

**THE NOATAK RIVER:  
FALL CARIBOU HUNTING AND AIRPLANE USE**

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## CHAPTER 1: INTRODUCTION

In recent years, the Noatak River has become a popular fall hunting destination for airplane users because of its plentiful caribou, moose, sheep, and bear, its proximity to Kotzebue, its scenic landscape, and its abundance of gravel bars and other spots suitable for landing aircraft. This, combined with increasingly restrictive and competitive hunting in other parts of the state, has resulted in northwest Alaska receiving growing numbers of non-local and non-resident hunters in recent years. Some participate in guided hunts while others are dropped off by local air taxis to hunt on foot or float the area's rivers in search of game.

The Noatak River is also the traditional fall hunting area for the residents of Noatak and other communities who hunt the river by boat. Aircraft-supported hunting along the Noatak River is reported by Noatak residents to be directly competing with and displacing them from traditional hunting sites. These families have reported an increasingly difficult time obtaining their fall meat due to heavy aircraft traffic.

In February 1987, the Kotzebue Fish and Game Advisory Committee submitted a proposal to the Alaska Board of Game requesting the formation of a controlled use area on the Noatak River. This proposal would close a corridor extending five miles on either side of the Noatak River from the mouth of the Eli River to the mouth of the Nimiuktuk River (about 125 air miles) to the use of aircraft in any manner for big game hunting from 15 August to 20 September.

The Noatak Traditional Council first recommended a controlled use area in the Noatak valley in spring 1985. This was submitted to the Board of Game who subsequently deliberated and tabled the proposal, feeling that Noatak's concerns were accommodated in another proposal adopted by the board. The Noatak Traditional Council resubmitted a proposal for a Noatak controlled use area for the November 1986 Board of Game meeting. The proposal was returned because the board was dealing with

the new subsistence law and was not considering other proposals. The proposal submitted in February 1987 by the Kotzebue Fish and Game Advisory Committee was also returned because the topic was not on the Board's agenda at that time. The Arctic Regional Council endorsed the controlled use area proposal at its February 6, 1987 meeting in Kotzebue. The Board now plans to consider this proposal at its March 1988 meeting.

Threatened or depleted wildlife populations are not an issue in this proposal. In 1986, the Western Arctic caribou herd was estimated at 230,000 animals, an increase of 58,000 since 1982. The herd is probably larger now than it has been for at least the last 20 years. Game Division biologists in Kotzebue anticipate no problems with caribou overharvest in the foreseeable future. The relevant questions in this case are whether aircraft traffic significantly interferes with Noatak residents' ability to successfully harvest caribou by boat in fall and whether it has displaced Noatak hunters from traditional hunting areas.

Aircraft traffic on the Noatak River and its effect on hunters in boats is one of the most frequently mentioned local concerns relating to hunting and fishing in Game Management Unit 23. The Alaska Department of Fish and Game in Kotzebue has received numerous reports and anecdotal accounts of conflicts. Discussion of this issue elicits strong responses from all involved individuals and groups in the region. With the pending proposal for a controlled use area, Department staff in Kotzebue believed that a concerted research effort was needed to document use patterns of the Noatak River by both hunters in boats and airplane users.

## **PURPOSE OF STUDY**

The purpose of this study is to provide information to the Alaska Board of Game to assist them in their consideration of the proposal of the Kotzebue Fish and Game

Advisory Committee and Arctic Regional Council for a controlled use area on the Noatak River. More specifically, this project:

1. describes the fall caribou hunting patterns of Noatak residents;
  2. characterizes the nature and extent of fall airplane use of the Noatak River between the Eli and Nimiuktuk rivers;
  3. documents changes in Noatak hunting patterns and airplane use of the Noatak River in the past several years;
  4. examines the relationship between aircraft traffic and Noatak hunters;
- and
5. describes the movement of caribou in the Noatak valley in fall.

#### METHODOLOGY

This project was a cooperative effort between the Divisions of Subsistence and Game in the Kotzebue office. The National Park Service was consulted during preparation of the research design and contributed to the personnel and travel costs associated with the field work.

Community and regional approval for the project was obtained through individual consultations with several members of the Noatak Traditional Council and with several Kotzebue leaders. Individual consultations were used because council meetings are generally not held during the summer months, a traditionally busy time when many Noatak families are camping at *Sisualik*, *Nuvugraq*, and Kotzebue. Kotzebue residents were informed of this research project through articles in the local newspaper and through interviews with researchers on the region's radio station.

The study area for this project corresponded with the portion of the Noatak River proposed as a controlled use area; that is, from the mouth of the Eli River to the mouth of the Nimiuktuk River. Although the proposed controlled use area also includes the area five miles on either side of this portion of the Noatak River, researchers spent

little time in this area due to the constraints of boat travel and the limited sites for airplane access away from the river within this ten-mile wide corridor.

The study focused on the period from August through September which is the time period specified by the controlled use area proposal. Information generally was not collected on airplane use or hunting patterns for other seasons though researchers noted such information if offered by respondents.

Researchers contributing field time to the project were Susan Georgette, Hannah Loon, and Jim Magdanz of the Division of Subsistence, Alaska Department of Fish and Game, and Jonas Ramoth of the National Park Service. David James of the Division of Game, Alaska Department of Fish and Game, provided air support for the aerial survey portion of the study.

Data for this project were gathered using key respondent interviews, participant observation, aerial surveys, and a review of secondary sources. Each of these methodologies is described in greater detail below.

### **Key Respondent Interviews**

This study featured two major groups of key respondents: 1) hunters in boats, primarily from the community of Noatak and 2) pilots, primarily based in Kotzebue. Researchers developed separate interview guides to use with each of these key respondent groups (see Appendix A).

Researchers used two interview guides with Noatak hunters, one for 1987 hunts and one for hunts prior to 1987. Information was gathered on hunting areas, methods, camp locations, costs in dollars and time, harvest groups, hunter success, caribou movements, aircraft incidents, and changes in these over time. Researchers attempted to reconstruct Noatak's caribou harvest patterns for the past ten years as well as document the current year's harvest activities.

Active and retired caribou hunters comprised the key respondent sample in Noatak. These individuals were identified through the researchers' own knowledge and through consultation with the Noatak Traditional Council. Researchers tried to interview all 1987 Noatak hunting parties during or after their hunts, most of whom were identified during the field work portion of the study. Although residents of other communities (i.e., Kotzebue) have hunted upriver from Noatak village in the past, few did in 1987 and so researchers concentrated their interview efforts among Noatak hunters. A total of 21 households in Noatak were interviewed during the course of this study.

Researchers traveled to the community of Noatak on 20-21 August 1987 to explain their project, seek advice on river conditions, and begin interviews with key respondents. Four Noatak households were interviewed at this time and numerous other informal discussions were held with local residents. Researchers took a second trip to Noatak on 28-31 October 1987 to gather information to supplement field observations and to contact those households whom researchers did not have an opportunity to interview on the river. Eighteen households were visited on this trip. Information was gathered informally and with interview guides on this year's hunting and on caribou hunting practices in past decades.

Interviews with pilots were mostly conducted by telephone in Kotzebue, though some were interviewed in person. Most of these interviews occurred between September and November 1987. Kotzebue pilots represented a broad range of airplane uses with the most notable distinction between personal aviation and business aviation. Pilots engaged in business aviation included big game guides, air taxi operators, and government agencies. The personal aviation category included most other airplane owners in the region who used their airplanes primarily for personal transportation or recreation. Because each of these groups merited slightly different questionnaires, a separate interview guide was prepared for each one (see Appendix A). Non-local pilots

could not be sampled systematically, and so were not included as a key respondent group but were interviewed in the field as opportunity allowed.

Researchers obtained a list of Kotzebue-based airplanes from the local Federal Aviation Administration in August 1987. This list indicated that approximately 53 airplanes were owned by 48 Kotzebue residents or groups of residents. This did not include airplanes used primarily for business (government, air taxi, or guiding). Researchers used this list to compile the sample of Kotzebue pilots whose primary use of their planes was for personal aviation. The large number of local airplane owners precluded researchers from contacting all of them. Using their own knowledge and the advice of active pilots, researchers contacted 22 (46 percent) of these local airplane owners to ask them about their use of the Noatak River. Most pilots known to use the Noatak valley regularly in the fall were interviewed. Others were selected to represent a cross-section of pilots in terms of length of residency, frequency of flying, age, employment, and ethnicity. Information was gathered on the number, timing, and purpose of trips made to the Noatak valley, observed caribou movements, extent of non-local aircraft traffic, interactions with boats and other aircraft, and changes in use patterns over the past ten years.

Ten of the 11 commercial air taxi services in Kotzebue were contacted for the purposes of this study. These businesses varied in the services they offered. Three of them primarily provided scheduled intervillage flights with very few air charters. One provided both scheduled flights and air charters; another flew freight only. Six businesses flew only air charters; two of these operated only in summer and fall.

Five big game guides have guiding areas in the vicinity of the proposed controlled use area. These guides were identified through the researchers' own knowledge and confirmed through maps available to the public through the state's Occupational Licensing office in Anchorage. Two of these guides were interviewed.

Air taxi operators and guides were asked similar questions about their use patterns of the Noatak valley: the number, timing, purpose, and destination of their flights, the origin of their customers and clients, the extent of non-local airplane traffic, potential effects of a controlled use area on their business, and changes in their use patterns over time.

### **Participant Observation**

Two Division of Subsistence researchers traveled by boat on 28-29 August 1987 from Kotzebue to the confluence of the Kugururok and Noatak rivers (about 125 river miles) where they established a field camp. This site had been suggested as a camp by Noatak residents on a previous trip to the community.

Researchers returned to the Kugururok River on 2 September 1987 and remained in the field until 17 September 1987. Their efforts concentrated on the area from the Kelly to the Nimiuktuk rivers (about 92 river miles), though the entire study area was traveled at least twice. Most days were spent boating along the river, taking every practical opportunity to talk with people on the river about their activities and their use patterns of the Noatak valley. These included Noatak hunters in boats, non-local sport hunters, recreational "floaters," airplane users, agency personnel, and other river travelers. Some of these trips were for the day while others were for two to five days. Days of inclement weather were spent in camp where river travelers often stopped to visit.

During the field period, researchers interviewed a total of 19 parties on the river. Most of these parties were visited more than once. Nine of these groups were Noatak hunters, four were non-local sport hunters, and six were non-hunting recreational parties (fishing, kayaking, camping), of which two were traveling by airplane.

A National Park Service ranger stationed at the Kelly River participated in this project by keeping field notes on airplane and boat traffic he observed at that location and in his travels along the river. This information supplemented that collected by researchers.

#### **Aerial Surveys**

Three aerial surveys of the Noatak River were flown during the study period. These were conducted by the Division of Game in cooperation with other Department staff in Kotzebue. The first was flown 11 August 1987, prior to the date (August 15) proposed for the controlled use area to go into effect. Researchers wanted to observe whether there were differences in use patterns on the river before and after August 15. This survey covered the entire study area from the mouth of the Eli River to the mouth of the Nimiuktuk River. A second survey was flown 2 September 1987 from the mouth of Akikukchiak Creek to the mouth of Eli River, about 75 percent of the study area. The third survey took place 17 September 1987 and covered the entire Noatak River study area.

Aerial surveys were intended primarily as a tool to document airplane use of the river corridor which by its nature is highly mobile and difficult to track by boat. The research design originally proposed weekly aerial surveys; however, competing research demands, inconclusive results about the usefulness of the aerial surveys, and reluctance to significantly add to aircraft traffic in the area curtailed the actual number of aerial surveys made.

On the first two aerial surveys, researchers landed where practical to talk with river users. On the first survey, these included three parties of recreational "floaters," one guide, and one group of sheep hunters with an airplane. No landings were made on

the third flight. From the air, researchers mapped locations of boats (motorized and non-motorized), airplanes, airplane tracks, and recreational and hunting camps.

### **Secondary Sources**

Researchers reviewed National Park Service 1987 field notes from the Kelly River ranger station to get an indication of the extent and nature of aircraft and boat use there. Federal Aviation Administration staff in Kotzebue were contacted about their estimates and impressions of aircraft use of the Noatak River. Information on the Western Arctic caribou herd's migration patterns and population status was obtained from existing Game Division data.

Several useful literature sources are available on Noatak's fall caribou hunting practices in 1959-1961 as a result of the Project Chariot studies in northwest Alaska. These studies were summarized in several reports with Foote (1959, 1961) and Foote and Williamson (1966) the most relevant to this current project. Noatak's economy and subsistence patterns in 1954 were described briefly in a report by a U.S. Fish and Wildlife Service employee (Woolford 1954). More recent information on Noatak's subsistence patterns is available in Uhl and Uhl's *Nuatakmitt: A Study of Subsistence Use of Renewable Resources in the Noatak River Valley* (1979).

## CHAPTER 2: THE SETTING

The Noatak River is one of northwest Alaska's major watersheds. Its headwaters lie in the central Brooks Range near mountain divides that separate it from the Yukon drainage and from the North Slope. Flowing 425 miles to the west and then to the south, the river empties into Kotzebue Sound about eight miles north of Kotzebue.

