

**The Subsistence Harvest of Seals and
Sea Lions by Alaska Natives in Three
Communities of the Yukon-Kuskokwim
Delta, Alaska, 1997-98**

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INTRODUCTION

This report describes the harvests of seals and sea lions in the communities of Emmonak, Hooper Bay, and Quinhagak, located on the coast of the Yukon-Kuskokwim Delta. The harvest information comes from household surveys conducted during late winter-early spring 1998 and interviews with key respondents in each community. The research was a joint effort between the Alaska Department of Fish and Game, Division of Subsistence, and Emmonak Village, Native Village of Hooper Bay, and Native Village of Kwinhagak (the tribal governments of the three communities). The research was funded by the National Oceanic and Atmospheric Administration.

Marine mammals, including seals, are important subsistence resources in the coastal area of the Yukon-Kuskokwim Delta region (Fig. 1). This report describes the subsistence harvest and use of bearded seal (*Erignathus barbatus*), ribbon seal (*Phoca fasciata*), ringed seal (*Phoca hispida*), spotted seal (*Phoca largha*), and Steller sea lion (*Eumetopias jubatus*) over a 12-month period. It includes information on the number of animals harvested, sex and age of animals harvested, seasons that animals were taken, numbers of animals struck and lost, and the percentage of households harvesting, using, and sharing seals and sea lions. The research was modeled after previous seal research conducted by the Division of Subsistence in other communities throughout coastal areas of Alaska, particularly in the Gulf of Alaska, Alaska Peninsula, Bristol Bay, and Bering Straits regions of Alaska (Wolfe and Mishler 1996, Georgette, Coffing, Scott and Utermohle 1998). Little information on the subsistence harvest and use of seal and sea lions had been gathered in the Yukon-Kuskokwim Delta region. Previous research conducted by the Division of Subsistence on the Yukon-Kuskokwim Delta in the 1980s included harvest estimates for nine communities (CPDB 1998). This report focuses on

three communities and provides more detailed information on harvests than earlier reports.

METHODOLOGY

Seals are harvested by all coastal and near-coastal communities in the Yukon-Kuskokwim region. Constraints of money, time, and staff prevented the collection of data from every community. The three communities of Emmonak, Hooper Bay, and Quinhagak were selected because of their geographic locations, the desire to get a wide geographic representation of harvests, and by the willingness of the communities to participate in the study. Quinhagak was selected because of its location in southern Kuskokwim Bay and the interest to learn if harbor seals were being taken there, as they were south of Cape Newenham. Both Quinhagak and Emmonak had established natural resource offices under their tribal governments and had staff particularly positioned to deal with natural resource related projects.

The survey covered a 12-month period from March 1, 1997 through February 1998. In each community, the Traditional Council approved the study. The survey instrument used was similar to the one used the previous year in the Bering Strait region (Appendix A). Household respondents were asked to recall information about the harvest and use of seal and sea lions by everyone in their household. Included on the survey forms were questions about hunting and using seal, sharing and receiving, and struck and loss. Respondents were asked to recall the sex and approximate age of animals they harvested and the month each animal was taken.

Local research assistants were hired in each community and trained by the project manager. Five of the six research assistants hired were seal hunters, familiar with the area used by the community and comfortable in talking with other hunters about

harvest and use of seal and sea lion. The surveys began in February 1998 and were completed in early May. The completed surveys were reviewed by the project manager before being forwarded to Division of Subsistence data management staff in Anchorage for data entry and analysis.

Respondents were informed of the purpose of the project, that their participation of the project was voluntary, and that their individual household information would remain confidential. Respondents were not paid for their participation.

Sampling methods varied by community. In Emmonak and Quinhagak, households were stratified into two groups -- those that hunted seal and those that did not hunt seal. This stratification was done with the input from the natural resource staff in each community and with the help of the assistants hired to conduct the surveys. A simple random sampling method was used in Hooper Bay (Table 1). Prior to beginning the surveys, the research assistants were each provided a list of all households in their community. These lists were provided by the tribal office and updated prior to the surveys. Only Alaska Native households were included in the surveys. A "Native" household was defined as any household having at least one adult Alaska Native occupant. Because of the size of the communities, there was no intention to survey all of the households. Instead, the goal was to survey as many of the seal hunting households in Quinhagak and Emmonak as possible, and a proportion of the non-hunting households as well. In Hooper Bay, the goal was to survey 50 percent of the total households. The percentages of households surveyed were 46 percent in Emmonak, 49 percent in Hooper Bay, and 70 percent in Quinhagak (Table 1). A total of 249 households (53 percent) were surveyed in the three communities.

