

COPPER BASIN CARIBOU USE:
A RESEARCH UPDATE

by
Lee Stratton

Technical Paper Number 75

Alaska Department of Fish and Game
Division of Subsistence
Anchorage, Alaska
March 1983

ABSTRACT

This report contains information on characteristics of the uses and users of the Nelchina and Mentasta caribou herds. Data were collected with questionnaires mailed to 1982-83 permit holders for the Nelchina caribou general (503) and subsistence (503W) hunts and the Mentasta (502) caribou hunt. A total of 2100 questionnaires were sent out, of which 1,055 (50.2 percent) were returned.

Questionnaire data were analyzed in order to compare the three groups of caribou hunters. Results showed that hunters in all three groups were predominantly males, and lived in households with an average size between three and four persons. Most Nelchina general (503) hunt permit holders resided in the Anchorage area (57.0 percent), the Palmer/Wasilla area (18.4 percent) and Fairbanks (11.4 percent). Mentasta (502) hunt permit holders primarily resided in the Nelchina Basin (38.0 percent), the Anchorage area (24.1 percent) and "Other Alaska" (16.9 percent). Nelchina subsistence (503W) hunters were, by regulation, Nelchina Basin (Game Management Unit 13) residents, with significant numbers giving addresses in Glennallen (28.7 percent), Copper Center (16.9 percent) and Cantwell (12.4 percent).

Of the three permit groups, 503W hunters had the greatest length of residency in their communities and in the State, and were generally older than the other two groups of hunters. The same group of permit holders had a longer history of having used the Nelchina caribou (mean number of 15 years) than did the 503 permit holders (mean number of 7 years). Of the three permit groups, the 503 permit holders hunted other caribou herds most frequently, and the herds were predominantly fly-in hunts. 503W permit holders that hunted other herds most commonly used

the Mentasta herd, which is relatively accessible to Basin residents. The 503W hunters reported the highest dependence on wild food resources, the lowest average income, and the most prevalent employment in part-time and seasonal jobs; in contrast, 503 and 502 permit holders had lower dependence on wild renewable resources, higher incomes, and were predominately employed full-time, year round.

The study corroborates previous research findings on caribou use patterns (Stratton 1982a) and Copper River Basin fishwheel users (Stratton 1982b) which noted extensive histories of use of local resources and wide utilization of a variety of wild natural resources by Copper Basin residents.

In summary, the results of the study indicate that substantial differences in economic circumstances and resource use patterns exist between the 503W subsistence permit hunters and the 503 general permit group. Also, the 1982 questionnaire results suggest that a large number of Basin residents who in 1981 were not participating in the permit system have obtained permits under the Nelchina subsistence hunt regulations.

TABLE OF CONTENTS

List of Tables and Figures.....	iii
Introduction.....	1
Purpose.....	2
Objectives.....	3
Methodology.....	3
Findings.....	4
Demographic Data.....	4
Place and Length of Residency.....	7
History of Use.....	10
Other Caribou Herds Hunted.....	14
Preservation.....	14
Resources Utilized.....	14
Diet Composition.....	17
Wage Employment.....	17
Income.....	21
Discussion.....	21
References Cited.....	28
Appendix A.....	29

LIST OF TABLES AND FIGURES

<u>Table</u>	<u>Page</u>
1	1982 Caribou Questionnaire Sample..... 4
2	Sex of Hunters by Caribou Hunt.....5
3	Mean and Median Ages of Hunters.....5
4	Household Size of Hunters.....7
5	Residency of 502 and 503 Permitholders and Questionnaire Respondents, 1982.....8
6	503W Questionnaire Respondent Residency.....9
7	Other Caribou Herds Hunted by 1982 Respondents.....15
8	Percentage of Wild Fish and Game in Diet.....17
9	1982 Income for 502, 503, and 503W Hunters.....21

Figure

1	Age of hunters of the 502, 503, and 503W caribou in ten-year ranges.....6
2	Mean number of years of residency in Alaska and current area.....11
3	Length of residency in community.....12
4	Number of years since initial use of herd.....13
5	Methods of caribou preservation, 1982.....16
6	Resource categories regularly used by hunters: big game.....18
7	Resource categories regularly used by hunters: waterfowl, small game and fish.....19
8	Percentage of fish and game in household's diet.....20
9	Wage employment of hunters.....22
10a	Hunt 502: Household income in thousands of dollars.....23
10b	Hunt 503: Household income in thousands of dollars.....23
10c	Hunt 503W: Household income in thousands of dollars.....23

INTRODUCTION

The ranges of two of Alaska's thirteen caribou herds, the Nelchina and the Mentasta, lie within the Copper River Basin. Both herds are hunted by Copper Basin residents, as well as non-local hunters. Hunting pressure increased significantly during the 1970s. Early in the same decade, the Nelchina herd also experienced a major decline in size. Consequently, since 1977 limited numbers of hunting permits for each herd have been allocated by means of a random drawing system.

Since 1981, the Board of Game has allocated a portion of the total number of Nelchina permits as subsistence permits for those individuals meeting certain specifications. In regulations passed by the Board of Game in March 1982, 1,300 drawing permits were made available in the Nelchina general drawing, and 450 subsistence drawing permits were available to those meeting the following requirements: 1) a minimum age for permit applicants of 12 years; 2) local (Game Management Unit 13) rural residency, and 3) use of wild fish and game for the majority of the applicant's household's meat supply. A winter season extending from January 1 to March 31, 1983 was open for 503W (Nelchina subsistence hunt) permit holders, in addition to the August 20 to September 20, 1982 season for both the general and subsistence permit holders. Any subsistence permits not issued in the drawing were to be issued on a registration basis on December 1. In the 1982-83 season, 233 Nelchina subsistence permits were issued in the drawing and the remaining 217 permits were issued on December 1.

Based on population size, 20 permits were made available in Cantwell and 197 in Glennallen.

The Mentasta caribou hunting regulations have been stable for the last five years. Since 1978, 350 permits have been awarded annually to applicants through a random draw system. The hunting season has remained August 10 to September 30 since the drawing permit system was implemented.

In this report, the term "Nelchina Basin" refers to the primary range of the Nelchina herd, a geographic area bounded by four mountain ranges: the Alaska Range, the Wrangell Mountains, the Chugach Mountains, and the Talkeetna Mountains. The Copper River Basin is a smaller area within the Nelchina Basin, essentially the drainage area of the Copper River. Thus, the Copper River Basin is the easterly two-thirds of the Nelchina Basin. With respect to human population, the majority of the population of the two Basins coincide, excepting Cantwell, the few year round Denali Highway residents, and the Gunsight Mountain vicinity residents.

PURPOSE

The purpose of this report is to present demographic and socioeconomic information about participants in the three caribou permit hunts during 1982 -- the 503 permitted hunt (Nelchina general), 503W permitted hunt (Nelchina subsistence), and 502 permitted hunt (Mentasta) -- as well as to obtain a greater understanding of the use of

natural resources by Mentasta and Nelchina caribou users. The report is part of an ongoing study of the patterns of use of wild, renewable resources within the Copper River Basin.

OBJECTIVES

The report provides the following information:

1. A profile of demographic and socioeconomic characteristics of hunters and the hunters' households including:
 - a) age, sex, and size of households of hunters;
 - b) place and length of residency; and
 - c) wage employment and income.
2. A description of caribou and natural resource use of the permit winners and their households, including:
 - a) history of use of the caribou herd;
 - b) other caribou herds utilized;
 - c) caribou meat preservation methods; and
 - d) other fish and game resources used regularly.
3. An estimate of the quantities of fish and game resources used within permit winners' households and shared with others.

METHODOLOGY

Sample

In July and August of 1982, a questionnaire (Appendix A) and postage paid return envelope were enclosed with the permit mailed to each of the 350 Mentasta permit winners (502), the 1,300 Nelchina general draw permit winners (503), and the 233 Nelchina subsistence

permit applicants (503W). An additional 217 subsistence permits and questionnaires were issued on December 1, 1982 in Glennallen and Cantwell. Table 1 shows the number of questionnaires mailed or distributed, the number returned, and the number which were usable and received in time to be computerized for tabulation. Usable questionnaires were those which had been filled out. Questionnaires received after February 1 are included in the count of questionnaires returned, but were not tabulated due to time limitations.

TABLE 1
1982 CARIBOU QUESTIONNAIRE
SAMPLE

<u>Permit Hunt</u>	<u>Questionnaires Issued</u>	<u>Questionnaires Returned</u>	<u>Usable</u>
502	350	167 (47.7%)	166 (47.4%)
503	1,300	705 (54.2%)	700 (53.9%)
503W	450	183 (40.7%)	178 (39.6%)
Overall	2,100	1,055 (50.2%)	1,044 (49.7%)

Returned questionnaires were coded for computer use and then tabulated and cross-tabulated with the Statistical Package for the Social Sciences (Nie et al 1975).