The Noatak River has a reputation for being difficult to negotiate by boat, particularly in comparison to the nearby Kobuk River, another major river system of northwest Alaska immediately south of and roughly parallel to the Noatak (Fig. 1). Novice boatmen from Kotzebue rarely dare to venture beyond the lower stretches of the Noatak where mountains generally confine the river to one deep channel. Below and above the community of Noatak, the Noatak River is very braided and demands familiarity with the river or skill in reading water to travel successfully. The river becomes easier to travel between the Kelly and Nimiuktuk rivers, though shallow water and gravel bars are still prevalent. Water level significantly influences the ease of river travel and is the primary factor limiting the possible extent of upriver travel by motor boat in any given year. The Noatak's tributaries are shallow and rocky and cannot be traveled by skiff except for short distances during high water. Several of the larger tributaries, however, such as the Kelly, Kugururok, Nimiuktuk, and Cutler rivers, are suitable for rafts, kayaks, and other small craft.

The lower portions of the Noatak River are forested with intermittent stands of spruce and poplar, the most northwestern white spruce forests in North America (Uhl and Uhl 1979:1). This is in marked contrast to the nearby Kotzebue environs which is essentially treeless with tundra predominating. Timber along the Noatak becomes sparse a short distance above the Kugururok River with the final stand of spruce not far above the head of Noatak Canyon. Upriver from there, views from the river banks are

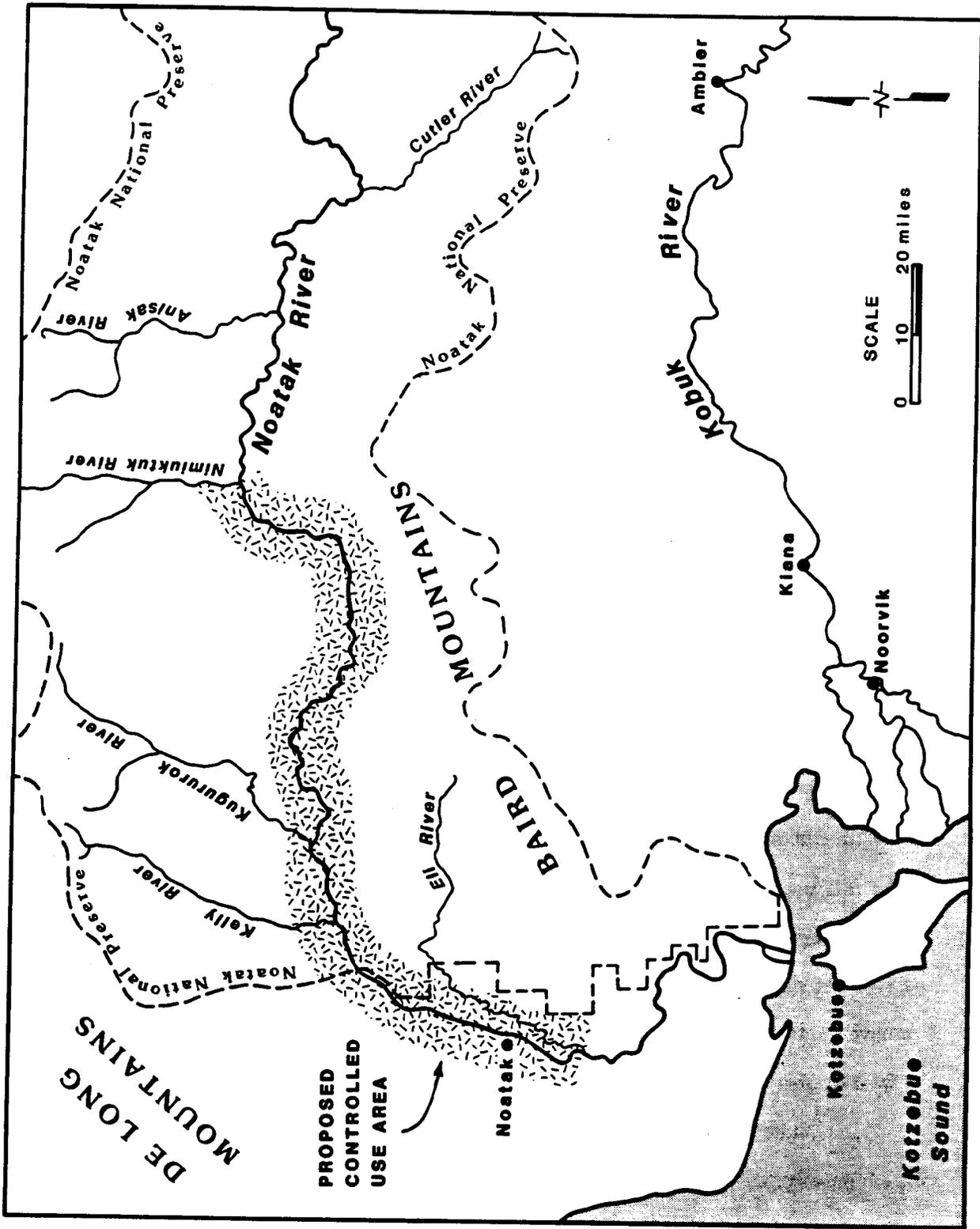


Figure 1. The Study Area.

unhindered by timber and, except for scattered patches of dense willows, the landscape is wide open.

The Western Arctic caribou herd passes through the Noatak valley on its seasonal north-south migration. Calving occurs in June along the headwaters of North Slope rivers such as the Colville, Ketik, Meade, and Utukok. After calving, the herd generally moves southwest, then eastward, into the high country of the DeLong Mountains. Many animals shift north to their summer range on the Arctic coastal plain. In fall, they move south through mountain passes and across the Noatak River to wintering areas in the Waring Mountains, Baird Mountains, and other areas to the south. Although caribou cross the Noatak River every fall, the exact route and timing of their migration varies from year to year and from decade to decade. Because of this, specific caribou crossing sites are not steadfastly predictable from year to year as most hunters, biologists, pilots, and others familiar with the area attest.

The Western Arctic herd was first censused by aircraft in 1950 with an estimated population of 238,000. In 1976 the herd reached a low of 75,000 (Davis et al. 1985). Since then the population has increased rapidly to its present size of 230,000 animals (Doug Larsen, pers.comm. 1987). Staff biologists consider the caribou population healthy in northwest Alaska and have few concerns about the existing hunting pressure on this population. As a result, caribou hunting regulations in Game Management Unit 23 are among the most liberal in the state with a year-round season and a bag limit of five per day for subsistence and resident hunters. (However, only five caribou per year may be transported south of the Yukon River.) Non-resident hunters have the same year-round season, but are limited to five caribou per regulatory year.

Although numerous studies have been done in Alaska and Canada on the effects of industrial development, aircraft, and vehicular traffic on caribou movements, a uniform conclusion has not been reached. Opinions of biologists and other observers diverge. One study (Calef et al. 1976) concluded that aircraft should operate at 500 feet

above ground level during the spring and fall migration to avoid injurious reactions by caribou, such as stampedes or collisions. To avoid the possibility of even mild responses, such as caribou moving away from the airplane, the study recommended that aircraft maintain an altitude of 1,000 feet above ground level. The same study also noted that caribou appeared to have increased sensitivity to aircraft during the rut, the calving period, and in early winter. Calef et al. observed that caribou at river crossings reacted more strongly to aircraft than traveling or feeding animals, and resting animals were least reactive.

This paper does not attempt to explore the impacts of motorized equipment on caribou. Researchers believe most people would agree that under some conditions both aircraft and boats disturb caribou. However, Noatak residents did not report boat traffic along the Noatak River to be heavy enough to disrupt their fall hunts, and so is not an issue here.

Much of the study area is within the Noatak National Preserve (Fig. 1) established by Congress in the Alaska National Interest Lands Conservation Act of 1980. This preserve is administered by the National Park Service (NPS). The duties of this agency include research, management, enforcement, and public information and safety. Within the study area, the NPS maintains a ranger station from June to October at the mouth of the Kelly River to which one ranger was assigned during the 1987 season.

The Noatak River is legendary to wilderness and recreational enthusiasts nationwide as an archetype of a free-flowing arctic river in a pristine and scenic landscape. During the summer, dozens of non-hunting recreational parties in rafts, kayaks, or canoes float the river or portions of it. Some of these are organized groups led by commercial recreational outfitters while others are independent parties. Most begin in the headwaters of the Noatak, reached by chartered plane from Bettles or Kotzebue, and end in Noatak, Kotzebue, or at other points along the river.

Currently there are few regulations affecting aircraft use in the Noatak valley. Air taxis, guides, and other commercial enterprises operating within the park system are required to obtain a business license from the National Park Service and report annually on their activities. To date, the NPS has not limited business activity in the Noatak National Preserve and has given a business license to all who requested one (Gil Hall, pers.comm. 1988). The NPS does not have other restrictions on airplane use in the Noatak National Preserve, though the agency recommends that aircraft maintain an altitude of 2,000 feet above ground level when flying over park units.

The Federal Aviation Administration, the primary agency regulating air space, has no specific heights airplanes must maintain over sparsely populated areas except that they may not operate closer than 500 feet to any person, vessel, vehicle, or structure. The FAA publishes a brochure entitled *How You Can Help FAA Identify Unauthorized Low-Flying Aircraft* which states that it is FAA policy to investigate citizen complaints of low-flying aircraft operated in violation of regulations.

The only community located along the Noatak River in contemporary times is Noatak (pop. 329), about 75 river miles from the mouth or about four or five hours by boat from Kotzebue (Alaska Department of Labor 1987:65). A number of permanent camps are located along the river below Noatak, particularly near the river mouth, many of which belong to Kotzebue residents. There are far fewer permanent camps upriver from the community.

The present community of Noatak was established in 1908 when Friend's missionaries built a church and school there. Before that, the people of the Noatak valley lived in small family groups in scattered temporary camps (Uhl and Uhl 1979:1). According to Burch (1980:290,294), two Eskimo societies occupied the Noatak valley in the early nineteenth century: the *Napaqturmiut* of the lower Noatak River and the *Nuatarmiut* of the upper Noatak River (from Noatak Canyon to the Aniuk River).

Members of both these groups eventually settled in Noatak when it was established. Today Noatak's population is 95 percent Native (Alaska Department of Labor 1985:80).

Noatak's contemporary economy is a mix of subsistence harvest of fish and game and cash-producing activities. According to the NANA Region Coastal Management Plan (1985:109), subsistence harvest of wild foods is the most important aspect of Noatak's economy. Limited job opportunities for cash are available in Noatak with the local, state, and federal governments (e.g., the school district, health clinic, post office, village public safety officer program, and National Guard) as well as with the store, power plant, traditional council, intervillage airlines, and seasonal construction projects in the community. Some Noatak residents work seasonally for the regional Native corporation's business enterprises in the North Slope oil fields. In the past two years, a few Noatak residents have been seasonally employed during the construction phase of Red Dog mine, a new development project north of Noatak.

A commercial salmon fishery in Kotzebue Sound provides a cash source for several Noatak families. This commercial fishery, initiated in 1962, is directed at chum salmon, though small numbers of other salmon and char are also caught. Fishermen operate set gill nets from open skiffs powered by outboard motors. According to Commercial Fisheries Entry Commission records, nine Noatak residents held limited entry permits for this fishery in 1987. Harvests in this fishery have ranged from 141,000 in 1979 to 677,000 in 1981.

In 1982, the average taxable income per tax return in Noatak was \$10,920, compared to \$18,586 in Kotzebue and \$21,624 in Alaska as a whole (Alaska Department of Revenue 1985). Commercial fishermen that year earned a gross average income of \$9,950. Because of fluctuations in harvests and prices, commercial fishermen's gross average income in 1986 was slightly less than \$5,000 (Alaska Department of Fish and Game 1987). The 1987 season was worse, with average gross incomes of about \$3,000 per fisherman. The cost of living in Noatak is extremely high with prices there

significantly higher than in Kotzebue. Food prices in Kotzebue are about 200 percent that of Anchorage prices (Alaska Department of Fish and Game 1986:488).

The people of the Noatak valley have a long history of hunting caribou in fall. According to Burch (1980:290,294), the *Napaqturmiut* of the lower Noatak River traveled upriver in fall to hunt caribou in the DeLong Mountains. The *Nuatarmiut* of the upper Noatak River hunted caribou in their territory for much of the year. During most of this century, caribou could be found in the upper Noatak valley when they were not available anywhere else in northwest Alaska, and people traveled there from the Kobuk River and beyond to hunt when caribou were not available closer to their homes (Uhl and Uhl 1979:18).

Foote (1959, 1961) documented caribou hunting practices by Noatak residents almost 30 years ago. He wrote (1961:95): "Life would not now be possible in Noatak without this (meat) source [caribou]." Foote reported that river-based caribou hunting usually began in mid-August and continued until freeze-up if caribou remained close to the river. In 1960 the last river-based caribou hunt took place in the last week of September. Foote (1961:95) observed:

Until early September, hunters can afford to travel long distances and to stay away from the village for more than a week, since there is no danger of a quick freeze-up and since fall seining has not reached its peak. Such trips may extend more than 150 miles up the river; this hunt can take Noatak men farther from the village than winter hunts by dog team. In 1960, the Noatak people hunted caribou as far up river as Ningnuktok [Nimiuktuk]. At that time, Noatak hunters killed 111 caribou and two brown bear. Later, between September 30th and October 5th, 1960, the caribou again crossed the Noatak River, in the vicinity of Aakallukseeyueech [20 miles upriver from the village]. Eleven hunting parties killed 75 caribou on this hunt.