Division of Subsistence staff also conducted key respondent surveys with a total of 18 residents in the communities. Key respondents were identified by the tribal government staff as people that were knowledgeable about seals and could share

information about seal ecology and distribution. A map of the area was used to initiate the discussion. A set of questions outlined on an interview guideline (Appendix B) were used to facilitate the sharing of information and local knowledge. A local assistant helped translate information during these interviews.

A summary of the statistical analysis of the harvest data by species and by each community is presented in Appendices C and D at the end of this report. These appendices include information about the sampling design, percentage of households harvesting, using, and sharing seals and sea lions, reported and estimated community harvest and take, sex and age information of seals and sea lions harvested, month of harvests and struck and lost, and number of seals and sea lions struck and lost.

In some instances the month of harvest of a seal was unknown. During the analysis, these animals were assigned a harvest month based on a percentage of the known harvest and take. This is presented in the portion of the tables labeled "Seasonally Adjusted Harvest and Take (Expanded)".

REGIONAL SETTING

There are 21 communities located in the coastal region of the Yukon-Kuskokwim Delta (Table 2). The estimated population of these combined communities is approximately 9,000 people. The per capita harvest of fish and wildlife within the region is among the highest in the state. The Yukon-Kuskokwim Delta supports a large population of seasonally available migratory waterfowl and a rich variety of anadromous and resident fish species. Moose, caribou, and bear are available in upland areas. Marine mammals play an important role in the subsistence diet of residents. Residents of other communities not situated along the coast also participate in seal hunting and

obtain seal meat, seal oil, and seal hides through gift giving, bartering, and trading with friends and extended family members within the region and beyond.

Seals are hunted all along the coast. Seal are also commonly harvested within the rivers and sloughs during spring, summer, and fall. Seal have been harvested up the Kuskokwim River as far as Kwethluk, located 100 miles from saltwater, and Pilot Station located on the Yukon River.

THE SUBSISTENCE TAKE OF SEALS AND SEA LIONS IN 1997-98

Harvest Levels

Hunters in Emmonak, Hooper Bay, and Quinhagak took an estimated total of 1,472 seals during the 12-month survey period (Table 3). In addition, two sea lions were reported harvested in Hooper Bay during this time. Ringed seal accounted for 736 (50 percent) of all seals taken (Table 4). Bearded seal accounted for 422 (29 percent), spotted seal for 300 (20 percent), and ribbon seal for 13 (1 percent). Of the total estimated seal take, 139 seals (9 percent) were struck and lost and 1,335 seals (91 percent) were harvested.

Per Capita Seal and Sea Lion Harvests

The per capita seal harvest of all seals combined was .67 animals per Alaska Native living in the three communities (Table 5). The per capita harvest was greatest for ringed seal (.37) and lowest for ribbon seal (.01). The per capita harvest of sea lion was less than .01. The per capita seal harvest was highest for Hooper Bay at .74 animals, followed by Emmonak at .65, and Quinhagak at .58 animals per Alaska Native.

Geographic Distribution of Seal and Sea Lion Takes

The highest proportion of the total seal take came from the communities of Emmonak and Hooper Bay. These two communities are generally better situated for favorable sea ice conditions that result in better seal hunting than Quinhagak, located on south Kuskokwim Bay. Key respondents in Emmonak and Hooper Bay reported that seal hunting was best when there were north and northwesterly winds that pushed the sea ice, and the seals with it, towards shore. The coastal area near Quinhagak is often opened and free of ice, primarily due to the currents caused by the Kuskokwim River emptying into Kuskokwim Bay.

Ringed seal was the most common seal type taken by hunters in Hooper Bay and Quinhagak (Table 4). In Emmonak, bearded seal was the seal most often taken. All three communities reported taking each of the four types of seal. Nearly 50 percent of the total spotted seal take was at Quinhagak. Compared to Emmonak and Hooper Bay, Quinhagak took a relatively low proportion of bearded seal (Table 4). Emmonak hunters took the majority of the ribbon seals. Although sea lions were known and observed occasionally by hunters in Emmonak and Quinhagak, only in Hooper Bay were sea lions taken during the study period.

Seasonal Distribution of Seal and Sea Lion Takes

Seals were harvested during every month of the study period, with peaks in spring and fall (Fig. 5). The majority of the overall harvest (71 percent) occurred during three months -- March, April and September. The take of seals was lowest during June, July, and November through February. Bearded seal were harvested from March through October. March, April, September and October were important months for hunters to take bearded seal. Ribbon seal were taken only during May, September, and October. Ringed seal were taken primarily during March, April, May, and September.

