

Wild Resource Harvests and Uses by Residents of Cantwell, Alaska 2000

By
William E. Simeone

Technical Paper Number 272

Prepared for:
Denali National Park
National Park Service
Address
Purchase Order No.

Division of Subsistence
Alaska Department of Fish and Game
Juneau, Alaska
September 2002

ADA PUBLICATIONS STATEMENT

The Alaska Department of Fish and Game administers all programs and activities free from discrimination on the bases of race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility, or if you desire further information please write to ADF&G, P.O. Box 25526, Juneau, AK 99802-5526 or O.E.O., U.S. Department of the Interior, Washington DC 20240.

For information on alternative formats for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-4120, (TDD) 907-465-3646, or (FAX) 907-465-2440.

ABSTRACT

This report summarizes the results of research by the Division of Subsistence, Alaska Department of Fish and Game, on the patterns of fish and wildlife harvest and use in the community of Cantwell, located on the George Parks Highway corridor east of Denali Park and Preserve. Research for this project was conducted in April 2000 and covers the period from April 1999 through March 2000.

Census figures collected by the U.S. government put the 2000 population of Cantwell at 222, while the Division of Subsistence estimated a year-round population of 210 with a mean household size of 2.2 persons. Researchers interviewed 76 (79.1 percent) of the approximately 96 year-round Cantwell households. Almost 69 percent of the total adult population was employed, but only 46.6 percent of employed adults were employed year around. Employed adults worked an average of 9.3 months and held an average of 1.4 jobs. The average household income, derived from all sources, was \$39,184, while the average earned income was \$27,883.

For the study year Cantwell's total community harvest of wild resources was 27,599 pounds usable weight, or an average household harvest of 293 pounds, and a per capita harvest of 135 pounds (note, the average per capita harvest of subsistence foods in rural Alaska is 375 pounds. In urban Alaska it is 22 pounds). Moose made up the largest component of the community's resource harvest as measured by edible weight (12,368 pounds; 44.8 percent of all resources). Households harvested on average 131 pounds of moose, or 60 pounds per capita. Caribou (3,698 pounds) and sockeye salmon (3,084 pounds) ranked second and third. Households harvested 39 pounds of caribou and almost 33 pounds of sockeye salmon. Other resources with a mean household harvest of 10 pounds or more were berries (15 pounds), king salmon (11 pounds), and hare (10 pounds).

In summary, the current research found that the harvest and use of wild resources played a significant role in the socioeconomic system of Cantwell and that these results were not that different from those reported by Stratton and Georgette (1984) and the Alaska Department of Fish and Game Community Profile Database (CPDB) of 111 pounds per capita and 324 pounds per household.

TABLE OF CONTENTS

List of Tables.....	iii
List of Figures.....	iii
Acknowledgements.....	iv
Chapter One: Introduction	1
Background	1
Purpose and Objectives	2
Methodology	2
Chapter Two: Environment, History and Local Concerns: Introduction.....	7
Environmental Setting	7
Historical Overview	8
Early History	8
Denali National Park.....	10
Local Concerns	12
The National Park	12
Four Wheelers and Snow Machines	14
Attitudes and Practices for Conserving and Protecting Resources.....	16
Subsistence	18
Summary	19
Chapter Three: Demography, Employment Characteristics and Monetary Income	21
Demography	21
Employment Characteristics and Monetary Income	25
Chapter Four: Resource Harvest and Use Patterns	31
Species Used and Seasonal Round	31
Harvest Quantities	31
Harvest Areas	39
Levels of Participation in the Harvest and Use of Wild Resources.....	48
Sharing and Receiving Wild Resources.....	50
Use and Harvest Characteristics by Resource Category	51
Salmon	51
Freshwater Fish	52
Regulations and Harvest Methods	52
Large Land Mammals	57
Moose and Caribou	57
Hunting Regulations for Moose and Caribou	59
Processing Moose and Caribou meat	63
Dall sheep.....	63
Other Large Land Mammals	65
Fur Bearers.....	67
Birds	67
Edible Plants and Wood	67
Marine Mammals and Marine Invertebrates.....	68
Chapter Five: Discussion and Conclusion	69
References Cited.....	76
Appendix A: Conversion Factors	77
Appendix B: Sample Survey Instrument	78

LIST OF TABLES

Table 1. Sample Achievement Cantwell 2000.....	6
Table 2. Demographic Characteristics of Households	22
Table 3. Population Profile	23
Table 4. Estimated Number of Residents Born in Various Locations	24
Table 5. Employment Characteristics	26
Table 6. Employment by Industry	27
Table 7. Community, Household, and Per Capita Income by Source	28
Table 8. Community, Household, and Per Capita Incomes, All Sources and by Employer Types	29
Table 9. Resource Harvest and Use Characteristics for the Community of Cantwell, 1999	32
Table 10. Estimated Harvest and Use of Fish, Game, and Plant Resources.....	34-37
Table 11. Estimated Number of Households Hunting and Fishing in GMUs	47
Table 12. Participation in the Harvest and Processing of Wild Resources	49
Table 13. Percentage of Households Harvesting Salmon by Gear Type and Species	54
Table 14. Estimated Salmon Harvest by Gear Type.....	55
Table 15. Estimated Harvest of Fish Other Than Salmon by Gear Type.....	56
Table 16. Reported Number of Road Kill and Confiscated Moose and Caribou Received by Households	58
Table 17. Estimated Number and Percentage of Households Using Various Preservation Methods for Large Land Mammals.....	64
Table 18. Estimated Number and Percentage of Households Using Various Parts of Large Land Mammals.....	66

LIST OF FIGURES

Figure 1. Map of the Cantwell Area	3
Figure 2. Population of Cantwell 1939-2000	21
Figure 3. Population Profile of Cantwell 1999.....	23
Figure 4. Seasonal Round.....	33
Figure 5. Composition of Wild Resource Harvests by Resource Category.....	38
Figure 6. Cantwell Subsistence Harvest Areas: Salmon, Vegetation and Freshwater Fish	41
Figure 7. Cantwell Subsistence Harvest Areas: Sheep and Furbearers	43
Figure 8. Cantwell Subsistence Harvest Areas: Bear, Moose and Caribou	45
Figures 9 and 10. Cantwell Moose and Caribou Hunts 1999: Type and Location of Hunt and Percent of Moose and Caribou Killed.....	60
Figure 11. Comparison of household and per capita harvests for Copper Center Mentasta, and Cantwell.....	71
Figure 12. Comparison of Harvest and Use of Wild Resources for Copper Center, Mentasta, and Cantwell	71
Figure 13. Composition of Household and Per Capita Harvests: Copper Center, Mentasta, and Cantwell	73

ACKNOWLEDGEMENTS

Thanks go to the people of Cantwell who allowed us into their homes, and to the Cantwell Tribal Council for supporting the project. Thanks also go to Marie Gore and LoAnn Smith, whose knowledge of the community and energy made the project a success. Don Calloway and Rachel Mason of the National Park Service provided support by conducting surveys and interviewing key people in the community. The Cantwell School provided a staging area to get the survey started. Appreciation also goes to Bob Gilberston and Bud Carlson who contributed information about the history of Cantwell.

CHAPTER ONE: INTRODUCTION

BACKGROUND

In 1983 the Division of Subsistence conducted research on the harvest and use of wildlife and fish resources in Cantwell, Alaska and the results of that research were published in Stratton and Georgette (1984). In 1999 the division was contacted by the National Park Service to update its research on Cantwell that, under Title VIII of the Alaska National Interest Lands Conservation Act (ANILCA), is recognized as a subsistence use community of the Denali National Park and Preserve. This report summarizes the results of research conducted in April 2000 on the uses of fish and wildlife resources by the residents of Cantwell. Under a cooperative agreement, the National Park Service provided funds for the project.

Located on uplands between the Alaska Range and Talkeetna Mountains, Cantwell is at the junction of the George Parks and Denali Highways (Figure 1). It is 211 miles north of Anchorage and 28 miles south of the entrance to Denali National Park. The area is noted for its abundant big game species, particularly moose, caribou, and Dall sheep. In the past the Denali Highway, which opened in the 1950s, provided road access to wild areas where anyone with a pickup truck could hunt. Over the years this area has become increasingly popular with urban-based hunters, who, with improvements in inexpensive all terrain vehicles (ATVs), are no longer confined to the narrow limits of the highway.

During interviews for this study many Cantwell residents said they have observed a decrease in almost every species of big game, as well as in the populations of freshwater fish and upland birds. To deal with this decline, and the pressure presented by increasing numbers of urban hunters, Cantwell residents have refocused their hunting efforts away from the Denali Highway to the Denali National Park and Preserve, and especially the drainages of the Bull River and Cantwell Creek.

PURPOSE AND OBJECTIVES

This report has three purposes: 1) describe the socioeconomic, demographic, and historical characteristics of Cantwell; 2) document the hunting and fishing patterns of the residents of

Cantwell; and 3) report mapped information on areas used for hunting and fishing by residents of Cantwell.

Research objectives included collecting the following information for all households with year around residents in Cantwell:

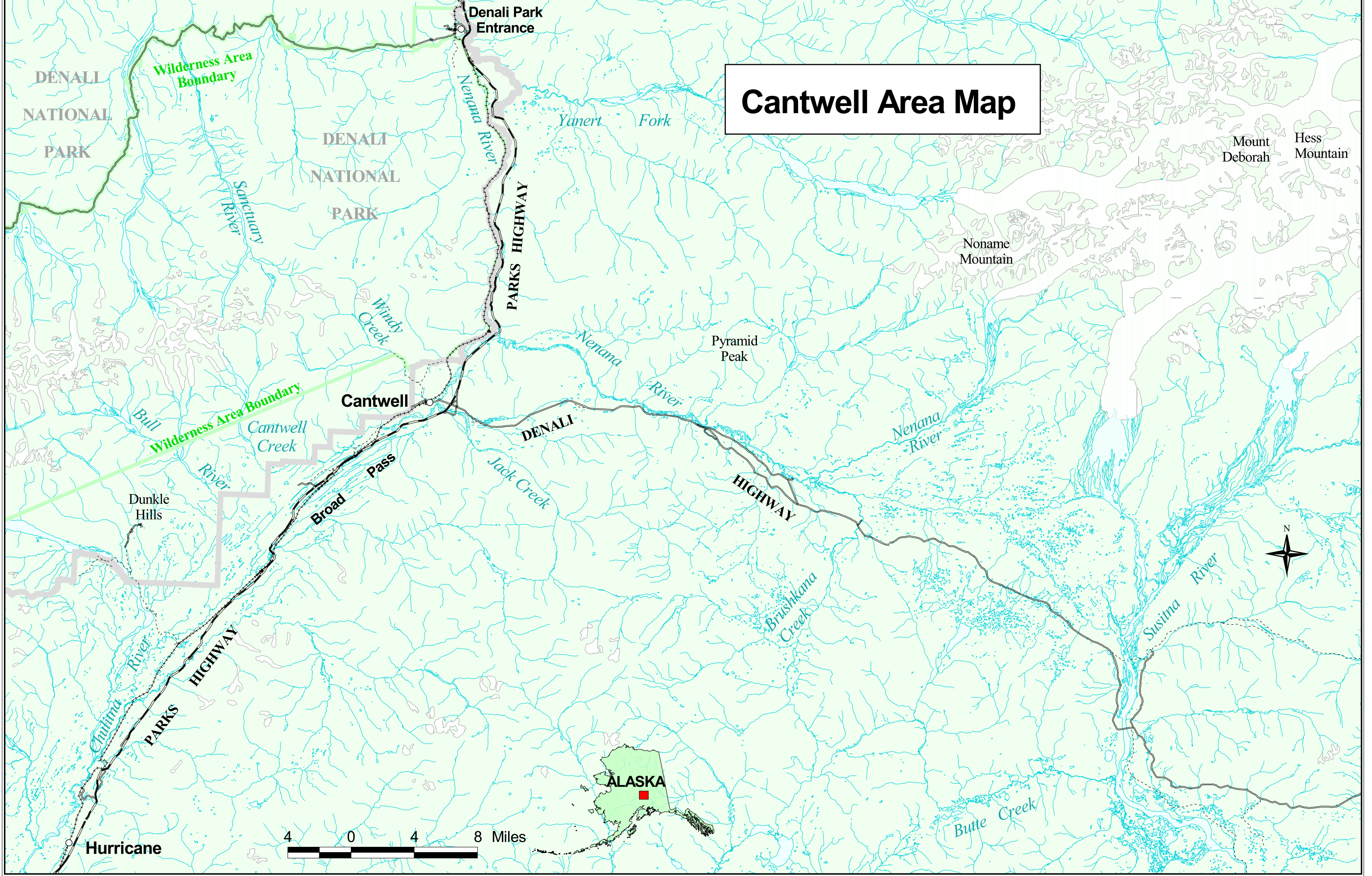
- Estimate the harvest of fish, game, and wild plants for a 12-month study period for April 1999 through March 2000.
- Estimate the level of participation in hunting and fishing activities of household members
- Collect demographic data on household size, ethnicity, age, and length of residency
- Document employment patterns for each adult in the sample, including number of months employed by job during the study period and location of cash employment;
- Estimate household monetary income provided by each job and other sources of income; and
- Map resource harvest areas used while residing in Cantwell.

METHODOLOGY

The study was conducted in cooperation with the Native Village of Cantwell and the National Park Service (NPS). Through a subcontract with ADF&G Division of Subsistence the Native Village hired two technicians, Marie Gore and Loann Smith, to adminstister the surveys. Personnel from the NPS, Rachel Mason and Don Callaway, and the project leader (William E. Simeone) also conducted some of the surveys.

With the help of the two local assistants, the project leader developed a list of households in the community. Households were identified through a map supplied by the Alaska State Department of Natural Resources and the local telephone directory. One of the local assistants had just completed working on the 2000 federal census so she had extensive knowledge of the

Cantwell Area Map



4 0 4 8 Miles

location and disposition of households in the community. The initial listing of households was based on the number of housing units, however only households establishing their primary residencies in the study area were included in the sample. There were an estimated 150 inhabitable structures in the community, 56 were vacant leaving 94 households occupied. We interviewed 74 or 78.7 per cent of households and conducted ten key informant interviews, seven of which we mapped for their lifetime use areas (Table 1).

Data gathering techniques included a brief review of the literature, administering a household survey instrument, conducting key informant interviews, and mapping of lifetime use areas. The household survey instrument included questions on the household size and demographic structure, kinds of wild resources used and amounts harvested and income, and employment. Also on the survey were questions about the intergenerational transmission of knowledge and what parts of the animal people used after the animal was harvested. The surveys were administered in person by the researchers. As each individual was contacted, frequently at their place of residence, they were informed that participation in the survey was voluntary and that their identity would be kept confidential.

Members of the study team also conducted key informant interviews with local residents who had lived in the area for an extended period of time. We also mapped the lifetime hunting and fishing areas for seven households whose members had lived in the area since the 1920s. Interviewees indicated their resource harvest areas on clear mylar overlaid on USGS maps of a scale of 1:250,000. The interviewees drew circles around areas they used for hunting, fishing, and gathering since they began to live in Cantwell. Mapping categories included: moose, caribou, black bear, sheep, furbearers, salmon and other fish, birds, and wild plants and berries.

Table 1. Sample Achievement

	Cantwell
Number of Dwelling Units	150
Interview Goal	94
Households Interviewed	74
Households Failed to Contact	12
Households Declined to be Interviewed	8
Moved/Seasonal/Non-Resident Households*	56
Total Households Attempted to Interview	94
Refusal Rate	9.76%
Final Estimate of Permanent Households	94
Percentage Interviewed	78.72%
Interview Weighting Factor	1.27

* Non-resident households are households which were not present during the study year or which were resident less than the required number of months.

CHAPTER TWO: ENVIRONMENT, HISTORY and LOCAL CONCERNS

INTRODUCTION

This chapter begins with a synopsis of the environmental setting and includes a brief historical sketch of Cantwell and Denali National Park. It also includes information collected from key informant interviews conducted with residents about National Park Service policies, the use of all terrain vehicles, and people's concerns about wildlife and habitat conservation. Unlike the harvest surveys, information collected about these topics was not collected on a systematic basis using a protocol.

ENVIRONMENTAL SETTING

Cantwell is located on the uplands situated between the central Alaska Range and the Talkeetna Mountains. In fair weather residents have a spectacular view of Mt. McKinley to the southwest. South of town is Broad Pass, elevation 2,300 feet, and to the north is the Nenana River canyon, which provides a corridor through the Alaska Range for both the Alaska Railroad and the Parks Highway. The climate is continental, characterized by relatively warm summers and long, cold, dark winters. Temperature extremes have been recorded from -54 F. to +89 F. degrees. Average annual snowfall is 78 inches.

Cantwell is located just below the tree line. In town are spruce and birch trees with an understory of alder, high bush and low bush cranberry, blue berry, and Labrador tea. On the surrounding hills the timber turns quickly to high brush, dwarf birch, alders and scattered spruce, and then disappears into alpine tundra.

The uplands around Cantwell have always been noted for big game. Today moose are fairly common and during the winter can be seen browsing in the alders in and outside of town. Caribou also occasionally migrate through the area and there are black and brown bears, wolves, and wolverine. At higher elevations live bands of Dall sheep. Salmon are not found in the immediate vicinity of Cantwell, but in the streams and lakes around Cantwell there are rainbow and lake trout, grayling, burbot, and whitefish. A variety of small animals inhabit the area including snowshoe hare, porcupine, beaver, land otter, mink, marten, weasel, coyote, and

red fox. Spruce grouse and ptarmigan are fairly common and during the spring and fall migratory waterfowl move through the area.

HISTORICAL OVERVIEW

Early History

The first identifiable people to live in the area were an Athabascan speaking people called Ahtna. The geologists Fred Moffit (1915:20) noted that Ahtna from the upper Susitna River basin spent a large part of the year hunting in the Broad Pass area, on Jack Creek, the Yanert Fork of the Nenana River, and the area around Valdez Creek. In 1903 gold was discovered on Valdez Creek and a small community of miners and Ahtna gathered to form the first relatively permanent settlement in the area. Eventually Ahtna from Valdez Creek settled in Cantwell, where their descendents live today.

In 1916 Cantwell was established as a construction camp for the Alaska Railroad and soon after became a jumping off point for miners and freight going to the Valdez Creek mine. In 1919 John Carlson and Jack West built a store at Cantwell, which they operated for prospectors, miners, and trappers working in the area. The geologist Stephen R. Capps visited Cantwell in the late 1920s and reported a roadhouse and store. By 1936 there was a landing field where an airplane was stationed throughout the summer (Tuck 1938). The population in 1939 was 17, but had swelled to 67 in 1950. The increase was due, at least in part, to an influx of Ahtna families who moved from Valdez Creek to Cantwell to work as laborers on the railroad. Both men and women worked on the section crews and since the work was steady most settled permanently in Cantwell and eventually retired from the railroad there.

