

North Slope Subsistence Study Barrow 1988

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BARROW, 1988

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with

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Alaska OCS Environmental Studies Program

North Slope Subsistence Study - Barrow, 1988

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INTRODUCTION

The North Slope Subsistence Study, sponsored by the Minerals Management Service (MMS), is a three year study of Barrow and Wainwright residents' subsistence harvests. The major focus of the study is to collect harvest and location data for species used in these communities in a manner that accurately represents total community harvests. This interim report is the second of three annual reports on the findings of the Barrow research. The first year of Barrow data collection began on April 1, 1987 and continued through March 31, 1988. Throughout the report, this time period is referred to as "Year One." The second year of Barrow data collection began on April 1, 1988 and continued through March 31, 1989. Throughout the report, this time period is referred to as "Year Two." The data presented in this interim report will be revised in subsequent reports as new or corrected information is gathered in the course of ongoing data collection. The reader is referred to the final year three report which will incorporate all three year's data.

During the first year of data collection, the North Slope Borough (NSB) provided both technical (e.g., Geographic Information Systems [GIS] mapping) and financial (e.g., local research assistants [RAs] were hired through the NSB Mayor's Job Program) support for this project. During Year Two, the NSB has continued this support and also provided supplemental funding for data collection and analysis. This additional funding has made possible the continuous field presence in both Wainwright and Barrow, added to the scope of work SRB&A personnel was able to accomplish, and facilitated the data collection and analysis.

PURPOSE OF THE PROJECT

When completed, this study will describe community subsistence harvest data and the extent both offshore and onshore areas were used by Barrow and Wainwright residents during the study period. This report specifically presents results from the first and second years of data collection in Barrow.

STUDY APPROACH

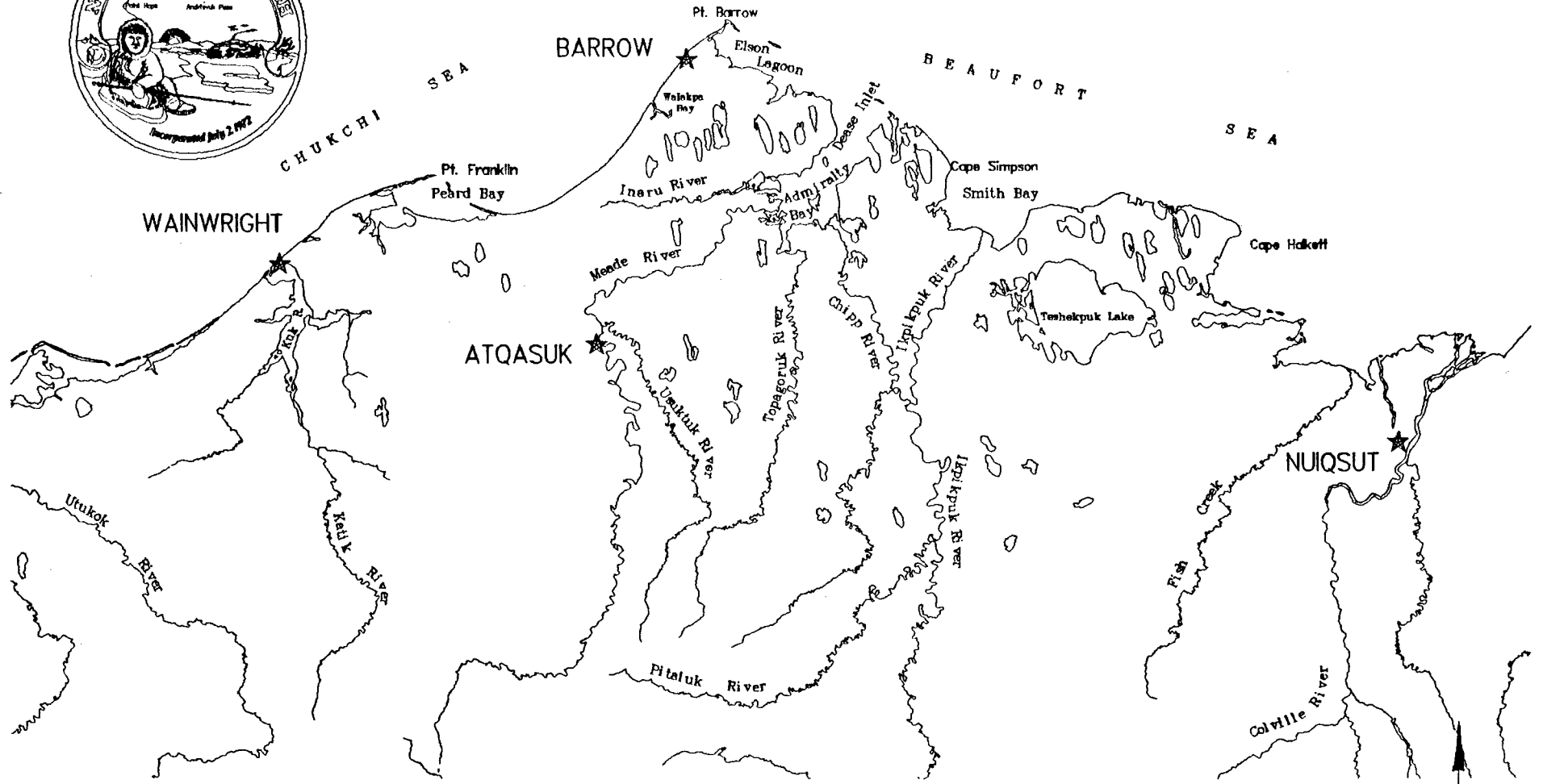
Essential to the study approach is the multi-year nature of the data collection effort. Two aspects of subsistence harvest patterns demonstrate the importance of this long-term approach. First, the areas used by Inupiat hunters vary seasonally according to resource distribution patterns and hunter access. Second, harvest patterns vary from year to year due to environmental conditions, the population status of the targeted resources, as well as due to social, economic, and cultural influences. The comparisons of Year One and Year Two results demonstrate the variability of harvest levels from year to year.

A second essential element of the study approach in Barrow is the application of stratified sampling techniques to increase the representation of active hunters within the sample while ensuring that study results are representative of the community as a whole. Subsistence harvest patterns differ among families within the same community due to varying socioeconomic circumstances, the location of fixed camps, and the experience and knowledge of family members. The stratified sampling approach employed in this study captures most of the variation in harvest patterns by including a majority of the households that account for most of the community's harvest (see Stephen R. Braund and Associates [SRB&A] and Institute of Social and Economic Research [ISER] 1988 - Appendix for a detailed discussion of the Barrow data collection methodology).

THE STUDY AREA

The community of Barrow is situated on the Chukchi Sea coast approximately 7.5 miles southwest of Point Barrow, the most northerly point in the United States (Map 1). In 1988 Barrow's population of 3,223 people lived in 988 households (North Slope Borough Planning Department, 1989). The unique marine environment near Barrow provides local residents with excellent hunting opportunities for most of the mammals, birds, and fish that inhabit or migrate through the Arctic region. The mixing of the Chukchi Sea and Beaufort Sea currents in the vicinity of the point results in areas of open water almost year around, providing access to marine mammals. Even in mid-winter, ringed seals are usually available at open pools in close proximity to Barrow. Beginning in

MAP 1 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO THE STUDY AREA



Map Production: North Slope Borough GIS
Date: June 27, 1989

March or April, a channel of open water -- an open lead -- forms within three to 10 miles from shore. Local residents hunt in this marine "river" rich in migrating resources: bowhead whales, beluga whales, walrus, bearded seal, ringed seal and eiders. During the Arctic summer, onshore winds and shifting currents periodically bring the moving pack ice and the associated walrus, bearded seals and ringed seals to within hunting range of Barrow residents.

Hunters travel along the coast in either direction from Barrow, traditionally hunting as far as Wainwright to the west and the Colville River delta to the east (Pedersen 1979). In 1988 Barrow residents' coastal cabins and camp sites were situated westerly to Peard Bay and easterly to Cape Simpson, Smith Bay, and the Teshekpuk Lake area. Hunters ranged throughout the coastal area, both in search of marine mammals and while traveling to camps and cabins. Experienced ocean travelers ventured out from the coast to a distance of 25 to 30 miles, primarily in search of the bowhead whale during its fall migration and while hunting for walrus and bearded seal in the summer.

Barrow residents also traveled extensively to inland cabins and numerous other traditional hunting and fishing sites. Four major rivers and numerous streams and lakes can be reached within four to eight hours by boat or snowmachine, providing access to the inland fish, caribou, bird and plant resources. For example, the Meade River is a four hour snowmachine or boat trip from Barrow. Peard Bay, Atqasuk, the central portion of the Chipp and Ikpikpuk rivers, and Teshekpuk Lake can all be reached from Barrow in less than a day. Seasonal conditions can drastically alter travel times and an intimate knowledge of the environment is required to safely and successfully exploit the inland areas. During the study the most experienced hunters traveled by snowmachine over 150 miles to the headwaters of the Meade and Ikpikpuk rivers in search of furbearers inhabiting the more mountainous terrain.

The most significant characteristic of the study area to a community dependent on local food resources is the diversity of species that can be harvested. As this report details, fish, fowl, marine mammal and terrestrial mammal species are all available to local residents, with a variety of species available from each group. Only in the case of terrestrial mammals is one species -- caribou -- the single major food source that is consistently harvested in large

numbers. Though most species are usually abundant at some period of the year, the presence of any one species during favorable harvest conditions is unpredictable. Successful harvests usually result from knowing where to intercept the resources as they migrate, and from being there at the right time. A few days delay in a hunting trip, adverse weather conditions, or equipment problems can mean missing the bulk of the migration and thus having a smaller harvest or missing out altogether. For some species like grayling, geese, and walrus to name only a few, to miss the migration means a year-long wait until the next harvest opportunity.

As in all the North Slope villages, there are members of many Barrow families who grew up out on the land. They have an intimate knowledge of the areas where their parents taught them how to catch the food they needed to survive. Those individuals continue to use the same areas, now teaching their children and their grandchildren when, where, and how to successfully harvest the available resources. Some of that information pertaining to the Barrow area has been published in other reports and conveys a sense of what the land, ocean, and resources mean to the local residents (see for example: Arundale and Schneider 1987; Carnahan 1979; Hoffman, Libbey, and Spearman 1988; Ivie and Schneider 1988; Kisautaq (Leona Okakok) 1981; Nelson 1979; Nelson 1981; North Slope Borough 1980; Pedersen, Libbey, and Schneider 1979; Schneider and Libbey 1979; Schneider, Pedersen, and Libbey 1980).

DIFFERENCES BETWEEN ANNUAL PROJECT REPORTS

The Year One report presents results of the first year of data collection in the form of tables, figures, maps, and accompanying textual interpretations. The report also describes the basis for harvest estimates and an extensive description of the sampling and data collection methods used in this study. The purpose of the Year Two report is principally to document ongoing data collection efforts and supply additional information (e.g., differences by household in harvest levels and the status of major faunal resources). The report contains three types of data: revised Year One results, Year Two results, and cumulative summaries. Since these data sets are interim results in a three year study, the Year Two report contains limited discussion concerning each individual data set. Differences in harvest levels from year

to year were a principal reason for adopting a multi-year study design, however, the Year Two report does contain comparisons of Year One and Year Two data. It is expected that the Year Three report will not only contain extensive documentation of harvest levels and locations by year, but also a more generalized set of conclusions on both harvest levels and locations.

FORMAT OF THIS REPORT

The purpose of this Year Two report is to present the subsistence harvest data collected for Barrow during the first two years of fieldwork. Following this introduction, the second section of the report (Overview of Barrow Demography and Household Characteristics) presents results from a recent census of Barrow households (North Slope Borough Planning Department, 1989). The third section of the report (Harvest Estimates for Major Resource Categories) summarizes Barrow harvest activities, including community and household harvest levels and land use patterns for the major resource categories, presenting both revised Year One estimates, and Year Two estimates as well as a cumulative summary and highlights of differences in harvest levels. Section four (Areal Extent of Subsistence Land Use) compares Year One and Year Two harvest sites. The fifth section (Locally Harvested Renewable Resources) presents the Year Two harvest data and maps for each major species or species group, again reporting data from both years. Section Six (Household Differences in Species Harvest Levels) contains several comparisons of overall or species-specific harvest levels among households in the study. Section Seven (Status of Major Faunal Populations) presents a report on the biological status of subsistence resources and is followed by references cited in this report. Finally an appendix contains the conversion factors used in the study and detail on Year Two whale harvests.

OVERVIEW OF BARROW DEMOGRAPHY
AND HOUSEHOLD CHARACTERISTICS

The North Slope Borough Planning Department recently completed a major census project of the Barrow population. It is therefore possible to accurately describe Barrow population and household characteristics. In 1988, 3,223 people resided in Barrow (see Table 1). Of this population, 1,822 (56 percent) were Inupiat. The remainder of the population was primarily white (25 percent of the total population). Smaller minority populations included Filipino (5 percent), other Alaska Natives (2 percent), blacks (1.5 percent), Hispanics (1 percent), and Orientals (1 percent).

Forty percent of the 1988 Barrow Inupiat population was under the age of 16. Both sexes were represented evenly in the Inupiat population with the exception that Inupiat females outnumbered Inupiat males in the 26-39, 4-15, and 66 and over age categories. The non-Inupiat population was disproportionately male (57 percent) and middle-aged, with 36 percent of the population 26 to 39 years old.

Five hundred and twenty-three of the 988 Barrow households in 1988 were headed by an Inupiat or someone married to an Inupiat (see Table 2). An average of almost four people (3.89) lived in each Inupiat household. Due to the larger size of most Inupiat households, non-Inupiat households constituted a larger proportion of all Barrow households (47 percent) than the non-Inupiat population constituted of the total Barrow population (39 percent).

Inupiat and non-Inupiat employment characteristics contrast similarly to Inupiat and non-Inupiat population characteristics. On average, Inupiat residents 16 or older were employed 6.8 months annually compared with 10 months for non-Inupiat.

TABLE 1: 1988 BARROW POPULATION CHARACTERISTICS

	<u>Inupiat</u>			<u>Other</u>			<u>Total</u>	<u>%</u>
	<u>Male</u>	<u>Female</u>	<u>Both</u>	<u>Male</u>	<u>Female</u>	<u>Both</u>		
<u>Age</u>								
Under 4	127	131	258	59	37	96	354	12%
4-8	126	131	257	45	36	81	338	11%
9-15	103	113	216	60	47	107	323	11%
16-17	31	35	66	16	12	28	94	3%
18-25	127	126	253	56	64	120	373	12%
26-39	181	225	406	242	180	422	828	28%
40-59	124	120	244	177	121	296	542	18%
60-65	25	20	45	11	7	18	63	2%
66 and up	<u>32</u>	<u>45</u>	<u>77</u>	<u>6</u>	<u>3</u>	<u>9</u>	<u>86</u>	<u>3%</u>
Subtotal	876	946	1,822	672	507	1,179	3,001	100%
Number of missing observations:							<u>222</u>	
Total population:							3,223	

Source: North Slope Borough Planning Department, 1989

Stephen R. Braund & Associates, 1989

TABLE 2: 1988 BARROW HOUSEHOLD CHARACTERISTICS
BY ETHNICITY

	<u>NUMBER OF HOUSEHOLDS</u>	<u>PERCENTAGE OF HOUSEHOLDS</u>	<u>MEAN HOUSEHOLD SIZE</u>	<u>MEAN NO. MONTHS EMPLOYED PER INDIVIDUAL</u>
Inupiat	523	53%	3.89	6.8
Non-Inupiat	465	47%	2.48	10.0
Overall	988	100%	3.23	8.2

Source: North Slope Borough Planning Department, 1989

Stephen R. Braund & Associates, 1989

HARVEST ESTIMATES FOR MAJOR RESOURCE CATEGORIES

The study findings for Year One (April 1, 1987 through March 31, 1988), and Year Two (April 1, 1988 through March 31, 1989) are summarized in this section. Throughout this report findings for the two years will be presented separately and as a cumulative average of harvest activity. The section begins with a review of harvest data collection procedures.

REVIEW OF HARVEST DATA COLLECTION PROCEDURES

Ideally, a study of this nature would observe the resource harvest activities of every village resident. This approach was not practical in Barrow, the home of over 3,000 people. Instead, the study team is tracking the harvest activities of a sample of over 100 households that statistically represent all households in Barrow.

All study results presented in this report are based on a sample of 110 Barrow households. These households constitute 74 percent of 149 households initially selected for the study in 1987 and reflect only those households for which harvest data are available for both study years (see Table 3). The sample of 149 Barrow households was selected from all houses in the community. The chance each household had of being selected varied. To ensure that study results are as reliable as possible, the study team assigned each Barrow household to one of seven sampling groups (strata) then varied the chances of selection for the sample based on the household's level of harvest activity.

Forty-one of the 48 households containing whaling captains and other highly active harvesters (stratum one) are included in the combined Year One/Year Two study results. This reflects a response rate among the most highly active harvesters of 85 percent. The response rate for households reporting in 1985 that virtually all their family's food came from hunting, fishing, and gathering (stratum two) is 68 percent. The response rate for households reporting that half their food came from family subsistence activities is

TABLE 3: SAMPLING CHARACTERISTICS -
BARROW, YEARS ONE & TWO

<u>STRATA</u>	<u>NUMBER OF HOUSEHOLDS</u>			<u>RESPONSE RATE</u>	<u>YEAR 1-2 SAMPLE WEIGHT</u>
	<u>IN BARROW</u>	<u>IN ORIGINAL SAMPLE</u>	<u>IN BOTH STUDY YEARS</u>		
1	48	48	41	85%	1.171
2	45	22	15	68%	3.000
3	67	17	13	76%	5.154
4	85	13	8	62%	10.625
5	222	17	13	76%	17.077
6	360	9	6	67%	60.000
7	<u>110</u>	<u>19</u>	<u>14</u>	74%	7.857
TOTALS	937	140	110		

Source: Stephen R. Braund & Associates, 1989

76 percent. The response rates within the less active subsistence strata are 62 percent, 76 percent, 67 percent, and 74 percent respectively. The predominately lower response rates in strata two through seven reflect the fact that households in these strata are more mobile and were dropped from the sample because they moved from Barrow.

To properly estimate harvest activities for the community as a whole it is necessary to take into account the probability each household had of being selected and the response rate within each strata. Each sample household is assigned a sample weight equal to the total number of households in the community assigned to the household's sampling stratum divided by the actual number of sample households in the same sampling stratum. Thus, for example, the sample weight assigned to households in the first stratum is 48 divided by 41, or 1.171. The reader can confirm that application of the sample weights yields estimates which pertain to all Barrow households by multiplying the sample weights reported in Table 3 by the number of sample households in each stratum. The result in each case is the total number of households in the stratum. Note that the total number of households eligible for selection in 1987 was 937 and that the total number of households enumerated in the North Slope Borough's 1988 census was 988. The difference (51) corresponds to the net increase in the number of Barrow households since 1985, the time of the last Barrow census.

Although the sample design employed yields more reliable results than a comparably sized simple random sample, the results are still subject to sampling error. That is, the community harvest amounts for each species are estimates that vary somewhat according to the specific households that happened to be selected. Although it is not possible to tell exactly what the actual community harvest amounts are from a single sample of households, it is possible to calculate the range of possible sampling errors at a specified level of confidence (in this study 95 percent). This range, or confidence interval, differs for each type of harvest. Confidence intervals are reported with all harvest estimate tables in this report.

Harvest estimates may also vary from actual harvest amounts due to errors in reporting, errors in recording, and errors introduced with the use of average weights in the conversion of the number harvested to the amount of edible pounds harvested. Errors in reporting were minimized through repeated contacts

with respondents over the course of the year; however, the level of reporting errors may differ between Year One and Year Two. Harvest estimates in Year Two may contain fewer reporting errors due to the fact that household contacts are now familiar with the type of information requested and know that they will be asked to recall this information. Harvest estimates in Year Two may, on the other hand, reflect a downward reporting bias. Although every attempt has been made to minimize the reporting burden on household contacts, it is reasonable to expect that household contacts may be increasingly reluctant to mention harvest activities when they know that a complete report of the activity involves a significant effort on their part. Comparisons of Year One and Year Two data suggest that a downward reporting bias may have occurred in Year Two, although other factors may also account for differences in harvest levels and are also discussed.

Errors in recording harvest activity were minimized with application of rules and definitions by trained research assistants and through a review of each report by an on-site field coordinator. The conversion weights applied are primarily those produced by the Alaska Department of Fish and Game (ADF&G) Division of Subsistence from data collected in Nuiqsut and Kaktovik, both North Slope villages (ADF&G n.d.). These weights, representing edible pounds harvested, allow comparisons between the data presented in this report and other ADF&G research. Also, weights are more conducive than numbers for comparing the relative contribution of each resource to the total community harvest.

REVISION OF YEAR ONE ESTIMATES

Repeated contacts with sample households occasionally reveal errors or gaps in past harvest reports. Field staff maintained a file of Year One harvest report corrections which have been incorporated in the data file to produce revised estimates for Year One. The net effect of these revisions is to increase the total edible pounds harvested by 7.5 percent in Year One from that reported in MMS Technical Report 133 (SRB&A and ISER 1988). Net increases by major resource category ranged from five percent for marine mammals to 12.5 percent for birds. The total edible pounds of both terrestrial mammals and fish increased by just under 10 percent.

The major adjustments made in the marine mammals category were an increase of 13 walrus and an increase of 55 ringed seal. The estimated harvest of polar bears increased from eight to 10. In the terrestrial mammal category, the estimated total harvest of caribou increased from 1,492 to 1,643 (a 10 percent increase). The largest change in the fish category resulted from a dropped digit in data processing. Correction of this error increased the estimated number of capelin harvested from 335 to 3,351. Other fish species requiring substantial adjustments included humpback whitefish (35% increase, partially due to greater specificity in reporting of whitefish), least cisco (20 percent increase), arctic grayling (26 percent increase) and burbot (19 percent increase). Bird species requiring adjustments included white-fronted geese (17 percent increase), and eiders (nine percent increase).

Tables 4 and 6 and Figures 1 and 3 replace the comparable harvest activity tables and figures contained in the Barrow Year One report.

DIFFERENCES BETWEEN YEAR ONE AND YEAR TWO ESTIMATES

The differences between Year One and Year Two harvest estimates are best discussed by individual species. However, a comparison of the data summarized by major resource category establishes a useful context within which to examine the more detailed results.

Year Two harvest estimates are lower in every major resource category. In percentage terms these reported decreases between Year One and Year Two range from 30 percent for fish to less than one percent for birds. Table 5 presents the Year Two data for the major resource categories; Table 7 and Figure 4 present the Year Two harvest data by month. The marine mammal harvest of 329,296 edible pounds compares to the Year One reported harvest of 345,156 edible pounds (a 4.5 percent decrease). The reported harvest in edible pounds of terrestrial mammals decreased from 218,657 to 190,459 (a 13 percent decrease). Total edible pounds of fish reported decreased from 68,969 to 48,661 while total edible pounds of birds stayed virtually the same.

Comparison of Figures 1 and 2 shows that the relative importance of major resource categories in Year Two is quite similar to that observed in Year One.

TABLE 4: TOTAL HARVEST ESTIMATES BY MAJOR RESOURCE CATEGORY - ALL BARROW HOUSEHOLDS, YEAR ONE REVISED (1)

RESOURCE	CONVERSION	AVERAGE POUNDS				PERCENT OF ALL BARROW HOUSEHOLDS HRVSTING RESOURCE	SAMPLING STATISTICS					
	FACTOR (2)	COMMUNITY TOTALS		HARVESTED			STANDARD DEVIATION (lbs)	SAMPLING ERROR AT 95% (lbs)	LOW ESTIMATE (Mean lbs/ Household)	HIGH ESTIMATE (Mean lbs/ Household)	SAMPLING ERROR AS % OF MEAN	
	(Edible Weight Per Resource in lbs)	EDIBLE	PER	PER	PERCENT OF TOTAL EDIBLE POUNDS HARVESTED							
		NUMBER HARVESTED	POUNDS HARVESTED	HOUSEHOLD	CAPITA							POUNDS HARVESTED
Marine Mammals (3,4)	n/a	n/a	345,156	368	114.4	53%						38.2%
Terrestrial Mammals	n/a	n/a	218,657	233	72.5	33%	29.4%	32	62	171	296	27%
Fish	n/a	n/a	68,969	74	22.9	11%	32.6%	9	18	55	92	25%
Birds	n/a	n/a	21,613	23	7.2	3%	33.9%	6	11	12	34	47%
Other Resources	n/a	n/a	286	0.3	0.1	**	3.1%	0	1	0	1	171%
Total (3)	n/a	n/a	654,680	699	217.1	100%	53.7%	55	107	592	806	15%

(1) Estimated sampling errors do not include errors in reporting, recording, and in conversion to usable weight.

(2) See Table A-4 for sources of conversion factors.

(3) Bowhead harvest does not contribute to the sampling error for marine mammals since the bowhead harvest is based on a complete count.

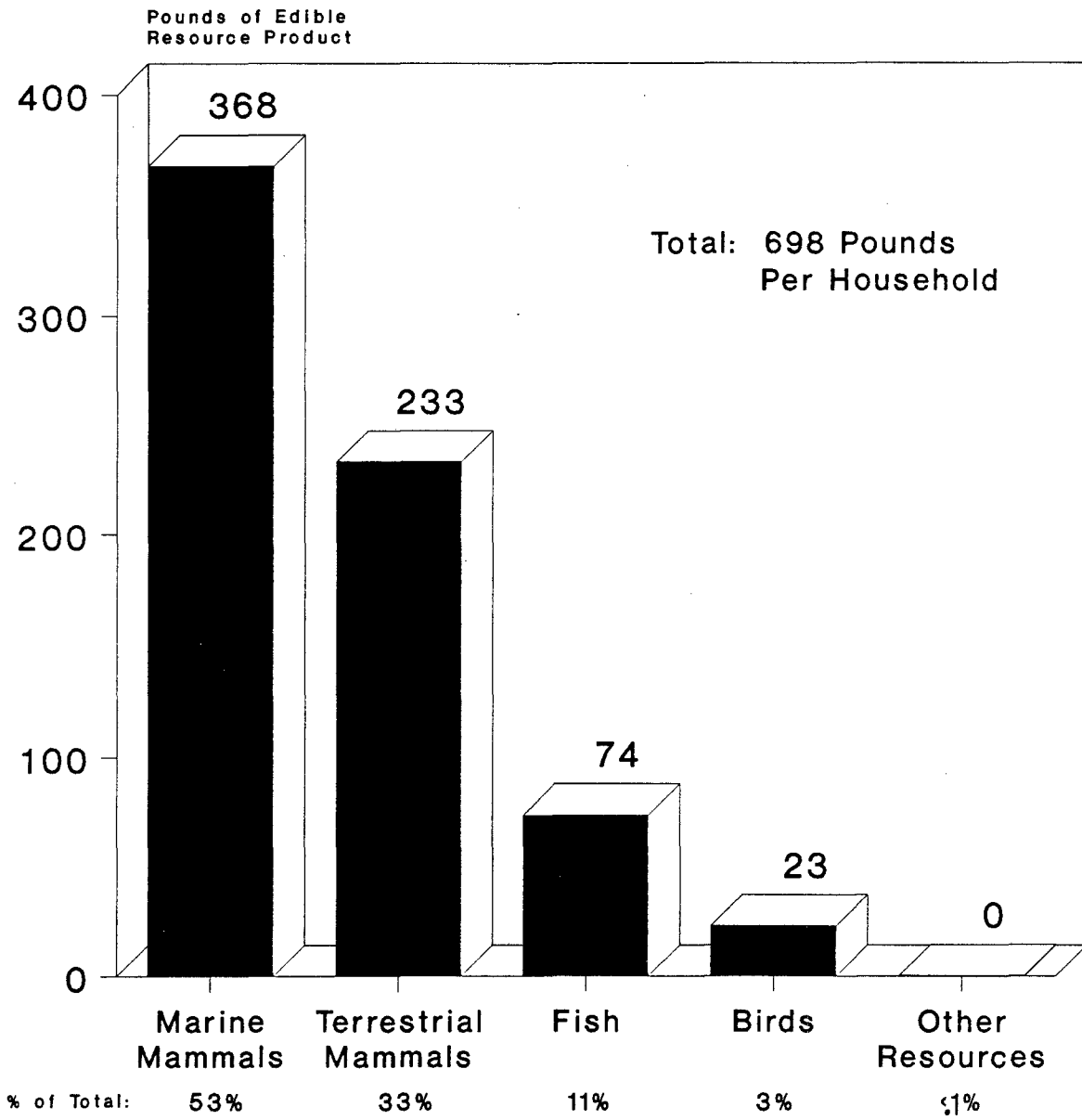
(4) The percent of Barrow households harvesting bowhead represents the percent of Barrow households receiving crew member shares at the whale harvest site, as extrapolated from the sample households.

** represents less than .1 percent

n/a means not applicable

Source: Stephen R. Braund & Associates, 1989

**Figure 1: Harvest Amounts By
Major Resource Category
All Barrow Households, Year One Revised**



(Mean Edible Pounds Per Household)

Source: Stephen R. Braund & Assoc., 1989

TABLE 5: TOTAL HARVEST ESTIMATES BY MAJOR RESOURCE CATEGORY - ALL BARROW HOUSEHOLDS, YEAR TWO (1)

RESOURCE	CONVERSION	AVERAGE POUNDS				SAMPLING STATISTICS						
	FACTOR (2) (Edible Weight Per Resource in lbs)	COMMUNITY TOTALS		HARVESTED		PERCENT OF TOTAL EDIBLE POUNDS HARVESTED	PERCENT OF ALL BARROW HSEHOLDS HRVSTING RESOURCE	STANDARD DEVIATION (lbs)	SAMPLING ERROR AT 95% (lbs)	LOW ESTIMATE (Mean lbs/ Household)	HIGH ESTIMATE (Mean lbs/ Household)	SAMPLING ERROR AS % OF MEAN
Marine Mammals (3)	n/a	n/a	329,296	351	109.2	56%	43.1%	16	31	320	382	9%
Terrestrial Mammals	n/a	n/a	190,459	203	63.1	32%	25.2%	33	65	138	268	32%
Fish	n/a	n/a	48,661	52	16.1	8%	17.5%	5	10	42	62	19%
Birds	n/a	n/a	21,434	23	7.1	4%	31.7%	4	7	16	30	30%
Other Resources	n/a	n/a	36	0.04	0.0	**	1.9%	0	0	0	0	181%
Total (3)	n/a	n/a	589,901	630	195.6	100%	53.1%	43	85	545	714	13%

(1) Estimated sampling errors do not include errors in reporting, recording, and in conversion to usable weight.

(2) See Table A-4 for sources of conversion factors.