FINDINGS

Demographic Data

For each of the hunts, the majority of hunters were male. Males accounted for 77.7 percent of the hunters in the 502 hunt,

while the percentage of males for the 503W hunt, 65.2 percent, was the lowest among the three groups of caribou hunters (Table 2).

TABLE 2
SEX OF HUNTERS BY CARIBOU HUNT

	<u>502</u>	<u>503</u>	<u>503W</u>
Male	129 (77.7%)	541 (77.3%)	116 (65.2%)
Female	35 (21.1%)	158 (22.6%)	62 (34.8%)
Unknown	2 (1.2%)	1 (0.1%)	--
	<u>166 (100.0%)</u>	<u>700 (100.0%)</u>	<u>178 (100.0%)</u>

Hunters ranged in age from 10 to 83 years. The mean ages and median ages are reported in Table 3. Figure 1 illustrates the age of hunters in ten year cohorts. Overall, 503 hunters were the youngest (mean age of 35.2 years), 502 hunters were in the middle (mean of 38.5 years) and 503W hunters were the oldest (mean age of 43.2 years).

TABLE 3
MEAN AND MEDIAN AGES OF HUNTERS

<u>Hunt</u>	<u>Mean</u>	<u>Median</u>
502	38.5	35.0
503	35.2	35.0
503W	43.2	40.2

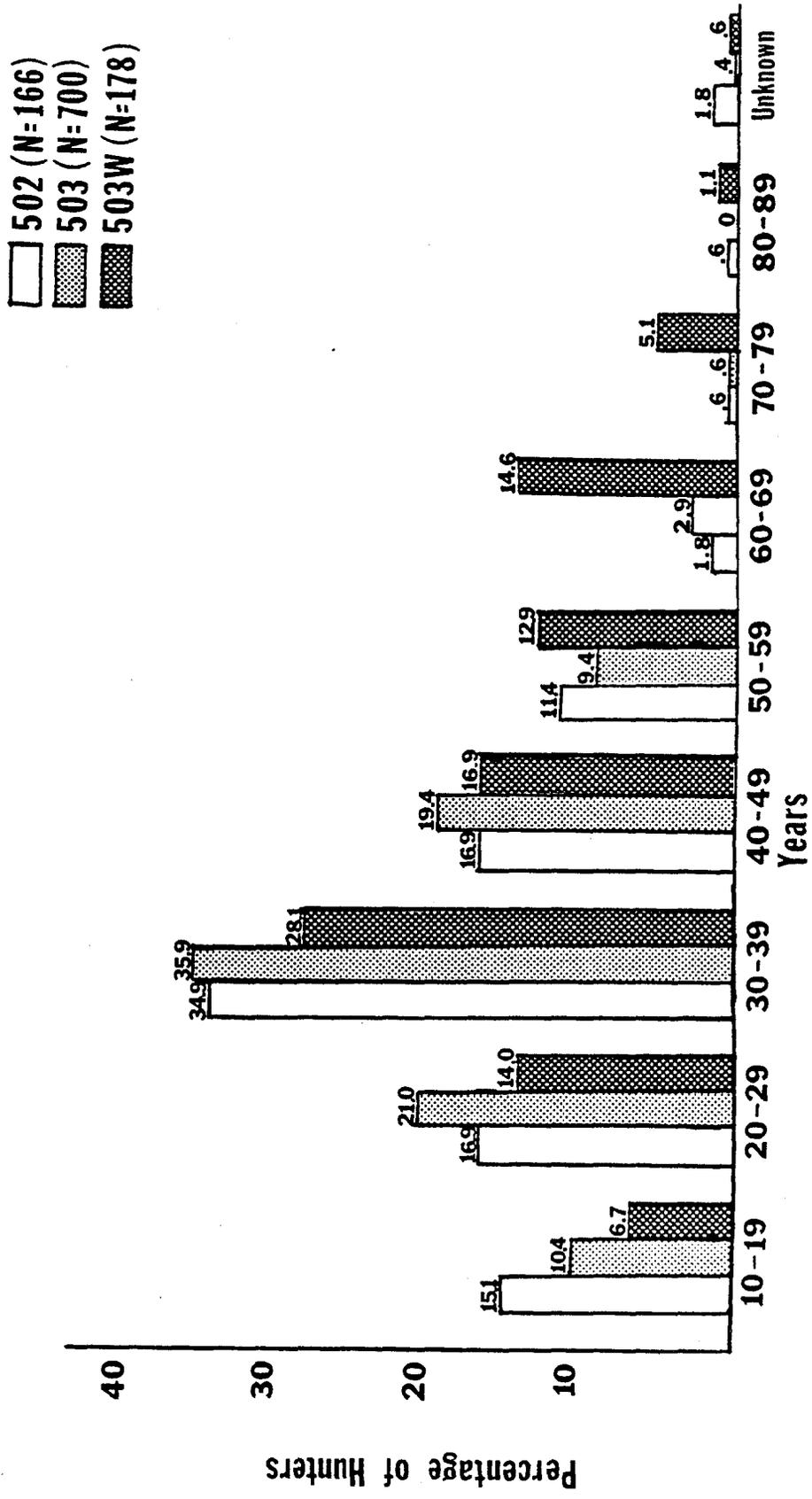


Figure 1. Age of hunters of the 502, 503, 503W caribou hunts in ten-year ranges

Household sizes for permit winners were similar. Table 4 depicts the household sizes for the three groups of hunters.

TABLE 4
HOUSEHOLD SIZE OF HUNTERS

<u>Hunt</u>	<u>Mean</u>	<u>Median</u>	<u>Range</u>
502	3.5	3.6	1 - 8
503	3.5	3.5	1 - 10
503W	3.4	3.2	1 - 8

Place and Length of Residency

Residences of questionnaire respondents accurately reflected the distribution of residences among all permit winners. Table 5 shows the residency of permit winners and questionnaire respondents for the 502 and 503 hunts. The 503W hunt is not included in Table 5 since all permit holders were from the Game Management Unit 13, the Nelchina Basin area. Table 6 delineates the residency of 503W respondents within the Nelchina Basin area. Comparison of the number mailed out and returned was not useful for this group, since permit winner residences are identified by mailing address. In the Nelchina Basin area, several localities receive mail through neighboring communities.

The 503 hunt permit holders were primarily residents of the Anchorage area (57.0 percent), Palmer/Wasilla vicinity (18.4 percent), and Fairbanks area (11.4 percent). Mentasta permit holders were primarily residents of the Nelchina Basin (36.3 percent), Anchorage area (24.0 percent) and "Other Alaska" (16.0 percent), a category including Valdez, Cordova, Juneau and other localities. Within the Nelchina Basin, 503W permit holders resided in at least 17 different

TABLE 5

RESIDENCY OF 502 and 503 PERMIT HOLDERS AND QUESTIONNAIRE RESPONDENTS, 1982¹

	<u>502 Hunt</u>				<u>503</u>			
	<u>All Permittees</u>		<u>Questionnaire Respondents</u>		<u>All Permittees</u>		<u>Questionnaire Respondents</u>	
	<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>
Anchorage area ²	84	24.0	40	24.1	741	57.0	376	53.7
Fairbanks area ³	28	8.0	13	7.8	148	11.4	95	13.6
Kenai Peninsula ⁴	9	2.6	2	1.2	26	2.0	18	2.6
Nelchina Basin ⁵	127	36.3	63	38.0	22	1.7	24	3.4
Palmer/Wasilla ⁶	26	7.4	6	3.6	239	18.4	119	17.0
Military ⁷	-	-	-	-	83	6.4	37	5.3
Other Alaska ⁸	56	16.0	28	16.9	41	3.2	21	3.0
Out of State	20	5.7	10	6.0	-	-	-	-
Unknown	-	-	4	2.4	-	-	10	1.4
	<u>350</u>	<u>100.0</u>	<u>166</u>	<u>100.0</u>	<u>1,300</u>	<u>100.1</u>	<u>700</u>	<u>100.0</u>

¹ Permitholder data derived from Division of Game permitwinner listings. Columns may not total 100.0 percent due to rounding errors.

² Includes Bird Creek, Chugiak, Eagle River, Girdwood.

³ Includes Big Delta (1), Clear (3), College (6), Delta Junction (14), Ester (1), Healy (1), Manley Hot Springs (1), McKinley Park (1), Nenana (2), North Pole (11), Tok (2).

