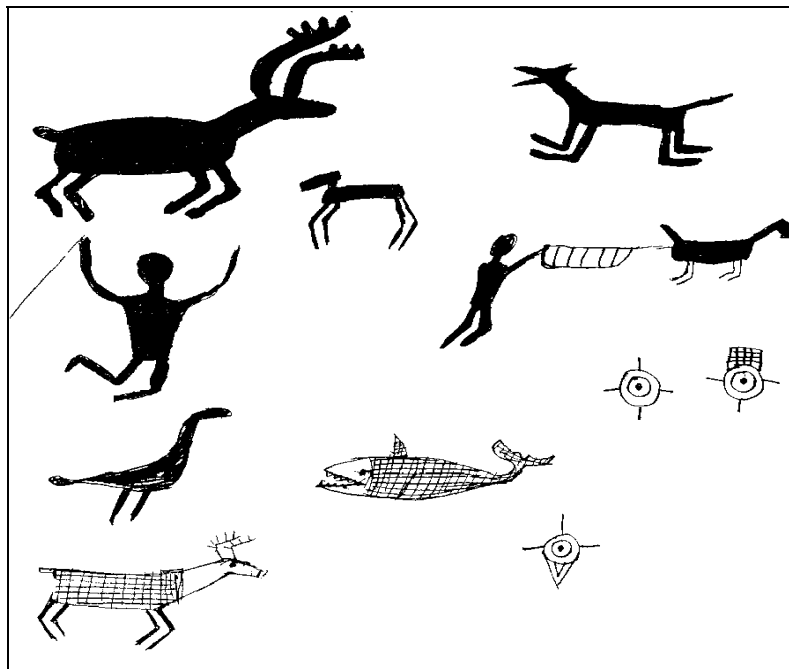


Evaluation of Subsistence Harvest Data from the North Slope Borough 1993 Census for Eight North Slope Villages: for the Calendar Year 1992



September 1997
[Reprinted March 1999]

Alan S. Fuller, Data Analyst ¹ John C. George, Wildlife Biologist ²

¹ 3003 Fayette Road, Kensington, Maryland, 20895

² North Slope Borough, Department of Wildlife Management, Box 69, Barrow, AK 99723

Copies available from the Department of Wildlife Management
Box 69, Barrow, Alaska 99723

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES.....	3
ACKNOWLEDGMENTS.....	7
ABSTRACT.....	8
INTRODUCTION.....	9
Objectives	10
METHODS	11
Data Collection-Household Surveys	11
Harvest Activity	11
Species Harvested.....	11
Data Analysis.....	12
Edible Weight Conversions for Species	15
Estimating Weight and Number of Bowhead Whales Harvested.....	16
Correcting for Non-Response	16
Explanation of Survey Total, Corrected Survey Total, and Estimated Total	18
Description of Harvest Periods	19
RESULTS AND DISCUSSION	21
Overview for All Villages	21
Species Identification Problems.....	22
ANAKTUVUK PASS	25
Marine Resources.....	25
Terrestrial Resources.....	25
Fish Resources.....	26
Participation in Subsistence Activities	26
Timing of Activities.....	26
Tables and Figures for Anaktuvuk Pass	28
ATQASUK	42
Harvest Activities.....	42
Tables and Figures for Atqasuk	42
BARROW	44
Marine Resources.....	44
<i>Bowhead whales</i>	44
<i>Walrus</i>	45
<i>Seals</i>	45
Terrestrial Resources.....	46
<i>Caribou</i>	46
<i>Moose and Dall Sheep</i>	46
Fish Resources.....	47
Bird/Waterfowl Resources	47
Participation in Subsistence Activities	48
Timing of Activities.....	48
Tables and Figures for Barrow.....	51
KAKTOVIK	65
Marine Resources.....	65
Terrestrial Resources.....	65
Fish Resources.....	66
Bird/Waterfowl Resources	66
Participation in Subsistence Activities	66
Timing of Activities.....	67

Tables and Figures for Kaktovik	68
NUIQSUT	82
Marine Resources.....	82
Terrestrial Resources.....	82
Fish Resources	83
Bird Resources	83
Participation in Subsistence Activities	84
Timing of Activities.....	84
Tables and Figures for Nuiqsut	85
POINT HOPE	99
Marine Resources.....	99
Terrestrial Resources.....	100
Fish Resources.....	100
Participation in Subsistence Activities	100
Timing of Activities.....	101
Tables and Figures for Point Hope.....	102
POINT LAY	116
Marine Resources.....	116
Participation in Subsistence Activities	116
Tables and Figures for Point Lay	117
WAINWRIGHT	119
Marine Resources.....	119
Terrestrial Resources.....	120
Bird Resources	120
Fish Resources.....	120
Participation in Subsistence Activities	121
Timing of Activities.....	121
Tables and Figures for Wainwright	122
SUGGESTIONS FOR FUTURE HARVEST DOCUMENTATION PROGRAMS	136
REFERENCES.....	137
APPENDIX 1. SURVEY FORM USED ON THE NSB SUBSISTENCE HARVEST STUDY.....	140
APPENDIX 2. WEIGHT CONVERSION TABLE.....	149
APPENDIX 3. LIST OF BOWHEAD WHALES LANDED BY NORTH SLOPE VILLAGES IN 1992.....	152

List of Tables and Figures

General

- Table G. Map of the North Slope Borough indicating locations of villages, and major rivers.
- Table G1. Numbers of households by village that responded to question 5-C (re: proportion of subsistence foods in diet) but did not respond to the Species Harvested section.
- Table G2. Description of codes in data tables and those used in the analysis of harvest data.
- Table G3. Response rates by village to the Species Harvested section of the 1993 North Slope Borough Economic Census.
- Table G4. Harvest per capita and household, number of households, and population estimates for North Slope communities for calendar year 1992.
- Table G5. Total harvest (in pounds) of birds, fish, invertebrates, marine mammals, plants, and terrestrial mammals for North Slope Villages.
- Table G6. Number of individual species harvested by village as determined by the 1992 census.
- Table G7. Listing of commonly misidentified species on the North Slope (included in the NSB Subsistence Harvest study).

Anaktuvuk Pass

- Table A1. Breakdown of total harvest by subsistence harvest category for Anaktuvuk Pass, Alaska, 1992.
- Figure A2. Percent harvest by category of subsistence resources for Anaktuvuk Pass, 1992 (edible pounds harvested).
- Table A3. Top five species harvested at Anaktuvuk Pass, Alaska during calendar year 1992.
- Table A4. Estimated pounds of caribou harvested by village and percentage weight (caribou) of the total village harvest for all resources.
- Table A5. Participation in subsistence harvest activities, Anaktuvuk Pass, Alaska, 1992.
- Figure A6. Percent of households participating in subsistence harvest activities at Anaktuvuk Pass, Alaska, 1992.
- Figure A7. Estimated edible pounds of species harvested at Anaktuvuk Pass, Alaska during the calendar year 1992. (summary)
- Table A8. Estimated edible pounds of species harvested at Anaktuvuk Pass, Alaska during the calendar year 1992. (detailed)
- Figure A9. Estimated numbers of species harvested at Anaktuvuk Pass, Alaska during the calendar year 1992. (summary)
- Table A10. Estimated numbers of species harvested at Anaktuvuk Pass, Alaska during the calendar year 1992. (detailed)
- Table A11. Breakdown of subsistence harvest activity by the month it occurred for each species, village of Anaktuvuk Pass, Alaska, calendar year 1992.

Atqasuk

- Table AT1. Participation in subsistence harvest activities, Atqasuk, Alaska, 1992.
- Figure AT2. Percent of households participating in subsistence harvest activities at Atqasuk, Alaska, 1992.

Barrow

- Table B1. Breakdown of total harvest by subsistence harvest category for Barrow, Alaska, 1992.
Figure B2. Percent harvest by category of subsistence resources for Barrow, 1992 (edible pounds harvested).
Table B3. Top five species harvested at Barrow, Alaska during calendar year 1992.
Table B4. Participation in subsistence harvest activities, Barrow, Alaska, 1992.
Figure B5. Percent of households participating in subsistence harvest activities at Barrow, Alaska, 1992.
Figure B6. Estimated edible pounds of species harvested at Barrow, Alaska during the calendar year 1992. (summary)
Table B7. Estimated edible pounds of species harvested at Barrow, Alaska during the calendar year 1992. (detailed)
Figure B8. Estimated numbers of species harvested at Barrow, Alaska during the calendar year 1992. (summary)
Table B9. Estimated numbers of species harvested at Barrow, Alaska during the calendar year 1992. (detailed)
Table B10. Breakdown of subsistence harvest activity by the month it occurred for each species, village of Barrow, Alaska, calendar year 1992.

Kaktovik

- Table K1. Breakdown of total harvest by subsistence harvest category for Kaktovik, Alaska, 1992.
Figure K2. Percent harvest by category of subsistence resources for Kaktovik, 1992 (edible pounds harvested).
Table K3. Top five species harvested at Kaktovik, Alaska during calendar year 1992.
Table K4. Participation in subsistence harvest activities, Kaktovik, Alaska, 1992.
Figure K5. Percent of households participating in subsistence harvest activities at Kaktovik, Alaska, 1992.
Figure K6. Estimated edible pounds of species harvested at Kaktovik, Alaska during the calendar year 1992. (summary)
Table K7. Estimated edible pounds of species harvested at Kaktovik, Alaska during the calendar year 1992. (detailed)
Figure K8. Estimated numbers of species harvested at Kaktovik, Alaska during the calendar year 1992. (summary)
Table K9. Estimated numbers of species harvested at Kaktovik, Alaska during the calendar year 1992. (detailed)
Table K10. Breakdown of subsistence harvest activity by the month it occurred for each species, village of Kaktovik, Alaska, calendar year 1992.

Nuiqsut

- Table N1. Breakdown of total harvest by subsistence harvest category for Nuiqsut, Alaska, 1992.
Figure N2. Percent harvest by category of subsistence resources for Nuiqsut, 1992 (edible pounds harvested).
Table N3. Top five species harvested at Nuiqsut, Alaska during calendar year 1992.
Table N4. Participation in subsistence harvest activities, Nuiqsut, Alaska, 1992.
Figure N5. Percent of households participating in subsistence harvest activities at Nuiqsut, Alaska, 1992.

- Figure N6. Estimated edible pounds of species harvested at Nuiqsut, Alaska during the calendar year 1992. (summary)
- Table N7. Estimated edible pounds of species harvested at Nuiqsut, Alaska during the calendar year 1992. (detailed)
- Figure N8. Estimated numbers of species harvested at Nuiqsut, Alaska during the calendar year 1992. (summary)
- Table N9. Estimated numbers of species harvested at Nuiqsut, Alaska during the calendar year 1992. (detailed)
- Table N10. Breakdown of subsistence harvest activity by the month it occurred for each species, village of Nuiqsut, Alaska, calendar year 1992.

Point Hope

- Table PH1. Breakdown of total harvest by subsistence harvest category for Point Hope, Alaska, 1992.
- Figure PH2. Percent harvest by category of subsistence resources for Point Hope, 1992 (edible pounds harvested).
- Table PH3. Top five species harvested at Point Hope, Alaska during calendar year 1992.
- Table PH4. Participation in subsistence harvest activities, Point Hope, Alaska, 1992.
- Figure PH5. Percent of households participating in subsistence harvest activities at Point Hope, Alaska, 1992.
- Figure PH6. Estimated edible pounds of species harvested at Point Hope, Alaska during the calendar year 1992. (summary)
- Table PH7. Estimated edible pounds of species harvested at Point Hope, Alaska during the calendar year 1992. (detailed)
- Figure PH8. Estimated numbers of species harvested at Point Hope, Alaska during the calendar year 1992. (summary)
- Table PH9. Estimated numbers of species harvested at Point Hope, Alaska during the calendar year 1992. (detailed)
- Table PH10. Breakdown of subsistence harvest activity by the month it occurred for each species, village of Point Hope, Alaska, calendar year 1992.

Point Lay

- Table PL1. Participation in subsistence harvest activities, Point Lay, Alaska, 1992.
- Figure PL2. Percent of households participating in subsistence harvest activities at Point Lay, Alaska, 1992.

Wainwright

- Table W1. Breakdown of total harvest by subsistence harvest category for Wainwright, Alaska, 1992.
- Figure W2. Percent harvest by category of subsistence resources for Wainwright, 1992 (edible pounds harvested).
- Table W3. Top five species harvested at Wainwright, Alaska during calendar year 1992.
- Table W4. Participation in subsistence harvest activities, Wainwright, Alaska, 1992.
- Figure W5. Percent of households participating in subsistence harvest activities at Wainwright, Alaska, 1992.
- Figure W6. Estimated edible pounds of species harvested at Wainwright, Alaska during the calendar year 1992. (summary)

- Table W7. Estimated edible pounds of species harvested at Wainwright, Alaska during the calendar year 1992. (detailed)
- Figure W8. Estimated numbers of species harvested at Wainwright, Alaska during the calendar year 1992. (summary)
- Table W9. Estimated numbers of species harvested at Wainwright, Alaska during the calendar year 1992. (detailed)
- Table W10. Breakdown of subsistence harvest activity by the month it occurred for each species, village of Wainwright, Alaska, calendar year 1992.

Appendix 2

Table APX2-1. Conversion factors used to calculate Edible Pounds as a common unit for each species.

Appendix 3

Table APX3-1. Basic harvest data and estimated weights for bowhead whales landed at Barrow, Kaktovik, Point Hope and Wainwright in 1992.

ACKNOWLEDGMENTS

First and foremost we would like to thank the people who responded to this lengthy and tedious survey. The information they shared has provided valuable information which will ultimately help both the people and the wildlife of the North Slope. Robert Harcharek is commended for implementing the 1993 Census and for the original study design. We thank Sverre Pedersen for consultation on the interpretation of the data. Dr. Judy Zeh gave us needed statistical advice. Harry Brower, Jr., Robert Suydam and Taqulik Opie provided many useful personal communications which greatly clarified and improved the text. Liza Delarosa, Connie and Rhonda Boynton all were very helpful with the tedious tasks of making the final edits and formatting changes. We thank Dr. Tom Albert, Sr. and Warren Matumeak for approving the funding and providing the time to conduct this analysis.

ABSTRACT

In 1993, the North Slope Borough (NSB) conducted a census to gather population and demographic data as well as subsistence harvest information in the villages of Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Lay, Point Hope, and Wainwright (Harcharek, 1995). This paper presents the results of the subsistence harvest portion of the survey, including estimates of participation in harvest activities and the total amount harvested of a wide variety of species for each village. Although the response rate was too low in Point Lay (8.2%) and Atqasuk (6.7%) to make harvest estimates, an average of 81% of the households in the remaining small villages and 71% of the households in Barrow responded to the subsistence portion of the survey. Response rate to the survey was highest for Anaktuvuk Pass and Point Hope (87%). Estimates were made using a stratified sampling approach where households were divided into three harvest categories (low/none, moderate and high) based on the reported level of participation in harvest activities or the percent of foods eaten that came from their own harvest activities. Estimates from stratified designs have some inherent problems for species taken in small numbers and these should be viewed with caution (e.g., moose, Dall sheep, Steller's and Spectacled eider). In most cases suspect estimates have been flagged. For all villages, the average harvest of all resources was 389 pounds per capita. The per capita harvest for each village was as follows: Anaktuvuk Pass--315, Atqasuk--NA, Barrow--349, Kaktovik--787, Nuiqsut--359, Point Hope--487, Point Lay--NA, and Wainwright--436. The number of species harvested ranged from 34 in Anaktuvuk Pass to 62 at Barrow. Species identification problems were noted for several species of fish and birds and an attempt was made to correct the associated estimates. Anaktuvuk Pass showed the highest reliance on terrestrial resources (87.5%) with caribou forming the bulk of the harvest. Caribou were taken by every village in substantial numbers. Marine mammals dominated the harvest for coastal villages. For Barrow, Kaktovik, Nuiqsut, and Point Hope, bowhead whale formed an important part of the diet. Bowhead whale products are normally a very important part of the diet in Wainwright as well, but due to very unusual ice conditions, none were taken in 1992. Fish were an important food item in every village surveyed. Nuiqsut showed the highest per capita fish harvest of all of the villages likely due to its proximity to the Colville River. Waterfowl were taken in each village, and while not contributing a great amount of food in terms of mass, waterfowl hunting did have a relatively high participation rate. Participation in subsistence activities varied by village but indicated a great deal of involvement in subsistence harvest activities.

INTRODUCTION

This report summarizes subsistence harvest information gathered as part of the 1993 North Slope Borough Census of Population and Economy. In 1993, the North Slope Borough (NSB) committed significant resources to gathering population and demographic data as well as subsistence harvest information (Harcharek, 1995). These harvest data, however, were not included in the final NSB 1993/94 Economic Profile and Census Report. With continuing industrial development and population growth on the North Slope, there is a pressing need for accurate subsistence harvest information by policy makers, fish and wildlife managers, resource and economic planners, and the public. In rural Alaska, communities are isolated and many residents rely heavily on subsistence activities to obtain their food. However, little quantitative harvest information is available.

The primary purpose of the census was to accurately count the human population and gather demographic information on each of the villages in the NSB (Figure G; inside cover). The demographic portion included sections to determine the racial make-up, education levels, and income of the population. A second purpose of the census was to gather subsistence harvest information. The subsistence portion of the census had three sections: a) requested general information on subsistence activities, b) asked about more specific activities, and c) requested detailed information on the actual harvest of a wide variety of species (see Appendix 1). The subsistence sections comprised about one-third of the census questionnaire.

The data were gathered from April to September 1993. Inupiat-speaking census takers were used to contact all households where the residents could not speak English. The data collected **represents the calendar year 1992**. Most of the results of the census, including the results of the general questions about subsistence activities, have been published by the North Slope Borough (Harcharek, 1995). This paper presents the results of the remaining two subsistence sections, the section about specific activities (5-I) and the section containing detailed harvest information about a wide variety of species (5-J to 5-O). These two sections are referred to as the “Harvest Activity” section and the “Species Harvested” section, respectively.