Before the construction of the Denali Highway it took 3 days to cover the 55 miles from Valdez Creek to Cantwell. The rough trail was gradually improved and between 1927 and 1929 the Alaska Road Commission built at least three shelter cabins along the trail (Dessauer and Harvey 1980:44). In 1930 the commission built a bridge over Brushkana Creek and in 1951 began construction of the Denali Highway. The road was completed in 1957 and provided the only

road access to Cantwell and Denali National Park until the completion of the Parks Highway in 1971.

Old Cantwell had been oriented toward the railroad. Following the completion of the Parks Highway the community reoriented itself toward the highway and in the process began to spread out. While a few people still reside near the railroad, almost all of the businesses, including a restaurant, two gas stations, a bed and breakfast, and the post office are now located at the intersection of the Parks and Denali Highways. This area, called “downtown,” also includes a number of residences, the offices of the Native Village of Cantwell, and a large parking lot built to accommodate recreational vehicles driven by tourists. A second group of homes, referred to as Cantwell Heights, is located three miles from the highway in a relatively new subdivision that is on the west side of the railroad tracks. A third group of houses, called the Drashner Subdivision, is located on a lake three miles up the Denali Highway. More homes are dispersed along the Parks Highway between mile 207 and mile 217 and along the first three miles of the Denali Highway.

In 1921 the U.S. government established a commercial reindeer herd in the Broad Pass region and drove 1,162 reindeer across country from the village of Goodnews Bay to Cantwell. The open country in Broad Pass and around Cantwell was considered to be good grazing land for reindeer. Later the government estimated that within the region there was 5,590,00 acres of grazing land with a carrying capacity of 100,000 reindeer (Luick 1973: 18). It was thought the railroad could be used to transport meat and hides to the south. The herd attracted tourists and in 1923 a movie called “Lure of the Yukon” was made in and around Cantwell. However, the herding project encountered a number of problems from the start. There was little government support, so herders tended to take higher paying jobs on the railroad; reindeer were lost to predators, especially wolves; and many of the animals simply wandered off and joined roving herds of caribou. In 1928 the government withdrew its support altogether and turned the herd over to the Cantwell Reindeer Company which lasted only three months. The reindeer were left to fend for themselves and eventually assimilated into the local caribou herds.

In 1968 a reindeer research station was opened in Cantwell. Initially the station was under contract to the U.S. Atomic Energy Commission to study the passage of fallout from radionuclides through Arctic and subarctic food chains (Luick 1976: 90). Later the station undertook research in direct support of the reindeer industry and was the only facility in the world devoted to the basic physiology and metabolism of reindeer (ibid. 91). The research station closed sometime in the 1980s.

Denali National Park

The central Alaska Range seems to have always been a paradise for hunters. The Ahtna called the Valdez Creek area *C'ilaan Na'* or 'a lot of game is present place' (Kari 1983:66) and the conservationist Belmore Browne referred to the entire region as the "fountain head of the game supply south of the Yukon and west of the Tanana River..." (cited in Kauffman 1954:2). Travelers commented especially on the herds of caribou and the numerous bands of Dall sheep that dotted the higher elevations. At the beginning of the 20th century the area drew two very different groups, market hunters and conservationists.

Hunting was one of the only ways for the growing population of interior Alaska to secure fresh meat. The primary market for fresh meat was the town of Fairbanks, which by 1905 had a population of 8,000 people. The amount of game consumed by Fairbanks residents was considerable. For example in November of 1907 one hunter shipped almost six thousand pounds of caribou and the geologist Stephen Capps estimated that hunters provided between 1,500 and 2,000 mountain sheep to the Fairbanks market every winter (Rawson 1994:22, 25). But this was only the tip of the iceberg. In 1914 construction crews began laying track for the Alaska Railroad, which ran from Anchorage to Fairbanks, and right through the heart of big game country. To feed the construction crews managers hired hunters to supply the railroad camps with fresh meat thus increasing pressure on the game resources that had already absorbed the demands of the growing population of Fairbanks (ibid:20).

Charles Sheldon was an ardent conservationist, big game hunter, and member of the Boone and Crockett Club. In 1906 Sheldon came to the central Alaska Range drawn by the reports of game, and especially mountain sheep, which was his particular interest. Enthralled with what he

found, Sheldon was also alarmed that market hunters would quickly decimate the game populations. To staunch this possibility, Sheldon proposed the creation of a park as a game sanctuary and in 1908 made a proposal to his fellow members of the Boone and Crocket Club. The idea stalled initially, in part because national conservationist groups were able to strengthen hunting regulations that reduced the “wholesale slaughter” of game in Alaska (Brown 1991:87). But in 1912 Congress made Alaska a territory and attached to the legislation was a rider creating the Alaska Railroad Commission. Fearing the effects of increased market hunting to supply railroad workers, and the effects of new development spurred by the railroad, Sheldon and a consortium of national conservation groups convinced Congress to establish Mount McKinley National Park, and in 1917 legislation was passed creating the park.

To begin with the park covered 2 million acres but the boundaries were altered in 1922 and again in 1932 so that eventually the eastern boundary rested on the west bank of the Nenana River (Pearson 1953:33). The park boundaries were created both to protect prime animal habitat and to avoid conflict with the mining industry. As a result the original park boundaries exclude areas that were under development and areas that had development potential. Mining was also allowed within the park and Congress specifically authorized hunting within its boundaries for miners and prospectors who could kill game for their own use, provided they did not sell it, remove it from the park, or waste it (Washburn 1951:80, cited in Pearson 1953:33). Most miners apparently ignored the regulations and seldom bothered to obtain a hunting permit so by the end of the 1920s NPS developed new regulations that excluded any hunting within the park (Catton 1997:218).

Under the Alaska National Interest Lands Conservation Act (ANILCA) of 1980, the park was expanded to 6 million acres and came to include three different land classifications. First there is the original park, which NPS classifies as Wilderness, and is referred to locally as the “hard park.” Under ANILCA no hunting is allowed in the wilderness or “hard park.”¹ Then there are the ANILCA Additions. These include land classified as either Park or Preserve. Under section 801 of ANILCA communities located in the vicinity of a National Park in Alaska are recognized in the Code of Federal Regulations as part of a “National Park Service area” and

¹ The National Park Service is also trying to eliminate snow machines from the wilderness.

designated as resident zone communities. The residents of these communities are allowed to hunt within the ANILCA Additions of Denali National Park. That is, they are allowed to hunt on lands designated as Park or Preserve but not on lands designated as wilderness. Other Alaska residents, however, who are not members of the resident zone communities, are only allowed to hunt on National Preserve Lands. In addition to creating resident zone communities, Title VIII of ANILCA also called for the creation of subsistence resource commissions to devise a subsistence hunting program for areas of the park where hunting was authorized.

LOCAL CONCERNS

The National Park

Denali National Park has four resident zone communities: Cantwell, Nikolai, Lake Minchumina, and Telida. Under ANILCA members of these communities can pursue subsistence activities on land that are called the ANILCA Additions. This includes land that is designated as Park or Preserve, but not lands designated as Wilderness. In the vicinity of Cantwell there are no ANILCA additions designated as National Preserve, there is only land designated as National Park. However, when discussing those ANILCA additions near their community most people in Cantwell refer to them as the “monument” or the “preserve.”

Despite the provisions of ANILCA the expansion of the park did not sit well with some residents of Cantwell and there were vocal demonstrations against the expansion, including some serious threats of violence. As one person interviewed for this project remarked, everyone had learned to live with the old park and had realized its importance. Expanding the park was viewed as an infringement on local freedoms based on an agenda driven by eastern environmentalists who had no understanding of, or sympathy with, local concerns. One person put it this way: “One of the problems that the park has, and you see it so commonly in the environmental movement, is the fact that somehow human beings are not part of the ecology. Ecology is for trees, bugs, and bears.”

Another problem is the NPS policy of ecosystem management that creates a situation in which the park, at least in some people's view, is always trying to expand its influence, even beyond the boundaries of the park. As one respondent remarked:

I think the park service has a real bad problem with this expanding area of concern. And that makes me very nervous because they apparently can't be content with what they have. And they can always find an area where, well ya, the bumble bees down here actually live over here a part of the year so we need to have some control on the other side of the line because they are our bumble bees. But they are just going to have to accept the fact when they are over on that side of the street they are someone else's animals. NPS objectives are so opposed to those communities that are outside of the park.

Today, while most Cantwell residents have come to accept the park's expansion, many seem ambivalent about the situation. For many residents the provisions in ANILCA that allowed subsistence hunting within the new park boundaries are welcome because they give them an advantage over urban hunters who are not allowed to hunt within the park. One resident put it this way:

[It is] important for us to have the ability to hunt, pick berries, and so forth in the monument/new park because of all the competition in the rest of Game Management Unit 13E from out-of-town hunters (non-locals). And rural preference should be given to rural people over city folks for hunting/fishing because we depend on it.

Other residents echoed this sentiment. One person said "Too many people not from around here are hunting and making it difficult for local hunters. They're using up our resources. The reason I got meat last year was because of illegal kills by non-locals" [meat confiscated from hunters because of illegal hunting]. On the other hand, one resident noted ironically that ANILCA did not really provide the community with anything since these areas were available to local hunters before ANILCA.

Although the ANILCA provisions have provided Cantwell residents with an advantage, several were quick to note that there are problems with the park boundary. Private land abuts the National Park boundaries and hunting on this land is regulated by the State of Alaska while the federal government regulates hunting on the other side of the line. Non-local hunters are not allowed to hunt on federal land. As one Cantwell resident noted, "the preserve/monument [park] boundary line needs to be properly marked and mapped. Even the enforcement officials

have a hard time distinguishing it. The preserve is our backyard and our traditional hunting and gathering area of choice.” Another person said the

State says the boundary is one place, but no one can tell.... People have moved [their hunting] from [the] Denali Highway to [the] new park, where there’s game and much less competition. [We] have real concerns with camps set on the boundary of new park - people from Glennallen, Wasilla – we had to get the park to maintain the boundary.

Uncertainty over the exact location of the park boundary has caused problems with enforcement as hunters claim they killed game in the park while state enforcement officers claim it was killed on private or state land. “The Fish & Game” one person said, “need to be better equipped with the knowledge of the boundaries and the area of which they are enforcing. [There are] concerns that the locals are being harassed.”

There is also the view that Cantwell is not wilderness and therefore the park and adjacent lands should not be managed as though they were wilderness. For example, some Cantwell residents interviewed for this project believe NPS should not try and destroy all evidence of human activity within park boundaries. They believe that although visitors come to Denali to see animals, they do not mind seeing human ruins. Instead of managing the park as wilderness NPS should manage it like an attraction such as Disney Land.

Four Wheelers and Snow Machines

Although some Cantwell residents may not think of themselves as living in wilderness, there are huge open tracks of land surrounding the community that attract recreational users from Fairbanks, Anchorage, and the Matanuska/Susitna Valley. The Denali Highway has attracted big game hunters since it was opened in the 1950s because it is one of the few “remote” areas accessible by automobile. As one resident remarked, the Denali Highway has always been a highly hunted area because it is accessible to “the guy in the pickup truck.” Snow machines and four wheelers have increased accessibility. In the fall hundreds of hunters from Fairbanks and Anchorage drive four wheelers into the hills searching for caribou and moose. In the late winter and spring hundreds more visit the area to ride snow machines. Many of these people drive campers or mobile homes up the Parks Highway, park in one of the many turnouts and camp for the weekend, while others stay at facilities in Cantwell. The season for riding snow machines

lasts well into April or even early May; when all the snow has melted in Anchorage there is often still good riding around Cantwell.

Transporting meat from the kill site to camp or home has always been a problem for hunters. Ahtna hunters often moved their families to the kill site or they used dogs to haul the meat. Later horses were used. After World War II people used surplus military vehicles and commercially made all terrain vehicles or ATVs. The first off the road vehicles to be used in Cantwell were surplus military tracked vehicles called Weasels. These were used occasionally to hunt moose but more often to haul meat out of remote locations. Some of the areas where Cantwell people hunted with ATVs were the Dunkle Hills, Pyramid Mountain, Bull River, and Windy Creek up to the National Park boundary, and Cantwell Creek (see map on page 2). However, not too many people could afford an ATV, so most hunters hunted on foot and if they were successful borrowed a vehicle to haul out their meat.

The use of off the road vehicles increased greatly in the late 1970s with the introduction of the three-wheel and then four-wheel ATVs. Now, according to one resident, the four-wheeler is the preferred vehicle for many hunters, although not all local people use them. While popular, four-wheelers have drawbacks in the eyes of some residents. One household commented that from the air the impact of ATVs on the environment is noticeable, and this is especially true along the Denali Highway. They believe there has been a huge increase in hunting pressure from urban hunters who use four wheelers, and that damage from four wheelers has increased precipitously during the last 10 years. This household is also of the opinion that outsiders, including those who ride snow machines, show little respect for the people who live here all year. “Urban residents from Anchorage and Fairbanks are the culprits,” they said. They support closing ATV access in the preserve and the park and note that even local Cantwell residents, who depend heavily on the park, are having a hard time obtaining moose.

Another person was very adamant that the NPS do more to keep four-wheel drive trucks out of the park. He noted these trucks with their big tires are tearing up the countryside, especially when they get stuck. He sees the damage they do. Generally four wheelers and snow machines are OK, but even here this person supports the park superintendent’s ban on snow machines,

and noted that he would say this publicly. A survey respondent summed up the problems with ATVs and urban hunters this way:

This area is terribly over hunted by [people from] Fairbanks, and Anchorage. You don't dare drive on the Denali Highway because it's a war zone. Locals are concerned about safety. I witnessed disgusting caribou hunt – non-locals line up waiting for the season to begin. Locals don't abuse.... You see ATVs everywhere now. Technology has caused people to go further than ever. There's one area on the Denali Highway (Clearwater) that's allegedly non-motorized. They catch a lot of ATVs there. I wish the NPS would be really strict and watch their boundaries a little better. Beef up signage and patrols. Even the locals are complaining.

Attitudes and Practices for Conserving and Protecting Resources

As noted several times, hunting pressure from urban residents is a major concern among Cantwell residents. Many people interviewed for this project believed that both fish and game populations have declined and people are very concerned about the future. One person noted that Cantwell was in a unique situation because it was on the road system and that because of pressure from urban hunters locals have taken to hunting in the park.

[I] have noticed a severe decline in game on [the] Denali [Highway] since 1988. [I] would see 50-60 cow moose, but few bulls. Seems to be over hunting. [There is] unique pressure because of road access, which the rest of Alaska doesn't face. Use four-wheelers in fall to hunt moose - hunt on foot, transport meat with four-wheeler two track vehicles. Past two years [I] have gone into Bull River [to hunt].

One respondent provided an overview of his concerns about game management and conservation in the area. He pointed out that until the development of efficient, affordable ATV's most of the hunting pressure was concentrated along the Denali Highway. With the advent of four-wheelers hunting pressure has been more dispersed over the landscape. This person also believed that the state does not invest enough in game management as compared to other states. He said,

It's silly to me. It's one of our really big assets. We haven't got much else going for us and the state spends very little money on game management. Game Management Unit 13 is the size of the State of Rhode Island, you know and you got two biologists, and those guys go for a year or two before they get to this end of it. So how are they going to know what's going on out here. We do people management.

The solution, in this person's opinion "is money, more money for biologists and aircraft."

When asked why harvest levels are not higher in Cantwell this person said it was a self-imposed conservation on the part of many residents and he then drew a distinction between environmentalists and conservationists.

It's an old attitude from the environmental green perspective, every hunter is a wanton slaughterer of wildlife, and that's not true. People who have lived, depended on natural resources, part of their heritage is that you have to leave some behind. It's just like farming, and the trappers know this, if you trap an area out you have to move some place else or you can't make a living, and the same way with hunting.

Another person expressed the opinion that wildlife was being managed more for the tourists than for people who actually depend on it and that the government [in particular the National Park Service] needs to listen to local people as to the management of wildlife resources.

I think that it is unfortunate that the wildlife is being managed to create a misrepresentation of Alaskan wildlife to the tourists. They in turn criticize the subsistence lifestyles that actually use and manage the wildlife for use. I think the government is throwing off the balance of the wildlife with their ways of controlling things and need to rely more on the tried and true practices of the traditional ways and the findings of the biologists and local advisory boards. It is a hassle and can be confusing having to have the right tags for the right area, and it is sometimes enforced to the point of what I believe could be categorized as harassment.

Other households voiced a concern over the decline in game populations. Members of one household said they were strongly of the opinion that moose and caribou had decreased considerably both in abundance and distribution during the last 20 years, and these decreases are particularly noticeable from the air. Another household said they are concerned that wildlife in the area will not support the hunting pressure, "there is not enough animals if everyone wants to take one." They support rural preference in the allocation of wildlife resources. Another solution suggested by someone else was to close the Denali Highway to hunting for a few years, relieve the pressure and let the animals rebound. The person also favors predator control, and said there are "so many wolves and bears they wipe out the calf crop." Another said [there is a] "Need to do something about [the] moose population, which is down, the result of road/railroad

kill. Opening day [there are] 11,000 hunters. Political pressure won't allow people to close it - have to do something. [Do not] License a general public moose hunt.”²

Not everyone agreed that game populations were down. One person thought moose and caribou were doing OK and noted that during the winter of 1999-2000 a couple hundred moose had wintered in and around Cantwell. This person also said that wolves are not a problem in the immediate area. Most of the wolves, he said, are located in the Yanert Basin. This same person said that trout and grayling are getting scarce now. “Back about 40 years,” he said “no matter what creek you go into you catch grayling. But now you go out and you’re lucky to get one or two... In the old days, [there were] probably thousands, you drop your line in the water you got fish. Every one of these streams, like Jack Creek and Fish Creek used to be real packed.”

Another lifetime resident commented that he no longer hunts spruce grouse, since their population has been down for nearly 25 years, and he is letting the population build back up. Another resident harvested a caribou this year in 13E (outside the preserve) but has not hunted moose since 1985. He discontinued hunting because he noticed a decline in their population and had alternative access to other meat.

Subsistence

Opinions about subsistence were collected in the course of conducting harvest interviews. Those who did express an opinion about subsistence seemed to agree that, as one person put it, “This community sustains itself on people passing meat back and forth. I think subsistence is absolutely essential to the area.” A number of people elaborated on the theme that subsistence was necessary for rural people. There was the practical view, expressed by so many rural residents, that “We don't have Safeway, Carrs, or Fred Myer where we live. Our grocery store is here where we choose to live.” And there was the appeal to tradition.

Tradition is a way of life, as is subsistence, and a way of life that works in balance with [pause], after all it's way of life [that] has been passed from generation to generation, and all has been good, how many laws have been passed only to be changed or done away with, because they didn't work? How many laws are still being used hundreds of years later?

² According to harvest permit data collected by ADF&G in 2000 there were 2,197 non-local hunters who hunted for moose, and 1,686 that hunted for caribou, in GMU 13E. See pages 56 and 57 for data on the number of local hunters.