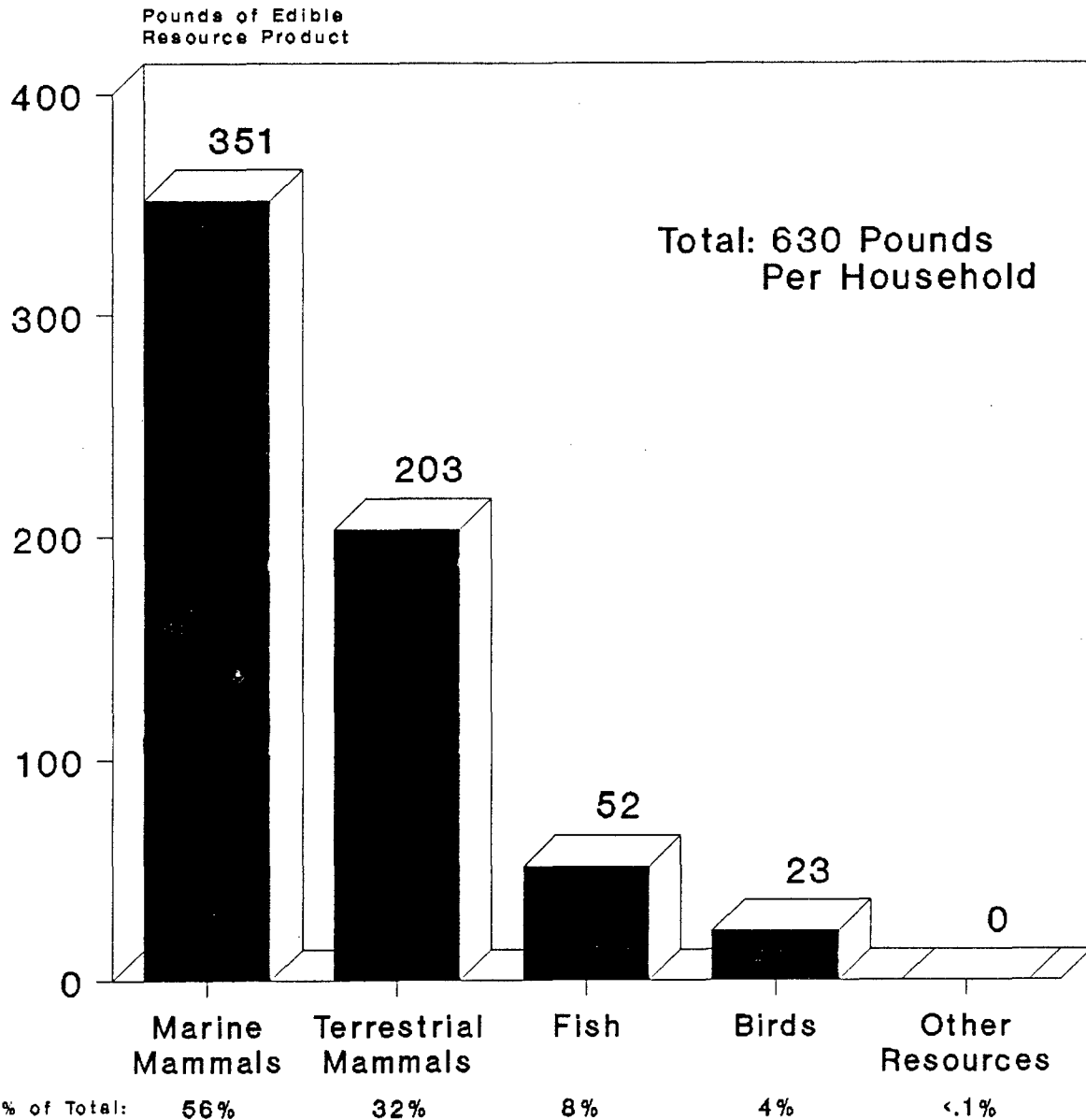
(3) Bowhead harvest does not contribute to the sampling error for marine mammals since the bowhead harvest is based on a complete count.

** represents less than .1 percent

n/a means not applicable

Source: Stephen R. Braund & Associates, 1989

Figure 2: Harvest Amounts By
Major Resource Category
All Barrow Households, Year Two



(Mean Edible Pounds Per Household)

Source: Stephen R. Braund & Assoc., 1989

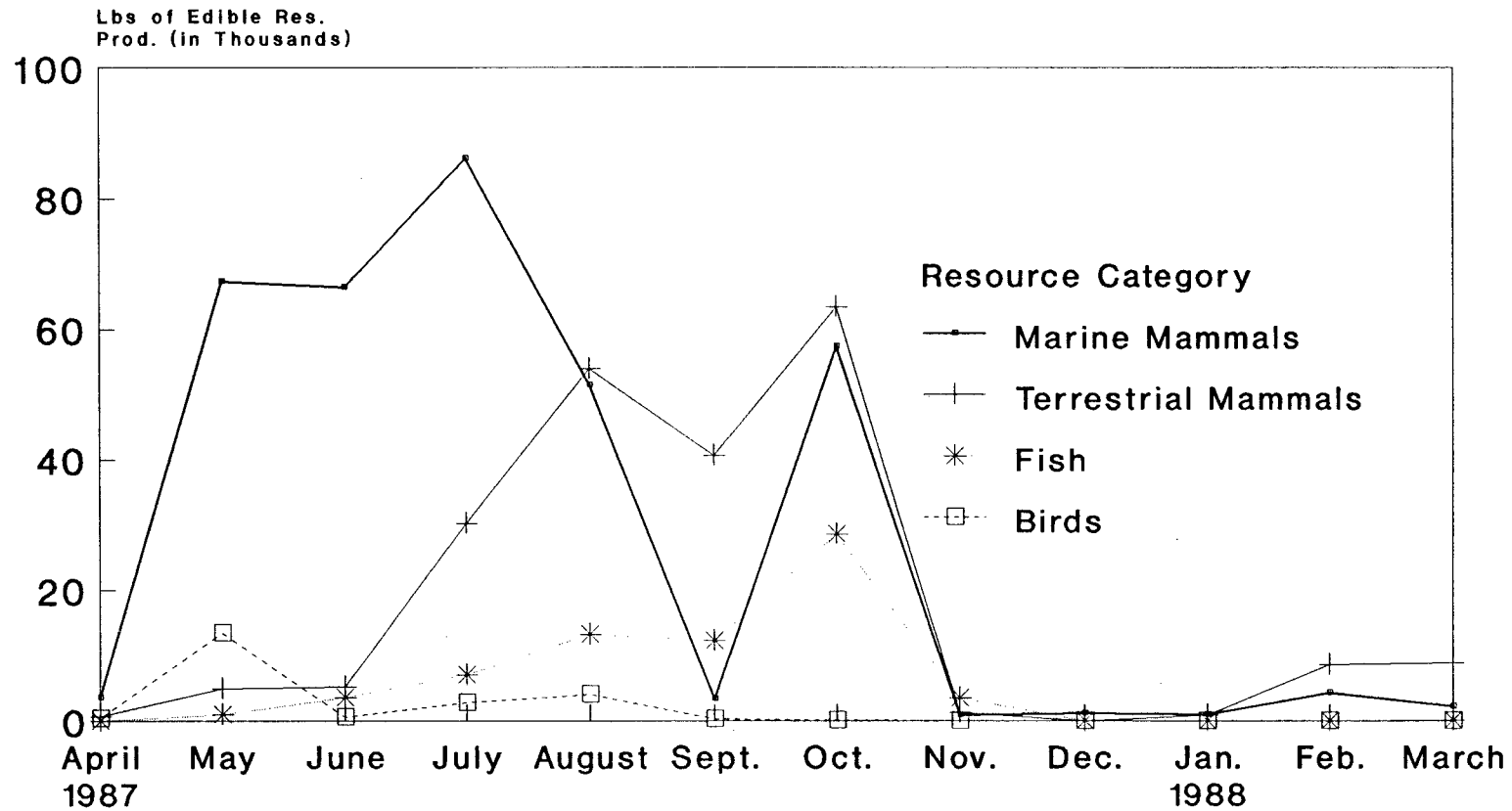
TABLE 6: MONTHLY HARVESTS BY MAJOR RESOURCE CATEGORY - BARROW, YEAR ONE REVISED
(Pounds of Edible Resource Product)

MAJOR RESOURCE CATEGORY	TOTALS											
	1987						1988					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Marine Mammals	3,561	67,303	66,454	86,137	51,493	3,381	57,373	896	1,183	994	4,210	2,173
Terrestrial Mammals	685	4,915	5,180	30,254	53,986	40,611	63,449	1,250	0	822	8,566	8,880
Fish	0	938	3,574	7,006	13,175	12,232	28,534	3,438	0	0	0	67
Birds	380	13,417	621	2,780	4,038	265	108	0	0	0	0	0
Total	4,626	86,573	75,830	126,177	122,693	56,489	149,463	5,583	1,183	1,816	12,776	11,120

MAJOR RESOURCE CATEGORY	PERCENTS											
	1987						1988					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Marine Mammals	1%	19%	19%	25%	15%	1%	17%	0%	0%	0%	1%	1% = 100%
Terrestrial Mammals	0%	2%	2%	14%	25%	19%	29%	1%	0%	0%	4%	4% = 100%
Fish	0%	1%	5%	10%	19%	18%	41%	5%	0%	0%	0%	0% = 100%
Birds	2%	62%	3%	13%	19%	1%	0%	0%	0%	0%	0%	0% = 100%
All Resources Combined	1%	13%	12%	19%	19%	9%	23%	1%	0%	0%	2%	2% = 100%

Source: Stephen R. Braund & Associates, 1989

Figure 3: Monthly Harvest by
Major Resource Category
All Barrow Households, Year One Revised



Source: Stephen R. Braund & Assoc., 1989

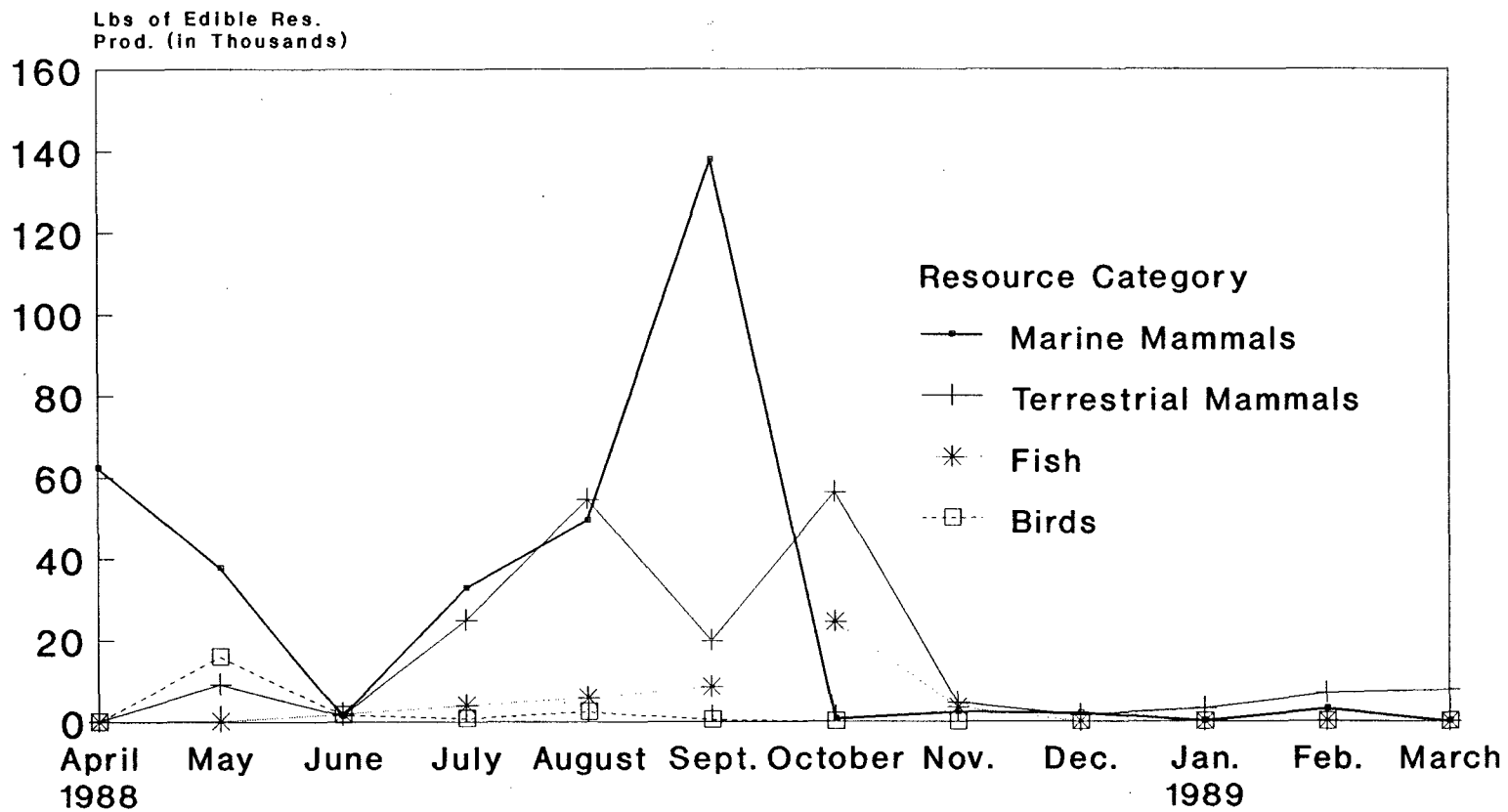
TABLE 7: MONTHLY HARVESTS BY MAJOR RESOURCE CATEGORY - BARROW, YEAR TWO
(Pounds of Edible Resource Product)

MAJOR RESOURCE CATEGORY	TOTALS											
	1988						1989					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Marine Mammals	62,250	37,759	1,377	32,684	49,372	137,778	659	2,276	2,010	126	3,006	0
Terrestrial Mammals	137	9,166	1,562	24,883	54,505	19,747	56,249	4,562	1,541	3,185	6,906	7,787
Fish	12	136	2,020	4,056	5,901	8,458	24,475	3,478	0	0	144	0
Birds	5	15,981	1,717	734	2,498	450	39	0	0	0	0	10
Total	62,404	63,042	6,676	62,358	112,276	166,433	81,421	10,316	3,551	3,311	10,056	7,797

MAJOR RESOURCE CATEGORY	PERCENTS											
	1988						1989					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Marine Mammals	19%	11%	0%	10%	15%	42%	0%	1%	1%	0%	1%	0% = 100%
Terrestrial Mammals	0%	5%	1%	13%	29%	10%	30%	2%	1%	2%	4%	4% = 100%
Fish	0%	0%	4%	8%	12%	17%	50%	7%	0%	0%	0%	0% = 100%
Birds	0%	75%	8%	3%	12%	2%	0%	0%	0%	0%	0%	0% = 100%
All Resources Combined	11%	11%	1%	11%	19%	28%	14%	2%	1%	1%	2%	1% = 100%

Source: Stephen R. Braund & Associates, 1989

Figure 4: Monthly Harvest By
Major Resource Category
All Barrow Households, Year Two



Source: Stephen R. Braund & Assoc., 1989

Marine mammals continued to account for over half of the total edible pounds harvested (56 percent in Year Two vs. 53 percent in Year One). Terrestrial mammals accounted for a third of the total in both years, and fish accounted for slightly less of the total in Year Two than in Year One (eight percent vs. 11 percent).

A comparison of Tables 4 and 5 shows that the percentage of households successfully harvesting at least some amount of a subsistence resource was identical in Years One and Two (53 percent). Participation rates varied by major resource category, however, with a slight reported increase in the percentage of households harvesting marine mammals (43 percent vs. 38 percent), a slight decline in the percentage harvesting terrestrial mammals (25 vs. 29 percent), a major decline in the percentage of households successfully harvesting fish (17 percent vs. 33 percent), and slight declines in the percentage of households harvesting birds (32 percent vs. 34 percent) and other resources (two percent vs. three percent).

At least at the level of the major resource categories, declines in harvest levels in one category between Year One and Year Two were not accompanied by increases in harvest levels in another category. Superficially, these findings appear inconsistent with the expectation that households will deliberately seek to compensate for variations in harvest due to environmental conditions or other factors outside their control. One cannot assume, however, that good hunting conditions in one resource category will occur in the same year as poor hunting conditions in another resource category, providing the opportunity for such compensation. In other words, a year in which hunting conditions are generally good may be just as likely to occur as a year of generally bad conditions. As mentioned earlier, a downward reporting bias in Year Two may also account in part for the generally observed lower harvest estimates.

The differences between revised Year One and Year Two estimates may primarily reflect the aggregate effect of small gaps and omissions in Year Two reporting that may be filled at a later time. As discussed above, the revised Year One harvest estimate of total edible pounds harvested is 7.5 percent higher than the original estimate. The Year Two comparable estimate is only 3.3 percent lower than the initial Year One estimate while it is 10 percent lower than the revised Year One estimate. The research team believes that the best estimates

of Year One (i.e., revised Year One) and Year Two harvest activity should be the basis for comparisons between the two years. The fact that the study team identified correctable reporting errors and omissions for Year One, however, leads the study team to expect to encounter similar errors and omissions in Year Two. It is therefore advisable to note differences while waiting for final harvest estimates before attempting to draw conclusions about variations in annual harvest activity. In any event, the reported harvests for Years One and Two in Barrow are fairly similar (i.e., less than a five percent difference).

CUMULATIVE AVERAGE HARVEST ESTIMATES

While comparing harvest estimates for individual years is useful as a means of understanding variability in harvest levels, developing a harvest activity profile that transcends any particular year is also useful. Tables 8 and 9 and Figures 5 and 6 present average (mean) estimates of each type provided on an annual basis. All columns in the Year One and Year Two combined tables are means of the two years of data. These results are of interest primarily as a demonstration of how multi-year harvest data can be used to develop cumulative averages. The Year Three report will present three year cumulative means as the basis for a discussion of average harvest activity.

As Burch (1985) notes, anomalies are a part of the normal annual cycle of subsistence harvesting in any Alaskan village. Extreme variations in harvest amounts can occur in any year and are a fact of life in the Arctic. In that sense, an "average harvest" for any North Slope village is a misnomer, an entity not nearly so stable as "average income" or "average age" for example. Therefore, average harvest amounts should be used in conjunction with the range of observed actual harvest amounts, as well as in terms of the contextual information (e.g., weather, social and cultural activities, employment opportunities).

TABLE 8: AVERAGE HARVEST ESTIMATES BY MAJOR RESOURCE CATEGORY - ALL BARROW HOUSEHOLDS, YEARS ONE & TWO (1)

RESOURCE	CONVERSION	AVERAGE POUNDS				PERCENT OF ALL BARROW HOUSEHOLDS HRVSTING RESOURCE	SAMPLING STATISTICS					
	FACTOR (2)	COMMUNITY TOTALS		HARVESTED			PERCENT OF TOTAL EDIBLE POUNDS HARVESTED	STANDARD DEVIATION (lbs)	SAMPLING ERROR AT 95% (lbs)	LOW ESTIMATE (Mean lbs/ Household)	HIGH ESTIMATE (Mean lbs/ Household)	SAMPLING ERROR AS % OF MEAN
	(Edible Weight Per Resource in lbs)	EDIBLE		PER HOUSEHOLD	PER CAPITA							
	NUMBER HARVESTED	POUNDS HARVESTED	POUNDS HARVESTED									
Marine Mammals (3,4)	n/a	n/a	337,225	360	111.8	54%	40.7%	20	40	320	399	11%
Terrestrial Mammals	n/a	n/a	204,547	218	67.8	33%	27.3%	35	69	150	287	31%
Fish	n/a	n/a	58,825	63	19.5	9%	25.1%	6	12	50	75	20%
Birds	n/a	n/a	21,523	23	7.1	3%	32.8%	4	8	15	31	35%
Other Resources	n/a	n/a	161	0.2	0.1	**	2.5%	0	0	0	0	172%
Total (3)	n/a	n/a	622,280	664	206.3	100%	53.4%	42	83	581	747	13%

(1) Estimated sampling errors do not include errors in reporting, recording, and in conversion to usable weight.

(2) See Table A-4 for sources of conversion factors.

(3) Bowhead harvest does not contribute to the sampling error for marine mammals since the bowhead harvest is based on a complete count.

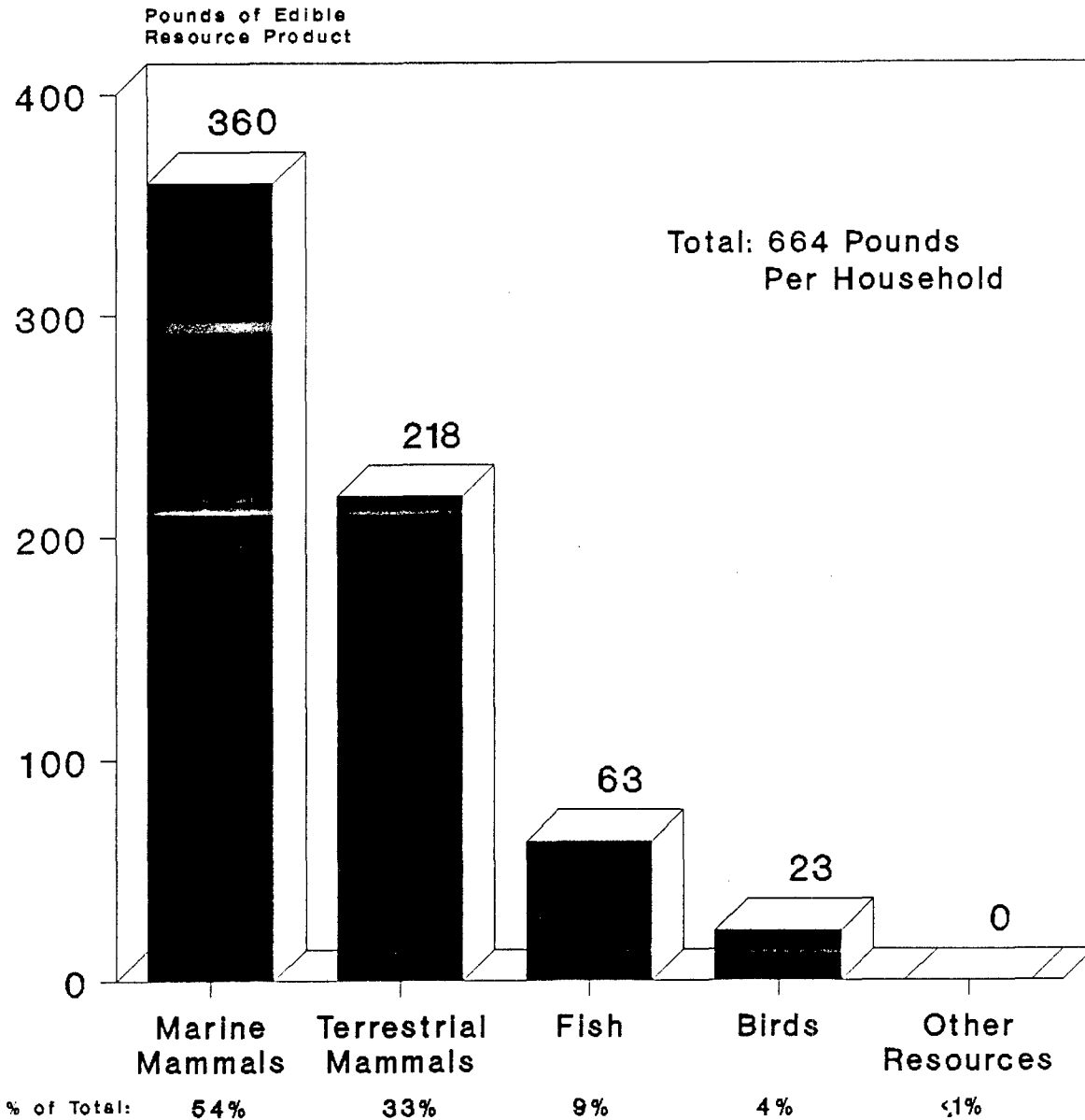
(4) The percent of Barrow households harvesting bowhead represents the percent of Barrow households receiving crew member shares at the whale harvest site, as extrapolated from the sample households.

** represents less than .1 percent

n/a means not applicable

Source: Stephen R. Braund & Associates, 1989

**Figure 5: Harvest Amounts By
Major Resource Category
All Barrow Households, Years One & Two**



(Mean Edible Pounds Per Household)

Source: Stephen R. Braund & Assoc., 1989

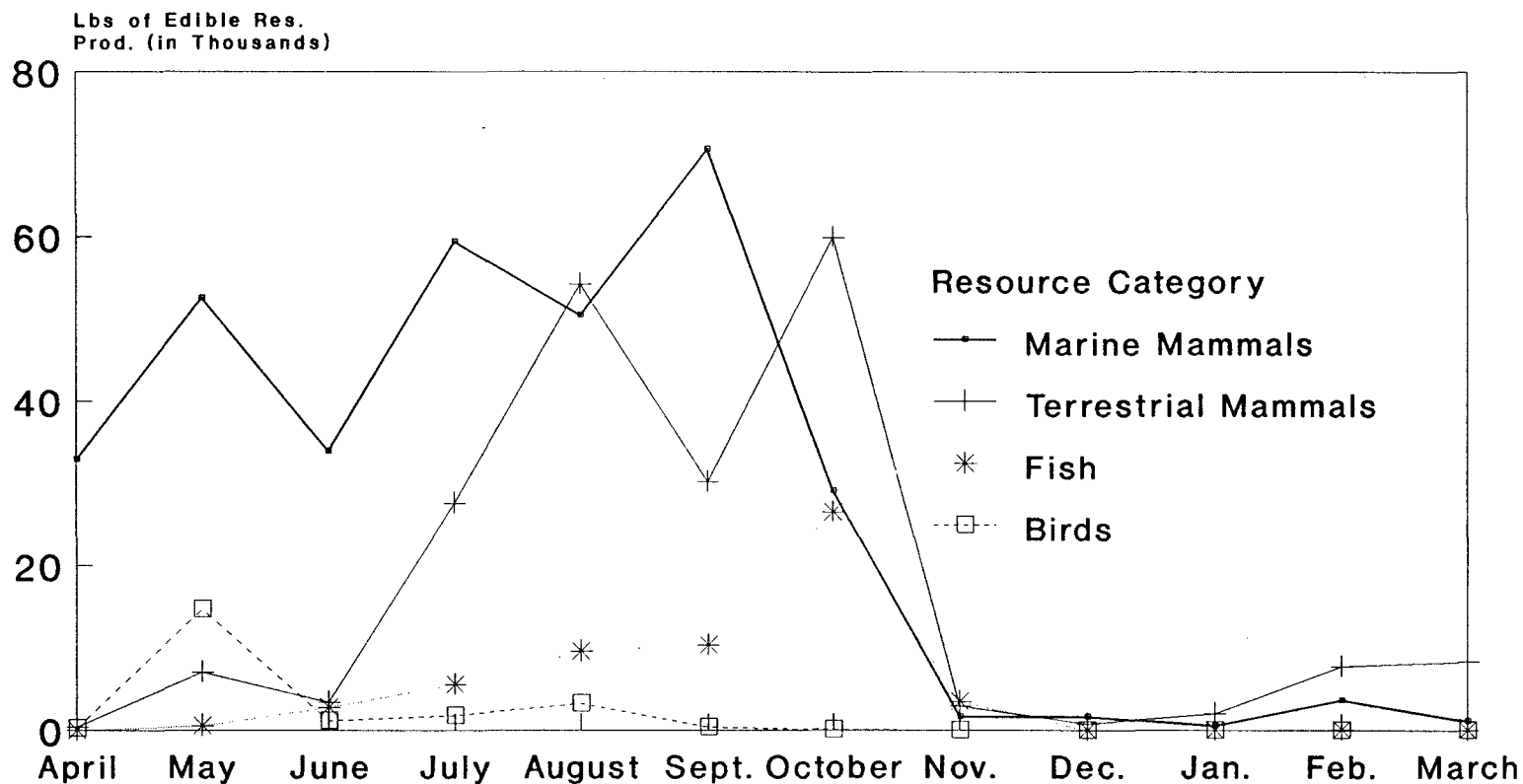
TABLE 9: AVERAGE MONTHLY HARVESTS BY MAJOR RESOURCE CATEGORY - BARROW, YEARS ONE & TWO
(Pounds of Edible Resource Product)

MAJOR RESOURCE CATEGORY	TOTALS											
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Marine Mammals	32,905	52,531	33,916	59,411	50,433	70,579	29,016	1,586	1,597	560	3,608	1,086
Terrestrial Mammals	411	7,040	3,371	27,573	54,246	30,179	59,875	2,906	771	2,004	7,736	8,334
Fish	6	537	2,797	5,531	9,538	10,345	26,507	3,458	0	0	72	33
Birds	193	14,699	1,170	1,757	3,268	357	74	0	0	0	0	5
Total	33,515	74,808	41,254	94,272	117,484	111,461	115,471	7,950	2,367	2,564	11,416	9,459

MAJOR RESOURCE CATEGORY	PERCENTS											
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Marine Mammals	10%	16%	10%	18%	15%	21%	9%	0%	0%	0%	1%	0% = 100%
Terrestrial Mammals	0%	3%	2%	13%	27%	15%	29%	1%	0%	1%	4%	4% = 100%
Fish	0%	1%	5%	9%	16%	18%	45%	6%	0%	0%	0%	0% = 100%
Birds	1%	68%	5%	8%	15%	2%	0%	0%	0%	0%	0%	0% = 100%
All Resources Combined	5%	12%	7%	15%	19%	18%	19%	1%	0%	0%	2%	2% = 100%

Source: Stephen R. Braund & Associates, 1989

Figure 6: Monthly Harvest by Major Resource Category, All Barrow Households Years One and Two



Source: Stephen R. Braund & Assoc., 1989

AREAL EXTENT OF SUBSISTENCE LAND USE

REVIEW OF MAP COLLECTION PROCEDURES

The data presented on all maps in the report only include the locations of successful harvests by the sample households and do not include the total area hunted nor the areas transited to reach hunting locations. During harvest discussions with study households, the hunter marked on a 1:250,000 scale map the location where each harvest occurred. These points were transferred along with a harvest entry identification number to aggregate maps of the same scale, thereby reducing the number of maps which had to be electronically registered to digitize the harvest sites. The North Slope Borough Planning Department Geographic Information System Office in Anchorage was responsible for digitizing the harvest data and for the production of all maps included in this report. Check plots of the digitized harvest sites were checked against the maps used to digitize the data and corrections to the digitized data base were made as necessary.