Various explorers, researchers and residents have described subsistence harvests and hunting patterns in the Alaskan Arctic villages (in the North Slope Borough) for over a century (Stefansson, 1913; Brower, 1942; Bockstoce, 1988; Pedersen, 1993, Braund, 1993a,b; Brower and Opie, 1996; Brower and Opie, 1997). Detailed comprehensive surveys have been conducted at Barrow and Wainwright (Braund, 1993a,b) and at Kaktovik, Anaktuvuk Pass and Nuiqsut

(Pedersen, 1990; and ADF&G, 1995). However, harvest studies had not been conducted for the villages of Atkasuk, Point Hope, and Point Lay when this census was conducted in 1992. It is not the intent of this report to rigorously summarize and compare the data reported here with prior studies. This study should be viewed as another source of baseline information in the continuum of existing literature on subsistence harvests in the North Slope communities--that is, the report is not intended to be a synthesis of the information on North Slope subsistence harvest patterns. The data in this report provide comparative (baseline) information on participation in subsistence activities not available from other studies. However, quantifying subsistence activities has some 'dangers' associated with it. These estimates do not convey the cultural aspect of hunting activities and harvest levels change markedly over time. Thus, these estimates should only be used as guidelines for harvest assessment and policy decisions.

Objectives

The objectives of the census and this analysis were the following:

1. To document the variety of mammals, fish, plants and birds harvested by the residents of the North Slope Borough villages.
2. To estimate the annual harvest (in numbers and pounds) by village for the 76 species included in the census survey for the calendar year 1992.
3. To quantify the involvement of North Slope Borough residents in various subsistence activity categories for the calendar year 1992. These activities include: fall whale hunting, spring whale hunting, assisting whale hunting crews, seal hunting, walrus hunting, waterfowl hunting and egg gathering, moose hunting, bear and sheep hunting, fishing, trapping, berry picking, caribou hunting, skin sewing and parka making, and sled and boat construction.
4. To describe the harvest periods for each of the 76 species included in the study for each village.

METHODS

Data Collection-Household Surveys

The census data were gathered by specifically trained employees of the North Slope Borough Planning Department. Census takers in each village formally interviewed as many households as possible using the census questionnaire as the survey instrument. The census taker completed the questionnaire by entering the responses given by the members of the household. For most villages, the census taker resided in the village.

Participation in the census was voluntary. An average of 88.1% of the households in the villages and 79.7% of the households in Barrow responded to at least part of the survey. However, the completion rate of the *Harvest Activity* and *Species Harvested* sections varied highly from village to village. This causes some problems with the interpretation of the data, which will be discussed in more detail below.

Harvest Activity

In the *Harvest Activity* section (5-I), respondents were asked to indicate if they or a member of their household participated in the given activity “Often, Sometimes, On vacation, or Not at all.” Only one of the four choices was accepted. A formal definition defining the differences between the choices was not usually given, although it was generally accepted that: a) Sometimes meant “occasionally” and b) On vacation meant “on a recreational outing or only on leave of absence from work.” The activities include fall whaling, spring whaling, helping the whaling crew (cooking, butchering, etc.), hunting seal, hunting walrus, hunting waterfowl and gathering eggs, hunting moose, bear and sheep, fishing, trapping, picking berries, hunting caribou, sewing skins and making parkas, and making sleds and boats.

The *Harvest Activity* data are reported as a simple tally of the responses for each village (see Tables A5, AT1, B4, K4, N4, PH4, PL1, and W4). The percentage of the total number of responses in each category is also presented.

Species Harvested

In the *Species Harvested* section (5-J through 5-O), for each of the 76 species in the survey, respondents were asked six questions:

1. Did the household use the species?
2. Did the household try to harvest the particular species?
3. How many of the species were harvested?
4. During what months were the species harvested?

5. Was the harvest shared with other households?
6. Was any received from other households?

Questions 1, 2, 5, and 6 were “Yes/No” questions. Question 3 (the amount harvested) asked for an estimate of the total amount harvested for each species for the year 1992. Question 4, the month harvested, referred to the actual calendar months in which the species was harvested. Multiple months were accepted as well as seasons.

Most census takers began by asking the respondent if they utilized the species in any way. If the respondent answered no, it was so marked in the first column and the remaining columns were left blank for that species. If the respondent answered yes, the census taker asked if they harvested the species themselves or if it was given to them. If the species was simply received from others this was recorded (columns 1 and 6 were marked yes). If the respondent harvested the species themselves, they were asked for the number taken and months harvested and whether they gave any away or received any from others. In some cases, the questions in the general subsistence section made it clear that the respondent did not participate in any subsistence activities in any way. In these cases, the entire *Species Harvested* section was left blank. These households were recorded separately.

Data Analysis

This section gives a very detailed explanation of how the harvest estimates were derived. The reader need not read this section unless they wish to examine these details. However, the authors highly recommend a close reading of the section on “Correcting for Non-Response” to understand the *weaknesses* of the survey.

The data were entered into database form and were analyzed using Microsoft Access and Microsoft Excel on personal computers. Two databases were made, one for the *Harvest Activity* section and one for the *Species Harvested* section. The *Harvest Activity* database has 13 records for each household corresponding to the activities listed in section 5-I of the census questionnaire. The computer fields corresponding directly to the questionnaire form are: Household Number, Activity, Often, Sometimes, Vacation, and Not At All. An additional Frequency field was added which summarized the responses in the Often, Sometimes, Vacation, and Not At All fields. An A was assigned in the Frequency field for Often responses, a B for Sometimes and Vacation responses, and a C for Not At All responses.

The *Species Harvested* database has 76 records for each household corresponding to the 76 species listed in sections 5-J through 5-O of the census questionnaire. The fields

corresponding directly to the questionnaire form are: Household Number, Species, Did Use, Try Harv, Amount Harv, Month Harv, Gave Away, and Recd. Three additional fields were created in the *Species Harvested* database: Hunter, Frequency, and Pounds.

In the Hunter field, each record was assigned as either a hunter or non-hunter based on the response to the questions in the *Species Harvested* section of the survey. Each household would therefore be designated as a hunter for some species but not others, according to their responses. When a household was determined to be a non-hunter for a given species, the amount of that species harvested by the household was assumed to be 0. In the Frequency field, an A, B, or C entry was made according to the household's response to the related activity in the *Harvest Activity* section of the questionnaire and summarized in the *Harvest Activity* database. For example, if a household reported in the *Harvest Activity* section that they fish often, an A was placed in the Frequency field for that household for all of the species of fish in the *Species Harvested* section. The Frequency field was used to stratify the subsistence data into three distinct groups: Often, Sometimes, and Not At All.

Stratified sampling introduces certain biases in estimates for individual species taken in low numbers. For instance, if a household in a low-harvest stratum made a significant harvest, then the *Estimated Total Village Harvest* can be biased upwards. This appears to have occurred with the moose estimates for Barrow and Nuiqsut, where the estimate is considerably higher than the harvest estimates using other methods.

In the Pounds field, the reported amount harvested for each species was converted to pounds as a standard unit of measurement. The conversion table used may be found in Appendix 2, and was based primarily on Braund (1993a,b) and Scott (1992). In some cases, enough information was provided to determine that a household was a hunter for a given species, but no valid amount harvested was given. For those records, an invalid response code of 999 was entered in the Pounds field.

In some cases, households completed questions from the first subsistence section of the census, which requested general information about subsistence activities, but left the *Harvest Activity* and *Species Harvested* sections blank. In these cases, information from the general subsistence section was used to assign a Frequency and place the household in the appropriate stratum group. Question 5-C of the general subsistence section was the question primarily used. Question 5-C is, "...how much of the meat, fish, and birds that you and your household consumed came from your own harvest or subsistence activities?" Those who responded *None* or *Very Little*, which were the majority of households that completed the general subsistence section but not the *Harvest Activity* or *Species Harvested* sections, were assigned as non-hunters and placed

in the “Not At All” stratum group. Those who responded as *Less than half* or *Half* were assigned as hunters (with an invalid amount harvested) and placed in the “Sometimes” group. Those who responded as *More than half*, *Nearly all*, and *All* were assigned as hunters (with an invalid amount harvested) and placed in the “Often” group. This was most prevalent in Barrow, which had 288 households assigned in this manner. Of the 288 households, 258 were assigned as non-hunters and placed in the “Not At All” stratum group, 14 were assigned to the “Sometimes” stratum group, and 16 were assigned to the “Often” stratum group. For the other villages, the number of households assigned in this manner was very small (please see Table G1).

Table G1. Numbers of households by village that answered question 5-C (re: proportion of subsistence foods in diet) but did not answer the *Species Harvested* section. These households were assigned to stratum groups based on their response to question 5-C. Those who responded *None* or *Very Little* were assigned to the Not At All group (n3), those who responded *Less Than Half* were assigned to the Sometimes group (m2), and those who responded *More Than Half*, *Nearly All* or *All* were assigned to the Often group (m1).

Village	None or Very Little	Less than Half or Half	More than Half or Nearly All	Total
Anaktuvuk Pass	0	0	0	0
Barrow	258	14	16	288
Kaktovik	3	0	3	6
Nuiqsut	5	0	1	6
Point Hope	4	2	1	7
Wainwright	5	2	1	8

The definitions in Table G2 help to clarify exactly how the harvest estimates are derived. As mentioned above, the data were stratified into three groups, Often, Sometimes, and Not At All (1, 2, and 3 respectively) using the responses to the *Harvest Activity* section. To begin the derivation of the harvest estimates, the number of valid responses (n1, n2, n3) and invalid responses (m1, m2, m3) in each stratum group were counted. The stratum mean, sum, and variance were calculated from the valid responses in a straightforward manner.

Table G2.

Description of the codes in data tables and those used in the analysis of harvest data.

Code	Description
Stratum Group 1	Often harvested
Stratum Group 2	Sometimes harvested
Stratum Group 3	No Harvest
n1, n2, n3	The number of valid responses in each stratum group, n1+n2+n3=N
m1, m2, m3	The number of invalid responses in each stratum, m1+m2+m3=M. Invalid responses were those where a hunter reported taking game but did not report the amount taken.
y1bar, y2bar, y3bar	Stratum averages. The mean of the valid responses in each stratum
s1, s2, s3	The sample variances of each stratum (valid responses)
N	The total number of valid responses
M	The total number of invalid responses
X	The number of households that completed some part of the survey, but left the subsistence sections entirely blank
Z	The households that did not participate in any part of the census
H	The total number of households in the village, H=N+M+X+Z
YBAR	Estimate of the population mean (the household average)

The population mean (YBAR or household average) was determined as follows:

$$YBAR = [y1bar(n1+m1) + y2bar(n2+m2) + y3bar(n3+m3)] / [N + M]$$

Please note that in determining the household average, the stratum mean was used for invalid responses.

The estimate of the total village harvest was computed directly from the household average by simply multiplying the household average times the total number of households in the village (YBAR*H).

Estimates for the variance of YBAR and YBAR*H were derived as follows:

$$Var(YBAR) = [1/(N+M)^2] * [(n1+m1)(m1)(s1/n1) + (n2+m2)(m2)(s2/n2) + (n3+m3)(m3)(s3/n3)]$$

$$Var(YBAR*H) = (H^2)(Var(YBAR))$$

Edible Weight Conversions for Species

The reported amount harvested for each species (except bowhead whales) was converted to edible pounds as a standard unit of measurement. The conversion was based primarily on Alaska Department of Fish and Game conversion tables, Braund (1993a,b) and Scott (1992). A table of the edible weights used for each species may be found in Appendix 3. For bowhead whales, data from the Alaska Eskimo Whaling Commission reports and George *et al.*, (1990) were used.

Estimating Weight and Number of Bowhead Whales Harvested

Bowhead whales are usually harvested by whaling crews with representatives from multiple households. It is normal for the meat from the harvest of a single whale to be shared by many households. Under these circumstances, the household by household census survey methodology is not an accurate or effective way of measuring the bowhead whale harvest. It is unclear how each household could appropriately respond to the amount harvested question in the *Species Harvested* section of the survey. Also, the actual number of whales harvested is closely monitored by the Alaska Eskimo Whaling Commission and the whale length and date harvested are recorded for each whale. For these reasons, the bowhead harvest estimates in this analysis are derived using the Alaska Eskimo Whaling Commission reports and George *et al.*, 1990.

It is estimated that about 40% of the whale's total "mass" is used as food (NSB unpublished data, 1995; Romans, 1984). Estimated weight was derived from a length/girth relationship (George *et al.*, 1990). Where girth measurements were not available, a simple length/weight regression was used. For large whales it was necessary to extrapolate the regression beyond the largest whale actually weighed (12.8 m, 42 ft). Thus, the estimates for large whales should be viewed cautiously.

Correcting for Non-Response

The response rate and data quality differed significantly by village. For most villages, the *Harvest Activity* section had good response and likely reflects a good estimate of the type of activities which take place by village. The *Species Harvested* section was, however, hindered in some villages by a high level of non-response. Some households were not surveyed because they were out of town during the summer months when the survey occurred. Others simply became impatient with the length (26 pages) of the census interview and left the subsistence sections (which were toward the end of the survey) blank or only partially completed. Still others were reluctant to give detailed harvest information because they thought the questions might lead to eventual regulation or they simply could not recall their harvest activities to that level of detail.

The best response rates were for Anaktuvuk Pass and Point Hope. For the villages of Atqasuk and Point Lay, the level of non-response in the *Species Harvested* section was too high to allow a meaningful estimate of the total village harvest for any of the species. Not counting Atqasuk and Point Lay, an average of 81% of households in the villages and 71% of the households in Barrow responded to the subsistence survey (Table G3). In the village of Kaktovik, the level of response was very low, but there were enough responses to make a reasonable estimate. The level of response in Barrow, Nuiqsut, Point Hope, and Wainwright

varies somewhat by species, but in general is high enough to give a satisfactory level of confidence in the estimates.

Table G3. Response rates by village to the subsistence section of the 1993 North Slope Borough Economic Census. Data are for calendar year 1992.

Category	Anak. Pass	Atqasuk	Barrow	Kaktovik	Nuiqsut	Pt. Hope	Pt. Lay	Wain.
Number Households	79	60	1,146	71	105	156	49	152
Number Resp. Survey	69	4	813	44	85	137	4	120
% Resp. to Survey	87.3%	6.7%	70.9%	62.0%	81.0%	87.8%	8.2%	78.9%

Three types of non-response exist in the data. The first type is households which completed the *Species Harvested* section but gave an invalid response as to the amount of the species harvested. A typical example would be a household which responded that they used the species, but did not report the amount harvested or reported an indecipherable amount, such as “a lot.” For this type of non-response, there is typically enough information to classify the record as hunter or non-hunter. If the record is classified as a non-hunter, the amount harvested is assumed to be 0 and the record is included in the group of valid responses. The records that are classified as hunters but have invalid responses for the amount harvested are assigned to a separate group, group M. Records in group M are stratified in the normal way. This group is assigned the applicable stratum average for purposes of determining the population mean and the estimate of the total village harvest.

The second type of non-response is where the household completed other sections of the census, such as income or education, but left the sections dealing with subsistence entirely blank. This group is difficult to deal with because of the impossibility of determining why the subsistence sections were left blank. One could conjecture that the subsistence sections were left blank because the household did not engage in subsistence activities. However, the census questionnaire was very long and it was not unusual for respondents to quit before reaching the subsistence sections.

This second type of non-response is also separated and is assigned to group X. This group is not included in the computation of the average household harvest. It would technically be possible to use regression analysis with variables such as race, income level, and education to predict the hunter/non-hunter status of records in group X. However, for households in group X the other sections of the census were often incomplete. Also, race and education data were reported by individual, whereas subsistence data was reported by household, making it difficult to directly apply regression analysis. In any case, with the exception of Kaktovik the percentage of

households in this category was relatively low. Given the extent of problems with the Kaktovik data, the marginal benefit of additional analysis did not justify the additional resources required to carry it out.

The third type of non-response is where the household did not complete any part of the census survey. These households are assigned to group Z and handled in the same manner as households in group X.

Explanation of Survey Total, Corrected Survey Total, and Estimated Total

Because non-response may cause errors in the estimate of the total village harvest, three estimates of the total amount harvested by the village are given for comparison. First, a “Survey Total” is given, which is the sum of all of the valid amount harvested responses, using pounds as a common unit. It does not include records from the non-response groups M, X, and Z. This estimate is clearly too low, because it assumes that the amount harvested by all households with any degree of non-response is 0. However, this is the amount that the census was able to actually document and is valuable for reference as a lower bound.

Second, a “Corrected Survey Total” is given, which is the Survey Total plus the stratum average for each record in group M (hunters who gave invalid responses). This estimate assumes that the amount harvested by group X and group Z are both 0. The corrected Survey Total is used to calculate the household average, Y_{BAR} .

Third, an “Estimated Total” is given which is the Corrected Survey Total plus the household average (Y_{BAR}) for all households in group X and group Z (no part of the subsistence portion of the survey was completed). This estimate is likely to be too high, but is useful as an upper bound.

The “best estimate” of the number of species harvested probably lies between the Corrected Survey Total and the Estimated Total. **The Corrected Survey Total is the best point estimate of the harvest for each species**. It is, however, conservative to some unknown degree since it accounts for less than 100% of the households. The Estimated Total accounts for every household in the village, but a significant portion of the people that were not surveyed may have been non-hunters (teachers and construction workers, for instance) who were absent during the summer. If this is a correct assumption, the Estimated Total may be somewhat inflated. A comparison of the data from this report with past studies also suggests that the Corrected Survey Total is a more reasonable estimate of the harvest (Braund, 1993a,b; Pedersen, 1990). Kaktovik is a special case, however, since the survey response was low in that village. For Kaktovik, the Estimated Total is the best point estimate of the total village harvest.

The issue of non-response is important to keep in mind when considering the variance of the estimates given. The formula used for calculating the variance is the usual formula for variance with a finite population correction. However, the households in N are not random samples. Because the data are not a random sample of the population, but are instead a survey of the entire population, the non-responses are not equivalent to non-sampled. Normal statistical conventions that rely on sample theory are not applicable. Caution is given that the non-response found in the data could cause the estimated variances to be smaller than the true variance. Nevertheless, the variances are still useful as measures of spread in the data and are presented as such in the form of standard deviations.

Description of Harvest Periods

For each village other than Point Lay and Atqasuk, there is a table presenting a summary of the months in which each species was harvested. These figures are based on the responses to the Months Harvested question in the *Species Harvested* section (see Appendix 1). The figures were generated by taking the amount of each species harvested by each household and averaging it over the months harvested reported by the household. For example, if a household reported a harvest of 500 pounds of caribou in the months of August and September, 250 pounds were attributed to August and 250 pounds were attributed to September.

For households who reported a season rather than specific months in the Months Harvested field, the seasons were interpreted as follows: spring was assumed to be April and May, summer was assumed to be June, July, and August, fall was assumed to be September and October, and winter was assumed to be November through March.