There was also the view that urban hunting should be curtailed in favor of rural subsistence users and that the only reason there are problems with wolves is because urban hunters demand more game.

Subsistence hunting should ONLY be for those who want it and need and use it. I feel that the trappers are having to manage the wolves because of the sport hunters who come to kill. We wouldn't have to manage the wolves if ONLY the true subsistence hunters were harvesting large game. There would be plenty for subsistence users and the wolves. I feel true subsistence hunters shouldn't have to hunt in specific seasons, but instead whenever they need it. We need to shut down the sport hunters who hunt to kill and waste.

This view was echoed by another resident who said that

Rural areas should have subsistence priority. I don't feel they should allow the military subsistence hunting or fishing. I think more land should be closed to motorized hunting. There should be a season or an area for traditional non-motorized hunting. Spike fork or 50" regulation SHOULD BE ABOLISHED because it is causing waste. Trophy hunting should be closed to allow herd development. Our wolf management program is ineffective. First time hunting license recipients should have to attend a hunters' safety course.³

Summary

Cantwell residents feel squeezed between urban Alaska and the National Park Service. Pressure from urban hunters has, according to local residents, caused game populations to dwindle, especially in areas that were once traditionally used by the residents of Cantwell. As a consequence many Cantwell residents now hunt almost exclusively on National Park lands, which are closed to urban residents. As members of a resident zone community Cantwell residents can conduct subsistence activities on land added to Denali National Park under ANILCA. Cantwell residents are also concerned about the effect of ATV and snow machine traffic on the landscape and some local people have gone so far as to advocate restricting the use of ATVs.

³ In some Game Management Units hunters are only allowed to kill moose with antlers that have a spread of 50 inches or more. Likewise, in some GMUs hunters are only allowed to take a moose if it has one antler on either side that is a spike, i.e., has one point.

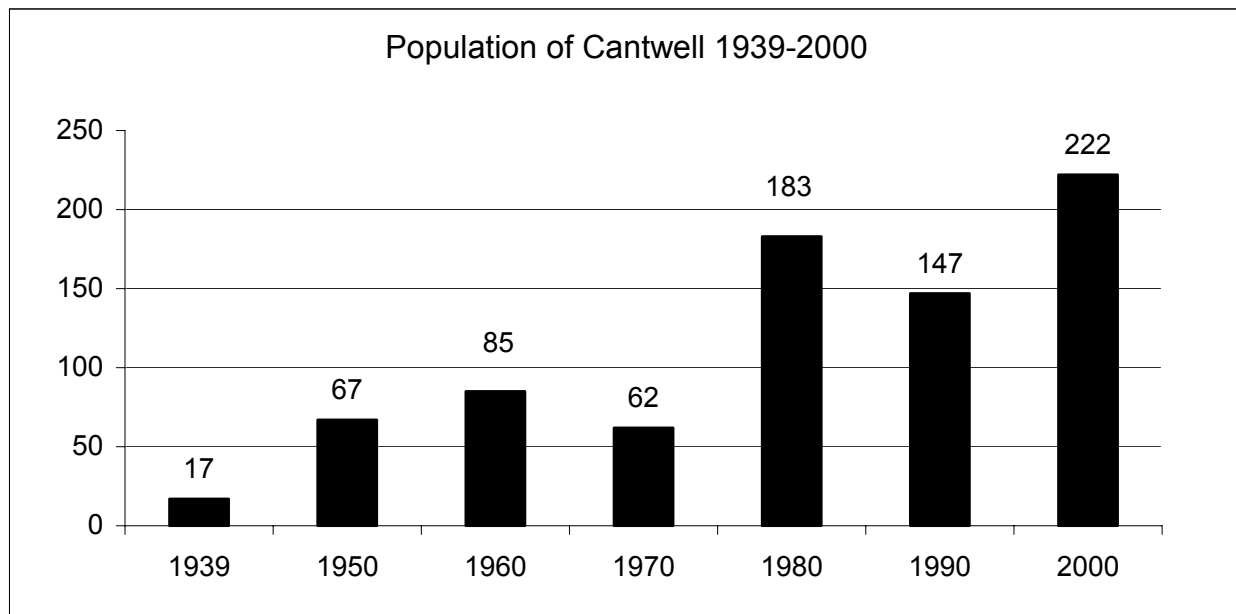
Cantwell people feel that, in contrast to urban dwellers, they depend on wildlife for food and have a tradition of subsistence hunting and fishing and providing for their families. There is the attitude that neither the State of Alaska nor the federal government is interested in Cantwell but more interested in satisfying external constituencies, particularly sport hunters and environmentalists. Cantwell residents view themselves as stewards of the land who have knowledge that could be utilized in making management decisions. This idea conflicts with agency ideas that management should be left to professionals who have a broader knowledge of the environment and ecosystem dynamics. The concept of ecosystem management worries some local people because it appears to them to be an excuse used by the National Park Service to extend its influence beyond the park boundaries and create more environmental regulation. At the same time people worry that the NPS is trying to preserve wilderness by eliminating any human activities or any traces of human activity within the park boundaries.

CHAPTER THREE: DEMOGRAPHY, EMPLOYMENT CHARACTERISTICS and MONETARY INCOME

DEMOGRAPHY

Figure 2 provides a population history of Cantwell from 1939 to 2000 (Rollins 1978; Alaska Department of Labor 1985, U.S. Census 2001). The Division of Subsistence estimated a population of 210 with a mean household size of 2.2 persons.

Figure 2. Population of Cantwell 1939-2000



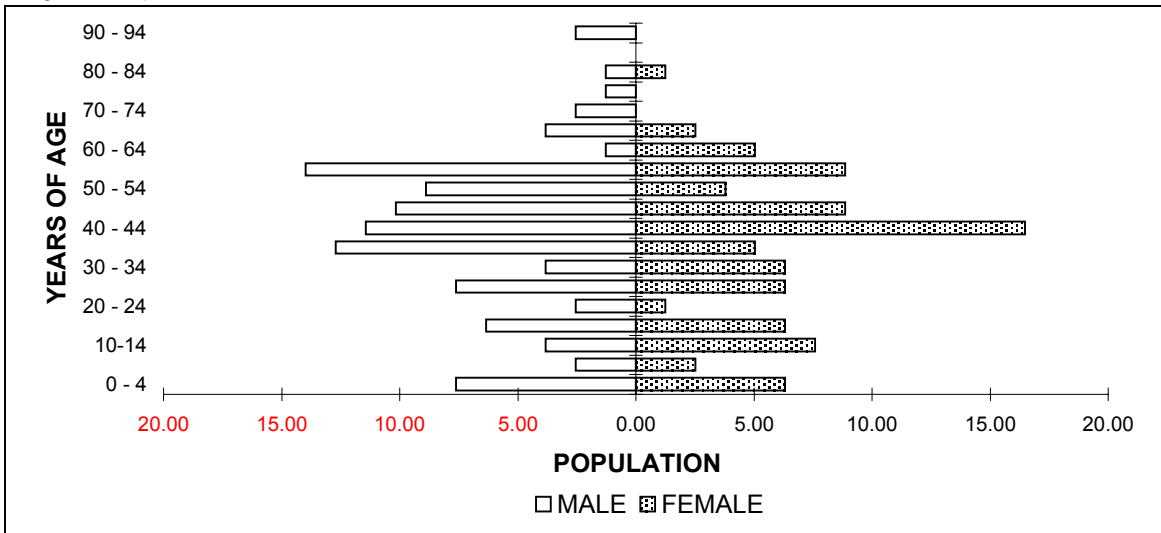
In 2000 the estimated population of Alaska Natives in Cantwell was 41, or 19 percent of the total population, which is three percent more than in 1983 (Stratton and Georgette 1984:177). The mean length of residency in Cantwell for all residents was a little over 16.5 years while the length of residency of heads of households was 19 years (Table 2). Note that mean length of residency in 1999 was no different than in 1983 (Stratton and Georgette 1984). Figure 3 and Table 3 show the age and sex structure of the community. In Cantwell, 53.9 percent of the population was male and 46.1 percent was female. A preponderance of the population was composed of several age groups. Most males were in the age groups: 35-39, 40-44, 45-49 and 55-59. Most females were in the 40-44, 45-49 and 55-59 age brackets. Just over 50 percent of Cantwell residents were born in the lower 48 states while 15 percent were born in Cantwell (Table 4).

Table 2. Demographic Characteristics of Households, Cantwell, 1999

Sampled Households	74
Number of Households in the Community	94
Percentage of Households Sampled	78.72
Household size	
Mean	2.23
Minimum	1
Maximum	5
Sample Population	165
Estimated Community Population	209.59
Age	
Mean	38.94
Minimum	0.14
Maximum	94
Median	41.43
Length of Residency - Population	
Mean	16.73
Minimum	0.25
Maximum	75
Length of Residency - Household Heads	
Mean	19.01
Minimum	0.25
Maximum	75
Sex	
Males	
Number	113.05
Percentage	53.94
Females	
Number	96.54
Percentage	46.06
Alaska Native	
Households (Either Head)	
Number	16.51
Percentage	17.57
Estimated Population	
Number	40.65
Percentage	19.39

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

Figure 3. Population Profile, Cantwell, 1999



SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 2000

Table. 3 Population Profile, Cantwell, 1999

AGE	MALE			FEMALE			TOTAL		
	NUMBER	PERCENT	CUM. PERCENT	NUMBER	PERCENT	CUM. PERCENT	NUMBER	PERCENT	CUM. PERCENT
0 - 4	7.62	6.74%	6.74%	6.35	6.58%	6.58%	13.97	6.67%	6.67%
5-9	2.54	2.25%	8.99%	2.54	2.63%	9.21%	5.08	2.42%	9.09%
10-14	3.81	3.37%	12.36%	7.62	7.89%	17.11%	11.43	5.45%	14.55%
15 - 19	6.35	5.62%	17.98%	6.35	6.58%	23.68%	12.70	6.06%	20.61%
20 - 24	2.54	2.25%	20.22%	1.27	1.32%	25.00%	3.81	1.82%	22.42%
25 - 29	7.62	6.74%	26.97%	6.35	6.58%	31.58%	13.97	6.67%	29.09%
30 - 34	3.81	3.37%	30.34%	6.35	6.58%	38.16%	10.16	4.85%	33.94%
35 - 39	12.70	11.24%	41.57%	5.08	5.26%	43.42%	17.78	8.48%	42.42%
40 - 44	11.43	10.11%	51.69%	16.51	17.11%	60.53%	27.95	13.33%	55.76%
45 - 49	10.16	8.99%	60.67%	8.89	9.21%	69.74%	19.05	9.09%	64.85%
50 - 54	8.89	7.87%	68.54%	3.81	3.95%	73.68%	12.70	6.06%	70.91%
55 - 59	13.97	12.36%	80.90%	8.89	9.21%	82.89%	22.86	10.91%	81.82%
60 - 64	1.27	1.12%	82.02%	5.08	5.26%	88.16%	6.35	3.03%	84.85%
65 - 69	3.81	3.37%	85.39%	2.54	2.63%	90.79%	6.35	3.03%	87.88%
70 - 74	2.54	2.25%	87.64%	.00	0.00%	90.79%	2.54	1.21%	89.09%
75 - 79	1.27	1.12%	88.76%	.00	0.00%	90.79%	1.27	0.61%	89.70%
80 - 84	1.27	1.12%	89.89%	1.27	1.32%	92.11%	2.54	1.21%	90.91%
85 - 89	.00	0.00%	89.89%	.00	0.00%	92.11%	.00	0.00%	90.91%
90 - 94	2.54	2.25%	92.13%	.00	0.00%	92.11%	2.54	1.21%	92.12%
95 - 99	.00	0.00%	92.13%	.00	0.00%	92.11%	.00	0.00%	92.12%
100 - 104	.00	0.00%	92.13%	.00	0.00%	92.11%	.00	0.00%	92.12%
Missing	8.89	7.87%	100.00%	7.62	7.89%	100.00%	16.51	7.88%	100.00%
TOTAL	113.05	53.94%		96.54	46.06%		209.59	100.00%	

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 2000

Table 4. Estimated Number of Residents Born in Various Locations, Cantwell, 1999

Place of Birth	Estimated Number of Residents	Percentage of Residents
Birthplace Unknown or Unspecified	6.2	3.0%
Anchorage	3.7	1.8%
Anvik	1.2	0.6%
Cantwell	33.4	16.4%
Cohoe	1.2	0.6%
Fairbanks	2.5	1.2%
Glennallen	1.2	0.6%
Point Hope	1.2	0.6%
Seldovia	3.7	1.8%
Skagway	2.5	1.2%
Tanacross	1.2	0.6%
Kodiak Island	1.2	0.6%
Southeast AK.	4.9	2.4%
Other Alaska	27.2	13.3%
Other U.S.	107.6	52.7%
Foreign	4.9	2.4%

Source: Alaska Dept. of Fish and Game, Div. Of Subsistence, Household Surveys, 2000

EMPLOYMENT CHARACTERISTICS AND MONETARY INCOME

In Cantwell almost 69 percent of the total adult population was employed during the study year, but only 46.5 percent of employed adults were employed year around. Employed adults worked an average of 9.3 months and held an average of 1.4 jobs (Table 5). Note that in 1983 employed adults reported being employed only 6.6 months of the year (Stratton and Georgette 1984). Of those households interviewed for this project, 85.1 percent reported they held some employment in the study year and within each household an average of 1.4 persons had a job within the last 12 months.

A majority of employed Cantwell residents were employed by the government, or worked in retail trade, or services. For example, 41.2 percent of employed households reported they worked either for the federal, state, or local government. Twenty-eight point five percent reported working in services and 26.9 percent in retail trade. Other forms of employment reported by households included construction (22.2 percent), transportation, communications and utilities (19 percent) and manufacturing (12.7 percent) (Table 6).

The average household income, derived from all sources, was \$39,184, while the average earned income was \$27,883 (Table 8). The average per capita income from all sources was \$17,912. Sources of earned income included government employment (35.9 percent), followed by employment in transportation, communications and utilities (15.1 percent), construction (14.7 percent), services (22.2 percent) and retail trade (8.5 percent) (Table 6). Only 3.1 percent of households said they gained income from hunting and trapping and only 0.1 percent of community income came from these endeavors (Table 6). It should also be noted that 14 percent of households reported receiving income from pensions and retirement and that 9 percent of the total community income was derived from some type of retirement income. Sources of unearned income, in order of importance, included the PFD (95 percent of households), unemployment (30 percent), social security (15 percent), and Native corporation dividends (15 percent (Table 7).

Table 5. Employment Characteristics, Cantwell, 1999

All Adults		
Number		162.59
Mean Weeks Employed		27.74
Employed Adults		
Number		111.78
Percentage		68.75
Mean per Household		1.19
Jobs		
Number		158.78
Mean Jobs per Person		1.42
Minimum		1
Maximum		6
Months Employed		
Mean		9.32
Minimum		1
Maximum		12
Percent Employed Year-Round		46.59
Mean Weeks Employed		40.35
Households		
Number		94
Employed		
Number		80.03
Percentage		85.14
Jobs per Employed Household		
Mean		1.98
Minimum		1
Maximum		6
Employed Adults		
Mean		1.4
Minimum		1
Maximum		3
Mean Number of Weeks Worked		47.98

Source: Alaska Department of Fish and Game, Division of Subsistence,
Household Surveys, 2000

Table 6. Employment by Industry, Cantwell 1999

	Jobs	Households	Individuals	Percent of Income
Estimated Total Number	154	78	108	
Agriculture, Forestry, Fishing	0.8%	1.6%	1.1%	0.1%
Agriculture/Forestry	0.8%	1.6%	1.1%	0.0%
Agriculture	0.8%	1.6%	1.1%	0.0%
Forestry	0.0%	0.0%	0.0%	0.0%
Fishing, Hunting, Trapping	1.6%	3.2%	2.3%	0.1%
Hatchery/Enhancement	0.0%	0.0%	0.0%	0.0%
Commercial Fishing	0.0%	0.0%	0.0%	0.0%
Hunting/Trapping	1.6%	3.2%	2.3%	0.1%
Mining	1.6%	3.2%	2.3%	2.7%
Construction	12.0%	22.2%	15.9%	14.8%
Manufacturing	7.2%	12.7%	10.2%	0.4%
Cannery	0.0%	0.0%	0.0%	0.0%
Other Manufacturing	6.4%	11.1%	9.1%	0.4%
Logging/Timber	0.8%	1.6%	1.1%	0.0%
Transportation, Communications and Utilities	11.2%	19.1%	13.6%	15.2%
Trade	20.8%	27.0%	21.6%	8.6%
Wholesale	0.0%	0.0%	0.0%	0.0%
Retail	20.8%	27.0%	21.6%	8.6%
Finance, Insurance, and Real Estate	0.8%	1.6%	1.1%	0.0%
Services	17.6%	28.6%	25.0%	22.3%
Government	25.6%	41.3%	33.0%	35.9%
Federal	8.8%	15.9%	11.4%	8.1%
State	7.2%	14.3%	10.2%	19.4%
Local	9.6%	17.5%	12.5%	8.5%
Local Government	3.2%	6.4%	4.6%	0.7%
Local Education	6.4%	12.7%	9.1%	7.8%

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

Table 7. Community, Household, and Per Capita Income by Source, Cantwell, 1999

	Percentage Reporting	Other Income Community Total	Average Household	Per Capita
All Sources		\$1,062,330	\$11,301	\$5,068
Exxon Claims	0.00%	\$0	\$0	\$0
Aid to Families with Dependent Children	0.00%	\$0	\$0	\$0
Adult Public Assistance	3.00%	\$10,162	\$108	\$48
Exxon Damages	0.00%	\$0	\$0	\$0
Pension/Retirement	14.00%	\$333,319	\$3,546	\$1,590
Longevity Bonus	9.00%	\$32,900	\$350	\$157
Social Security	15.00%	\$162,645	\$1,730	\$776
Workman's Comp./Insurance*	1.00%	\$0	\$0	\$0
Energy Assistance	7.00%	\$2,421	\$26	\$12
Supplemental Security Income	0.00%	\$0	\$0	\$0
Food Stamps	3.00%	\$9,527	\$101	\$45
Unemployment	30.00%	\$97,500	\$1,037	\$465
Native Corporation Dividend	15.00%	\$13,973	\$149	\$67
Dividend/Interest	12.00%	\$34,094	\$363	\$163
Child Support	0.00%	\$0	\$0	\$0
Rental Income	3.00%	\$12,728	\$135	\$61
Veteran Disability	0.00%	\$0	\$0	\$0
Equipment Leasing	0.00%	\$0	\$0	\$0
Rental Assistance	0.00%	\$0	\$0	\$0
Fishing Permit Leasing	0.00%	\$0	\$0	\$0
Per Diem	0.00%	\$0	\$0	\$0
Disability	0.00%	\$0	\$0	\$0
Weatherization	0.00%	\$0	\$0	\$0
Veteran's Assistance	0.00%	\$0	\$0	\$0
Investments/Stocks/Bonds	0.00%	\$0	\$0	\$0
Bureau of Indian Affairs Grants	0.00%	\$0	\$0	\$0
Housing Allowances/Off-Base Allowances	0.00%	\$0	\$0	\$0
Women, Infants, and Children Program	0.00%	\$0	\$0	\$0
General Assistance Grant	0.00%	\$0	\$0	\$0
Foster Care	0.00%	\$0	\$0	\$0
Alaska Permanent Fund Dividend	95.00%	\$351,789	\$3,742	\$1,678
Contest Winnings	0.00%	\$0	\$0	\$0
Capital Gains	1.00%	\$1,270	\$14	\$6
ASRC Elder Trust	0.00%	\$0	\$0	\$0
Supplemental Union Benefits	0.00%	\$0	\$0	\$0
Gifts	0.00%	\$0	\$0	\$0
Medicare/Medicaid	0.00%	\$0	\$0	\$0
Other	0.00%	\$0	\$0	\$0
Inheritance	0.00%	\$0	\$0	\$0
Reparation Payment	0.00%	\$0	\$0	\$0
Salmon Disaster Assistance	0.00%	\$0	\$0	\$0
Scholarships	0.00%	\$0	\$0	\$0

