When it was extremely cold, the lines were not checked as often as when it was mild.

More beaver and marten were trapped than any other species by residents of Allakaket/Alatna (Table 21). Most of the individuals who trapped, trapped for these two species. The majority of the fox and lynx were taken by a few trappers. Many residents noted low populations of carnivorous furbearers and correlated it with low populations of rabbits, voles and lemmings. No individual set out to specifically trap mink or porcupine, presumably because of low economic value. The number of rabbits trapped is probably a gross underrepresentation of the actual harvest. This suspicion is founded in the rather late realization that rabbits generally were not preferentially trapped. Unless there was a direct query, it appears highly probable that any rabbits harvested were not mentioned.

The residents of Bettles/Evensville who provided information on numbers of furbearers harvested, trapped more marten than any other species. Only one beaver was reported taken, however, probably more were trapped as one individual, who had a rather extensive trapline throughout the lakes in the northern portion of the refuge, declined to discuss the numbers of animals he had trapped and another individual with an active trapline declined to be interviewed at all. No rabbits were reported to have been trapped in 1983-1984 by Bettles/Evensville residents. This is probably an inaccurate representation of trapping levels since information presented by some respondents was incomplete. Additionally, as was discovered with the residents of Allakaket/Alatna, trapping rabbits almost seemed to be an incidental and insignificant event which was not mentioned unless directly questioned.

Table 20.
Intensity and Duration of Trapping 1983-1984

	Allakaket/Alatna	Bettles/Evensville
Number of Households involved in trapping*	45/73%	6/21%
# traps set**	N=1751	N=1452
	x=44.95 s=43.22	x=161.33 s=246.42
# snares set**	N=945	N=123
	x=26.25 s=25.13	x=30.75 s=8.30
# days traps/snares set**	N=3204	N=546
	x=96.21 s=41.88	x=91.00 s=47.52

*Data presented as number/% of households surveyed who trapped.

**N=Total #, x=average per household, s=standard deviation

Table 21.
Trapping Harvest Levels in 1973, 1982 and 1983.

	Bettles/Evensville			Allakaket/Alatna		
	1973*	1982**	1983	1972*	1982**	1983
Beaver	43	11	1	300	230	198
Fox	5	20	24	20	89	48
Hare	100	231	***	200	818	170
Lynx	12	30	12	20	135	65
Marten	100	154	153	150	1072	907
Mink	6	0	0	100	0	4
Muskrat	20	13	0	400	126	3
Otter	--	--	0	10	4	2
Porcupine	10	--	***	15	--	***
Wolverine	2	7	2	6	4	8
Wolf	10	0	3	5	2	0

*Nelson, Mautner and Bane, 1982.

**Marcotte and Haynes, 1984.

***None reported.

--No data

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.