There are several weaknesses of this methodology. First, dividing the household's take evenly across the "months harvested" may not actually correspond to how the actual harvest occurred. For example, if a household reported a harvest of 100 pounds of lake trout in the

summer, this amount would be spread evenly over the months of June, July, and August, while the household's harvest may actually have all occurred in July. Also, some seasons may actually begin or end in the middle of a month. Some people may have reported a harvest in the fall that actually took place in early November.

There was some confusion among the census takers as to what was meant by the "Months Harvested" question. In some villages a significant number of responses were invalid because the census taker interpreted this question as meaning the number of months the household engaged in harvesting a particular species, rather than requesting and recording the actual months by name. To be a valid response for the sake of this part of the study, the household had to report both a valid amount in the Amount Harvested field and a valid response in the Months Harvested field. Because many responses in the Months Harvested field were not valid, the sum of the amounts harvested in each month does not equal the survey total shown on the Census Results and Harvest Estimates. Care should be taken in interpreting the Months Harvested result if only a small number of valid responses were received.

A unique situation arose in Anaktuvuk Pass. A high percentage of the households responded that they hunt caribou year-round. However, spreading the amount harvested evenly over the entire year for most of the households in the village is somewhat misleading. Therefore, we noted that caribou are hunted year-round in Anaktuvuk Pass, but caribou was dropped from the "Months Harvested" summary table for this village. This problem was not significant for any other species or any other village.

In general, the results are reliable and point to the seasons in which each species was harvested. The results are presented as a percentage of the total annual take (valid responses only).

RESULTS AND DISCUSSION

Overview for All Villages

The results of the harvest survey indicate a heavy reliance on subsistence or “country foods” for all North Slope villages (Table G4). The average harvest per capita of all resources was 389 pounds and ranged from 315 to 787 pounds. For villages other than Barrow, the average harvest per capita of all resources was 460 pounds. Barrow alone harvested an estimated 1.36 million pounds, or 349 pounds per capita. The results from this survey are consistent with results from other surveys (Braund, 1993a). By comparison, Braund (1993a) estimated a three-year average harvest for Barrow of 233 pounds per capita (Range = 204-289) for the years 1987 to 1989. ADF&G (1995) indicated a harvest of 399 and 741 pounds per capita for Nuiqsut for the years 1985 and 1993 respectively.

Table G4. Harvest per capita and household, number of households and population estimates for North Slope communities for calendar year 1992. Harvest data for villages which did not respond to the subsistence survey are not included.

Category	Ank.							
	Pass	Atqasuk	Barrow	Kaktovik	Nuiqsut	Pt. Hope	Pt. Lay	Wainwright
Lbs./Household	1076	NA	1190	2549	1430	2182	NA	1677
Lbs./Capita	315	NA	349	787	359	487	NA	436
No. Households	79	60	1146	71	105	156	49	152
Tot. Pop.	270	237	3908	230	418	699	192	584

For coastal villages, the largest portion of the harvest (by weight) was marine mammals, as shown in Table G5. The whale harvest and the walrus harvest were particularly plentiful in 1992, making the marine mammal harvest a greater percentage of the total harvest than normal. As in all of the North Slope villages, subsistence activities vary by season, year, and the spatial distribution (availability) of the species hunted (Braund, 1993a; Pedersen, 1990). The success of the harvest can vary markedly. Braund (1993a) found significant changes in harvest rates between years depending on the availability of the species. Walrus harvests can vary by ten fold (i.e., 10 to 100) between years (Sonnenfeld, 1956) and in some years none are taken.

Table G5. Total harvest (in edible pounds) of birds, fish, invertebrates, marine mammals, plants, and terrestrial mammals for North Slope Villages. No data were available for Point Lay and Atqasuk. Data are for calendar year 1992.

	Anak.			Point		
	Pass	Barrow	Kaktovik	Nuiqsut	Hope	Wainwright
Birds	913	23,866	2,624	3,924	9,429	11,480
Fish	6,897	96,003	33,063	51,955	30,589	22,441
Invertebrates	0	694	0	0	88	16
Marine Mammals	0	989,348	119,884	52,749	262,009	130,755
Plants	2,818	1,164	219	65	2,720	393
Terrestrial Mammals	74,412	252,661	25,180	41,503	35,548	89,802
Total	85,040	1,363,736	180,970	150,196	340,383	254,887

The harvest for all villages included a large variety of plants and animals and ranged from 34 to 62 different species depending on the village (Table G6). The coastal villages tended to have a more diverse harvest. Anaktuvuk Pass, the only truly “inland” village, harvested the lowest variety of species and also harvested the least per capita of any of the villages. This is probably because these hunters do not have access to marine resources.

Table G6. Number of individual species harvested by village as determined by the 1992 census.

Anaktuvuk Pass	Nuiqsut	Barrow	Pt. Hope	Wainwright	Kaktovik
34	44	62	59	50	40

Data were also gathered on some inedible species such as fox and wolverine (i.e., fur bearers). These data are not presented in tables showing edible pounds, but are presented with the harvest estimates showing the number of species harvested. The inedible species not converted to pounds are noted on the conversion table in Appendix 2.

Species Identification Problems

As in all subsistence harvest studies, species identification was a problem in many cases. In general, the Inupiat names are very specific and there are seldom identification problems if *just* Inupiat names are used. When English common names are used there appear to be many ambiguities--particularly with fish, birds and possibly plants. There did not appear to be any discrepancies with mammals in this study. Individual species are discussed in Table G7.

The survey form also had a few inaccuracies, i.e., the form queried for *Great Scout* rather than *Great Scaup*. White-fronted geese are sometimes referred to as “Canadian geese” in Barrow and Nuiqsut. Emperor geese were on the query form, however, they are very infrequent on the North Slope and it is very unlikely the reported harvests are actually this species. Note that the

common name for whistling swan has been changed to tundra swan. Because whistling swan was used in the original survey form, it is used consistently in all tables herein.

Table G7. List of commonly misidentified species on the North Slope (included in the NSB Subsistence Harvest Study).

English Common Name	Inupiat Name	Scientific Name	Comments
Arctic char	<i>Iqalukpik</i>	<i>Salvelinus alpinus</i>	In Alaska, this species only occurs in lakes. The sea-run anadromous form is Dolly Varden (<i>S. malma</i>). In lakes they can be confused with their ‘first cousins’ the lake trout (<i>S. namaycush</i>).
Burbot	<i>Tittaaliq</i>	<i>Lota lota</i>	Burbot are often referred to as “Ling Cod” which are a marine fish (<i>Ophiodon elongatus</i>)
White-fronted Geese	<i>Niglik</i>	<i>Anser albifrons</i>	These are sometimes called “Canada geese” since they are locally said to be “those geese from Canada.”
Least cisco	<i>Iqalusaaq</i>	<i>Coregonus sardinella</i>	Least cisco are sometimes referred to as “herring” particularly at Barrow; however, they are not the “true” Pacific Herring (<i>Clupea harengus</i>).
Lake Trout	<i>Iqaluaqpaq</i>	<i>S. namaycush</i>	Smaller trout may be reported as Dolly Varden or Arctic char in some villages.
Round Whitefish	<i>Savigunnaq</i> ; <i>Aanaaliq</i>	<i>Prosopium cylindraceum</i>	Here is a rare case where two fish species (round and broad whitefish) can share the same Inupiaq name; this may have stemmed from a recording error since at least some Inupiat recognize Round whitefish as <i>Savigunnaq</i> . Round whitefish are uncommonly taken in gill nets.
Silver or Coho Salmon	<i>Iqalugruaq</i>	<i>Oncorhynchus kisutch</i>	True silver salmon are <u>very</u> rare in the Beaufort Sea but may occasionally occur near Point Hope. Sea-run chum salmon (<i>O. keta</i> salmon are often misidentified as Sliver salmon.
Bering Cisco	<i>Tiipuq</i>	<i>C. laurettae</i>	Bering cisco are very difficult to distinguish from <i>Qaaktaq</i> Arctic cisco (<i>C. autumnalis</i>). They are separated by subtle differences in body shape and coloring. As a general rule, Arctic cisco occur east from the Colville River to Canada; the Bering cisco form is most common from Dease Inlet (near Barrow) and west along the Chukchi Sea coast.
Spectacled Eider	<i>Kavaasuk</i>	<i>Somateria fisher</i>	The different species of female eiders are easily confused with each other. It is possible that male Spectacled eiders may be confused with other Pacific eiders during the fall migration.
Steller’s Eider	<i>Igniqauqtuq</i>	<i>Polysticta Stelleri</i>	As above.
Emperor Geese	<i>Mitilugruak</i>	<i>Chen canagica</i>	Emperor Geese are very rare along the Beaufort Sea coast; they occasionally occur near Pt. Hope.

Anaktuvuk Pass

The subsistence harvest at Anaktuvuk Pass is primarily focused on caribou as it has been for perhaps a millennia (Hall *et al.*, 1985). The total harvest (in pounds) per capita at Anaktuvuk Pass is similar to that of Barrow at roughly 300 pounds per capita (see Figures A1 and B1). The hunters compensate for the lack of marine resources, used heavily by coastal villages, by substituting a high proportion of caribou in their diet. Obviously in years when caribou fail to migrate through the Anaktuvuk Pass region (such as 1994), the local residents experience significant hardship due to their singular dependence on this resource (Brower and Opie, 1996).

A total of 34 species were taken in 1992, which is the fewest of the villages surveyed. This low species diversity in the harvest may reflect the lower diversity of the terrestrial environment in which they hunt. Anaktuvuk Pass is unique among the North Slope villages in that it is too far inland to have easy access to the ocean and marine mammal hunting. Accordingly, this study indicated no marine mammal harvest in 1992. As shown in Figure A2, the harvest of terrestrial mammals dominated the total harvest. Figure A3 shows the top five species harvested at Anaktuvuk Pass.

The response rate (87%) and the quality of the data gathered in the subsistence survey for Anaktuvuk Pass was the highest of all the villages surveyed (Figure G3) and the number of invalid responses was the lowest.

Marine Resources

No marine species were taken by Anaktuvuk Pass residents in 1992. Marine mammal “products” taken in other villages, however, are routinely shared with Anaktuvuk Pass residents however, the survey was not designed to record such sharing. Bowhead whale, bearded seal, walrus, and ringed seal are examples of some of the resources that Barrow residents share with Anaktuvuk Pass (H. Brower, Jr., personal communication, 1997).

Terrestrial Resources

Terrestrial mammals accounted for 88% of the total harvest at Anaktuvuk Pass in 1992. Caribou comprised nearly all of the terrestrial harvest and 83% of the total village harvest (Figure A3). Such dependence is well documented, as stated in Hall *et al.* (1985) “the livelihood of Anaktuvuk Pass residents essentially depends on caribou.” The survey estimated 600 caribou taken for 1992, or 8.7 harvested per household. Estimates from past studies estimate 592 for 1990-1991 and 574 for 1993-1994 (Brower and Opie, 1996). Caribou are seasonally abundant during the spring and fall migration but sometimes do not use Anaktuvuk Pass as a migratory pathway. In recent years most of the hunting has occurred relatively near the village. In 1994-95

the caribou harvest was considerably lower (291) than past years and the residents experience meat shortages (Brower and Opie, 1996). In lean years such as this, other resources are often exploited more heavily. Dall sheep and moose form the other important terrestrial resources and sources of red meat. However, since much of the hunting area is within Gates of the Arctic National Park, and population numbers are *relatively* low, the harvest of sheep and moose is highly regulated. In 1995, for example, a special hunt for Dall sheep was opened to compensate for the poor caribou harvest.

Fish Resources

Fish resources comprised 8% of the harvest at Anaktuvuk in 1992. Grayling, Lake Trout and Dolly Varden char accounted for essentially all of the fish harvested. With one exception, whitefish species which are staples at Nuiqsut and Barrow were not harvested at Anaktuvuk Pass. Arctic mountain streams and lakes are generally not suitable habitat for many of the whitefish species occurring in Alaska (Craig, 1989).

Participation in Subsistence Activities

The results of the *Subsistence Activity* survey showed that subsistence activities in Anaktuvuk Pass were focused on terrestrial harvest activities (Figure A5). Only one household reported involvement in marine mammal hunting outside the village. Not surprisingly, caribou hunting, fishing and berry picking were the most frequent activities in 1992. Thirty-three percent of the households indicated that they hunted caribou “often.” Interestingly, this is less than in several other villages that are less dependent on caribou. Point Lay, for instance, indicated that 77% of the households often hunted caribou. This is most likely due to the relative and subjective nature of this section of the survey and the fact that it was administered by different census takers in each village. For instance, a given person in Anaktuvuk Pass may not consider themselves to hunt caribou “often” compared to other people in their village. However, they may in fact hunt considerably more than someone that reports hunting “often” in another village.

Timing of Activities

Waterfowl hunting appeared to peak in April and May at Anaktuvuk. Fur-bearer trapping for wolf, lynx and wolverine was most prevalent from January through March in 1992.

Trapping is accomplished mainly by snow machine. Fishing for lake trout, Arctic char and grayling peaked in April and May. Dall sheep hunting was restricted to August through October; the bulk of the harvest occurred in October. Caribou were apparently available throughout the

year since most of the residents reported year-round harvesting. Thus, it was not possible to specifically quantify the months in which caribou were harvested.

Tables and Figures for Anaktuvuk Pass

Table A1. Breakdown of total harvest by subsistence harvest category for Anaktuvuk Pass, Alaska, 1992. The 1993 population of Anaktuvuk Pass was 270; the total number of households was 79.

Subsistence Harvest Category	Total Weight	Pounds Per Household	Pounds Per Capita
Birds	913	12	3
Fish	6,897	87	26
Invertebrates	0	0	0
Marine Mammals	0	0	0
Plants	2,818	36	10
Terrestrial Mammals	74,412	942	276
Total	85,040	1,076	315

Figure A2. Percent Harvest by Category of Subsistence Resources for Anaktuvuk Pass 1992 (edible pounds harvested).

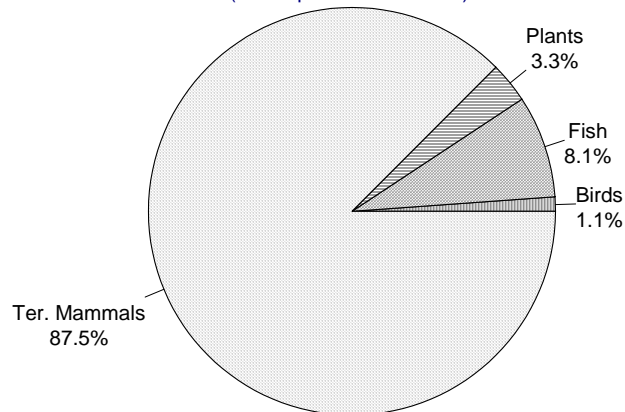


Table A3. Top Five Species Harvested at Anaktuvuk Pass, Alaska during calendar year 1992.

Top Five Species Harvested	Edible Pounds Harvested	Number Harvested	Pounds Per Household	Pounds Per Capita	Percent of Total Harvest
Caribou	70,222	600	889	260	82.6%
Dall Sheep	3,168	32	40	12	3.7%
Grayling	2,967	3,709	38	11	3.5%
Lake Trout	2,124	531	27	8	2.5%
Arctic Char	1,791	640	23	7	2.1%

Table A4. Estimated pounds of caribou harvested by village; and percentage weight (caribou) of the total village harvest for all resources. Data are for the calendar year 1992.

	Anaktuvuk Pass	Barrow	Nuiqsut	Pt. Hope	Wainwright	Kaktovik
Pounds Harvested	70,222	233,206	32,551	26,303	87,514	15,926
% of Total Harvest	83%	17%	10%	8%	34%	9%

Table A5. Participation in subsistence harvest activities, Anaktuvuk Pass, Alaska, 1992. Of 79 households, 69 households participated in this survey.

Activity	Often	Some-times	Vaca-tion	Not At All	% Often	% Some-times	% Vaca-tion	% Not at all
Fall Whaling	0	0	1	68	0%	0%	1%	99%
Fish	15	31	0	23	22%	45%	0%	33%
Helped Whaling Crew	0	0	0	69	0%	0%	0%	100%
Hunt Caribou	23	28	0	18	33%	41%	0%	26%
Hunt Moose, Bear, or Sheep	5	23	0	41	7%	33%	0%	59%
Hunt Seal	0	0	1	68	0%	0%	1%	99%
Hunt Walrus	0	0	0	69	0%	0%	0%	100%
Hunt Waterfowl & Eggs	5	10	0	54	7%	14%	0%	78%
Make Sleds or Boats	0	15	0	54	0%	22%	0%	78%
Pick Berries	10	36	1	22	14%	52%	1%	32%
Sew Skins, Make Parkas	6	26	0	37	9%	38%	0%	54%
Spring Whaling	0	0	0	69	0%	0%	0%	100%
Trap	6	6	0	57	9%	9%	0%	83%

Table A11. Breakdown of subsistence harvest activity by the month it occurred for each species. Villaq Anaktuvuk Pass, Alaska, calendar year 1992.