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

* Amount Masked

Table 8. Community, Household, and Per Capita Incomes, All Sources and by Employer Types
Cantwell, 1999

INCOME SOURCE	COMMUNITY TOTAL	AVERAGE HOUSEHOLD	PER CAPITA
All Sources	\$3,683,323	\$39,184	\$17,912
Earned Income	\$2,620,992	\$27,883	\$12,843
Agriculture, Forestry, Fishing	\$2,884	\$31	\$14
Agriculture/Forestry	\$371	\$4	\$2
Agriculture	\$371	\$4	\$2
Forestry	\$0	\$0	\$0
Fishing, Hunting, Trapping	\$2,513	\$27	\$12
Hatchery/Enhancement	\$0	\$0	\$0
Commercial Fishing	\$0	\$0	\$0
Hunting/Trapping	\$2,513	\$27	\$12
Mining	\$71,737	\$763	\$352
Construction	\$387,305	\$4,120	\$1,898
Manufacturing	\$11,428	\$122	\$56
Cannery	\$0	\$0	\$0
Other Manufacturing	\$11,428	\$122	\$56
Logging/Timber	\$0	\$0	\$0
Transportation, Communications, and Utilities	\$398,038	\$4,234	\$1,950
Trade	\$224,000	\$2,383	\$1,098
Wholesale	\$0	\$0	\$0
Retail	\$224,000	\$2,383	\$1,098
Finance, Insurance, and Real Estate	\$371	\$4	\$2
Services	\$583,295	\$6,205	\$2,858
Government	\$941,934	\$10,021	\$4,616
Federal	\$212,898	\$2,265	\$1,043
State	\$507,229	\$5,396	\$2,485
Local	\$221,807	\$2,360	\$1,087
Local Government	\$17,975	\$191	\$88
Local Education	\$203,832	\$2,168	\$999
Unknown	AMT UNK	AMT UNK	AMT UNK
Other Income	\$1,062,330	\$11,301	\$5,069

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 2000

CHAPTER FOUR: RESOURCE HARVEST AND USE PATTERNS

SPECIES USED AND SEASONAL ROUND

Table 9 describes the resource harvest and use characteristics of Cantwell. It shows that during the study year Cantwell residents harvested an average of 5.6 different kinds of resources and used an average of 8.6 different kinds of resources. Some of the most widely used resources included berries (93.0 percent of households), moose (84.2 percent), salmon (69.7 percent), halibut (51.3 percent), and ptarmigan (50.0 percent) (Table 10).

Figure 4 depicts the seasonal round of resource harvest activities in Cantwell. For the most part, resource harvests occurred within regulated seasons. During the early spring, in late April and May, people fish for several kinds of fresh water fish such as trout, grayling, and Dolly Varden. Black and brown bear are hunted during this time of year. Summer activities include fishing for resident fresh water species and traveling outside the area to fish for salmon. Berry picking begins in August, as does the state sanctioned season for Dall sheep and moose. Caribou are hunted in the fall but there is also an extended season that takes in most of the winter and early spring. Other fall activities include hunting for ptarmigan, grouse, and ducks, as well as fishing for silver salmon outside of the region. Resource harvest activities in winter include hunting for ptarmigan and grouse, trapping fur-bearing animals, and fishing through the ice for trout and burbot. Finally, wood is harvested year around.

HARVEST QUANTITIES

Table 10, summarizing resource harvest and use, is organized first by general category and then by specific species. In all instances domesticated animals and plants have been excluded. All resources have been recorded in pounds (see Appendix A for conversion factors). The ‘harvest category’ includes resources actually taken by a member of the surveyed household during the year covered in the survey. The ‘use’ category includes all resources taken and given away by a household, and resources acquired after a harvest, either as gifts, by trade, through hunting partnerships, or from road or train-killed animals. This includes meat given to hunting guides by their clients. The use category was not confined to resources for human consumption, but

Table 9. Resource Harvest and Use Characteristics for the Community of Cantwell

Mean Number of Resources used Per Household	8.61
Minimum	0
Maximum	26
95% Confidence Limit (+/-)	6.43
Median	8
Mean Number of Resources Attempted to Harvest Per Household	8.34
Minimum	0
Maximum	34
95% confidence Limit (+/-)	9.34
Median	6.5
Mean number of Resources Harvested Per Household	5.66
Minimum	1
Maximum	17
95% confidence Limit (+/-)	7.82
Median	5
Mean number of Resources Received per Household	3.74
Minimum	0
Maximum	14
95% confidence Limit (+/-)	8.62
Median	3
Mean Number of Resources Given Away per Household	2.12
Minimum	0
Maximum	18
95% confidence Limit (+/-)	15.61
Median	1
Mean Household Harvest, Pounds	293.61
Minimum	0
Maximum	1917.23
Total Pounds Harvested	27599.49
Community Per Capita Harvest, Pounds	135.24
Percent Using Any Resource	97.37
Percent Attempting To Harvest Any Resource	97.37
Percent Harvesting Any Resource	97.37
Percent Receiving Any Resource	90.79
Percent Giving Away Any Resource	61.84
Number of Households in Sample	76
Number of Resources Available	64

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

Figure 4. Seasonal Round, Cantwell

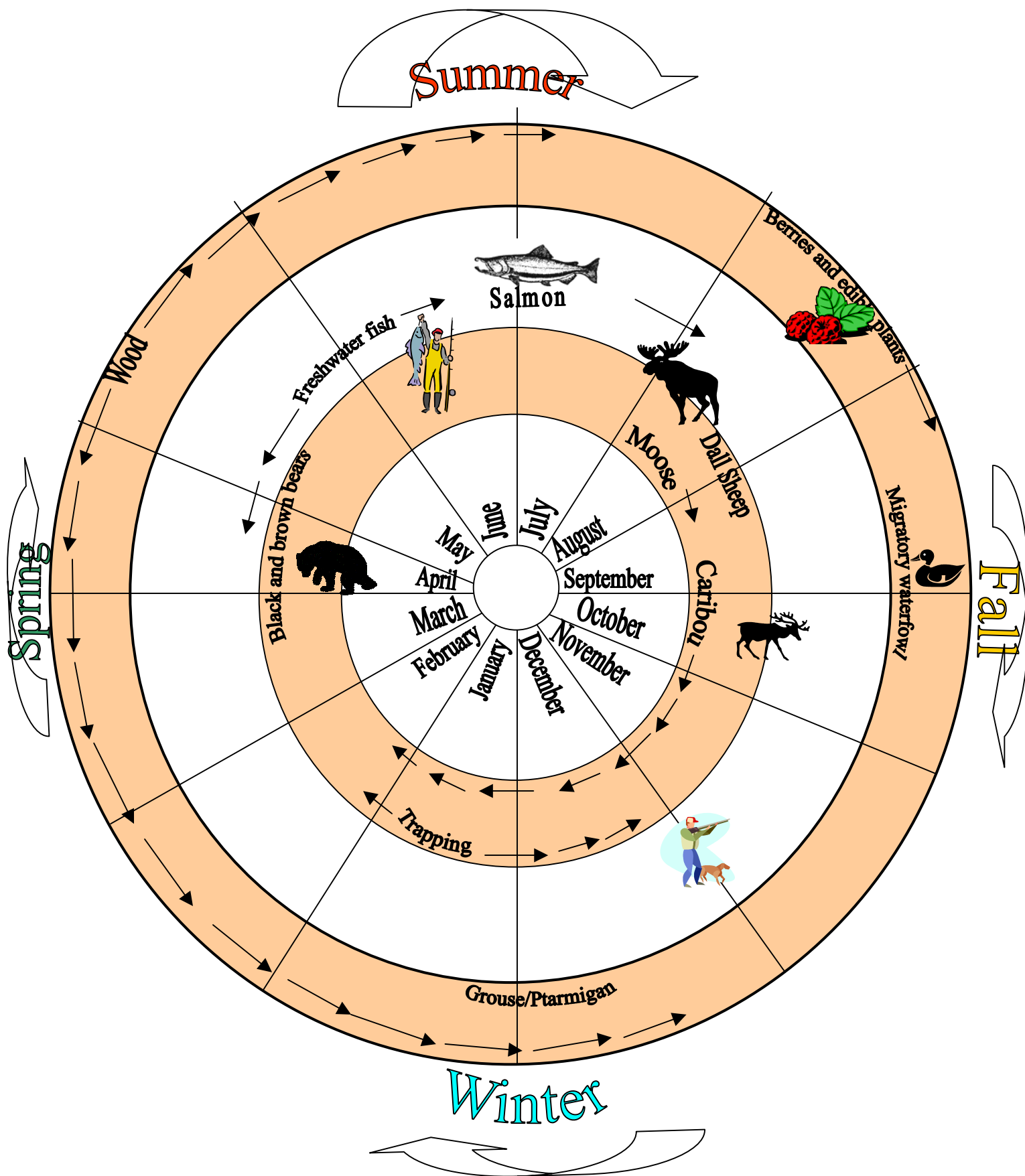


Table 10. Estimated Harvest and Use of Fish, Game, and Plant Resources, Cantwell, 1999.

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		(95% Conf Limit (+/-))	
	Use	Attempt	Harvest	Receive	Give	Total	Mean Household	Household Percapita	Total	Mean Household	Harvest	Percapita
All Resources	97.4	97.4	97.4	90.8	61.8	27599.49	293.61	135.24	27599.49 Lbs	293.61	12.70%	11.60%
Fish	88.2	77.6	73.7	69.7	27.6	6712.03	71.4	32.89	6712.03 Lbs	71.4	31.50%	31.70%
Salmon	69.7	47.4	38.2	50	17.1	4630.92	49.27	22.69	899.18	9.57	54.10%	45.10%
Chum Salmon	6.6	6.6	3.9	2.6	2.6	80.68	0.86	0.4	13.61	0.14	54.90%	54.70%
Coho Salmon	31.6	21.1	13.2	21.1	6.6	357.55	3.8	1.75	81.63	0.87	31.90%	31.10%
Chinook Salmon	44.7	34.2	27.6	23.7	10.5	1063.68	11.32	5.21	61.84	0.66	23.00%	22.90%
Pink Salmon	11.8	6.6	3.9	7.9	1.3	44.72	0.48	0.22	19.79	0.21	53.40%	53.10%
Sockeye Salmon	31.6	19.7	14.5	21.1	5.3	3084.29	32.81	15.11	722.32	7.68	67.20%	67.40%
Landlocked Salmon	0	1.3	0	0	0	0	0	0	0	0	0.00%	0.00%
Unknown Salmon	1.3	1.3	0	1.3	0	0	0	0	0	0	0.00%	0.00%
Non-Salmon Fish	82.9	72.4	69.7	59.2	19.7	2081.11	22.14	10.2	2081.11 Lbs	22.14	20.90%	21.40%
Smelt	2.6	1.3	0	2.6	0	0	0	0	0 Gal	0	0.00%	0.00%
Eulachon (hooligan)	2.6	1.3	0	2.6	0	0	0	0	0 Gal	0	0.00%	0.00%
Cod	1.3	1.3	0	1.3	1.3	0	0	0	0	0	0.00%	0.00%
Pacific Cod (gray)	1.3	1.3	0	1.3	1.3	0	0	0	0	0	0.00%	0.00%
Flounder	1.3	1.3	1.3	0	0	3.71	0.04	0.02	1.24	0.01	87.20%	86.40%
Starry Flounder	1.3	1.3	1.3	0	0	3.71	0.04	0.02	1.24	0.01	87.20%	86.40%
Greenling	1.3	2.6	1.3	0	0	14.84	0.16	0.07	3.71	0.04	87.20%	86.40%
Lingcod	1.3	2.6	1.3	0	0	14.84	0.16	0.07	3.71	0.04	87.20%	86.40%
Halibut	51.3	11.8	7.9	48.7	3.9	524.42	5.58	2.57	24.74	0.26	72.20%	72.90%
Rockfish	5.3	1.3	1.3	3.9	0	4.95	0.05	0.02	1.24	0.01	87.20%	86.40%
Red Rockfish	3.9	1.3	1.3	2.6	0	4.95	0.05	0.02	1.24	0.01	87.20%	86.40%
Unknown Rockfish	1.3	0	0	1.3	0	0	0	0	0	0	0.00%	0.00%
Sablefish (black cod)	2.6	2.6	1.3	1.3	1.3	30.67	0.33	0.15	9.89	0.11	87.20%	86.40%
Burbot	11.8	11.8	9.2	2.6	1.3	65.31	0.69	0.32	27.21	0.29	36.90%	37.70%
Char	36.8	40.8	28.9	11.8	3.9	360.17	3.83	1.76	257.26	2.74	21.80%	22.40%
Dolly Varden	10.5	22.4	10.5	0	1.3	91.77	0.98	0.45	65.55	0.7	40.40%	41.00%
Lake Trout	35.5	36.8	27.6	11.8	3.9	268.39	2.86	1.32	191.71	2.04	21.60%	22.10%
Grayling	73.7	68.4	67.1	13.2	17.1	924.66	9.84	4.53	1320.95	14.05	14.60%	14.30%
Pike	0	2.6	0	0	0	0	0	0	0	0	0.00%	0.00%

Table 10. Estimated Harvest and Use of Fish, Game, and Plant Resources, Cantwell, 1999.

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		(95% Conf Limit (+/-))	
	Use	Attempt	Harvest	Receive	Give	Total	Mean Household	Household Percapita	Total	Mean Household	Harvest	Percapita
Unknown Pike	0	2.6	0	0	0	0	0	0	0	0	0.00%	0.00%
Trout	14.5	17.1	13.2	1.3	3.9	74.46	0.79	0.36	53.18	0.57	43.10%	42.20%
Rainbow Trout	14.5	17.1	13.2	1.3	3.9	72.73	0.77	0.36	51.95	0.55	44.10%	43.20%
Unknown Trout	1.3	2.6	1.3	0	0	1.73	0.02	0.01	1.24	0.01	87.20%	86.90%
Whitefish	3.9	5.3	3.9	1.3	1.3	77.92	0.83	0.38	44.53	0.47	50.10%	49.80%
Unknown Whitefish	3.9	5.3	3.9	1.3	1.3	77.92	0.83	0.38	44.53	0.47	50.10%	49.80%
Land Mammals	86.8	63.2	53.9	76.3	43.4	18332.47	195.03	89.83	920.21	9.79	34.60%	12.60%
Large Land Mammals	85.5	59.2	40.8	73.7	40.8	17361.55	184.7	85.07	66.79	0.71	15.70%	12.80%
Bison	0	1.3	0	0	0	0	0	0	0	0	0.00%	0.00%
Black Bear	11.8	21.1	5.3	5.3	5.3	286.95	3.05	1.41	4.95	0.05	42.70%	42.20%
Brown Bear	9.2	26.3	3.9	3.9	3.9	742.11	7.89	3.64	3.71	0.04	49.70%	48.60%
Caribou	55.3	48.7	22.4	39.5	19.7	3698.16	39.34	18.12	28.45	0.3	22.30%	22.10%
Deer	1.3	1.3	1.3	0	0	105.13	1.12	0.52	2.47	0.03	87.20%	87.40%
Moose	84.2	52.6	26.3	71.1	31.6	12368.42	131.58	60.61	24.74	0.26	16.80%	14.80%
Dall Sheep	13.2	15.8	2.6	10.5	7.9	160.79	1.71	0.79	2.47	0.03	61.20%	61.60%
Small Land Mammals	39.5	35.5	31.6	13.2	10.5	970.92	10.33	4.76	853.42	9.08	37.20%	48.30%
Beaver	2.6	7.9	1.3	1.3	1.3	0	0	0	2.47	0.03	87.20%	0.00%
Coyote	3.9	11.8	3.9	0	0	0	0	0	4.95	0.05	52.80%	0.00%
Fox	17.1	21.1	15.8	1.3	2.6	0	0	0	155.84	1.66	54.30%	0.00%
Red Fox	17.1	21.1	15.8	1.3	2.6	0	0	0	155.84	1.66	54.30%	0.00%
Hare	30.3	26.3	25	7.9	6.6	959.79	10.21	4.7	487.32	5.18	47.20%	48.80%
Snowshoe Hare	30.3	26.3	25	7.9	6.6	959.79	10.21	4.7	487.32	5.18	47.20%	48.80%
Land Otter	0	6.6	0	0	0	0	0	0	0	0	0.00%	0.00%
Lynx	1.3	6.6	1.3	0	0	4.95	0.05	0.02	3.71	0.04	87.20%	88.00%
Marmot	0	2.6	0	0	0	0	0	0	0	0	0.00%	0.00%
Marten	3.9	7.9	3.9	0	0	0	0	0	13.61	0.14	54.90%	0.00%
Mink	1.3	5.3	1.3	0	0	0	0	0	1.24	0.01	87.20%	0.00%
Muskrat	2.6	3.9	2.6	0	1.3	2.47	0.03	0.01	8.66	0.09	66.80%	87.40%
Porcupine	10.5	9.2	7.9	2.6	3.9	0	0	0	14.84	0.16	40.10%	0.00%
Squirrel	6.6	9.2	6.6	0	2.6	3.71	0.04	0.02	145.95	1.55	53.90%	87.40%

Table 10. Estimated Harvest and Use of Fish, Game, and Plant Resources, Cantwell, 1999.