On most of the maps in this report, individual harvest locations are depicted by a shaded circle. Each circle represents an actual harvest site surrounded by a two mile buffer. Overlapping circles form larger shaded areas. The two mile buffer serves three purposes. First, the depiction of harvest sites with a two mile buffer reflects an intent to include at least the immediate hunting area. Second, the use of a buffer also accounts for possible errors in reporting the exact location of harvest sites. Respondents reported the location of fish sites, for example, with certainty because those sites were identified easily by the geographic features of the lake or river. Other harvest sites with distinct geographic features were reported with a high degree of accuracy as well, evidenced by the respondent's ease and confidence in mapping the location. Harvests of marine mammals or birds from boats offshore, for example, or of caribou out in the open tundra, were reported typically as an approximate location but recorded as one point on the map representing his best estimate of the exact harvest site. The lack of geographic landmarks reduced the precision with which the hunter could locate his harvest site on a map. Third, the buffer is used to enhance the visual effectiveness of the data presented on the maps, particularly where distinct categories of data must be differentiated.

Also illustrated on several of the maps is a dashed line that represents the area used during the lifetime of 20 Barrow harvesters interviewed in the late 1970s. The data were collected for the University of Alaska Fairbanks Cooperative Park Studies Unit and the NSB (Pedersen 1979) and later entered into the NSB Geographic Information System (GIS). These perimeter data are included to demonstrate how the area used in two single years is not inclusive of the areas used by community members over time. Geographic features are not named on maps displaying harvest data since the combination of geographic features and harvest data on the same map would be difficult to interpret.

These maps currently indicate where one or more harvest events occurred. On the individual resource group maps, these harvest events pertain to an individual species or species group harvested at that site. However, on maps displaying harvest location data on a more general level (for example Map 2), a harvest site may represent one harvest event during which one animal was harvested, or it could represent any number and variety of animals harvested on different dates and by different households, all in the same location. Hence, as presented in this report, the harvest sites do not represent the number of kills or the pounds of edible resource product harvested at each site.

The approach taken in reporting harvest location data differs from that of harvest amounts in three ways. First, map data are reported for all sample households providing information in either Year One or Year Two. Estimates of community harvest amounts are based on reports from only households who participated in both study years. Second, map data are not weighted to take into account different probabilities of selection and different response rates as in the case of harvest amounts. Third, map data for Year One and Two have been combined as a cumulative total rather than as a cumulative average.

The basis for all three differences in how data on harvest locations and amounts are reported is the greater variability in harvest locations. Individual harvesters tend to hunt and fish in different locations. They become familiar with different areas and establish camp or cabin sites, returning to the same area year after year, thereby preserving differences in hunting and fishing locations.

The reliability of harvest location estimates is subject to the same principles of sampling theory as the reliability of harvest amount estimates. In both

instances, reliability is a function of the variability in the characteristics (i.e., harvest location or harvest amount) and of the size of the sample. Since the location of harvest activities is more variable than the amount harvested, the reliability of harvest location data is lower. The reliability of harvest amount estimates is sufficiently high to support the calculation of average harvest amounts. In the case of harvest locations, however, the variability is great enough to preclude the construction of meaningful averages, or measures which purport to show "typical" or "usual" harvest locations. The research team therefore decided to restrict the reporting of map data in the Year One and Year Two reports to a graphic representation of the actual harvest sites reported by household contacts (i.e., the "raw" data). The reader can easily draw interim conclusions about the areas most heavily used for harvest activities by visually identifying those areas with the highest concentration of reported harvest sites.

SUBSISTENCE HARVEST SITES: YEARS ONE AND TWO

Map 2 illustrates the harvest locations of members of 118 sample households for the harvest of all species either in Year One or Year Two. Comparing this cumulative harvest map with the harvest locations just in Year Two (see Map 3) it is evident that the general harvest pattern in the two years is quite similar (maps depicting harvest locations for just Year One are contained in the Year One report). The significance of Pedersen's (1979) lifetime community harvest area line is demonstrated by the correspondence of almost all the most remote harvest locations with the lifetime boundary. Furbearer hunting along the southern part of the line and fishing on the Colville River near Nuiqsut are examples of the close correspondence between the two sets of data (see Maps 2 through 5). It should also be noted that the lifetime line is not an impenetrable boundary as can be seen from the occasional harvest outside the lifetime line. One apparent increase in the subsistence use area is the greater extent of marine mammal hunting offshore from Barrow, on both the Chukchi and Beaufort sea sides of Point Barrow.

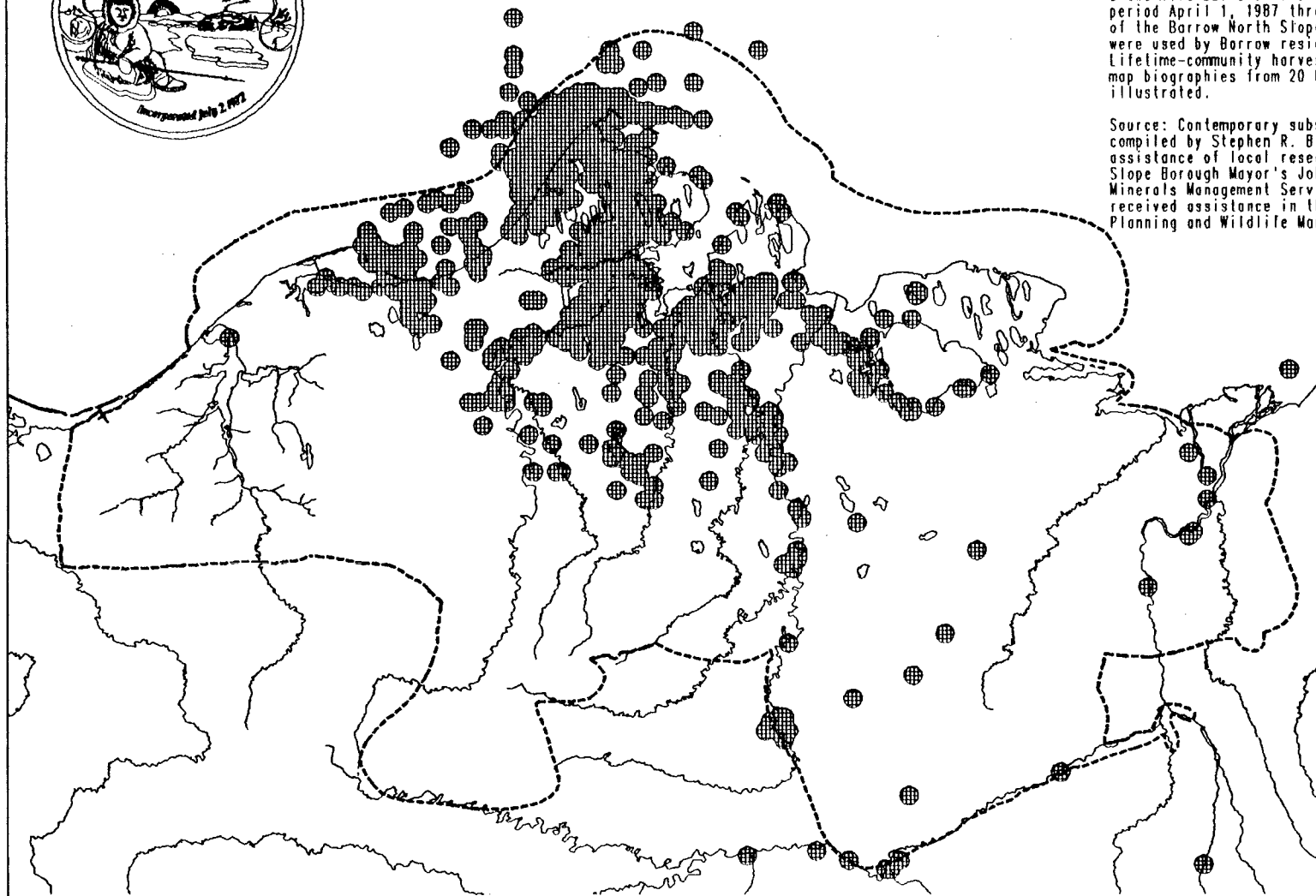
Inland areas where successful harvests were not recorded by study participants are most apparent in the vicinity of the other area villages. Barrow hunters for the most part did not tend to hunt around Wainwright, south of Atqasuk, or in the Nuiqsut area. Exceptions are illustrated by the Barrow harvest sites

MAP 2 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO SUBSISTENCE HARVEST SITES, 1987-1989





This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1987 through March 31, 1989: Years One and Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study. Lifetime-community harvest areas, collected in the form of map biographies from 20 households (Pedersen 1979), are also illustrated.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SR&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SR&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

-  Lifetime community land use (Pedersen 1979).
-  All Species Harvested
 - Caribou, Moose
 - Brown Bear, Fox
 - Wolverine, Seals
 - Walrus, Polar Bear
 - Bowhead Whale
 - Geese, Eiders
 - Other Ducks
 - Ptarmigan
 - Fish, Water



Map Production: North Slope Borough GIS

Date: June 26, 1989

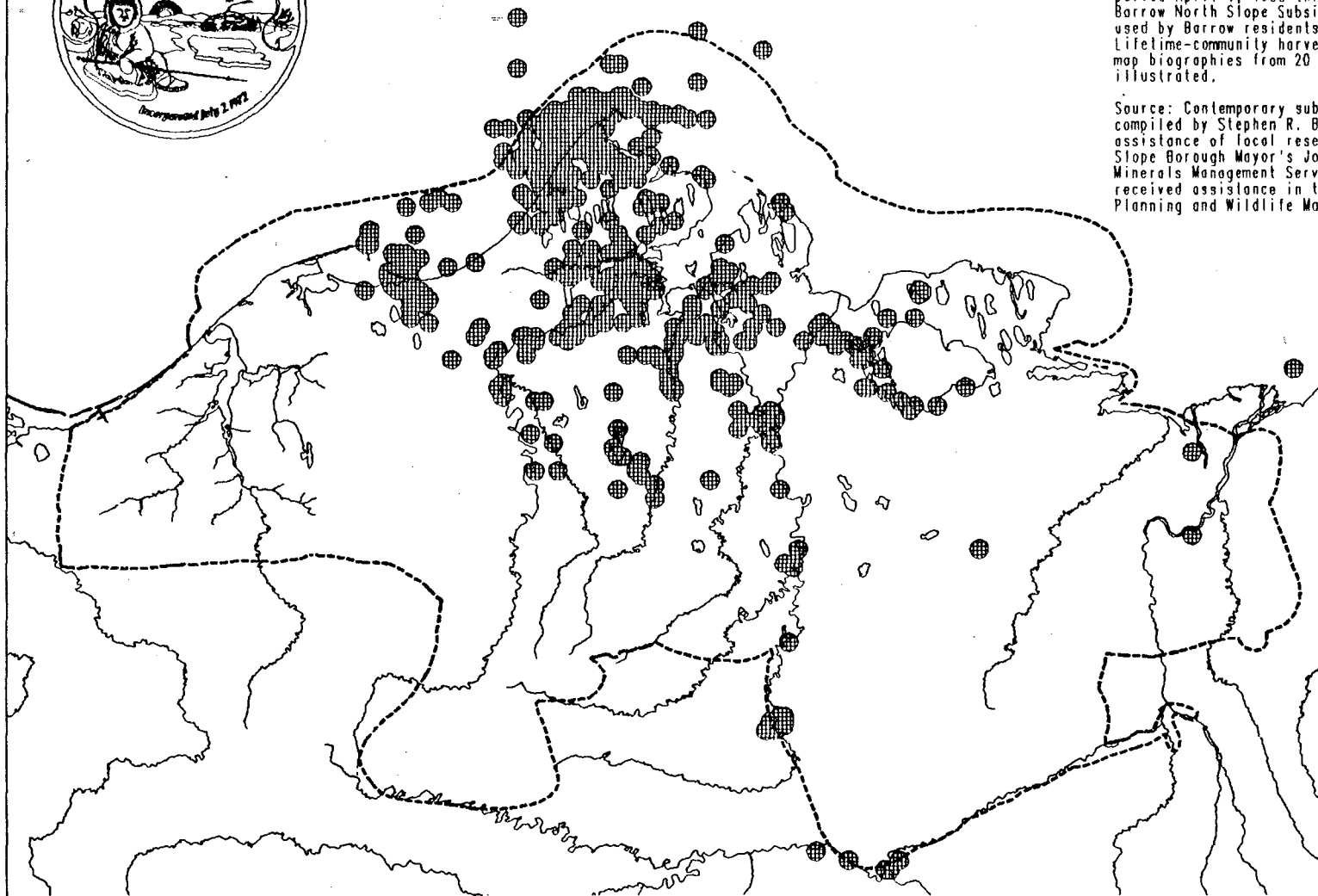


MAP 3 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO SUBSISTENCE HARVEST SITES, 1988-1989



This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1988 through March 31, 1989: Year Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study. Lifetime-community harvest areas, collected in the form of map biographies from 20 households (Pedersen 1979), are also illustrated.

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LEGEND INFORMATION



Lifetime community land use (Pedersen 1979).



All Species Harvested

Caribou, Moose
Brown Bear, Fox
Wolverine, Seals
Walrus, Polar Bear
Bowhead Whale
Geese, Eiders
Other Ducks
Ptarmigan
Fish, Water

Map Production: North Slope Borough GIS

Date: June 26, 1989

25 0 25 50 75 100 125

MILES

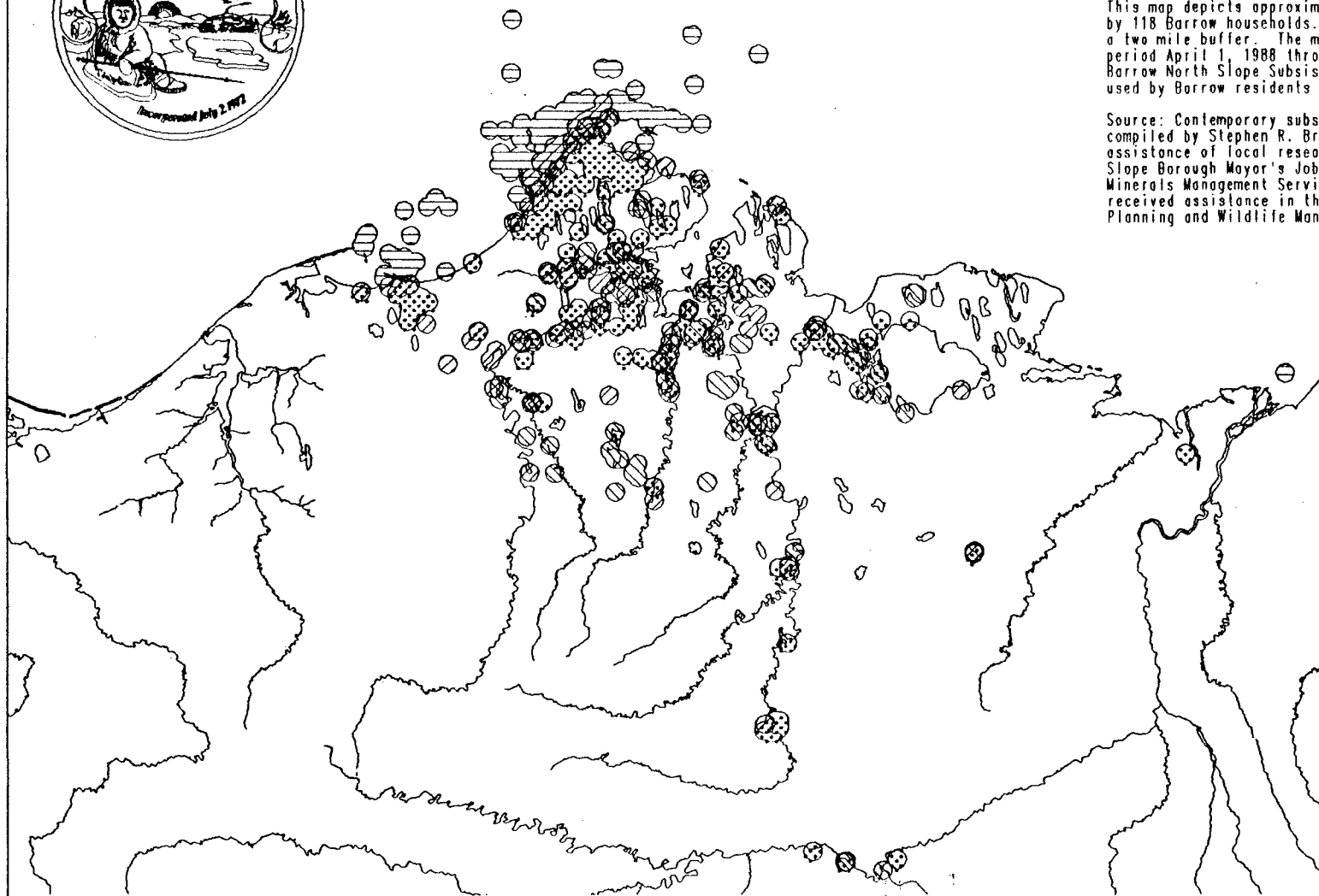


MAP 4
 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO
 SUBSISTENCE HARVEST SITES BY MAJOR RESOURCE CATEGORY







This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1988 through March 31, 1989; Year Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

-  Marine Mammals (Bowhead whale, seals, walrus, polar bear)
-  Terrestrial Mammals (Caribou, moose, brown bear, fox, wolverine)
-  Fish (Whitefish, other freshwater fish, salmon, other coastal fish)
-  Birds (Eiders, geese, ptarmigan)

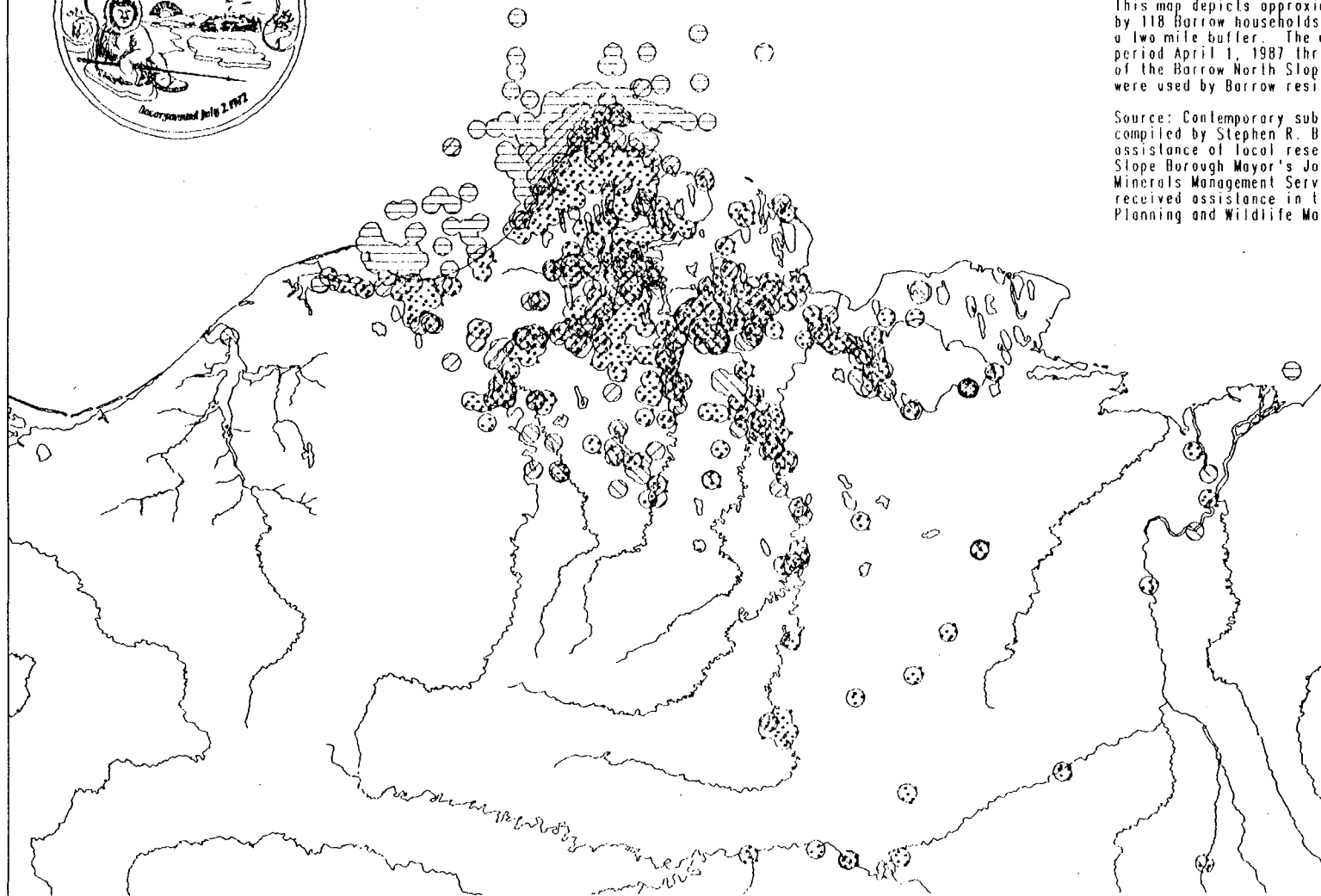


MAP 5
 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO
 SUBSISTENCE HARVEST SITES BY MAJOR RESOURCE CATEGORY:
 YEARS ONE AND TWO







This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1987 through March 31, 1989; Years One and Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

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(Bowhead whale, seals, walrus, polar bear)
-  Terrestrial Mammals
(Caribou, moose, brown bear, fox, wolverine)
-  Fish
(Whitefish, other freshwater fish, salmon, other coastal fish)
-  Birds
(Geese, eiders, other ducks, ptarmigan)

Map Production: North Slope Borough GIS

Date: June 26, 1989

25 0 25 50 75 100 125
 MILES



near those villages. Another example is the report by the Wainwright subsistence study field coordinator of one Barrow hunter (not participating in this study) who harvested polar bear and furbearers southwest of Wainwright. Barrow residents with relatives in the villages were especially likely to hunt or fish during visits with their relatives. These maps do not represent harvests by residents of other villages.

Another traditional use area where harvests did not occur during the first two years of this study is the marine environment east of Barrow to approximately Cape Halkett. The Admiralty Bay, Cape Simpson, and Smith Bay areas were used intensively for travel to subsistence harvest sites rather than as harvest areas. Locally known as important spotted seal, polar bear, and beluga hunting locations, harvests in those areas did not occur by the study participants during the first two years of the study.

FIXED CABIN SITES

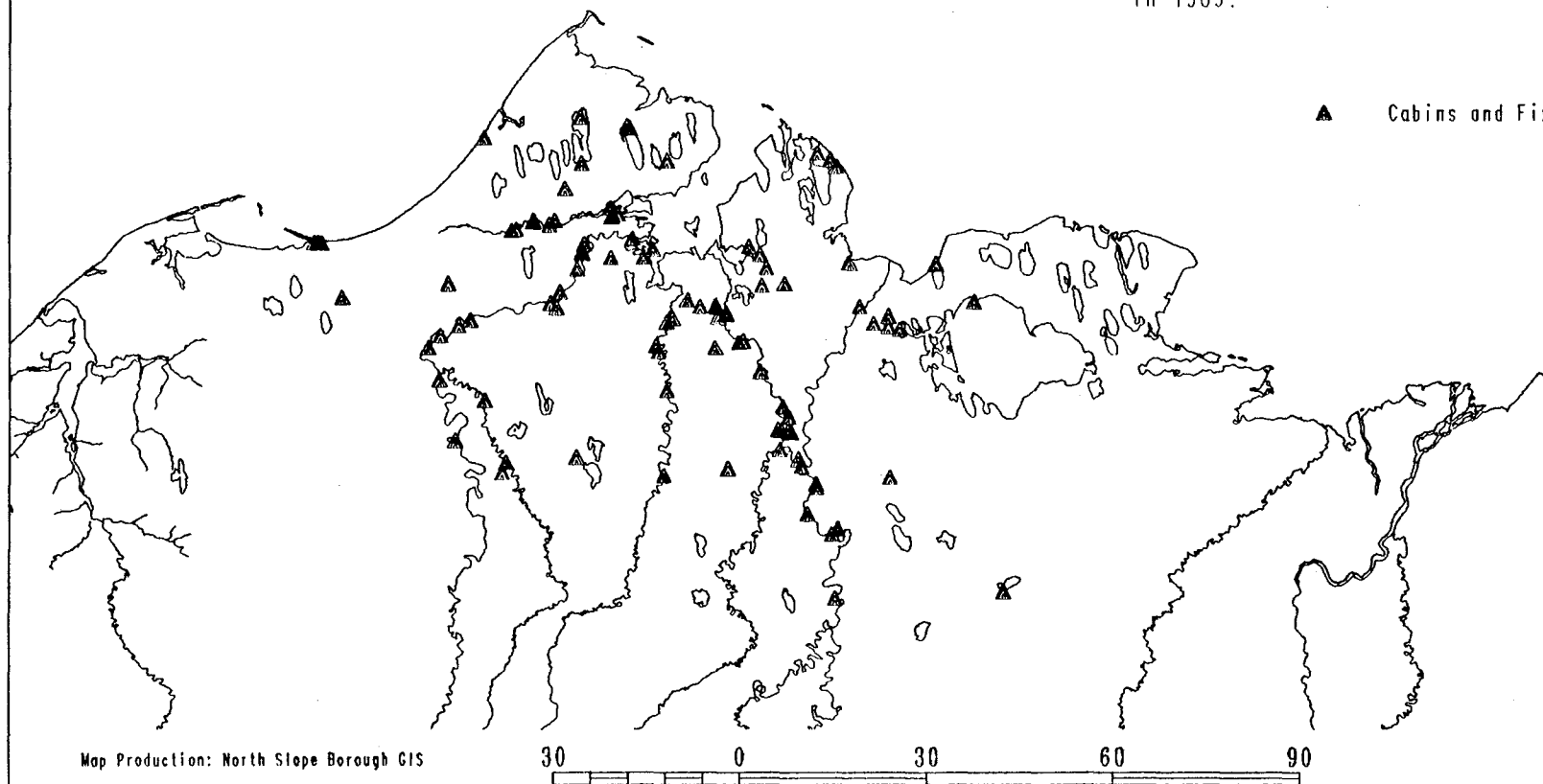
The locations of most of the cabins owned by Barrow residents are shown on Map 6, Cabin and Fixed Camp Locations. These sites represent only those locations where a cabin is standing and by no means represent all the camping sites used by Barrow families. Most families visit their cabins each year and the area within the vicinity of the cabin is often the focus of most of their subsistence activities. When viewed in relation to Maps 2 through 5, the cabin locations closely correspond with most of the successful harvest locations.

MAP 6
NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO
CABIN AND FIXED CAMP LOCATIONS



This map displays the locations of fixed hunting and fishing camps used by Barrow residents. The locations of many temporary subsistence camps are not shown.

Source: Data compiled by Worl and Smythe (1986) and updated by the North Slope Borough Planning Department in 1989.



Map Production: North Slope Borough GIS

Date: June 26, 1989

MILES

LOCALLY HARVESTED RENEWABLE RESOURCES

The principal objectives of the Barrow Subsistence Study are to produce species-specific estimates of harvest locations and harvest amounts. The preceding two sections provided a useful background against which these detailed estimates can be presented. The purpose of this section is: (1) to present species-specific harvest amount estimates in three ways - (a) revised Year One estimates, (b) Year Two estimates, and (c) Year One/Year Two cumulative averages; and (2) to present species-specific harvest location estimates in two ways: (a) Year Two harvest sites, and (b) Combined Year One/Year Two harvest sites.

This section begins by identifying the species harvested by sample households in either Year One or Year Two. The section continues with an overview of seasonal activities, focusing on differences between Year One and Year Two. The main body of the section is devoted to a presentation of harvest amount and harvest location data. This presentation is accompanied by a discussion of the differences between Year One and Year Two harvest activity.

SPECIES HARVESTED IN YEAR ONE OR YEAR TWO

Species recorded in either Year One or in Year Two are displayed in Table 10. Beluga whale and ribbon seal are examples of species that are known to have been harvested by Barrow residents historically, but were not harvested in either Year One or Year Two by the sample households nor by other Barrow households (fieldwork for this study).

In some instances, the researchers were not able to record each successful subsistence harvest by individual species. This problem occurred most commonly for those species harvested in mixed groups (e.g., various species of birds or fish). The recording of marine and terrestrial mammals, on the other hand, was more accurate. The harvest of these larger animals was more memorable for most people, and respondents had no problem distinguishing one from the other.

TABLE 10: SPECIES HARVESTED BY BARROW STUDY SAMPLE
APRIL 1987 - MARCH 1989

<u>Species</u>	<u>Iñupiaq Name</u>	<u>Scientific Name</u>
Marine Mammals		
Bearded seal	Ugruk	Erignathus barbatus
Ringed seal	Natchiq	Phoca hispida
Spotted seal	Qasigiaq	Phoca largha
Bowhead whale	Aġviq	Balaena mysticetus
Polar bear	Nanuq	Ursus maritimus
Walrus	Aiviq	Odobenus rosmarus
Terrestrial Mammals		
Caribou	Tuttu	Rangifer tarandus
Moose	Tuttuvak	Alces alces
Brown bear	Aklaq	Ursus arctos
Dall sheep	Imnaiq	Ovis dalli
Arctic fox (Blue)	Tiġiganniaq	Alopex lagopus
Red fox (Cross, Silver)	Kayuqtuq	Vulpes fulva
Porcupine	Qinaġluk	Erethizon dorsatum
Ground squirrel	Siksrik	Spermophilus parryii
Wolverine	Qavvik	Gulo gulo
Fish		
Salmon (non-specified)		
Chum salmon	Iqalugruaq	Oncorhynchus keta
Pink (humpback) salmon	Amaqtuuq	Oncorhynchus gorbuscha
Silver (coho) salmon	Iqalugruaq	Oncorhynchus kisutch
King (chinook) salmon		Oncorhynchus tshawytscha
Whitefish (non-specified)		
Round whitefish	Aanaakliq	Coregonus sp.
Broad whitefish	Aanaakliq	Prosopium cylindraceum
River caught	Aanaakliq	Coregonus nasus
Lake caught	Aanaakliq	Coregonus nasus
Humpback whitefish	Pikuktuuq	Coregonus clupeaformis
Least cisco	Iqalusaaq	Coregonus sardinella
Bering, Arctic cisco	Qaaktaq	Coregonus autumnalis
Other Freshwater Fish		
Arctic grayling	Sulukpaugaq	Thymallus arcticus
Arctic char	Iqalukpik	Salvelinus alpinus
Burbot (Ling cod)	Tittaaliq	Lota lota
Lake trout	Iqaluaqpak	Salvelinus namaycush
Northern pike	Siulik	Esox lucius
Other Coastal Fish		
Capelin	Pagmaksraq	Mallotus villosus
Rainbow smelt	Iġhuaġniq	Osmerus mordax
Arctic cod	Iqalugaq	Boreogadus saida
Tom cod	Ugaq	Eleginus gracilis

TABLE 10 (cont.): SPECIES HARVESTED BY BARROW STUDY SAMPLE,
APRIL 1987 - MARCH 1989

<u>Species</u>	<u>Iñupiaq Name</u>	<u>Scientific Name</u>
Birds		
Eider (non-specified)		
Common eider	Amauligruaq	Somateria mollissima
King eider	Qigalik	Somateria spectabilis
Spectacled eider	Tuutalluk	Somateria fischeri
Other Ducks (non-specified)	Qaugak	
Goose (non-specified)	Nigliq	
Brant	Niglingaq	Branta bernicla n.
White-fronted goose	Niglivialuk	Anser albifrons
Snow goose	Kaṇuq	
Canada goose	Iqsragutilik	
Ptarmigan (non-specified)	Aqargiq	Lagopus sp.
Willow ptarmigan	Nasaullik	Lagopus lagopus
Other Resources		
Berries (non-specified)		
Blueberry	Asiaq	Vaccinium uliginosum
Cranberry	Kimmignaq	Vaccinium vitis-idaea
Salmonberry	Aqpik	Rubus spectabilis
Bird Eggs (non-specified)	Mannik	
Eider eggs		
Greens/Roots (non-specified)		
Wild rhubarb	Qugulliq	Oxyric digyna
Water		
Fresh water	Imiq	
Fresh water ice	Sikutaq	
Sea ice	Siku	

As mentioned above, beluga whale and ribbon seal are notably absent from the list of marine mammals that have been harvested commonly in the past but are not known to have been harvested by any Barrow residents in Year One or Year Two. Wolves, one of the most desirable furbearers available to Barrow residents, have reportedly been scarce in the areas where they are usually hunted. Hunters scouting the foothills north of the Colville River have reported a scarcity of tracks during the past two years. One hunter followed tracks south to the cliffs above the Colville, then turned back, unable to find a safe route down to the river. It is likely that perhaps one or two wolves were harvested by Barrow residents during the first two years of the study; however, no harvests were reported by participating households. Some of the smaller furbearers (e.g., marmot and ermine) were also absent from the harvest reports and were likely harvested in very small numbers if at all.