Species	Responses*	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Arctic Char	25	0%	0%	1%	48%	46%	2%	2%	2%	0%	0%	0%	0%
Black Brant	3	0%	0%	0%	17%	83%	0%	0%	0%	0%	0%	0%	0%
Blueberry	42	0%	0%	0%	0%	0%	0%	0%	94%	4%	2%	0%	0%
Canada Geese	6	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%
Common Eider Duck	3	0%	0%	0%	33%	67%	0%	0%	0%	0%	0%	0%	0%
Cranberry	20	0%	0%	0%	0%	0%	0%	0%	75%	18%	7%	0%	0%
Crowberry	33	0%	0%	0%	0%	0%	0%	0%	94%	4%	2%	0%	0%
Dall Sheep	13	0%	0%	0%	0%	0%	0%	0%	21%	25%	54%	0%	0%
Grayling	30	0%	0%	0%	29%	29%	6%	6%	6%	11%	13%	0%	0%
Great Scaup	2	0%	0%	0%	45%	55%	0%	0%	0%	0%	0%	0%	0%
Grizzly Bear	5	0%	0%	0%	20%	0%	0%	0%	20%	50%	10%	0%	0%
Ground Squirrel	4	0%	0%	0%	45%	50%	5%	0%	0%	0%	0%	0%	0%
Hudson's Bay Tea	1	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%
Lake Trout	16	0%	0%	0%	40%	40%	1%	1%	1%	8%	8%	0%	0%
Ling Cod	1	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%
Lynx	2	9%	9%	9%	0%	0%	0%	0%	0%	0%	0%	9%	66%
Moose	1	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%
Oldsquaw Duck	6	0%	0%	0%	24%	76%	0%	0%	0%	0%	0%	0%	0%
Pintail Duck	11	0%	0%	0%	24%	76%	0%	0%	0%	0%	0%	0%	0%
Red Fox	8	13%	10%	10%	6%	6%	6%	6%	6%	6%	6%	13%	13%
Rock Ptarmigan	1	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Round Whitefish	1	0%	0%	0%	0%	0%	20%	20%	20%	20%	20%	0%	0%
Salmonberry	34	0%	0%	0%	0%	0%	0%	0%	99%	1%	0%	0%	0%
Snow Goose	1	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Snowshoe Hare	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Weasel	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
White Fronted Goose	3	0%	0%	0%	33%	67%	0%	0%	0%	0%	0%	0%	0%
Wild Chives or Spinach	2	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%
Wild Potato	21	0%	0%	0%	4%	4%	4%	2%	68%	8%	8%	0%	0%
Wild Rhubarb	3	0%	0%	0%	0%	0%	0%	73%	27%	0%	0%	0%	0%
Willow Ptarmigan	16	10%	10%	19%	26%	19%	0%	0%	0%	0%	0%	7%	7%
Wolf	10	12%	12%	45%	5%	5%	0%	0%	0%	0%	0%	12%	12%
Wolverine	3	10%	10%	43%	8%	8%	0%	0%	0%	0%	0%	10%	10%

*Due to the large number of invalid responses to the Months Harvested question in the survey, the number of responses useable for this analysis does not represent the number of households that harvested each species. Note: Caribou is not included because most responses were "all year," which rendered the method of analyzing the data unusable for that species.

Atqasuk

Atqasuk is a “resettled” village that is sited along the Meade River approximately 60 miles south of Barrow. In 1992, it had a population of 237 people in 60 households (Harcharek, 1995). Harvest information from previous subsistence studies is scarce. Although the NSB census survey included Atqasuk, the response rate for the *Species Harvested* section of the survey was too poor to make reasonable harvest estimates for any species.

Harvest Activities

Atqasuk residents did respond to the *Subsistence Activity* section of the survey. Fishing and caribou hunting drew very high participation where nearly 90% of the households indicated they “often” or “sometimes” took part in these activities. These are the highest rates for these activities for any of the villages in the NSB, which suggests that the village is highly involved in subsistence activities. Waterfowl hunting also drew high participation.

Tables and Figures for Atqasuk

Table AT1. Participation in subsistence harvest activities, Atqasuk, Alaska, 1992. Of 60 households, 42 households participated in this survey.								
Activity	Often	Some-times	Vaca-tion	Not At All	% Often	% Some-times	% Vac-ation	% Not at all
Fall Whaling	3	4	1	34	7%	10%	2%	81%
Fish	32	5	1	4	76%	12%	2%	10%
Helped Whaling Crew	6	5	0	31	14%	12%	0%	74%
Hunt Caribou	30	8	0	4	71%	19%	0%	10%
Hunt Moose, Bear, or Sheep	1	3	0	38	2%	7%	0%	90%
Hunt Seal	1	11	0	30	2%	26%	0%	71%
Hunt Walrus	1	11	0	30	2%	26%	0%	71%
Hunt Waterfowl & Eggs	27	5	1	9	64%	12%	2%	21%
Make Sleds or Boats	24	8	0	10	57%	19%	0%	24%
Pick Berries	16	15	0	11	38%	36%	0%	26%
Sew Skins, Make Parkas	7	14	0	21	17%	33%	0%	50%
Spring Whaling	7	3	1	31	17%	7%	2%	74%
Trap	1	8	1	32	2%	19%	2%	76%

Barrow

Barrow is the largest community in the survey and is the largest community on the North Slope by a factor of at least four with 3,908 people in 1,146 households in 1992 (Harcharek, 1995). It is a coastal community and as such, has access to both terrestrial and marine resources. It relies, however, most heavily on marine resources. Barrow is the only village which (currently) successfully harvests bowhead whales in both spring and fall. The impressive 1992 harvest reflects this dual-season hunt and the fact that unused 'strikes' are often transferred to Barrow in the fall (Table B1).

Barrow also has the largest pool of non-hunters (Table B7). The survey indicated that roughly half of Barrow's residents do not take part in any subsistence activities. This may be a reflection of the relatively high percentage of non-native residents (Harcharek, 1995).

Barrow residents harvested 61 terrestrial and marine species in 1992. Most of the available subsistence resources were used with the exception of those that do not usually occur in the Barrow area (i.e., musk ox, Dall sheep).

Marine Resources

The total harvest of marine mammals for 1992 was quite high and accounted for 72.5% of the total village harvest of all species (Figure B2). The marine mammal harvest included a larger than usual harvest of bowhead whales. Thus, the total weight (989,348 pounds) of the marine mammal harvest and the percentage of the total harvest which marine mammals represent exceeds other years at Barrow for which such data exist (Braund, 1993a).

Bowhead whales

Barrow landed 22 bowhead whales in 1992. This is considerably higher than previous years--particularly since the imposition of the quota system in 1978 (Suydam *et al.*, 1997). Unused strikes are often transferred to Barrow which increases the harvest. The total edible weight of the whale harvest is, as with other mammals, considerably less than the total landed weight. The blubber comprises about 40% of the animals' weight with bone and inedible viscera (which is usually discarded) contributing another 20%. Thus an edible weight conversion ratio of 40% was used and it was estimated that 741,676 pounds (331 metric tons) of edible whale resources were harvested. By comparison, for a typical steer, retail cuts of meat comprise 37% of the animal's weight (Romans *et al.*, 1984). Historically, apart from food, some of the blubber was used for heating and feeding dogs, but it is currently not used for these purposes. Still,

bowhead whale provided by far the greatest single contribution of food to the village in 1992 (Table B3).

The last seven of the whales that were landed resulted from strike transfers from other villages (AEWC, 1992). Reportedly half of the edible portions of these whales (approximately 45,000 pounds) were shipped to the donating village. Thus, not all of the whale harvest was used at Barrow and the contribution of the whale harvest to the village total is somewhat over-represented. These portions were not subtracted from the Barrow total since the amount is relatively small compared to the massive harvest and it was not clear which whales and which proportions were sent to the donor villages.

Walrus

Walrus (206) were second to bowhead whales in terms of the harvested weight of marine mammals (Table B3). Overall, walrus were third in terms of harvested weight (caribou were second overall). In some years very few or no walrus are taken at Barrow depending on their availability and distribution. Barrow is considered to be at the northeastern periphery of the Pacific Walrus's range. However, they were relatively abundant near Barrow in 1992 (H. Brower, Jr., pers. comm., 1995). Walrus hunting is confined to late July and August at Barrow (Table B10). As noted above, the walrus harvest can vary greatly between years. For example, Braund (1993a) estimated the harvest of walrus at 61 for 1987 and 101 for 1989, which is less than half the estimated 1992 harvest.

Seals

Ringed and bearded seal comprised the bulk of the remaining marine mammal harvest. The total harvest (in pounds) of bearded seal exceeded ringed seal for this particular year, however, access to bearded seal is generally more variable and the number taken is less than half the number of ringed seal harvested (Braund, 1993a). Ringed seal are considerably more abundant in the Arctic Ocean than bearded seal. Seal hunting essentially takes place year-round with a peak in July particularly for bearded seal. Historically, according to Sonnenfeld (1956), ringed seal were perhaps *the* staple food/resource for Barrow since they provided meat, blubber, heating oil, dog food, skins and sinew. Braund (1993a) stated that their importance has waned considerably since the advent of snow machines in the mid 1960s.

Spotted seal are not nearly as abundant in the Barrow area as ringed seal. They are more common in the southern Chukchi Sea which partly explains the relatively low harvest of 65 animals.

Terrestrial Resources

Terrestrial mammals contributed about 18.5% of the total harvest at Barrow in 1992 (Figure B2). In other years terrestrial species are proportionately much greater, but the very large whale harvest in 1992 dominated the total harvest. Braund (1993a) estimated that terrestrial mammals contributed 30% of the total averaged harvest from 1987 to 1989. Plants contributed less than one percent in terms of weight.

Caribou

Caribou were the principle terrestrial resource for Barrow in 1992 and second only to bowhead whales in terms of pounds harvested at approximately 233,206 pounds. The estimated number of individual caribou harvested in 1992 is 1,993 animals. This compares with estimates of 1,595 in 1987, 1,533 in 1988 and 1,656 in 1989. The 1992 estimate is slightly higher but well within the range of these earlier estimates. Caribou hunting was the single most important hunting activity, probably because many non-natives actively hunt caribou and because caribou are hunted year-round. Caribou are also one of the most consistently eaten subsistence foods in Barrow (Braund, 1993a). The caribou harvest is also dependent on their distribution and varies between years. Apparently caribou were fairly abundant and accessible in the Dease Inlet and Chipp River area in 1992.

Moose and Dall Sheep

The survey suggested a harvest of 34 moose and 1 Dall sheep taken by residents of Barrow in 1992. The majority of moose harvested by Barrow residents are taken in the Colville River drainage and most sheep are taken along the Brooks Range. The Alaska Department of Fish and Game has good records of the moose harvest in game Unit 26 and their records indicate a harvest of 11 in 1992 for Barrow residents, which is more than most years (Geoff Carroll, pers. comm., 1995). Some of the moose reported in the NSB study, however, may have been taken off-slope. Regardless, the survey estimate is obviously too high; a possible explanation is given below.

From personal observations and conversations with the local ADF&G Wildlife Biologist Geoff Carroll (pers. comm., 1996) moose and sheep are harvested largely by Barrow non-natives. Braund (1993a) found that their estimates of moose harvest were highly affected by their stratified sampling method. They found that hunters in the low-harvest strata tended to be non-natives but these hunters are also more likely to be moose hunters. Thus, the harvest estimates for moose were inflated in Braund (1993a). The same problem probably occurred in this survey where the moose harvest was “over represented” in the low hunting strata which inflated the

village estimate. For other species which are taken more frequently (e.g., caribou), this should not be a significant problem. That is, the survey is optimized for estimating the harvest of the most frequently harvested species.

Fish Resources

Fish constituted about 7% of the total harvest in Barrow in 1992. As with other resources, the large harvest of bowhead whales dominated the total poundage in 1992. In a more typical year, for instance, fish constituted an average of 11% for the years 1987 to 1989 (Braund, 1993a).

Broad whitefish are by far the most important fish resource to the residents of Barrow (Table B7). They are considered one of the best eating fish by Barrow residents and are generally preferred over salmon species. Those caught in the summer are generally filleted and dried into *pifsi*. Most broad whitefish are harvested during autumn when they move to spawning and overwintering areas. The egg-laden females are, in some cases, targeted in the fall harvest. Fall harvested fish are stored in ice cellars and eaten as *quaq* (frozen) or boiled. They are harvested entirely using gill nets since they will not take a hook or lure.

Grayling are also a highly preferred fish and were the second most important fish in terms of weight in 1992. They are taken by both gill net and hook and line.

Bird/Waterfowl Resources

Birds contributed less than 2% of the total harvest by weight. Nonetheless, participation in bird hunting was relatively high. Of the total bird harvest, eiders formed the greatest portion by weight with geese a close second (Table B7). Numerically, however, eiders were taken in much greater numbers than geese (Table B9). King and Common eider are by far the most heavily harvested ducks and white-fronted geese are the most important geese species taken at Barrow.

Like fish, birds are sometimes misidentified or the wrong common name is used, particularly in the autumn return migration when the birds are no longer in breeding plumage. Based on published information of bird distribution, it is highly unlikely that emperor geese were taken at Barrow and may have been mistaken for snow geese (National Geographic, 1987). Likewise, it is unlikely that there were as many Canada geese taken as the survey indicated; these were very likely white-fronted geese. Barrow native hunters sometimes refer to white-fronted geese as “Canadian geese” since they are said to be “those geese that come from Canada” (Harry Brower, Jr., pers. comm., 1995). Thus the actual harvest of white-fronted geese is likely 2,140 to 2,987 birds for 1992 (total = White-fronted geese + Canada geese). This combined estimate is

very similar to earlier estimates by Braund (1993a). They reported an average white-fronted geese harvest of 2,795 for 1987 to 1989. Only one true Canada goose was reported taken in the Braund Study.

A concern is the harvest of Spectacled Eiders (350) and Steller's Eiders (113) in 1992 since both species are experiencing significant population declines and Spectacled Eiders are now listed as a Threatened Species under the U.S. Endangered Species Act (R. Suydam, personal communication, 1997). The estimated take of Spectacled and Steller's eiders is probably too high since very few (less than 100) were counted during spring census work at Barrow (Suydam *et al.*, 1997). However, since the survey accounts for 315 Spectacled and 101 Steller's eiders harvested before any corrections were made, it is possible that the take is actually close to these estimates. Braund (1993a) however, reports a strikingly different harvest estimate of 1 Spectacled Eider and 3 Steller's Eiders for 1987 through 1989. Furthermore, estimates from recent (1987-1996) eider censuses at Barrow conducted by the NSB Department of Wildlife Management indicate low passage numbers for these species (Suydam *et al.*, 1997). Thus, it is likely that these birds were misidentified.

Participation in Subsistence Activities

Barrow residents participated in every subsistence activity category queried in the survey (Figure B4). Caribou hunting drew the greatest participation with 28.3% responding "often" and 17% responding "sometimes." Taken together, this suggests that nearly half (45%) of the village households did some caribou hunting. This may be reflecting the large proportion of non-natives in Barrow who avidly pursue caribou hunting while not partaking in other subsistence activities.

Participation in spring and fall whaling were a close second to caribou hunting. This is somewhat misleading since one of the activity categories was "Helped with Whaling." Taken together, whaling activities (including boat building) were the greatest single involvement.

Trapping drew the least participation with about 8% total participation and only about 3% of the villagers reporting they trapped "often." Thus, about 3% of the households consider themselves "active" trappers. This is a tremendous change from the middle of this century when virtually all households participated in trapping to some degree (Harry Brower, Jr., pers. comm., 1995).

Timing of Activities

Harvest activities in Barrow took place in some form throughout the year (Table B10). Activities peaked between April and October--certainly in terms of pounds harvested. Because this was a one-year recall survey, many of the respondents gave general dates when a species was

taken. The harvest was then averaged over the months recorded and as such may not clearly reflect the exact month of harvest as accurately as it should. (See the methodology section “Quantification of Monthly Harvest” for further details.) The harvest timing for each of the major resource groups is discussed below.

Bird/Waterfowl. Bird hunting has two activity peaks corresponding to the spring migration and “fall” migration of eiders and geese. Eider harvests peak in May along the lead edge and again during their return migration in July at *Pigniq* or “Duck Camp.” Most eiders are taken on the return migration. Geese harvests are nearly all confined to May.

Terrestrial Mammals. Caribou were taken mostly in July and August when they were available to boat hunters. Caribou are generally in peak condition in August at the end of the summer grazing, and Barrow hunters like to harvest them at that time. All moose were taken in August and September when moose hunting season is open. Fur-bearers are taken during winter months.

Marine Mammals. Bowhead whales are harvested in a spring and fall hunt at Barrow. However, if weather and sea ice conditions are satisfactory, most of the strikes are used in spring. If conditions are poor, as they were in 1992, then much of the hunt takes place in fall. The 1992 spring whaling season suffered some of the worst environmental conditions in recollection. The leads were essentially closed most of April and May at Barrow, Wainwright and Point Hope. Barrow whalers managed to land two whales in late May when the leads opened briefly (two days) but then closed again through most of June. Wainwright hunters did not take any whales nor did they make any strikes in spring 1992 which is very unusual. Many of the unused strikes were transferred to Barrow since most villages can not access whales in the fall.

Walrus are taken only in July and August when they drift north with the floe ice. However, some respondents responded “year-round” to the query so the catch was averaged over the winter months, during which walrus harvesting does not actually occur (Table B10). The 1992 open water resulted in a particularly good year for walrus hunting (H. Brower, Jr., pers. comm., 1995).

Ringed seal and bearded seal are now taken primarily by power boat during the open water season in July and August. However, some hunters specialize in sea-ice based seal hunting in winter, which appears in the data as a peak in February.

Fish. Fishing for freshwater species takes place from breakup (June) through November. Arctic cod can be taken at any time of the year through cracks in the sea ice. The most heavily harvested species, broad whitefish, are taken from June to October. Generally, the fall harvest of broad whitefish peaks in late September and October (personal observations; Braund, 1993a).

However, these data indicate a peak in summer. This may be due to high fishing pressure in summer (which sometimes occurs). Grayling are taken primarily from August through October. Least cisco, the most common fish in the Barrow area, are taken throughout the summer and fall. Fish harvesting generally peaks in October (in the under ice fishery) when fishermen target overwintering areas where whitefish and grayling are highly concentrated (Braund, 1993a; Moulton, 1997). The least cisco monthly harvest is represented by only four events and does not reflect the actual harvest period for this species, which includes summer and fall.

Tables and Figures for Barrow

Table B1. Breakdown of total harvest by subsistence harvest category for Barrow, Alaska, 1992. The 1993 population of Barrow was 3908; the total number of households was 1146.

Subsistence Harvest Category	Total Weight	Pounds Per Household	Pounds Per Capita
Birds	23,866	21	6
Fish	96,003	84	25
Invertebrates	694	1	0
Marine Mammals	989,348	863	253
Plants	1,164	1	0
Terrestrial Mammals	252,661	220	65
Total	1,363,736	1,190	349

Figure B2. Percent Harvest by Category of Subsistence Resources for Barrow 1992 (edible pounds harvested)

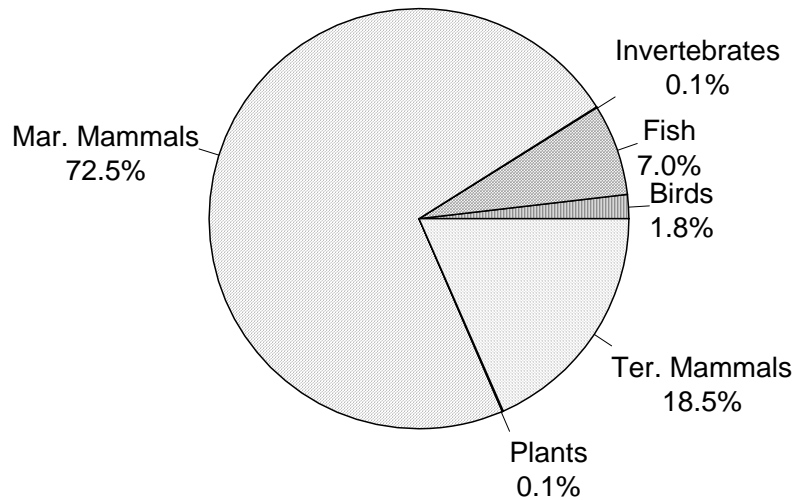


Table B3. Top Five Species Harvested at Barrow, Alaska during calendar year 1992.