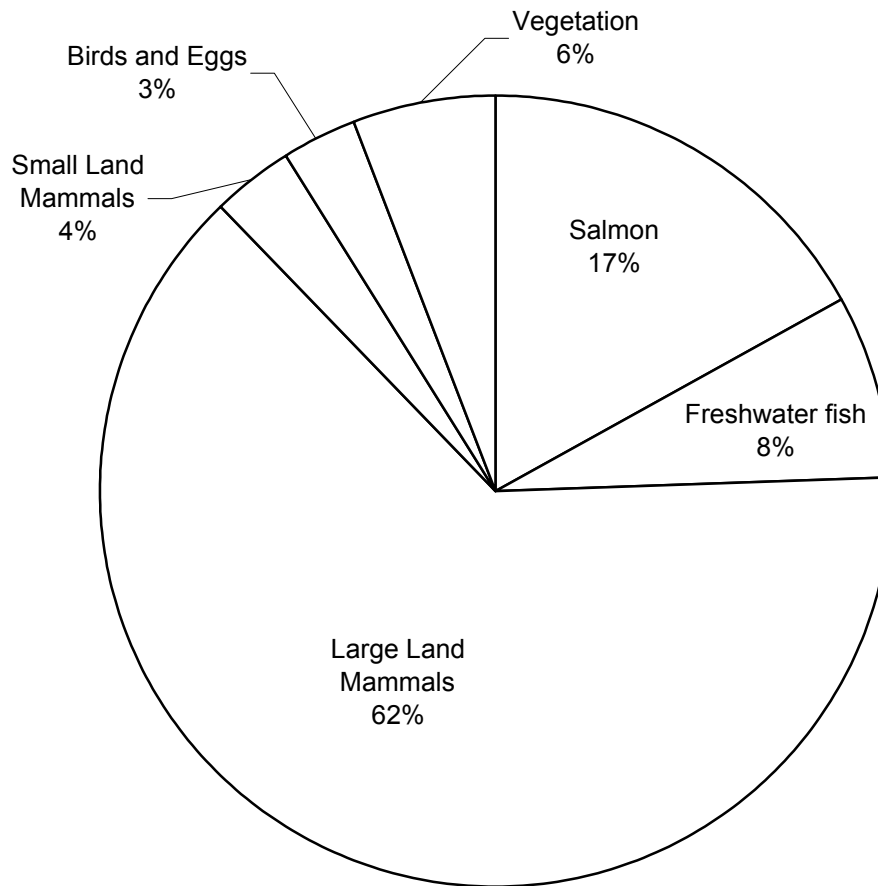
Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		(95% Conf Limit (+/-))	
	Use	Attempt	Harvest	Receive	Give	Total	Mean Household	Household Percapita	Total	Mean Household	Harvest	Percapita
Parka Squirrel (ground)	6.6	9.2	6.6	0	2.6	3.71	0.04	0.02	53.18	0.57	41.30%	87.40%
Tree Squirrel	2.6	5.3	2.6	0	1.3	0	0	0	92.76	0.99	71.70%	0.00%
Weasel	0	3.9	0	0	0	0	0	0	0	0	0.00%	0.00%
Wolf	6.6	15.8	3.9	2.6	0	0	0	0	8.66	0.09	64.40%	0.00%
Wolverine	2.6	13.2	2.6	0	0	0	0	0	6.18	0.07	71.70%	0.00%
Marine Mammals	2.6	1.3	0	2.6	0	0	0	0	0	0	0.00%	0.00%
Seal	1.3	0	0	1.3	0	0	0	0	0	0	0.00%	0.00%
Harbor Seal	1.3	0	0	1.3	0	0	0	0	0	0	0.00%	0.00%
Harbor Seal (saltwater)	1.3	0	0	1.3	0	0	0	0	0	0	0.00%	0.00%
Whale	2.6	1.3	0	2.6	0	0	0	0	0	0	0.00%	0.00%
Belukha	1.3	0	0	1.3	0	0	0	0	0	0	0.00%	0.00%
Bowhead	1.3	1.3	0	1.3	0	0	0	0	0	0	0.00%	0.00%
Birds and Eggs	59.2	57.9	53.9	10.5	7.9	801.97	8.53	3.93	1137.89	12.11	21.00%	22.00%
Migratory Birds	3.9	5.3	3.9	1.3	0	58.26	0.62	0.29	75.45	0.8	80.10%	82.60%
Ducks	3.9	5.3	3.9	1.3	0	56.77	0.6	0.28	74.21	0.79	80.00%	82.50%
Mallard	2.6	3.9	2.6	0	0	21.03	0.22	0.1	21.03	0.22	77.50%	78.20%
Teal	2.6	3.9	2.6	1.3	0	1.11	0.01	0.01	3.71	0.04	64.60%	63.50%
Green Winged Teal	2.6	3.9	2.6	1.3	0	1.11	0.01	0.01	3.71	0.04	64.60%	63.50%
Unknown Ducks	1.3	1.3	1.3	0	0	34.63	0.37	0.17	49.47	0.53	87.20%	88.00%
Geese	1.3	2.6	1.3	0	0	1.48	0.02	0.01	1.24	0.01	87.20%	88.00%
Canada Geese	1.3	2.6	1.3	0	0	1.48	0.02	0.01	1.24	0.01	87.20%	88.00%
Lesser Canada Geese	1.3	2.6	1.3	0	0	1.48	0.02	0.01	1.24	0.01	87.20%	88.00%
Other Birds	57.9	56.6	52.6	9.2	7.9	743.71	7.91	3.64	1062.45	11.3	18.20%	18.80%
Upland Game Birds	57.9	56.6	52.6	9.2	7.9	743.71	7.91	3.64	1062.45	11.3	18.20%	18.80%
Grouse	42.1	43.4	38.2	6.6	6.6	223.37	2.38	1.09	319.11	3.39	18.00%	17.80%
Ptarmigan	50	47.4	44.7	9.2	6.6	520.34	5.54	2.55	743.34	7.91	20.70%	21.50%
Unknown Ptarmigan	50	47.4	44.7	9.2	6.6	520.34	5.54	2.55	743.34	7.91	20.70%	21.50%
Marine Invertebrates	11.8	5.3	5.3	10.5	1.3	125.33	1.33	0.61	125.33 Lbs	1.33	61.00%	60.40%
Clams	7.9	3.9	3.9	6.6	0	76.68	0.82	0.38	25.56 Gal	0.27	71.30%	70.40%
Butter Clams	3.9	1.3	1.3	3.9	0	11.13	0.12	0.05	3.71 Gal	0.04	87.20%	86.40%

Table 10. Estimated Harvest and Use of Fish, Game, and Plant Resources, Cantwell, 1999.

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested			(95% Conf Limit (+/-))	
	Use	Attempt	Harvest	Receive	Give	Total	Mean Household	Household Percapita	Total		Mean Household	Harvest	Percapita
Pacific Littleneck Clams	2.6	0	0	2.6	0	0	0	0	0	Gal	0	0.00%	0.00%
Razor Clams	5.3	2.6	2.6	2.6	0	65.55	0.7	0.32	21.85	Gal	0.23	82.30%	81.50%
Crabs	5.3	2.6	2.6	3.9	1.3	47.62	0.51	0.23	47.62	Lbs	0.51	61.50%	61.60%
Dungeness Crab	3.9	2.6	2.6	1.3	1.3	47.62	0.51	0.23	68.03	Gal	0.72	61.50%	61.60%
King Crab	3.9	0	0	3.9	1.3	0	0	0	0		0	0.00%	0.00%
Unknown King Crab	3.9	0	0	3.9	1.3	0	0	0	0		0	0.00%	0.00%
Shrimp	2.6	1.3	1.3	2.6	0	1.03	0.01	0.01	0.52	Gal	0.01	87.20%	86.40%
Vegetation	93.4	92.1	92.1	27.6	35.5	1627.68	17.32	7.98	1627.68	Lbs	17.32	9.40%	8.80%
Berries	93.4	92.1	92.1	17.1	32.9	1439.68	15.32	7.05	359.92		3.83	9.60%	9.10%
Plants/Greens/Mushrooms	27.6	25	23.7	6.6	13.2	188	2	0.92	47	Gal	0.5	23.30%	23.20%
Wood	55.3	51.3	51.3	13.2	11.8	0	0	0	305.81	Cords	3.25	21.00%	0.00%

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

Figure 5. Composition of Wild Resource Harvest by Resource Category, Cantwell, 1999



Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

incorporated all non-commercial uses of resources including trap bait and dog food. Purchased seafood such as halibut, crab, and salmon were not recorded. Differences between harvest and use percentages reflect resources that have been shared and sharing between households, which resulted in a wider distribution of wild foods.

For the study year Cantwell's total community harvest of wild resources was 27,599 pounds usable weight. The average household harvest for all wild foods was 293 pounds, 135 pounds per person (Table 10). Note, by comparison the 1983 the mean household harvest was 324 pounds or 111 pounds per person (ADF&G Community Profile Database). Land mammals comprised 62 percent of the total harvest in 1999/2000. In terms of pounds edible weight, the community harvested 18,332 pounds or 89 pounds per capita (Table 10, Figure 5). Cantwell residents also harvested a total of 6,712 pounds of fish, which was 25 percent of the total harvest, 1,627 pounds of edible plants (6 percent of the total harvest), 801 pounds of birds and eggs (3 percent of the total harvest) and 125 pounds of marine invertebrates.

In terms of specific resources, moose made up the largest component of the community's resource harvest as measured by edible weight (12,368 pounds). Households harvested on average 131 pounds of moose, or 60 pounds per capita. Caribou (3,698 pounds) and sockeye salmon (3,084 pounds) ranked second and third. Households harvested 39 pounds of caribou and almost 33 pounds of sockeye salmon. Other resources with a mean household harvest of 10 pounds or more were berries (15 pounds), king salmon (11 pounds), and hare (10 pounds) (Table 10).

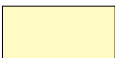
HARVEST AREAS

In April of 2000 members of the study team mapped lifetime use areas for seven Cantwell households who had lived in the community an average of 31 years. The information on the maps represents, in broad terms, the hunting history of the community. Historically Cantwell residents hunted and fished in a wide area around their community. Athabascan speaking people known as Koyukon, Lower Tanana, Ahtna, and Dena'ina used the uplands in and around Denali National Park for subsistence purposes. There are, for example, Lower Tanana and Ahtna place names scattered around the landscape near Cantwell. Some of these names are

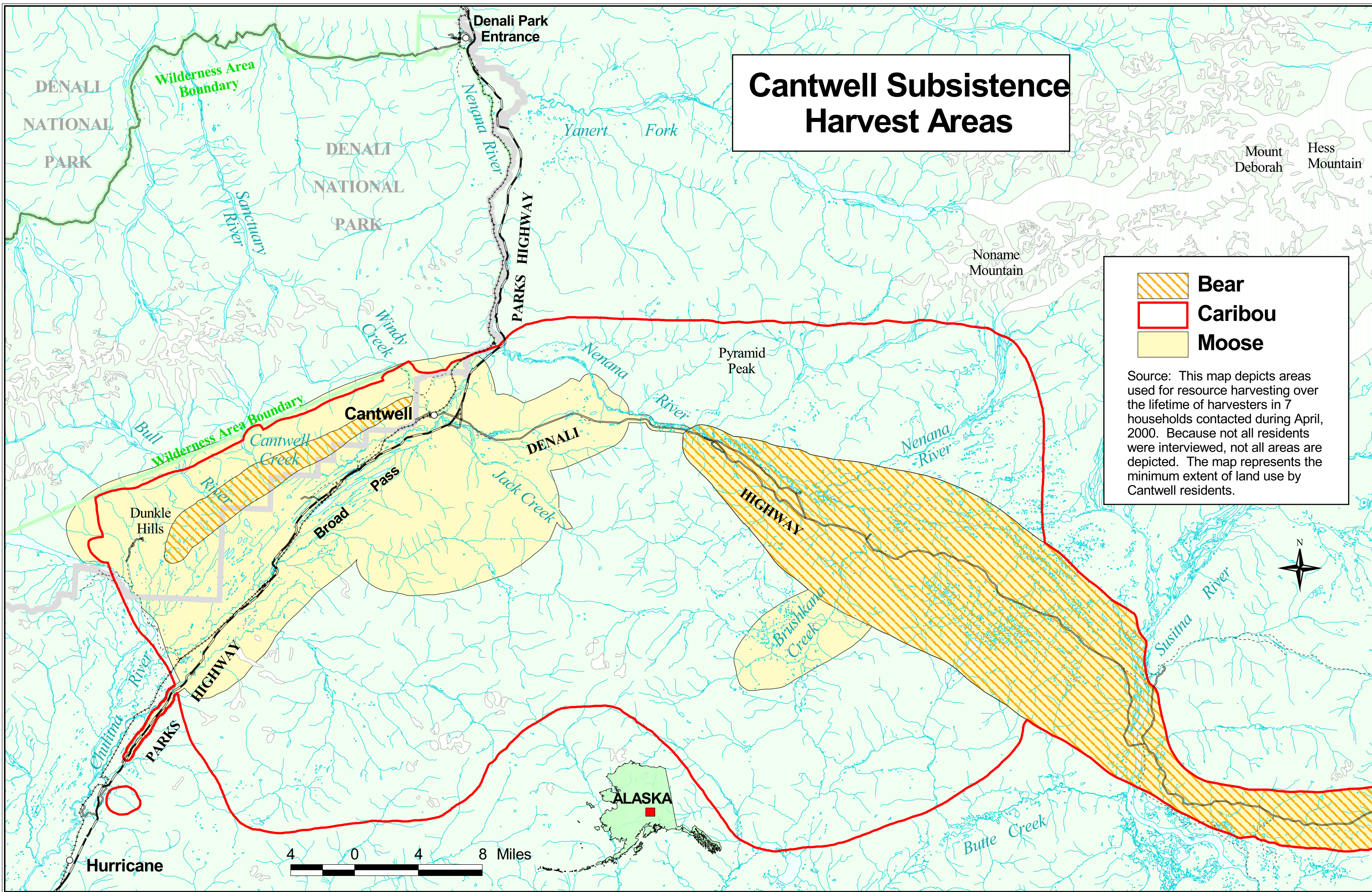
used for landforms, such as hills and passes, while others are used for streams and glaciers (cf. Kari 1999:19A). In the early 20th century Ahtna hunters, who lived in Valdez Creek, had hunting territories that included the drainage of the upper Nenana River (see the travel narrative of Jake Tansy in Kari 1999:37). According to one local Ahtna man his relatives trapped mountain squirrels and hunted Dall sheep on the slopes of the Alaska Range in what is now Denali National Park. The opening of the Denali Highway in the 1950s created a corridor for Cantwell residents that they used to hunt caribou and moose and gather berries. While the road provided access to Cantwell residents it also opened the region to hunters from Fairbanks and Anchorage. With increased access, via the George Parks Highway, and a growing statewide population spurred by oil development, the area around Cantwell became a magnet for urban hunters. In the 1980s Cantwell residents began to shift their subsistence hunting efforts to areas such as the Bull River and Cantwell Creek located inside the boundaries of the ANILCA Addition of Denali National Park. At the same time, Cantwell residents continue to use areas adjacent to the Denali Highway for fishing and gathering berries.

In addition to mapping lifetime hunting areas, we also questioned residents about the Game Management Units (GMU) in which they harvested fish and game in the study year. The reason for asking this question was to find out how many people use Denali National Park for subsistence purposes. Portions of the park are located in GMU 13E and GMU 20C. Table 11 provides information about where people harvested a variety of species. The table shows that most Cantwell residents stay close to home and hunt, fish and gather plants in GMU 13E. Over 60 percent of households reported that they had hunted moose and gathered plants on lands managed by the National Park Service. As well, over 50 percent reported hunting caribou, and 25 percent reported hunting bear within the park boundary. A majority of this activity took place in GMU 13E in Cantwell Creek or the Bull River, places that are fairly close to Cantwell and accessible by ATV. In addition over 19 percent of households said they fished for freshwater fish within the boundaries of the park. Not all harvesting activities took place so close to home. Cantwell residents fished for salmon in 11 different GMUs, fished for freshwater fish in seven, harvested moose in six different GMUs, caribou in four, Dall sheep in three and gathered plants in four different units.

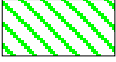
Cantwell Subsistence Harvest Areas

-  **Bear**
-  **Caribou**
-  **Moose**

Source: This map depicts areas used for resource harvesting over the lifetime of harvesters in 7 households contacted during April, 2000. Because not all residents were interviewed, not all areas are depicted. The map represents the minimum extent of land use by Cantwell residents.



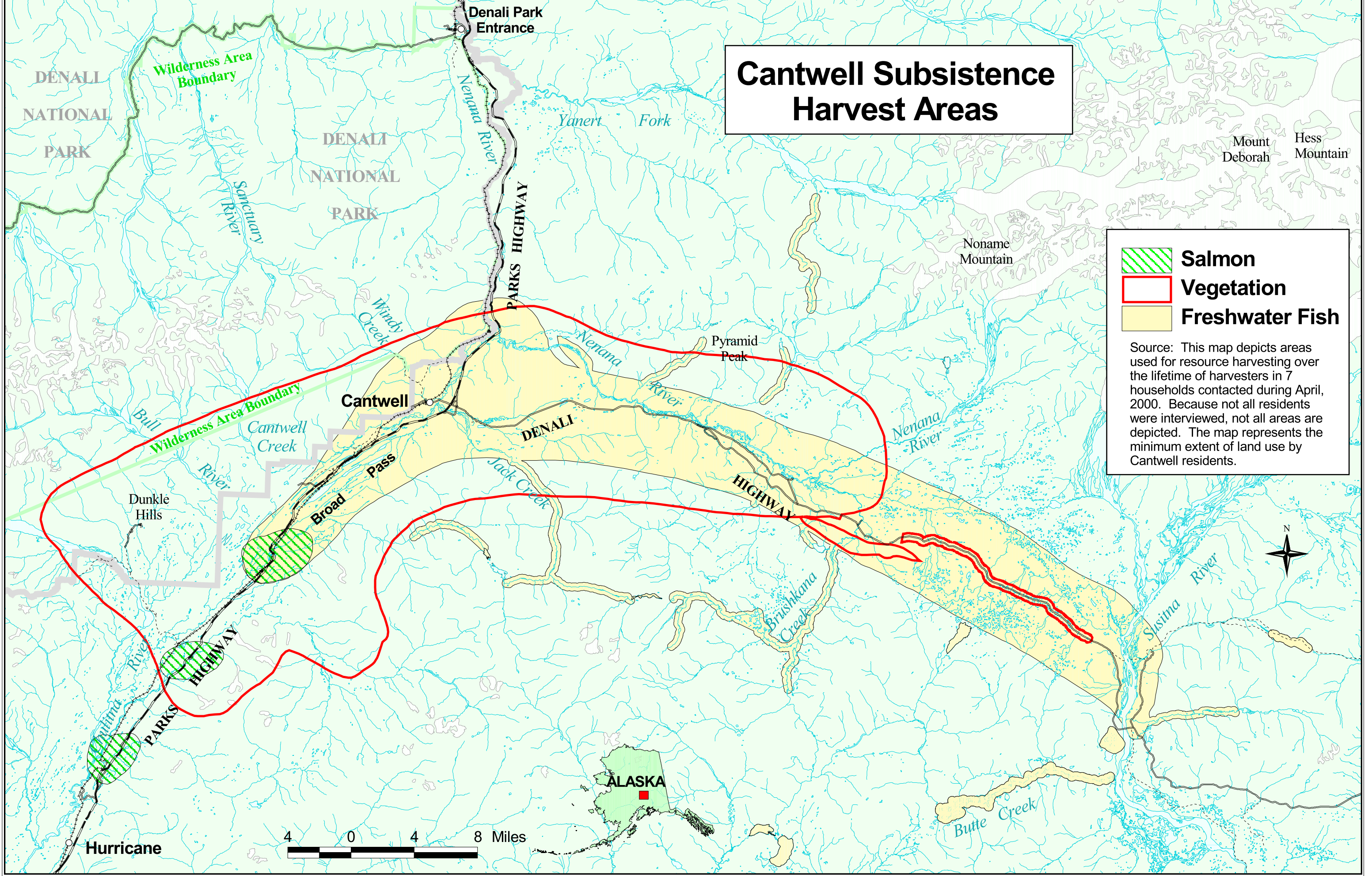
Cantwell Subsistence Harvest Areas

**Salmon**

**Vegetation**

**Freshwater Fish**

Source: This map depicts areas used for resource harvesting over the lifetime of harvesters in 7 households contacted during April, 2000. Because not all residents were interviewed, not all areas are depicted. The map represents the minimum extent of land use by Cantwell residents.