⁴ Includes Anchor Point, Clam Gulch, Homer, Kasilof, Kenai, Seward, Soldotna, Sterling.

⁵ Includes Cantwell, Copper Center, Gakona, Glennallen, Paxson. Some Nelchina Basin residents have Palmer SRB addresses.

⁶ Includes Big Lake, Sutton, Talkeetna, Trapper Creek, Willow.

⁷ Includes Eielson Air Force Base, Elmendorf Air Force Base, Fort Greely, Fort Richardson, Fort Wainwright, APO Seattle.

⁸ Includes Cordova, Ketchikan, Kodiak, Juneau, Auke Bay, Metlakatla, Sitka, Skagway, Valdez.

TABLE 6
503W QUESTIONNAIRE RESPONDENT RESIDENCY

<u>Location</u>	<u>Number of Questionnaires Returned</u>	<u>Percentage¹</u>
Cantwell	22	12.4
Chistochina	2	1.1
Chitina	4	2.2
Copper Center	30	16.9
Denali	2	1.1
Dry Creek	1	0.6
Gakona	9	5.1
Glenn Highway	7	3.9
Glennallen	51	28.7
Gulkana	6	3.4
Hurricane	3	1.7
Kenny Lake	11	6.2
Lake Louise	3	1.7
Slana	6	3.4
Tazlina	5	2.8
Tonsina	4	2.2
Unknown	12	6.7
	<u>178</u>	<u>100.1</u>

¹ column does not total 100.0 due to rounding error.

areas. Glennallen (28.7 percent), Copper Center (16.9 percent) and Cantwell (12.4 percent) accounted for the highest number of respondents in individual localities.

Of the three groups of hunters, the 503W respondents were characterized by a greater length of residency both in their current community and in the State of Alaska. As a group, 503W hunters have resided in the state about twice as long as 502 and 503 hunters. Figure 2 illustrates the mean number of years of local and state residency for hunters of each of the three permit hunts. Figure 3 illustrates length of residency at current locale in ten year cohorts.

History of Use

Nelchina subsistence hunt permittees were generally characterized by a longer history of hunting the Nelchina herd in comparison with the 502 and 503 permittees. The mean number of years since the hunter first hunted Nelchina caribou was 15.0 years for 503W respondents. In comparison, the Nelchina general group had first used the Nelchina herd an average of 7.0 years ago. The Mentasta hunt respondents had a history of use of the Mentasta caribou of 9.7 years.

Seventy-eight percent of the Mentasta hunters had first used Mentasta caribou within the last 10 years. Of the Nelchina subsistence permittees, only 38.7 percent had a use confined to the last decade. Conversely, 19.8 percent of the 502 respondents and 29.4 percent of the 503 respondents had a use exceeding 10 years, while 54.0 percent of the 503W respondents had a history of use of greater than 10 years (Figure 4).