Top Five Species Harvested	Edible Pounds Harvested	Number Harvested	Pounds Per Household	Pounds Per Capita	Percent of Total Harvest
Bowhead	729,952	22	637	187	53.5%
Caribou	233,206	1,993	203	60	17.1%
Walrus	159,236	206	139	41	11.7%
Bearded Seal	81,471	463	71	21	6.0%
Broad Whitefish	59,993	23,997	52	15	4.4%

Table B4. Participation in subsistence harvest activities, Barrow, Alaska, 1992. Of 1146 households, 813 households participated in this survey.

Activity	Often	Some-times	Vaca-tion	Not At All	% Often	% Some-times	% Vaca-tion	% Not at all
Fall Whaling	160	77	1	575	20%	9%	0%	71%
Fish	169	146	31	467	21%	18%	4%	57%
Helped Whaling Crew	179	97	2	535	22%	12%	0%	66%
Hunt Caribou	230	135	13	435	28%	17%	2%	54%
Hunt Moose, Bear, or Sheep	46	55	11	701	6%	7%	1%	86%
Hunt Seal	137	96	5	575	17%	12%	1%	71%
Hunt Walrus	117	92	4	600	14%	11%	0%	74%
Hunt Waterfowl & Eggs	154	138	7	514	19%	17%	1%	63%
Make Sleds or Boats	106	95	3	609	13%	12%	0%	75%
Pick Berries	42	75	10	686	5%	9%	1%	84%
Sew Skins, Make Parkas	115	113	1	584	14%	14%	0%	72%
Spring Whaling	197	79	2	535	24%	10%	0%	66%
Trap	28	35	4	746	3%	4%	0%	92%

Table B10. Breakdown of subsistence harvest activity by the month it occurred for each species. Village of Barrow, Alaska, calendar year 1992.

Species	Responses*	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Arctic Char	18	0%	6%	0%	0%	0%	4%	14%	42%	24%	8%	0%	0%
Arctic Cisco	9	0%	0%	0%	0%	0%	1%	13%	68%	0%	19%	0%	0%
Arctic Cod	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%
Arctic Fox	7	17%	17%	0%	3%	3%	0%	0%	0%	0%	50%	6%	6%
Bearded Seal	27	0%	0%	0%	0%	0%	10%	81%	10%	0%	0%	0%	0%
Beluga	2	0%	0%	0%	25%	25%	0%	50%	0%	0%	0%	0%	0%
Bering Cisco	1	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%
Black Brant	13	0%	0%	0%	0%	67%	9%	10%	13%	0%	0%	0%	0%
Blueberry	12	0%	0%	0%	0%	0%	4%	18%	42%	35%	0%	0%	0%
Bowhead	23	0%	0%	0%	8%	8%	0%	0%	6%	47%	31%	0%	0%
Broad Whitefish	32	0%	0%	0%	0%	0%	2%	37%	33%	14%	14%	0%	0%
Canada Geese	26	0%	0%	0%	0%	83%	3%	3%	0%	4%	7%	0%	0%
Capelin	2	0%	0%	0%	0%	0%	0%	0%	0%	33%	67%	0%	0%
Caribou	83	5%	4%	6%	4%	4%	8%	15%	23%	16%	8%	5%	3%
Clam	6	0%	0%	0%	25%	0%	1%	31%	26%	1%	15%	0%	0%
Common Eider Duck	41	0%	0%	0%	2%	36%	12%	20%	21%	9%	0%	0%	0%
Crab	1	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Cranberry	6	0%	0%	0%	0%	0%	16%	21%	27%	36%	0%	0%	0%
Crowberry	1	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%
Dall Sheep	1	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%
Emperor Goose	1	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%
Flounder	5	0%	0%	0%	1%	42%	42%	9%	0%	0%	6%	0%	0%
Four Horned Sculpin	2	0%	0%	0%	0%	0%	0%	0%	57%	43%	0%	0%	0%
Grayling	36	0%	0%	0%	1%	1%	6%	10%	35%	18%	28%	0%	0%
Grizzly Bear	2	0%	0%	0%	50%	0%	0%	0%	0%	0%	50%	0%	0%
Ground Squirrel	2	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Hudson's Bay Tea	1	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Humpback Salmon	8	0%	0%	0%	0%	0%	7%	75%	18%	0%	0%	0%	0%
Humpback Whitefish	14	0%	0%	0%	0%	0%	3%	43%	8%	9%	37%	0%	0%
King Eider	35	0%	0%	0%	15%	20%	4%	13%	40%	7%	0%	0%	0%
King Salmon	17	0%	0%	0%	0%	3%	19%	29%	37%	4%	8%	0%	0%
Lake Trout	9	0%	0%	0%	0%	0%	43%	20%	22%	14%	0%	0%	0%
Least Cisco	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%
Ling Cod	15	0%	9%	0%	0%	0%	4%	10%	17%	1%	59%	0%	0%
Moose	7	0%	0%	0%	0%	0%	0%	0%	17%	83%	0%	0%	0%
Northern Pike	3	0%	0%	0%	0%	0%	33%	47%	0%	10%	10%	0%	0%
Oldsquaw Duck	7	0%	0%	0%	0%	10%	33%	8%	15%	35%	0%	0%	0%
Pintail Duck	3	0%	0%	0%	0%	0%	0%	0%	62%	0%	19%	19%	0%
Polar Bear	4	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Red Fox	3	21%	44%	0%	8%	8%	0%	0%	0%	0%	0%	0%	21%
Ringed Seal	20	0%	8%	0%	0%	11%	17%	30%	34%	0%	0%	0%	0%
Rock Ptarmigan	5	0%	4%	0%	0%	38%	0%	0%	0%	36%	7%	7%	7%
Round Whitefish	5	0%	0%	0%	0%	0%	19%	14%	14%	0%	53%	0%	0%
Salmonberry	17	0%	0%	0%	0%	0%	7%	35%	56%	2%	0%	0%	0%
Sandhill Crane	2	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Silver Salmon	21	0%	0%	0%	0%	0%	8%	15%	57%	15%	4%	0%	0%
Smelt	7	0%	0%	0%	0%	0%	0%	0%	16%	42%	42%	0%	0%
Snow Goose	4	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Spectacled Eider	5	0%	0%	0%	30%	69%	0%	0%	1%	0%	0%	0%	0%
Spotted Seal	7	0%	0%	0%	0%	20%	60%	20%	0%	0%	0%	0%	0%
Steller's Eider	2	0%	0%	0%	0%	87%	0%	0%	13%	0%	0%	0%	0%
Walrus	18	1%	1%	1%	1%	4%	20%	49%	22%	1%	1%	1%	1%
White Fronted Goose	23	0%	0%	0%	17%	82%	0%	0%	1%	0%	0%	0%	0%
Wild Chives or Spinach	1	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Wild Rhubarb	2	0%	0%	0%	0%	0%	33%	67%	0%	0%	0%	0%	0%
Willow Leaves	1	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Willow Ptarmigan	27	2%	8%	0%	12%	37%	6%	6%	8%	11%	3%	8%	0%
Wolverine	5	1%	44%	30%	1%	1%	1%	1%	1%	1%	1%	15%	1%

*Due to the large number of invalid responses to the Months Harvested question in the survey, the number of responses useable for this analysis does not represent the number of households that harvested each species.

Kaktovik

Kaktovik is the easternmost village in the survey and is located on a small island adjacent to a brackish lagoon system. In autumn, bowhead whales migrate past the village relatively near shore and the village undertakes an annual fall whale hunt. In 1992, bowhead whale accounted for 472 pounds of food per capita which was 60% of the total village harvest. Abundant terrestrial resources are also available in coastal and inland areas. Due perhaps to the abundance of resources, successful whale harvest and low population, this village had the highest per capita use of subsistence resources (787 pounds/capita) in this study (1992).

Prior to the survey, an agreement was made with the Alaska Dept. of Fish and Game Subsistence Division not to collect subsistence harvest information in Kaktovik since the Division had planned to do subsistence surveys in the village at the same time. However, in the process of collecting data for the other portions of the NSB census, some subsistence data were collected. Because of this confusion, the response rate for the *Species Harvested* section of the survey was poor. Thus, these results are presented mainly to provide comparative harvest statistics with other villages and the ADF&G research. Harvest estimates of individual species should be viewed with caution since the response rate was low.

Marine Resources

Kaktovik had a very successful bowhead autumn whale harvest with three whales taken. Two of these whales were fairly large (over 40 feet) and provided a considerable amount of food. The total for all three whales was estimated at about 110,000 pounds. Bearded seal and beluga whales were other important sources of marine mammals. The study also indicated a harvest of 5 walrus. Walrus are rare in the Eastern Beaufort Sea and are only occasionally available. Walrus were listed in only one of four previous years when surveys were conducted (ADF&G, 1995).

Terrestrial Resources

Caribou are an important terrestrial resource for Kaktovik residents. Pedersen (1990) indicates the annual harvest ranges between 43 and 172 animals and a six year average of 126 caribou. Availability of caribou varies by year depending on the distribution of the animals. Animals from both the Porcupine and Central Arctic Caribou herds are taken near Kaktovik. This study indicated a harvest of 136 animals for calendar year 1992.

Dall sheep are another important source of red meat and an estimated 53 animals were taken. The ADF&G (1995) indicated a harvest of 47, 17 and 44 respectively for the periods

1985-6, 1986-7 and 1992-3. The data from this study and the ADF&G 1992-3 study are not directly comparable since they report on different time periods. It should be restated that the ADF&G estimates are more reliable since the reporting rate was low in this study.

Musk ox can only be taken by permit and the survey indicated a harvest of six animals. However, the actual catch was probably five (ADF&G, 1995). These animals provide a considerable (600 pounds/animal) source of red meat. Moose are also occasionally taken but none were indicated in this survey.

Fish Resources

Kaktovik residents reported an impressive fish harvest in 1992. The study indicated approximately 7,900 Arctic char harvested. These are probably actually *Dolly Varden* since the anadromous form of Arctic char is not known to occur in Alaska (ADF&G Wildlife Notebook Series, 1994; Fred DeCicco, pers. comm., 1996). Arctic cisco were also taken in substantial numbers with an estimated 7,100 fish taken. These are gill netted in the lagoon systems and along the barrier islands in summer. The ADF&G (1995) indicated catches of 5,741 Arctic char and 8,809 Arctic cisco during the period 7/1/1992 to 6/20/1993. Grayling were the third most important species with an estimated 2,600 harvested in 1992.

Bird/Waterfowl Resources

A considerable harvest (333) of Pacific brant was reported for 1992 (Table K7). During roughly the same period, 7/1/1992 to 6/20/1993, the ADF&G (1995) indicated a harvest of 378 taken. Some Canada geese were reportedly taken and approximately 180 White-fronted geese. Very few snow geese were reported taken (11) although these birds stage in tremendous numbers in the lagoons to the east of Kaktovik.

Relatively low numbers of eiders were reported taken. A few (11) Steller's eiders were reported harvested although this species does not appear in earlier studies.

Participation in Subsistence Activities

Fall whaling drew the greatest participation at the household level. Caribou hunting, sheep hunting, and fishing were similar in their participation levels with respondents indicating roughly 40% "often" participated in these activities. The bowhead whale hunt is hunted strictly in the fall in an area north and east of the village. Skiffs approximately 20 feet long are used for whaling. Caribou hunting is accessed by both boat in the summer time and snow machine after freeze up.

Timing of Activities

Arctic char (probably Dolly Varden) fishing peaked in July through September (Table K10). They are often taken by angling near the village in summer. The caribou hunt took place primarily during the summer, peaking in July when animals are forced to the coast to seek insect relief (Pedersen, 1990). Bowhead whale hunting takes place from the last week in August to the first weeks of October, depending on the timing of the migration and the success of the hunt. The bulk of the harvest, however, takes place in September. Brant and White-fronted geese are taken in April and May.

Tables and Figures for Kaktovik

Table K1. Breakdown of total harvest by subsistence harvest category for Kaktovik, Alaska, 1992. The 1993 population of Kaktovik was 230; the total number of households was 71.

Subsistence Harvest Category	Total Weight	Pounds Per Household	Pounds Per Capita
Birds	2,624	37	11
Fish	33,063	466	144
Invertebrates	0	0	0
Marine Mammals	119,884	1,689	521
Plants	219	3	1
Terrestrial Mammals	25,180	355	109
Total	180,970	2,549	787

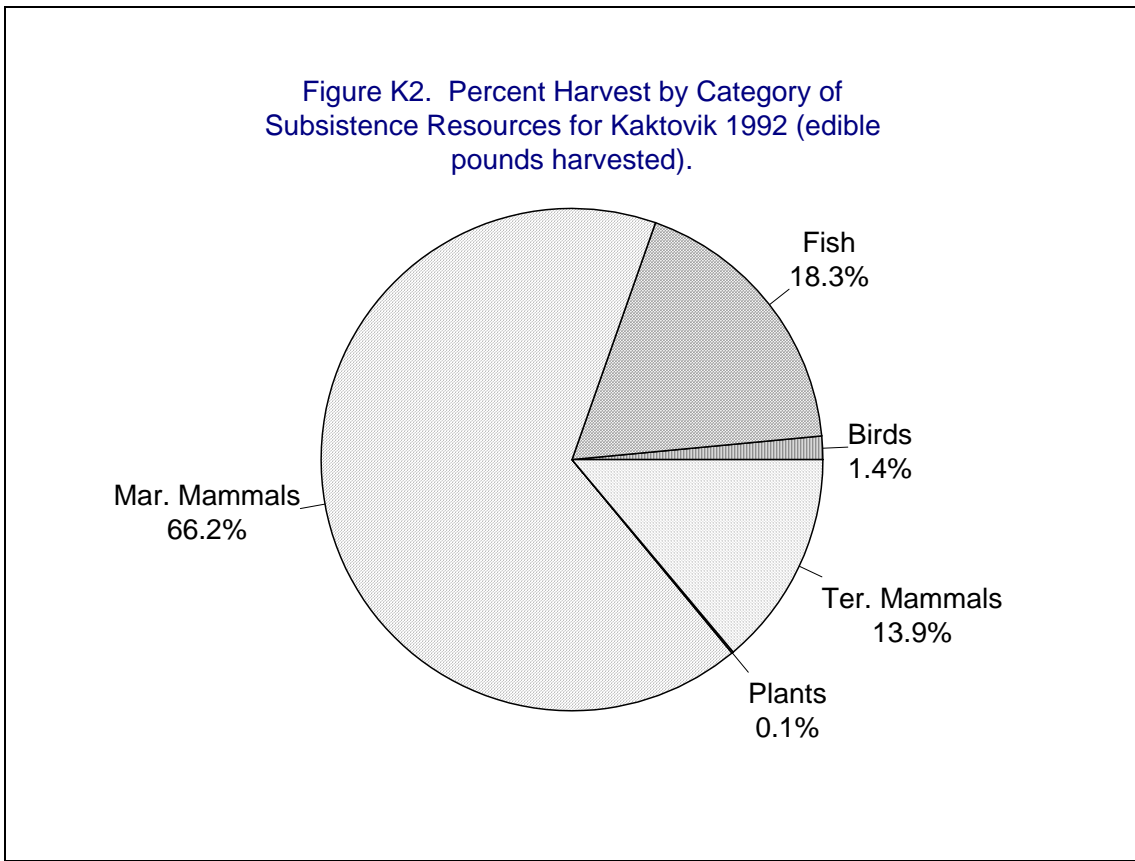


Table K3. Top Five Species Harvested at Kaktovik, Alaska during calendar year 1992.

Top Five Species Harvested	Edible Pounds Harvested	Number Harvested	Pounds Per Household	Pounds Per Capita	Percent of Total Harvest
Bowhead	108,463	3	1,528	472	59.9%
Arctic Char	22,224	7,937	313	97	12.3%
Caribou	15,926	136	224	69	8.8%
Arctic Cisco	7,143	7,143	101	31	3.9%
Dall Sheep	5,249	53	74	23	2.9%

Table K4. Participation in subsistence harvest activities, Kaktovik, Alaska, 1992. Of 71 households, 44 households participated in this survey.

Activity	Often	Some-times	Vaca-tion	Not At All	% Often	% Some-times	% Vaca-tion	% Not at all
Fall Whaling	22	4	0	18	50%	9%	0%	41%
Fish	19	10	0	15	43%	23%	0%	34%
Helped Whaling Crew	19	10	0	15	43%	23%	0%	34%
Hunt Caribou	21	8	0	15	48%	18%	0%	34%
Hunt Moose, Bear, or Sheep	20	8	0	16	45%	18%	0%	36%
Hunt Seal	14	13	0	17	32%	30%	0%	39%
Hunt Walrus	6	4	0	34	14%	9%	0%	77%
Hunt Waterfowl & Eggs	17	11	0	16	39%	25%	0%	36%
Make Sleds or Boats	8	9	0	27	18%	20%	0%	61%
Pick Berries	9	13	0	22	20%	30%	0%	50%
Sew Skins, Make Parkas	17	1	0	26	39%	2%	0%	59%
Spring Whaling	5	0	0	39	11%	0%	0%	89%
Trap	7	2	0	35	16%	5%	0%	80%

Table K10. Breakdown of subsistence harvest activity by the month it occurred for each species. Village of Kaktovik, Alaska, calendar year 1992.