Cantwell Subsistence Harvest Areas

- Sheep
- Furbearers

Source: This map depicts areas used for resource harvesting over the lifetime of harvesters in 7 households contacted during April, 2000. Because not all residents were interviewed, not all areas are depicted. The map represents the minimum extent of land use by Cantwell residents.

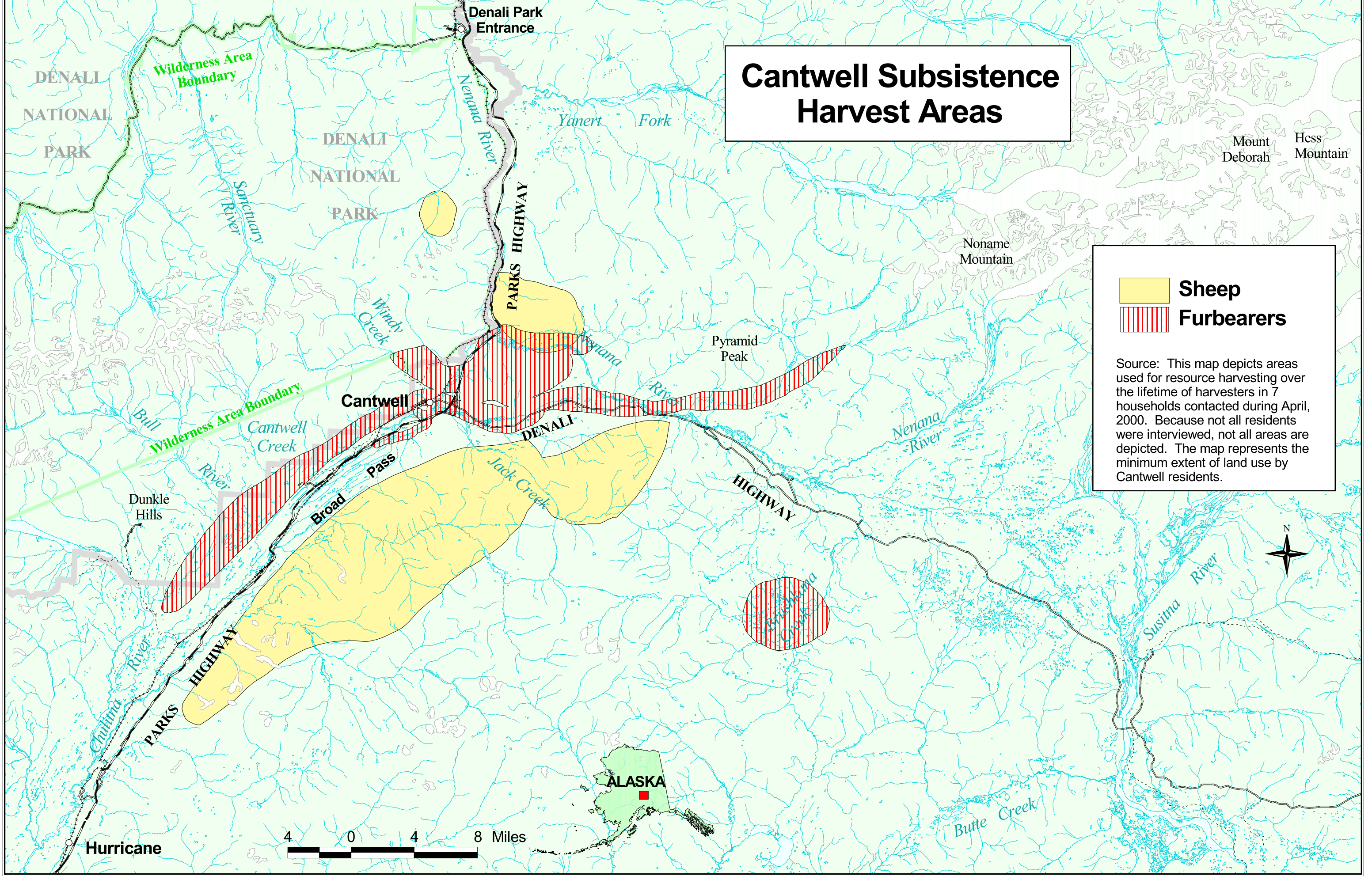


Table 11. Estimated Number of Households Hunting and Fishing in GMU's, Cantwell, 1995

RESOURCE	GMU 13E		GMU 20C		GMU 13B		GMU 13A		GMU 20A	
	#	%	#	%	#	%	#	%	#	%
Salmon	0	0.0%	43	46.1%	0	0.0%	1	1.3%	1	1.3%
Freshwater Fish	21	22.4%	80	85.5%	1	1.3%	2	2.6%	11	11.8%
Black Bear	15	15.8%	31	32.9%	2	2.6%	1	1.3%	12	13.2%
Brown Bear	24	25.0%	37	39.5%	4	3.9%	1	1.3%	14	14.5%
Caribou	53	56.6%	67	71.1%	1	1.3%	1	1.3%	16	17.1%
Moose	62	65.8%	68	72.4%	6	6.6%	1	1.3%	21	22.4%
Dall Sheep	5	5.3%	32	34.2%	0	0.0%	0	0.0%	11	11.8%
Furbearers	25	26.3%	36	38.2%	1	1.3%	0	0.0%	12	13.2%
Plants	72	76.3%	88	93.4%	2	2.6%	1	1.3%	14	14.5%

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

LEVELS OF PARTICIPATION IN THE HARVEST AND USE OF WILD RESOURCES

Table 12 illustrates levels of participation in the harvest and processing of wild resources by residents of Cantwell. Overall 91.5 percent of Cantwell residents reported that they had attempted to harvest or process a wild resource during the study year. Most (83 percent) had gathered and processed plants, while 70 percent harvested and processed fish. Only 50.9 percent hunted game but 66.6 processed game. Only 30.3 percent said they trapped or hunted fur-bearing animals and 39.3 percent processed these animals.

The most widely harvested category of wild resources was plants (92.1 percent), followed by fish (73.7 percent); birds and eggs (53.9 percent); large land mammals (40.8 percent); small land mammals (31.6 percent); and marine invertebrates (5.3 percent) (Table 10). Not surprisingly, no one harvested marine mammals. The most widely used resources were plants (93.4 percent of households), followed by fish (88.2 percent). Only a slightly smaller percentage of households (85.5 percent) said that they had used a large land mammal. Wild birds and eggs were used by 59.2 percent of households and 39.5 percent used some type of small land mammal. Marine invertebrates were used by 11.8 percent of households while only 2.6 percent of households used marine mammals. Both of these resources were obtained outside of the area.

One of the reasons why almost 40 percent more residents used large land mammals than harvested them was that many households received meat from moose and caribou that were either killed by trains or cars or had been confiscated from hunters, or they received meat from friends, relatives or neighbors who participated in a successful hunt. In fact some residents reported that they did not need to hunt because there was so much meat available from a variety of sources. This situation is reflected in the statistics relating to the use and harvest of specific resources categories (Table 10). The most widely used resource, after wild berries, which were used by 93.4 percent of households, was moose (84.2 percent). But only 52.6 percent of households hunted a moose and even fewer (26.3 percent) were successful. Similarly, 55.3 percent of households reported using caribou but only 48.7 hunted and an even smaller

Table 12. Participation in the Harvest and Processing of Wild Resources, Cantwell, 1999

Total Number of People		209.59
Game		
Hunt	Number	106.7
	Percentage	50.91
	Missing	0
	Missing %	0
Process	Number	139.73
	Percentage	66.67
	Missing	0
	Missing %	0
Fish		
Fish	Number	148.62
	Percentage	70.91
	Missing	0
	Missing %	0
Process	Number	144.81
	Percentage	69.09
	Missing	0
	Missing %	0
Furbearers		
Hunt or Trap	Number	63.51
	Percentage	30.3
	Missing	0
	Missing %	0
Process	Number	82.57
	Percentage	39.39
	Missing	0
	Missing %	0
Plants		
Gather	Number	174.03
	Percentage	83.03
	Missing	0
	Missing %	0
Process	Number	174.03
	Percentage	83.03
	Missing	0
	Missing %	0
Any		
Attempt	Number	191.81
	Percentage	91.52
Process	Number	191.81
	Percentage	91.52

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

number (22.4 percent) actually harvested this animal. Other widely used resources were grayling (73.7 percent), halibut (51.3 percent), ptarmigan (50.0 percent), and chinook salmon (44.7 percent). In descending order the most widely harvested resources were berries (92.1), grayling (67.1 percent), ptarmigan (44.7 percent), chinook salmon (27.6 percent), and hare (25 percent).

Cantwell residents who attempted to harvest a resource were often successful (Table 10). For example, 94.9 percent of households who attempted to harvest fish were successful, 68.9 percent who attempted to harvest a large mammal were successful, 93 percent who attempted to harvest birds and eggs were successful and 100 percent that attempted to harvest some kind of wild vegetation were successful. Success in harvesting particular species was much more varied however. The highest success rates were in fishing for chinook salmon (80.7 percent) and grayling (98 percent), and in hunting for snowshoe hare (95 percent) and ptarmigan (94 percent). In contrast there was only a 50 percent success rate in harvesting moose and a 45 percent rate in harvesting caribou. Success rates fell further for black bear (25 percent), Dall sheep (16 percent success rate), and brown bear (14 percent).

SHARING AND RECEIVING WILD RESOURCES

As noted above, sharing of wild resources is important in Cantwell and there is considerable sharing among Cantwell households (Tables 9 and 10). Of those households interviewed 90.8 percent reported they received a resource and 61.8 percent said they gave one or more resources away. Households gave away an average of 2.12 resources but received an average of 3.7 resources. The most commonly distributed resources were berries (32.9 percent of households), moose (31.6 percent), and fish (27.6 percent), particularly king salmon (10.5 percent of households). In contrast, resources harvested out of the area, such as marine invertebrates were seldom given away.

Those resources most commonly received were moose (71.1 percent), halibut (48.7 percent), caribou (39.5 percent), king salmon (23.7 percent), berries (17.1 percent), Dall sheep (10.5 percent) and marine invertebrates (10.5 percent). It is not surprising that so many households reported receiving moose or caribou. In addition to the meat available from road and railroad

kills, and that confiscated by the fish and wildlife protection officer, residents reported receiving meat from successful hunters. What is notable is the amount of halibut and marine invertebrates that was received by Cantwell households during the study year. A similar situation was reported in a study conducted by the Division of Subsistence (Stanek et al. 1988:50) in the community of Chase, which is just south of Cantwell. There are two possible explanations for this situation. People received halibut from someone who does not live in Cantwell or from a halibut fisherman who lives in the community but was not interviewed.

Although evidence from the survey indicated there was considerable sharing between households people interviewed had varying opinions. One long time resident thought that sharing was still fairly widespread, especially among old timers and the Native segment of the community and that sharing was much more evident and occurred more on a daily basis in rural areas than in urban areas. He did allow that the younger generation was “not so closely attuned to that.” Other people interviewed told about sharing various resources, such as homemade jam, berries, fiddlehead ferns, and fish with friends and relatives. But a life long resident of the community thought that patterns of sharing had changed considerably since he was a young man, especially in the last 20 year or more. He noted that when he was a boy if someone shot a moose the entire community shared but he said [you]“don’t see that no more hardly.” He had no explanation for why things had changed.

USE AND HARVEST CHARACTERISTICS BY RESOURCE CATEGORY

Salmon

Salmon comprised 17 percent of the total harvest of Cantwell residents during the study year (Figure 5). Of the households interviewed for this survey, 69.7 percent reported using salmon during the study year, while 38.2 percent said they harvested salmon. This is much higher than in 1983 when 23 percent of households reported harvesting salmon (Stratton and Georgette 1984:179). In 1999-2000 the mean household harvest of salmon was 49.2 pounds or 22.6 pounds per person (Table 10). In addition, 17.1 percent of households said they gave away salmon while 50 percent said they received salmon.

The most widely used and harvested salmon was Chinook or king salmon. Forty four point seven percent of households reported using Chinook salmon and 27.6 percent reported harvesting them. The community harvested a total of 1,063.6 pounds of king salmon, or 11.3 pounds per household. Sockeye salmon ranked second in terms of use (31.6 percent) and harvest (14.5) but was first in terms of amount harvested, the community reporting a harvest of 3,084 pounds, or 32.8 pounds per household. Silver salmon were a close third in terms of use (31.6 percent) and harvest (13.2), but a distant third in terms of pounds harvested with the community reporting a harvest of 357.5 pounds or 3.8 pounds per household. Pink salmon were used (11.8 percent) by a greater number of households than chum salmon (6.6 percent) but an equal number of households reported harvesting (3.9 percent) both pink and chum salmon. At the same time the community harvested a greater amount of chums (80.6 pounds) than pinks (44.7 pounds).

Freshwater fish

As shown in Figure 5 fresh water fish made up 8 percent of the total Cantwell harvest in the study year. The total community harvest of non-salmon fish was 2,081.1 pounds or 22.1 pounds per household. Over 82 percent of households reported using some species of non-salmon fish and 69.7 percent reported a harvest. At the same time 19.7 percent of households said they gave away freshwater fish and 59.2 percent said they received such fish. The harvest of non-salmon fish was composed primarily of grayling (924.6 pounds), halibut (524.4 pounds), char (360.1 pounds) and lake trout (268.3 pounds). Dolly Varden (91.77 pounds), Rainbow trout (72.7 pounds) and whitefish (77.9 pounds) were also part of the larder. Except for the harvest of halibut and char, which are not local species, most of the harvest of non-salmon fish took place close to Cantwell, either in lakes or streams off the Parks or the Denali highways.

Regulations and Harvest Methods

In 1999-2000 there were no subsistence fisheries located in the Cantwell area and most Cantwell residents caught salmon or non-salmon species using rod and reel under sport fishing regulations. The nearest subsistence salmon fishery accessible by road is located on the Copper River and the types of gear allowed in that fishery are limited to fish wheels and dip nets. As Table 13 indicates 32.8 percent of households reported using rod and reel to catch salmon while

only 6.5 percent reported using any subsistence gear. Only 1.3 percent of households reported harvesting salmon with a fishwheel and only 3.9 percent reported using a dip net. The nearest fishwheel salmon fishery is located on the Copper River while the closest dip net subsistence salmon fisheries are located on the Copper River and the Kenai Peninsula. As noted above, Cantwell residents are fairly mobile and fish for salmon in different areas of the state, such as the Copper River. Though most people used rod and reel to catch salmon, by weight more salmon was caught using subsistence gear. For example, more pounds of sockeye were caught using a dip net than rod and reel (Table 14). At least one household in Cantwell had access to a set net that was used to catch sockeye and this provided the bulk of the salmon catch for the community.

The overwhelming majority of freshwater fish were caught using rod and reel, either fishing in the summer or by ice fishing in the winter (Table 15). For example, households reported catching 211 pounds of lake trout with rod and reel and 53.6 pounds by ice fishing. More households reported (67.1 percent) fishing for grayling with a rod and reel than for any other species of fish, including salmon.