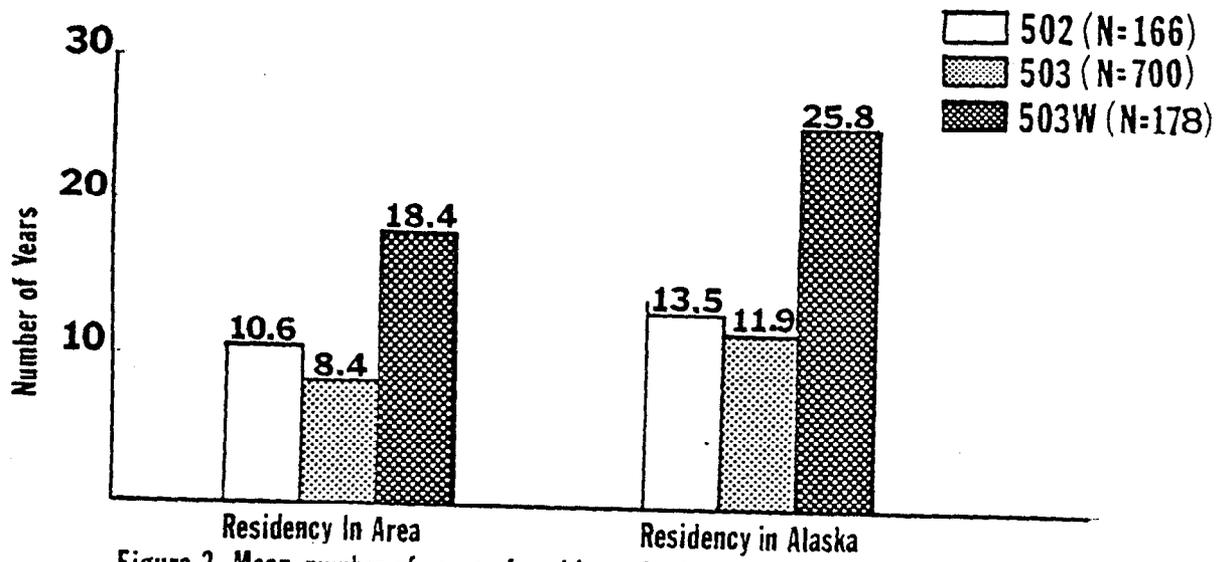


Figure 2. Mean number of years of residency in Alaska and current area

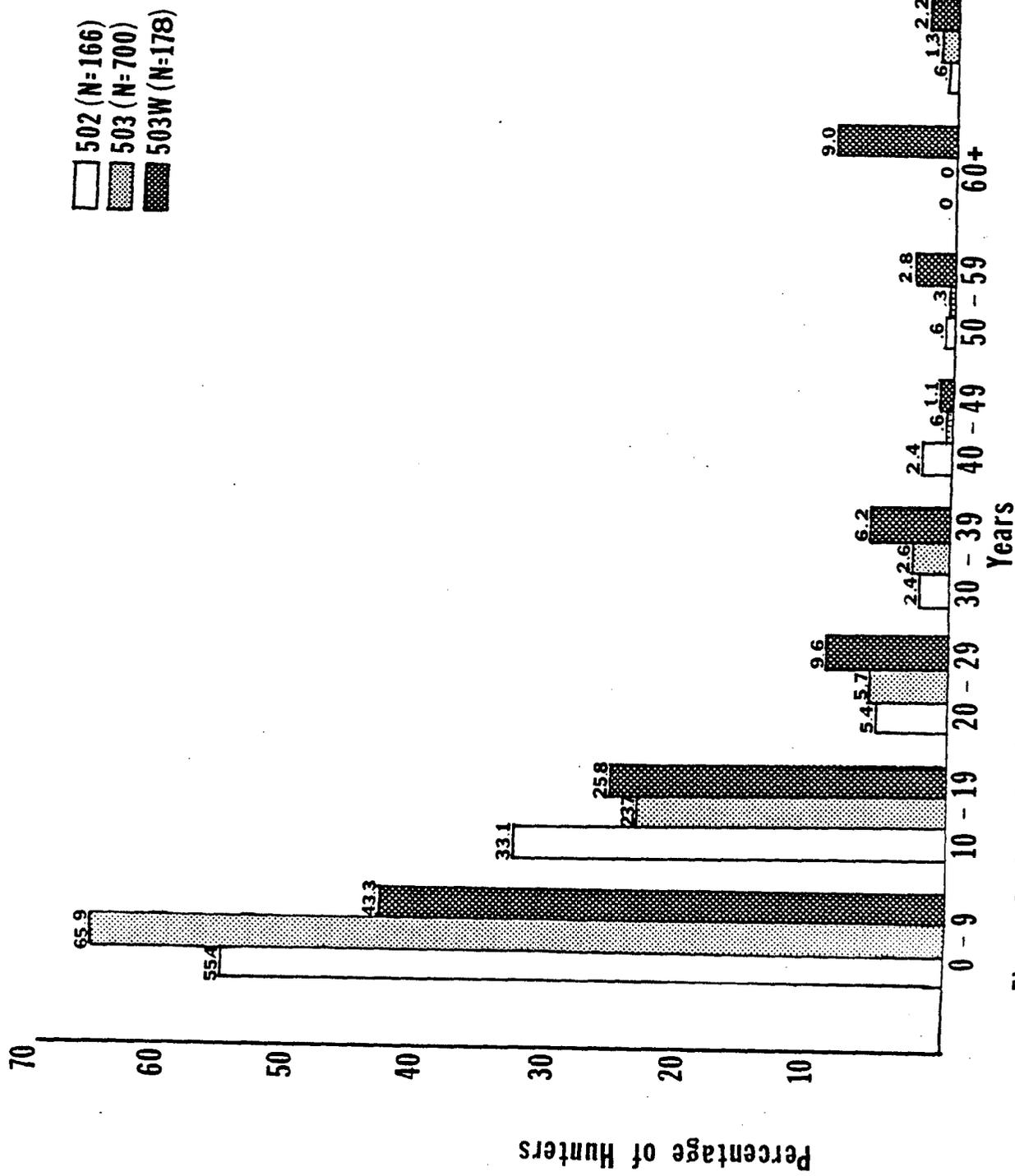


Figure 3. Length of residency in community

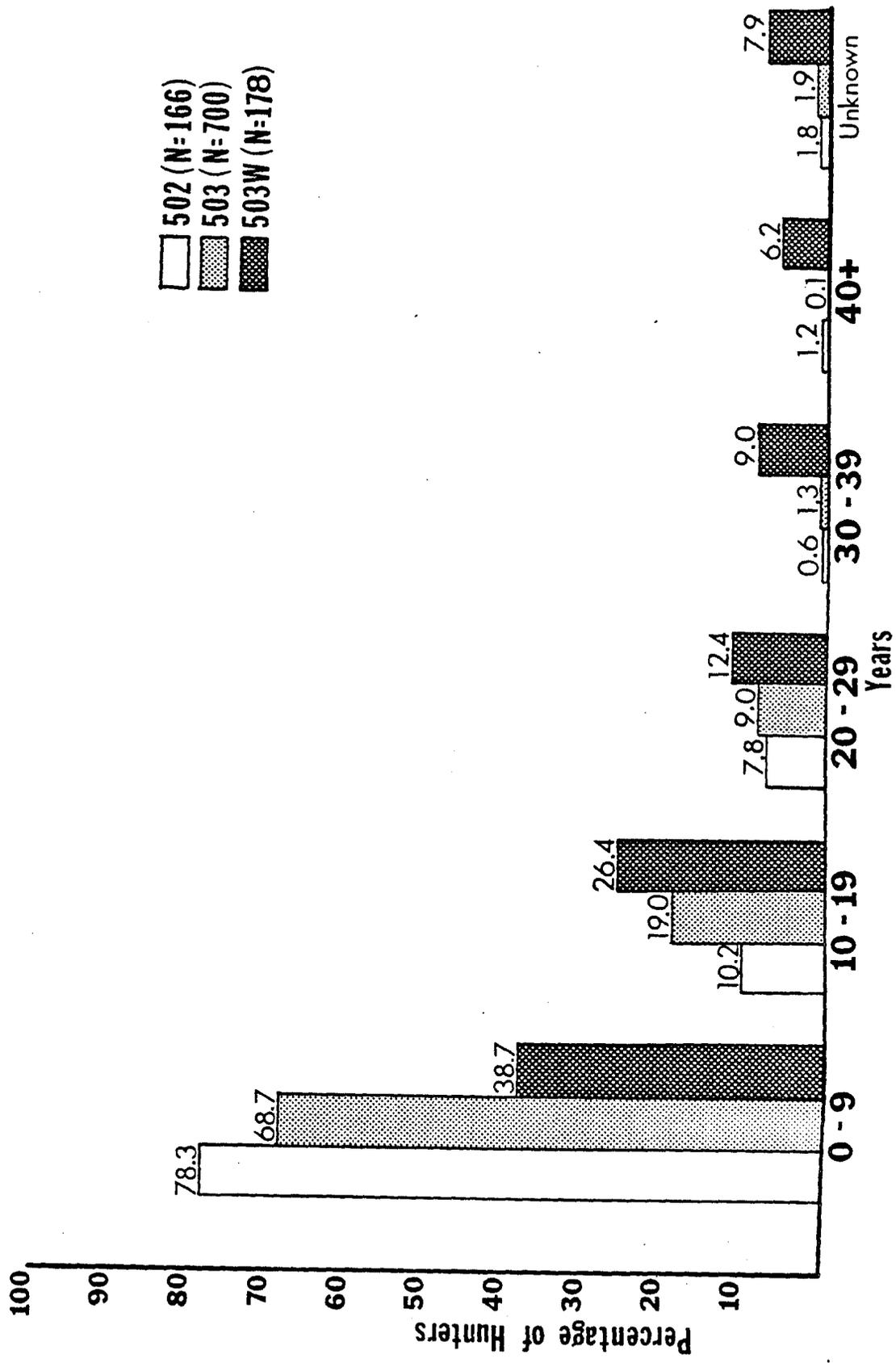


Figure 4. Number of years since initial use of herd

Other Caribou Herds Hunted

The majority of all three hunting groups had not hunted other caribou herds in their lifetimes. Thirty-five percent of the 502 hunters had hunted other herds, which compared with 19.1 percent of the 503 hunters and 24.4 percent for the 503W hunters. Table 7 lists the other herds hunted.

Hunt 503 participants clearly had hunted the widest range of other herds, most frequently mentioning the Alaska herd, a predominately fly-in hunt. Hunt 502 respondents had a slightly smaller range of use, with the Nelchina, a road-accessible herd, being mentioned most often. Only four herds were mentioned by 503W hunters. The most frequently listed, the Mentasta herd, is relatively close and accessible to Copper Basin residents.

Preservation

Many hunters reported that they preserved caribou meat in more than one way. Hunters from all three hunts almost universally mentioned freezing as a method of caribou meat preservation. Making sausage was the second most frequently mentioned method, but patterns diverged between hunt participants with respect to preservation other than freezing. Higher percentages of hunts 502 and 503 participants reported making sausage, while 503W hunters cited canning, smoking, and drying meat more often than other permit hunt groups (Figure 5).

Resources Utilized

Hunters were asked which resources their households used regularly. Moose and salmon were the resources most frequently mentioned

TABLE 7
OTHER CARIBOU HERDS HUNTED BY
1982 RESPONDENTS*

<u>502</u>		<u>503</u>		<u>503W</u>	
<u>Caribou Herd</u>	<u>Number of Respondents</u>	<u>Caribou Herd</u>	<u>Number of Respondents</u>	<u>Caribou Herd</u>	<u>Number of Respondents</u>
Nelchina	42	Alaska	50	Mentasta	23
Alaska	9	Mulchatna	23	Forty-Mile	7
Forty-Mile	7	Forty-Mile	22	Alaska	4
Mulchatna	6	Arctic	18	Arctic	3
Porcupine	3	Mentasta	15		
Arctic	2	Delta	10		
Kenai	1	McComb	5		
McKinley	1	Porcupine	4		
		McKinley	4		
		Kenai	4		
		Adak	2		

* Listed in order of frequency mentioned; on the questionnaire, space was given for hunters to list up to three different herds. Hunting reported in Game Management Unit 12 presented data coding difficulties. For this reason, the Chisana herd is omitted; and the Nelchina and Mentasta caribou herds, which also range in Unit 12 and account for the majority of caribou harvested in that Unit, may be used more frequently than shown in the table.