Species	Responses	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Arctic Char	4	0%	0%	0%	0%	0%	0%	22%	25%	39%	14%	0%	0%
Arctic Cisco	2	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%
Arctic Cod	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%
Bearded Seal	3	0%	0%	0%	25%	25%	0%	25%	25%	0%	0%	0%	0%
Beluga	1	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%
Black Brant	3	0%	0%	0%	12%	77%	6%	0%	0%	6%	0%	0%	0%
Bowhead	7	0%	0%	0%	0%	0%	0%	0%	0%	67%	33%	0%	0%
Caribou	8	0%	0%	0%	0%	0%	4%	48%	9%	16%	16%	0%	8%
Common Eider Duck	2	0%	0%	0%	0%	0%	0%	8%	46%	46%	0%	0%	0%
Dall Sheep	3	0%	0%	0%	0%	0%	0%	0%	0%	17%	50%	33%	0%
King Eider	1	0%	0%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%
Lake Trout	1	0%	0%	33%	33%	33%	0%	0%	0%	0%	0%	0%	0%
Least Cisco	1	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%
Musk Ox	2	8%	8%	58%	0%	0%	0%	0%	0%	0%	8%	8%	8%
Oldsquaw Duck	1	0%	0%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%
Red Fox	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Ringed Seal	3	0%	0%	0%	0%	0%	0%	10%	0%	45%	45%	0%	0%
Rock Ptarmigan	1	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Round Whitefish	1	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Silver Salmon	1	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%
Snow Goose	1	0%	0%	0%	0%	50%	0%	0%	0%	50%	0%	0%	0%
Spotted Seal	1	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%
Steller's Eider	1	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%
Walrus	2	0%	0%	0%	0%	0%	0%	0%	50%	25%	25%	0%	0%
White Fronted Goose	3	0%	0%	0%	31%	69%	0%	0%	0%	0%	0%	0%	0%
Wild Rhubarb	1	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Willow Ptarmigan	1	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Wolf	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Wolverine	1	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%

*Due to the large number of invalid responses to the Months Harvested question in the survey, the number of responses useable for this analysis does not represent the number of households that harvested each species.

Nuiqsut

Nuiqsut is situated on the western side of the Colville River Delta. The Colville River is by far the largest river system on the North Slope and supports the largest over-wintering areas for whitefish (Craig, 1989). Correspondingly, Nuiqsut had by far the largest percent harvest of fish per household (and second largest per capita) of the North Slope villages. These resources have been a staple for centuries. Stefansson reported “several tons” of fish harvested near Itkillitpaat which is about 4 miles from the modern Nuiqsut village (Stefansson, 1913).

Village hunters have access to marine, riverine and terrestrial resources. This diverse harvest is reflected in the evenly distributed harvest (Figure N2). Whale hunters travel a considerable distance to Cross Island each fall to hunt bowhead whales, where two were successfully harvested in 1992. Most fishing and hunting for terrestrial species takes place either near the village or to the east and south of the village.

Nuiqsut is much closer to areas of petroleum development than any of the other villages in this study. As a result, hunters are not using areas to the east of the village to the extent that they have in past years (Brower and Opie, 1997; S. Pedersen, pers. comm., 1996). Nonetheless, the total harvest in terms of pounds per capita is similar to other villages in the study. Thus, the hunters appear to be compensating for the reduced hunting area.

Marine Resources

Marine resources dominated the subsistence harvest in 1992. This is largely due to the successful bowhead whale hunt. Nuiqsut whalers established a base camp at Cross Island and landed two whales in September 1992. The other harvested marine mammals included polar bear, bearded seal, and ringed seal. Walrus are very uncommon in the Beaufort Sea and are therefore not often available to Nuiqsut hunters.

Terrestrial Resources

Caribou and moose are the principle terrestrial resources for Nuiqsut. Most moose are harvested along the Colville River above Nuiqsut in the fall. The estimated moose harvest of 18 animals is very likely much higher than the actual harvest. However, a minimum of 10 animals can be accounted for by the survey before the Survey Total is corrected for non-responding households. In 1994, a take of 3 moose was reported to ADF&G, but the harvest may have been about 5. A harvest of about 6 to 7 moose is typical for this village (ADF&G, 1995; Brower and Opie, 1997). This estimate may have been inflated by the stratified estimation technique used in this study which is more appropriate for more frequently harvested species.

The caribou harvest was estimated at 278 for 1992 (Table N3). Estimates from other studies range from 270 for 1985 to 485 for 1993 (ADF&G, 1995). Thus, the village caribou harvest in 1992 was fairly typical for the village based on comparisons with past data.

Fish Resources

Fish are abundant near Nuiqsut, particularly in fall, since the Colville Delta has by far the largest over-wintering volume of all the North Slope river systems (Craig, 1989). Detailed quantitative studies on the Nuiqsut fishery have been conducted since 1985 (Entrix, 1986; Moulton, 1997). Their estimate for 1992 indicated that 45,402 Arctic cisco and 2,658 least cisco were taken. Since their study was essentially a direct count of fish pulled from nets, it is far more accurate than the recall data reported in this study. As shown in Table N9, harvests of 23,391 Arctic cisco and 628 least cisco were estimated, which is considerably lower than the Moulton (1997) estimate. This discrepancy could partially be due to the conversion ratios used to convert reported amounts harvested to pounds. However, it is not known why these estimates are so low.

Harvest of least and Arctic cisco varies considerably by year depending mainly on the abundance of these species within the Delta and on fishing efforts. During the 1992 season, fishermen experienced some of the highest catch rates (an index of abundance) for Arctic cisco in the past 10 years, which resulted in a very large catch (Moulton, 1997). Least cisco catches were also above the 10 year average.

The other important species taken in terms of weight are broad whitefish. The survey indicated a harvest of about 6,200 fish taken. Using large mesh, this could total 30,000 pounds of fish--or about the same weight as the Arctic cisco harvest. ADF&G (1995) data indicated a harvest of 7,900 broad whitefish in 1985.

Bird Resources

Bird hunting was primarily focused on white-fronted geese, Black brant and Common eiders. Egg taking was very modest in 1992 according to the study. The species of eggs taken were not recorded. It is highly likely that the Canada geese (319) reported were in fact white-fronted geese resulting from an identification ambiguity which also occurred in Barrow. Thus, the total harvest of white-fronted geese was probably $(279 + 319) = 598$ white-fronted geese for 1992. Canada geese nest about 20-30 miles up-river but according to villagers they are seldom taken (Eric Leavitt, pers. comm., 1995).

Participation in Subsistence Activities

The highest participation in subsistence activities was roughly split between fishing, caribou hunting, and moose/bear/sheep hunting. Because of Nuiqsut's close family ties with Barrow, a significant percent of households participated in Spring whale hunting (at Barrow) despite the fact that the village does not have its own spring hunt.

Participation in moose hunting was surprisingly high despite the low number of animals taken. This high level probably reflects the "family activity" nature of the hunt where the extended family may go up-river and take part in other activities at this time, such as berry picking and fishing.

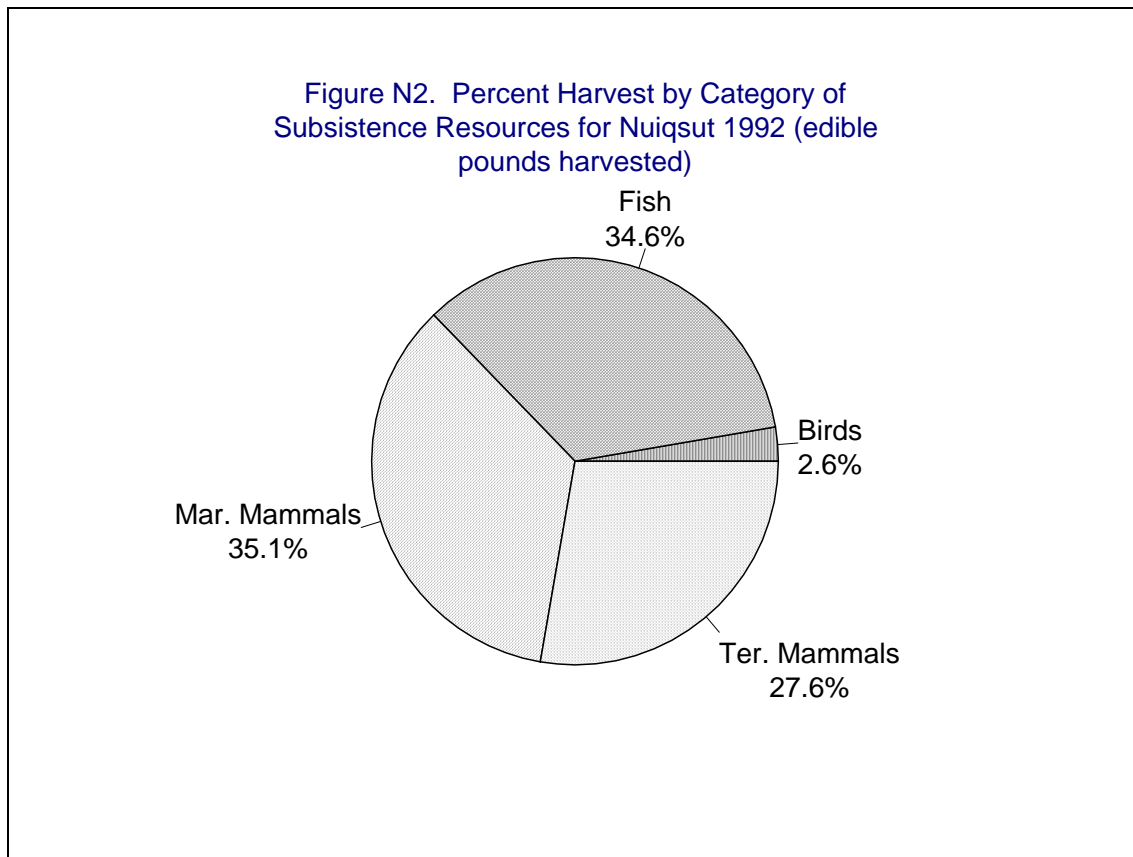
Timing of Activities

Fishing takes place in some form throughout the year, but most fishing occurs from breakup (June) through November. The largest portion of the fish harvest takes place during the fall targeting Arctic and least cisco (under-ice gill net fishery). However, in terms of pounds harvested an almost equal portion of the fish is harvested during the open water period (June-early September). Moose hunting takes place in August and September south of Nuiqsut where the hunting areas are generally accessed by boat. Waterfowl hunting is heaviest in May and June, according to this study, with little waterfowl hunting occurring in the autumn with the exception of Spectacled Eider.

Tables and Figures for Nuiqsut

Table N1. Breakdown of total harvest by subsistence harvest category for Nuiqsut, Alaska, 1992. The 1993 population of Nuiqsut was 418; the total number of households was 105.

Subsistence Harvest Category	Total Weight	Pounds Per Household	Pounds Per Capita
Birds	3,924	37	9
Fish	51,955	495	124
Invertebrates	0	0	0
Marine Mammals	52,749	502	126
Plants	65	1	0
Terrestrial Mammals	41,503	395	99
Total	150,196	1,430	359



Top Five Species Harvested	Edible Pounds Harvested	Number Harvested	Pounds Per Household	Pounds Per Capita	Percent of Total Harvest
Bowhead	48,715	2	464	117	32.4%
Caribou	32,551	278	310	78	21.7%
Arctic Cisco	22,391	22,391	213	54	14.9%
Broad Whitefish	15,621	6,248	149	37	10.4%
Moose	8,835	18	84	21	5.9%

Activity	Often	Some-times	Vaca-tion	Not At All	% Often	% Some-times	% Vaca-tion	% Not at all
Fall Whaling	22	9	1	48	28%	11%	1%	60%
Fish	39	20	0	21	49%	25%	0%	26%
Helped Whaling Crew	17	14	0	49	21%	18%	0%	61%
Hunt Caribou	42	22	0	16	53%	28%	0%	20%
Hunt Moose, Bear, or Sheep	37	16	0	27	46%	20%	0%	34%
Hunt Seal	23	17	0	40	29%	21%	0%	50%
Hunt Walrus	2	7	1	70	3%	9%	1%	88%
Hunt Waterfowl & Eggs	30	16	0	34	38%	20%	0%	43%
Make Sleds or Boats	12	20	0	48	15%	25%	0%	60%
Pick Berries	10	14	1	55	13%	18%	1%	69%
Sew Skins, Make Parkas	18	17	0	45	23%	21%	0%	56%
Spring Whaling	8	8	0	64	10%	10%	0%	80%
Trap	6	10	1	63	8%	13%	1%	79%

Table N10. Breakdown of subsistence harvest activity by the month it occurred for each species. Village of Nuiqsut, Alaska, calendar year 1992.

Species	Responses*	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Arctic Char	4	0%	0%	0%	0%	0%	0%	18%	79%	1%	1%	0%	0%
Arctic Cisco	14	0%	0%	0%	0%	0%	0%	0%	0%	36%	47%	16%	0%
Arctic Cod	1	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%
Bearded Seal	8	0%	0%	0%	0%	0%	0%	0%	64%	36%	0%	0%	0%
Black Brant	5	0%	0%	0%	0%	54%	46%	0%	0%	0%	0%	0%	0%
Blueberry	4	0%	0%	0%	0%	0%	0%	0%	94%	6%	0%	0%	0%
Bowhead	12	0%	0%	0%	17%	17%	0%	0%	0%	67%	0%	0%	0%
Broad Whitefish	13	0%	0%	0%	0%	0%	23%	32%	23%	9%	11%	3%	0%
Canada Geese	6	0%	0%	0%	0%	88%	12%	0%	0%	0%	0%	0%	0%
Caribou	18	5%	7%	5%	5%	5%	6%	12%	33%	5%	5%	5%	5%
Common Eider Duck	5	0%	0%	0%	0%	71%	12%	9%	0%	8%	0%	0%	0%
Cranberry	2	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%
Eggs	3	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Grayling	11	0%	0%	0%	0%	0%	0%	1%	3%	54%	40%	1%	0%
Humpback Whitefish	4	0%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%
King Eider	2	0%	0%	0%	0%	90%	5%	5%	0%	0%	0%	0%	0%
Lake Trout	1	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Least Cisco	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%
Ling Cod	13	12%	24%	20%	0%	0%	0%	0%	0%	0%	16%	15%	12%
Moose	13	0%	0%	0%	0%	0%	0%	0%	85%	12%	4%	0%	0%
Oldsquaw Duck	2	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Pintail Duck	1	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%
Polar Bear	4	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%
Red Fox	1	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ringed Seal	10	1%	1%	1%	1%	1%	1%	65%	22%	6%	1%	1%	1%
Rock Ptarmigan	1	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Round Whitefish	1	0%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%
Salmonberry	3	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%
Snow Goose	1	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Spectacled Eider	7	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%
Spotted Seal	1	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%
White Fronted Goose	10	0%	0%	0%	6%	94%	0%	0%	0%	0%	0%	0%	0%
Willow Ptarmigan	10	0%	0%	81%	1%	10%	3%	0%	0%	2%	2%	0%	0%
Wolf	1	20%	20%	20%	0%	0%	0%	0%	0%	0%	0%	20%	20%
Wolverine	2	20%	20%	20%	0%	0%	0%	0%	0%	0%	0%	20%	20%

*Due to the large number of invalid responses to the Months Harvested question in the survey, the number of responses useable for this analysis does not represent the number of households that harvested each species.

Point Hope

Point Hope is one of the oldest continually occupied villages in North America (Burch 1981). It is uniquely located on a spit of land that extends into the Southern Chukchi Sea and enjoys a remarkable array of resources, most notably bowhead whales.

Burch (1981) estimated the pre-contact population (ca 1850) of the Point Hope “Region” at about 1,300 people which is *greater* than it is at present. Historically and currently, the people of Point Hope consider themselves first and foremost a whaling culture. However, bowhead whales alone do not support the entire village and villagers rely on other resources as well. The village’s close proximity to lead systems allows access to migrating bowhead and beluga whales. Walrus, marine fish and invertebrates (crabs) are also available during the summer season.

Burch (1981) lists approximately 60 species harvested by the village, however, he did not estimate the number taken. This survey indicated 59 species were used in 1992 and provides the first full year all species harvest estimates for the village. Spring whaling success was poor in 1992 as it was in other Chukchi Sea villages (Wainwright and Barrow) due to onshore winds. The village does not have a fall whale harvest, so the hunters could not compensate for the low take. Bowheads apparently migrate down the west side of the Bering Strait in autumn and are not accessible at Point Hope.

Marine Resources

Point Hope landed only three bowhead whales in spring 1992 due to poor whaling conditions which affected the entire Chukchi Coast (Philo *et al.*, 1993). Still, the marine mammal harvest comprised about 77% of the total harvest by weight. The beluga harvest, estimated at 98 animals, actually exceeded the total weight of the bowhead harvest by a considerable margin. This is in part because the three whales taken at Point Hope were quite small (6-8 m). Some biologists believe that the conversion factor used in this study (1400 pounds) for beluga whales is too high and a lower estimate is more suitable (R. Suydam, pers. comm., 1996). If this is the case, the beluga whale harvest could be over represented in this study.

The edible weight of the walrus harvest also exceeded the bowhead harvest in 1992. This is apparently unusual, although since no comparative data exist it is difficult to say for sure. In other villages, such as Barrow, Wainwright, and Kaktovik, bowhead whales dominate the marine mammal harvest in terms of weight. Other marine mammal species included substantial takes of bearded, ringed and spotted seal.

Terrestrial Resources

Caribou were the only non-marine mammal species in the top five species harvested at Point Hope. As in Barrow, caribou are seasonally available and tend to move into the eastern boundary of the Point Hope hunting area in July [following the post-calving aggregations in the northern foothills of the De Long Mountains]. Burch (1981) reported accounts of dozens to hundreds of animals moving towards the village from the Kukpowruk basin to the northeast. During the early and middle portion of the 19th century when the Western Arctic Herd (WAH) was apparently quite large, small groups of caribou moved out towards the Point itself. However, this was highly variable then as it is now (Burch, 1981). It is known from personal observations that caribou moved onto the Pt. Hope peninsula and adjacent sea ice during the winter of 1995, but this was considered unusual. The WAH is currently considered to be near its maximum population size. Caribou have always been an essential source of raw materials (other than food) such as sinew for thread, skins for clothing and tents, antler for tools, etc. The survey indicated a harvest of 14 moose, probably from areas to the southeast. Fur bearers harvested included wolverine, red fox, Arctic fox and ground squirrel.

Fish Resources

The survey indicated a substantial take of grayling, Arctic char, lake trout and salmon species. The lake trout may be mistaken for their close “cousins” Dolly Varden char. Burch (1981) does not list lake trout as one of the species taken at Point Hope. According to Earl Kingik, these “lake trout” were taken in rivers and were likely Dolly Varden. The reported silver salmon are probably chum salmon (*O. keta*) although it is possible that true silver salmon are taken. The take of king salmon (*O. tshawytscha*) was surprisingly high, peaking in August. Although unlikely (because of their size), some of the king salmon catch may have been large chum salmon misidentified as king salmon which are fished in commercial numbers in Kotzebue Sound. A few such identification errors have been noted at Barrow.