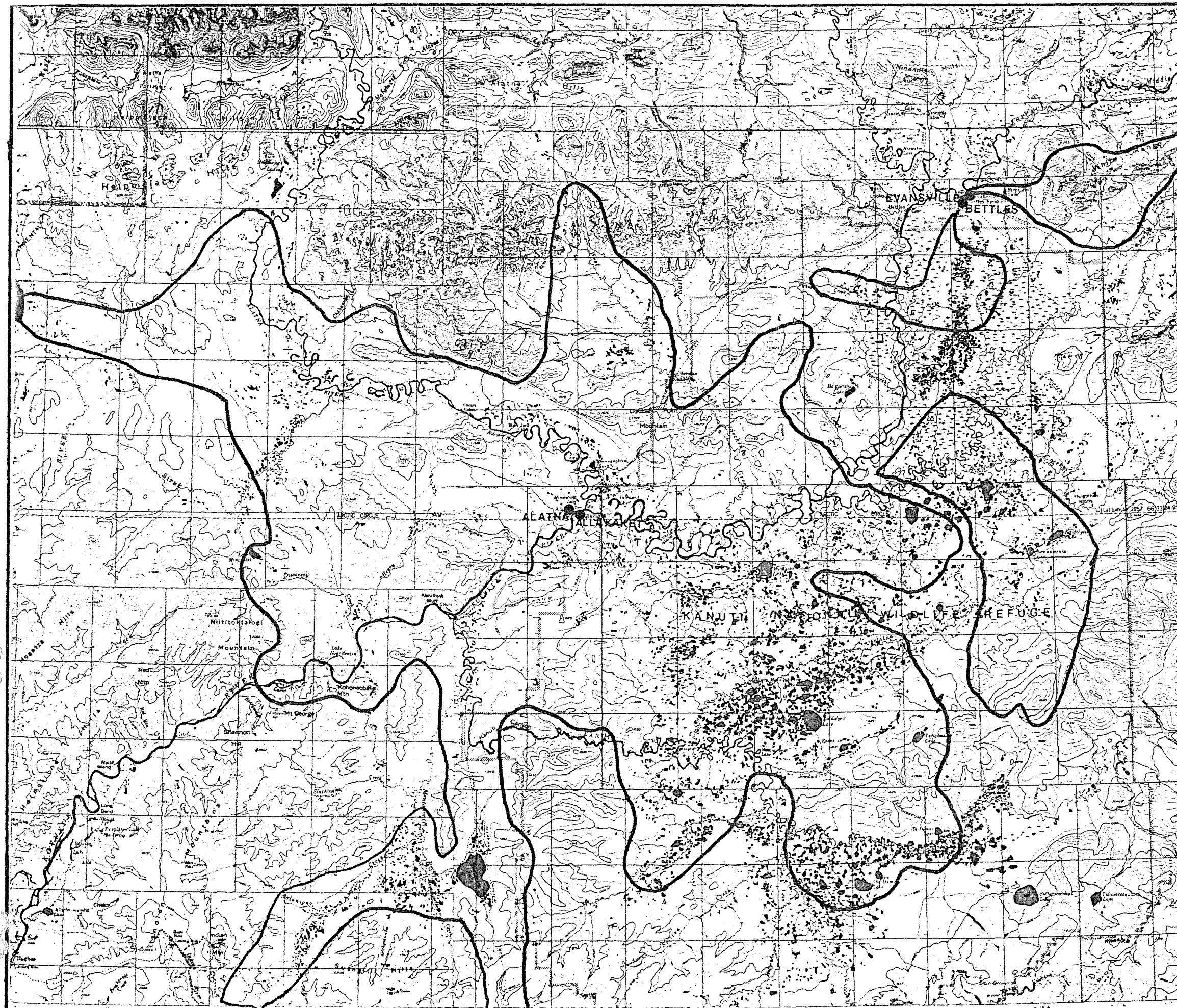
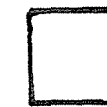


FIG. 15 COMPOSITE TRAPPING AREA OF LOCAL RESIDENTS OF ALLAKAKET AND ALATNA DURING THE 1983-84 TRAPPING SEASON.

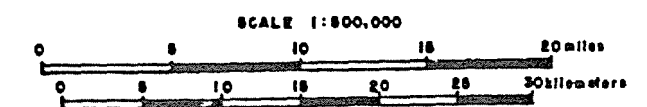


TRAPPING AREAS

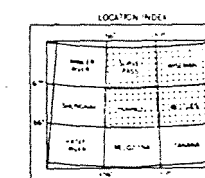
INFORMATION COLLECTED FROM 45 OF 51 HOUSEHOLDS IN ALLAKAKET AND ALATNA BY REBECCA MCGEE, MATHEW GOLDEN AND VALERIE WILLIAMS FOR THE KANUTI NATIONAL WILDLIFE REFUGE IN JULY 1984.