Spotted seal takes occurred primarily during March through May and August through October. Sea lion were taken only during June. Both Quinhagak and Hooper Bay followed a pattern of increased take during the spring (March and April). Emmonak, however, exhibited a pattern of highest take during September (Appendix D).

Age and Sex of Seal and Sea Lion Harvests

The age and sex of harvests by species are shown in Tables 7 to 11. Adult seals comprised about 67 percent of the seals taken. Juvenile seals comprised approximately 28 percent of the harvest. Approximately 50 percent of the bearded seals and 52 percent of the ribbon seals harvested were juveniles (Table 7 and 10). Hunters had relatively little difficulty recalling the age category of the seals they harvested. Hunters were less certain of the sex of the seals they caught. Of all seals harvested, nearly half (49.8 percent) were reported as “unknown sex” (Table 6). The sex of juvenile seals was particularly difficult for hunters to recall.

Hunting Participation and Harvest Success

Approximately 56 percent of the Alaska Native households in the three communities hunted seal (Table 12). Nearly all (91 percent) that hunted were successful in their attempts. Household participation in seal hunting was highest in Emmonak (61 percent). Hunting success was highest in Quinhagak (100 percent). Use of seals by Alaska Native households was high in each of the communities and averaged over 85 percent overall. A very small percentage (1.3 percent) of households hunted sea lion. About twice that amount (3 percent) reported using sea lion during the previous twelve months (Appendix C).

Some households were relatively more successful harvesting seals than other households. Even though a significant proportion of community households hunted seal,

approximately 70 percent of the seals were taken by only 30 percent of the hunting households (Figs. 6, 7, 8, and 9). A relatively small proportion of highly successful hunting households took the majority of the seals harvested.

Bearded seal and ringed seal were the seals hunted most often (Table 13). Approximately one-third (32.9 percent) of households reported hunting spotted seal. Ribbon seal and sea lion were hunted by relatively few households -- 4.2 percent and 1.3 percent respectively. Harvest success was highest for those households that hunted ringed seal (85.8 percent). Harvest success for households hunting bearded seal and spotted seal was also high (76.9 and 74.2 percent). Only 50 percent of households that hunted ribbon seal and one-third of sea lion hunting households were successful (Table 13).

Bearded seal and ringed seal were shared or given away to other households more than any other seal (Appendix C). Sharing and distribution of seal and sea lion was common across harvesting households.

Population Status and Health of Seal and Sea Lion in the Region

Most key respondents reported that the seal populations in the region were healthy. Animals that were being harvested were reported to be in good condition and fat. There were occasions when hunters reported taking a seal that appeared to be missing fur on part of its body, however, this was generally attributed to the seal molting or laying out in the sun. Some residents of Emmonak and Hooper Bay reported that the number of bearded seal had declined in their areas. Quinhagak hunters reported that bearded seal populations in their area were stable or increasing. A common thread across the communities was the observation that seal populations vary year to year and that seal abundance and availability were strongly linked to ice and wind conditions. However, beyond the normal year-to-year variation, residents believed that seal

populations were stable. Respondents were less certain about sea lion populations. Some residents reported that they see them so rarely that was difficult to tell if sea lion populations had changed. Only in Hooper Bay did respondents indicate that the sea lion populations in the area had declined over time. Quinhagak residents commented that sea lions were more common in the Goodnews Bay and Cape Newenham area, south of them. Quinhagak respondents reported that spotted seal were the most common and abundant seal near their community. This is clearly reflected in the harvest data.

Some hunters in each community indicated that they preferred bearded or ringed seal for meat and oil. A few hunters reported that any seal is a gift and that they were happy to receive any type of seal they could harvest.

Although hunters were aware of sand islands where seals routinely hauled out, they were not aware of any seals that pupped on land anywhere in their community's use area. All of the seal pupping observed took place on ice. Hunters on occasion observed young sea lions (juveniles, not pups), usually swimming alone. Hunters reported sea lion haulouts at Cape Romanzof and at Cape Newenham.