Participation in Subsistence Activities

The *Subsistence Activity* survey indicated a relatively high level of participation in subsistence activities (Figures PH4, PH5). Regarding spring whaling, 80% of the households indicated they “often” or “sometimes” participated. By comparison, in Barrow the survey indicated that 34% of the households “sometimes” or “often” participated in spring whaling (Table B4). A high percentage of participation occurred for fishing as well. The low

participation in fall whaling suggests only a few hunters attempted (unsuccessfully) to take whales during autumn.

Timing of Activities

Spring whaling takes place from early April through May. Point Hope crews typically harvest whales two weeks earlier than Barrow, where intensive hunting begins in the last week of April. Ringed seal hunting took place in all but September and October. Bearded seal hunting was most prevalent from April through August. Walrus hunting peaked in June and July. It is doubtful that many walrus were taken in April as shown in Table PH10. This is probably an artifact of how the harvest was averaged over months when a less specific season was reported.

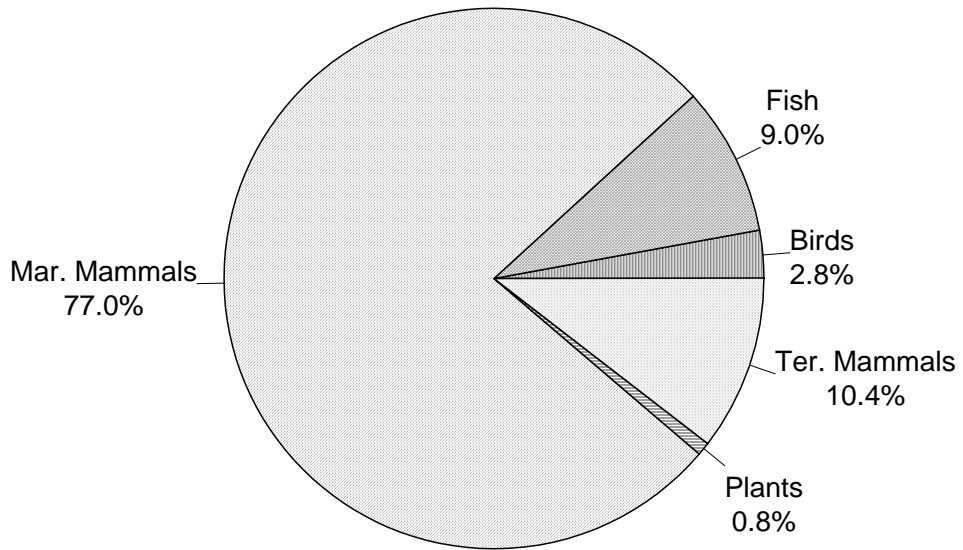
Some caribou hunting appeared to take place throughout the year, but peaked in August and September when the animals are in prime condition. The fishing activities appeared to be divided into a summer open water fishery for salmon and char and an autumn under-ice fishery for grayling. Summer fishing peaked in June, July and August while grayling fishing was confined mainly to October.

Tables and Figures for Point Hope

Table PH1. Breakdown of total harvest by subsistence harvest category for Point Hope, Alaska, 1992. The 1993 population of Point Hope was 699; the total number of households was 156.

Subsistence Harvest Category	Total Weight	Pounds Per Household	Pounds Per Capita
Birds	9,429	60	13
Fish	30,589	196	44
Invertebrates	88	1	0
Marine Mammals	262,009	1,680	375
Plants	2,720	17	4
Terrestrial Mammals	35,548	228	51
Total	340,383	2,182	487

Figure PH2. Percent Harvest by Category of Subsistence Resources for Point Hope 1992 (edible pounds harvested)



Top Five Species Harvested	Edible Pounds Harvested	Number Harvested	Pounds Per Household	Pounds Per Capita	Percent of Total Harvest
Beluga	137,172	98	879	196	40.3%
Walrus	55,797	72	358	80	16.4%
Bearded Seal	28,242	160	181	40	8.3%
Caribou	26,303	225	169	38	7.7%
Bowhead	23,365	3	150	33	6.9%

Activity	Often	Sometimes	Vacation	Not At All	% Often	% Sometimes	% Vacation	% Not at all
Fall Whaling	4	5	0	133	3%	4%	0%	94%
Fish	86	29	1	26	61%	20%	1%	18%
Helped Whaling Crew	92	27	2	21	65%	19%	1%	15%
Hunt Caribou	71	27	1	43	50%	19%	1%	30%
Hunt Moose, Bear, or Sheep	35	27	2	78	25%	19%	1%	55%
Hunt Seal	78	29	0	35	55%	20%	0%	25%
Hunt Walrus	70	33	0	39	49%	23%	0%	27%
Hunt Waterfowl & Eggs	81	27	1	33	57%	19%	1%	23%
Make Sleds or Boats	53	26	0	63	37%	18%	0%	44%
Pick Berries	81	39	1	21	57%	27%	1%	15%
Sew Skins, Make Parkas	49	35	0	58	35%	25%	0%	41%
Spring Whaling	98	16	4	24	69%	11%	3%	17%
Trap	14	22	0	106	10%	15%	0%	75%

Table PH10. Breakdown of subsistence harvest activity by the month it occurred for each species. Village of Point Hope, Alaska, calendar year 1992.

Species	Responses*	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Arctic Char	25	0%	0%	0%	1%	1%	5%	7%	42%	30%	12%	2%	0%
Arctic Cod	22	22%	24%	9%	0%	0%	0%	0%	0%	20%	19%	3%	4%
Arctic Fox	6	18%	26%	18%	0%	0%	0%	0%	0%	0%	0%	18%	18%
Bearded Seal	38	0%	0%	0%	21%	21%	36%	14%	8%	0%	0%	1%	0%
Beluga	25	0%	0%	0%	54%	46%	0%	0%	0%	0%	0%	0%	0%
Black Brant	42	0%	0%	0%	11%	11%	9%	3%	2%	41%	24%	0%	0%
Blueberry	30	0%	0%	0%	0%	0%	29%	30%	38%	1%	1%	0%	0%
Bowhead	10	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%
Broad Whitefish	2	0%	0%	0%	0%	0%	0%	0%	0%	16%	16%	68%	0%
Canada Geese	17	0%	0%	0%	25%	31%	7%	1%	3%	24%	10%	0%	0%
Caribou	44	1%	1%	1%	2%	4%	12%	14%	31%	17%	12%	2%	3%
Clam	6	0%	0%	0%	0%	0%	16%	16%	16%	15%	36%	0%	0%
Common Eider Duck	53	0%	0%	0%	36%	51%	8%	2%	2%	0%	0%	0%	0%
Crab	6	0%	0%	0%	41%	41%	4%	4%	4%	3%	3%	0%	0%
Cranberry	9	0%	0%	0%	0%	0%	32%	34%	34%	0%	0%	0%	0%
Crowberry	2	0%	0%	0%	0%	0%	0%	42%	42%	17%	0%	0%	0%
Eggs	37	0%	0%	0%	1%	1%	26%	49%	24%	0%	0%	0%	0%
Emperor Goose	1	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%
Grayling	50	0%	0%	0%	0%	0%	0%	1%	1%	5%	62%	31%	2%
Ground Squirrel	5	0%	0%	0%	13%	13%	25%	25%	25%	0%	0%	0%	0%
Hudson's Bay Tea	1	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%
Humpback Salmon	15	0%	0%	0%	0%	0%	34%	29%	28%	9%	0%	0%	0%
Humpback Whitefish	4	0%	0%	0%	2%	2%	9%	68%	14%	5%	0%	0%	0%
King Eider	39	0%	0%	0%	43%	49%	2%	2%	1%	2%	0%	0%	0%
King Salmon	24	0%	0%	0%	0%	0%	31%	31%	34%	3%	0%	0%	0%
Lake Trout	33	0%	0%	0%	0%	0%	28%	29%	33%	3%	2%	3%	1%
Moose	8	0%	0%	0%	0%	0%	21%	21%	48%	5%	5%	0%	0%
Murre	22	0%	0%	0%	20%	26%	22%	19%	8%	5%	0%	0%	0%
Oldsquaw Duck	4	0%	0%	0%	36%	36%	23%	3%	3%	0%	0%	0%	0%
Pacific Herring	1	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%
Pintail Duck	5	0%	0%	0%	30%	33%	28%	4%	4%	0%	0%	0%	0%
Polar Bear	14	9%	3%	9%	28%	34%	0%	0%	0%	0%	0%	15%	3%
Red Fox	3	18%	30%	18%	0%	0%	0%	0%	0%	0%	0%	18%	18%
Ringed Seal	40	4%	5%	6%	22%	22%	20%	8%	6%	0%	0%	2%	6%
Rock Ptarmigan	3	7%	7%	7%	7%	7%	7%	7%	7%	0%	0%	40%	7%
Round Whitefish	4	0%	0%	0%	0%	0%	22%	22%	22%	12%	12%	12%	0%
Salmonberry	73	0%	0%	0%	0%	0%	27%	32%	36%	3%	2%	0%	0%
Sandhill Crane	11	0%	0%	0%	13%	29%	35%	9%	9%	2%	2%	0%	0%
Silver Salmon	22	0%	0%	0%	0%	0%	20%	35%	30%	8%	7%	0%	0%
Smelt	2	40%	40%	0%	0%	0%	7%	7%	7%	0%	0%	0%	0%
Snow Goose	26	0%	0%	0%	27%	33%	13%	4%	4%	15%	4%	0%	0%
Snowy Owl	14	2%	2%	2%	1%	1%	1%	1%	1%	43%	37%	4%	2%
Spectacled Eider	17	0%	0%	0%	29%	45%	20%	0%	0%	5%	1%	0%	0%
Spotted Seal	12	6%	6%	7%	23%	23%	19%	9%	6%	0%	0%	0%	0%
Steller's Eider	8	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%
Walrus	27	0%	0%	0%	17%	17%	37%	22%	8%	0%	0%	0%	0%
Whistling Swan	1	0%	0%	0%	0%	0%	33%	33%	33%	0%	0%	0%	0%
White Fronted Goose	7	0%	0%	0%	22%	25%	8%	8%	8%	25%	6%	0%	0%
Wild Chives or Spinach	4	0%	0%	0%	0%	0%	33%	33%	33%	0%	0%	0%	0%
Wild Potato	1	0%	0%	0%	0%	0%	33%	33%	33%	0%	0%	0%	0%
Wild Rhubarb	3	0%	0%	0%	0%	0%	31%	31%	33%	2%	2%	0%	0%
Willow Leaves	1	0%	0%	0%	0%	0%	33%	33%	33%	0%	0%	0%	0%
Willow Ptarmigan	16	3%	1%	1%	2%	2%	1%	1%	1%	54%	28%	3%	3%
Wolverine	1	20%	20%	20%	0%	0%	0%	0%	0%	0%	0%	20%	20%

*Due to the large number of invalid responses to the Months Harvested question in the survey, the number of responses useable for this analysis does not represent the number of households that harvested each species.

Point Lay

Point Lay has the smallest population of the villages in the study (Harcharek, 1995). It is poised on Kasegaluk Lagoon near the confluence of the Kokoluk River. In this location, villagers have access to a wide variety of resources including: marine, riverine and terrestrial resources. Many species of fish, birds and mammals use the lagoon systems. The village harvest is dominated by a summer beluga whale harvest. No bowhead whales are taken in Point Lay, principally because they do not have access to them near the village site. Very little *Species Harvested* data were received for Point Lay, thus it was not possible to estimate harvest levels for this village.

Marine Resources

From personal observations and recent unpublished data, it is clear that marine resources dominate the harvest. The beluga harvest is substantial for such a small village. The harvest has averaged 40 belugas per year over the past 10 years, however, only 24 were taken in 1992 based on a direct count (Robert Suydam, pers. comm., 1997). Using a conversion rate of 1,400 pounds, this suggests that 33,600 pounds of beluga products, or 175 pounds per person, were harvested by the village in 1992. However, some biologists believe that this conversion factor is too high and that a lower estimate is more suitable (R. Suydam, pers. comm., 1997).

Participation in Subsistence Activities

A very high percentage of households participated in caribou hunting--perhaps the highest of any village. Waterfowl hunting, seal hunting and fishing were other activities which drew a high level of participation (Table PL1 and Figure PL2).

Tables and Figures for Point Lay

Table PL1. Participation in subsistence harvest activities, Point Lay, Alaska, 1992. Of 58 households, 40 households participated in this survey.								
Activity	Often	Some-times	Vaca-tion	Not At All	% Often	% Some-times	% Vaca-tion	% Not at all
Fall Whaling	2	2	0	36	5%	5%	0%	90%
Fish	23	13	0	4	58%	33%	0%	10%
Helped Whaling Crew	9	5	0	26	23%	13%	0%	65%
Hunt Caribou	31	5	0	4	78%	13%	0%	10%
Hunt Moose, Bear, or Sheep	6	13	1	20	15%	33%	3%	50%
Hunt Seal	24	6	0	10	60%	15%	0%	25%
Hunt Walrus	19	11	0	10	48%	28%	0%	25%
Hunt Waterfowl & Eggs	25	10	0	5	63%	25%	0%	13%
Make Sleds or Boats	12	18	0	10	30%	45%	0%	25%
Pick Berries	14	11	0	15	35%	28%	0%	38%
Sew Skins, Make Parkas	7	8	0	25	18%	20%	0%	63%
Spring Whaling	7	4	0	29	18%	10%	0%	73%
Trap	4	7	0	29	10%	18%	0%	73%

Wainwright

Wainwright is the second largest village on the North Slope with an estimated population of 584 in 1992. The harvest survey had a high response rate (79%) and thus the data are quite reliable. The village is sited in an area well-suited for hunting terrestrial, riverine and marine species--including bowhead whales. Wainwright hunters, however, tend to harvest mostly from the ocean . [The village has a spring bowhead whale hunt in which it is one of the most successful in terms of the recovery rate of struck whales.] Villagers have attempted to initiate a fall hunt in recent years, but have not been successful since the whales travel a considerable distance offshore (often more than 50 nm).

A comprehensive harvest survey was conducted by Braund (1993b) for the years 1988 and 1989. The two year average for the total harvest was 304,047 pounds for the years 1988 and 1989 (Braund, 1993b). This figure is only slightly higher than the estimated 1992 harvest (254,886 pounds) despite the unsuccessful whale harvest.

Marine Resources

Marine mammals contributed about 51% of the overall harvest for Wainwright in 1992. In 1988 and 1989, 79% of the harvest was attributed to marine mammals (Braund, 1993b). The 1992 season is particularly noteworthy since no bowhead whales were harvested in the spring. The authors are not aware of any other season in the last 20 years where the spring whale hunt failed due to poor weather. Regardless, Wainwright hunters were able to compensate for the unsuccessful whale harvest with other resources.

Because no bowhead whales were taken in 1992, the marine mammal harvest was dominated primarily by walrus, beluga and bearded seal. Braund (1993b) estimated that the walrus harvest averaged 106 animals for 1988 and 1989, which is somewhat higher than the 1992 estimate of 82 animals. Although walrus are more common near Wainwright than Barrow, the availability of walrus varies considerably by year and can be totally eclipsed by environmental conditions. This likely explains much of the difference in these estimates.

Beluga formed another important marine resource in 1992 with an estimated 23 animals taken. The animals reportedly entered the Kuk River lagoon near the village and “over 20 were taken” according to the personal account of Winford Ahvakana (pers. comm., 1996) which corroborates the survey estimate. The availability of beluga is quite unpredictable; for instance, only two were reported taken in 1988 by Braund. (1993b). However, they report that 30 were taken in 1987 (the year before the study) in the shallow lagoon waters (Braund, 1993b).

Terrestrial Resources

Caribou were by far the most extensively harvested terrestrial resource and were the single most important resource overall for the village in 1992, with 87,514 edible pounds (748 harvested). Wainwright ranked second in terms of the importance of caribou in the village's overall total harvest--only Anaktuvuk Pass was higher. The only other reported terrestrial resource included a single moose taken that year.

Bird Resources

Although a number of species were taken, the bulk of the harvest was of Brant, King and Common eider and White-fronted geese. The Canada geese noted in the survey were probably White-fronted geese. The take of Pacific Brant, Spectacled and Steller's eiders are of some concern since they are currently on a Federal no-hunting policy for the North Slope. Spectacled eiders are listed as a Threatened Species. The eider take was quite modest, but the Brant harvest of about 1,290 birds is substantial. The Brant harvest could be an over estimate or partly an identification problem, although this is difficult to determine. Braund (1993b) estimated a two year average of 634 Brant taken, which also suggests a fairly large harvest of these birds. The two year average for Spectacled eiders was 155 birds per year and 2 per year for Steller's eiders for the years 1988 and 1989 (Braund, 1993b).

Fish Resources

Fish catches were relatively modest compared with other villages in terms of total mass. However, the smelt fishery is considered by some to be Wainwright's greatest resource. Rainbow smelt (*Osmerus mordax*) move into the lagoon in early winter (January), where they are enthusiastically fished by many of the village's residents. [They are in close proximity to the village considered to be very delicious.] An estimated 72,527 fish were taken. The survey indicated a substantial harvest of broad whitefish; however, Braund (1993b) did not show any taken. There could have been some confusion in identification between round and broad whitefish.

Grayling and Burbot were caught in substantial numbers, probably in the river systems to the south. Salmon catches included pink, "silver," humpback and king salmon. It is likely that the silver salmon, the most abundant salmon caught, were actually chum or dog salmon in a "silvery" sea-run condition.

Participation in Subsistence Activities

As in most villages, caribou hunting drew the greatest participation (by household) of all the activities (Table W4, Figure W5), with about 68% of the households “often” or “sometimes” participating. Fishing was another popular activity, with roughly half the village participating at some level. The other important activity was spring whaling.

Timing of Activities

In general, the response to the “Months Harvested” question for this village was very poor, so the data in Table W10 should be interpreted carefully. It is generally known, however, that Wainwright is a spring whaling village where the bulk of the hunting activity takes place in May. They tend to hunt later than Barrow when the lead systems are generally wider. Caribou hunting appeared to peak in August, although some may have taken place throughout the year. Walrus hunting takes place in July and August. Braund (1993b) indicated that fishing for whitefish and grayling takes place mainly in autumn, while salmon are taken during the summer season. Smelt are taken in January and February.

Tables and Figures for Wainwright

Table W1. Breakdown of total harvest by subsistence harvest category for Wainwright, Alaska, 1992. The 1993 population of Wainwright was 584; the total number of households was 152.