In the previous fall, Foote (1959:32) reported 22 Noatak men hunted to the Kelly River or farther, some traveling as far as 130 miles up the Noatak River, or as far as the Nimiuktuk River.

In the late 1950s and early 1960s, Noatak hunters waited until caribou were crossing or near the Noatak River before setting out toward them. Pilots in the region

reported movements of the caribou herd to the hunters. Although caribou taken on fall hunts supplied a needed addition to the diet until winter hunting commenced, the meat was secondary in importance to the fish harvest, and caribou hunting was not undertaken at a sacrifice to fishing (Foote 1961:94-95).

In 1979 Uhl and Uhl reported that caribou continued to be the main source of red meat for Noatak residents. Successful fall caribou hunting frequently required that Noatak hunters travel to the more open area between the Kelly and Nimiuktuk rivers. With many caribou crossings in this area, hunting opportunities were better than in the heavily timbered sections of the lower river (Uhl and Uhl 1979:28).

In summary, fall caribou hunting is a well-established tradition of Noatak people, stretching back to at least the early nineteenth century and continuing to the present. In recent years, caribou have become plentiful in the Noatak basin and significant land status changes have occurred, particularly the establishment of the Noatak National Preserve and other park units in the region. With its abundant wildlife and scenic landscape, the Noatak River has increasingly attracted visitors who hunt, fish, camp, or float along the river, most of whom reach the area by airplane.

## CHAPTER 3: FINDINGS

The results of the 1987 field research are presented in this chapter. Noatak hunting patterns are discussed first with sections describing seasons, hunting areas and methods, participation rates and work groups, equipment and costs, hunting success, and interactions with aircraft. Following these is a discussion of airplane use patterns on the Noatak River with descriptions of the patterns of various user groups.

### NOATAK HUNTING PATTERNS

Caribou hunting practices observed during the 1987 field season were largely similar to those described by Foote almost 30 years earlier. Most sufficiently equipped Noatak households still traveled upriver in August or September to hunt caribou. In 1987, 19 Noatak boats representing 27 households participated in this upriver hunt. All of these boats made at least one trip to the area between the Kelly and Nimiuktuk rivers. Three Kotzebue parties also hunted caribou upriver from Noatak in 1987, two of whom were formerly Noatak residents. In recent years, Kotzebue residents hunting caribou by boat have typically used the Kobuk or lower Noatak rivers, and less frequently traveled the portions of the Noatak River above the community of Noatak.

Caribou have been a dietary staple of Noatak residents for generations. The fall caribou hunt provides Noatak residents with a substantial portion of their fall food store and with their first fresh caribou since the previous spring. Although caribou have wintered in recent years in the Noatak vicinity, this has not always been the case and Noatak hunters feel they cannot count on caribou being within easy reach in winter. In contrast, Noatak hunters are confident that at some point and time caribou will cross the Noatak River during the herd's southern migration. Hunting by boat in fall is thus more dependable, though perhaps no more efficient, than snowmachine hunting in winter.

Many Noatak residents have made annual hunting trips upriver since they were children and have deep attachments to these upriver areas. Those interviewed in the field often voiced delight and satisfaction at being on the river again. One young man said, "I just had to get out of town," and appeared in no hurry to return despite having killed several caribou. Two women who were camped with their families on a river bar said they were enjoying camp so much they were not eager to go home. Others talked often of the beauty of the upriver country. Although obtaining meat is of foremost concern, fall caribou hunting is meaningful to Noatak residents for other reasons as well.

Noatak residents are thoroughly familiar with the river. During the course of this study, researchers repeatedly heard history, geography, natural history, and stories associated with the river basin: events that led to place names, changes in river channels, locations of ancient camps, travel routes, areas of mineralization, and behavior of wolves, sheep, and other animals. From that perspective, the study area is clearly Noatak's "backyard." More specific details on Noatak's fall caribou hunting are presented below.

### **Seasons**

Noatak residents typically start traveling by boat upriver to hunt caribou in mid- to late August. As summer draws to a close in the second half of August, Noatak hunters begin watching for evidence of the start of the caribou migration. They take day or weekend trips as far as the Kelly River vicinity to pick berries and look for caribou. They ask recreational rafters and canoeists who stop in the village whether they saw caribou upriver. Most of these late summer trips are made by families who remain in Noatak all summer. Other Noatak households spend the summer commercial fishing in Kotzebue Sound and do not usually return to the village until September. Depending on weather and caribou movements, the first Noatak hunters travel beyond the Kelly River for

extended hunting trips (three days to two weeks) in very late August or early September. As news of their success reaches the village, other hunting parties head upriver.

In 1987, the most intensive caribou hunting activity by Noatak residents occurred in early to mid-September. Several factors account for the timing of the caribou hunt. First, the advent of colder temperatures and snow in the mountains is believed to induce the caribou herd's southern migration toward the Noatak River. Second, cool temperatures are needed to preserve harvested meat both at camp and in the village. If the weather were still warm, a hunter would have to return immediately to the village after catching caribou in order to prevent the meat from spoiling. This is not possible given the distance Noatak hunters travel and the associated costs. In addition, Noatak residents said their freezers are filled with fish in the fall, necessitating the preservation of caribou meat in cool outdoor air.

Other constraints also determine the timing of Noatak's caribou hunt. Berry picking and salmon fishing are the primary harvest activities in August, and caribou hunting is not undertaken at the expense of these. Many Noatak households also relocate seasonally to the Kotzebue Sound area in spring and summer to hunt marine mammals, fish commercially, or seek other wage employment. These households do not usually return to Noatak until early September, after which time they hunt caribou.

During the 1987 fall hunting season, researchers made the following estimates on the number of local boats hunting caribou upriver from Noatak during each week between mid-August and mid-September:

**TABLE 1: NOATAK RIVER BOAT TRAFFIC BY WEEK**

Week	No. of Boats
August 15-22	1
August 23-29	1
August 30-September 5	8
September 6-12	16
September 13-20	11

The most intensive hunting period in 1987 was 3-16 September, when 18 local boats were on the river. Many Noatak households said they seldom hunt upriver until Labor Day or later, and thus the 1987 pattern was typical. River ice and low water levels which accompany freeze-up mark the end of the river-based hunting season.

In 1987 most Noatak boats headed back downriver to the village between 14-18 September because of what appeared to be an early freeze-up. Ice began running in the upper river 17 September. During the previous few days, snow fell and the water level rapidly dropped due to freezing temperatures. In late September, however, the weather warmed again and at least three Noatak boats traveled upriver to hunt. Freeze-up did not finally occur until the second half of October.

In field interviews, Noatak residents said that during their lifetimes they have always hunted caribou in September and that the timing of this has not changed in recent years. Field observations in 1987 on the timing of the caribou hunt are thus most likely typical of contemporary Noatak caribou hunting practices.

#### **Use Areas**

With their many years of hunting experience, Noatak residents are thoroughly familiar with caribou crossing areas on the Noatak River. One Noatak hunter identified on a map 17 specific caribou crossing areas between Noatak and the Nimiuktuk River, as well as several others farther upriver. These sites were scattered fairly evenly along the river. Because of variations in caribou migration routes, Noatak hunters are not certain from year to year which crossings the caribou will use.

In 1987 the most intensive caribou hunting activity occurred between the head of Noatak Canyon (known locally as simply "the canyons") and Nakolik River, a distance of 32 river miles. This section of river is located in the upper half of the proposed controlled use area. Of the 19 Noatak boats that hunted caribou upriver in 1987, 17

hunted in this area and all but one of those camped in this area. At least one Kotzebue boat also hunted and camped in this area.

Noatak hunters consider this area between the canyons and Nakolik River good for hunting for several reasons. Foremost, of course, is that caribou usually cross the river in this area. In addition, the area is above tree line and offers unobstructed views of the tundra which allow hunters to watch for approaching caribou. And lastly, this stretch of river is not braided and is thus comparatively easy to boat up and down for the day in search of caribou. There are other areas with similar features also good for caribou hunting, but these are farther upriver and take more time and gasoline to reach. Noatak hunters do not usually travel farther than necessary to reach caribou.

Within this area between the canyons and Nakolik River, Noatak hunters know specific points where caribou are likely to cross and specific sites that are good for camping. A good camp site is generally one located near a caribou crossing point and with unobstructed views of the surrounding landscape so caribou can be spotted as they approach the river. The best camp sites are occupied repeatedly during a season as hunting parties arrive and depart. In 1987 researchers documented 12 different camp sites of Noatak hunters, nine of which were located between the canyons and Nakolik River (Fig. 2). In other years, hunters might use different camp sites depending on the route of the caribou migration. Noatak hunters most commonly set up temporary camps while caribou hunting in the fall, though at times they use permanent camps located in the Kelly and Nimiuktuk River areas.

In field interviews, Noatak residents said the area between the canyons and Nakolik River has generally been dependable for caribou hunting for at least the past several decades. However, fall caribou hunting by Noatak residents is not limited to this area. Areas both below the canyons and above Nakolik River are also used.

The lower stretch of the proposed controlled use area between Noatak village and the canyons is used in late summer and fall for caribou hunting as well as for a variety

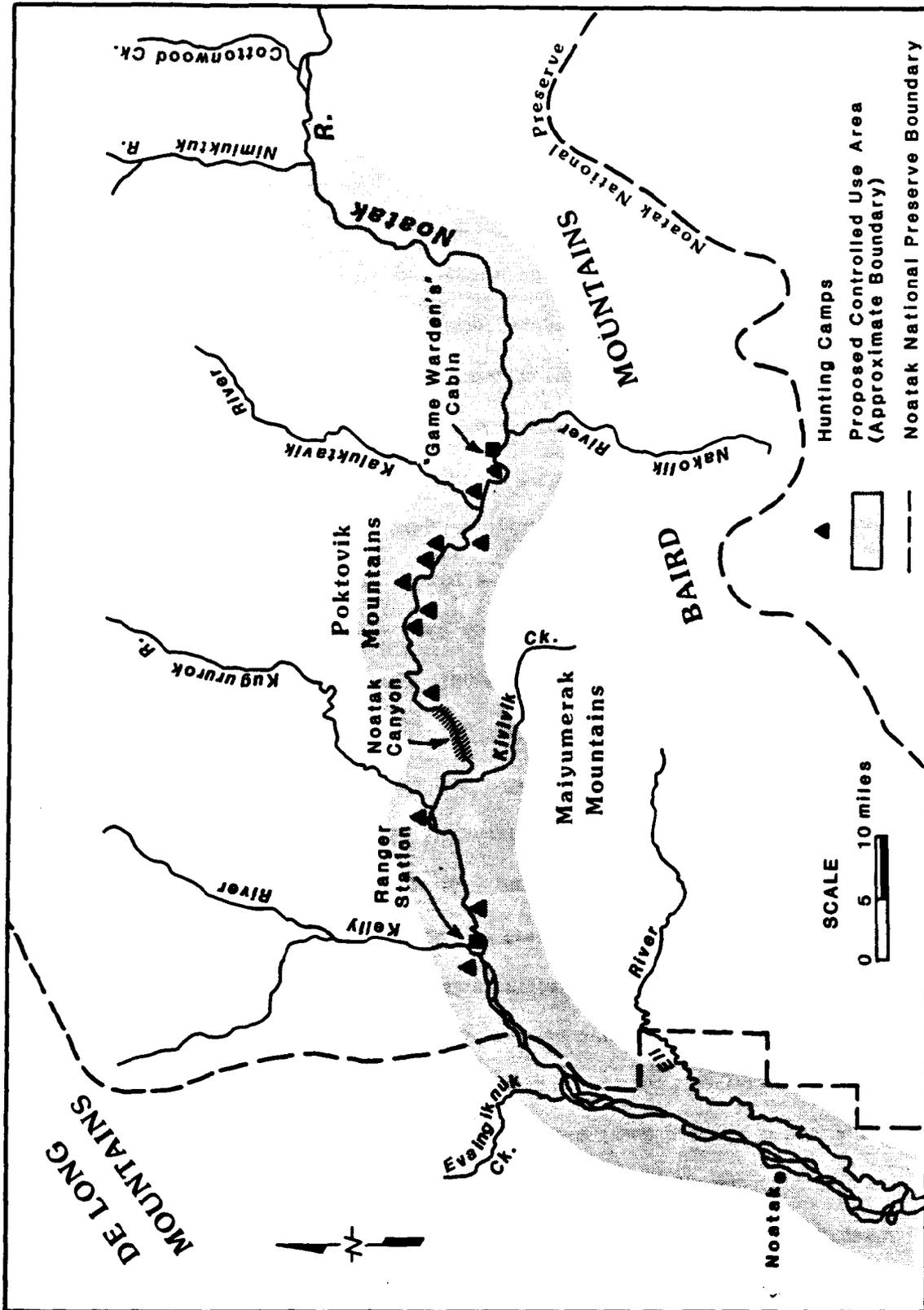


Figure 2. Fall Hunting Camps of Noatak Residents, 1987.

of other harvest activities including fishing, berry picking, and wood cutting. Caribou hunting in this area is sometimes undertaken in conjunction with these other harvest activities. Because it is relatively close to the village, Noatak residents commonly take day trips to this area though some occasionally camp in the Kelly River area. Most of this portion of the river is timbered, and so does not provide the open views available farther upriver. In 1987, when the weather warmed again after a mid-September cold snap, caribou crossed in large numbers near Evaingiknuk Creek, about 20-25 river miles above the village. Several Noatak boats took day trips to hunt caribou there. According to Noatak hunters, caribou frequently cross the river in that area just before freeze-up.