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TABLE 1. SAMPLING METHODOLOGY BY COMMUNITY, YUKON-KUSKOKWIM DELTA SEAL AND SEA LION SURVEYS, 1997-98

Community	Estimated 1997 Native Population	Number of Native Households	Type of Sampling Design	Number of Households Surveyed	Percent of Households Surveyed	Key Respondents Interviewed
Emmonak	646	163	Two Strata	75	46.0%	6
Hooper Bay	858	195	Random	95	48.7%	5
Quinhagak	481	113	Two Strata	79	69.9%	7
Total	1,985	471		249	52.9%	18

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

TABLE 2. POPULATION OF YUKON-KUSKOKWIM DELTA COASTAL COMMUNITIES, 1990 AND 1997

Community	1990 Census Population	1997 Estimated Population
Kotlik	461	461
Emmonak	642	798
Alakanuk	544	651
Sheldon Point	109	150
Scammon Bay	343	459
Chevak	598	721
Hooper Bay	845	1,012
Newtok	207	269
Tununak	316	330
Toksook Bay	420	496
Nightmute	153	206
Mekoryuk	177	192
Chefornak	320	405
Kipnuk	470	567
Kwigillingok	278	333
Kongiganak	294	349
Tuntutuliak	300	351
Eek	254	277
Quinhagak	501	567
Goodnews Bay	241	263
Platinum	64	41
Total	7,537	8,898

Source: Alaska Department of Labor 1998.

TABLE 3. ESTIMATED SUBSISTENCE TAKES OF SEALS AND SEA LIONS BY ALASKA NATIVES IN EMMONAK, HOOPER BAY, AND QUINHAGAK, 1997-98

	Harvest	Estimated Total Struck And Lost	Total Take	Lower and Upper Confidence Range for Total Take
Bearded Seal	377.7 89.4%	44.7 10.6%	422.4 100.0%	254 - 609
Ribbon Seal	12.9 100.0%	0 0.0%	12.9 100.0%	7 - 25
Ringed Seal	679.5 92.2%	57.2 7.8%	736.7 100.0%	538 - 960
Spotted Seal	263.4 87.7%	37.1 12.3%	300.5 100.0%	228 - 375
Sea Lion	2.1 100.0%	0 0.0%	2.1 100.0%	1 - 5
All Seals/S.Lions	1,335.5 90.6%	139.0 9.4%	1,474.5 100.0%	1,042 - 1,907

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998

TABLE 4. SPECIES COMPOSITION OF SEAL TAKE AT EMMONAK, HOOPER BAY, AND QUINHAGAK, 1997-98

Community	Percent of Each Community's Total Seal Take				
	Bearded Seal	Ringed Seal	Spotted Seal	Ribbon Seal	Sea Lion
Emmonak	47.2	35.8	15.4	1.5	0.0
Hooper Bay	43.2	60.9	12.2	0.6	0.3
Quinhagak	10.3	45.2	43.8	0.6	0.0
Total	28.6	50.0	20.4	0.9	0.1

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

TABLE 5. SUBSISTENCE SEAL AND SEA LION HARVEST, TAKE, AND USE BY ALASKA NATIVES IN THREE YUKON-KUSKOKWIM DELTA COMMUNITIES, 1997-98 WITH CONFIDENCE INTERVALS AND STATISTICAL RANGES

	Number Of Animals Harvested Per Capita	Percent of Native Households Harvesting	Percent of Native Households Using	Estimated Number Harvested	Estimated Number Struck and Lost	Total Take	Total Take		
							Confidence Interval (+/- %)	Lower Range Estimate	Upper Range Estimate
BEARDED SEAL									
Emmonak	.31	40.8%	85.6%	198.4	6.7	205.1	63.9%	92.0	336.1
Hooper Bay	.17	36.8%	75.8%	145.7	36.9	182.7	27.5%	132.5	232.9
Quinhagak	.07	22.2%	28.3%	33.6	1.1	34.6	15.9%	30.0	40.1
Total	.19	34.7%	67.8%	377.7	44.7	422.4	44.2%	254.5	609.1
RIBBON SEAL									
Emmonak	.01	2.7%	4.1%	6.7	0.0	6.7	108.3%	3.0	14.0
Hooper Bay	.00	2.1%	7.4%	4.1	0.0	4.1	99.2%	2.0	8.2
Quinhagak	.00	0.9%	0.9%	2.1	0.0	2.1	48.3%	2.0	3.2
Total	.01	2.0%	4.7%	12.9	0.0	12.9	95.5%	7.0	25.3
RINGED SEAL									
Emmonak	.23	28.4%	62.9%	151.4	4.5	155.9	65.0%	70.0	257.2
Hooper Bay	.48	47.4%	76.8%	408.5	20.5	429.0	22.4%	332.9	525.1
Quinhagak	.25	31.7%	41.4%	119.6	32.2	151.8	17.1%	135.0	177.7
Total	.34	37.1%	63.5%	679.5	57.2	736.7	30.3%	537.9	960.0
SPOTTED SEAL									
Emmonak	.09	23.3%	53.5%	60.4	6.7	67.1	32.8%	45.0	89.1
Hooper Bay	.09	18.9%	61.1%	78.0	8.2	86.2	44.2%	48.1	124.3
Quinhagak	.26	35.5%	64.5%	125.1	22.2	147.2	9.7%	135.0	161.5
Total	.13	24.4%	59.3%	263.4	37.1	300.5	24.7%	228.1	374.9
SEA LION									
Emmonak	.00	0.0%	1.3%	0.0	0.0	0.0	0.0%	0.0	0.0
Hooper Bay	.002	1.1%	6.3%	2.1	0.0	2.1	140.4%	1.0	4.9
Quinhagak	.00	0.0%	0.0%	0.0	0.0	0.0	0.0%	0.0	0.0
Total	.001	0.4%	3.0%	2.1	0.0	2.1	140.4%	1.0	4.9
ALL SEALS									
Emmonak	.65	50.0%	92.1%	416.8	17.9	434.7	55.9%	191.5	677.9
Hooper Bay	.74	53.7%	82.1%	638.4	65.7	704.1	22.2%	547.9	860.2
Quinhagak	.58	46.4%	80.6%	280.3	55.4	335.8	9.9%	302.6	368.9
Total	.67	50.7%	85.2%	1,335.5	139.0	1,474.5	29.3%	1,042.0	1,907.1