SURVEY SUPERVISED BY ERVIN W. MCINTOSH, REFUGE MANAGER

BASE MAP ADAPTED FROM USGS HUGHES, BETTLES, SURVEY PASS AND WISEMAN 1:250,000 QUADS



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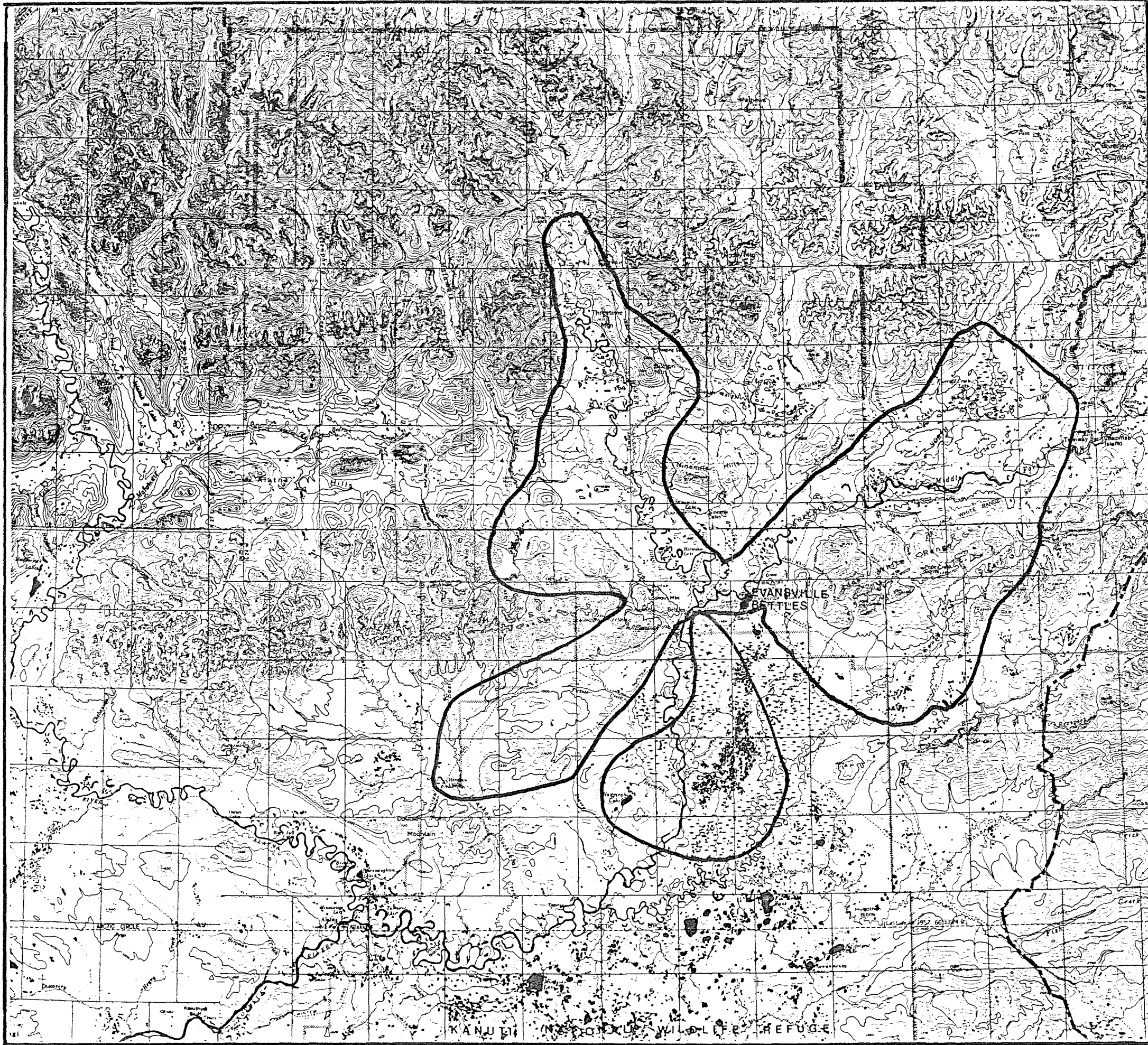


FIG. 16 COMPOSITE TRAPPING AREA OF LOCAL RESIDENTS OF BETTLES AND EVANSVILLE DURING THE 1983-84 TRAPPING SEASON.

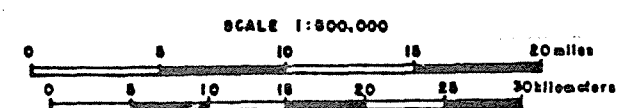


TRAPPING AREAS

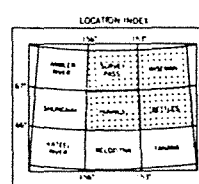
INFORMATION COLLECTED FROM 21 OF 26 HOUSEHOLDS IN BETTLES AND EVANSVILLE BY REBECCA MCGEE, MATHEW GOLDEN AND VALERIE WILLIAMS FOR THE KANUTI NATIONAL WILDLIFE REFUGE IN JULY 1984.