The fish species harvested include essentially all species available to Barrow residents except sculpin and blackfish. Arctic and Bering cisco are grouped together for this study and, in fact, differentiation of the two is often difficult without dissecting the fish.

A variety of bird species available to Barrow residents were not recorded in Year One or Year Two. Respondents often noted duck, eider, and geese harvests at a generic level, e.g., "eiders" or "geese." Further probing sometimes led to a finer level of distinction between species, but often the species breakdown was a best guess. Of the six or more duck species (other than eiders), none was recorded individually, but rather generically as a "duck" harvest. Other unrecorded species included loons, owls, swans, and cranes.

Resources presented in Table 10 in the "other species" category elicited the least specific responses. Harvest of these species was often forgotten unless the researcher specifically asked about them. Greens, roots and berries were often harvested and consumed while at inland camps.

THE SEASONAL ROUND

The following month by month report of subsistence activities documents Barrow residents' annual subsistence cycle from April 1, 1988 through March 31, 1989. This general description of the yearly cycle or "seasonal round" emphasizes environmental, social, and cultural factors that affected or were otherwise related - on a community level - to Barrow's subsistence harvest activities during Year Two of the study. The descriptions highlight the month's major subsistence activities, point out any significant or unusual environmental conditions that may have affected hunting that month, and offer comparisons with the respective month in Year One.

APRIL

This was the time for final preparations for whaling. New bearded seal (ugruk) skins were sewn on the umiak frames. Ice cellars were cleaned out and fresh snow placed inside. Trail building also began in earnest as crews decided where they would like to locate their camps during the spring bowhead whale migration. At least five trail systems extended out from major landmarks and traditional camping areas along the coast, from Walakpa Bay 15 miles south of Barrow to off of Pt. Barrow 10 miles to the north.

The ice remained closed during the the first two weeks of April. When it did open at mid-month the lead was about four miles from shore. Most crews went out about the 23rd, a few days later than last year. On April 24, the Jonathan Aiken crew landed the first Barrow whale of the season. The next day four whales were landed. On the 26th the lead edge began to close and the camps moved back from the lead. On the 28th a crack in the ice began to widen only one-half mile from shore. The lead edge became established there when a large ice pan broke off and floated out that evening. Crews began reestablishing their camps along the new lead edge the next day. The lead was so close to town that the crews traveled away from town at least ten miles up or down the coast to make camp. According to one whaling captain, "town is too noisy."

MAY

Three whales were harvested in early May. The whaling season ended for some crews on May 6 when the last whale in Barrow's spring quota was harvested. However, a strike was received from Kivalina at mid-month and approximately one-half of the crews reestablished camps on the ice. The brief two day whale hunt proved unsuccessful. A few crews had maintained their camps on the ice throughout the first half of the month. Eiders and seals were harvested at this time. Successful crews especially were attempting to harvest extra subsistence foods to serve at the Nalukataq celebrations in June.

Travel conditions were not favorable the second week of May. Blowing snow and average wind speeds of 25 m.p.h., with gusts to 35, limited travel. About mid-month many families began traveling to camps to hunt waterfowl and to get ready for fishing. The major rivers stayed frozen through May and the travel conditions remained favorable, though moderate winds and fog persisted through the end of the month. The more popular waterfowl hunting locations were primarily along the Inaru River and lower section of the Meade River.

Ptarmigan were also harvested at camp. Harvest of caribou was uncommon. Although a few were harvested to provide food for camp, most hunters refrained from taking caribou later in the month as fawning time neared. One hunter also reported that the caribou hair falls out very easy this time of year and is impossible to keep out of the meat when butchering the animal. Two polar bears that wandered close to town were also harvested this month.

Late in the month successful crews began hosting their "bring up the boat" celebrations. Usually held on the beaches in front of town or on the cliffs near the old village site, it was a time for the successful crew to again share their good fortune of a successful hunt. The crews usually served a special treat of mikigaaq on these occasions, a delicacy of fermented whale meat and maktak. Fresh eider, goose, and caribou soup were also served at these celebrations, as well as Eskimo donuts, fruit, tea, and cake.

JUNE

Geese and duck hunting continued in early June. Wind, blowing snow, and migration patterns significantly affected harvest success from one location to another. As the snow receded in the warmer inland areas, families moved their camps closer and closer to Barrow. Though white-fronted geese were the most common variety harvested, one hunter reported seeing many more brant than usual this year.

Seals were harvested during June. Early in the month most hunters traveled to the lead edge by snowmachine, while others walked out to the lead that remained within a half mile of shore. By mid-month the ice melted near shore preventing easy access to the lead from town. A common practice was for hunters to pull their boats behind snowmachines down the coast for 10 miles or so to an easier point of access to the open lead.

A few whaling crews continued whaling until mid-month but the transferred strikes remained unused. In the previous year a whale was harvested in mid-June, nearly a month and a half later than the final whale harvest of spring season.

Some caribou hunting occurred during the month, primarily from fish camps or marine mammal hunting camps. Fresh fish was a welcome addition to the local diet and was supplied primarily by families that traditionally supply fish to all who need them this time of year. The Teshekpuk Lake and Chipp River areas produced a significant amount of these early season fish.

By mid-month the eight successful crews and their families and friends were devoting their free time to preparations for Nalukataq. Shares of whale were cut into smaller pieces, fish were cut in sections, and caribou and ducks were prepared for soups, all intended for distribution at the community-wide feast. New parkas and parka-covers were sewn and the blankets for the blanket-toss were prepared from the boat skins of the successful crews.

The two Nalukataq celebrations took place on June 27 and June 28. Four crews served the people each day. Everyone seemed to be in town for the celebrations and the soon-to-follow Independence Day holiday.

The temperatures were very similar in Years One and Two, averaging in the mid-30⁰s for June, with the high for the month falling on the 28th in both years: 49⁰ in Year One and 54⁰ in Year Two. The winds were more moderate in Year Two. It is also important to note that there were eight "heavy fog" days in Year Two, twice as many as there were in June of Year One.

JULY

On July 5 and 6 the shorefast ice floated out, opening up the boat launching areas in front of town. That corresponded very closely with the date the ice floated out last summer. Boating from town began in earnest on July 6. Many bearded seal or ugruk harvests were reported.

Ice conditions favorable for boating in the ocean came to an abrupt end during the evening of July 13. The wind began blowing from the southwest on the 13th and pushed the pack ice tight against the shore. The ice remained against shore through the end of the month. The wind was more often out of the west and southwest in Year Two, blowing westerly or southwesterly almost consistently from July 14 through August 3. July was also extremely foggy in Year Two, with heavy fog recorded for 19 days during the month.

The same winds that blew the ice in to the beach on the Chukchi side of Point Barrow carried the ice out of Elson Lagoon. The lagoon was relatively ice free on July 14 and that signaled the beginning of boating to inland camps. Hunters also began hunting for bearded seal in Elson Lagoon and in the vicinity of the barrier islands east of Point Barrow in the Beaufort Sea. Occasionally hunters ventured into the Chukchi side of the point; however, one experienced ocean hunter reported that with all the ice and the fast current, travel on that side was dangerous unless other conditions (e.g., wind, visibility) were just right. With the foggy conditions most of the month, visibility was seldom favorable for boating among swiftly moving ice floes.

With the opening of Elson Lagoon, the area river systems became accessible to families who wanted to boat to fish camp. Whitefish (broad and humpback) were the major species harvested during the month. Some families also set nets near Point Barrow on the lagoon side of the point. Whitefish, arctic cisco, arctic

char, silver salmon, and chum salmon were being caught there by mid-month. Families were also occupying their cabins or setting up camp at the "Shooting Station" or Pigniq at the base of Point Barrow. Many families enjoyed staying out there, away from the noise of town. One study participant wistfully wanted to move his office to Pigniq.

Eiders were flying back over the point toward the west and harvests took place primarily at Pigniq. The hunters were often young boys 7 to 15 years old, some of whom were just learning how to shoot.

Caribou were very near town. One elder reported driving out the Gaswell road and seeing 5,000 caribou from the road.

AUGUST

In early August south and southeast winds finally blew the ice off shore in front of town. On August 5th, for the first time since mid-July, bearded seal and walrus hunting crews could launch boats from the beaches near town. A portion of the ice pack was blown back to within sight of shore and hunting conditions remained excellent throughout the week with fairly calm winds. Some of the first walrus harvests of the year occurred during that first weekend of August.

Activities mirrored July to a major extent; however there was much more boating and marine mammal harvests were more common. Those with free time or with time off from work traveled to fish camps for fish and caribou. Others took weekend trips as often as possible. This was the time for travel, as boating had been limited for many in July and school would be starting at the end of this month.

Caribou were available in most areas though usually not taken in large numbers. However, there were exceptions. One family took home 14 caribou for the ice cellar after finding themselves surrounded by thousands of caribou, with room in their boat, and unsure if they would have the time or the opportunity to catch caribou in the fall. A few families were disappointed in not harvesting any caribou during week-long boating trips.

Fishing continued inland at camps and at Pigniq, although catches tapered off at Pigniq as the month progressed. Fishing was slow at some of the camps. Many families related that high water conditions were moving grass and other debris downstream, causing them to pull their nets to prevent them from being fouled. These high water conditions were similar to last year.

Eiders were harvested as they traveled on their westerly migration back over Barrow. A few families gathered greens at camp. The berry season was again poor. It has been three years since a good berry season, according to one person who likes to pick berries near the Meade River. A similar report was given by a family that picks berries in the Teshekpuk area.

School started a little earlier this year, on the 18th of August.

SEPTEMBER

Boating continued this month until about the 18th. By that time ice had blown in and piled up against the grounded offshore ice to the extent that all passage to open ocean had been blocked. Open water remained in the 300 yard area between shore and ice and seal hunting continued from small boats or near shore through the end of the month.

Barrow whaling crews harvested three whales this month, successfully using all three of their allocated fall strikes. The first was harvested on September 15 and two were harvested on Saturday, September 17. Two males and one female were harvested, all in the 48 to 51 foot range. Over 40 boats participated in pulling in the two whales on the 17th. The ocean was calm and the ice floes scattered during the successful whaling period. The day after the last harvest the wind grounded the ice on shore and conditions favorable to fall whaling were absent for the rest of the season.

Fall fishing under the ice and related caribou hunting began as snow conditions improved during mid-month. Many families were observed going out shortly after the whale harvests. Grayling tend to school and swim downstream in mid- to late September, earlier than the whitefish species. Families that know of these good grayling fishing locations were eager to get out as soon as travel

conditions permitted. Flying to fish camp was more common during this time of year since neither boating or snowmachine travel conditions were favorable.

Caribou were taken in larger numbers this month; the rut was approaching and the meat of the older bulls would soon become inedible.

The lakes and rivers froze earlier than usual and five families who had boated to their camps were forced to break through ice to get out to open water. Some were able to make it back to Barrow while others had to charter a plane to get back and would retrieve their boats this winter. Although the early freeze-up made boat travel more difficult, fishermen were able to take advantage of the situation and set their nets under the ice earlier than expected.

OCTOBER

Fishing and caribou hunting were the primary subsistence activities this month. Families traveled extensively to inland cabins and camps.

In addition to jigging for grayling and burbot, one to four nets were commonly set by a family under the ice in rivers and lakes near their camp. Once in place, the nets were usually checked once or twice daily and left at the same location until the family broke camp or until they caught a sufficient amount of fish. As two households related after their fall fishing trip, once they had sufficient amounts of fish they left their nets in place for other families who wanted to fish.

In October caribou hunters traveled out from camp by snowmachine as far as the weather, the daylight, their equipment and fuel, and their navigation skills permitted, or as far as necessary to successfully catch caribou. Many people reported caribou being scarce near their camps on the lower Meade, Topagoruk, and Chipp rivers. Although caribou were present, and at times abundant in the vicinity of Barrow during the month, many of the active harvesters were inland at fishing sites and family camp sites. Since caribou were more scarce in those inland locations this year, total harvests for the month were less than in Year One.

A few individuals were jigging for the small arctic cod in the the tidal cracks just in front of town. These are a popular fish that were not caught in very large numbers during the first year of the study.

The snow cover was much deeper this year than last. This had both favorable and unfavorable ramifications for snowmachine travel. On the favorable side, travel was at times much faster this year. Rough stretches of ground were well covered and very few detours were required. More miles could be covered in a day. However, the deep snow conditions also presented significant problems:

- o Deep snow is harder on the machine. Rubber belts burn up quickly especially when pulling a heavy load. One key informant reported burning up three belts on a day trip and then had to abandon his sled and load of caribou when it became apparent he would not otherwise make it home before dark.
- o Gas consumption is much greater in deep snow. Trips were more expensive and reports of running out of gas were more common this year.
- o Deep snow hides drop-offs and ditches. Though snow machine travel is always a dangerous endeavor in the Arctic, accidents to traveling hunters caused by snow covered hazards this year included a broken collarbone and a broken leg.

The wind and temperature were favorable for hunting and traveling most of the month though white-out conditions became more common near month's end. It was cooler this year than last, with an average monthly temperature of 2^o compared with 22^o the year before. Cold temperatures however are not nearly such a limiting factor to subsistence activity levels as are wind, visibility, and ice conditions.

Out on the ice, an open lead formed less than one mile out from town on October 23. These were very favorable conditions for seal hunting as hunters did not have to venture very far out during this time of unstable ice conditions.

Though not a subsistence activity, the Barrow gray whale rescue - Operation Breakthrough - likely had a significant influence on mid- to late-October subsistence harvest activities. The whales were discovered on October 7 and the local rescue effort began in earnest on October 16. From that date until the whales eventually escaped the ice on October 28, the local commitment of manpower was extensive. At least 30 people, mostly men, were employed full-time through the Mayor's Job Program on the rescue effort.

NOVEMBER

Most families had moved from their camps back to town by mid-month.

Caribou remained in the vicinity of Barrow throughout the month and harvests of caribou during November were triple that of the same month in Year One.

Conditions were very good for fishing arctic cod along the shoreline in front of Barrow. A combination of ice conditions and availability of fish made this fishery much more productive than last year. At least two families traveled to the Admiralty Bay area to fish for arctic cisco.

The last ten days of November especially provided favorable seal hunting conditions, with very moderate wind conditions and an open lead within a mile of town. It was an hour's walk to the edge of the lead according to one hunter. The Thanksgiving holiday also provided extra time for hunting during the favorable conditions for those who wanted fresh seal meat for their families. One pair of hunters harvested seven seals in one day during this period. Other reported harvests varied from zero to one or two seals per hunter.

November was characterized by lower than average temperatures, usually in the -15° F to -20° F range. Wind speeds remained moderate most of the month. One exception was on the 8th when wind speeds to 35 miles per hour pushed the windchill to -65° F.

Thanksgiving was the major community event during the month and was a significant occasion for the distribution of subsistence foods. Pre-holiday preparations included cutting up whale meat and maktak, cutting fish, making caribou soup, and preparing fruit and donuts. The successful whaling crews and successful fishermen delivered their boxes of whale and fish to the churches early Thanksgiving morning. By noon the churches were full. At 1:30 the food distribution began. Servers continued to walk by for the next three hours with soups and other foods to eat at the church, as well as with whale and fish for each household to take home. Approximately 40 pounds of whale and a few

pounds of fish were distributed to each of the families present at the churches. Those with larger families received more.

A portion of the day before Thanksgiving was set aside for a North Slope Borough potluck dinner and the day after Thanksgiving was a North Slope Borough holiday.

DECEMBER

Caribou remained in the vicinity of Barrow in December, though the harvest of caribou remained relatively low. Hunters perceived the condition of the animals to be not as favorable as in other times of the year. Seal hunting and fox trapping were other subsistence activities in December. All the successful whaling crews distributed whale and other foods at the churches during Christmas. Some of the crews were busy in early December already boxing up the food to be distributed during Christmas.

Community games and competitions were held during the period between Christmas and New Years.

Similar to last year, temperatures plummeted near month's end, the low hitting -42°F on the 24th. Wind speeds increased during this same period as well. Although temperatures increased to -21°F on Christmas day, wind speeds increased to 37 m.p.h. giving a resultant windchill of -80°F . Fog and blowing snow were common throughout the month.

JANUARY

The Kiviq or Messenger Feast, held during three days in early January was the most significant subsistence related community activity during January. Many people from all the North Slope villages visited Barrow for the recently revived traditional celebration, held for the second year in Barrow. Last year was the first time the gathering had been held since the early 1900s. A community potluck and the exchange of subsistence items (e.g., ivory, furs, crafts) and subsistence foods were important aspects of the event. Wooley &

Okakok (1989) provide an excellent overview of this year's event as well as describing its historical context. As described in the beginning of their paper:

Kivgiq consists of three days of Inupiat dancing, singing, story and joke telling, trading, bartering, and socializing, all of which reinforce North Slope Inupiat unity. Kivgiq brings North Slope villagers together in Barrow for the event, helping to strengthen kinship and partnerships. Kivgiq fosters traditional values such as sharing, spiritual guidance, storytelling, respect for elders and gratefulness for local game animals. Kivgiq promotes leadership qualities. Kivgiq is a celebration of living the Inupiaq way (Wooley and Okakok 1989: 1)

Bitter cold persisted the last three weeks of January. The National Weather Service in Barrow recorded -50° F on January 24 with winds to 21 miles per hour, taking the wind chill factor to below -100° F. Temperatures remained in the -50° F range for the rest of the week. The monthly average temperature for the month (-24° F) was -14° F the previous year. Hunting effort, primarily targeted on seals, was very limited during the month. Fox trapping also continued near town.

Because of low temperatures, most air travel to the villages was grounded for close to two weeks except for emergency medical flights. An extreme high pressure settled over the state at the end of the month, grounding even large jets for a few days. Shipments of food, supplies, and equipment to the villages were very limited during the last two weeks of the month. Travelers to the villages became stranded in Barrow and Barrow residents traveling home from Fairbanks and Anchorage were stranded in those cities.

FEBRUARY

Extremely strong winds blew on February 25, 27 and 28. Drifting snow closed all the roads on those days. This major storm piled blocks of ice the size of houses up onto the beach to height of 20 feet or higher. Many reported that it was the first time they had seen ice piled that high on the beach so

extensively, stretching from Point Barrow all the way to Skull Cliffs. The trail systems developed by seal hunters out through the ice pack were totally demolished. Travel away from town during the end of February was at a minimum.

Prior to the storm, seal hunters had some success in periodically open stretches of water, usually on the Beaufort Sea side of Point Barrow. The best seal hunting appeared to be around mid-month. After the storms, the Beaufort Sea side of Point Barrow was entirely open water, a phenomenon seldom if ever witnessed at this time of year by current Barrow residents. The open area refroze within the week in a very smooth condition. Seals could be seen sunning themselves out in the middle of the large open flat area, though most attempts at harvesting them were reportedly unsuccessful. The smooth area of ice provided easy access out to the Beaufort side of the point, while the Chukchi side was basically inaccessible without major trail work.

Trapping and hunting of furbearers (i.e., fox, wolverine, and wolves), caribou hunting, and polar bear hunting occurred during the month. Furbearer hunters made extended trips to inland camps located 100 miles or more from Barrow. The first whaling boat umiaq frame of the season was covered with bearded seal skins on February 24. One of the women who sews the skins related that crews are covering their boats earlier these days.

MARCH

Rough ice conditions and a lack of open water appeared to curtail seal harvests during the month. Many polar bears were sighted in an area 30 miles northeast of Pt. Barrow but harvests were few. In one instance, a hunter was alone and knew he could only handle a smaller bear by himself, but could see only very big bears. Another hunter wanted to select only a bear with clean fur. Each one he began stalking, however, was soiled with blood and oil from the carcasses on which they had been feeding. The extreme winds in late February caused a continuous stretch of rubble ice in front of town between the shore and the open lead. The open lead was about seven miles from town. A few crews began building trails out through the rubble near town, while others were exploring the smoother ice conditions to the south out from Walakpa Bay and even further south.

At least 12 hunters traveled inland in search of wolverine and wolves. Reportedly there were few tracks to be seen and fewer wolverine were harvested were less than last year. No wolves were reported harvested by the study participants. Hunters reported good travel conditions in the foothills because of the deep snow; the large drifts facilitating the crossing of rivers and ravines. Closer to town the solid drifts, which were like cement according to one hunter, led to an increase in travel times.

Caribou were harvested near the Meade and Inaru rivers. Those who traveled further inland reported a scarcity of caribou.

Other whaling activities continued: sewing the bearded seal skins together, stretching the skins over the boat frames, building sleds and preparing other equipment.

The annual Alaska Eskimo Whaling Commission convention was held this month in Barrow, March 8 through 11. The 1989 bowhead whale quota of 41 landed whales was allocated among the nine whaling villages. Barrow received a quota of 14 whales landed, an increase of three over last year.

In summary, the following list highlights the key subsistence-related dates and events for Year Two. Also listed are the many events and holidays that indirectly influenced harvest patterns. With full-time employment a reality for many heads of households, subsistence activities were often coordinated to coincide with long weekends and national holidays. Other local celebrations, such as Nalukataq, also affected subsistence activities. Successful whaling crews were especially active after whaling, expending extra effort hunting caribou, eiders, and geese to serve at the feast. By the week prior to Nalukataq, however, the crews and their families were no longer hunting but were occupied preparing food and dividing the whale for distribution at the celebration. Barrow families would also adjust their harvest patterns (e.g., return from their camps or delay their departure) so that they might participate in events and holidays such as Nalukataq, Fourth of July games, and Thanksgiving.

<u>DATE</u>	<u>ACTIVITY OR EVENT</u>
April 3	Easter.
April 14	Open lead develops for the first time during the month, approximately four miles from shore.
April 15-17	Barrow Spring Carnival (<u>Piuraagiaqta</u>).
April 18	Gambell: First whale harvest of the 1988 season.
April 18	NSB bowhead whale census crew established camp on the ice.
April 22	First whaling crews go out.
April 24	Whale harvest, Barrow's first whale of the season.
April 25	Four whales harvested by Barrow crews.
April 26	Lead closes for a few days.
April 28	New lead develops only a half mile from shore.
May 2	Whale harvest, Barrow's sixth whale.
May 4	Whale harvest, Barrow's seventh whale.
May 6	Whale harvest, Barrow's eighth whale and last whale in Barrow's spring quota.
May 7	Most whaling crews move off ice today.
May 8	Mother's Day.
May 16	International Whaling Convention begins in New Zealand.
May 17-18	Barrow whalers receive two strikes from other villages, strikes are taken unsuccessfully.
May 20	Barrow high school graduation.
May 26	School out for the summer.
May 31	AEWC announces IWC yearly bowhead whale quota for 1989-91, 44 strikes, with 41 landed per year. Barrow's allocation is 14 landed.
June 7	Whale strike transferred to Barrow.
June 14-18	Elders/Youth Conference held in Barrow.
June 28-29	Nalukataq celebration both days.
July 2-4	4th of July games.
July 7-13	Shore ice moved offshore, winds fairly calm, good ugruk hunting conditions.
July 14	Ice moved in against beach at Barrow - through end of month, focus of marine mammal hunting effort moves to Beaufort side of Point Barrow.
July 18	Open water in Dease Inlet allows boating to inland camps.
July 19-24	International Eskimo-Indian Olympics in Fairbanks.
August 3	Shore ice in front of town finally moving out.
August 5	Good walrus hunting.
August 18	School starts in Barrow.
September (early)	Rivers begin freezing.
September 15	Whale harvest, Barrow's 9th whale of the season and first fall whale of the year.
September 17	Two whales harvested, Barrow's 10th and 11th whales.
September 20	Grounded ice offshore blocks boat passage to the ocean for the season.

<u>DATE</u>	<u>ACTIVITY OR EVENT</u>
October 7	Trapped gray whales discovered off Pt. Barrow.
October 12	Newsmen start arriving in Barrow to cover gray whale story.
October 13-15	North and Northwest Mayor's Conference in Barrow.
October (mid)	Caribou rutting time begins.
October 17	Gray whale rescue operation begins.
October 19-22	Alaska Federation of Natives annual meeting begins in Fairbanks.
October 26	Russian ice breakers arrive off of Barrow.
October 28	Gray whales swim free.
October (late)	Arctic cod fishing in front of Barrow.
October 31	Halloween.
November 8	High winds, 40 + m.p.h.
November 18	Sun sets in Barrow for 65 days.
November 24	Thanksgiving
November (late)	Wolf and wolverine hunting begins.
December 25	Christmas. Major storm, blowing snow and winds to 35 m.p.h.
December 26-31	Christmas games.
January 1-3	Messenger Feast (Kivgiq) in Barrow.
January 22	First sunrise of the year in Barrow.
January	Extremely cold temperatures during last three weeks of January. Flights to villages limited mainly to emergencies.
February 12	Snow storm, 6 to 8 inches.
February 20	NSB holiday.
February 25	Severe wind storm, peak gusts to 74 m.p.h. Ice conditions totally altered, ice piled high all along the beach and extremely rough ice conditions result.
February 27-28	High winds again with gusts to 50 m.p.h.
March 8-11	Alaska Eskimo Whaling Commission annual meeting in Barrow.
March 26	Easter.

MARINE MAMMALS

Comparison of Year One and Year Two

The variability in Barrow harvest amounts from Year One to Year Two is most clearly demonstrated by the marine mammal harvests. There are differences in harvest amounts for each of the six species. These differences can be seen by comparing Tables 11 and 12 and Figures 7 and 8. The most substantial difference between Year One and Year Two was the harvest of five more bowhead whales in Year Two. The amount of edible meat, maktak, and blubber increased accordingly by almost 50,000 pounds during Year Two.

Though ice conditions, current, weather, and species availability play a role in whale hunting as they do in the harvest of other species, the bowhead whale quota imposed by the International Whaling Commission has been a major influence on the number of whales harvested each year. During Year One the original quota was nine struck whales for Barrow, while in Year Two the quota was 11 strikes. The allocation of unused strikes by the AEWC was also a factor in the total Barrow harvest. In Year Two three fall whale strikes were allocated to Barrow, all of them used successfully.

The estimated number of polar bear harvests also increased, from the 10 harvested in Year One to 12 harvested in Year Two. There were reportedly many more polar bears in the vicinity of Barrow during the second year of the study.

The harvest of spotted seal increased slightly. The estimated harvest numbers were very small for both years primarily because the meat of these seals is not usually eaten, though it was often used for dog food when dog teams were common in Barrow. Their skins are desirable for crafts, as demonstrated by one study participant's excitement over her son's harvest of a "beautiful" spotted seal skin. Another factor in the low harvest numbers is that spotted seals were usually scarce in the area where most of the marine mammal harvests took place. People traveling by boat reported seeing large numbers of spotted seals in both Admiralty Bay and Smith Bay.

TABLE 11: HARVEST ESTIMATES FOR MARINE MAMMALS - ALL BARROW HOUSEHOLDS, YEAR ONE REVISED (1)

RESOURCE	CONVERSION	AVERAGE POUNDS				SAMPLING STATISTICS						
	FACTOR (2)	COMMUNITY TOTALS		HARVESTED		PERCENT		SAMPLING STATISTICS				
	(Edible Weight Per Resource in lbs)	NUMBER HARVESTED	EDIBLE POUNDS HARVESTED	PER HOUSEHOLD	PER CAPITA	PERCENT OF TOTAL EDIBLE POUNDS HARVESTED	PERCENT OF ALL BARROW HRVSTING RESOURCE	STANDARD DEVIATION (lbs)	SAMPLING ERROR AT 95% (lbs)	LOW ESTIMATE (Mean lbs/ Household)	HIGH ESTIMATE (Mean lbs/ Household)	SAMPLING ERROR AS % OF MEAN
Total Marine Mammals	n/a	n/a	345,156	368	114.4	52.7%	38.2%	35	68	300.4	436.3	18%
Bowhead (3,4)	26,375.6	7	184,629	197	61.2	28.2%	27.2%	0	0	197.0	197.0	0%
Walrus	772.0	117	90,420	96.5	30.0	13.8%	11.8%	27	52	44.3	148.7	54%
Bearded Seal	176.0	259	45,507	48.6	15.1	7.0%	23.7%	9	18	30.3	66.8	38%
Total Ring. & Spot. Seal	42.0	466	19,555	20.9	6.5	3.0%	14.4%	5	9	11.4	30.3	45%
Ringed Seal	42.0	463	19,456	20.8	6.5	3.0%	14.4%	5	9	11.3	30.2	45%
Spotted Seal	42.0	2	98	0.1	*	**	0.2%	0	0	0.1	0.2	52%
Polar Bear	496.0	10	5,045	5.4	1.7	0.8%	0.8%	3	6	0.0	10.9	103%

(1) Estimated sampling errors do not include errors in reporting, recording, and in conversion to usable weight.

(2) See Table A-4 for sources of conversion factors.