Table 13. Percentage of Households Harvesting Salmon by Gear Type and Species, Cantwell, 1999

Species	Set Net	Dip Net	Fishwheel	Subsistence Gear	Any	Rod and Reel	Any Method
Salmon	1.3%	4.0%	1.3%	6.6%		32.9%	38.2%
Chum Salmon	0.0%	0.0%	1.3%	1.3%		2.6%	4.0%
Coho Salmon	0.0%	0.0%	1.3%	1.3%		11.8%	13.2%
Chinook Salmon	0.0%	2.6%	0.0%	2.6%		25.0%	27.6%
Pink Salmon	0.0%	0.0%	1.3%	1.3%		2.6%	4.0%
Sockeye Salmon	1.3%	4.0%	1.3%	6.6%		9.2%	14.5%
Landlocked Salmon	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%
Unknown Salmon	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

Table 14. Estimated Salmon Harvest by Gear Type, Cantwell, 1999

Species	Harvest Unit	Set Net			Dip Net			Fishwheel			Subsistence Gear			Rod and Reel			Any Method		
		Total	HH		Total	HH		Total	HH		Total	HH		Total	HH		Total	HH	
			Mean	HH		Mean	HH		Mean	HH		Mean	HH		Mean	HH		Mean	HH
Salmon	Lbs	554.1	5.9	100.2	1.1	38.3	0.4	692.6	7.4	206.6	2.2	899.2	9.6						
Chum Salmon	Lbs	2366.0	25.2	475.8	5.1	158.2	1.7	3000.0	31.9	1630.9	17.4	4630.9	49.3						
		0.0	0.0	0.0	0.0	7.4	0.1	7.4	0.1	6.2	0.1	13.6	0.1						
		0.0	0.0	0.0	0.0	44.0	0.5	44.0	0.5	36.7	0.4	80.7	0.9						
Coho Salmon		0.0	0.0	0.0	0.0	18.6	0.2	18.6	0.2	63.1	0.7	81.6	0.9						
Chinook Salmon	Lbs	0.0	0.0	0.0	0.0	81.3	0.9	81.3	0.9	276.3	2.9	357.6	3.8						
		0.0	0.0	3.7	0.0	0.0	0.0	3.7	0.0	58.1	0.6	61.8	0.7						
	Lbs	0.0	0.0	63.8	0.7	0.0	0.0	63.8	0.7	999.9	10.6	1063.7	11.3						
Pink Salmon	Lbs	0.0	0.0	0.0	0.0	9.9	0.1	9.9	0.1	9.9	0.1	19.8	0.2						
Sockeye Salmon	Lbs	0.0	0.0	0.0	0.0	22.4	0.2	22.4	0.2	22.4	0.2	44.7	0.5						
		554.1	5.9	96.5	1.0	2.5	0.0	653.1	7.0	69.3	0.7	722.3	7.7						
	Lbs	2366.0	25.2	411.9	4.4	10.6	0.1	2788.5	29.7	295.8	3.2	3084.3	32.8						
Landlocked Salmon	Lbs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
Unknown Salmon	Lbs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
	Lbs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

Table 15. Estimated Harvest of Fish Other Than Salmon by Gear Type, Cantwell, 1999

Species	Harvest Unit	Unspecified Gear		Subsistence Gear		Rod and Reel		Ice Fishing		Any Method	
		Total	HH Mean	Total	HH Mean	Total	HH Mean	Total	HH Mean	Total	HH Mean
Non-Salmon Fish	Lbs	13.9	0.2	13.9	0.2	1986.9	21.1	80.4	0.9	2081.1	22.1
Eulachon (hooligan)	Lbs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific Cod (gray)	Lbs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Starry Flounder	Lbs	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	3.7	0.0
Lingcod	Lbs	0.0	0.0	0.0	0.0	14.8	0.2	0.0	0.0	14.8	0.2
Halibut	Lbs	0.0	0.0	0.0	0.0	524.4	5.6	0.0	0.0	524.4	5.6
Red Rockfish	Lbs	0.0	0.0	0.0	0.0	5.0	0.1	0.0	0.0	5.0	0.1
Unknown Rockfish	Lbs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sablefish (black cod)	Lbs	0.0	0.0	0.0	0.0	30.7	0.3	0.0	0.0	30.7	0.3
Burbot	Lbs	0.0	0.0	0.0	0.0	38.6	0.4	26.7	0.3	65.3	0.7
Dolly Varden	Lbs	0.0	0.0	0.0	0.0	91.8	1.0	0.0	0.0	91.8	1.0
Lake Trout	Lbs	3.5	0.0	3.5	0.0	211.3	2.3	53.7	0.6	268.4	2.9
Grayling	Lbs	10.4	0.1	10.4	0.1	914.3	9.7	0.0	0.0	924.7	9.8
Unknown Pike	Lbs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Trout	Lbs	0.0	0.0	0.0	0.0	72.7	0.8	0.0	0.0	72.7	0.8
Unknown Trout	Lbs	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	1.7	0.0
Unknown Whitefish	Lbs	0.0	0.0	0.0	0.0	77.9	0.8	0.0	0.0	77.9	0.8

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 2000

LARGE LAND MAMMALS

Large land mammals, especially moose and caribou, provided 62 percent of the total subsistence harvest of Cantwell residents in 1999-2000 (Figure 5). In 1983 large land mammals comprised 70 percent of the total harvest (Stratton and Georgette 1984).

Moose and Caribou

As measured in pounds edible weight, moose made the largest contribution to the Cantwell community's wild resources harvest in 1999-2000. The total community harvest of moose was 25 animals or a total of 12,368.4 usable pounds, which equals 131.5 pounds per household. Moose represented 44 percent of the total harvest and 71 percent of all large land mammal harvests. Overall, 84.2 percent of households used moose meat and 26.3 percent said they harvested moose. Where as moose represented 44 percent of the harvest, caribou represented only 13 percent by weight. The total community harvest of caribou was 28 animals for a total of 3,698 pounds. The household harvest was 39.4 pounds. Of the sampled households, 55.3 percent said they used caribou and 22.4 percent reported a harvest. Note that ADF&G Division of Wildlife Conservation recorded 27 moose and 26 caribou taken by Cantwell residents in 1999.

As stated previously, one reason why so many more households used moose and caribou meat than harvested it was because people received meat from animals killed by automobiles and trains or confiscated by the Alaska Department of Fish and Game protection officer from hunters who had violated the law. Apparently most of the road-killed animals were moose while the caribou meat came from confiscated animals. One resident who works for the Alaska Railroad reported that he shot over 40 moose during the winter of 1999-2000 that had been injured by trains. He thinks nearly all of them had calves with about half having twins. Moose eat out the browse in valley bottoms and then get on the tracks as an easy way to get to the next valley.

Table 16 shows the percent of households reporting the receipt of caribou and moose during the study period. The table shows that just over 43 percent of Cantwell households reported receiving road-kill moose, while 17.1 percent reported receiving caribou. In comparison,

Table 16. Reported Number of Roadkilled and Confiscated Moose and Caribou Received by Households, Cantwell, 1999

Resource	Percent of Households Reporting Receipt of Roadkilled or Confiscated Resource	Number of Animals Received
Caribou	17.1%	15
Moose	43.4%	45

Source: Alaska Dept. of Fish and Game, Div. Of Subsistence, Household Surveys, 2000.

research conducted by the division in 1987 in the communities of Chase, Gold Creek-Chulitna and the Hurricane-Broad Pass area, located on the Parks Highway just south of Cantwell, showed that 12 percent of households in Chase, 60 percent in Gold Creek-Chulitna and 37 percent in the Hurricane-Broad Pass area, reported receiving road-kill moose (Stanek et al. 1988: 62).

One method for overcoming spoilage or storage problems is to distribute meat. Most people have freezers but they did not always have room to store all of the meat that was available so some of the road-killed meat was cached in snowdrifts until it could be distributed. Meat was widely distributed throughout the community. One resident said he had not hunted in 15 years but his household had access to half a moose, from two different members of the community. Another resident reported that his work schedule did not allow for much free time but that he always had meat because of the distributions from road kills and confiscated meat. He said that he was provided with the back strap and a liver from a moose (road kill) and friends gave him some caribou sausage. Another resident said he does not have time to hunt in September but he was able to obtain meat through the distribution of road kills; he got about half a caribou and half a moose and friends gave him some additional meat in the form of sausage.

Hunting Regulations for Moose and Caribou

Much of the land around Cantwell is state land, which means that the State of Alaska has jurisdiction over the management of fish and game. The only federal land in the area is Denali National Park, located on the west side of the Parks Highway. For management purposes all of the land around Cantwell is designated Game Management Unit 13 (GMU), which is divided into 5 subunits, A through E. In addition to hunting in GMU 13 Cantwell hunters reported successful Moose hunts in GMU 20, subunits A and B. Figures 9 and 10 show the location of successful moose and caribou hunts by Cantwell hunters in 1999. Note several different hunts are represented on the figures: the general hunt, open to all state residents and non-residents, two Tier II hunts (TM300 and TC566), and two federal permit hunts (RC513 and RM313).

Figure 9. Cantwell Caribou Hunts 1999: type and location of hunt and percent killed, N = 27 caribou

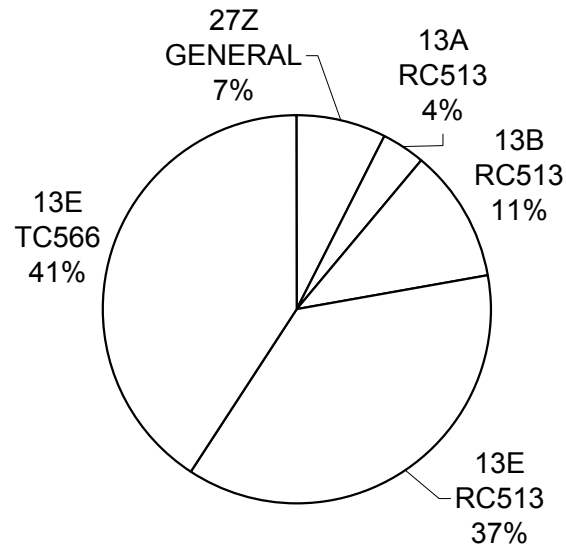
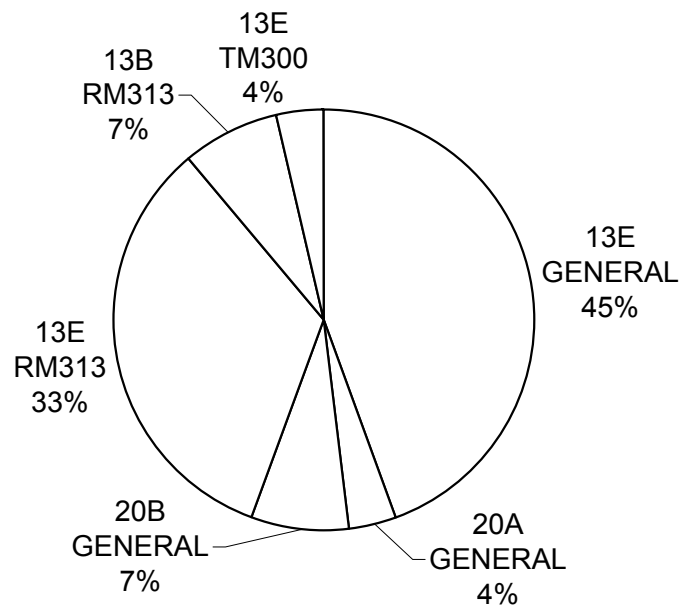


Figure 10. Cantwell Moose Hunts 1999: type and location of hunt and percent killed, N = 27 moose



Source: Alaska Department of Fish and Game, Division of Wildlife Conservation

There are two state sponsored hunts in the Cantwell area: a general hunt, for which all state residents are eligible, and a Tier II hunt, which has specific eligibility requirements. No general hunt for caribou takes place in Game Management Unit 13. The general hunt for moose lasts from September 1 to September 30. Hunters are restricted to harvesting one bull moose with a very specific antler configuration. Non-residents of the state of Alaska are also allowed to participate in this hunt. According to statistics compiled by the Alaska Department of Fish and Game, Division of Wildlife Conservation, 79 Cantwell residents participated in the general moose hunt and harvested 15 animals.

Under state law all Alaska residents are considered to be subsistence hunters, but if the Alaska Board of Game determines that a game population, which has traditionally been hunted by subsistence users, is so low that even local subsistence hunters would not have a reasonable opportunity of success, the state organizes a Tier II hunt. Applicants for a Tier II hunt are scored on their long-term use of the resource, on the relative availability of alternative subsistence resources, and the cost of food and fuel in their community. Those applicants who have the highest score receive a permit. The number of animals available determines the number of permits issued.

In GMU 13 the Tier II moose hunt, takes place between August 15 and August 31. Hunters participating in the Tier II moose hunt are allowed to harvest one bull moose with any antler configuration. In 1999 ten Cantwell residents received Tier II permits to hunt moose, but only one reported a successful harvest (Communication with ADF&G Division of Wildlife Conservation). Tier II caribou hunts in GMU 13 take place from August 10 to September 20 and from October 21 through March 31. Hunters are allowed to take one bull caribou. According to data from the Division of Wildlife Conservation 45 Cantwell hunters participated in the Tier II caribou hunt and harvested 11 animals.

In addition to being eligible to hunt on state lands under the general hunt or with a Tier II permit, Cantwell residents are also eligible to hunt within Denali National Park as members of a resident zone community. Hunters must obtain a permit from the National Park Service and are

allowed to hunt within the ANILCA additions to the park. Regulations pertaining to federal hunts are slightly different than those for state hunts. Under federal regulation, the moose season runs from August 1 to September 20, hunters must obtain a federal permit, and they are allowed to kill one bull moose, regardless of antler size or configuration. Division of Wildlife Conservation reported that 52 Cantwell hunters received permits to hunt moose on federal land and harvested 11 animals. Open season for caribou occurs from August 10 to September 30 and from October 21 through March 31. Federally qualified hunters are allowed to take two bull caribou. According to the Division of Wildlife Conservation 124 Cantwell hunters obtained federal caribou permits and harvested 14 animals.

Cantwell residents complained that in the last decade pressure from urban hunters has made it difficult for local people to find game. To avoid the competition and take advantage of their status as members of a resident zone community a number of Cantwell hunters began to hunt almost exclusively within the national park, an area that includes Cantwell Creek and Bull River. One Cantwell resident said that in 1999-2000 he received tags for both moose and caribou but that he did not try especially hard to get a caribou but would have harvested one if he had come across one while hunting moose (the seasons overlap). To hunt moose he went with three other men and all three harvested an animal for their families. All the hunters coordinated logistics between themselves and all took their moose in the ANILCA Additions to the park.

Generally Cantwell residents expressed concern over the decline in big game and moose in particular. One resident said that he moved to the area about three years ago but had hunted big game on the Denali Highway before that. It was his opinion that hunting on the Denali highway has declined, the “bull moose-cow ratio is terrible” he said. “I never see any legal bulls.” The problem is too many hunters from Anchorage and Fairbanks, so now he and his family hunt up the Cantwell and Bull rivers in an area of the national park where there is less hunting pressure and more animals. He said there were “lots of grizzly bears and moose in that area, compared to the Denali Highway.” But even there people from Glennallen and Wasilla put up tent camps and wait for animals to cross the park boundary. He said that he had asked the NPS to patrol

the boundary because of these camps. He concluded by saying that resident zone status has really helped the residents of Cantwell.

Processing moose and caribou meat

On the harvest survey we asked residents how they processed the caribou and moose they had harvested and what parts of the animal they used. The responses to these questions are listed in Tables 17 and 18. Not surprisingly the majority of households in Cantwell freeze their caribou meat (51.3 percent) and moose meat (82.8 percent). Fewer households dry, can or corn their meat and none reported salting or smoking meat. Half of the households surveyed said they made hamburger with their moose meat and 44.7 percent made sausage. One resident said that he took some of the meat from the moose and caribou into Anchorage to have it processed into sausage, but it cost him \$397 for only about 100 lbs of sausage, which he considered much too expensive. Over 30 percent of those households interviewed said they used the heart, liver, fat and antlers of moose and over 20 percent responded they used the heart, fat and antlers of caribou (Table 18). One resident said that he uses most of the animal, including the liver, and he hangs fat out for the chickadees and boils the bones for his dog. His freezer broke recently so he used some of the spoiled meat for his trapline and took the rest up into the mountain for the scavengers.

Dall Sheep

The community reported harvesting 2 Dall sheep, for a total community harvest of 160.7 pounds. Only 2.6 percent of households reported harvesting Dall sheep but 13.2 reported using it, indicating that it was widely shared. Dall sheep are available in the mountains around Cantwell but they are difficult to hunt and require considerable effort. The state of Alaska's season is open from August 10 to September 20 and each hunter is allowed one ram with a full curl horn or larger. The federal season is the same but hunters are allowed to take one ram with 7/8 curl horn.

Table 17. Estimated Number and Percentage of Households
Using Various Preservation Methods for Large Land Mammals, Cantwell, 1999

Preservation Method		Caribou	Moose
Freeze	Number	48	78
	Percent	51.3%	82.9%
Dry	Number	11	19
	Percent	11.8%	19.7%
Sausage	Number	22	42
	Percent	23.7%	44.7%
Hamburger	Number	28	47
	Percent	30.3%	50.0%
Salt	Number	0	0
	Percent	0.0%	0.0%
Smoke	Number	0	0
	Percent	0.0%	0.0%
Can	Number	6.2	16
	Percent	6.6%	17.1%
Corn	Number	1	1
	Percent	1.3%	1.3%

Source: Alaska Dept. of Fish and Game, Div. Of Subsistence, Household Surveys, 2000

Other Large Land Mammals

In addition to moose, caribou and Dall sheep, Cantwell residents harvested black and brown bears, and deer. Although one household attempted to harvest a bison, which are available outside of the region, they were unsuccessful. Only one household harvested deer. It should be noted that the nearest area to hunt deer is Prince William Sound. More households used black bear than brown bear, but more households attempted, unsuccessfully, to hunt brown bear, than black bear. In state and federal regulations there is no closed season on black bears and a hunter may take three bears. Regulations regarding brown bears are more restrictive: a hunter may take only one bear per season and the season is open only nine months of the year.

Table 18. Estimated Number and Percentage of Households Using Various Parts of Large Land Mammals, Cantwell, 1999

Parts Used		Caribou	Moose
Heart	Number	20	33
	Percent	21.1%	35.5%
Liver	Number	12	30
	Percent	13.2%	31.6%
Kidney	Number	4	7
	Percent	3.9%	7.9%
Stomach	Number	2	5
	Percent	2.6%	5.3%
Hide	Number	15	24
	Percent	15.8%	25.0%
Antler	Number	21	35
	Percent	22.4%	36.8%
Bone	Number	19	25
	Percent	19.7%	26.3%
Sinew	Number	5	7
	Percent	5.3%	7.9%
Hoof	Number	5	11
	Percent	5.3%	11.8%
Fat	Number	21	33
	Percent	22.4%	35.5%
Head	Number	12	19
	Percent	13.2%	19.7%

Source: Alaska Department of Fish and Game Division of Subsistence Household Surveys, 2000

FURBEARERS

In 1999-2000, 39.5 percent of Cantwell households reported using furbearing animals and 31.6 reported harvesting them. Cantwell residents reported using a wide variety of fur bearing animals including beaver, coyote, fox, hares, marten, parka and tree squirrels, wolves and, wolverines. Species used by over 10 percent of households were hare (30.3), fox (17.1) and porcupine (10.5). Hare and porcupine were used largely for food while fox were harvested for their fur. According to one resident the snow was too deep in 1999-2000 to effectively trap.

BIRDS

Cantwell residents reported the use of migratory and upland game birds. As shown in Table 10, 59.2 percent of households reported using birds and 53.9 percent reported a harvest. The total community bird harvest was 801.9 pounds or 8.5 pounds per household. Compared to that of upland game birds, the use and harvest of migratory species was low, only 3.9 percent of households reported using and harvesting a migratory species. These species included mallard ducks, teal, and Canada geese. Grouse and ptarmigan, on the other hand, were used by 42.1 and 50 percent of households respectively. Grouse were hunted by 38.3 percent of households and ptarmigan by 44.7 percent. The total community harvest of grouse was 319 birds or 223.3 pounds. For ptarmigan the total community harvest was 743 birds or 520 pounds.

EDIBLE PLANTS and WOOD

Almost all (93.4 percent) of the sampled Cantwell households used wild edible plants and over 92 percent reported harvesting plants (Table 10). The mean household harvest of 1,627.6 pounds was 6 percent of the community's total resource harvest (Figure 5), the third highest percentage after large land mammals and salmon. Berries made up the vast majority of the wild plant harvest. Types of berries included blueberries, currents, high bush cranberries, crowberries, low bush cranberries, raspberries and cloud berries. The total community harvest for berries was 1,439.6 pounds or 15.3 pounds per household. Additionally, 27.6 percent of households reported using other edible wild plants. These included fiddlehead ferns, rosehips, wild celery, fireweed, Labrador tea and mushrooms. Just over 50 percent of households reported harvesting and using cordwood. The average household cut was 3.2 cords.