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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 vehicling 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.

Berry gathering and wood cutting activities in 1983 are presented in Table 22 and 23. Although blueberries are not as easy to pick or as locally abundant as high bush cranberries, more blueberries were picked than any other type of berry - undoubtedly because of their superior flavor. As can be seen from Figures 17 and 18, most berry gathering took place either within walking distance of the villages or at summer fish camps (setnet sites).

In all homes visited in Allakaket/Alatna and in many of the homes in Bettles/Evansville, the primary source of heat is a wood stove. Woodcutting for home use usually occurs up river from a village or overland within a few miles radius of the village. Recent community building projects have necessitated the cutting of large numbers of 'house logs'.

Table 22
1983 Berry Gathering

	Gallons of Berries Picked			
	Allakaket/Alatna		Bettles/Evansville	
	Total	On KNWR	Total	On KNWR
Blueberries	65.00	3.0	84.50	15
Lowbush Cranberries	29.75	12.0	25.00	0
Highbush Cranberries	51.25	6.1	31.75	0
Salmon Berries	3.00	0	1.00	0
Rosehips	11.50	0	1.00	0
Raspberries	0.00	0	37.50	0
Cloud Berries	0.00	0	2.00	0
Current	0.00	0	1.00	0

Table 23
1983 Wood Cutting

	Cords of Firewood and Number of Trees Cut			
	Allakaket/Alatna		Bettles/Evansville	
	Total	On KNWR	Total	On KNWR
Firewood:				
Dry Spruce	285.00	91	75.5	14
Green Spruce	4.75	0	20.0	5
Dry Birch	3.00	0	0.5	0
Green birch	3.00	0	0.5	0
Drift	5.00	0	0.0	0
House Logs	959	562	41	17
Poles	92	9	75	65