Noatak residents said they do not usually hunt caribou in fall downriver from the village except incidentally as they travel to Kotzebue by boat. One Noatak resident said it is better to travel downriver with a heavy load of meat than upriver against the current, especially if one's gasoline supply is low. In addition, Noatak residents consider the Eli River area downriver from the village to be primarily the hunting territory of Kotzebue residents, some of whom have camps in the area.

The farthest upriver portions of the proposed controlled use area are also used for caribou hunting. Although younger hunters tend not to travel much beyond Nakolik River, older Noatak residents regularly travel as far as the Nimiuktuk River to hunt caribou. Good caribou crossing areas are located both below and above the Nimiuktuk River, and in most years at least some hunters travel this far.

In general, most Noatak hunters seldom travel much beyond the Nimiuktuk River to hunt caribou. A stretch of rapids above the Nimiuktuk discourages the more inexperienced boatmen and the cost of gasoline to travel this far is prohibitive to many households. Notwithstanding, most middle-aged or older Noatak men have at some time traveled by boat as far as the Anisak or Cutler rivers. High water is needed to travel this far in outboard-powered skiffs. One Noatak man reported once traveling as far as 50 miles above the Cutler River by boat; another traveled past the Anisak River to Okak

Bend when caribou were not available nearer. A Noatak elder said that in times of scarce caribou earlier generations traveled by boat as far as Midas Creek in the headwaters of the Noatak to hunt caribou.

Some of these trips to the Anisak and Cutler River areas were within the past ten years, partly a consequence of profitable commercial fishing seasons that provided Noatak residents with the cash necessary to purchase gas for the trip. Other trips taken into these upriver areas occurred many years ago during older men's youth. Some Noatak residents are quite knowledgeable about the Anisak and Cutler River areas, having camped and traveled there during their lives. If caribou again become scarce in the lower stretches of river, it is likely that Noatak hunters will again travel beyond the Nimiuktuk River to hunt.

Areas used by Noatak residents for caribou hunting in fall 1987 were remarkably similar to those described by Foote in 1960. In 1960, Noatak residents hunted caribou as far upriver as Nimiuktuk in early September, and then again in early October about 20 miles upriver from the village (Foote and Williamson 1966:1090). In 1987, Noatak residents hunted in virtually the same areas during the same time periods.

#### **Participation Rates and Harvest Groups**

In 1987, 19 Noatak boats representing 27 of the community's households traveled upriver to hunt caribou in fall. With an estimated 65 households in Noatak (Jason Jessup, pers.comm. 1987), this indicates that a substantial portion (41 percent) of the community's households participated in the 1987 fall hunt. Most of these 27 households hunt upriver every year, though there is variation from year to year. For instance, extremely high water in 1986 prevented some households from hunting that season. In 1987 employment opportunities at Red Dog mine and on the North Slope precluded a few individuals from hunting. This employment was particularly welcomed given the

poor commercial fishing season, but the remoteness of the job site required workers to be away from home for weeks at a time. On the other hand, at least one Noatak man had recently quit a job and so was able to hunt upriver for an extended period for the first time in five years.

Few Kotzebue boats were observed on the Noatak River above the community of Noatak during the 1987 field season. Researchers knew of three households from Kotzebue who hunted upriver from Noatak village in their own boats in 1987. Two of these households were former Noatak residents. Kotzebue residents occasionally accompany Noatak hunting parties, but in 1987 probably fewer than three or four did so.

Although Kotzebue residents hunt extensively in the lower stretches of the Noatak River, the upper river is difficult to negotiate by boat particularly in comparison to the Kobuk River, another major river system immediately south of the Noatak. With its shallow water, braided channels, and abundant gravel bars, the Noatak River takes its toll on boats and outboard motors. This is particularly true for those not familiar with the river and its annual shift in course. Because of the rough waters of Kotzebue Sound and their participation in the local commercial fishery there, many Kotzebue residents use 20-22 foot boats with outboard motors ranging from 85 to 175 horsepower. The Noatak River is less suitable for these boats than the Kobuk River where they can travel fast in the deep channels and are less likely to suffer expensive damage to propellers and lower units. More than one Kotzebue resident remarked that prime caribou hunting areas can be reached in one day of travel along the Kobuk River while two days were needed to reach a similar area on the Noatak River, even though the actual distance in miles was fairly similar.

Other Kotzebue residents who used to hunt on the Noatak River a decade ago said they started to use the Kobuk River for fall caribou hunting because of the growing aircraft traffic on the Noatak. Not only does the Kobuk River have fewer gravel bars

for landing aircraft, but a frequently hunted portion of it was designated a national park in 1980 and is now closed to aircraft-supported hunting.

The composition of Noatak's harvest groups for fall caribou hunting appeared to vary widely with little structure. One Noatak man said that in the past women did not participate in this hunt though this is no longer the case today. Members of two or more households sometimes travel and hunt together in one boat in order to share costs.

The following is a sampling of harvest groups in the 1987 season:

- \* two male cousins (age 20s);
- \* husband and wife (age 40s);
- \* husband and wife (age 60s) with adult son and adult nephew;
- \* two male friends with the non-local father and brother-in-law of one of them;
- \* a husband and wife (age 40s), their teenage son, and a husband and wife (age 60s);
- \* a father (age 30s), his school-age son, and the 11-year-old son of a friend;
- \* three men (age 20s and 30s) and a school-age boy;
- \* a husband and wife (age 50s), their adult son, their adult nephew, and the husband's sister-in-law; and
- \* a man alone (age 30s).

Most harvest groups in 1987 were composed of adults of mixed ages, though a few school-age boys also participated. Very young children generally did not accompany their families on these hunting trips. Women varied in their interest in traveling upriver in fall. While some said they would not miss it for anything, others preferred to stay in the village. Several women said they have rarely gone upriver because they usually have young children at home to care for.

## **Hunting Methods**

Because of the time and costs involved, Noatak boats generally take only one fall trip beyond Noatak Canyon to hunt caribou. If caribou are available in areas below the canyons, such as the Kelly River, hunters may take more frequent trips. These upriver trips are an annual event for Noatak hunters. In field interviews, most Noatak hunters said they first hunted upriver when they were young boys.

In 1987 the length of upriver hunting trips ranged from three to nine days with the average about five days. The length of the trip was determined by a number of factors including hunter success, weather, supplies of gasoline, and constraints of wage employment.

Noatak hunters typically travel from the village to hunting areas in one day. In 1987 most Noatak hunting parties traveled in one boat, though at times two or more boats traveled together. Much of the 1987 hunting took place in the Poktovik area, about five or six hours by boat from Noatak. Because most Noatak residents avoid traveling in the dark when shallow water is difficult to see, hunting parties who get a late start or are delayed en route will often camp along the way to their destination. Unwritten local river etiquette prescribes boat operators to reduce speed or drift when encountering another drifting boat or one obviously in the process of hunting so as to avoid disrupting another party's hunt.

Noatak hunters choose their hunting area and camp site based on their own knowledge of the landscape and of caribou crossing locations and on the success of other hunting parties that season. Hunters know specific sites along the river well-situated for camping and hunting. They said they often have a particular destination in mind when they head upriver to hunt. If that site is already occupied by other Noatak hunters or non-local parties, Noatak residents usually move on to another spot. In this way, non-

local hunters or recreational boaters can inadvertently disrupt Noatak community's hunting practices by camping in prime hunting locations.

Noatak residents use an efficient strategy for hunting caribou. While in camp, they constantly scan the tundra for caribou approaching the river. During the days, Noatak hunters often travel by boat up or down the river, watching for caribou. If they see some, Noatak hunters wait in their boats at a point where the caribou are likely to cross the river. As the caribou reach the river, hunters shoot them on the bank or beach where they can easily be butchered and loaded into a boat. If the caribou are scared away, Noatak hunters move on, believing that caribou will not come down to the river soon after they are spooked. Noatak hunters try to shoot bulls only during the fall hunt because these are fat and considered tasty. Later in the year, the meat of bulls is of poor quality, and hunters will then take cows.

Occasionally Noatak hunters unexpectedly come upon caribou crossing the river as they round a bend in their boats. A number of caribou are taken this way. Noatak hunters occasionally shoot caribou in the water, though more commonly they are shot on a gravel bar or bank. Hunters prefer not to shoot caribou away from the river because it is difficult to pack the meat back to the boat across tundra tussocks. Because Noatak hunters often shoot several caribou at a time, packing meat can be a particularly laborious and time-consuming task. However, Noatak residents said they are skilled in hunting caribou in the tundra and will shoot them away from the river if they feel that is their only opportunity for taking caribou.

Although a few Noatak hunters said they occasionally hunt moose while upriver, most said they prefer not to take moose during the fall caribou hunt. These hunters reported there are plenty of opportunities for taking moose close to the village, and thus no reason to fill the limited space in their boats with moose while upriver. Noatak residents occasionally fish for char and grayling while upriver, usually harvesting enough for a meal or two.

In summary, caribou are the focus of Noatak's fall upriver hunting trips, the average length of which was five days in 1987. Noatak's hunting strategy relies on hunters' knowledge of the landscape and caribou behavior. Hunters select camp sites and hunting areas based on this knowledge and watch for caribou approaching the river. Because it is less efficient in terms of labor and time to hunt caribou away from the river, Noatak hunters wait in their boats or camps for caribou to reach the river before shooting them.

### **Equipment and Costs**

Noatak residents use open skiffs of aluminum or wood to travel the Noatak River. These boats can generally be divided into two groups based on size. The first are 20-22 foot boats commonly used by Noatak residents who commercially fish in summer in Kotzebue Sound. These boats are suitable for rough ocean travel as well as river travel and typically have outboard motors ranging from 85 to 175 in horsepower. They can travel quickly and carry heavy loads, the latter of which is a particular advantage while caribou hunting. However, these boats consume much gas and have difficulty in shallow water. In addition, repairs to the lower unit and propeller are expensive. One Noatak hunter reported spending almost \$400 for a new stainless steel propeller for his boat. Another broke a lower unit with a repair cost of almost \$2,000. The river course changes frequently and damage to motors from rocks or shallow water is common and assumed to be an expense of the hunting trip.

The second group of boats used on the Noatak River are smaller (14-18 feet) and are primarily used locally on the river and for occasional trips to Kotzebue. These boats typically have smaller outboard motors, ranging from 35 to 70 in horsepower. Although they travel slower and carry less, these boats are less expensive to operate and repair. A new stainless steel propeller for a 35 horsepower motor, for instance, costs about \$250.

These smaller boats are capable of traveling through shallower water than the larger boats. This advantage was evident in 1987 when large numbers of caribou crossed in late fall about 20 miles above Noatak. The water level was low at that time, and the larger boats were not able to travel the river to reach the caribou.

Gasoline is a significant expense of fall hunting trips. In 1987 Noatak hunters reported using 18-30 gallons of gas to travel one-way from the village to the hunting area at Poktovik. Noatak hunters typically carry one or two 55-gallon drums of gas with them. They estimate that two drums are needed to travel from Noatak to the Nimiuktuk River and back. Hunters do not necessarily use all the gas they bring, but they are not certain how far they might have to travel to find caribou and are careful to have an adequate gas supply. Some hunters said they normally use 35-40 gallons during their fall upriver trips, while another said he usually brings 150 gallons with him. As it is, many hunters drift part of the way back downriver in order to save fuel. Others have had to drift all the way back to the village after running low on gas.

In Noatak a 55-gallon drum of gasoline cost \$156 in 1987. In Kotzebue a drum of gas sold for \$81. If a Noatak hunter purchased all his gas in Noatak, the cost of gas alone could range from \$100 to \$470. Some hunters were able to purchase gas in Kotzebue, significantly reducing this cost. Noatak residents widely agreed that four drums of gas were required for boats from Kotzebue to hunt to the Nimiuktuk River and back. If a Kotzebue hunter purchased all his gas in Kotzebue, this would cost about \$325.

When asked about changes in their fall caribou hunting practices, several Noatak residents cited larger outboard motors as the most significant change. Noatak hunters said they have always used the same areas for caribou hunting but now they can reach them more quickly. One Noatak elder, for instance, towed a boat with dogs from Noatak to Nakolik River in his younger days. He said it took six or seven days. With the outboard motors now available, that trip takes one day. Another Noatak resident

said that eight to ten hours were needed to reach the Kelly River in the early 1950s with the first small outboard motors. Hunters camped there, then traveled another eight to ten hours to reach caribou hunting areas.

For Noatak residents, a fall hunting trip upriver requires a significant investment of cash for gasoline and propellers particularly in years when commercial fishing is poor and other summer job opportunities are few. In addition there is a risk of expensive damage to outboard motors. Members of two or more households sometimes travel and hunt together in one boat in order to share these costs. Cash is limited in Noatak, and residents there feel they cannot afford to take upriver hunting trips and return without caribou.

#### **Hunter Success**

In 1987 virtually all Noatak hunting parties who traveled above Noatak Canyon in fall were successful in harvesting caribou. One hunter traveled for the day from a camp near Kelly River to the Kaluktavik River without finding caribou, but this hunter later caught some not far above the village. Another hunter took several trips for the day from Noatak to the Kelly and Kugururok areas without finding caribou, but said he did not hunt in earnest because his household still had meat remaining from the previous spring.