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

TABLE 6. AGE AND SEX COMPOSITION OF SEAL HARVESTS, ALL SPECIES, BY ALASKA NATIVES IN EMMONAK, HOOPER BAY, AND QUINHAGAK, 1997-98

	Male	Female	Unknown Sex	Total
Adult	326.4	181.1	384.5	892.0
Row Percent	36.6%	20.3%	43.1%	100.0%
Column Percent	69.8%	89.4%	57.8%	66.8%
Juvenile	126.1	14.9	228.6	369.6
Row Percent	34.1%	4.0%	61.9%	100.0%
Column Percent	27.0%	7.3%	34.4%	27.7%
Pup	15.3	6.6	21.1	43.0
Row Percent	35.5%	15.3%	49.1%	100.0%
Column Percent	3.3%	3.3%	3.2%	3.2%
Unknown Age	0.0	0.0	30.9	30.9
Row Percent	0.0%	0.0%	100.0%	100.0%
Column Percent	0.0%	0.0%	4.6%	2.3%
Total	467.8	202.6	665.2	1335.5
Row Percent	35.0%	15.2%	49.8%	100.0%
Column Percent	100.0%	100.0%	100.0%	100.0%

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

TABLE 7. AGE AND SEX COMPOSITION OF BEARDED SEAL HARVESTS, BY ALASKA NATIVES IN EMMONAK, HOOPER BAY, AND QUINHAGAK, 1997-98

	Male	Female	Unknown Sex	Total
Adult	77.4	54.8	36.2	168.3
Row Percent	46.0%	32.5%	21.5%	100.0%
Column Percent	55.9%	87.7%	20.5%	44.6%
Juvenile	48.1	2.1	137.5	187.7
Row Percent	25.6%	1.1%	73.2%	100.0%
Column Percent	34.7%	3.4%	77.8%	49.7%
Pup	13.0	5.5	3.1	21.7
Row Percent	60.1%	25.5%	14.4%	100.0%
Column Percent	9.4%	8.9%	1.8%	5.7%
Unknown Age	0.0	0.0	0.0	0.0
Row Percent	0.0%	0.0%	0.0%	0.0%
Column Percent	0.0%	0.0%	0.0%	0.0%
Total	138.5	62.4	176.7	377.7
Row Percent	36.7%	16.5%	46.8%	100.0%
Column Percent	100.0%	100.0%	100.0%	100.0%

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

TABLE 8. AGE AND SEX COMPOSITION OF RINGED SEAL HARVESTS, BY ALASKA NATIVES IN EMMONAK, HOOPER BAY, AND QUINHAGAK, 1997-98

	Unknown			Total
	Male	Female	Sex	
Adult	187.3	97.9	251.8	537.0
Row Percent	34.9%	18.2%	46.9%	100.0%
Column Percent	82.1%	93.0%	72.8%	79.0%
Juvenile	38.5	7.4	62.4	108.3
Row Percent	35.5%	6.8%	57.6%	100.0%
Column Percent	16.9%	7.0%	18.0%	15.9%
Pup	2.2	0.0	13.8	16.0
Row Percent	14.0%	0.0%	86.0%	100.0%
Column Percent	1.0%	0.0%	4.0%	2.4%
Unknown Age	0.0	0.0	18.1	18.1
Row Percent	0.0%	0.0%	100.0%	100.0%
Column Percent	0.0%	0.0%	5.2%	2.7%
Total	228.0	105.3	346.1	679.5
Row Percent	33.6%	15.5%	50.9%	100.0%
Column Percent	100.0%	100.0%	100.0%	100.0%