(3) Bowhead harvest does not contribute to the sampling error for marine mammals since the bowhead harvest is based on a complete count.

(4) The percent of Barrow households harvesting bowhead represents the percent of Barrow households receiving crew member shares at the whale harvest site, as extrapolated from the sample households.

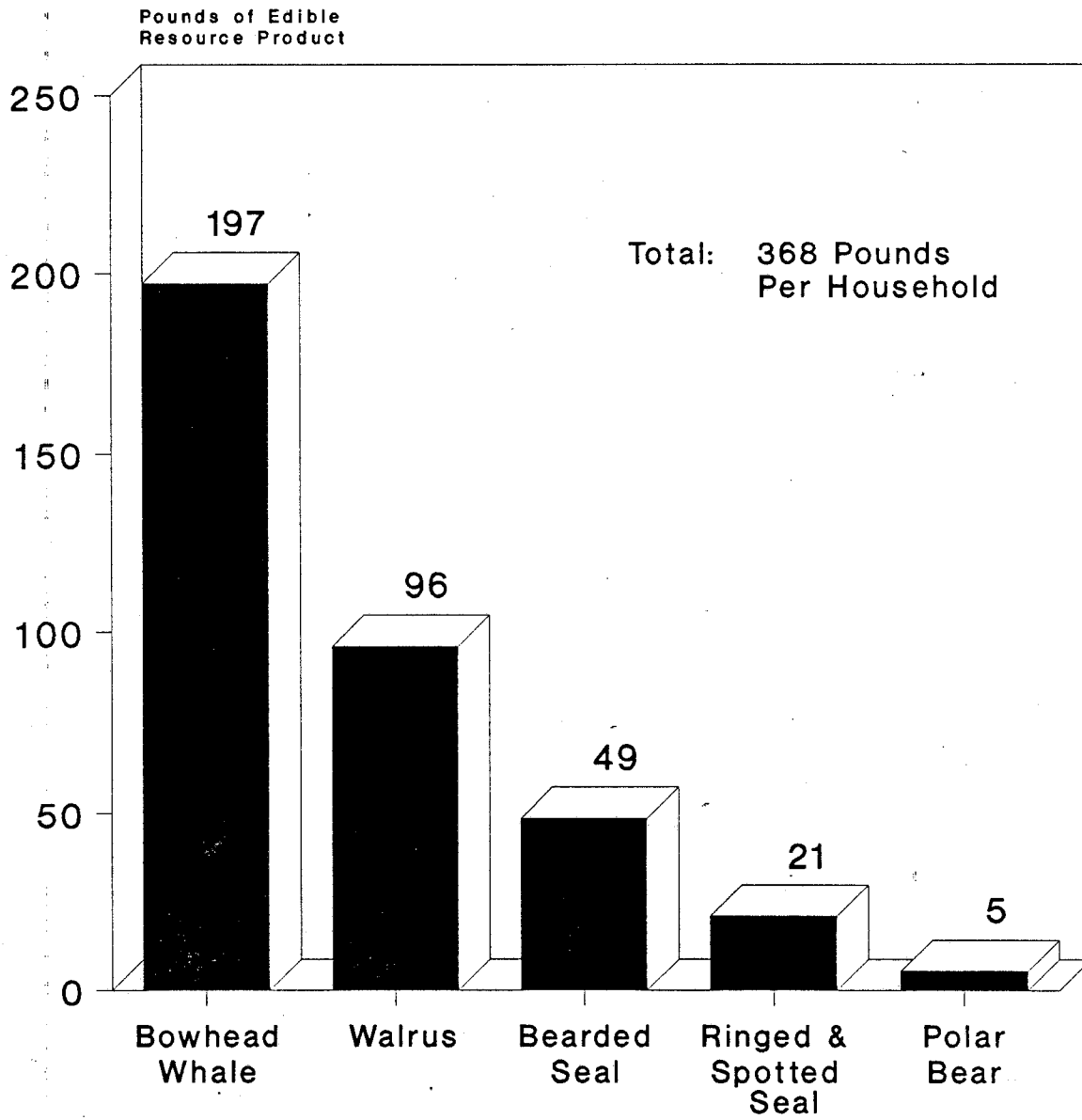
* represents less than .1 pound

** represents less than .1 percent

n/a means not applicable

Source: Stephen R. Braund & Associates, 1989

Figure 7: Harvest of Marine Mammals
 All Barrow Households, Year One, Revised
 (Mean Edible Pounds Per Household)



% of Marine Mammals:	53%	26%	13%	6%	1%
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Source: Stephen R. Braund & Assoc., 1989

TABLE 12: HARVEST ESTIMATES FOR MARINE MAMMALS - ALL BARROW HOUSEHOLDS, YEAR TWO (1)

RESOURCE	CONVERSION	AVERAGE POUNDS				SAMPLING STATISTICS						
	FACTOR (2)	COMMUNITY TOTALS		HARVESTED		PERCENT		SAMPLING STATISTICS				
	(Edible Weight Per Resource in lbs)	NUMBER HARVESTED	EDIBLE POUNDS HARVESTED	PER HOUSEHOLD	PER CAPITA	PERCENT OF TOTAL EDIBLE POUNDS HARVESTED	PERCENT OF ALL BARROW HRVSTING RESOURCE	STANDARD DEVIATION (lbs)	SAMPLING ERROR AT 95% (lbs)	LOW ESTIMATE (Mean lbs/ Household)	HIGH ESTIMATE (Mean lbs/ Household)	SAMPLING ERROR AS % OF MEAN
Total Marine Mammals	n/a	n/a	329,296	351	109.2	55.8%	43.1%	16	31	320.4	382.4	9%
Bowhead (3,4)	21,218.3	11	233,401	249	77.4	39.6%	37.5%	0	0	249.1	249.1	0%
Walrus	772.0	58	44,828	47.8	14.9	7.6%	6.1%	9	17	31.1	64.6	35%
Bearded Seal	176.0	167	29,427	31.4	9.8	5.0%	10.0%	10	19	12.2	50.6	61%
Total Ring. & Spot. Seal	42.0	369	15,500	16.5	5.1	2.6%	10.0%	3	7	9.7	23.4	41%
Ringed Seal	42.0	365	15,336	16.4	5.1	2.6%	10.0%	3	7	9.5	23.2	42%
Spotted Seal	42.0	4	148	0.2	*	**	0.2%	0	0	0.1	0.2	55%
Polar Bear	496.0	12	6,157	6.6	2.0	1.0%	1.7%	1	2	4.7	8.4	28%

(1) Estimated sampling errors do not include errors in reporting, recording, and in conversion to usable weight.

(2) See Table A-4 for sources of conversion factors.

(3) Bowhead harvest does not contribute to the sampling error for marine mammals since the bowhead harvest is based on a complete count.

(4) The percent of Barrow households harvesting bowhead represents the percent of Barrow households receiving crew member shares at the whale harvest site, as extrapolated from the sample households.

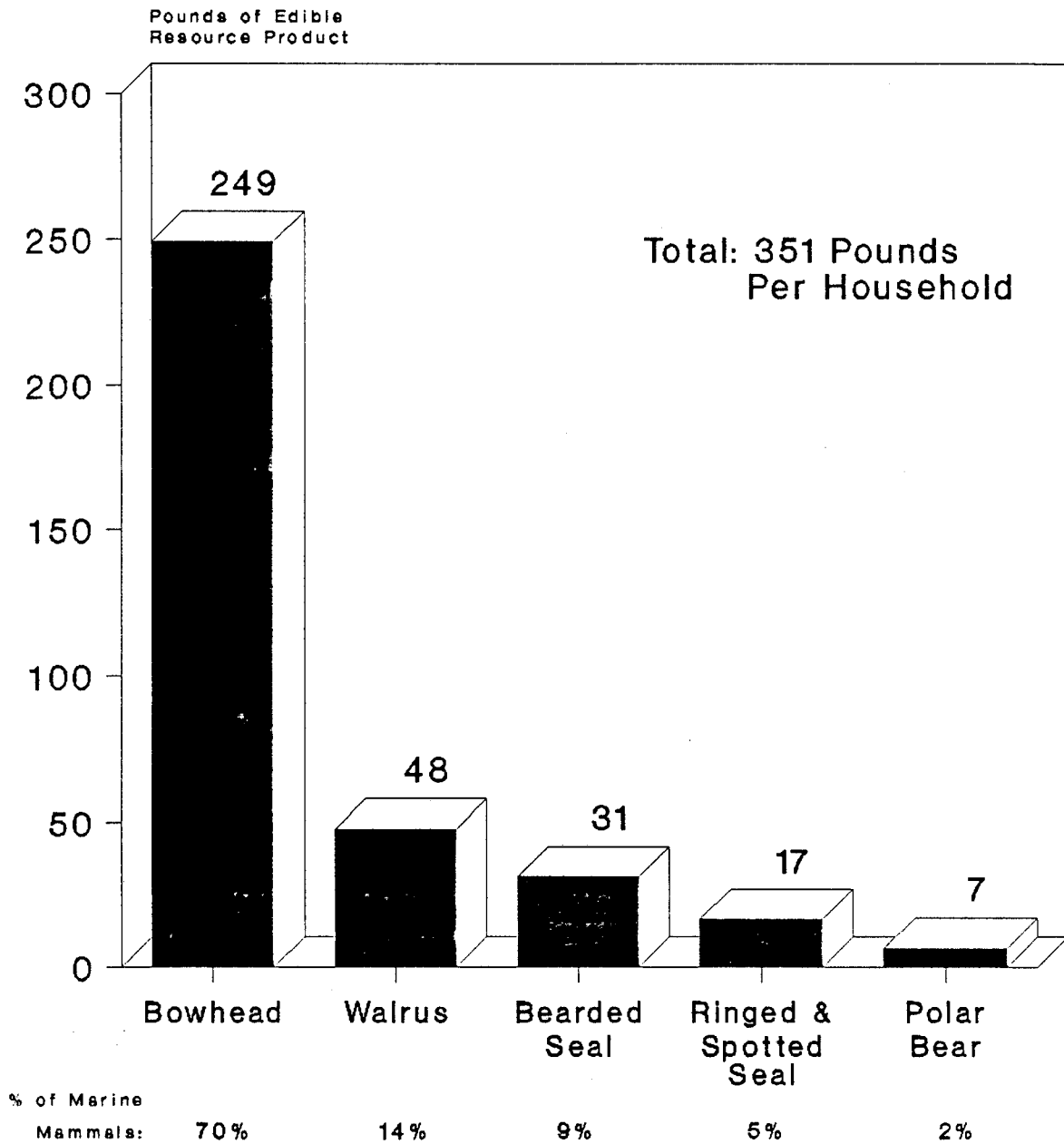
* represents less than .1 pound

** represents less than .1 percent

n/a means not applicable

Source: Stephen R. Braund & Associates, 1989

**Figure 8: Harvest of Marine Mammals
All Barrow Households, Year Two
(Mean Edible Pounds Per Household)**



Source: Stephen R. Braund & Assoc., 1989

The harvest of walrus, bearded seal, and ringed seal declined in Year Two. Approximately half as many walrus were harvested in Year Two, while the estimated harvest of bearded seal declined by one third (35 percent). The estimated harvest of ringed seals declined by 98 animals or about 20 percent.

The decline in walrus, bearded seal, and ringed seal harvests was due primarily to the relatively poor boating conditions during July and early August of Year Two. Walrus harvests are usually associated with moving pack ice; however, the ice moved in against the beach in early July and remained there until early August, denying Barrow hunters access to the pack ice for approximately half the walrus hunting season in Year Two.

The monthly variation between years is illustrated in Tables 13 through 16 and in Figures 9 and 10. That the harvest of bearded seal was lower than average, or at least less than was desired by the hunters, was evidenced in the shortage of bearded seal skins for covering umiaq frames. Although the trading and sharing of bearded seal skins between crews occurred, obtaining the six or seven skins necessary to cover a boat was more difficult than usual. At least two crews had to forego replacing the skins on their boat when they could not obtain enough to do the job. The skins are usually replaced every third year. Another feature of the 1988 summer marine mammal harvest was that it happened late in the season. As can be seen in Figures 9 and 10, the July walrus harvest that occurred in Year One did not occur in Year Two. According to one key informant, his aged walrus meat did not acquire the right taste in 1988 because it was harvested too late (mid-August) to benefit from the warmer days of July.

The principal focus of marine mammal harvest activity was within a 15 mile ocean radius of Barrow. Additional harvest areas occurred along the coast southwest of Barrow to Peard Bay and seaward to a distance of 35 miles (Maps 7, 9, 10, 13, and 14). Maps 8, 11 and 12 depict marine mammals harvest sites for both Years One and Two. As is evident from the maps of seasonal marine mammal harvest locations (Maps 13 and 14), Year Two harvests occurred more often on the Beaufort Sea side of Point Barrow than was the case in Year One. The easternmost site depicted on Map 7 but not visible on Map 9 represents a ringed seal harvested during Year Two. The grounded ice on the beach in Barrow was the primary cause of change in harvest locations and the decline in harvest

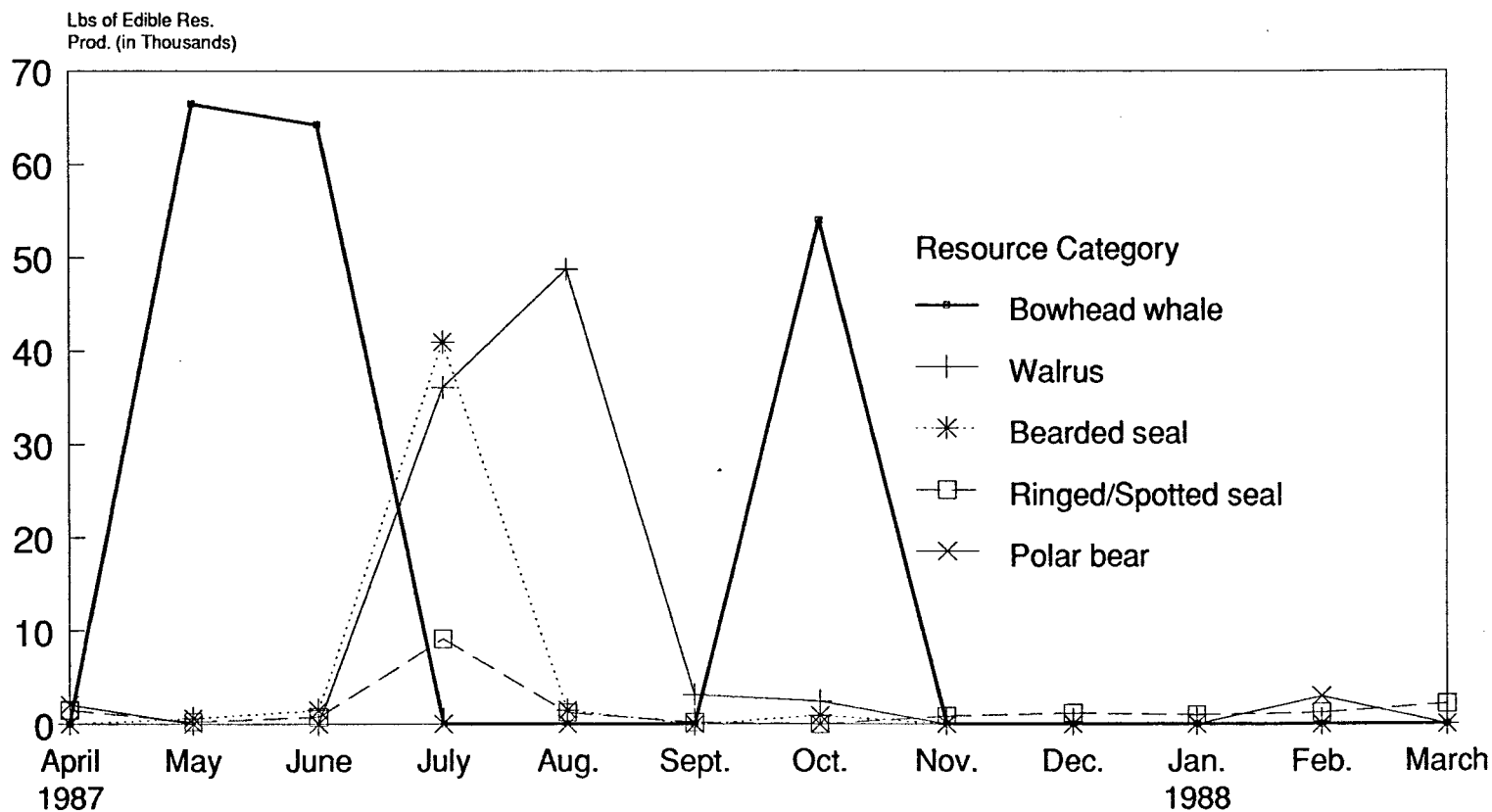
TABLE 13: MARINE MAMMAL HARVEST BY SPECIES AND MONTH - BARROW, YEAR ONE REVISED
(Pounds of Edible Resource Product)

SPECIES	TOTALS											
	1987						1988					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Bowhead Whale	0	66,439	64,213	0	0	0	53,977	0	0	0	0	0
Walrus	0	0	0	36,067	48,730	3,164	2,461	0	0	0	0	0
Bearded Seal	0	618	1,484	40,920	1,509	0	935	41	0	0	0	0
Polar Bear	2,069	0	0	0	0	0	0	0	0	0	2,976	0
Total Ring. & Spot. Seal	1,492	246	757	9,150	1,255	216	0	854	1,183	994	1,234	2,173
Ringed Seal	1,492	246	757	9,150	1,156	216	0	854	1,183	994	1,234	2,173
Spotted Seal	0	0	0	0	98	0	0	0	0	0	0	0
All Marine Mammals	3,561	67,303	66,454	86,137	51,493	3,381	57,373	896	1,183	994	4,210	2,173

SPECIES	PERCENTS											
	1987						1988					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Bowhead Whale	0%	36%	35%	0%	0%	0%	29%	0%	0%	0%	0%	0% = 100%
Walrus	0%	0%	0%	40%	54%	3%	3%	0%	0%	0%	0%	0% = 100%
Bearded Seal	0%	1%	3%	90%	3%	0%	2%	0%	0%	0%	0%	0% = 100%
Polar Bear	41%	0%	0%	0%	0%	0%	0%	0%	0%	0%	59%	0% = 100%
Total Ring. & Spot. Seal	8%	1%	4%	47%	6%	1%	0%	4%	6%	5%	6%	11% = 100%
Ringed Seal	8%	1%	4%	47%	6%	1%	0%	4%	6%	5%	6%	11% = 100%
Spotted Seal	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0% = 100%
All Marine Mammals	1%	19%	19%	25%	15%	1%	17%	0%	0%	0%	1%	1% = 100%

Source: Stephen R. Braund & Associates, 1989

Figure 9: Monthly Harvest of Marine Mammals
All Barrow Households, Year One Revised



Source: Stephen R. Braund & Assoc., 1989

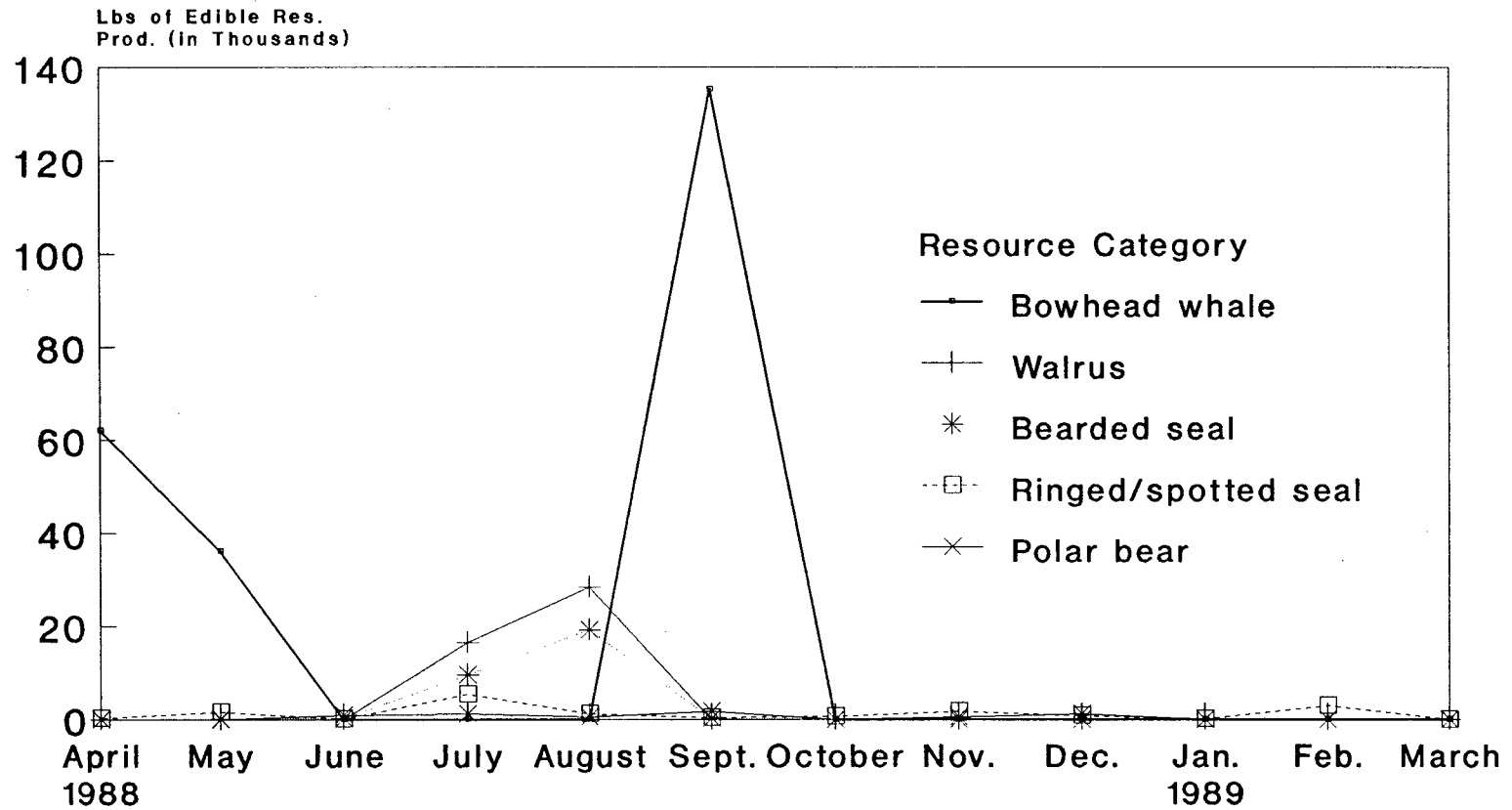
TABLE 14: MARINE MAMMAL HARVEST BY SPECIES AND MONTH - BARROW, YEAR TWO
(Pounds of Edible Resource Product)

SPECIES	TOTALS *****											
	1988						1989					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Bowhead Whale	62,004	36,037	0	0	0	135,360	0	0	0	0	0	0
Walrus	0	0	0	16,446	28,383	0	0	0	0	0	0	0
Bearded Seal	0	82	309	9,567	19,159	309	0	0	0	0	0	0
Polar Bear	0	0	871	1,220	581	1,742	0	581	1,162	0	0	0
Total Ring. & Spot. Seal	246	1,640	197	5,451	1,249	367	659	1,695	848	126	3,006	0
Ringed Seal	246	1,640	197	5,353	1,200	367	659	1,695	848	126	3,006	0
Spotted Seal	0	0	0	98	49	0	0	0	0	0	0	0
All Marine Mammals	62,250	37,759	1,377	32,684	49,372	137,778	659	2,276	2,010	126	3,006	0

SPECIES	PERCENTS *****											
	1988						1989					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Bowhead Whale	27%	15%	0%	0%	0%	58%	0%	0%	0%	0%	0%	0% = 100%
Walrus	0%	0%	0%	37%	63%	0%	0%	0%	0%	0%	0%	0% = 100%
Bearded Seal	0%	0%	1%	33%	65%	1%	0%	0%	0%	0%	0%	0% = 100%
Polar Bear	0%	0%	14%	20%	9%	28%	0%	9%	19%	0%	0%	0% = 100%
Total Ring. & Spot. Seal	2%	11%	1%	35%	8%	2%	4%	11%	5%	1%	19%	0% = 100%
Ringed Seal	2%	11%	1%	35%	8%	2%	4%	11%	6%	1%	20%	0% = 100%
Spotted Seal	0%	0%	0%	67%	33%	0%	0%	0%	0%	0%	0%	0% = 100%
All Marine Mammals	19%	11%	0%	10%	15%	42%	0%	1%	1%	0%	1%	0% = 100%

Source: Stephen R. Braund & Associates, 1989

Figure 10: Monthly Harvest of Marine Mammals
All Barrow Households, Year Two



Source: Stephen R. Braund & Assoc., 1989

TABLE 15: MARINE MAMMAL HARVEST BY SPECIES AND MONTH - BARROW, YEAR ONE REVISED
(Number Harvested)

SPECIES	1987						1988					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Bowhead Whale		4	1				2					
Walrus				47	63	4	3					
Bearded Seal		4	8	233	9		5	0				
Polar Bear	4										6	
Total Ring. & Spot. Seal	36	6	18	218	30	5	0	20	28	24	29	52
Ringed Seal	36	6	18	218	28	5		20	28	24	29	52
Spotted Seal					2							

Source: Stephen R. Braund & Associates, 1989

TABLE 16: MARINE MAMMAL HARVEST BY SPECIES AND MONTH - BARROW, YEAR TWO
(Number Harvested)

SPECIES	1988					1989						
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Bowhead Whale	5	3	0	0	0	3	0	0	0	0	0	0
Walrus	0	0	0	21	37	0	0	0	0	0	0	0
Bearded Seal	0	0	2	54	109	2	0	0	0	0	0	0
Polar Bear	0	0	2	2	1	4	0	1	2	0	0	0
Total Ring. & Spot. Seal	6	39	5	130	30	9	16	40	20	3	72	0
Ringed Seal	6	39	5	127	29	9	16	40	20	3	72	0
Spotted Seal	0	0	0	2	1	0	0	0	0	0	0	0

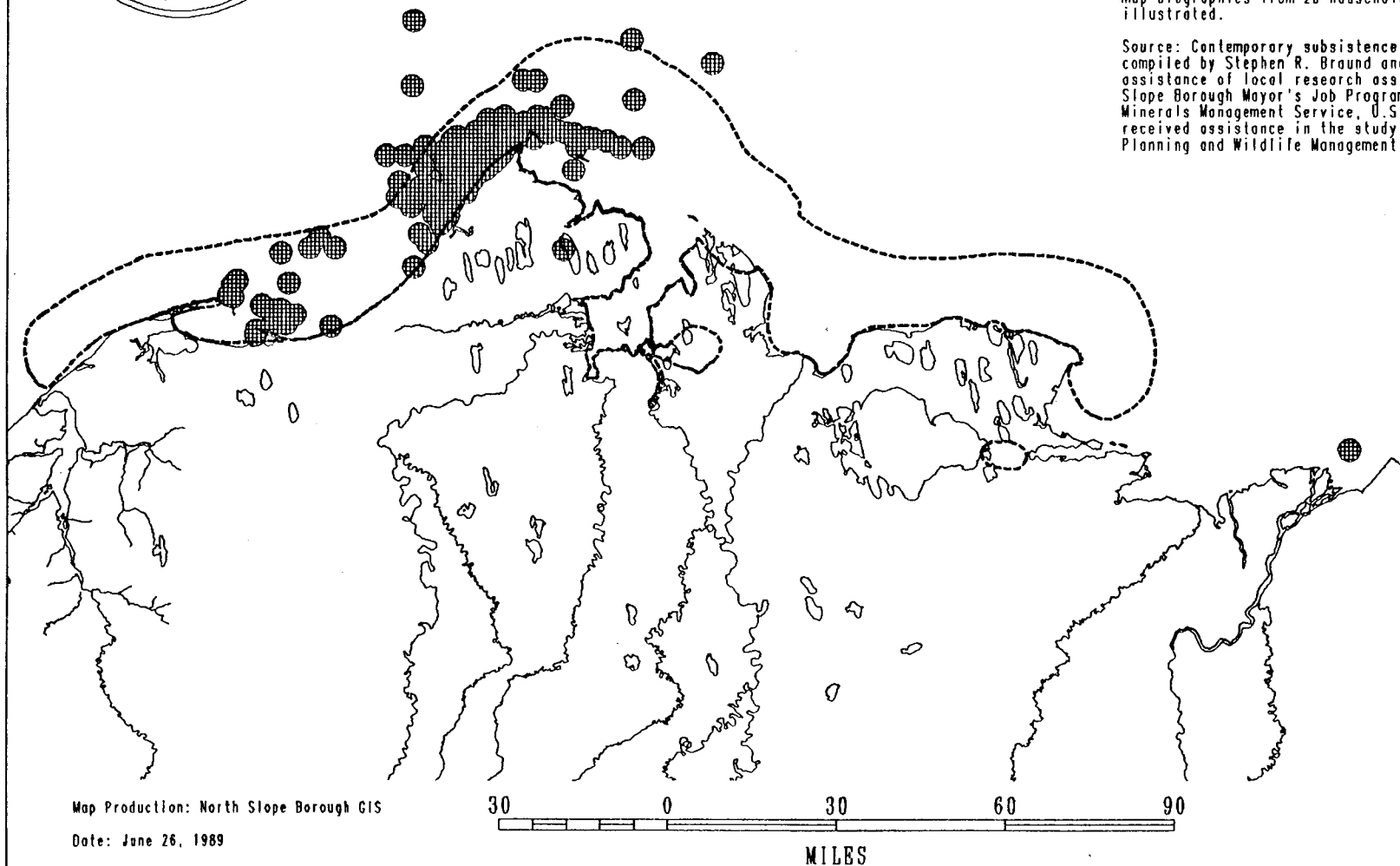
Source: Stephen R. Braund & Associates, 1989

MAP 7 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO MARINE MAMMAL HARVEST SITES - ALL SPECIES



This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1988 through March 31, 1989: Year Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study. Lifetime-community harvest areas, collected in the form of map biographies from 20 households (Pedersen 1979), are also illustrated.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION



Lifetime community land use (Pedersen 1979).