The number of caribou taken by individual Noatak hunters depended on how many they needed, how many fit in their boat, and how much time they had to hunt. This latter factor was influenced by weather, water level, and time constraints of wage employment or school in cases where children accompanied the hunting party.

Researchers counted a minimum of 112 caribou taken by Noatak boats in September and October 1987. The number taken per hunting party ranged from 2 to 19 with an average of slightly more than seven. These figures are based on field interviews

with hunters from 15 of the 19 Noatak boats that hunted upriver in 1987. It is not known how many caribou the other four boats caught, though two at least were known to be successful in caribou hunting.

In 1960, Foote reported that Noatak people killed 111 caribou on their September hunt upriver as far as Nimiuktuk and another 75 caribou in early October when they crossed about 20 miles above the village. The estimated 1987 harvest was similar to the September portion of the 1960 harvest and about 60 percent of the total 1960 fall caribou harvest. The lower harvest in 1987 compared with 1960 is likely related to the decline in dogteams in Noatak during that time period.

Noatak residents said that caribou hunting was particularly good during fall 1987. Most hunters were able to harvest caribou without great expenditures of time and money. Some Noatak residents said this was in contrast to previous years when considerable time and effort were required to harvest caribou as a result of heavy airplane traffic. In 1986, caribou hunting was disrupted by a fall flood. Compared to these years, one Noatak resident said 1987 appeared to be a bountiful season.

#### **Interactions With Aircraft**

In interviews, Noatak residents said they were concerned with the amount of aircraft traffic they have encountered in recent years on their fall hunting trips on the Noatak River. According to Noatak residents, some of these planes fly low over the river or circle low over caribou on the adjacent hills or tundra. Noatak hunters reported observing airplanes herding caribou towards gravel bars where planes can land or where non-local hunters are camped. Because Noatak hunters wait along the river for caribou to cross, low-flying planes in the vicinity can reportedly disrupt their hunt by frightening caribou away from the river crossing. Noatak residents said they are not certain who is responsible for low-flying airplanes. Some believe these low-flying

planes are from Anchorage, Fairbanks, Palmer, the Kenai Peninsula, or similar areas. Others say that big game guide camps are significant contributors to low-flying airplane traffic.

Noatak hunters widely remarked that low-flying aircraft were not much of a problem during fall 1987. Some credited this to the presence of ADF&G researchers on the river and to the publicity the research project received in Kotzebue. There was, however, one reported incident this fall in which a Noatak hunter and his wife were waiting for a group of caribou to move down to the river when a small airplane approached and circled low over the animals. The caribou did not cross and the hunter was angry. The next day he moved his camp farther downriver. This incident was also observed by a National Park Service ranger camped nearby. Another hunter this year said he saw a plane belonging to an air taxi operator fly low over the river. Except for these cases, Noatak hunters reported little conflict with airplanes during the 1987 hunting season.

Nearly all Noatak hunters interviewed by researchers reported having had more than one experience in recent years with airplanes disrupting their caribou hunting. One woman said that three years ago her family hunted for two weeks and returned without caribou as a result of extensive airplane activity. Other hunters said they have also returned from caribou hunting empty-handed because of airplane traffic. One hunter reported that four or five years ago a group of Kenai Peninsula hunters camped with airplanes above the Kelly River and created a great deal of air traffic in that area. Several hunters told researchers that in some years they have seen low-flying airplanes every day along the river in fall. Many households have moved their camps after airplanes flew low over or landed near them. Noatak hunters generally believe that caribou will not come down to the river soon after they are frightened by an airplane. One man commented that even though caribou are more abundant now than ten years

ago, they are more difficult to hunt because of airplane traffic. Some hunters said they have become so frustrated they were tempted to shoot at offending airplanes.

Noatak hunters report that airplanes first became a problem for them in the 1970s though the problem has become worse in the past five years. In their 1979 report on subsistence use in the Noatak National Preserve, Uhl and Uhl cite the conflict between boat hunters and airplane hunters as a current and growing problem on the Noatak River. Noatak hunters are careful to explain that airplanes generally do not bother them at other times of year, nor is the presence of non-local hunters on the river of particular concern. Most Noatak residents said they do not mind non-local hunters, at least at the current level of use, except in cases where these hunters do not retrieve all the meat from their harvests.

The frequency of airplane disturbances on Noatak caribou hunts in past years has not been quantified. Because 1987 had few airplane disturbances, researchers did not observe first-hand the types of airplane incidents described by Noatak hunters. However, 1987 might not have been representative of airplane traffic along the Noatak River in recent years. The presence of ADF&G researchers on the river might have discouraged inappropriate airplane activity while the recent downturn in the state economy might have reduced the number of non-local Alaska pilots visiting the area.

In summary, fall caribou hunting on the Noatak River is a well-established tradition of Noatak residents. The hunt requires an investment of cash for equipment and gas as well as several days of time. Fall is the time of year when bulls are choice and fat. Noatak hunters want to get the caribou they need without unnecessary expenditures of time and money. Noatak hunters said airplanes at times interfere with this.

## AIRPLANE USE PATTERNS

With its abundant gravel bars, plentiful wildlife, scenic beauty, and relative remoteness, the Noatak River is an attractive destination for Alaska residents and visitors with access to a small plane. One pilot called the Noatak River "one giant airstrip" in reference to its seemingly endless string of smooth gravel bars suitable for landing aircraft. Researchers found that two types of airplane uses characterized the pattern on the Noatak River: personal aviation and business aviation. The former group consisted of local and non-local pilots flying in the area for personal transportation and recreation (camping, hunting, fishing, sightseeing) while the latter group consisted of air taxi operators, guides, and government agencies.

Field observations did not yield conclusive information on airplane use patterns along the Noatak River. The mobile and transient nature of airplane use made it impossible for a few observers to completely document patterns over the large study area. However, the results of field observations can perhaps point to general trends in airplane use in portions of the study area. Field observations reported here were compiled from the aerial surveys, participant observation, and notes of a National Park Service ranger at the Kelly River as described in the methodology.

Researchers flew aerial surveys of the Noatak River study area on 11 August, 2 September, and 17 September 1987. During the first survey, researchers sighted airplanes at two locations: at the Kelly River and at a guide camp between Noatak village and the Kelly River. Three airplanes were at this latter location, while the one at the Kelly River belonged to a Nome resident who was sheep hunting in the area. During the second survey, researchers noted airplanes at the same guide camp as well as at two other locations: at the mouth of the Kugururok River and on the east bank of the Noatak several miles above Noatak village. Two airplanes were at this latter location; a Fairbanks resident was hunting there with friends. The airplane at the Kugururok River

belonged to a California resident who was camping and fishing in the area. On the third survey, airplanes were noted at the same sites as on the second survey, excluding the Kugururok River.

During their 16 days on the river in September, researchers observed three to six airplanes per day, most of which were passing through the area. Combining researchers' notes with records of the National Park Service ranger at the Kelly River, the following observations were made on the amount and type of airplane traffic in the study area between 15 August and 20 September 1987:

TABLE 2: NOATAK RIVER AIRCRAFT TRAFFIC BY WEEK

Week	Government	Business	Personal
<i>Landings</i>			
Aug 15-22	2	1	3
Aug 23-29	2	6	0
Aug 30-Sep 5	9	5	4
Sep 6-12	7	1	0
Sep 13-20	9	8	0
<i>Total Landings</i>	29	21	7
<i>Overflights</i>			
Aug 15-22	2	6	1
Aug 23-29	3	7	2
Aug 30-Sep 5	0	10	3
Sep 6-12	0	2	5
Sep 13-20	0	19	2
<i>Total Overflights</i>	5	44	13

These results are based on first-hand observations of airplane activity and thus represent a minimum number of flights. The figures for landings are perhaps skewed toward government (primarily the National Park Service) because many of these observations were made at the Kelly River where the National Park Service maintains a ranger station. The business category includes air taxi operators and guides. An identifiable round trip, such as when an air taxi flew out and back to Kotzebue within a few hours,

was counted as one trip or one overflight. Thus the number of overflights underestimates the actual number of times an airplane flew over the river corridor.

These field data are perhaps most useful in indicating the relative proportion of airplane traffic each group contributed in 1987. Government was responsible for a substantial portion of the landings at the Kelly River because of the ranger station there, though this was probably not applicable throughout the study area. Business flights by air taxis and guides accounted for considerably more aircraft traffic than flights by pilots for personal purposes.

Because field observations were spotty and inconclusive, researchers used interviews with pilots in Kotzebue to augment field data. Based on these combined sources, patterns of personal aviation and business aviation on the Noatak River are each discussed below, followed by a description of use areas including popular landing sites.

### **Personal Aviation**

Two groups of pilots were included in this category of personal aviation: Kotzebue pilots and non-local pilots. Because no Noatak residents owned airplanes and few were owned by residents of other villages in the region, Kotzebue pilots were essentially the only significant group of local pilots. Because information on use patterns was more readily available from Kotzebue pilots than non-local pilots, researchers chose to discuss these groups separately.

#### **Kotzebue Pilots**

Based on a 1987 FAA list, approximately 53 airplanes used for personal aviation are based in Kotzebue. These are owned by 48 Kotzebue residents or groups of residents. A few individuals own more than one plane, and a few planes are owned by more than

one person. Researchers do not know how many Kotzebue residents are pilots but do not own airplanes.

According to local FAA personnel, many of these airplanes are used infrequently. Some need repair. Many airplane owners are employed full-time and have only weekends and evenings to fly. Others are getting on in years, and do not fly as often as they once did.

Researchers interviewed 22 (46 percent) of the 48 airplane owners in Kotzebue whose primary use of their planes is personal aviation. Of these, seven said they had taken trips in their planes to the Noatak River study area during August and September 1987. The remaining 15 pilots had not taken any trips to the study area during that time period. Researchers primarily documented airplane use in August and September since that is the period addressed by the controlled use area proposal.

The seven pilots who traveled to the Noatak River by airplane in late summer and fall made a cumulative total of 33 trips. Researchers only counted those trips in which pilots landed at least once in the study area. The number of trips by each pilot ranged from one to ten. Of the 33 trips, five were for hunting, 19 for fishing (mostly rod and reel fishing for char and grayling), and nine were for camping, hiking, sightseeing, or other recreation. The Kelly bar vicinity was overwhelmingly the most commonly used landing site with all seven pilots having taken trips there. For some pilots the Kelly bar accounted for nearly all their landings in the Noatak River study area. However, pilots also reported using other areas including the mouth of the Eli River (for fishing), the Poktovik area (for sheep hunting), and Sapun Creek (for caribou hunting).

Fishing and camping trips by Kotzebue pilots to the Kelly bar more frequently occurred in August than September due to better fishing and warmer summer weather. Hunting trips typically took place in September. The National Park Service ranger

reported much more local airplane traffic landing at the Kelly River during fishing season (June through August) than in September.

Most trips by Kotzebue pilots to the Noatak River were of short duration, usually for a day or weekend. One pilot, however, said he spends a week every September camping and hunting along the Noatak River. He does not usually hunt along the main river itself, but flies from his camp to hunting areas in the Noatak tributaries. Another pilot said his trips to the Noatak River range from two days to three weeks.

Most pilots set up temporary camps when they spend more than one day hunting, fishing, or hiking along the river. One pilot maintains a permanent camp along the Noatak a few miles above the Kelly River which he uses in fall and winter. This camp was originally established by another Kotzebue resident in the 1960s. Other than this, there are no permanent camps maintained by Kotzebue pilots for personal purposes within the study area. One Kotzebue pilot has a permanent camp along the Noatak River several miles above the mouth of the Nimiuktuk, but this is a few miles beyond the proposed controlled use area.

Pilots who did not use the Noatak River had a variety of reasons. Several owned airplanes not suited to off-airport landings. Others used their airplanes mainly for trips to Anchorage or Fairbanks or to camps in other parts of the region. One man said there is so much local criticism of airplane hunting along the Noatak that he avoids the area and does not hunt with his plane. Another pilot who has flown in the region for many years said that ten years ago he hunted frequently along the Noatak but now feels displaced both by the National Park Service and by "too many people" in the area. As an older, more experienced pilot, this man said he has found other places to hunt but that many younger pilots are confined to the Noatak River because it is easy to land there.

Kotzebue pilots had a number of observations on airplane activity along the Noatak River. One pilot asserted that although there were now more private planes in

Kotzebue than in the past, fewer of them were used for hunting. This pilot also believed that aircraft hunters now hunt more in the Noatak tributaries than along the main river because they are unaccustomed to the National Park Service which now patrols the river. Another pilot thought that creation of a controlled use area along the Noatak River would displace even more aircraft hunters into the tributaries.

As a group, Kotzebue pilots generally did not feel there was much conflict between aircraft and boats on the Noatak River, though most believe there are occasional incidents when airplanes -- either inadvertently or intentionally -- fly too low along the river. These pilots, however, did not believe the problem was serious enough to warrant a controlled use area. Several pilots suggested alternative solutions. These included requiring a minimum height for airplanes to maintain along the river; presenting information at pilot meetings on the effect of airplanes on Noatak hunters; encouraging pilots to voluntarily stay out of the main river corridor during fall caribou hunting; and distributing educational flyers with aeronautical charts explaining the impact of low flying aircraft on Noatak hunters. This latter measure was suggested as a way to inform non-local pilots who might not be aware of Noatak's hunting activity along the river during fall.