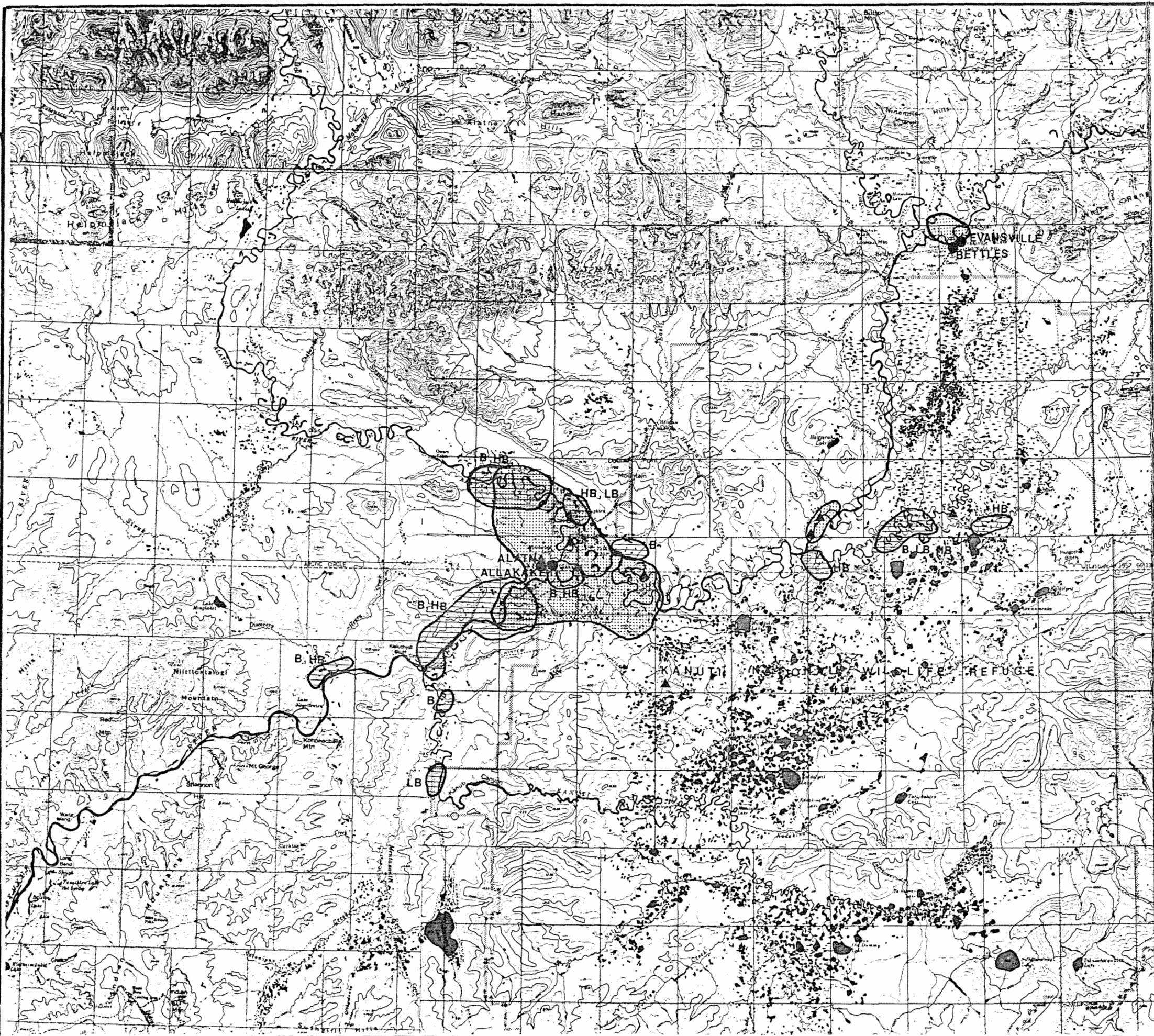
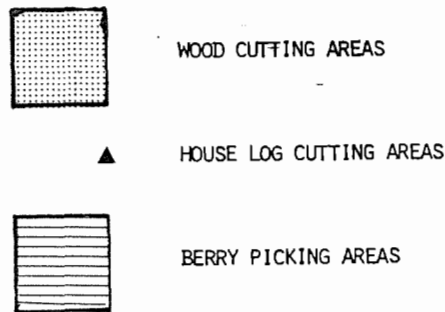


FIG. 17 WOOD CUTTING AND BERRY PICKING AREAS USED BY LOCAL RESIDENTS OF ALLAKAKET AND ALATNA, JANUARY 1983 THRU DECEMBER 1983.

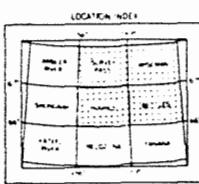
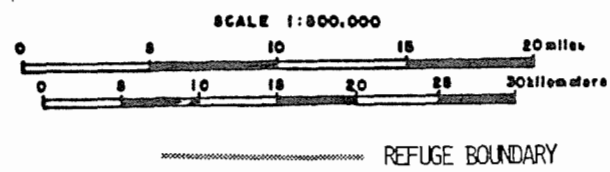