Marine Mammals

- Bowhead whale
- Bearded seal
- Ringed seal
- Spotted seal
- Walrus
- Polar bear

Map Production: North Slope Borough GIS

Date: June 26, 1989

MILES

MAP 8

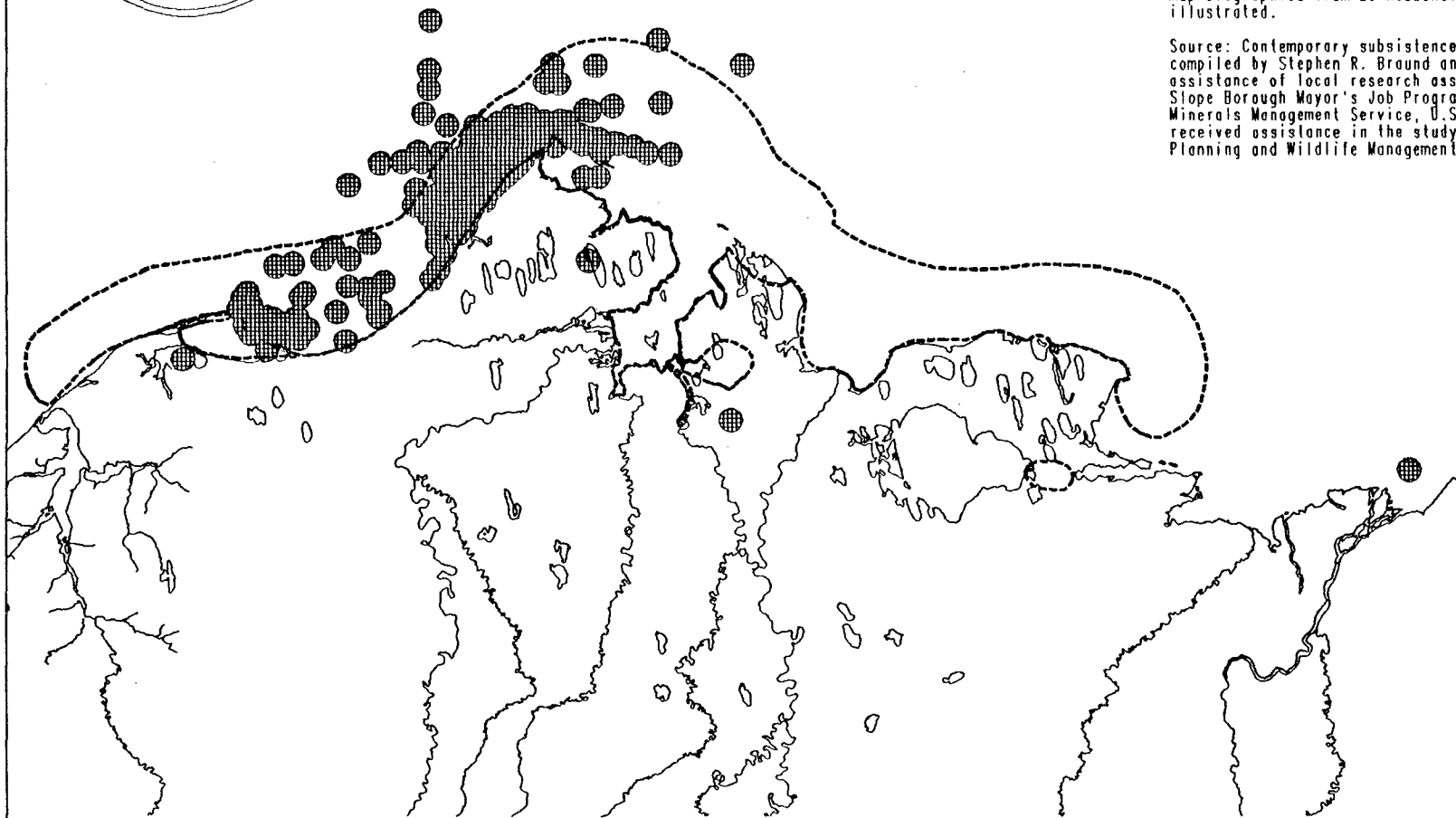
NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO

MARINE MAMMAL HARVEST SITES - ALL SPECIES: YEARS ONE AND TWO





This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1987 through March 31, 1989: Years One and Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study. Lifetime-community harvest areas, collected in the form of map biographies from 20 households (Pedersen 1979), are also illustrated.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

-  Lifetime community land use (Pedersen 1979).
-  Marine Mammals
 - Bowhead whale
 - Bearded seal
 - Ringed seal
 - Spotted seal
 - Walrus
 - Polar bear

Map Production: North Slope Borough GIS
Date: June 26, 1989

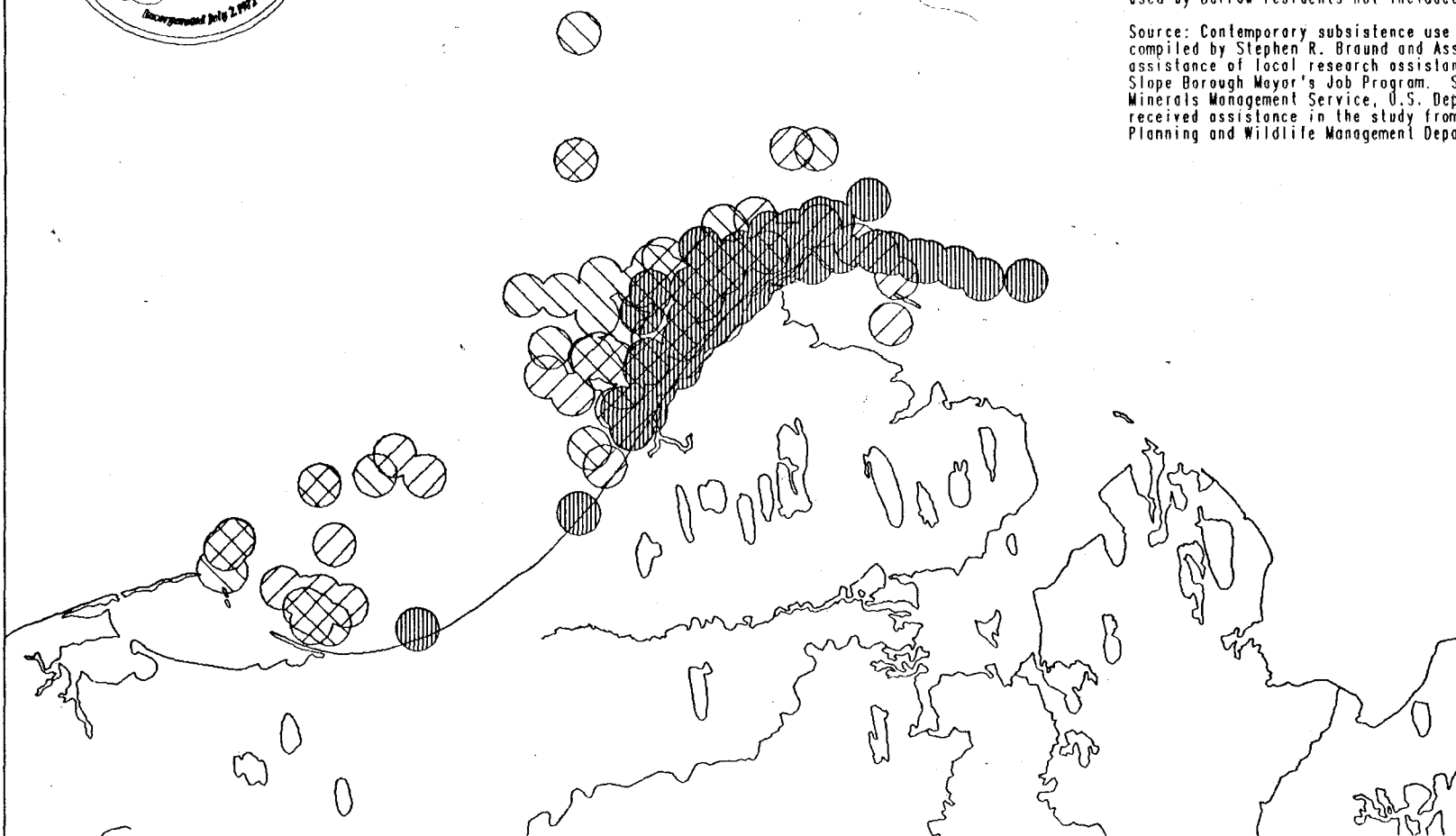


MAP 9
 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO
 MARINE MAMMAL HARVEST SITES BY SPECIES:
 WALRUS AND SEALS






This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1988 through March 31, 1989: Year Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.

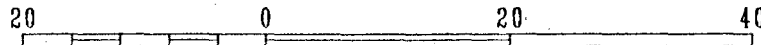


LEGEND INFORMATION

-  Walrus
-  Bearded seal
-  Ringed and spotted seals

Map Production: North Slope Borough GIS

Date: June 26, 1989



MILES

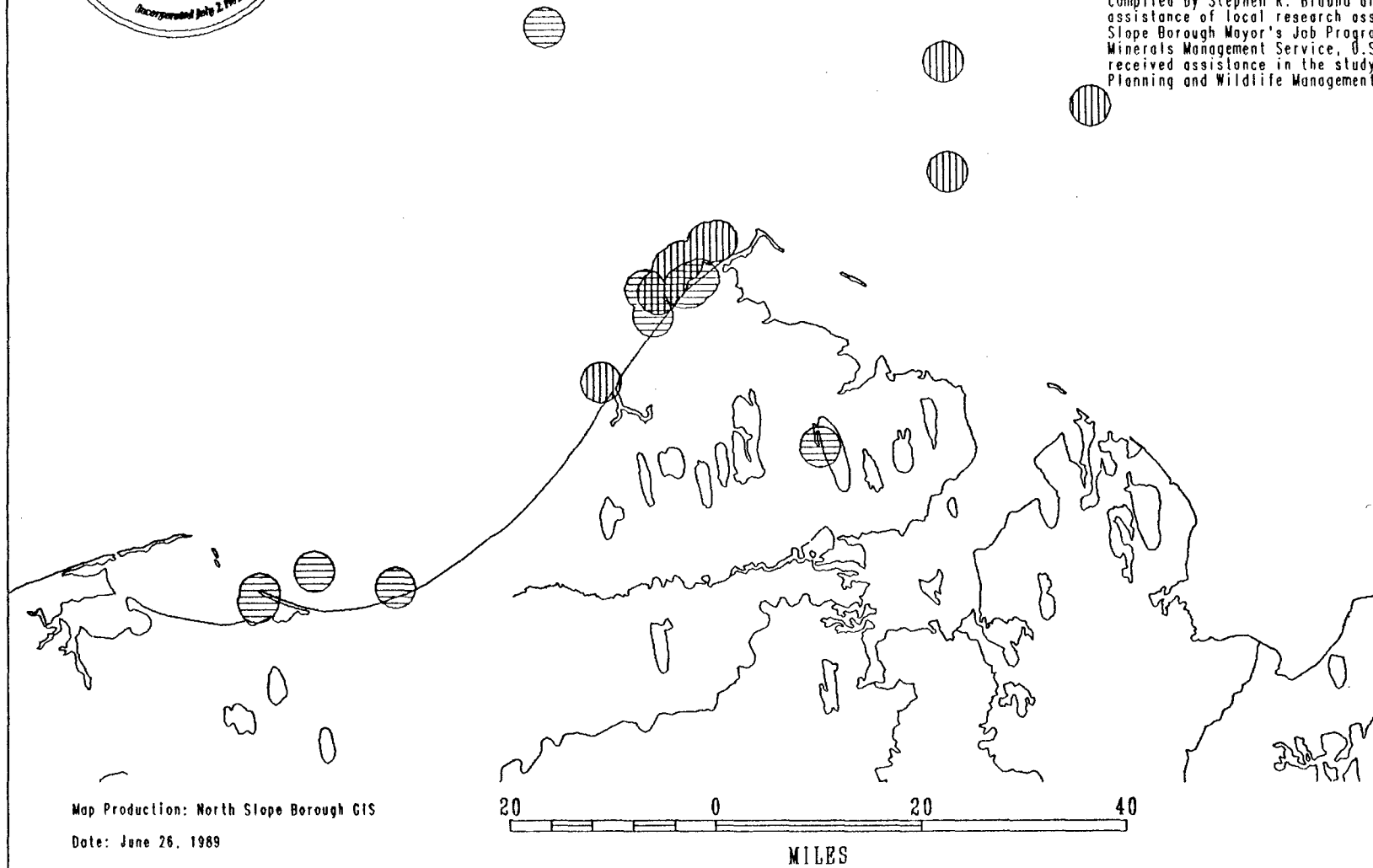


MAP 10
 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO
 MARINE MAMMAL HARVEST SITES BY SPECIES:
 BOWHEAD WHALE AND POLAR BEAR





This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1988 through March 31, 1989: Year Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

-  Bowhead Whale
-  Polar Bear

Map Production: North Slope Borough GIS

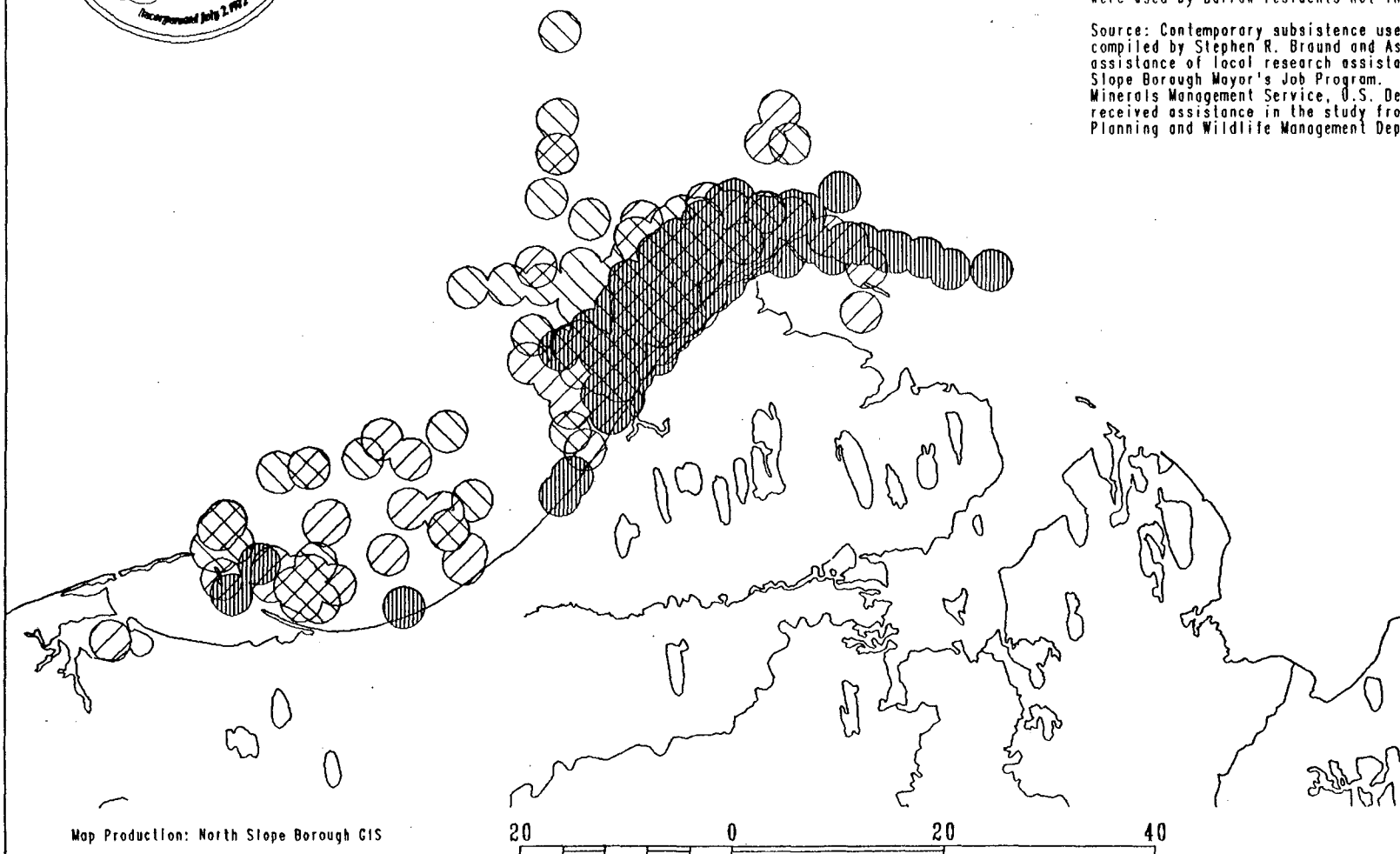
Date: June 26, 1989

MAP 11
 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO
 MARINE MAMMAL HARVEST SITES BY SPECIES, YEARS ONE AND TWO:
 WALRUS AND SEALS






This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1987 through March 31, 1989: Years One and Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

-  Walrus
-  Bearded seal
-  Ringed and spotted seals

Map Production: North Slope Borough GIS

Date: June 26, 1989

20 0 20 40
 MILES

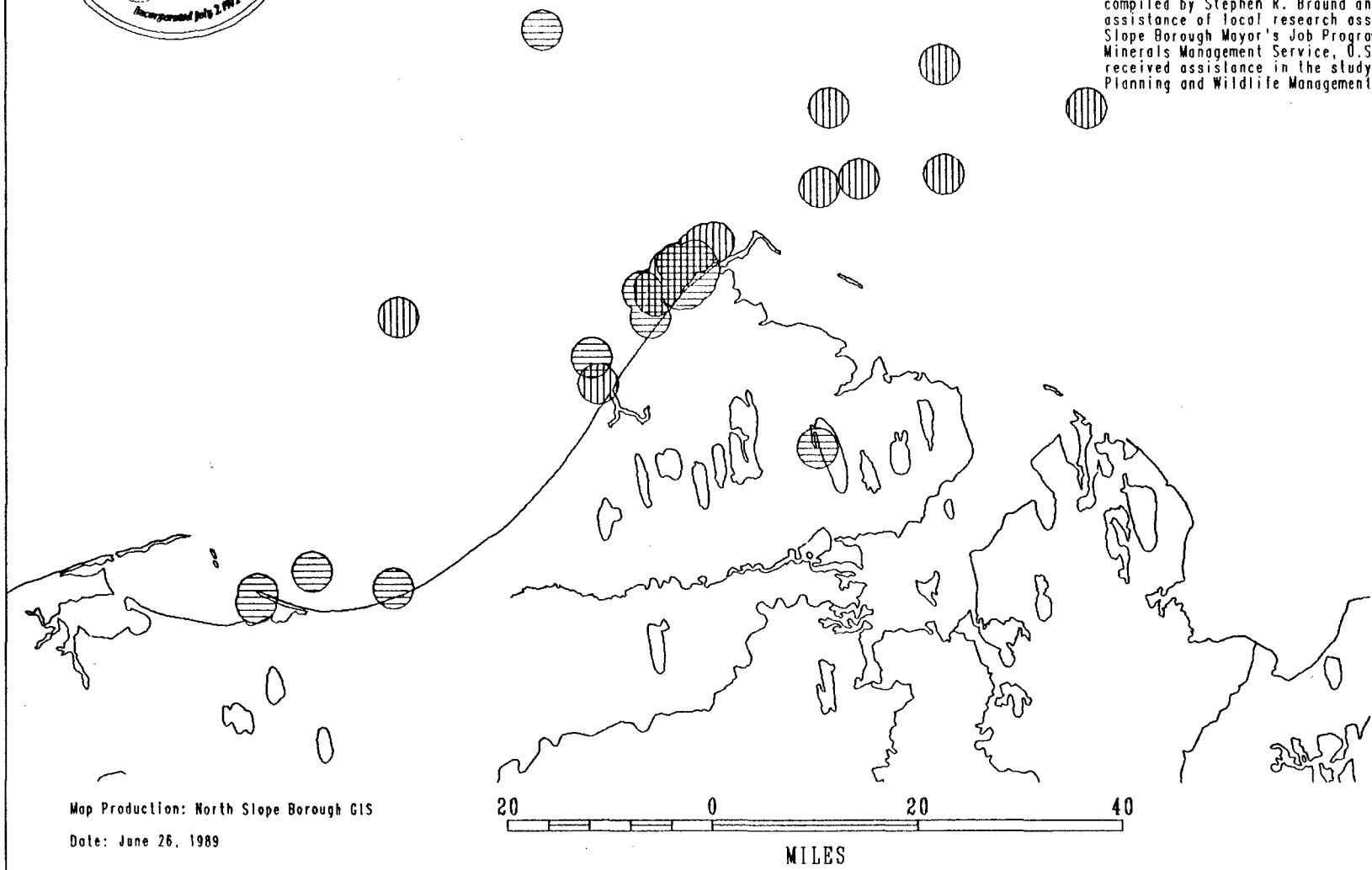


MAP 12
 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO
 MARINE MAMMAL HARVEST SITES BY SPECIES, YEARS ONE AND TWO:
 BOWHEAD WHALE AND POLAR BEAR





This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1987 through March 31, 1989: Years One and Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

-  Bowhead Whale
-  Polar Bear

Map Production: North Slope Borough GIS

Date: June 26, 1989





MAP 13
 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO
 MARINE MAMMAL HARVEST SITES BY SEASON

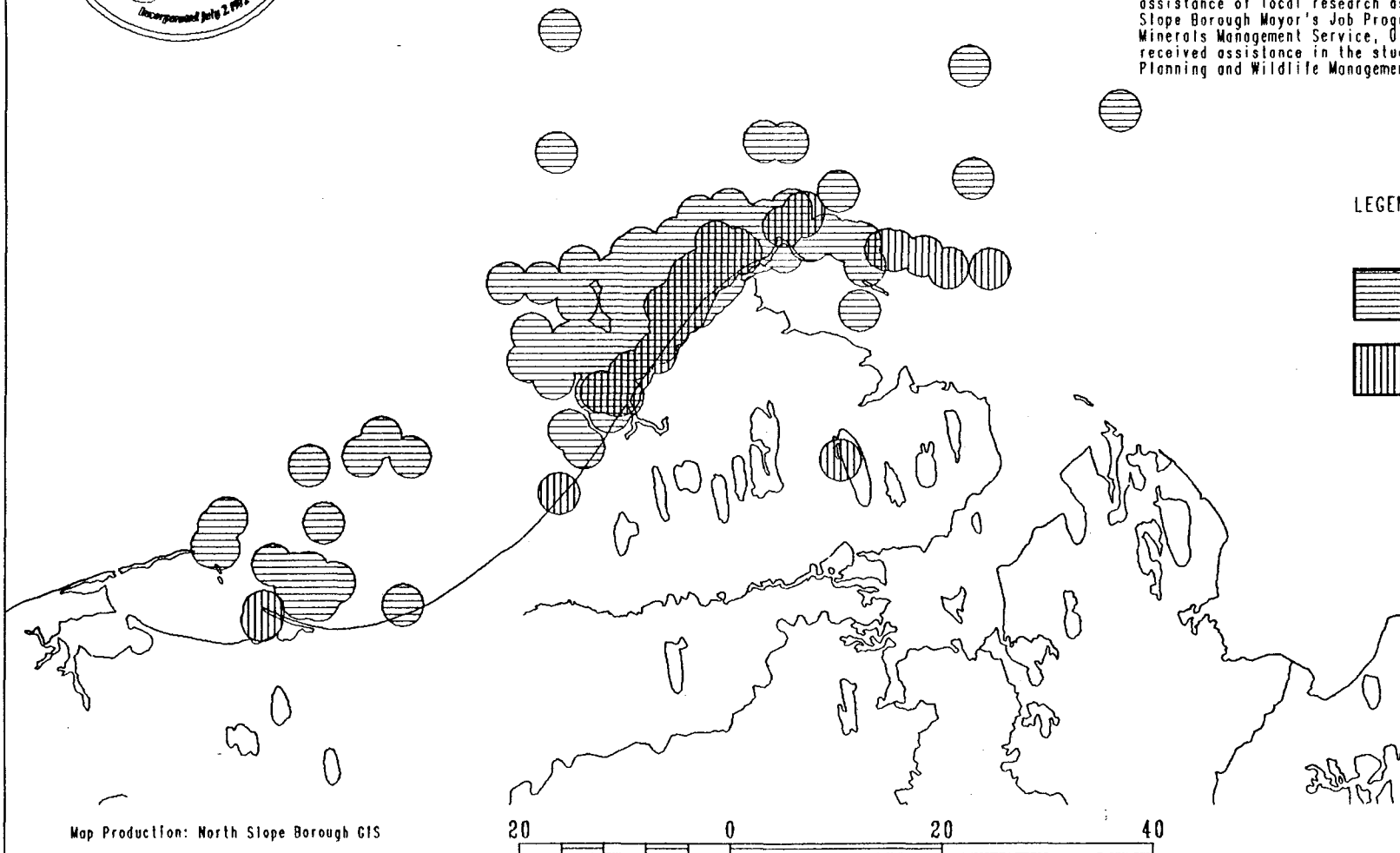


This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1988 through March 31, 1989: Year Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SR&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SR&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.

LEGEND INFORMATION

-  July - October
-  November - June



Map Production: North Slope Borough GIS

Date: June 26, 1989

MILES

MAP 14

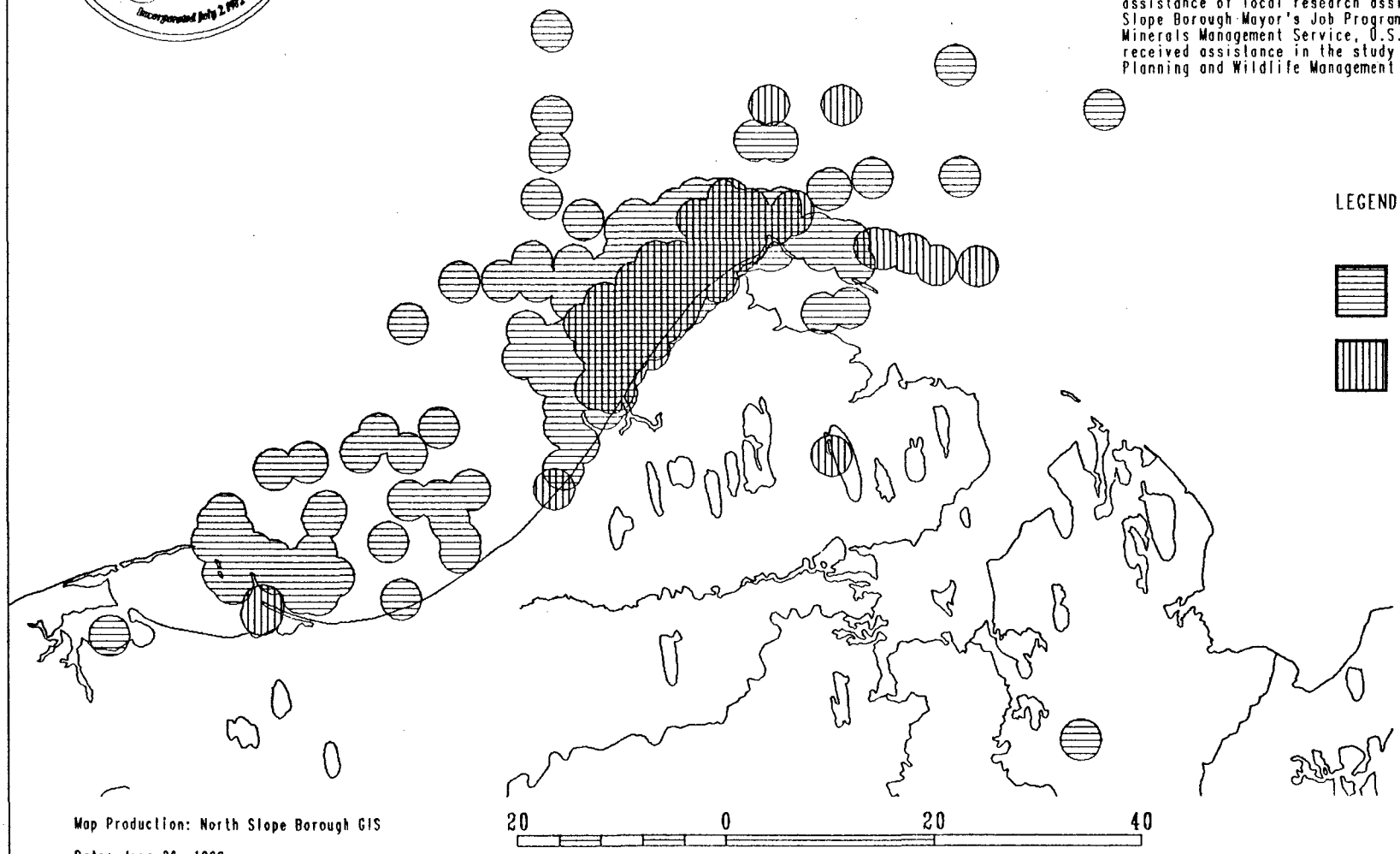
NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO

MARINE MAMMAL HARVEST SITES BY SEASON, YEARS ONE AND TWO





This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1987 through March 31, 1989; Years One and Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

-  July - October
-  November - June

Map Production: North Slope Borough GIS

Date: June 26, 1989



numbers in Year Two. The ice was troublesome for a number of reasons: it blocked passage to the more productive areas in the Chukchi Sea; it prevented hunters from reaching the moving pack ice that many of the marine mammals are associated with; and its almost constant presence in July discouraged hunters from ranging over a wider area of the ocean. In addition, the current tends to be faster near the point according to one of the hunters. Since the only route to the ocean was out around the point in July, the moving ice made boat travel even riskier.

Tables 17, 18, and 19 and Figures 11 and 12 illustrate the average harvest for the two years of study combined. Marine mammals comprised 54 percent of the average Barrow harvest. Bowhead was approximately one-third of the average community harvest (33.6 percent), walrus 10.9 percent, bearded seal six percent, and ringed seal approximately three percent (2.8 percent) of the average harvest.

TABLE 17: AVERAGE HARVEST ESTIMATES FOR MARINE MAMMALS - ALL BARROW HOUSEHOLDS, YEARS ONE & TWO (1)

RESOURCE	CONVERSION FACTOR (2) (Edible Weight Per Resource in lbs)	COMMUNITY TOTALS		AVERAGE POUNDS HARVESTED		PERCENT OF TOTAL EDIBLE POUNDS HARVESTED	PERCENT OF ALL BARROW HSEHOLDS HRVSTING RESOURCE	SAMPLING STATISTICS				
		NUMBER HARVESTED	EDIBLE POUNDS HARVESTED	PER HOUSEHOLD	PER CAPITA			STANDARD DEVIATION (lbs)	SAMPLING ERROR AT 95% (lbs)	LOW ESTIMATE (Mean lbs/ Household)	HIGH ESTIMATE (Mean lbs/ Household)	SAMPLING ERROR AS % OF MEAN
Total Marine Mammals	n/a	n/a	337,225	359.9	111.8	54.2%	40.7%	20	40	320.3	399.5	11%
Bowhead (3,4)	11,612.0	9	209,015	223.1	69.3	33.6%	32.4%	0	0	223.1	223.1	0%
Walrus	772.0	88	67,623	72.2	22.4	10.9%	9.0%	14	27	44.8	99.5	38%
Bearded Seal	176.0	213	37,467	40.0	12.4	6.0%	16.9%	14	27	12.6	67.3	68%
Total Ring. & Spot. Seal	42.0	417	17,519	18.7	5.8	2.8%	12.2%	4	8	10.9	26.5	42%
Ringed Seal	42.0	414	17,396	18.6	5.8	2.8%	12.2%	4	8	10.7	26.4	42%
Spotted Seal	42.0	3	123	0.1	*	**	0.2%	0	0	0.1	0.2	38%
Polar Bear	496.0	11	5,600	6.0	1.9	0.9%	1.3%	1	3	3.0	8.9	49%

(1) Estimated sampling errors do not include errors in reporting, recording, and in conversion to usable weight.