In summary, seven of 22 interviewed Kotzebue pilots took trips to the Noatak River study area in August and September 1987. Many other Kotzebue airplane owners rarely, if ever, travel to that area with their airplanes. Although data on the number and purpose of airplane trips cannot be extrapolated to all Kotzebue airplane owners, the information suggests that fishing and other non-hunting recreation were the predominant uses of the Noatak River area by this user group in 1987. Researchers believe that 1987 was a fairly representative year of the contemporary use patterns of Kotzebue pilots in the study area. In interviews, most pilots reported a stable use pattern of the Noatak River area in recent years. With good weather, many exposed gravel bars, and plenty of caribou, pilots would not have been deterred from traveling to the Noatak River in 1987.

The presence of ADF&G researchers on the river might have affected the altitude at which airplanes flew, but researchers believe it did not significantly affect the number or purpose of flights taken by Kotzebue pilots.

#### Non-local Pilots

Information on use patterns of non-local pilots was difficult to obtain because it was virtually impossible to contact these people in a systematic fashion. Researchers had to rely on incidental field encounters with these pilots and on observations of FAA personnel, local pilots, and Noatak hunters.

During the two weeks researchers camped at the Kugururok River, airplanes landed there on five occasions. Three of these were in association with the research project; the other two were non-local pilots. One non-local pilot was from California, vacationing by airplane in the Brooks Range. He stayed three days at the Kugururok River, camping and fishing. The other pilot, a Fairbanks resident, stopped at the Kugururok for a few hours to catch char to take back to a hunting camp downriver.

Researchers interviewed one other non-local pilot during an aerial survey of the Noatak River study area on 11 August 1987. This plane was at the Kelly bar. The pilot and his passenger were Nome residents who were sheep hunting in the mountains south of the Noatak River. They had flown over to the Kelly River to fish for char for the afternoon. The pilot said there were several planes flying around the mountains at the opening of sheep season (August 10), including two others from Nome.

Researchers definitively know of two other non-local airplanes in the study area during fall 1987. Both of these were from Anchorage and landed at the Kelly bar where they visited the National Park Service ranger there. Neither of these parties were hunting.

Beyond these, the extent of non-local airplane traffic in the Noatak corridor during 1987 was undocumented. Other observers in the region do not have a uniform opinion on the extent of this traffic. One FAA employee in Kotzebue estimated that in 1986 10 to 12 non-local airplanes passed through Kotzebue headed for the Noatak to hunt. Other non-local planes passed through in July but these pilots were mostly sightseeing or fishing. One Kotzebue pilot believed that non-local planes comprised a relatively small percentage of total air traffic on the Noatak but that these pilots might be the least sensitive to local boat travelers. Another local pilot thought that non-local traffic seemed worse about four years ago, but has since tapered off slightly. One air taxi pilot estimated that he saw about six non-local airplanes along the river during fall 1987.

Several other pilots, however, differed in their opinions. One guide said there were many airplanes from Anchorage, Fairbanks, and the Kenai Peninsula in the Noatak area. A pilot for the National Park Service said he noticed many non-local airplanes along the Noatak this fall. Two air taxi pilots also believed there were "lots" of non-local airplanes in the Noatak area, and that these pilots often stayed close to the river because they did not know their way around the area.

Noatak hunters said they sometimes stop and talk with airplane users along the river and that these people are often from Anchorage, Fairbanks, Kenai Peninsula, and the Mat-Su valley. One group of Kenai Peninsula hunters who camped a few years ago with several airplanes above the Kelly River particularly stands out in Noatak residents' memory.

Spotty field data and disparate opinions of observers led to inconclusive results on the extent of non-local airplane traffic in the Noatak study area. Certainly there is some -- perhaps a substantial number -- and this has likely increased in the 1980s due to the heightened publicity and growing popularity of the Noatak River as a result of its designation as a national park system unit. Field data indicates that some non-local

pilots engage in hunting along the Noatak River, while others do not. Reliable estimates on the types and levels of use, however, are not available, though researchers believe it is unlikely to exceed 20 or so parties throughout the fall season. Non-local pilots might be unaware of the presence of boat hunters on the Noatak River and as a consequence might inadvertently fly too low or engage in other inappropriate airplane activity.

### **Business Aviation**

Researchers identified three groups of pilots whose principal use of the Noatak River was for business purposes, and not for personal recreation. These were big game guides, air taxi operators, and government agencies. Each group's use patterns are discussed separately below.

### **Big Game Guides**

Five big game guides operated in the Noatak drainage between the Eli and Nimiuktuk rivers in 1987. These guides take clients on hunts for caribou, moose, sheep, and brown bear. Access to these guides' camps is primarily by airplane. Some guides also use boats and all-terrain vehicles as transportation from their main camps to hunting areas.

Guide camps are typically centers of airplane activity. Planes are used to transport hunters, gear, and meat between Kotzebue and camps and between camps and hunting areas. Guides must also periodically bring supplies in to camp and take trips to Kotzebue to pick up mail, make phone calls, or take care of other business. This results in regular airplane traffic near guides' camps and along their commonly traveled routes.

Of the five guides operating in the Noatak drainage between the Eli and Nimiuktuk, one has a camp within the boundaries of the proposed controlled use area. This camp is located along the Noatak River slightly more than halfway between Noatak

village and the Kelly River. According to Noatak residents and FAA personnel in Kotzebue, this camp contributes significantly to aircraft traffic along that portion of the river. This guide camp was established within the past three or four years; prior to that the guide operated out of Kotzebue. In interviews, Noatak residents expressed concern about airplane activity in that area, particularly because the camp is located in a prime caribou crossing area.

The other four guides in the area have camps in the Kelly, Kugururok, and Nimiuktuk tributaries and in other drainages adjacent to the Noatak watershed. These guides have little reason to hunt along the main Noatak River: their camps are not near the river and they have access to and knowledge of more remote areas where they are less likely to encounter other hunters. One interviewed guide said he does not use the Noatak River at all during August and September, though he occasionally lands there to fish in June and July.

In summary, the five big game guides in the Noatak River region frequently use airplanes and often travel over the Noatak River on their way to and from hunting camps. Four of the guides seldom use the main Noatak River for hunting, preferring more remote areas near their camps. One of the guides has a main camp along the Noatak River which, by its location, creates regular airplane traffic associated with hunting within the proposed controlled use area. This guide would be substantially affected by the creation of a controlled use area.

#### **Air Taxi Operators**

In fall 1987, 11 air taxi businesses operated in Kotzebue. Ten were interviewed by researchers. These businesses varied in types of aircraft, customers, and facilities and in length and seasonality of operation.

Three of the 11 air taxi businesses focused primarily on scheduled intervillage travel and engaged in very limited charter flying to off-airport areas. Managers of these air taxis cited higher insurance premiums and inappropriate aircraft as reasons for their limited charter flying to unmaintained air strips. Two of these businesses took no trips to off-airport areas during the 1987 study period, while another said his company took one or two trips to the Nimiuktuk River in August to transport equipment for a customer.

A fourth air taxi operator primarily hauled freight and did not have aircraft suitable for passengers. The extent of his use of the Noatak River in fall 1987 was three loads of freight to a guide camp along the river.

The remaining six air taxis accounted for most of the air taxi traffic in the Noatak River study area in 1987. These operations, however, were not all alike. For instance, three used mostly float planes while the other three used wheeled planes. Length of time in business ranged from one year to 30 years. These businesses also differed in the number and purpose of flights each took to the Noatak study area and in the facilities, equipment, and staff each had available in Kotzebue.

In interviews, these six air taxis reported taking a cumulative total of 298 flights to the Noatak River area in August and September 1987. However, not all these flights landed within the proposed controlled use area because some pilots used floatplanes on nearby lakes and were unable to estimate the number of trips within the actual boundaries of the proposed controlled use area. Based on the air taxi operators' descriptions of their use patterns, researchers estimated 196 (66 percent) of the 298 flights were within the proposed controlled use area.

To some extent, the air taxis varied in the number of trips each took to the Noatak River area. Four reported taking from 15-30 trips, one took 50 trips, and another made 170 trips. The reasons for this variation are not entirely clear. Some of the air taxis in the 15-30 range derive a portion of their business from sources other

than chartered off-airport flying in northwest Alaska. One, for instance, also operates scheduled intervillage flights. Two others operate only seasonally in Kotzebue, most likely earning income from other activities in other parts of the country during the rest of the year. It is possible that the most active air taxi in the area takes most of its customers to the Noatak River rather than dispersing them throughout the region. This operator may also have taken larger or more successful hunting parties which required more flights per party. This air taxi charged lower charter rates than some of its competitors and as a result might have attracted a greater share of customers.

Air taxi operators reported that 72 percent (215) of the 298 flights to the Noatak River area were associated with hunting (i.e., transporting hunters or game), while the other 28 percent were for non-hunting recreation (camping, fishing, river running) or for government charters. August 15 to September 15 is the peak season for chartered hunting trips. Several air taxis depend heavily on business obtained during this period. Most air taxis operators said the majority (50-75 percent) of their late summer and fall customers are non-local Alaska residents, often from the Anchorage or Fairbanks areas. The remainder are out-of-state or foreign visitors.

One common practice of air taxi operators is to drop off hunting parties along a tributary of the Noatak, then pick them up several days or weeks later at the mouth of the tributary or at another point along the main river. Sometimes hunters are dropped off along the main Noatak River and picked up at a pre-arranged point downriver. The Noatak River area is well-suited to these combined floating and hunting trips and many hunters arrive in Kotzebue equipped with inflatable rafts. Other hunters are dropped off at one location where they hunt on foot, then are picked up and dropped off at another location where they hunt on foot again, typically for a different big game species.

Air taxis generally use a variety of landing areas so as not to concentrate hunters in the same location. The Kelly, Kugururok, and Nimiuktuk rivers are among the most

popular while the Eli, Cutler, and Cottonwood rivers and other gravel bars also are used. One air taxi pilot said his customers frequently request the Noatak River area as a destination because it is so well-known. In general the proposed controlled use area would enable air taxis to drop off hunters at many of their customary landing sites, but would make it very difficult for air taxis to find a place to pick these hunters up again.

Of the six air taxis accounting for most of the flights to the Noatak River area in 1987, two have been operating for more than 25 years, one for nine years, one for five years, and two for less than two years. Some current air taxi operators originally flew for other companies before starting their own businesses. While four air taxis reported stable or slightly increasing business in recent years, two said their 1987 business was down by 50 percent. These latter air taxi operators credited the drop to the declining state economy. This might indeed be a factor; however, because all Kotzebue air taxis did not experience a similar decline it might also be that these air taxi operators were affected by other business conditions as well.

Because two air taxis reported a decline in business during the past season, 1987 might not be entirely representative of air taxi traffic on the Noatak River in contemporary times. However, researchers believe that the number of air taxi flights to the Noatak River area in 1987 was not substantially below what it has been in recent years. The two air taxis reporting a decline accounted for only a small portion of the total number of flights to the Noatak. The air taxi reporting the most trips to the Noatak area had been in business for less than two years. Although there might have been less air taxi traffic in the Noatak area in 1987 than in 1986, observers in the region -- both pilots and non-pilots alike -- widely agreed that air taxi traffic in the Noatak area has significantly increased in the 1980s. The extent of this, however, has not been quantified. With the recent decline in the state economy, it might be the case that aircraft traffic is no longer increasing at the rate it once was, or is perhaps slightly decreasing.

In summary, six of the eleven air taxi businesses in Kotzebue accounted for most of the air taxi traffic in the Noatak River area in 1987. Based on estimates reported by air taxi operators, about 303 trips were made by air taxis to the Noatak River area in August and September 1987. One air taxi operator was not interviewed and so his trips were not included. All these flights did not land within the proposed controlled use area because some pilots used floatplanes on nearby lakes and were unable to estimate the number of trips within the boundaries of the proposed controlled use area. However, most of these flights probably flew over the Noatak River since most of the popular landing sites are either along the river or to the north of it.

Of the 303 trips estimated to the Noatak River area, air taxi operators reported that 218 (72 percent) were hunting related while 85 (28 percent) were not hunting related (fishing, camping, rafting, government charters). Most chartered hunting activity occurred between mid-August and mid-September while other chartered recreational activity occurred mostly in August. Compared to pilots flying for personal purposes, air taxi operators contributed substantially more to aircraft traffic in the Noatak River area.

### **Government Agencies**

Several federal and state agencies in Kotzebue are equipped with airplanes and have various reasons to fly to the Noatak River while carrying out their responsibilities. The amount of aircraft traffic they generate is at times significant and is relatively new in the case of the National Park Service.

In 1987, the National Park Service (NPS) accounted for most of the agency flights in the Noatak River study area. From about 15 miles below the Kelly River to the Nimiuktuk River, the study area is within the Noatak National Preserve established by the Alaska National Interest Lands Conservation Act of 1980. Because a seasonal ranger station is maintained by the NPS at the mouth of the Kelly River, this location

receives the bulk of NPS aircraft traffic. Staff rotations, supply and equipment transportation, and the relay of information are essential to the maintenance of the ranger station and often require air transport. In addition, ranger station staff use aircraft in search and rescue operations, enforcement, and area patrols. Because the NPS did not become a land manager in the region until 1980, this source of aircraft traffic is fairly recent.