Subsistence Harvest Category	Total Weight	Pounds Per Household	Pounds Per Capita
Birds	11,480	76	20
Fish	22,441	148	38
Invertebrates	16	0	0
Marine Mammals	130,755	860	224
Plants	393	3	1
Terrestrial Mammals	89,802	591	154
Total	254,887	1,677	436

Figure W2. Percent Harvest by Category of Subsistence Resources for Wainwright 1992 (edible pounds harvested)

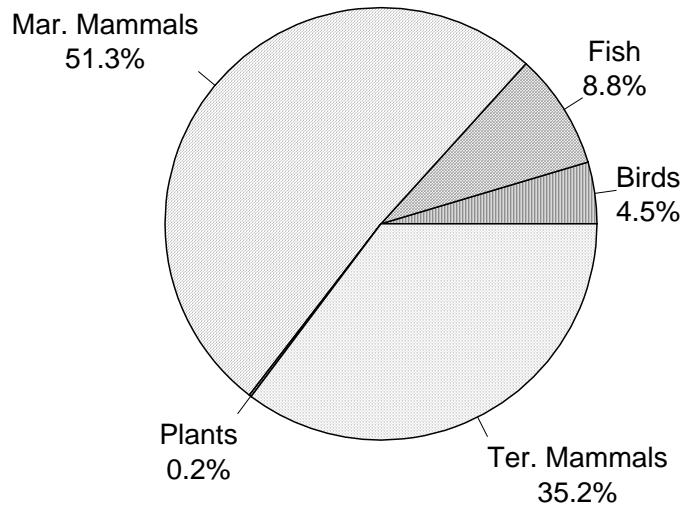


Table W3. Top Five Species Harvested at Wainwright, Alaska during calendar year 1992.

Top Five Species Harvested	Edible Pounds Harvested	Number Harvested	Pounds Per Household	Pounds Per Capita	Percent of Total Harvest
Caribou	87,514	748	576	150	34.3%
Walrus	63,614	82	419	109	25.0%
Beluga	32,321	23	213	55	12.7%
Bearded Seal	28,005	159	184	48	11.0%
Smelt	8,703	72,527	57	15	3.4%

Table W4. Participation in subsistence harvest activities, Wainwright, Alaska, 1992. Of 152 households, 120 households participated in this survey.

Activity	Often	Some-times	Vaca-tion	Not At All	% Often	% Some-times	% Vaca-tion	% Not at all
Fall Whaling	13	22	0	85	11%	18%	0%	71%
Fish	30	35	4	51	25%	29%	3%	43%
Helped Whaling Crew	18	25	1	76	15%	21%	1%	63%
Hunt Caribou	58	24	2	36	48%	20%	2%	30%
Hunt Moose, Bear, or Sheep	1	9	1	109	1%	8%	1%	91%
Hunt Seal	15	53	0	52	13%	44%	0%	43%
Hunt Walrus	12	40	0	68	10%	33%	0%	57%
Hunt Waterfowl & Eggs	17	45	2	56	14%	38%	2%	47%
Make Sleds or Boats	6	35	0	79	5%	29%	0%	66%
Pick Berries	4	33	2	81	3%	28%	2%	68%
Sew Skins, Make Parkas	9	20	1	90	8%	17%	1%	75%
Spring Whaling	28	35	2	55	23%	29%	2%	46%
Trap	3	6	0	111	3%	5%	0%	93%

Table W10. Breakdown of subsistence harvest activity by the month it occurred for each species. Village of Wainwright, Alaska, calendar year 1992.

Species	Responses*	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Arctic Cisco	1	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Bearded Seal	3	0%	0%	0%	0%	33%	33%	33%	0%	0%	0%	0%	0%
Black Brant	5	4%	4%	4%	4%	4%	11%	11%	7%	37%	7%	4%	4%
Canada Geese	3	7%	7%	7%	11%	15%	10%	7%	7%	7%	7%	7%	7%
Caribou	7	5%	5%	5%	5%	5%	9%	9%	26%	10%	10%	5%	5%
Common Eider Duck	4	4%	4%	4%	9%	43%	15%	4%	4%	4%	4%	4%	4%
King Eider	3	0%	0%	0%	13%	50%	38%	0%	0%	0%	0%	0%	0%
Ling Cod	1	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Pintail Duck	1	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%
Polar Bear	1	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%
Ringed Seal	3	0%	0%	0%	0%	25%	75%	0%	0%	0%	0%	0%	0%
Rock Ptarmigan	1	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%
Salmonberry	2	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%
Smelt	3	26%	26%	22%	0%	0%	0%	0%	0%	0%	0%	4%	22%
Spectacled Eider	2	0%	0%	0%	7%	87%	7%	0%	0%	0%	0%	0%	0%
Spotted Seal	1	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%
Walrus	1	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
White Fronted Goose	3	0%	0%	0%	21%	50%	29%	0%	0%	0%	0%	0%	0%

*Due to the large number of invalid responses to the Months Harvested question in the survey, the number of responses useable for this analysis does not represent the number of households that harvested each species.

Suggestions for Future Harvest Documentation Programs

Many problems were encountered during this census ranging from interview problems to analytical problems. A few strict guidelines are needed if such an extensive survey is to be conducted again. These include:

- The principal problem with the design of the census was that the form was far too long. The subsistence section should be separated from the economic/demographic questions. The demographic and subsistence queries should probably be done on separate years. The NSB Department of Wildlife Management also collects harvest data. The subsistence section of the census should probably be dropped or coordinated with the harvest data collection of the Department of Wildlife Management.
- A North Slope field guide with good pictures of all subsistence species is needed to assist in the interviews. Also, field staff need to be thoroughly trained prior to conducting the interviews in identifying species and collecting the data under the strict guidelines established by the Wildlife Department and Alaska Department of Fish and Game to protect anonymity and allow residents to review the reports prior to publication.
- Harvest calendars should be circulated prior to the survey if the one-year recall method is used.
- Harvest location data should be collected.
- Units need to be better standardized (i.e., use only quarts for berries) and weight conversions need to be re-examined.

REFERENCES

- Alaska Department of Fish and Game (ADF&G). 1995. Community Profile Database. Volume 5. Arctic Region. Alaska Department of Fish and Game, Division of Subsistence, Juneau, Alaska.
- Ahvakana, Winford. 1996. Personal Communication. General Delivery, Wainwright, AK.
- Bockstoce, J. 1988. The Journal of Rochfort Maguire 1852-54: two years at Pt. Barrow, Alaska, aboard H.M.S. Plover in the search of Sir John Franklin. Volumes I and II, The Hakluyt Society, London, England. 584 pp.
- Braund, Stephen R. and Associates, 1993*a*. The North Slope Subsistence Study: Barrow, 1987, 1988, 1989. Submitted to the US Department of Interior, Minerals Management Service, Alaska OCS Region, Anchorage, Alaska. 234 pages and appendixes A through D.
- Braund, Stephen R. and Associates, 1993*b*. The North Slope Subsistence Study: Wainwright, 1988 and 1989. Submitted to the US Department of Interior, Minerals Management Service, Alaska OCS Region, Anchorage, Alaska. 221 pages and appendixes A through D.
- Brower, Jr., Harry. 1996. Personal Communication, North Slope Borough, Department of Wildlife Management, Barrow, Alaska 99723.
- Brower, H.K. and Opie, R. T. 1996. North Slope Borough subsistence harvest documentation project: Data for Anaktuvuk Pass, Alaska for the period July 1, 1994 to June 30, 1995. Department of Wildlife Management, North Slope Borough, Box 69, Barrow, AK 99723.
- Brower, H.K. and Opie, R.T. 1997. North Slope Borough subsistence harvest documentation project: Data for Nuiqsut, Alaska for the period July 1, 1994 to June 30, 1995. Department of Wildlife Management, North Slope Borough, Box 69, Barrow, AK 99723.
- Carroll, G. 1996. Personal communication. Alaska Dept. of Fish and Game, Box 1284 Barrow, AK 99723.
- Burch, E. 1981. The traditional Eskimo hunters of Point Hope, Alaska 1800-1875. Published by the North Slope Borough, Box 69, Barrow, Alaska 99723. [Available from the Inupiat History and Language Commission, NSB, Barrow, AK].
- Craig, P. 1989. An introduction to anadromous fishes in the Alaskan Arctic. In: Research advances on anadromous fish in Arctic Alaska and Canada. Biological Papers of the University of Alaska 24:27-54.
- DeCicco, F. 1996. Personal Communication. Alaska Department of Fish and Game, 1300 College Rd., Fairbanks, AK.

- Entrix, Inc. 1986. Colville River Fish Study. 1985 Annual Report. Prepared by Entrix, Inc. for ARCO Alaska, Inc., North Slope Borough, and City of Nuiqsut.
- George, J.C., Philo, M.P., Carroll, G.M. 1990. Observations on weights of subsistence harvested bowhead whales. Fifth Conference on the Biology of the Bowhead Whale.
- Hall, E., Gerlach, S. C., Blackman, M.B. 1985. In the National Interest: A geographically based study of Anaktuvuk Pass Inupiat subsistence through time. North Slope Borough, Barrow, Alaska. 99723. [Available from the Inupiat History and Language Commission, NSB, Barrow, AK].
- Harcharek, Robert. 1995. North Slope Borough 1993/94 Economic Profile and Census Report. Copies available from: North Slope Borough, Planning Department, Box 69, Barrow, Alaska 99723.
- Leavitt, Eric. 1996. Personal Communication. General Delivery, Nuiqsut, Alaska.
- Moulton, L.L. 1997. The 1996 Colville River Fishery. The 1997 Endicott Development Fish Monitoring Program. Volume II. Compiled by LGL Alaska Research Assoc. for BP Exploration (Alaska) Inc., Anchorage, and North Slope Borough, Barrow, Alaska.
- National Geographic Society. 1983. Field Guide to Birds of North America. National Geographic Society, Washington, D.C. 464 p.
- Pedersen, S. 1990. Caribou hunting: land use dimensions, harvest levels, and selected aspects of the hunt during regulatory year 1987-88 in Kaktovik, Alaska. Alaska Dept. of Fish and Game, Division of Subsistence, Technical Paper No 172. 43pp.
- Pedersen, Sverre. 1995. Personal Communication. Alaska Department of Fish and Game, Division of Subsistence, Fairbanks, Alaska 99701.
- Philo, L. M., George, J.C., Suydam, R., Albert, T.F., and Ramey, D. 1994. Report of field activities of the spring 1992 census of bowhead whales, *Balaena mysticetus*, off Point Barrow, Alaska with observations on the subsistence hunt of bowhead whales 1991 and 1992. Rep. int. Whal. Commn. 44:335-342.
- Romans, J., Costello, W., Jones, K., Carlson, C., and P. Zeigler. 1984. The meat we eat. Interstate Printers and Publishers, Inc. Danville, IL. Scott, Cheryl L., Paige, Amy W., Jennings, Gretchen, and Brown, Louis, 1992. Conversion Factors Used to Calculate Pounds of Edible Weight For Subsistence Resources by Region and Project. Division of Subsistence, Alaska Department of Fish and Game, 65pp.
- Sonnenfeld, J. 1956. Changes in subsistence among the Barrow Eskimo. Unpublished Ph.D. dissertation. Johns Hopkins University, Baltimore, MD.

Stefansson, V. 1913. My life with the Eskimo. The Macmillan Company, New York, NY, 538 pp.

Suydam, Robert. 1996, 1997. Personal communication. North Slope Borough, Department of Wildlife Management, Box 69, Barrow, AK 99723.

Suydam, R.S., Angliss, R.P., George, S.R. Braund, D.P. DeMaster. 1995. Revised data on the subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaska Eskimos, 1973-1993. Rep. Int. Whal. Commn. 45:335-338. Suydam, R., Quakenbush, L., Johnson, M., George, J.C., and Young, J. 1997. Migration of king and common eiders past Point Barrow, Alaska, in spring 1987, spring 1994, and fall 1994. In: king and common eiders of the Western Canadian Arctic, Occasional paper No. 94. Canadian Wildlife Service, Environment Canada, Edmonton AB T6B 2X3. 75p.

Wildlife Notebook Series. 1994. Alaska Department of Fish and Game. Public Communications Section, Box 22526, Juneau, Alaska 99802-5526.

APPENDIX 1. Survey form used on the NSB Subsistence Harvest Study.

APPENDIX 2. Weight conversion table.

Table APX2-1. Conversion factors used to calculate edible pounds as a common unit.

Species	Unit	Conversion Factor*
Arctic Char	individual	2.8
Arctic Char	sack (gunny)	125
Arctic Cisco	individual	1
Arctic Cisco	sack (gunny)	100
Arctic Cod	individual	0.2
Arctic Cod	sack (grocery)	16
Arctic Cod	ziploc bag	5
Arctic Fox	individual	no translation
Bearded Seal	individual	176
Beluga	individual	1400
Bering Cisco	individual	1
Bering Cisco	sack (gunny)	100
Black Brant	individual	3
Blueberry	gallons	4
Blueberry	ziploc bags	4
Bowhead	individual	no translation
Broad Whitefish	sack (gunny)	125
Broad Whitefish	individual	2.5
Canada Geese	individual	4.5
Capelin	individual	0.2
Capelin	sack	16
Caribou	individual	117
Clam	gallon	3
Clam	individual	0.25
Clam	individual (small)	0.13
Common Eider Duck	individual	1.5
Crab	individual	0.7
Cranberries	gallon	4
Cranberries	ziploc bags	4
Crowberries	gallon	4
Crowberries	ziploc bags	4
Dall Sheep	individual	99
Eggs	individual	0.15
Emperor Goose	individual	4.3
Flounder	individual	0.5
Flounder	sack	18
Four Horned Sculpin	individual	0.6
Grayling	individual	0.8
Grayling	sack (gunny)	72

Great Scaup	individual	no translation
Grizzly Bear	individual	no translation
Ground Squirrel	individual	0.41
Hudson's Bay Tea	gallon	4
Humpback Salmon	individual	3.1
Humpback Salmon	sack	125
Humpback Whitefish	individual	2.5
Humpback Whitefish	sack	125
King Eider	individual	1.5
King Eider	sack, bag	18
King Salmon	individual	18
King Salmon	sack, bag	125
Lake Trout	individual	4
Lake Trout	sack	125
Least Cisco	individual	1
Least Cisco	sack	100
Ling Cod	individual	4
Ling Cod	sack	125
Lynx	individual	no translation
Marmot	individual	no translation
Moose	individual	500
Murre	individual	1.5
Murre	sack	18
Musk Ox	individual	593
Northern Pike	individual	4.5
Oldsquaw Duck	individual	1.5
Oldsquaw Duck	sack	18
Pacific Herring	gallon	5
Pintail Duck	individual	1.5
Pintail Duck	sack	18
Polar Bear	individual	100
Red Fox	individual	no translation
Ringed Seal	individual	42
Rock Ptarmigan	individual	0.7
Round Whitefish	individual	1
Round Whitefish	sack	50
Salmonberry	gallon	4
Salmonberry	ziploc bag	4
Sandhill Crane	individual	6
Silver Salmon	individual	6
Silver Salmon	sack	125
Smelt	individual	0.12
Smelt	sack	10
Snow Goose	individual	4.5
Snowshoe Hare	individual	2
Snowy Owl	individual	no translation
Spectacled Eider	individual	1.5
Spectacled Eider	sack	18

Spotted Seal	individual	42
Steller's Eider	individual	1.5
Steller's Eider	sack	18
Walrus	individual	772
Weasel	individual	no translation
Whistling Swan	individual	10
White Fronted Goose	individual	4.5
Wild Chives or Spinach	gallon	4
Wild Chives or Spinach	ziploc bag	4
Wild Potato	gallon	8
Wild Potato	ziploc bag	8
Wild Rhubarb	gallon	4
Wild Rhubarb	ziploc bag	4
Willow Leaves	gallon	4
Willow Leaves	ziploc bag	4
Willow Ptarmigan	individual	0.7
Wolf	individual	no translation
Wolverine	individual	no translation

*The two primary sources for these conversion factors are Braund (1993a,b) and Scott (1992).

APPENDIX 3. List of Bowhead Whales Landed by North Slope Villages in 1992.

Figure APX3-1.

Basic harvest data and estimated mass or “weight” (in metric tons) for bowhead whales landed at Barrow, Kaktovik, Point Hope and Wainwright. Calwt = the estimated mass using a length-girth model ($W=38.5*\text{Length (m)}*\text{Girth(m)}^2$). PolyFit = weight estimate using a second-order polynomial model, Combdata = the combined data using estimated length-girth weight and weight using the polynomial model. Note: whale 92FD1 was recovered as a stinker and only the maktak was salvaged.

Village	Whale ID	Date Landed	Len. (m)	Sex	Calwt	Poly Fit	Combdata
BRW	92B1	5/28/92	8.5	F	16.89		16.89
BRW	92B2	5/29/92	15.7	F		63.81	63.81
BRW	92B3	8/31/92	14.6	F	46.70		46.70
BRW	92B4	9/1/92	16.23	F	65.26		65.26
BRW	92B5	9/2/92	13.7	M	55.09		55.09
BRW	92B6	9/2/92	14.6	M	57.83		57.83
BRW	92B7	9/2/92	14.2	F	54.09		54.09
BRW	92B8	9/3/92	15.7	F	67.43		67.43
BRW	92B9	9/4/92	15	F	52.77		52.77
BRW	92B10	9/12/92	14.6	F	49.91		49.91
BRW	92B11	9/17/92	15	M	52.95		52.95
BRW	92B12	9/19/92	12	F	27.91		27.91
BRW	92B13	9/23/92	15	F	45.64		45.64
BRW	92B14	9/25/92	14.5	M	44.67		44.67
BRW	92B15	9/26/92	11.7	M	24.21		24.21
BRW	92B16	9/26/92	11	M	20.15		20.15
BRW	92B17	10/8/92	7.5	F	8.23		8.23
BRW	92B18	10/9/92	8.8	M	12.37		12.37
BRW	92B19	10/9/92	10.5	F	21.22		21.22
BRW	92B20	10/12/92	8.5	F	10.85		10.85
BRW	92B21	10/13/92	10	M	13.58		13.58
BRW	92B22	10/13/92	9.8	F	16.20		16.20
BTI	92KK1	8/23/92	15.2	F		57.38	57.38
BTI	92KK2	8/30/92	14.2	F		45.77	45.77
BTI	92KK3	9/3/92	11	F		19.85	19.85
NUI	92N1	9/17/92	10.1	M		15.63	15.63
NUI	92N2	9/21/92	13.6	M		39.61	39.61
PHO	92H1	4/30/92	8.5	F		11.49	11.49
PHO	92H2	5/1/92	8.2	M		11.19	11.19
PHO	92FD1	7/2/92	6.9	F		3.82	3.82