(2) See Table A-4 for sources of conversion factors.

(3) Bowhead harvest does not contribute to the sampling error for marine mammals since the bowhead harvest is based on a complete count.

(4) The percent of Barrow households harvesting bowhead represents the percent of Barrow households receiving crew member shares at the whale harvest site, as extrapolated from the sample households.

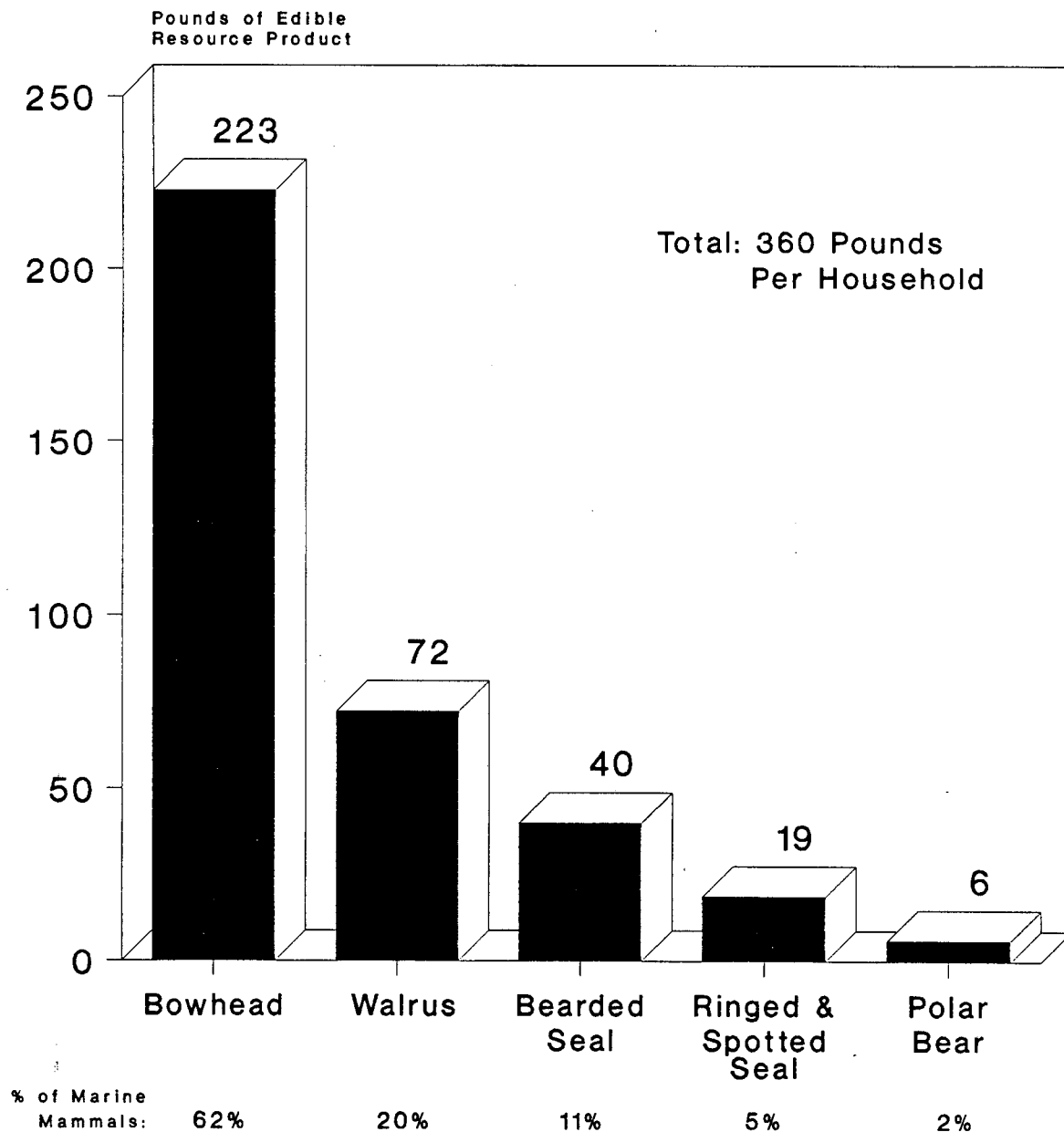
* represents less than .1 pound

** represents less than .1 percent

n/a means not applicable

Source: Stephen R. Braund & Associates, 1989

Figure 11: Harvest of Marine Mammals
 All Barrow Households, Years One & Two
 (Mean Edible Pounds Per Household)



Source: Stephen R. Braund & Assoc., 1989

TABLE 18: AVERAGE MARINE MAMMAL HARVEST BY SPECIES AND MONTH - BARROW, YEARS ONE & TWO
(Pounds of Edible Resource Product)

TOTALS

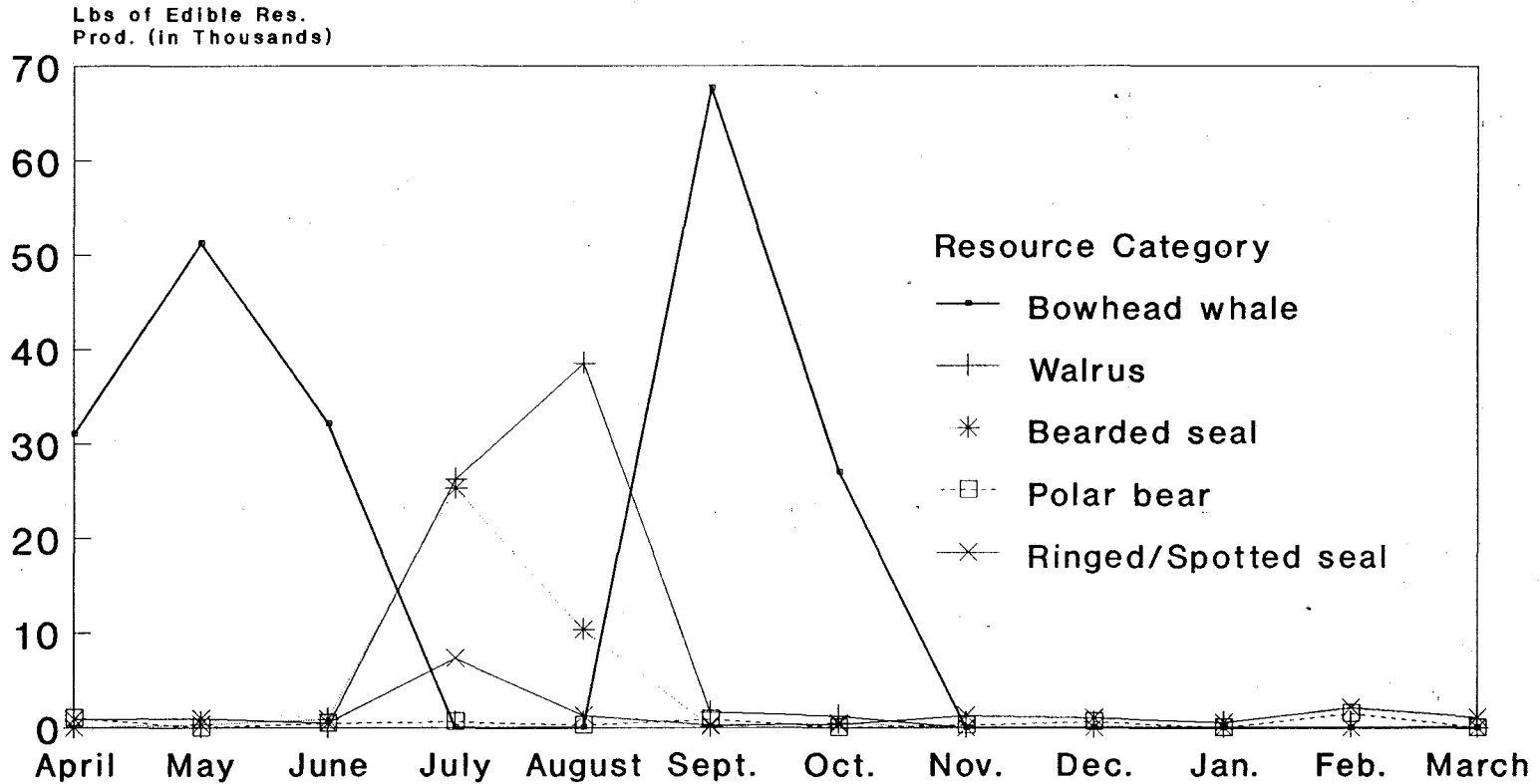
SPECIES	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Bowhead Whale	31,002	51,238	32,107	0	0	67,680	26,989	0	0	0	0	0
Walrus	0	0	0	26,256	38,556	1,582	1,230	0	0	0	0	0
Bearded Seal	0	350	897	25,244	10,334	155	468	21	0	0	0	0
Polar Bear	1,034	0	436	610	290	871	0	290	581	0	1,488	0
Total Ring. & Spot. Seal	869	943	477	7,301	1,252	292	330	1,275	1,016	560	2,120	1,086
Ringed Seal	869	943	477	7,252	1,178	292	330	1,275	1,016	560	2,120	1,086
Spotted Seal	0	0	0	49	74	0	0	0	0	0	0	0
All Marine Mammals	32,905	52,531	33,916	59,411	50,433	70,579	29,016	1,586	1,597	560	3,608	1,086

PERCENTS

SPECIES	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Bowhead Whale	15%	25%	15%	0%	0%	32%	13%	0%	0%	0%	0%	0% = 100%
Walrus	0%	0%	0%	39%	57%	2%	2%	0%	0%	0%	0%	0% = 100%
Bearded Seal	0%	1%	2%	67%	28%	0%	1%	0%	0%	0%	0%	0% = 100%
Polar Bear	18%	0%	8%	11%	5%	16%	0%	5%	10%	0%	27%	0% = 100%
Total Ring. & Spot. Seal	5%	5%	3%	42%	7%	2%	2%	7%	6%	3%	12%	6% = 100%
Ringed Seal	5%	5%	3%	42%	7%	2%	2%	7%	6%	3%	12%	6% = 100%
Spotted Seal	0%	0%	0%	40%	60%	0%	0%	0%	0%	0%	0%	0% = 100%
All Marine Mammals	10%	16%	10%	18%	15%	21%	9%	0%	0%	0%	1%	0% = 100%

Source: Stephen R. Braund & Associates, 1989

Figure 12: Monthly Harvest of Marine Mammals, All Barrow Households Years One and Two



Source: Stephen R. Braund & Assoc., 1989

TABLE 19: AVERAGE MARINE MAMMAL HARVEST BY SPECIES AND MONTH - BARROW, YEARS ONE & TWO
(Number Harvested)

SPECIES	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Bowhead Whale	3	4	1	0	0	0	3	0	0	0	0	0
Walrus	0	0	0	34	50	2	2	0	0	0	0	0
Bearded Seal	0	2	5	143	59	1	3	0	0	0	0	0
Polar Bear	2	0	1	1	1	2	0	1	1	0	3	0
Total Ring. & Spot. Seal	21	22	11	174	30	7	8	30	24	13	50	26
Ringed Seal	21	22	11	173	28	7	8	30	24	13	50	26
Spotted Seal	0	0	0	1	2	0	0	0	0	0	0	0

Source: Stephen R. Braund & Associates, 1989

TERRESTRIAL MAMMALS

Terrestrial mammals contributed one-third (218,657 pounds) of the total edible pounds harvested by Barrow residents in Year One (Table 20). In terms of total pounds, slightly less (approximately 13 percent) was harvested in Year Two though the contribution of terrestrial mammals to the total community harvest remained at just under one-third (Table 21). The harvest of terrestrial mammals provided an average of 233 pounds per Barrow household in Year One and 203 pounds in Year Two, with over 99 percent of the harvest consisting of caribou and moose. Approximately 25 percent of all Barrow households participated in harvesting a terrestrial mammal, down from 29 percent the previous year.

The considerable contribution of caribou to the total harvest is evident in Figures 13 and 14. Caribou was the most important terrestrial mammal harvested by Barrow residents and was the only terrestrial mammal harvested by many families. Caribou harvest amounts were very similar during the first two years of the study (see Tables 20 and 21 and Figures 13 and 14). Caribou composed 28 percent of the total community harvest of all species in Year Two, while it was just over 29 percent of the total harvest in Year One. Over 85 percent of the terrestrial mammal harvest was caribou in each year.

Community participation in caribou harvest activities was also very similar, with approximately 24 percent of all Barrow households participated in harvesting an estimated 1,403 caribou in Year Two and 26 percent of all households harvested 1,643 caribou the year before. In Year Two that amount was equal to approximately 175 pounds of caribou per household and 54 pounds for every resident in the community. The community harvested approximately 240 more caribou in Year One, or approximately 30 more pounds per household. Averaged over the entire community for both years, approximately 1.6 caribou were harvested per household. Finally, also represented in Tables 20 and 21, the sampling error for caribou data was 32 percent in Year Two, similar to that in Year One (29 percent).

Moose was the next most important terrestrial resource harvested, though providing only four percent of the total community harvest and approximately 12 percent of the total weight of all the terrestrial mammals harvested in each

TABLE 20: HARVEST ESTIMATES FOR TERRESTRIAL MAMMALS - ALL BARROW HOUSEHOLDS, YEAR ONE REVISED (1)

RESOURCE	CONVERSION	AVERAGE POUNDS				SAMPLING STATISTICS						
	FACTOR (2)	COMMUNITY TOTALS		HARVESTED		PERCENT		SAMPLING STATISTICS				
	(Edible Weight Per Resource in lbs)	NUMBER HARVESTED	EDIBLE POUNDS HARVESTED	PER HOUSEHOLD	PER CAPITA	PERCENT OF TOTAL EDIBLE POUNDS HARVESTED	PERCENT OF ALL BARROW HSEHOLDS HRVSTING RESOURCE	STANDARD DEVIATION (lbs)	SAMPLING ERROR AT 95% (lbs)	LOW ESTIMATE (Mean lbs/ Household)	HIGH ESTIMATE (Mean lbs/ Household)	SAMPLING ERROR AS % OF MEAN
Total Terrestrial Mammals	n/a	n/a	218,657	233	72.5	33.4%	29.4%	32	62	171.17	295.54	27%
Caribou	117.0	1,643	192,229	205.2	63.7	29.4%	25.5%	31	60	145.28	265.03	29%
Moose	500.0	50	25,198	26.9	8.4	3.8%	5.6%	12	24	2.49	51.29	91%
Dall Sheep	99.0	11	1,052	1.1	0.3	0.2%	1.1%	1	2	0.00	3.22	187%
Brown Bear	100.0	1	117	0.1	*	**	0.1%	0	0	0.03	0.22	75%
Other Terrestrial Mammals		29	61	0.1	*	**	0.7%	0	0	0.00	0.16	149%
Porcupine	10.0	5	52	0.1	*	**	0.6%	0	0	0.00	0.15	176%
Ground Squirrel	0.4	23	10	0.01	*	**	0.1%	0	0	0.00	0.02	75%
Wolverine	n/a	4	n/a	n/a	n/a	n/a	0.4%	n/a	n/a	n/a	n/a	n/a
Arctic Fox (Blue)	n/a	177	n/a	n/a	n/a	n/a	2.4%	n/a	n/a	n/a	n/a	n/a
Red Fox (Cross, Silver)	n/a	8	n/a	n/a	n/a	n/a	0.1%	n/a	n/a	n/a	n/a	n/a

(1) Estimated sampling errors do not include errors in reporting, recording, and in conversion to usable weight.

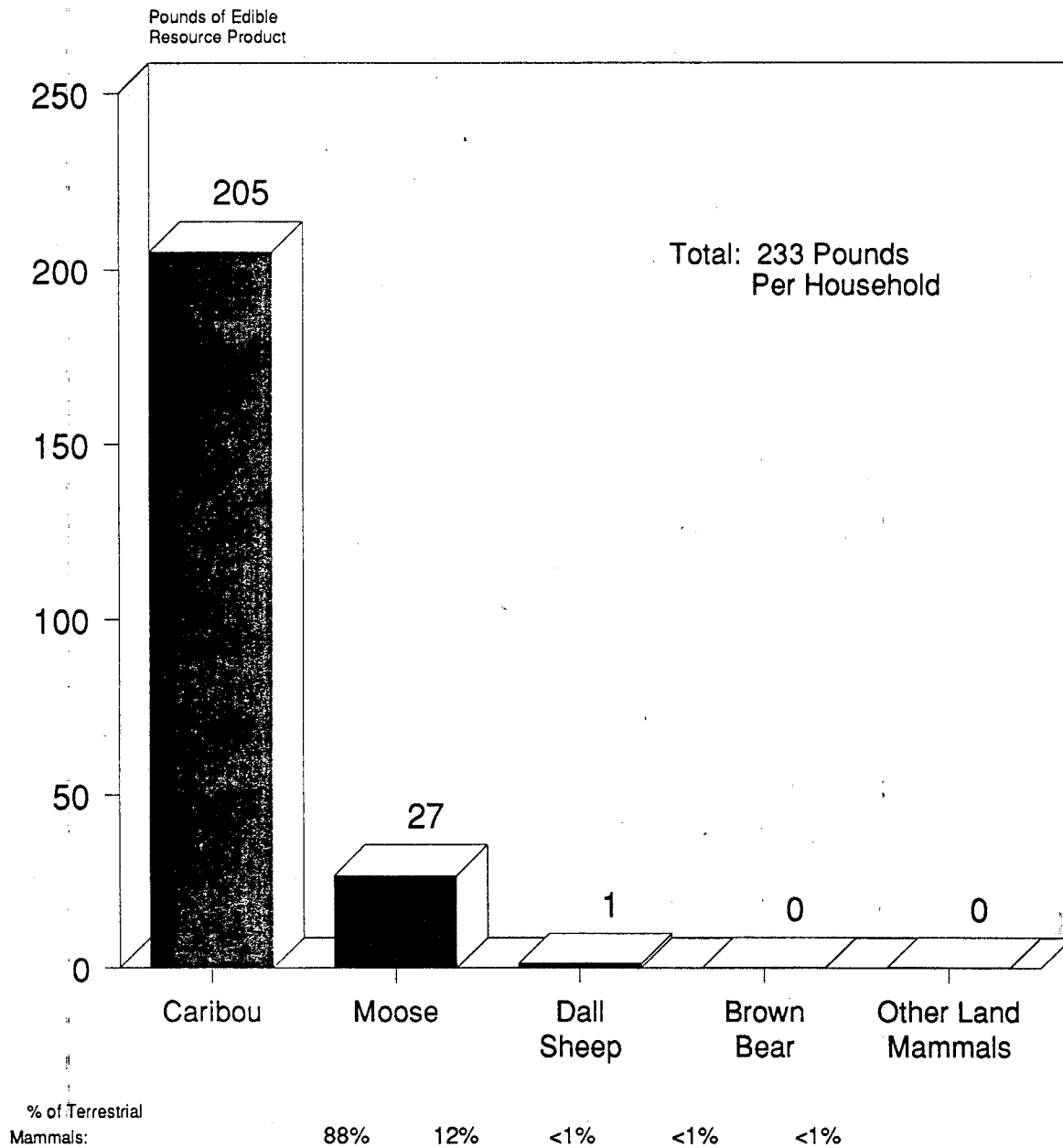
(2) See Table A-4 for sources of conversion factors.

* represents less than .1 pound

** represents less than .1 percent

n/a means not applicable

Figure 13: Harvest of Terrestrial Mammals
 All Barrow Households, Year One Revised
 (Mean Edible Pounds Per Household)



Source: Stephen R. Braund & Assoc., 1989

TABLE 21: HARVEST ESTIMATES FOR TERRESTRIAL MAMMALS - ALL BARROW HOUSEHOLDS, YEAR TWO (1)

RESOURCE	CONVERSION	AVERAGE POUNDS				PERCENT OF TOTAL EDIBLE POUNDS HARVESTED	PERCENT OF ALL BARROW HSEHOLDS HRVSTING RESOURCE	SAMPLING STATISTICS				
	FACTOR (2)	COMMUNITY TOTALS		HARVESTED				STANDARD DEVIATION (lbs)	SAMPLING ERROR AT 95% (lbs)	LOW ESTIMATE (Mean lbs/ Household)	HIGH ESTIMATE (Mean lbs/ Household)	SAMPLING ERROR AS % OF MEAN
	(Edible Weight Per Resource in lbs)	NUMBER HARVESTED	EDIBLE POUNDS HARVESTED	PER HOUSEHOLD	PER CAPITA							
Total Terrestrial Mammals	n/a	n/a	190,459	203.3	63.1	32.3%	25.2%	33	65	138.26	268.27	32%
Caribou	117.0	1,403	164,162	175.2	54.4	27.8%	24.4%	29	57	118.48	231.92	32%
Moose	500.0	50	25,128	26.8	8.3	4.3%	4.0%	19	36	0.00	63.12	135%
Brown Bear	100.0	1	117	0.1	*	**	0.1%	0	0	0.03	0.22	75%
Dall Sheep	99.0	11	1,052	1.1	0.3	0.2%	1.1%	1	2	0.00	3.22	186%
Wolverine	n/a	2	n/a	n/a	n/a	n/a	0.2%	n/a	n/a	n/a	n/a	n/a
Arctic Fox (Blue)	n/a	131	n/a	n/a	n/a	n/a	0.4%	n/a	n/a	n/a	n/a	n/a
Red Fox (Cross, Silver)	n/a	4	n/a	n/a	n/a	n/a	0.1%	n/a	n/a	n/a	n/a	n/a

(1) Estimated sampling errors do not include errors in reporting, recording, and in conversion to usable weight.

(2) See Table A-4 for sources of conversion factors.

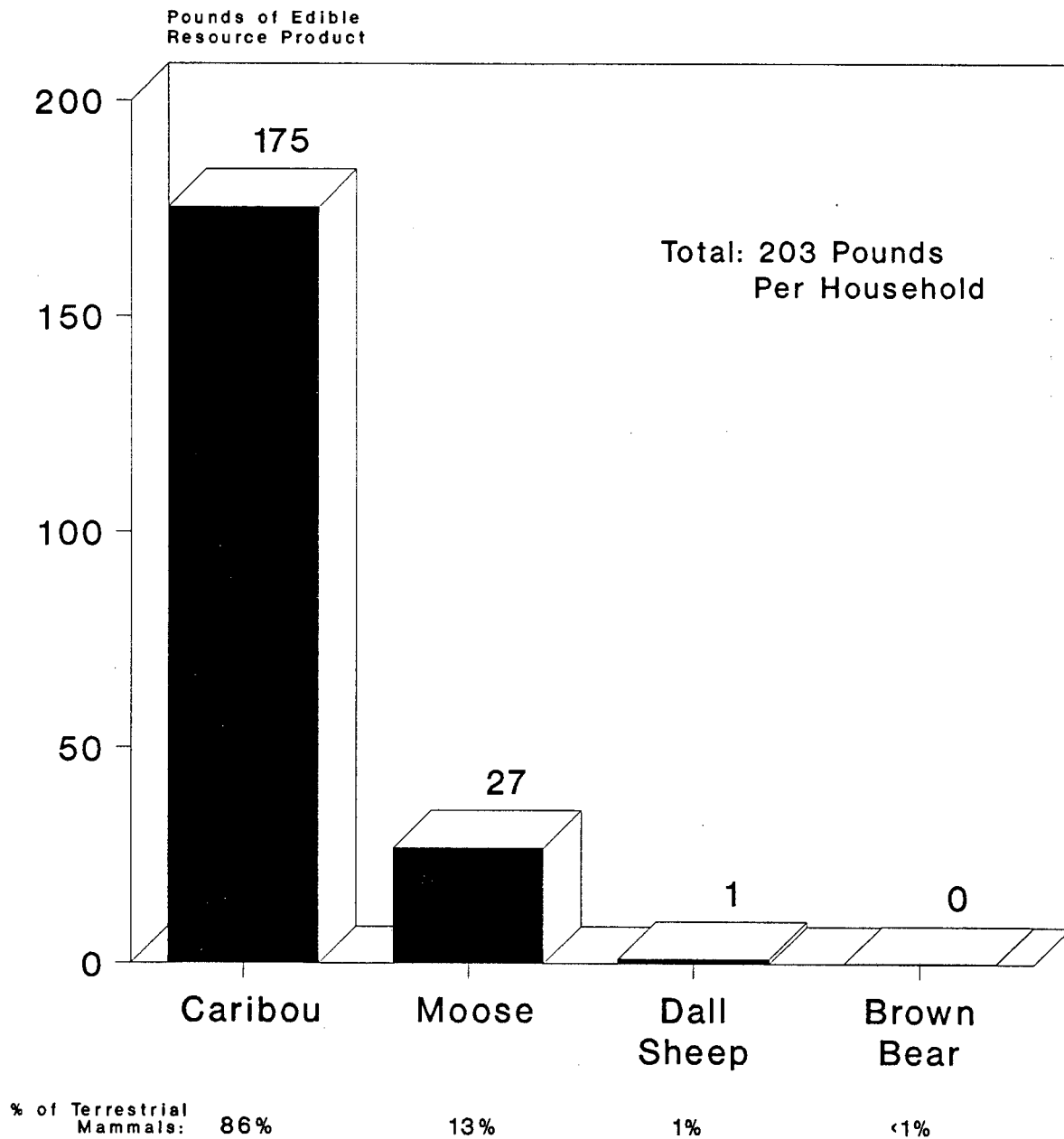
* represents less than .1 pound

** represents less than .1 percent

n/a means not applicable

Source: Stephen R. Braund & Associates, 1989

Figure 14: Terrestrial Mammal Harvest
 All Barrow Households, Year Two
 (Mean Edible Pounds Per Household)



Source: Stephen R. Braund & Assoc., 1989

year. The estimated number of moose harvested was identical in each year; however, the estimated harvest of 50 animals per year by Barrow residents is considered by the study team to be a high estimate rather than an average. The high sampling error for moose means that chance may play a large role in the observed moose harvest; another sample of households could have yielded a much different result. The best available estimate, however, is that moose harvests provided an average of 27 pounds of meat per household in each year.

Other edible species harvested in both years were brown bear and Dall sheep. The contribution of these species together was less than one percent of the harvest of terrestrial mammals during Year One. With the exception of caribou, the other terrestrial mammal species are harvested in such low numbers and by so few households that the estimate of the total amount harvested is statistically less reliable (evident in the increased sampling error as a percentage of the mean in Table 20 and 21).

Furbearers do not contribute to the edible harvest of the community. The number of animals harvested are presented in the tables. Total harvests were less for each furbearer in Year Two, with one-half as many wolverine and red fox (cross and silver fox) harvested in the second year. Arctic fox harvests were down by approximately one-quarter. Though there was apparently no scarcity of Arctic fox, one of the Year One trappers in the study decided not to trap in Year Two. Employment and personal commitments were the major influences on his decision. In general there appeared to be less trapping by community members in Year Two. There was a scarcity of wolverine and wolf in the areas used by Barrow hunters during both years of the study. Though the study households have not reported taking a wolf in either year, there was a report of at least one wolf taken in Year Two by a Barrow hunter.

As illustrated in Tables 22 through 25 and Figures 15 and 16, caribou were harvested during every month in Year Two. The peak harvest months were August and October, just as in Year One. Together those months accounted for 58 percent of the harvest, or about 810 animals in Year Two.