In 1987, the ranger at the Kelly River station recorded his observations on airplane and boat traffic along the Noatak River. Though most of his observations were at the Kelly River, some were from other areas along the river where he camped while traveling by boat. His period of observations corresponded with the period proposed for the controlled use area, 15 August to 20 September. During this period, the ranger recorded 23 landings by the National Park Service, most of them at the Kelly River. Additionally, there were five recorded occasions when the National Park Service flew over the area without landing. Researchers believe this information is fairly complete; presumably the ranger was well informed of NPS activities.

The Alaska Department of Fish and Game was responsible for some aircraft traffic in the Noatak River area in 1987, most of which was associated with this study. Between 15 August and 20 September, the ADF&G made four chartered flights to the Kelly or Kugururok rivers to transport research staff and on two occasions conducted aerial surveys of the study area to record observations on airplane and boat traffic. In addition, the ADF&G biologist in Kotzebue flew part of the study area on one occasion, landing to inform hunters that the sheep season had been closed.

In all likelihood, other local and non-local agencies occasionally have reasons to fly in the Noatak River study area. To the researchers' knowledge this traffic is very light.

In summary, the National Park Service has been a regular airplane user in portions of the study area since the early 1980s. Their use is centered at the Kelly

River mouth where the NPS maintains a ranger station, though this station is not equipped with its own airplane. The NPS also lands occasionally on other gravel bars as necessary within the proposed controlled use area. Other federal and state agencies also travel occasionally with airplanes in the Noatak River area. Researchers believe that 1987 was a representative year for NPS aircraft traffic in the area. Because of this study, the Alaska Department of Fish and Game was responsible for more aircraft traffic in the study area in 1987 than in previous years.

### **Aircraft Use Areas**

Although there are many possible landing places along the Noatak River, some sites are used more often than others. Popular landing sites are usually ones with better landing conditions, good access to fishing and hunting areas, proximity to camps, or easily identified landmarks for use by river travelers as pick-up points. Figure 3 depicts some of the common landing sites in the study area though other sites are used as well.

The mouth of the Kelly River, known as the Kelly bar, is undoubtedly one of the most popular landing sites along the Noatak River. The bar has an unmaintained airstrip of sufficient size and quality to permit a wide variety of light aircraft to land there. The good landing conditions attract many novice and non-local pilots who do not have the skills to land on shorter or rougher fields. In addition, the National Park Service maintains a seasonal ranger station at the Kelly bar staffed with one or two people during the summer and fall months. This alone is a significant contributor to air traffic in the area.

The Kelly River is well known for its excellent char fishing. Kotzebue pilots often fly there to fish on a summer day as it can be reached in about one hour. Camping is also popular. When asked for advice on places to visit, FAA and National Park Service staff often direct non-local pilots to the Kelly bar. The bar is also

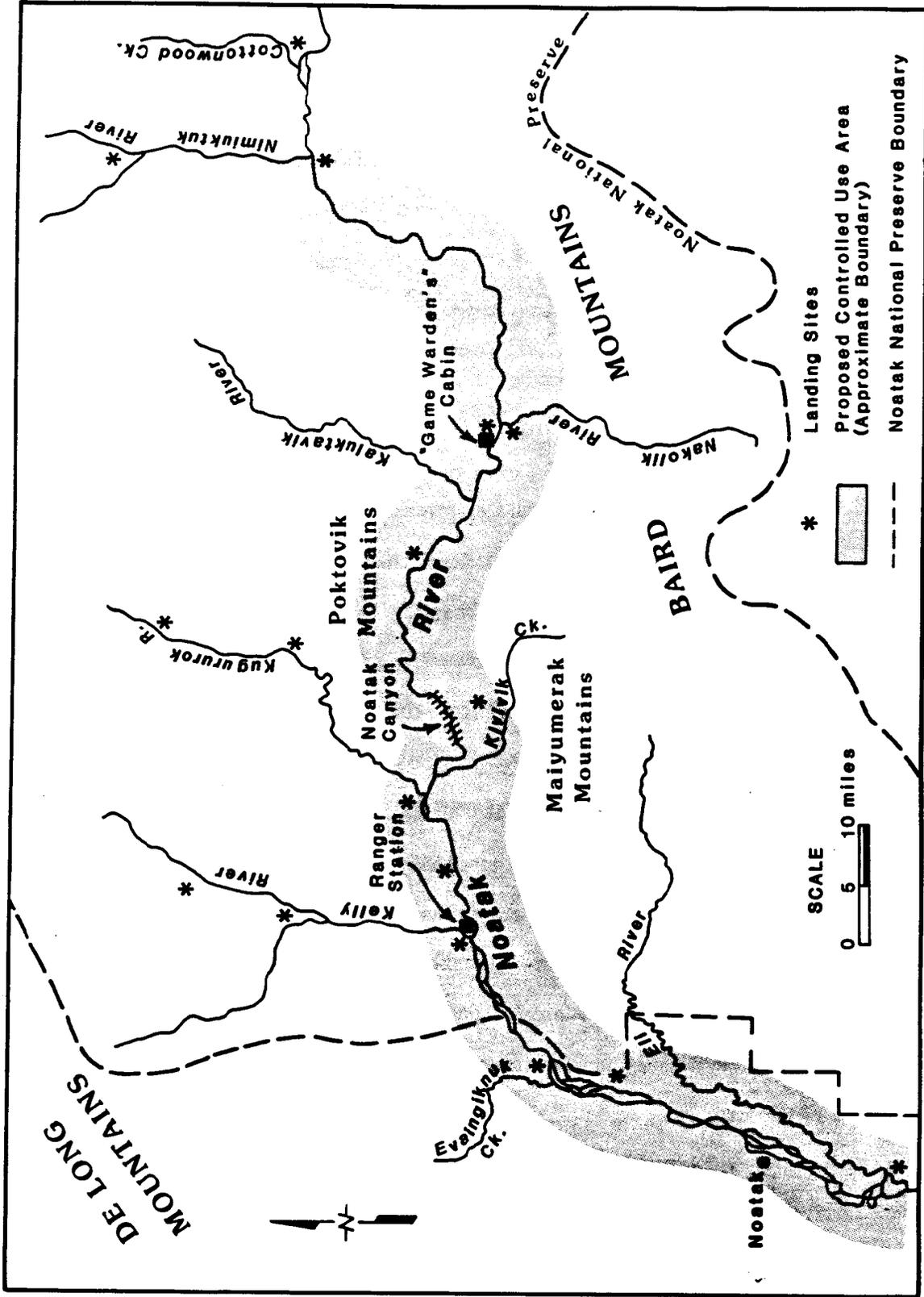


Figure 3. Common Landing Sites for Airplanes.

sometimes used by air taxi operators as a staging area for shuttling passengers to and from remote sites that require a Supercub or similar aircraft for access. A group of non-local hunters, for instance, might charter a Cessna 185 or 206 from Kotzebue to the Kelly bar, then be ferried one at a time in a Supercub from there to a more remote hunting location.

Other popular landing areas along the river include the mouths of the Kugururok, Nakolik, and Nimiuktuk rivers, the Poktovik Creek area, and the "game warden's" cabin (a public cabin between Kaluktavik and Nakolik rivers). The Kugururok is used for char fishing and moose hunting, the Nakolik for caribou and moose hunting, and the Poktovik Creek area for caribou and sheep hunting. The Nimiuktuk and the "game warden's" cabin are commonly used as pick-up points for non-local hunting parties floating the river.

A significant portion of the air traffic passing over the Noatak River is actually destined to the tributaries and not the main river itself. Air taxi operators and guides in particular commonly use landing sites in the upper Kelly, Kugururok, and Nimiuktuk watersheds to drop off and pick up hunting or rafting parties. Some of these are gravel strips while others are lakes used by pilots with floatplanes. Nearly all these landing sites in the tributaries are located more than five miles from the main Noatak River, and therefore would not fall within the boundaries of the proposed controlled use area. One exception might be a landing area used by sheep hunters near Kivivik Creek in the Maiyumerak Mountains.

Although this describes some of the most popular landing areas, there are many other locations along the Noatak River used occasionally by airplanes. Researchers saw evidence of airplane activity on many of the larger gravel bars. In some years, high water levels reduce or completely eliminate the number of gravel bars suitable for landing airplanes, though in most cases this does not last the entire season.

#### CHAPTER 4: SUMMARY AND DISCUSSION

One of the most striking points to emerge from this research project was the constancy and stability of Noatak's fall caribou hunting practices. As technology has changed, Noatak hunters have gone from skin boats pulled upriver by hand and by dogs to wood and aluminum boats propelled by outboard motors. This has shortened the time needed to reach hunting areas which in turn has allowed hunters to travel farther more easily, but it has not otherwise significantly changed the basic pattern and importance of the fall caribou hunt to Noatak residents. In terms of seasons, harvest levels, hunting areas, and methods, Noatak's hunting practices in 1987 were remarkably similar to those described by Foote almost 30 years ago and were not substantially different from those Noatak elders today describe from their youth.

Caribou has been the main source of red meat for Noatak residents for generations. The fall caribou hunt is particularly important because it provides a substantial portion of the community's fall food store. This hunt is the first opportunity since the previous spring for Noatak residents to harvest caribou, and the last opportunity until overland travel becomes possible in early winter. In recent years, caribou have wintered in the Noatak vicinity, and hence have been accessible to snowmachine hunters. However, this has not always been the case. Although snowmachine hunting can be very efficient, Noatak residents feel they cannot count on caribou wintering within reach. In contrast, hunting by boat on the Noatak River during the caribou herd's southern migration is considered more dependable. Noatak hunters' experience has been that if they wait long enough at the proper locations, caribou will eventually cross the river at which time they can be readily harvested. If the fall hunt is missed, Noatak residents must wait until winter at which time they harvest cows, if available, rather than the preferred fat bulls of fall.

The fall caribou hunt occurs in a circumscribed place and time. Most of it takes place between the Kelly and Nimiuktuk rivers, though areas farther upriver and downriver are also used. In 1987, Noatak residents hunted most intensively between Noatak Canyon and Nakolik River, a 36-mile stretch within the Kelly to Nimiuktuk River area. The lower section of river between Noatak village and the Kelly River is used for caribou hunting most frequently just before freeze-up. As caribou migration routes shift from year to year, the hunting areas used by Noatak residents shift with them.

Early to mid-September is typically the most intensive period for fall caribou hunting by Noatak residents. The entire season for fall caribou hunting, however, stretches from late August until late September or early October, the latter depending on weather, water level, and freeze-up.

Although the number of Noatak boats that travel upriver to hunt in fall is not numerous in absolute terms, it does represent a substantial portion of Noatak households. In 1987, 19 Noatak boats representing 27 (41 percent) of the community's 65 households traveled upriver to hunt caribou in fall. Most of these 27 households hunt upriver every year. In recent years, few Kotzebue boats have hunted along the Noatak River above the village, preferring instead to hunt caribou along the Kobuk River, another major river system of northwest Alaska immediately south of the Noatak. With deeper water and fewer gravel bars, the Kobuk River is easier to travel with the large outboard motors commonly used by Kotzebue residents in the rough waters of Kotzebue Sound.

The fall caribou hunt is a sensitive subsistence period and a traditional and meaningful activity for Noatak residents. The time and costs involved with this hunt are substantial, and Noatak residents feel they cannot afford to come home empty-handed. They do not want to see the hunt disrupted. However, Noatak residents reported that in recent years their fall caribou hunt has been disrupted by airplane activity. According to Noatak hunters, certain types of airplane activity frighten approaching caribou away

from the river and into the hills, where they cannot be readily harvested by hunters waiting along the river in boats. When this happens, Noatak hunters said they move on in search of other caribou, believing the animals will not come down to the river soon after they are spooked. This can increase the time and costs of the hunt for Noatak residents. Many Noatak households also reported having to move their camps after airplanes flew low over or landed near them. Noatak residents said they have become thoroughly frustrated at times, even to the point of being tempted to shoot at offending airplanes.

During 1987, there were two reported incidents of airplanes disrupting a hunt. This was reported by Noatak hunters to be a lower number of incidents than in previous years. The frequency of airplane disruptions in previous years has not been quantified. Noatak hunters credited the low number of airplane disruptions in 1987 to the presence of ADF&G researchers on the river and to the public attention the research project received in Kotzebue. In 1987, most Noatak hunters were able to harvest enough caribou during the fall hunt. Several households, however, said they have had unsuccessful caribou hunts in past years because of heavy aircraft traffic.

Caribou migration patterns are not entirely predictable from year to year, according to Noatak hunters. Some years caribou cross farther upriver, while in other years they cross lower down. Most Noatak hunters believe that in recent years caribou have crossed lower along the river (Kelly, Kugururok, Poktovik) than they have in the past. Noatak hunters did not believe aircraft traffic accounted for these shifts. Some Noatak hunters considered airplanes responsible for other changes in caribou behavior observed at times. Reportedly, caribou cross the river in smaller groups and cross at night if daytime aircraft traffic is heavy.

It is important to note that Noatak hunters' frustration is directed specifically at airplanes and not at all other river users in general. For instance, virtually no Noatak residents were concerned about "floaters," non-hunting recreational parties traveling the

river by canoe, kayak, or raft. Few were bothered by the current level of non-local hunters except in cases where these hunters camped in traditional Noatak sites or were believed to have not retrieved meat from their harvests. Noatak hunters did not seem to feel that competition affected them (in that there were not enough caribou to go around), but simply that airplane use in the area was such that their own hunting practices had been disrupted.