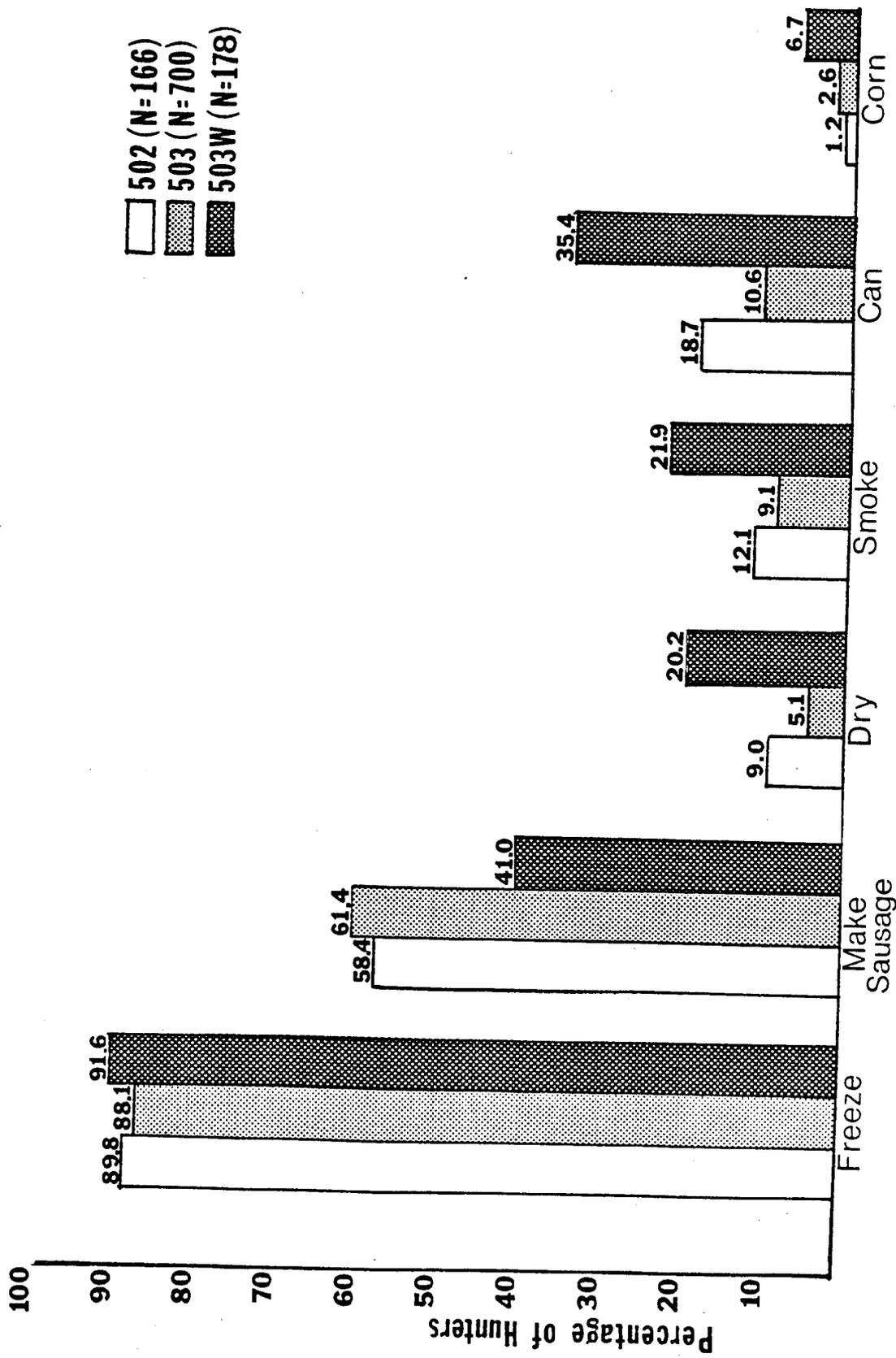


Figure 5. Methods of caribou preservation, 1982★

★Columns are not mutually exclusive

within each hunting group. Caribou and "other fish" (such as trout, burbot, and halibut) were also widely used by the three groups. Diverging patterns occurred in some of the other categories. Of the three permit hunt groups, participants in the 503W Nelchina subsistence hunt demonstrated the highest use of black bear, whitefish, birds other than waterfowl (ptarmigan and grouse), and small game such as hare, porcupine, and muskrat (Figures 6 and 7).

Diet Composition

In response to the request to "estimate the percentage of your household fish and meat which comes from wild fish and game resources," the majority of 503 respondents (56.6 percent) indicated that 50 percent or less of their diet was from wild fish and game. Forty-two percent of the Mentasta hunter and 29.8 percent of the Nelchina subsistence hunt participants also reported half or less. The majority of 502 and 503W respondents reported diets consisting of greater than fifty percent of wild fish and game (Figure 8 and Table 8).

TABLE 8
PERCENTAGE WILD FISH AND GAME IN DIET

<u>Hunt</u>	<u>Mean</u>	<u>Median</u>
502	59.7	60.4
503	48.1	49.7
503W	66.4	74.7

Wage Employment

Reported wage employment patterns differed markedly among participants in the three permit hunts. Sixty three percent of the Nelchina