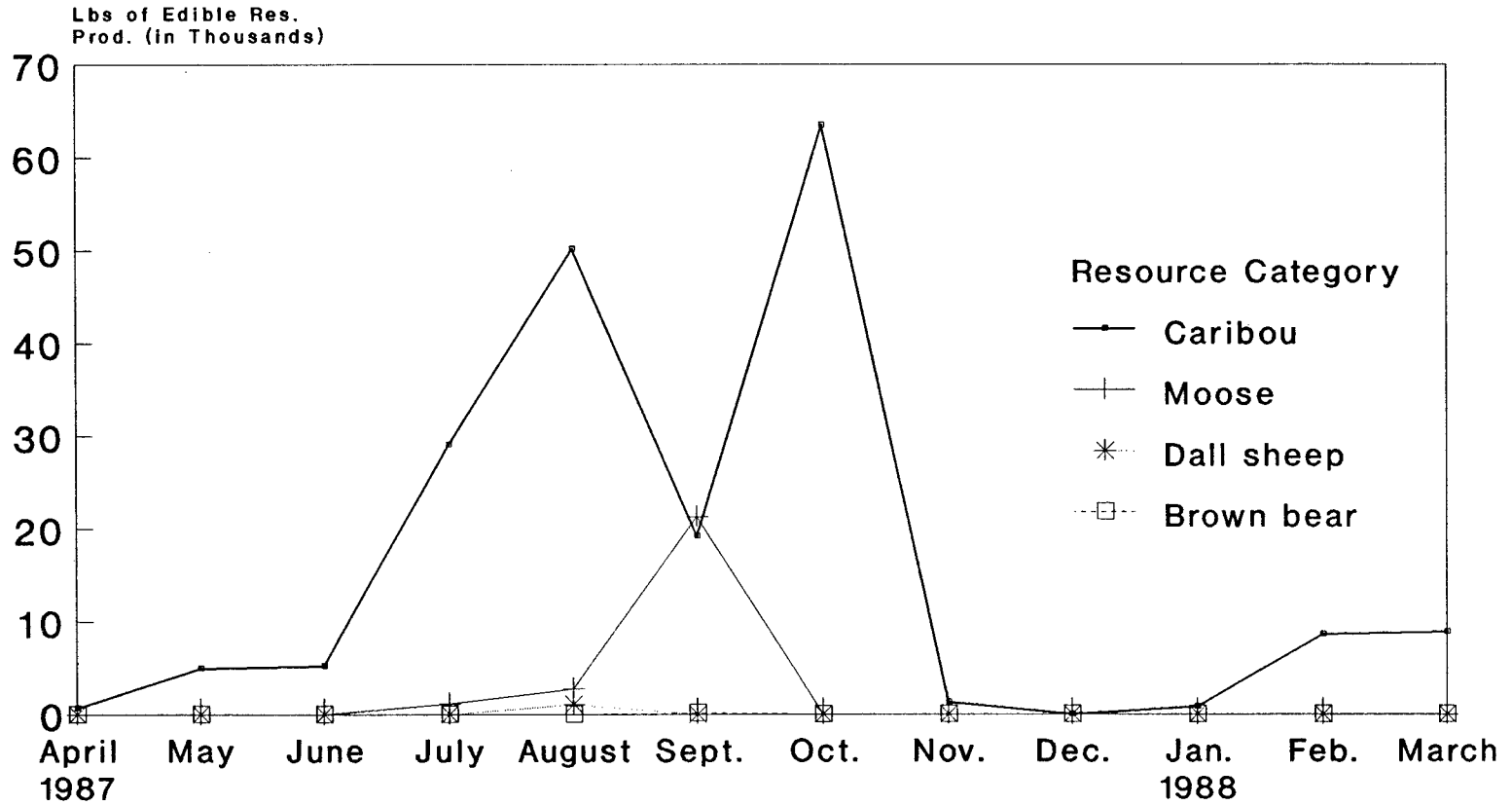
TABLE 22: TERRESTRIAL MAMMAL HARVEST BY SPECIES AND MONTH - BARROW, YEAR ONE REVISED
(Pounds of Edible Resource Product)

SPECIES	TOTALS											
	1987						1988					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Caribou	685	4,915	5,180	29,083	50,182	19,219	63,449	1,250	0	822	8,566	8,880
Moose	0	0	0	1,171	2,753	21,275	0	0	0	0	0	0
Brown Bear	0	0	0	0	0	117	0	0	0	0	0	0
Dall Sheep	0	0	0	0	1,052	0	0	0	0	0	0	0
All Terrestrial Mammals (excluding furbearers)	685	4,915	5,180	30,254	53,986	40,611	63,449	1,250	0	822	8,566	8,880

SPECIES	PERCENTS											
	1987						1988					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Caribou	0%	3%	3%	15%	26%	10%	33%	1%	0%	0%	4%	5% = 100%
Moose	0%	0%	0%	5%	11%	84%	0%	0%	0%	0%	0%	0% = 100%
Brown Bear	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0% = 100%
Dall Sheep	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0% = 100%
All Terrestrial Mammals (excluding furbearers)	0%	2%	2%	14%	25%	19%	29%	1%	0%	0%	4%	4% = 100%

Source: Stephen R. Braund & Associates, 1989

Figure 15: Monthly Harvest of Terrestrial Mammals
All Barrow Households, Year One Revised



Source: Stephen R. Braund & Assoc., 1989

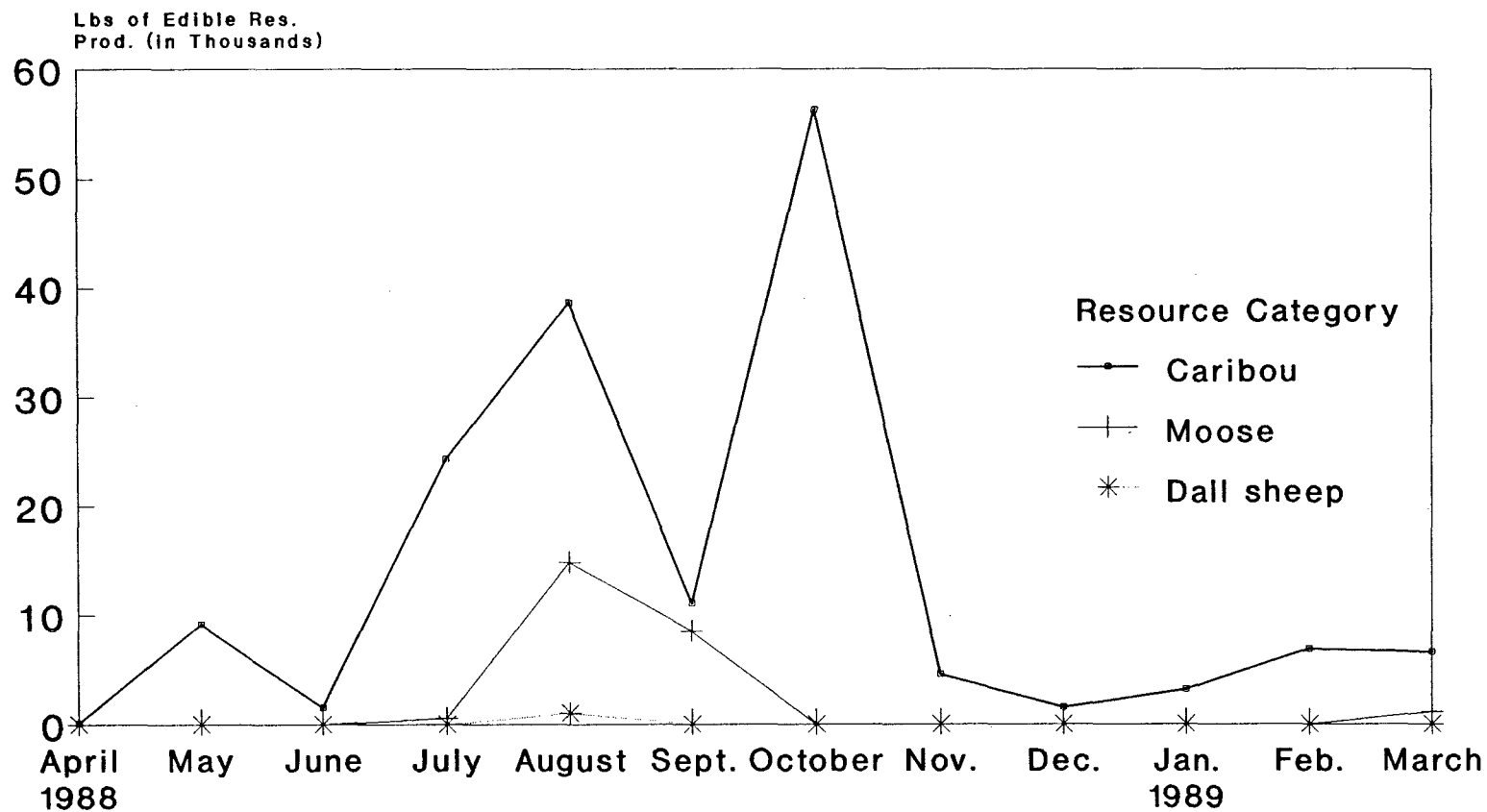
TABLE 23: TERRESTRIAL MAMMAL HARVEST BY SPECIES AND MONTH - BARROW, YEAR TWO
(Pounds of Edible Resource Product)

SPECIES	TOTALS *****											
	1988						1989					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Caribou	137	9,166	1,562	24,298	38,620	11,092	56,249	4,562	1,541	3,185	6,906	6,616
Moose	0	0	0	585	14,833	8,538	0	0	0	0	0	1,171
Brown Bear	0	0	0	0	0	117	0	0	0	0	0	0
Dall Sheep	0	0	0	0	1,052	0	0	0	0	0	0	0
All Terrestrial Mammals (excluding furbearers)	137	9,166	1,562	24,883	54,505	19,747	56,249	4,562	1,541	3,185	6,906	7,787

SPECIES	PERCENTS *****											
	1988						1989					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Caribou	0%	6%	1%	15%	24%	7%	34%	3%	1%	2%	4%	4% = 100%
Moose	0%	0%	0%	2%	59%	34%	0%	0%	0%	0%	0%	5% = 100%
Brown Bear	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0% = 100%
Dall Sheep	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0% = 100%
All Terrestrial Mammals (excluding furbearers)	0%	5%	1%	13%	29%	10%	30%	2%	1%	2%	4%	4% = 100%

Source: Stephen R. Braund & Associates, 1989

Figure 16: Monthly Harvest of
Terrestrial Mammals
All Barrow Households, Year Two



Note: 117 lbs. of brown bear were harvested in September but do not appear on this chart due to scale.

Source: Stephen R. Braund & Assoc., 1989

TABLE 24: TERRESTRIAL MAMMAL HARVEST BY SPECIES AND MONTH - BARROW, YEAR ONE REVISED
(Number Harvested)

SPECIES	TOTALS *****											
	1987					1988						
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Caribou	6	42	44	249	429	164	542	11	7	73	76	
Moose				2	6	43						
Brown Bear						1						
Dall Sheep					11							
Arctic Fox (Blue)						1		85	37	34	19	
Red Fox (Cross, Silver)											8	
Wolverine							1				2	

Source: Stephen R. Braund & Associates, 1989

TABLE 25: TERRESTRIAL MAMMAL HARVEST BY SPECIES AND MONTH - BARROW, YEAR TWO
(Number Harvested)

SPECIES	TOTALS *****											
	1988						1989					
	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan.	Feb.	March
Caribou	1.17	80.3	13.35	207.68	330.09	94.8	480.76	38.99	13.17	27.22	59.03	56.55
Moose	0	0	0	1.17	29.67	17.08	0	0	0	0	0	2.34
Brown Bear	0	0	0	0	0	1.17	0	0	0	0	0	0
Dall Sheep	0	0	0	0	10.63	0	0	0	0	0	0	0
Arctic Fox (Blue)	1.17	0	0	0	0	0	0	15.22	40.99	40.99	25.76	7.03
Red Fox (Cross, Silver)	0	0	0	0	0	0	0	0	0	0	0	3.51
Wolverine	0	0	0	0	0	0	0	0	0	0	0	2.34

In Year Two, caribou harvests were less during the peak harvest months, but were greater during some of the other months in Year Two, specifically in November through January and in May. The increase during the winter months may have been influenced by a number of factors. Some families harvested less caribou in October than they had planned on, primarily because there were reportedly low numbers of caribou in the vicinity of many of the fall fishing camps. The gray whale rescue also kept many hunters occupied during the second half of October. Also significant in Year Two were the relatively large numbers of caribou over-wintering in the vicinity of Barrow.

In both years, caribou harvests increased noticeably in February and March as compared with the three preceding winter months. February and March were the months to put fresh meat on the table, obtain caribou for consumption at whaling camp, and provide for families who had depleted their subsistence foods supply. As represented by the data, relatively little caribou hunting occurred in April, most energy during that month being devoted to preparations for whaling.

September was the principal moose harvesting month in Year One with 84 percent of the harvest. August appears to be the primary month in Year Two; however, the majority of those moose were harvested on hunting trips that began in late August, with the actual harvest taking place in early September. Moose that wandered near summer fish camps earlier in the season were also sometimes harvested. Residents have reported seeing moose closer to Barrow in recent years. The brown bear harvest took place in September and the Dall sheep were harvested in August, 100 percent of those species being harvested in the respective months in both years. Porcupine and ground squirrel harvests were recorded only in Year One, in October and July respectively.

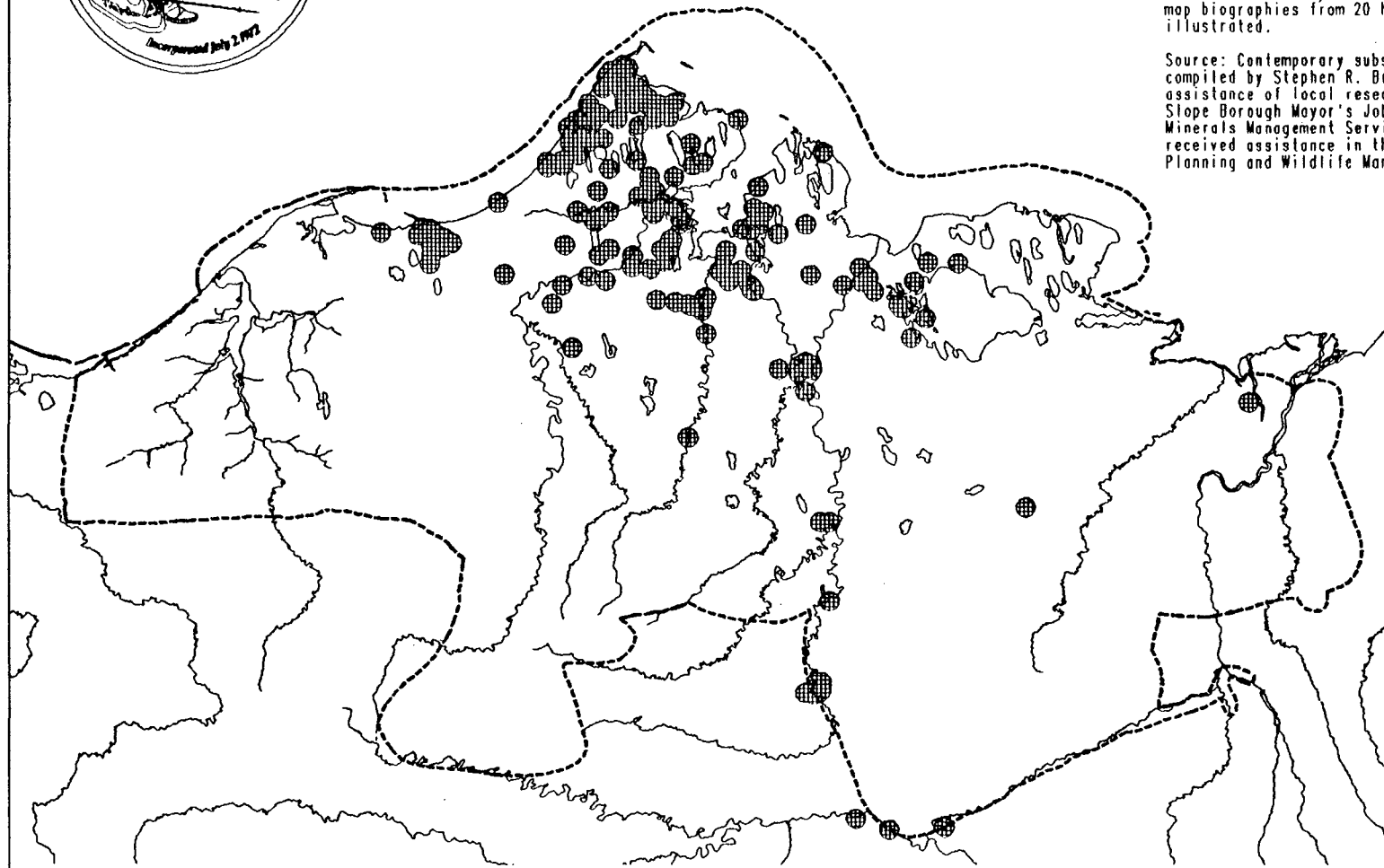
Terrestrial mammal harvest sites in Year Two were spread throughout the central portion of the lifetime community harvest area (Map 15). The majority of sites were within 80 miles of Barrow. The compilation of Year One and Year Two sites illustrates a similar pattern (Map 16). The general area from Peard Bay to Teshekpuk Lake and south to the central portion of the Ikpikpuk River encompasses the majority of terrestrial mammal harvest locations recorded for this study.

MAP 15 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO TERRESTRIAL MAMMAL HARVEST SITES - ALL SPECIES



This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1988 through March 31, 1989: Year Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study. Lifetime-community harvest areas, collected in the form of map biographies from 20 households (Pedersen 1979), are also illustrated.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION



Lifetime community land use (Pedersen 1979).



Terrestrial Mammals

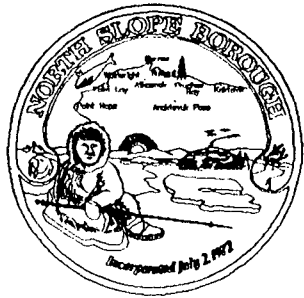
- Caribou
- Moose
- Brown bear
- Fox
- Wolverine

Map Production: North Slope Borough GIS

Date: June 26, 1989

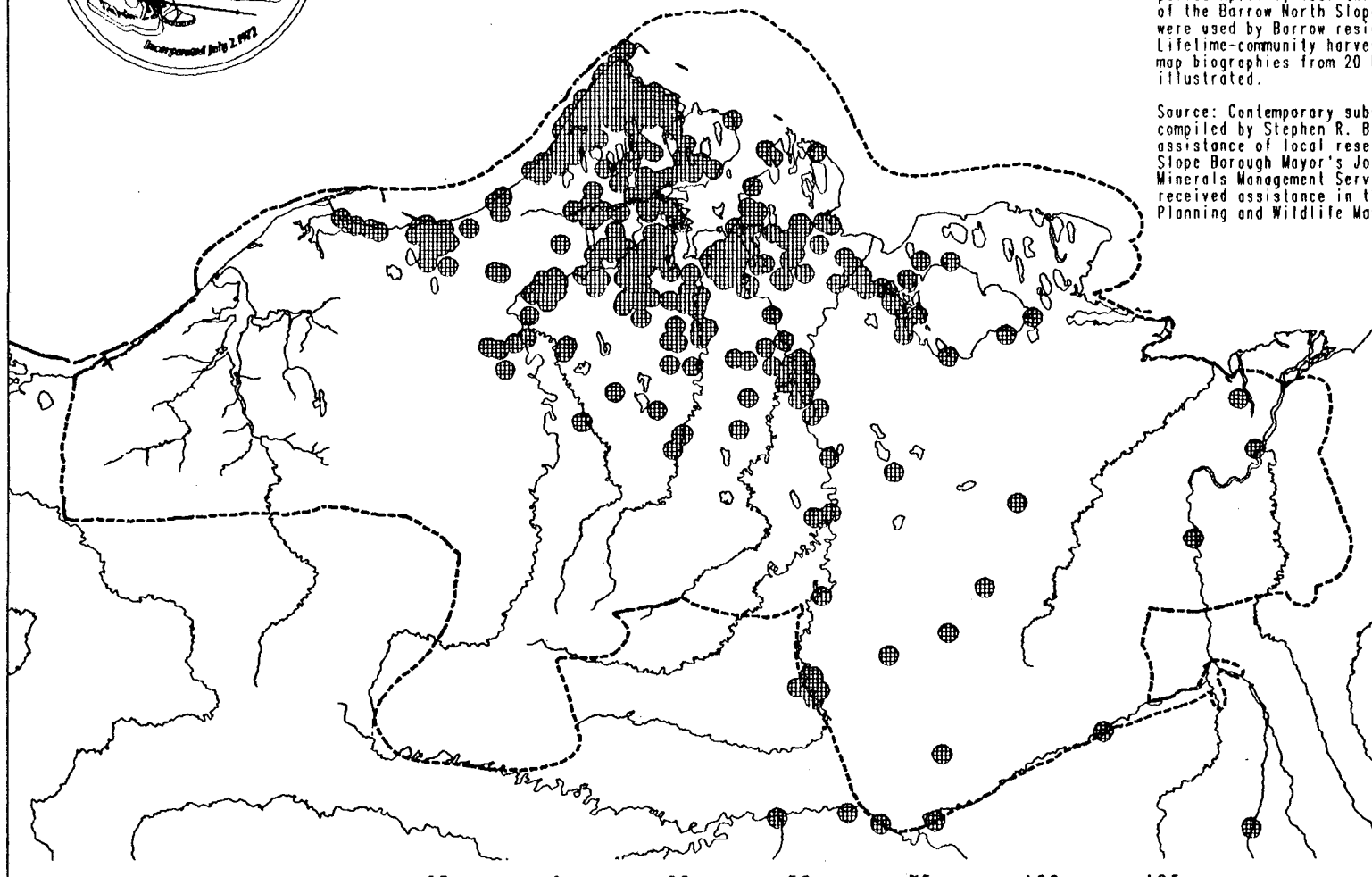


MAP 16
 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO
 TERRESTRIAL MAMMAL HARVEST SITES - ALL SPECIES:
 YEARS ONE AND TWO





This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1987 through March 31, 1989: Years One and Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study. Lifetime-community harvest areas, collected in the form of map biographies from 20 households (Pedersen 1979), are also illustrated.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

-  Lifetime community land use (Pedersen 1979).
-  Terrestrial Mammals
 - Caribou
 - Moose
 - Brown bear
 - Fox
 - Wolverine
 - Porcupine
 - Ground squirrel



Map Production: North Slope Borough GIS

Date: June 26, 1989



The most distant terrestrial harvest locations were moose, fox and wolverine (Maps 17 and 18). Moose harvests were the most distant from Barrow, with the exception of harvest of sheep near Kaktovik by Barrow residents (not illustrated). The moose harvest events on the Colville river documented for this study were all taken during fly-in hunting trips. Hunters chartered out of Barrow in late August or early September and either established a camp near a landing site or floated downstream in search of moose. The additional moose harvest sites along the Colville River indicate that moose harvest locations were more dispersed along the Colville during Year One. Moose harvests did occur closer to Barrow, on the Ikpikpuk River in Year Two and on the Meade River in Year One.

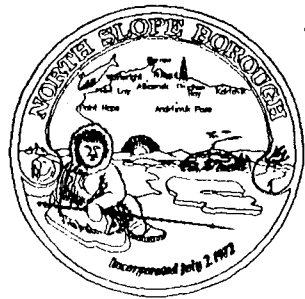
Fox, wolverine and brown bear were harvested in the upper portion of the Ikpikpuk drainage, all during snowmachine trips from Barrow. One of the most distant hunting areas accessed overland by Barrow residents is represented by those harvest sites located in the upper Ikpikpuk drainage. Use of that area is limited to the November through April time period, although boat trips that far upstream have taken place in the recent past during high water periods.

Fox harvests were not prevalent during the first two years of the study. Fox harvest locations were both among the closest and the most distant harvest locations from the village, occurring along traplines maintained from Barrow or taken incidental to wolverine and wolf hunting far inland. Cross and silver varieties of the red fox were more likely taken at the inland locations, while the arctic fox was predominant near Barrow.

Caribou harvest sites by season for Year Two (Map 19) and for the first two years of the study (Map 20) reveal a few major characteristics of caribou hunting by Barrow residents. The overall pattern has been that caribou harvests varied by location not only according to the animals' presence or absence, but also in relation to what other harvest activities were taking place. The seasonal differences in harvest locations also reflect to a major extent the mode of transportation during that time of year.

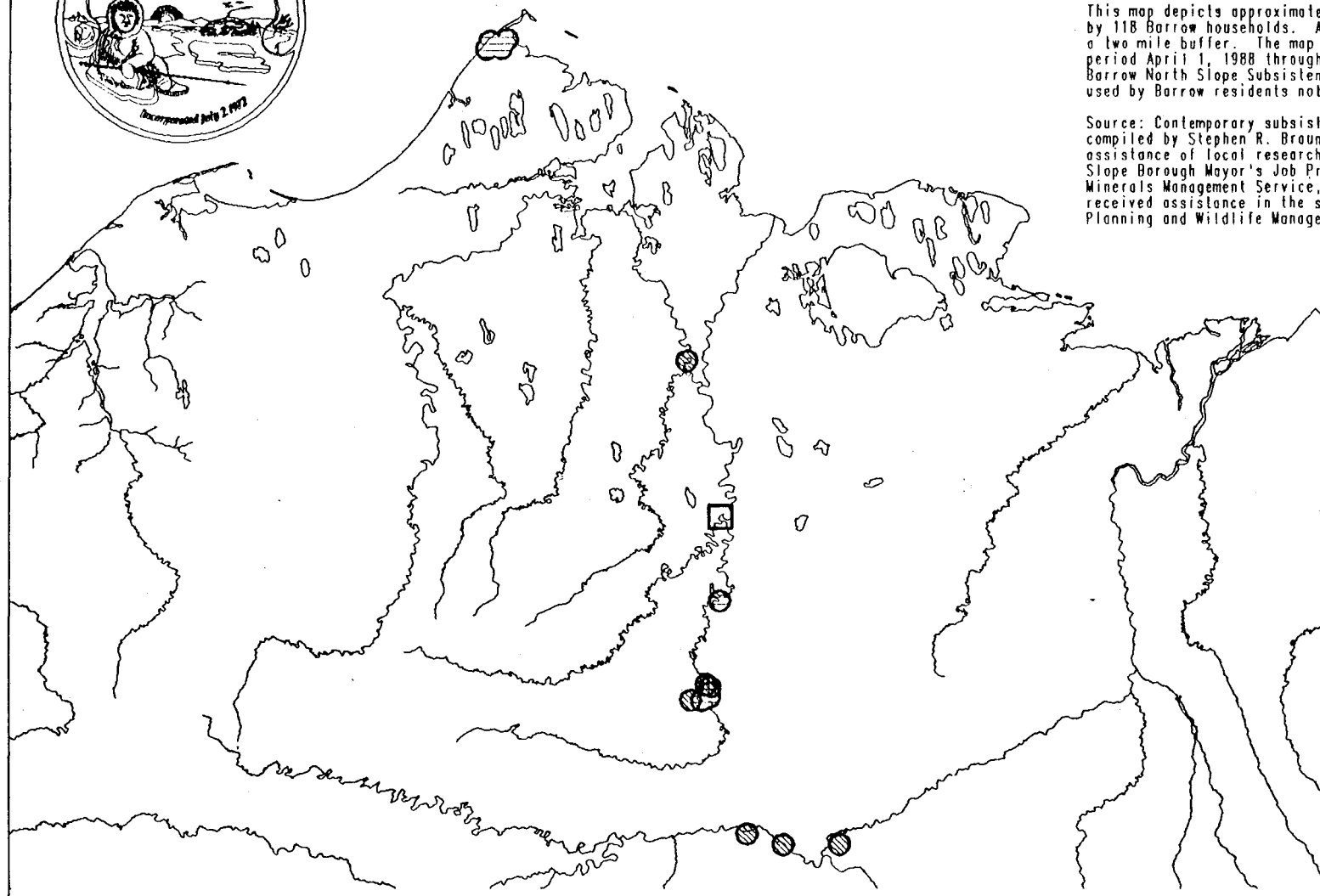
MAP 17

NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO TERRESTRIAL MAMMAL HARVEST SITES BY SPECIES (EXCLUDING CARIBOU)







This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1988 through March 31, 1989; Year Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

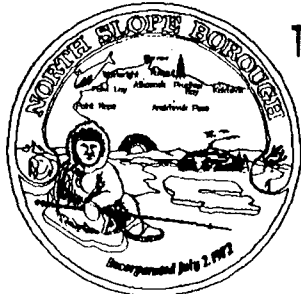
-  Moose
-  Fox
- Arctic
- Red
-  Wolverine
-  Brown Bear



Map Production: North Slope Borough GIS
Date: June 26, 1989

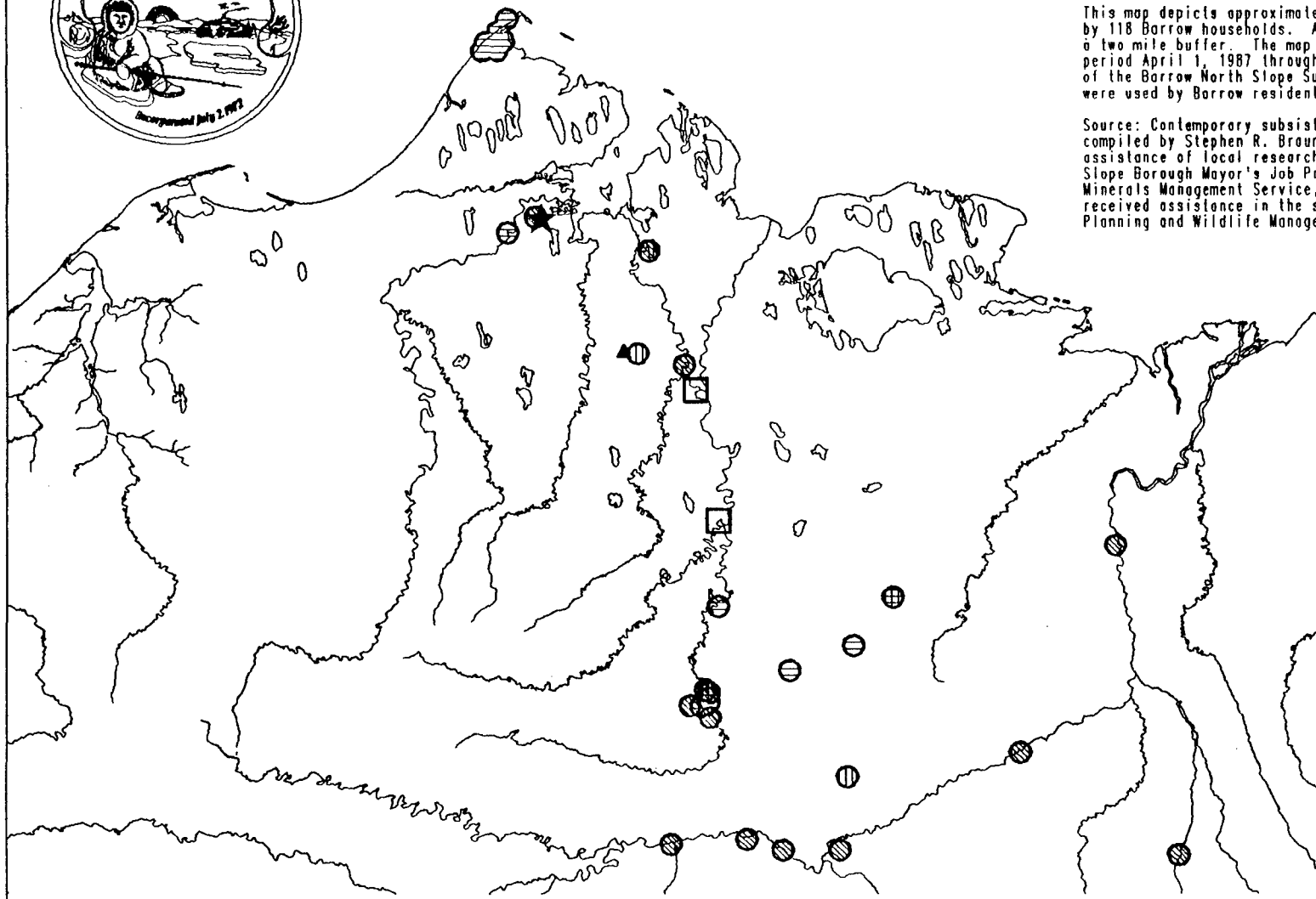


MAP 18
 NORTH SLOPE SUBSISTENCE STUDY - BARROW: YEAR TWO
 TERRESTRIAL MAMMAL HARVEST SITES BY SPECIES (EXCLUDING CARIBOU):
 YEARS ONE AND TWO









This map depicts approximate subsistence harvest sites used by 118 Barrow households. All harvest sites are depicted with a two mile buffer. The map depicts subsistence use for the time period April 1, 1987 through March 31, 1989: Years One and Two of the Barrow North Slope Subsistence Study. Additional areas were used by Barrow residents not included in the study.

Source: Contemporary subsistence use information gathered and compiled by Stephen R. Braund and Associates (SRB&A) with the assistance of local research assistants hired through the North Slope Borough Mayor's Job Program. SRB&A is under contract to the Minerals Management Service, U.S. Department of Interior, and received assistance in the study from the North Slope Borough Planning and Wildlife Management Departments, Barrow, Alaska.



LEGEND INFORMATION

-  Moose
-  Fox - Arctic - Red
-  Wolverine.
-  Brown bear
-  Porcupine
-  Ground squirrel

Map Production: North Slope Borough GIS

Date: June 26, 1989