HB - HIGHBUSH CRANBERRIES
 LB - LOWBUSH CRANBERRIES
 R - RASBERRIES

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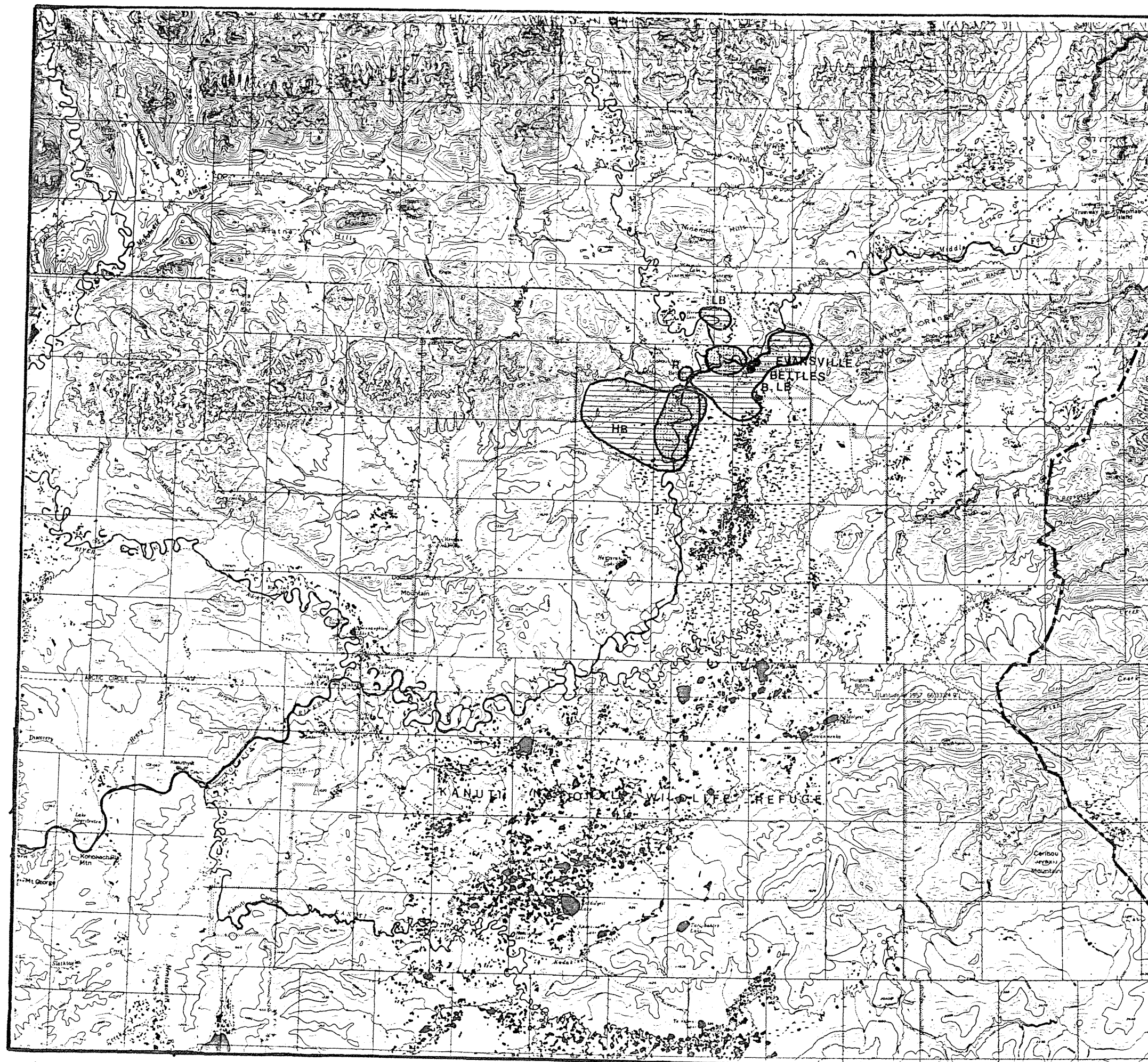
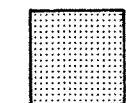


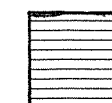
FIG. 18 WOOD CUTTING AND BERRY PICKING AREAS USED BY LOCAL RESIDENTS OF BETTLES AND EVANSVILLE, JANUARY 1983 THRU DECEMBER 1983.