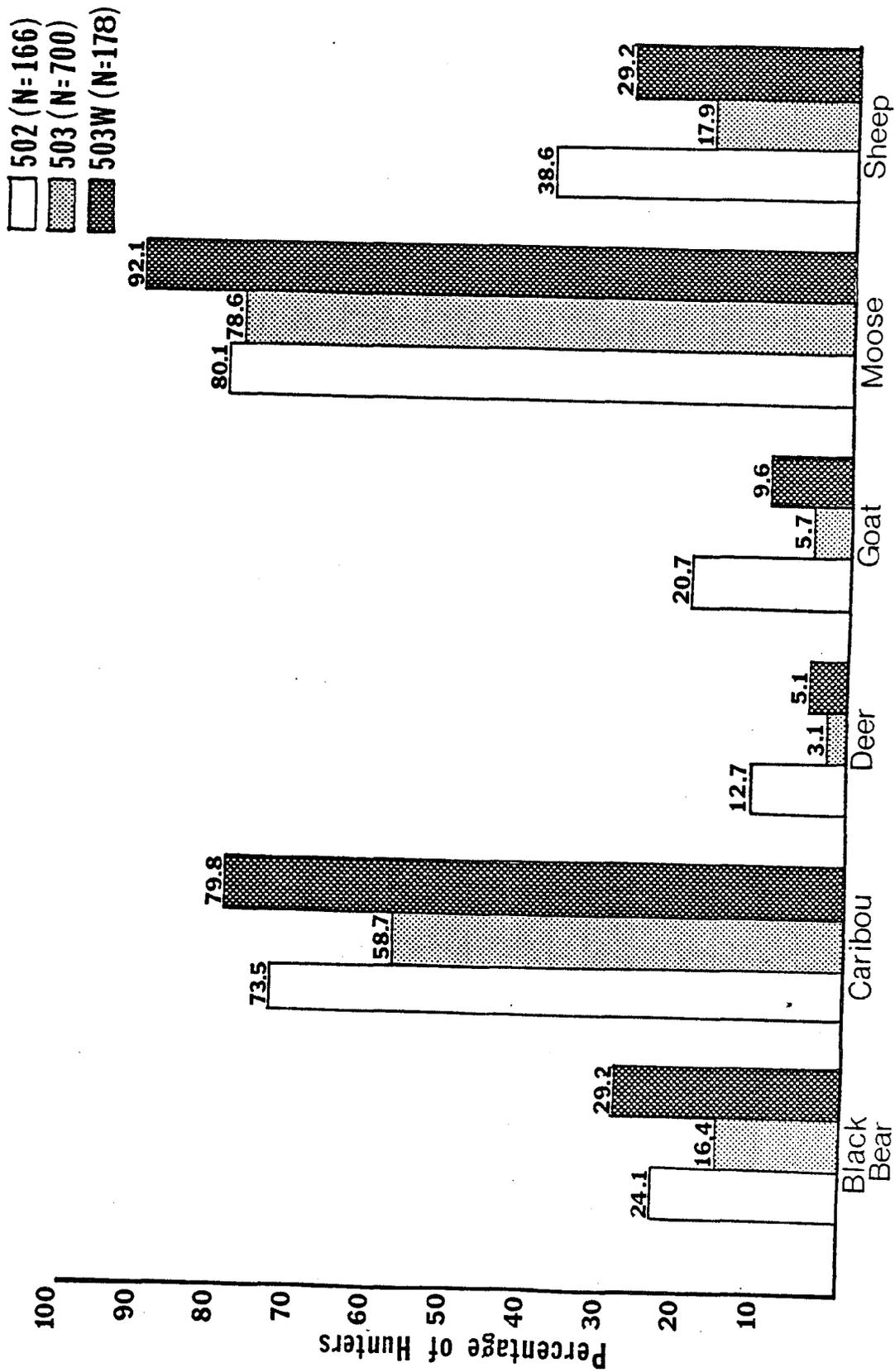


Figure 6. Resource categories regularly used by hunters: big game*

*Columns are not mutually exclusive

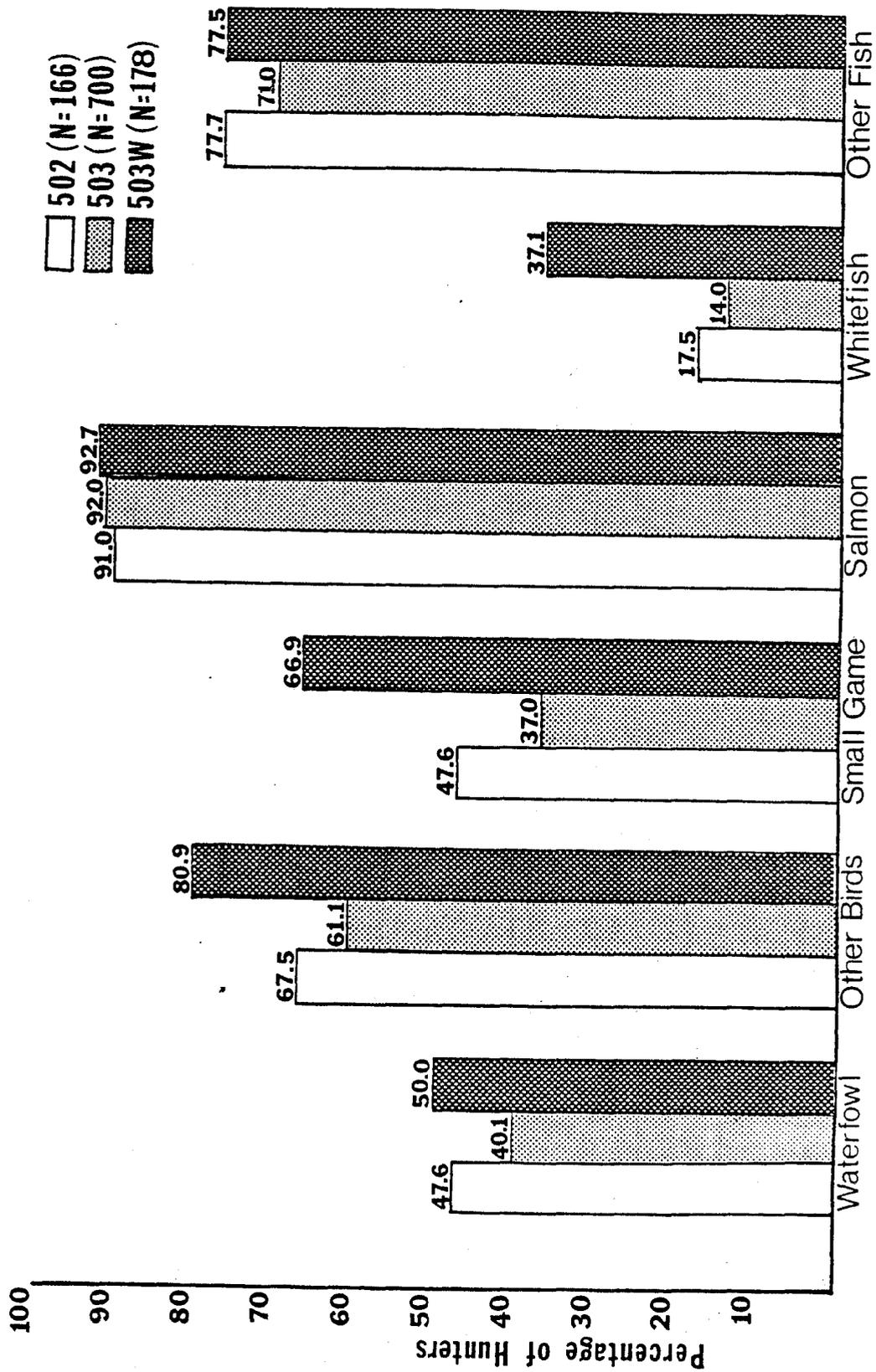


Figure 7. Resource regularly used by hunters: waterfowl, small game, and fish*

*Columns are not mutually exclusive

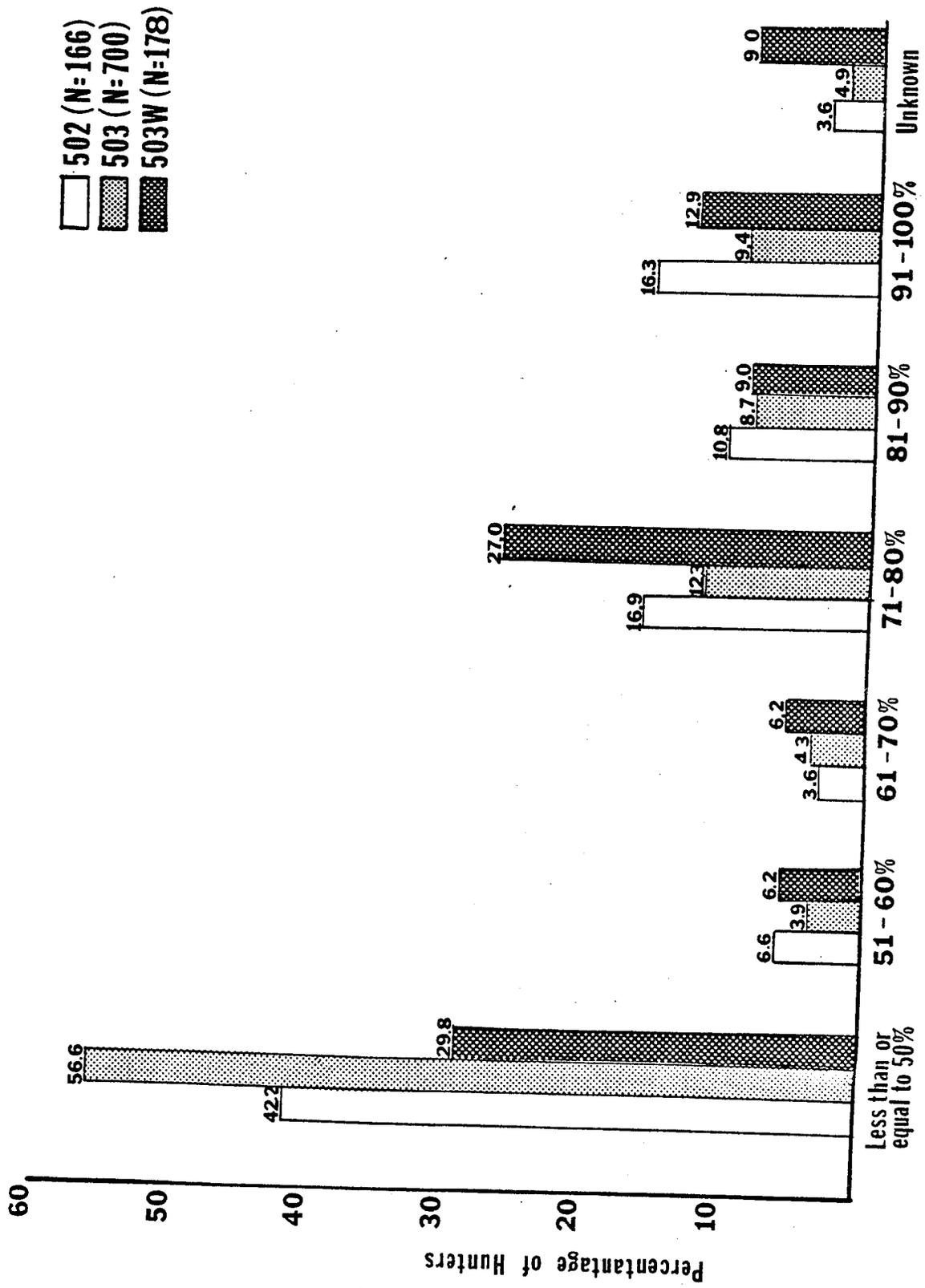


Figure 8. Percentage of fish and game in household's diet

general hunt participants indicated that they held full-time year round jobs, in contrast to 20.2 percent of the Nelchina subsistence hunt participants. Nelchina subsistence hunt permit holders more frequently held part-time or seasonal jobs, or were retired or unemployed (Figure 9). Of the Mentasta hunt group, 51.2 held full-time year-round wage employment.

Income

Like wage employment, reported household income patterns differed markedly between the three hunting groups. Nelchina subsistence hunters more frequently fell into the lower income ranges while Nelchina general and Mentasta hunters reported higher incomes (Table 9, Figure 10).