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

TABLE 9. AGE AND SEX COMPOSITION OF SPOTTED SEAL HARVESTS, BY ALASKA NATIVES IN EMMONAK, HOOPER BAY, AND QUINHAGAK, 1997-98

	Unknown			Total
	Male	Female	Sex	
Adult	56.5	25.3	96.6	178.4
Row Percent	31.7%	14.2%	54.1%	100.0%
Column Percent	60.2%	79.8%	70.1%	67.7%
Juvenile	37.3	5.4	24.3	66.9
Row Percent	55.7%	8.0%	36.3%	100.0%
Column Percent	39.8%	16.9%	17.6%	25.4%
Pup	0.0	1.1	4.3	5.3
Row Percent	0.0%	20.0%	80.0%	100.0%
Column Percent	0.0%	3.4%	3.1%	2.0%
Unknown Age	0.0	0.0	12.8	12.8
Row Percent	0.0%	0.0%	100.0%	100.0%
Column Percent	0.0%	0.0%	9.3%	4.8%
Total	93.8	31.7	137.9	263.4
Row Percent	35.6%	12.0%	52.3%	100.0%
Column Percent	100.0%	100.0%	100.0%	100.0%

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

TABLE 10. AGE AND SEX COMPOSITION OF RIBBON SEAL HARVESTS, BY ALASKA NATIVES IN EMMONAK, HOOPER BAY, AND QUINHAGAK, 1997-98

	Unknown			Total
	Male	Female	Sex	
Adult	5.2	1.1	0.0	6.2
Row Percent	82.9%	17.1%	0.0%	100.0%
Column Percent	69.8%	100.0%	0.0%	48.2%
Juvenile	2.2	0.0	4.5	6.7
Row Percent	33.3%	0.0%	66.7%	100.0%
Column Percent	30.2%	0.0%	100.0%	51.8%
Pup	0.0	0.0	0.0	0.0
Row Percent	0.0%	0.0%	0.0%	0.0%
Column Percent	0.0%	0.0%	0.0%	0.0%
Unknown Age	0.0	0.0	0.0	0.0
Row Percent	0.0%	0.0%	0.0%	0.0%
Column Percent	0.0%	0.0%	0.0%	0.0%
Total	7.4	1.1	4.5	12.9
Row Percent	57.2%	8.2%	34.6%	100.0%
Column Percent	100.0%	100.0%	100.0%	100.0%

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

TABLE 11. AGE AND SEX COMPOSITION OF SEA LION HARVESTS, BY ALASKA NATIVES IN EMMONAK, HOOPER BAY, AND QUINHAGAK, 1997-98

	Unknown			Total
	Male	Female	Sex	
Adult	0.0	2.1	0.0	2.1
Row Percent	0.0%	100.0%	0.0%	100.0%
Column Percent	0.0%	100.0%	0.0%	100.0%
Juvenile	0.0	0.0	0.0	0.0
Row Percent	0.0%	0.0%	0.0%	0.0%
Column Percent	0.0%	0.0%	0.0%	0.0%
Pup	0.0	0.0	0.0	0.0
Row Percent	0.0%	0.0%	0.0%	0.0%
Column Percent	0.0%	0.0%	0.0%	0.0%
Unknown Age	0.0	0.0	0.0	0.0
Row Percent	0.0%	0.0%	0.0%	0.0%
Column Percent	0.0%	0.0%	0.0%	0.0%
Total	0.0	2.1	0.0	2.1
Row Percent	0.0%	100.0%	0.0%	100.0%
Column Percent	0.0%	100.0%	0.0%	100.0%

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

**TABLE 12. SUBSISTENCE HUNTING, HARVEST, AND USE OF SEALS, ALL SPECIES,
BY THREE YUKON-KUSKOKWIM DELTA COMMUNITIES, 1997-98**

Community	Percent of Native Households			Hunting Success Rate	Estimated Community Harvest (animals)	Mean Harvest Per capita (animals)
	Using Seal	Hunting Seal	Harvesting Seal			
Emmonak	92.1	60.8	50.0	82%	416.8	0.65
Hooper Bay	82.1	56.8	53.7	94%	638.4	0.74
Quinhagak	80.6	46.4	46.4	100%	280.3	0.58
Total	85.2	55.7	50.7	91%	1,335.5	0.67

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

**TABLE 13. PERCENT OF ALASKA NATIVE HOUSEHOLDS IN EMMONAK,
HOOPER BAY, AND QUINHAGAK HUNTING SEALS AND
SEA LIONS, BY SPECIES, 1997- 98**