WOOD CUTTING AREAS



HOUSE LOG CUTTING AREAS



BERRY PICKING AREAS

B - BLUEBERRIES

HB - HIGHBUSH CRANBERRIES

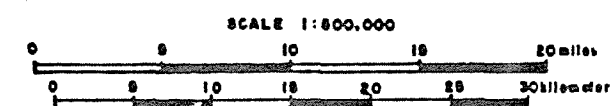
LB - LOWBUSH CRANBERRIES

R - RASBERRIES

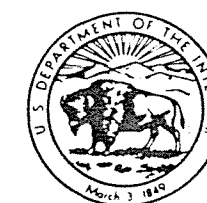
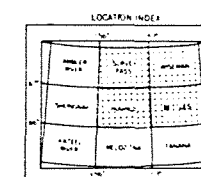
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Wood was cut by people of Allakaket/Alatna for either firewood or construction. Most individuals cut spruce, preferentially dry, for heating. A number of families were cutting wood from areas that had been burned in previous years and some were collecting drift logs from gravel bars in the rivers. Very little birch, which was generally burned in smoke houses, was cut. Many Bettles/Evansville residents were reluctant to cut birch because of its aesthetic values and relative scarcity. In Allakaket there were two large building projects during the summer of 1983. One of the buildings, the community hall, is a log structure made of locally harvested timber. Most of the trees (up to approximately 12" in diameter) cut for this and the few private projects were taken from along the rivers in the refuge. If this level of cutting is sustained for a number of years in highly localized areas, it has the potential of drastically reducing the stand of mature white spruce along the rivers. This may result in deterioration of scenic qualities, erosion control, loss of suitable raptor habitat and reduce the ability of the resource to provide a sustained yield capable of meeting the annual needs of subsistence users.

Most of the wood used in Bettles/Evansville was harvested from areas up river from or within a few miles radius of the village (usually at the end of the airstrip). Residents noted a distinct difficulty in obtaining sufficient quantities of firewood within a reasonable distance of their homes. This problem was perceived as being one of the most pressing to the people of Bettles/Evansville.

17. Law Enforcement

Law enforcement activities have been confined to learning where problems exist or are thought to exist by local residents. Information obtained from numerous contacts reveals some illegal activities may exist, especially during moose season, with the controlled use areas being violated by fly-in hunters and possible aerial hunting or wolves. No violations were observed during CY 1984.

18. Cooperative Associations - Nothing to report.

19. Concessions - Nothing to report.

I. Equipment & Facilities

1. New Construction - No new construction occurred during CY 1984. However, Congress appropriated \$761,000 for design and construction of a bunkhouse storage and office in Bettles. It was requested in the appropriation that "The FWS and the National Park Service should review the following list and advise the Committee of opportunities for joint facilities and the related costs". The Committee will consider supplemental funding at the next opportunity. As a result there have been several meetings between the FWS & NPS concerning development of joint facilities in Bettles. The BLM's Alaska Fire Service also expressed an interest. Their needs will also be considered in the development of joint facilities.

2. Rehabilitation - Nothing to report.

3. Major Maintenance - Maintenance on Kanuti NWR during CY 1984 consisted primarily of the repair and preventive maintenance on field equipment such



Kanuti's transportation equipment. Canoes are shown at Kanuti Lake on an idyllic September day - very unlike the mosquito infested monsoons of July. E.M.



Hangar and Trading Post building being considered for purchase by Kanuti to be used by AFS, NPS and FWS as joint facilities in Bettles Field, Alaska. 1/85 E.M.

as outboard motors, tents, sleeping bags, canoes, guns, radios, scientific instruments, snow mobiles, etc., all of which are critical to safety and accomplishment of our mission.

Kanuti also shared in the costs of maintenance of various office machines such as the Wang, Xerox, typewriters, etc.

4. Equipment Utilization and Replacement

New equipment purchased and received during CY 1984 include:

- 2 - Snowmobiles (Yamaha Long Track) w/ sleds & trailer
- 5 - Tents (3 wall & 2 dome style)
- 6 - Sleeping bags
- 4 - Cold weather Parkas w/pants
- 4 - Snowmobile suits
- 2 - Canoes w/accessories (Gruman 17' Aluminum)
- 2 - Outboards (4 H.P.)
- 1 - Inflatable boat
- 2 - Emergency Radios
- 2 - Intercom Sets (head)
- 1 - Ice Auger
- 1 - Chainsaw
- 1 - Drill
- 4 - Bookshelves
- 2 - File Cabinets

Equipment transferred to Kanuti from other stations or from surplus property of Department of Defense included:

Bunny boots	(DOD)
Mittens	(DOD)
Parkas (cold weather)	(DOD)
Blankets (wool)	(DOD)
Sleeping mats	(DOD)
Waterproof bags	(DOD)
Parachute cord	(DOD)
Sleeping bags	(DOD)
2 Radios (CB)	(Arctic NWR)
4 shotguns	(Yukon Flats NWR)

5. Communication Systems

The SGC Model SG-715 radios were again utilized in the 1984 season with even poorer results than in 1983. The proposal for a new radio system submitted in 1983 was considered in the purchase of a system with fire equipment funds through the FMC. Neither these radios nor the system have been received by this station at the writing of this report. According to the last update, the system is to be installed on Kanuti NWR in the spring of 1985. We do not however, know how many radios or whether the system will meet the needs of Kanuti. A meeting is being set up for the managers to discuss the system with the individual designing the system to answer pertinent questions.