TABLE 9
1982 HOUSEHOLD INCOME FOR 502, 503, 503W HUNTERS

<u>Hunt</u>	<u>Mean</u>	<u>Median</u>
502	\$43,800	\$40,200
503	\$41,500	\$39,000
503W	\$16,200	\$11,800

DISCUSSION

Research conducted in 1982 on the participants in the three drawing permit caribou hunts, the Nelchina general (503), the Nelchina subsistence (503W), and the Mentasta (502), identified several significant characteristics which contrast the three groups. In most cases, the greatest differences occurred between the 503 and 503W groups, with Mentasta hunters falling in between. All 503W hunters

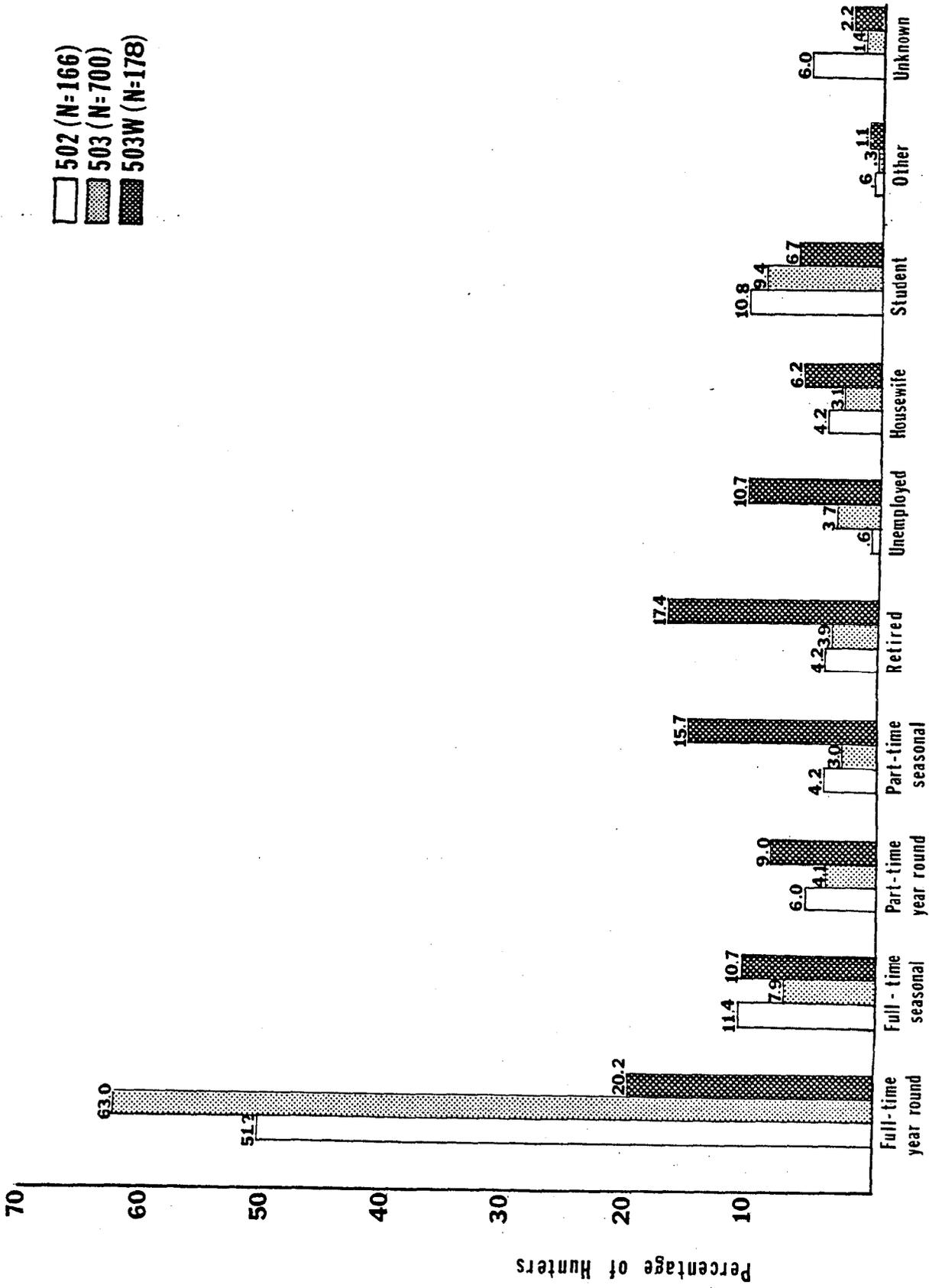


Figure 9. Wage employment of hunters

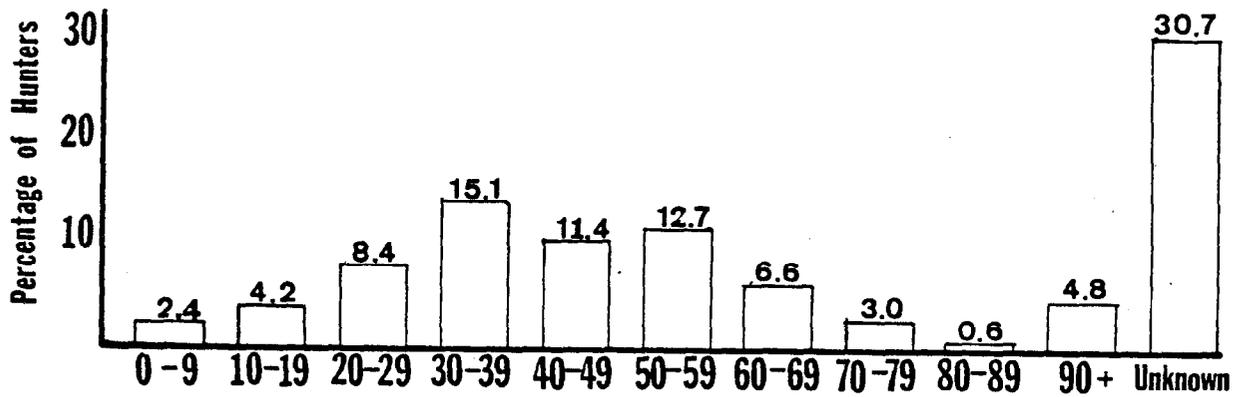


Figure 10a. Hunt 502 household income in thousands of dollars (n=166)

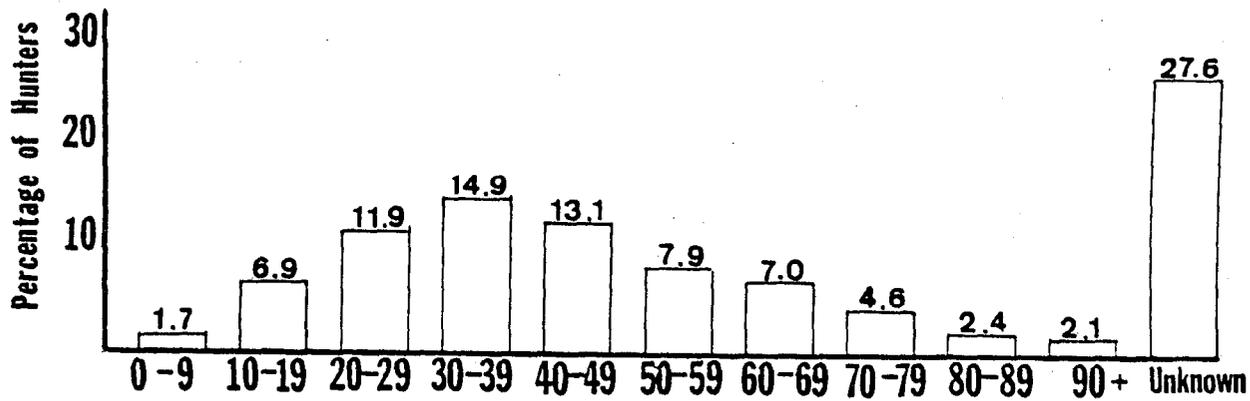


Figure 10b. Hunt 503 household income in thousands of dollars (n=700)

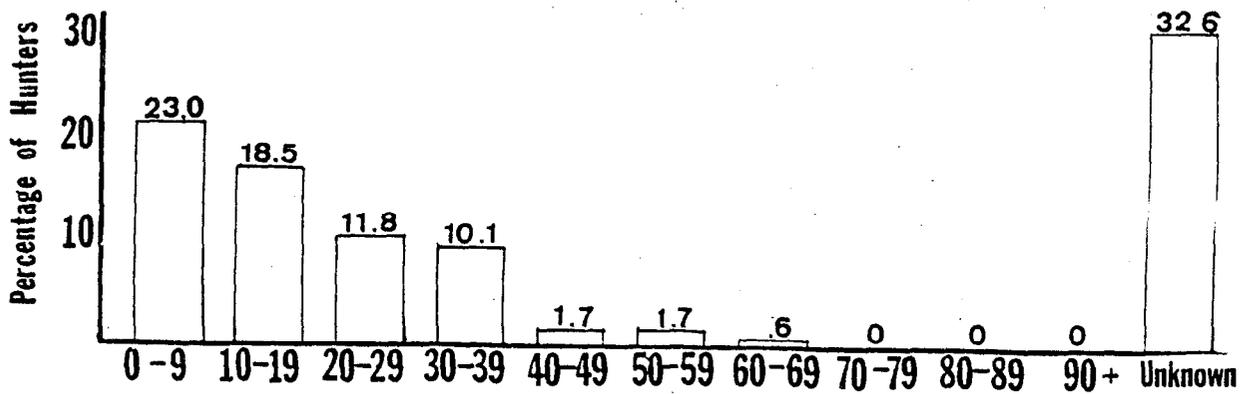


Figure 10c. Hunt 503W household income in thousands of dollars (n=178)