	Percentage of Native Households	Percentage of Hunting Households
BEARDED SEAL		
Hunted	45.0%	100.0%
Harvested	34.6%	76.9%
Did Not Harvest	10.4%	23.1%
Did Not Hunt	55.0%	--
RINGED SEAL		
Hunted	43.3%	100.0%
Harvested	37.2%	85.8%
Did Not Harvest	6.2%	14.2%
Did Not Hunt	56.7%	--
SPOTTED SEAL		
Hunted	32.9%	100.0%
Harvested	24.4%	74.2%
Did Not Harvest	8.5%	25.8%
Did Not Hunt	67.1%	--
RIBBON SEAL		
Hunted	4.2%	100.0%
Harvested	2.1%	50.0%
Did Not Harvest	2.1%	50.0%
Did Not Hunt	95.8%	--
SEA LIONS		
Hunted	1.3%	100.0%
Harvested	0.4%	33.3%
Did Not Harvest	0.8%	66.7%
Did Not Hunt	98.7%	--

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

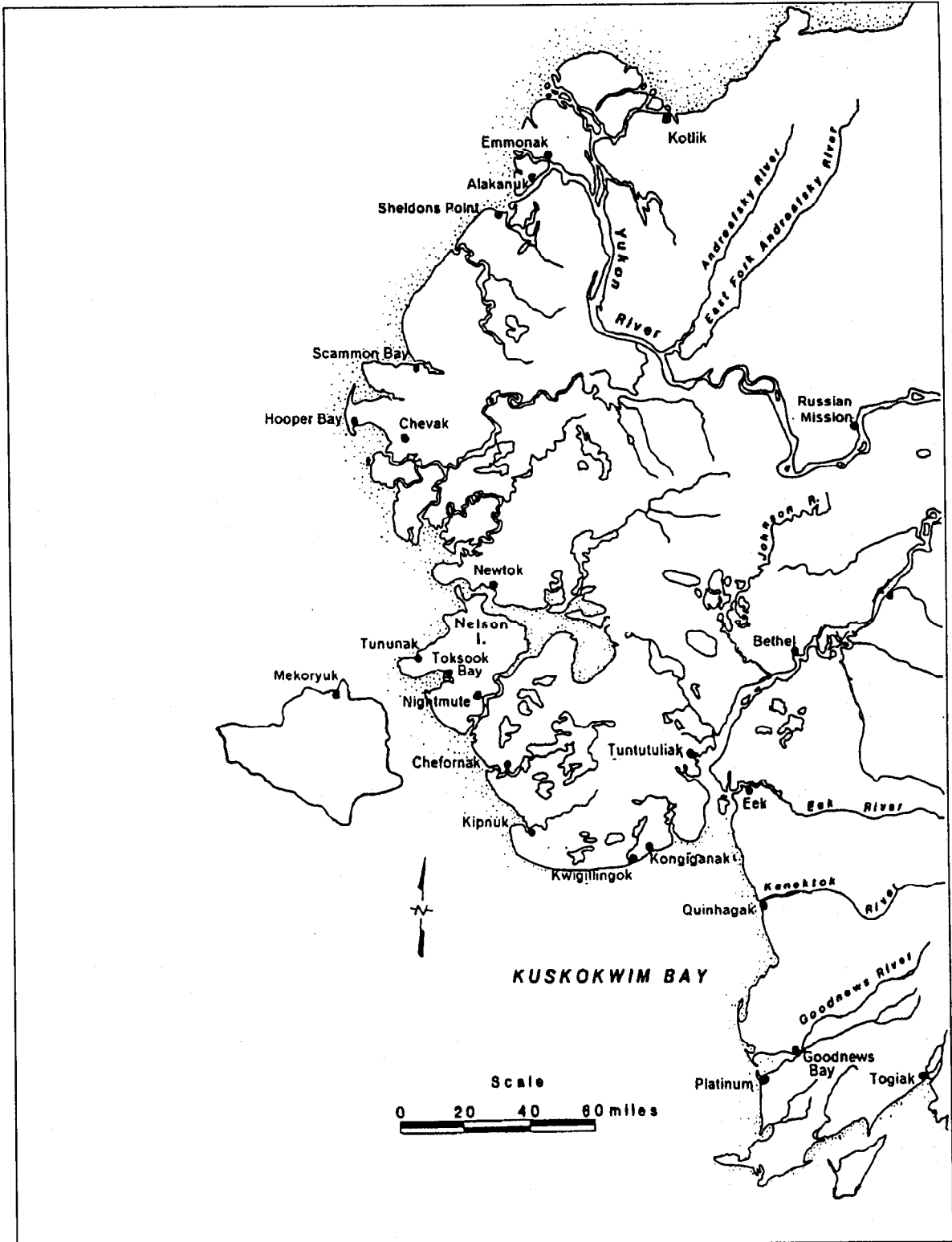


Fig. 1. Map of the Yukon-Kuskokwim Delta Region with Locations of Coastal Communities