The most disruptive airplane behavior for Noatak hunters is low-flying aircraft. This includes airplanes that:

- \* fly at less than 500 feet, and under some conditions at less than 1,000 feet;
- \* land and take off;
- \* make low passes to assess landing conditions;
- \* buzz boats or camps;
- \* circle low over wildlife for better viewing; and
- \* fly beneath the weather.

The total number of flights in the area might also be a contributing factor to the airplane disturbances reported by Noatak hunters. According to many residents in the region, there appears to have been an increase in the amount of aircraft traffic along the Noatak River in the past five to ten years. The extent of this, however, is not quantified. With a number of different pilots flying in the area, even if each one only occasionally flew low for some reason, the cumulative impact of this on hunters in boats could be substantial.

Researchers believe a number of factors has contributed to this reported increase in aircraft traffic along the Noatak River, particularly that associated with hunting. First, ever more restrictive and competitive hunting in more accessible portions of the state has encouraged sport hunters to seek more remote hunting locations. In the Noatak River area, locally plentiful populations of caribou, moose, and bear in recent years have led to liberal sport hunting regulations and good opportunities for hunting success. In

addition, the Noatak River basin is a particularly scenic and accessible arctic landscape with few permanent inhabitants and a variety of rivers suitable for hunting and floating. All these factors attract sport hunters, who commonly credit "word of mouth" as the way they first learned about the Noatak River.

Other circumstances have also likely been responsible for increased aircraft traffic along the Noatak River. The establishment of the Noatak National Preserve in 1980 by the Alaska National Interest Lands Conservation Act has in itself attracted publicity to the area while the National Park Service has encouraged visitation by providing visitor support in the form of information and safety. The National Park Service has more directly contributed to aircraft traffic by regularly traveling by plane to the Noatak River to carry out its management responsibilities and to maintain a ranger station there. And, finally, the establishment of a permanent big game guiding camp along the Noatak River in recent years has also led to additional aircraft traffic in that area.

Several patterns of airplane use along the Noatak River were identified in this study. These included about 50 Kotzebue-based airplane owners who primarily used their planes for personal transportation or recreation; an undetermined number of non-local pilots; five big game guides; eleven Kotzebue-based air taxis; and federal and state agencies, particularly the National Park Service.

The principal source of aircraft traffic in 1987 -- in terms of number of overflights and landings -- appeared to be six commercial air taxi operators who made an estimated 298 trips to the Noatak River area in August and September 1987. Not all of these landed with the proposed controlled use area because some pilots were unable to estimate their activity based on these boundaries. Researchers estimated about 196 (66 percent) of the flights landed within the proposed controlled use area. An estimated 72 percent of the total number of air taxi trips were associated with hunting. Air taxi operators dispersed their activity throughout much of the study area.

Another major source of aircraft traffic along the Noatak River was the commercial big game guiding industry. Much of this traffic, however, was overflights with all but one guide rarely landing within the proposed controlled use area. The one guide camp located along the Noatak River between Noatak village and the Kelly River was, by the nature of its business and its location, a center of airplane activity in that portion of the study area. Most of this activity was associated with hunting.

Kotzebue pilots flying for personal purposes accounted for some aircraft traffic in the Noatak River area in 1987 though their use of this area for hunting was comparatively light. Researchers interviewed 22 (46 percent) of the 48 airplane owners in Kotzebue who primarily use their planes for personal aviation. Seven of these had taken their planes to the proposed controlled use area during August and September 1987. These seven pilots made a total of 33 trips to the study area. Five of these trips were for hunting while the rest were for fishing, camping, hiking, or other recreation. Much of this activity focused on the Kelly River vicinity.

Use of the Noatak River area by non-local pilots was not well documented because it was virtually impossible to contact these people systematically. Field work and interviews in 1987 revealed that some non-local aircraft traffic is certainly present, but the exact extent is not known. As a rough estimate, researchers believe it is unlikely to exceed 20 or so parties throughout the season, half of whom might be hunting.

Government agencies accounted for a portion of the aircraft traffic in the Noatak River area in 1987, particularly the National Park Service which is responsible for managing the Noatak National Preserve. Most of the National Park Service's activity centered at the Kelly River where they maintain a seasonal ranger station. The National Park Service made an estimated 23 landings within the proposed controlled use area during the study period.

In some respects, 1987 might not have been entirely representative of activities on the Noatak River in recent years. Researchers believe that Noatak hunting practices

as documented in 1987 were representative of that community's contemporary fall caribou hunting patterns. However, unlike other years, Noatak hunters reported few problems in 1987 with airplanes along the river. The publicity of this research project and the pending proposal for a controlled use area might have encouraged pilots to be particularly careful about their airplane activity. In addition, the recent downturn of the state economy might have reduced air taxi business to some extent as well as visits to the area by non-local Alaska pilots. It is possible that aircraft traffic on the Noatak River is no longer increasing, but remaining at stable levels or slightly decreasing. Whether fewer airplane disturbances for Noatak hunters is a temporary or permanent trend is unknown.

The establishment of the proposed controlled use area would not affect overflights nor would it reduce the number of flights to the area for non-hunting purposes. It might in fact increase the number of overflights in that some aircraft-supported hunters displaced from the main Noatak River would probably move to the river's tributaries, intensifying hunting activity in these areas. Because the most popular of these tributaries are north of the river, air traffic would have to fly over the river corridor to reach them. However, if these flights maintained a sufficient altitude, they should not disrupt Noatak residents hunting by boat along the river.

Because it only prohibits aircraft-supported hunting, the proposed controlled use area would not affect aircraft activity by federal or state agencies or by air taxis and local pilots for non-hunting purposes. An estimated 28 percent of air taxi trips and 85 percent of local pilots' trips to the Noatak River area in 1987 were for non-hunting purposes.

Although it would not completely eliminate aircraft traffic along the Noatak River, establishment of the proposed controlled use area would significantly reduce the amount of aircraft traffic in the area. Commercial air taxis accounted for the greatest number of landings within the study area, 72 percent of which were associated with

hunting. These landings would be prohibited. In addition, one big game guide along the river would no longer be able to use airplanes to transport hunters or game. This would substantially reduce airplane traffic along that portion of the river.

The effect of a controlled use area on low-flying aircraft is not as predictable. While the proposed controlled use area does not specifically prohibit low-flying aircraft, it would reduce this activity where associated with landing and taking off by decreasing the total number of flights in the area. A controlled use area could possibly deter some low circling over wildlife in cases where the pilot or passengers were looking for trophy animals to hunt in the vicinity. However, if these pilots were sightseeing or otherwise had no intention to land, a controlled use area would likely have little effect. Some activities, such as buzzing camps or boats or flying low enough to harass wildlife, are in violation of existing state and federal regulations; enhanced enforcement might provide sufficient discouragement to alleviate this behavior. Other low-flying activity as a result of bad weather or landing and taking off for non-hunting purposes would not be affected by a controlled use area. Some pilots in Kotzebue, angered by the possibility of airplane restrictions, have threatened to deliberately fly low along the Noatak River as an expression of their resentment. In this way, a controlled use area might in fact increase the number of low-flying airplanes.

It is possible that non-local pilots might be responsible for many of the disruptions reported by Noatak hunters. This group, though probably few in number, are likely to be the least aware of the presence of Noatak hunters on the river and the impact of low-flying aircraft on them.

Along with other rural areas, northwest Alaska is experiencing mounting land and regulatory complexities, a growing regional center, and increased visitation from people outside the region, all of which in turn shape events on the Noatak River. Discussion of the proposed controlled use area on the Noatak River elicits strong responses from all affected parties, sometimes leading to polarization and accusations.

Researchers hope that information presented in this paper will facilitate constructive discussion on this issue and a satisfactory resolution.

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APPENDIX A

FALL CARIBOU HUNTING  
ON THE NOATAK RIVER

Interview Guide for Noatak Hunters

1987 Hunts

1. How many hunting trips did you make this fall?
2. Which areas did you hunt?
3. How far upriver did you travel?
4. Where did you camp? For how many days?
5. How many people were with you? From how many households? From which communities?
6. When did you leave Noatak? When did you return?
7. How much did it cost you to go hunting? How much gas did you use?
8. Where did you see caribou?
9. Did you get caribou? How many? Where did you get them?
10. Did you do anything besides hunt caribou? (hunt moose, pick berries, fish, etc.)
11. Did you see any airplanes? How many? Where? Where were they from? What were they doing?
12. Did airplanes affect your hunting? How? How do you feel about airplanes?
13. Did you see any floaters? How many? Where? What were they doing? Did they affect your hunting? How? How do you feel about floaters?

FALL CARIBOU HUNTING ON  
THE NOATAK RIVER

Interview Guide for Noatak Hunters

Previous Hunts

1. Did you hunt caribou last fall? How many trips? How many years of the past ten did you hunt caribou in fall?
2. When did you go hunting last year? What determines when you go? How has this changed?
3. In what year did you first go caribou hunting up the Noatak River in fall?
4. How many days did you spend caribou hunting last fall? How has this changed over the past ten years?
5. Which areas did you hunt last year? Which areas have you used most often in the past ten years?
6. How far upriver do you usually go? How has that changed?
7. Where did you camp last year? For how many days? How has that changed?
8. How much did it cost you to go hunting last year? How much gas did you use? How has that changed in the past ten years?
9. In which areas have you most often seen caribou in the past ten years?
10. How have caribou movements changed in the past ten years?
11. In which areas have you most often caught caribou in the past ten years?
12. How many caribou did you catch last fall? How has this changed?
13. How many people hunted with you last year? From how many households? From which communities? How has this changed?
14. Have there been years (in the past ten) when you have been unable to get any caribou in falltime? Why?
15. In the past ten years, do you usually do anything besides hunt caribou while on the river in fall? (hunt moose, pick berries, fish, etc.)
16. How do you feel about airplanes?
17. Did airplanes affect your hunting last year? How?
18. Where have you most often seen airplanes along the river in fall? How many? From where?
19. Have there been changes in the kind of airplane traffic in the past ten years? (number of trips, landing areas, origin, activities, etc.)
20. Have floaters affected your hunting? How? How do you feel about floaters? How has this changed?

FALL CARIBOU HUNTING ON  
THE NOATAK RIVER

Interview Guide for Airplane Users

Private Airplane Owners

1. Do you feel there is a problem between aircraft and boats on the Noatak River?
2. How would a controlled use area on the Noatak River affect you?
3. Last August and September, how many trips did you make by plane to the Noatak River (between Eki and Mimiuktuk)? How has this changed over the past ten years?
4. When did your trips occur? How has this changed?
5. Were your trips usually for the day, or for several days? How many days? How has this changed?
6. Which areas along the Noatak River did you use most often? How many times? For what purposes? (fishing, hunting, other recreation, etc.)
7. Do you have a camp there?
8. When did you first start going to the Noatak River by plane?
9. How has your use of the Noatak River changed over the years?
10. In what areas have you most often seen caribou in the fall in the past ten years?
11. Have you hunted by plane in fall along the Noatak River in the past ten years? How many times? In which years? Where have you got caribou?
12. What are your observations on use of the Noatak River by non-local aircraft?
13. Has your use of the Noatak River in fall been affected by other user groups? (other airplanes, hunters, boaters, etc.)
14. Do you have any suggestions for solutions other than a controlled use area?

FALL CARIBOU HUNTING ON  
THE NOATAK RIVER

Interview Guide for Airplane Users

Big Game Guides

1. Do you feel there is a problem between aircraft and boats on the Noatak River?
2. How would a controlled use area affect you?
3. Last August and September, how many trips did you make to the Noatak between the Eli and Nimiuktuk? How does this compare to previous years?
4. When do the most trips occur? The least?
5. When did you first start using this area with a plane?
6. Do you have or use camps along the Noatak River? Where?
7. Could you estimate the number of people you take per week to this area of the Noatak?
8. Where are your clients from?
9. Which areas do you use most often? For what purposes? How does this compare to previous years?
10. How has your use of the Noatak River changed over the past ten years? (e.g. number of trips, number of hunters, areas used, hunter success, interactions with boats, etc.)
11. In which areas along the Noatak have you most often seen caribou in fall in the past ten years?
12. Has your use of the Noatak River been affected by other users? (boats, other aircraft, floaters, etc.)
13. Is there any licensing, leasing, or permitting required to operate along the Noatak?
14. Do you have any suggestions for solutions other than a controlled use area?

FALL CARIBOU HUNTING ON  
THE NOATAK RIVER

Interview Guide for Airplane Users

Air Taxis

1. Do you feel there is a problem between aircraft and boats on the Noatak River?
2. How would a controlled use area affect you?
3. In August and September, could you estimate how many trips your business made to the Noatak River (between Eli and Nimiuktuk)? How does this compare to previous years?
4. When do you take the most trips up there? The least?
5. Could you estimate the average number of people you take per trip? Where are your customers mostly from?
6. Which areas along the Noatak River do you use most often? (How many trips to each area (in August and September)? For what purposes?
7. Could you estimate the proportion of your (all time trips to the Noatak for: a) hunting, b) fishing, c) other recreation (sightseeing, picnicking, floating, etc.), d) other (business, etc.)?
8. When did your business first start flying people to the Noatak River?
9. How has your use of the Noatak River changed over the years?
10. Is there any licensing, leasing, or permitting required to use the Noatak River?
11. In the past ten years, in which areas have you most often seen caribou in fall along the Noatak River?
12. What are your observations on use of the Noatak by non-local aircraft?
13. Do you have any suggestions for solutions other than a controlled use area?