resided in the Nelchina Basin, while the vast majority of 503 permit holders (98.3 percent) lived outside of the Basin. About 38 percent of the hunters of Mentasta caribou lived in the Nelchina Basin. Of the three groups, the 503W hunters had the greatest length of residency in their communities and in the State, and in addition, were generally older than the other sets of hunters. The mean number of years since Nelchina subsistence permit holders first hunted Nelchina caribou was 15 years, over twice the average of 7 years for general permit holders. Hunt 503 participants were far more likely to have hunted other herds (35 percent), many mentioning herds which require fly-in hunts. In contrast, most 503W hunters who have used other caribou have hunted the Mentasta herd, which is relatively accessible to Nelchina Basin residents. Other patterns of resource use also differed between the three groups. 503W hunters reported the highest dependence on wild food resources for their household's protein supply. Accordingly, they were more likely to use black bear, whitefish, and small game. Patterns of wage employment also contrasted the three groups. The Nelchina Basin has few towns and very limited employment opportunities, which is reflected in the finding that only 20.2 percent of the 503W hunters reported having full-time, year-round wage employment. Nelchina subsistence permit holders more frequently held part-time or seasonal jobs than did Nelchina general hunters, 63 percent of whom were employed full-time year round. About 51 percent of the Mentasta hunters had full-time year round employment. Mean household incomes for the three groups were \$16,200 for the 503W, \$41,500 for 503, and \$43,800 for Mentasta. These data suggest that in general, the household economies of Nelchina Basin residents who

hunted caribou in 1982 were based upon limited cash incomes and extensive use of natural resources.

Research conducted by the Division of Subsistence in the summer of 1982 on uses of the Copper River salmon fisheries (Stratton 1982b) provided similar conclusions about Copper River Basin fishwheel users. For example, local residents had longer histories of use of salmon and wider utilization of Basin resources than did fishwheel users residing outside of the Basin.

The results of the 1982 survey of 503 and 503W permitholders can be compared with the findings of previous research on Nelchina caribou users conducted by the Division of Subsistence in 1981. The 1981 study employed two methodologies. Questionnaires were mailed to fifty percent of a composite list of all 1979, 1980, and 1981 Nelchina caribou permit winners. A second sample of people, the majority of whom were not involved in the permit system, were interviewed.

Survey data from the 1979 to 1981 permitholder sample characterized Nelchina caribou users as predominantly residents of the Anchorage, Palmer/Wasilla and Fairbanks areas. History of use of the Nelchina caribou extended less than ten years for 53.9 percent of this sample (Stratton 1982a:10, 20). Other patterns which were demonstrated by the survey sample included dominant use of freezing as a method of meat preservation, and use of moose and salmon. Many mentioned the use of more than one caribou herd, either currently or in the past.

The 1981 interview sample, which consisted of 73.3 percent Nelchina Basin residents, displayed a different set of patterns,

including long-term residency in the area and a lengthy history of having used the herd. Hunting areas were utilized because of their proximity to hunters' residences and also because of long standing family use patterns. Preservation methods included drying and smoking meat in addition to the commonly employed freezing. Salmon and moose were other resources mentioned as important. The use of small game (such as hare, ptarmigan, and grouse), whitefish, and other fish was also frequently reported. Although a few had acquired caribou hunting permits, most of those interviewed were not participating in the Nelchina hunt. Use had been interrupted for some when the herd's numbers declined in the late 1960s, making the animals less abundant and less accessible. Other factors which discouraged use included the shorter season, smaller bag limits, and the drawing permit system with its limited chances of winning and the cost of applying. Many stated that given different regulatory conditions, they would resume hunting the herd.

The 1982 responses to the Nelchina general hunt (503) questionnaire duplicate the findings of the 1981 questionnaire on residency, history of caribou use, and methods of meat preservation. A larger percentage of the 1982 questionnaire respondents for the 503 hunt reported caribou use histories of 10 years or less. This may be attributable to the movement of Nelchina Basin residents out of the general draw and into the 503W hunt, thereby increasing the proportion of Basin residents and newcomers who received 503 permits.

Another characteristic of the 503 group which corresponded to earlier findings on Nelchina hunters was that respondents' mean estimated household diets consisted of less than half wild fish and

game for protein. The availability and accessibility of reasonably priced meat and fish to the permit holders, most of whom reside in or near urban service centers, may be largely responsible for this. The high rate of full-time year round employment reported by 503 permit winners (63 percent) might also limit the permit holders' available time to harvest fish and game resources. The mean household incomes of those reporting income information was \$41,500, more than double the 503W respondents' reported mean household income of \$16,200. Thus, in general the 503 permit holders had more alternatives to hunting for their households' food supply than did the participants in the Nelchina subsistence hunt.

The higher participation in the caribou permit system by local residents made possible by the 1982 503W regulations allowed for a better sampling of local residents' use patterns through the questionnaire methodology. The 1982 503W questionnaire results mirrored the findings of the earlier interview data with respect to lengthy residency in the Nelchina Basin area, extensive histories of use of the Nelchina caribou, wide utilization of meat preservation methodologies in addition to freezing, particularly canning, smoking and drying, and use of a number of wild renewable resources, especially those which are available and reasonably accessible within the Nelchina Basin. Thus, the 1982 findings indicate that substantial differences in economic circumstances and resource use patterns exist between the 503W subsistence permit group and the 503 general permit group. Also, the 1982 503W questionnaire results suggest that a large number of Basin residents who in 1981 were not participating in the permit system have obtained permits under the Nelchina subsistence hunt regulations.

REFERENCES CITED

- Nie, Norman H., C. Hadlai Hull, Jean G. Jenkins, Karin Steinbrenner
and Dale H. Bent
1975 SPSS Statistical Package for the Social Sciences, Second
Edition. McGraw-Hill Book Company, New York.
- Stratton, Lee
1982a Patterns of Use of the Nelchina Caribou Herd. Alaska
Department of Fish and Game, Division of Subsistence, Anchorage,
Alaska.
- 1982b The Dipnet and Fishwheel Fisheries of the Copper River, 1982.
Alaska Department of Fish and Game, Division of Subsistence,
Anchorage, Alaska.

APPENDIX A

Original Size:
11" x 14"

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF SUBSISTENCE

Dear 503 Permit Holder:

This survey is being conducted to help the Department of Fish and Game manage the Nelchina caribou herd. Participation in the survey is completely voluntary. You may skip any question you do not wish to answer. Your cooperation in filling out this survey and returning it within two weeks in the enclosed envelope (no postage necessary) is greatly appreciated.

Important: If more than one person in your household receives a permit, please have each permit holder complete a separate questionnaire. Return all the questionnaires from your household together in the same envelope.

(PLEASE DO NOT SIGN THIS FORM)

- *****
1. Age of permit holder _____
 2. Sex of permit holder _____
 3. Community/area of residence _____
 4. How long have you been a resident there? _____ years _____ months
 5. How long have you been a resident of Alaska? _____ years _____ months
 6. How many people live in your household? _____
 7. In what year did you first use Nelchina caribou? _____
 8. Since then, about how many years have you hunted Nelchina caribou? _____
 9. Please list other caribou herds and in which years you have hunted. (You may continue on the back of the survey.)
 Herd hunted (or GMU) _____ Year(s) _____
 Herd hunted (or GMU) _____ Year(s) _____
 10. How do you usually preserve your caribou meat? (Check all that apply)
 _____ freezing _____ canning _____ corning
 _____ drying _____ sausage
 _____ smoking _____ other (specify) _____
 11. Check wild fish and game resources regularly used by your household:
 _____ moose _____ whitefish
 _____ sheep _____ other fish (burbot, trout, grayling, etc.)
 _____ goat _____ small game (hare, porcupine, etc.)
 _____ black bear _____ waterfowl (ducks, geese, etc.)
 _____ salmon _____ other birds (ptarmigan, grouse, etc.)
 _____ caribou _____ other (specify) _____
 12. How much of your harvested fish and game resources do you usually share with people not living in your household?
 _____ none _____ about 1/2 (40 - 59%)
 _____ some (1 - 19%) _____ more than 1/2 (60 - 79%)
 _____ less than 1/2 (20 - 39%) _____ almost all (80 - 100%)
 13. Estimate the percentage of your household fish and meat which comes from wild fish and game resources: _____%
 14. Employment of permit holder:
 _____ full-time year round _____ student
 _____ full-time seasonal _____ retired
 _____ part-time year round _____ unemployed
 _____ part-time seasonal _____ other: (specify) _____
 15. Please estimate your annual gross income:
 a. personal _____
 b. household _____
 16. Additional comments. (May be continued on the back of this sheet.)