One household member reported harvesting blueberries, cranberries and during the study year she made crowberry jelly. She estimated that in all she harvested about 15 gallons of berries from GMU (13E), and she gave away about 5 gallons (but received none in return). She also bought a ½ cord of wood this year from Nenana but it was a relatively mild winter and normally she will burn about a chord. Wood is a supplement to her normal heating system. This person also reported harvesting 3 shopping bags full of fiddlehead ferns in GMUs 16A and 13E, the stems of which she gave away.

MARINE MAMMALS and MARINE INVERTEBRATES

Not surprisingly no households in Cantwell reported harvesting marine mammals although 2.6 percent said they used harbor seals, belukha whale, and bowhead whale. No household gave away marine mammals but 2.6 percent said they received seal and whale. On the other hand, 11.8 percent of households said they used marine invertebrates and 5.3 percent said they harvested them. Clams were the most widely used (7.9 percent) and harvested (3.9 percent) invertebrates, followed by crabs and shrimp. The total community harvest of marine invertebrates was 125.33 pounds with a mean household harvest of 1.33 pounds. The nearest location for harvesting clams is on the Kenai Peninsula approximately 300 miles from Cantwell.

CHAPTER FIVE: DISCUSSION AND CONCLUSION

We begin this section by comparing Cantwell with two communities located in the Copper River Basin: Copper Center and Mentasta. Information about these communities comes from data gathered in 1987 under a cooperative agreement between ADF&G, NPS, and the Arctic Environmental Information and Data Center (AEIDC) (McMillan and Cuccarese 1988:1). Demographic and economic data is taken directly out of the printed report (McMillan and Cuccarese 1988), while the harvest data is taken from the Community Profile Database (CPDB).

Copper Center and Mentasta are similar to Cantwell in several respects. They are rural communities located on the road system, and on the border of a National Park. Wrangell-St. Elias National Park was established in 1980 under the Alaska National Interest Lands Conservation Act so that, unlike Denali, the entire park is available to members of resident zone communities to pursue subsistence activities. Both Mentasta and Copper Center are resident zone communities.

In terms of population and demographic structure Cantwell contrasts with both Copper Center and Mentasta. Copper Center is a relatively large, mixed community. In 1987-88 it had a population of about 439 people and was 44 percent Native (ibid:81,82). Mentasta is a small, predominately Alaska Native community. It had a population, in 1987-88, of 80 people and was 86 percent Native (ibid:123). Cantwell, on the other hand, had a population of 222 people and was about 19 percent Native.⁴ It should be pointed out that most of the Native people living in all three communities are Ahtna and belong to Ahtna Incorporated, the regional corporation started under the Alaska Native Claims Settlement Act. In addition, Ahtna living in Copper Center and Cantwell are members of the Copper River Native Association.

In economic terms Cantwell and Copper Center are similar in that a much higher percentage of employed adults was employed year round in Cantwell and Copper Center than in Mentasta. Mean annual household incomes were also higher in Cantwell and Copper Center. In Copper Center, 69 percent of the total number of adults were employed during 1987-88, and 58.6

⁴ According to the 2000 federal census Copper Center had a population of 362 people and was 50.6 percent Native whereas Mentasta had a population of 142 and was 71.1 percent Native.

percent of those were employed year round (McMillan and Cuccarese 1988:81). About the same number of adults (59.6 percent) was employed in Mentasta during the study year, but only 25 percent of those worked year round (ibid:122). In Cantwell 69 percent of adults were employed and 46.5 percent of those worked year round. The mean annual household income in Copper Center in 1987/88 was \$35,078 (McMillan and Cuccarese 1988:82) and \$27,883 in Cantwell, while in Mentasta it was \$14,620 (ibid:123).⁵

Copper Center had both higher household and per capita harvests in 1987-88 than did Cantwell in 1999-2000. Copper Center households harvested 533.5 pounds or 174.3 per capita (ADF&G CPDB). However Cantwell's per capita harvests (135.2 pounds) were slightly higher than those of Mentasta (125.4 pounds) while Cantwell's household harvests were 112 pounds lower than those of Mentasta (Figure 11).

Participation rates in Cantwell were comparable to those in basin communities, as was the diversity of resources harvested (Figure 12). In Cantwell, 97.4 percent of households used, attempted to harvest or harvested resources. Copper Center rates were slightly higher at 100 percent for all three categories (ADF&G CPDB), while Mentasta households had lower rates: 95.8 percent of households used wild resources, and 91.7 attempted to harvest or harvested wild resources (ADF&G CPDB). The average number of resources used by Cantwell households (8.6) was higher than in Copper Center (5.5) (McMillan and Cuccarese 1988:83) and about the same as Mentasta (8.2) (ibid:70).

Sharing of wild resources was widespread in all three communities. Ninety-three percent of Copper Center households reported receiving and 44.0 percent reported giving wild foods (ibid:70). In Mentasta 83.3 of households said they received wild foods while 58.3 said they

⁵ According to 2000 federal census data the mean annual household income in Copper Center was \$32,188 and in Mentasta it was \$17,344.

Figure 11. Comparison of household and per capita harvests for Copper Center, Mentasta and Cantwell

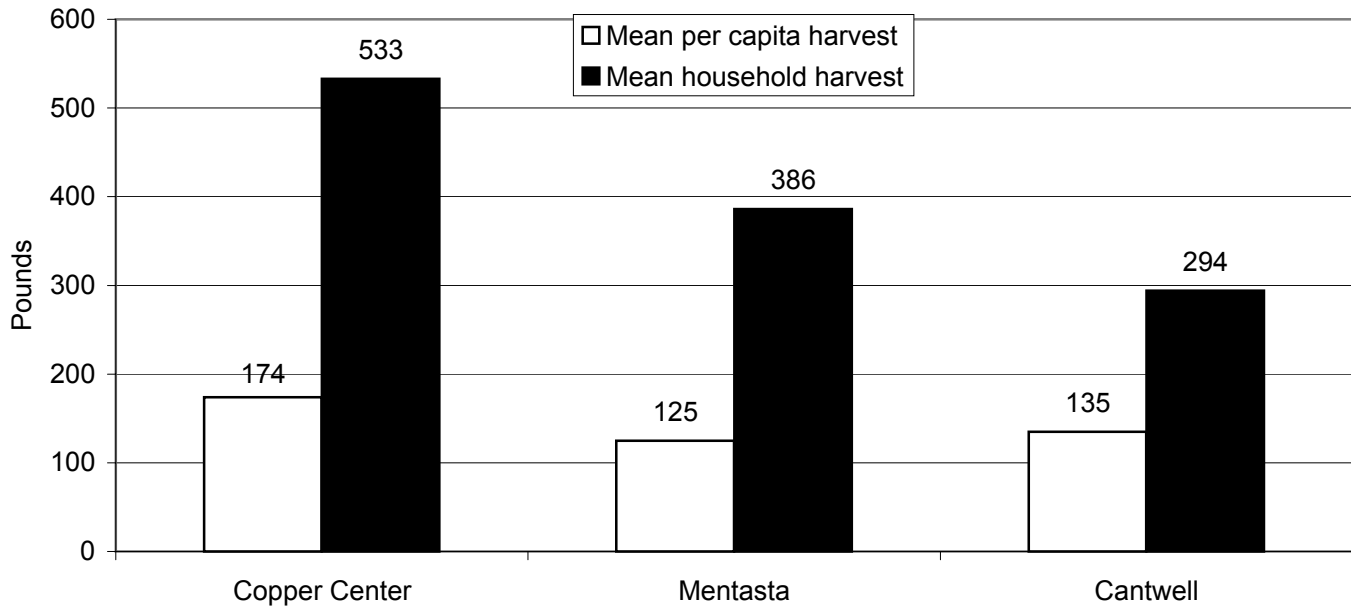
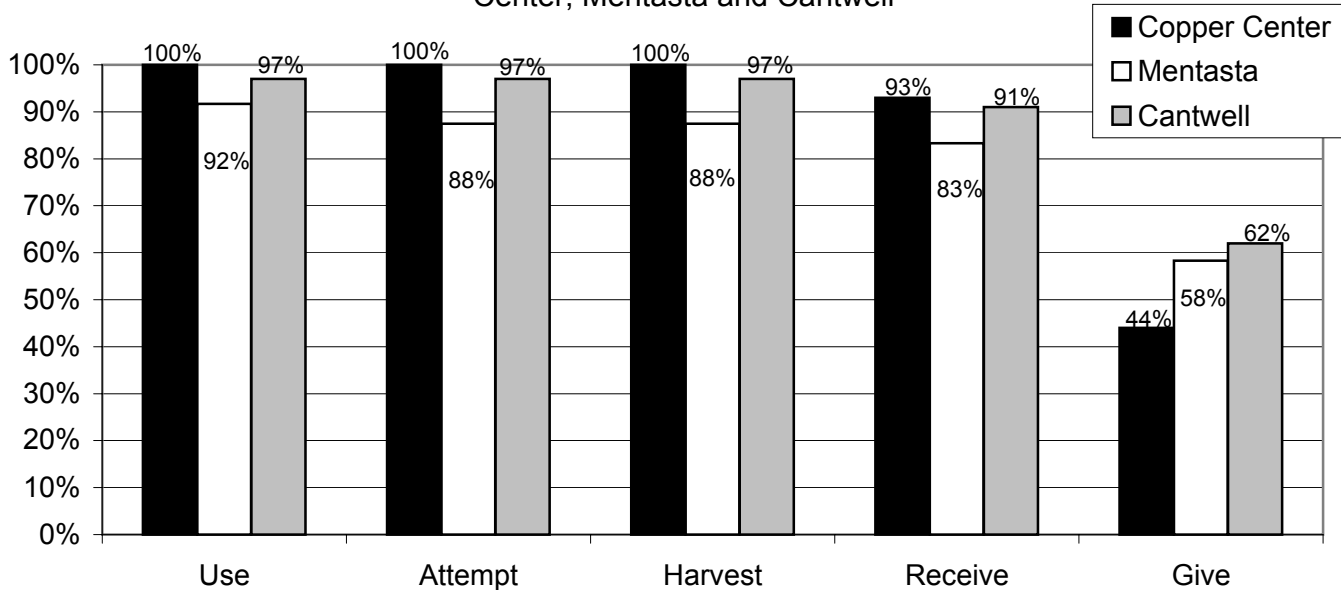


Figure 12. Comparison of Harvest and Use of Wildlife Resources for Copper Center, Mentasta and Cantwell



Source: Alaska Department of Fish and Game; Community Profile Data Base; Alaska Department of Fish and Game, Division of Subsistence Household Survey, 2000

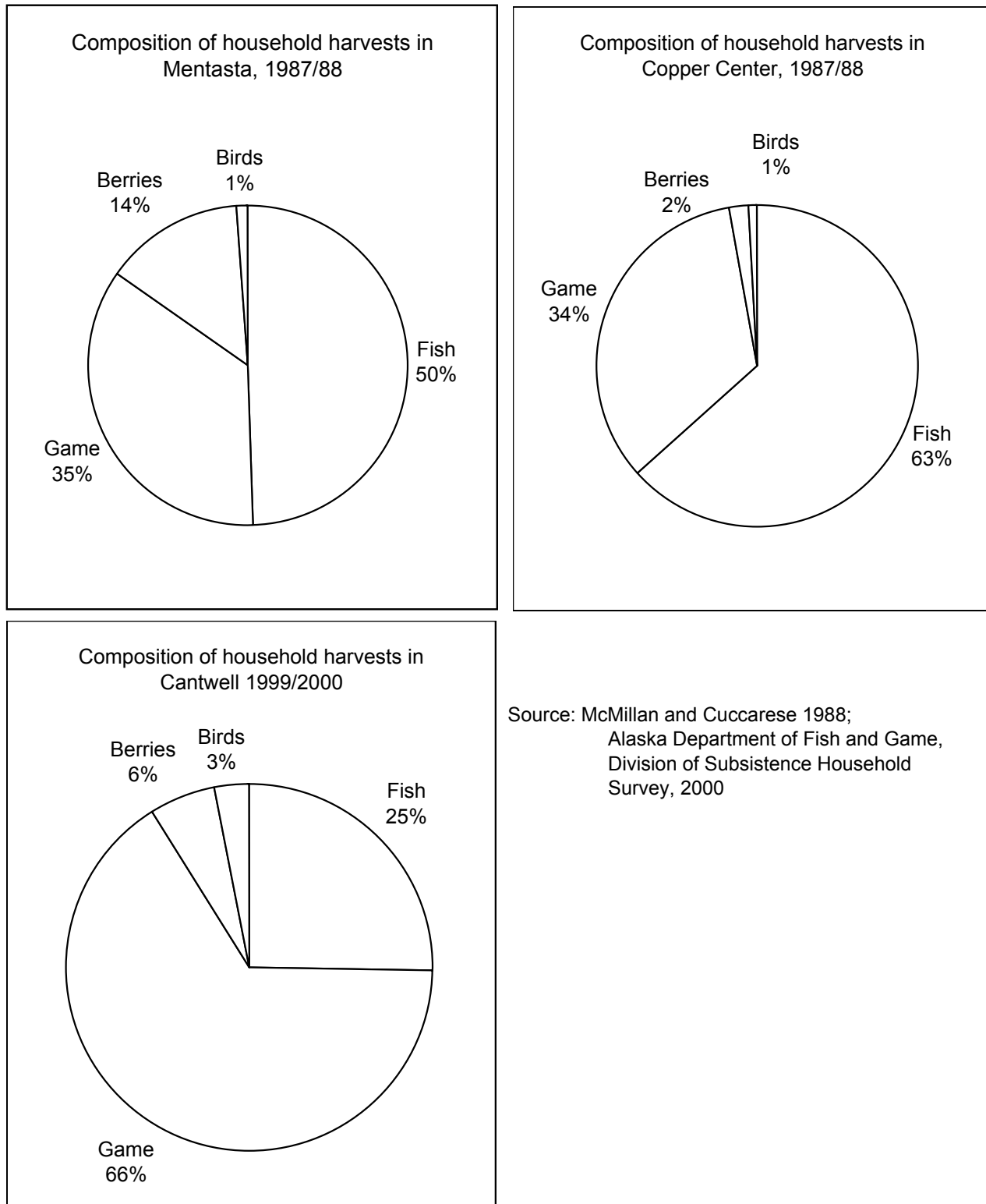
gave them (ibid). In Cantwell 90.8 percent of households received and 61.8 gave away wild foods.

Comparing the harvest composition (Figure 13) of the three communities we find that fish made up a larger percentage of household harvests in Copper Center (63 percent) and Mentasta (50 percent) than in Cantwell (24 percent). However, there was a difference in the composition of the fish harvest from community to community. Salmon dominated household harvests in Copper Center, at 316 pounds (ibid: 84), but in Mentasta the salmon harvest was more like that of Cantwell. Mentasta households harvested on average 73 pounds (ibid:125) and Cantwell households harvested about 50 pounds of salmon. Harvests of freshwater fish, on the other hand, were much smaller in Copper Center and Cantwell than in Mentasta. Copper Center households harvested just 15 pounds of freshwater fish, mostly Dolly Varden and lake trout (ibid: 84) while Cantwell households harvested 22 pounds, mostly grayling. In contrast, Mentasta households harvested just over 80 pounds of freshwater fish, with whitefish (53.8 pounds) the dominant species (ibid:125). Mentasta households harvested only a few grayling and no Dolly Varden or lake trout.

The difference in fish harvests between these three communities can be attributed to geography. Copper Center is located adjacent to the Copper River and its abundant salmon fishery and the Ahtna people of the central Copper River have a strong tradition of salmon fishing. Furthermore, there are no whitefish in the immediate vicinity of Copper Center. Mentasta is located in the Slana River drainage, a tributary of the upper Copper River. Salmon runs are smaller and there are strong runs of whitefish. Cantwell, as noted earlier, is not located near a salmon fishery and there are no whitefish in the area, but grayling are fairly plentiful.

Game was a much larger part of household harvests in Cantwell and Mentasta than in Copper Center (Figure 6). In Cantwell game made up 67 percent of household harvests and 53 percent in Mentasta, but in Copper Center game was only 34 percent. In all three communities moose was the dominant big game species harvested. In Copper Center households harvested an average of 86.1 pounds of moose meat (McMillan and Cuccarese 1988: 84), in Mentasta they

Figure 13. Composition of Household Harvests: Copper Center, Mentasta and Cantwell



harvested 75 pounds (ibid:125), and in Cantwell households harvested an average of 131.5 pounds. The numbers were reversed for caribou. Copper Center households harvested an average of 80.4 pounds of caribou, Mentasta households 48.8 pounds and Cantwell households 39.3 pounds.

When comparing the three communities bird and plant harvests, Copper Center households had the lowest harvest, 4.4 pounds and 11.9 pounds respectively but were similar to harvests in Cantwell: 8.5 pounds of birds and 15.3 pounds of plants. The Mentasta bird harvest was only 5.3 pounds but the plant harvest far exceeded the other two communities with an average of 52.9 pounds per household.

To conclude, Cantwell, at the beginning of the new millennium, is similar in terms of subsistence harvests and uses to other rural Alaskan communities that are on the road system. As measured against Copper Center, which is a relatively large mixed community, and Mentasta, which is a small, primarily Native community, Cantwell is similar in a variety of categories.

Compared to 1983, when the last community wide harvest survey was done, per capita harvests in 1999 were higher (135 and 111 pounds respectively), although mean household harvests were lower (293 pounds versus 324 pounds) (ADF&G CPDB). The diversity of household harvests has increased since 1983. Matched against other Copper Basin communities in 1983, Cantwell had one the least diversified resources harvests of all the communities surveyed, (5.7 different species) (ibid:179). In 1999 the number of different kinds of resources harvested (8.6 different species) surpassed that of Mentasta in 1987-88 (8.2 different species)⁶. One reason for this was that Cantwell residents traveled to different parts of the state and were therefore able to harvest a wide array of resources.

Although Cantwell residents harvested resources found outside their region, such as clams, arctic char, halibut, and Sitka deer, most resources were harvested locally. Stratton and Georgette (1984:185) noted this pattern in 1983. For example, a great proportion of the

⁶ Note, in 1983 Mentasta households harvested an average of 8.3 different kinds of resources.

Cantwell harvest, in 1999 and 1983, was composed of big game while a lesser amount was composed of fish. The main reason for this is that big game is more readily available. In addition to harvesting moose and caribou, many households received meat that was either killed by trains or cars or had been confiscated from sport hunters, or they received meat from friends, relatives or neighbors who participated in a successful hunt. Salmon, on the other hand, are not locally available. People have to travel outside the region, either going south on the Parks Highway or to the Copper River Basin or the Kenai Peninsula.

The importance of subsistence in Cantwell is reflected in these statistics. Of all the households surveyed for this report, 97.4 percent reported using, harvesting, or attempting to harvest a wild resource. At the same time 90.8 percent reported they received a resource and 61.8 percent said they gave one or more resources away. As one resident said, “This community sustains itself on people passing meat back and forth. I think subsistence is absolutely essential to the area.”