6. Computer Systems

A Data General computer system was purchased for FWS stations in Fairbanks. One terminal is for Kanuti NWR and will hook up to the central system elsewhere in the building. Unfortunately, many operation and growth factors were not considered and therefore inadequate for the needs of some offices. Modification and new parts for the system must be obtained before it becomes useful to this station.

7. Energy Conservation

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

8. Other

Facility needs of Kanuti NWR have been submitted to the regional office in the briefing for the TLM preparation and other submissions that affected the resource problems.

These facilities included:

Fairbanks Headquarters w/furnishings

Refuge Office - 7 persons
Equipment Storage - 1,200 sq. st.
Hangar and tie down space (winter)
Float pond space (summer)
Oil and gas storage
Maintenance shop space
Volunteer Housing (Bunkhouse)

Bettles Substation w/furnishings

Refuge Office - 4 persons
Equipment storage - heated & unheated
Bunkhouse - 6-8 persons
Hangars and tie-down space winter
Float pond space (summer)
Oil and gas storage
Maintenance shop
Two-bay garage
Residence

Allakaket Substation w/furnishings

Bunkhouse = 6-8 persons
Office - Garage - Workshop

Refuge Administration Sites

Two cabins, 600 & 800 sq. ft.



Structure in Bettles being considered for possible purchase with special funding we received this year. Presently, it houses a store below and living quarters above. 1/85 E.M.



Back of building. 1/85 E.M.



The hangar and fuel facilities being considered. 1/85
E.M.



Back of hangar building. 1/85 E.M.



Cooperators met to discuss joint facilities and inspect potential properties. Left to right: Ron Dunton, AFS; Craig Johnson, NPS; Jack Ledgerwood, AFS; Dick Ring, NPS; Anne Carswell and Daughter, owner of Trading Post. 1/85
E.M.

J. Other Items

1. Cooperative Programs

Only four Special Use Permits were issued in CY 1984.

K-1-84	John Cady - Conduct Geologic Investigations
K-2-84	Michael Smith - Fisheries Resources FWS Conduct Lake Classification Surveys
K-3-84	M.G. Sheldon - Fire Management Coordinator Helicopter landings and on ground examinations of various perspective mountain top radio repeater locations.
K-4-84	Gerald Zamber - BLM - to identify vegetation types representing the ordinary high water shoreline of lakes and rivers for determination of upland acreages of native select lands.

Note: No SUP was issued to Willard D. or Ronald K. Lambert for commercial Guiding of Hunting Parties within the refuge during CY 1984.

2. Other Economic Uses - Nothing to report.

3. Items of Interest - Nothing to report.

4. Credits - The narrative was written by Ervin McIntosh and Harvey Heffernan and typed and edited by Gayle Hudson.

Photo Credits

E.M.	Ervin McIntosh
H.H.	Harvey Heffernan
K.T.	Ken Troyer
V.M.	Vivian Mendenhall
J.P.	Jill Parker
D.K.	Donna Kafka
C.H.	Cathy Heffley
L.K.	Leslie Kerr
J.C.	Jim Clark

FEEDBACK

This year's Annual Narrative for Kanuti NWR is unusually long for a reason. I intentionally included as much basic information in this particular report as feasible since we are in the middle of the Comprehensive Conservation Planning stages. Within the next two years many persons in Alaska and Washington, D.C. will be critically reviewing the plan for approval. It is important that they have available to them as much basic information as possible to insure our management directions and activities are in accordance with the Congressional intent for the purposes of the refuge and to insure the wisest possible management of the resources. I also hope that upon the completion of the CCP and the provision of appropriate information, that Kanuti NWR will be provided, at last, the minimum funding and personnel to accomplish the basic management and protection of its resources.