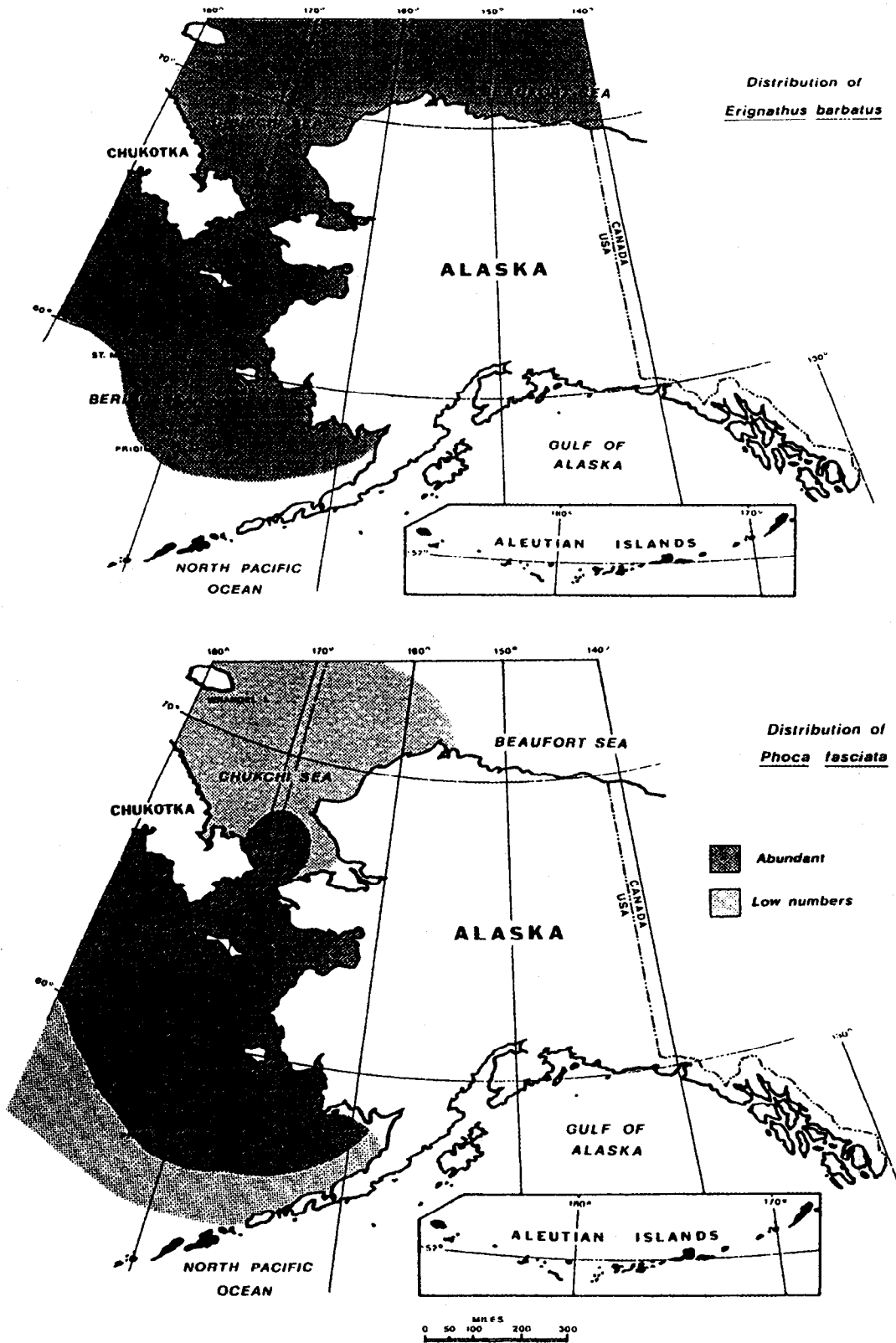


Fig. 2. [Top] General distribution of bearded seal (*Erignathus barbatus*) in Alaska. [Bottom] General distribution of ribbon seal (*Phoca fasciata*) in Alaska. (Source: Burns, Frost, and Lowery 1985)

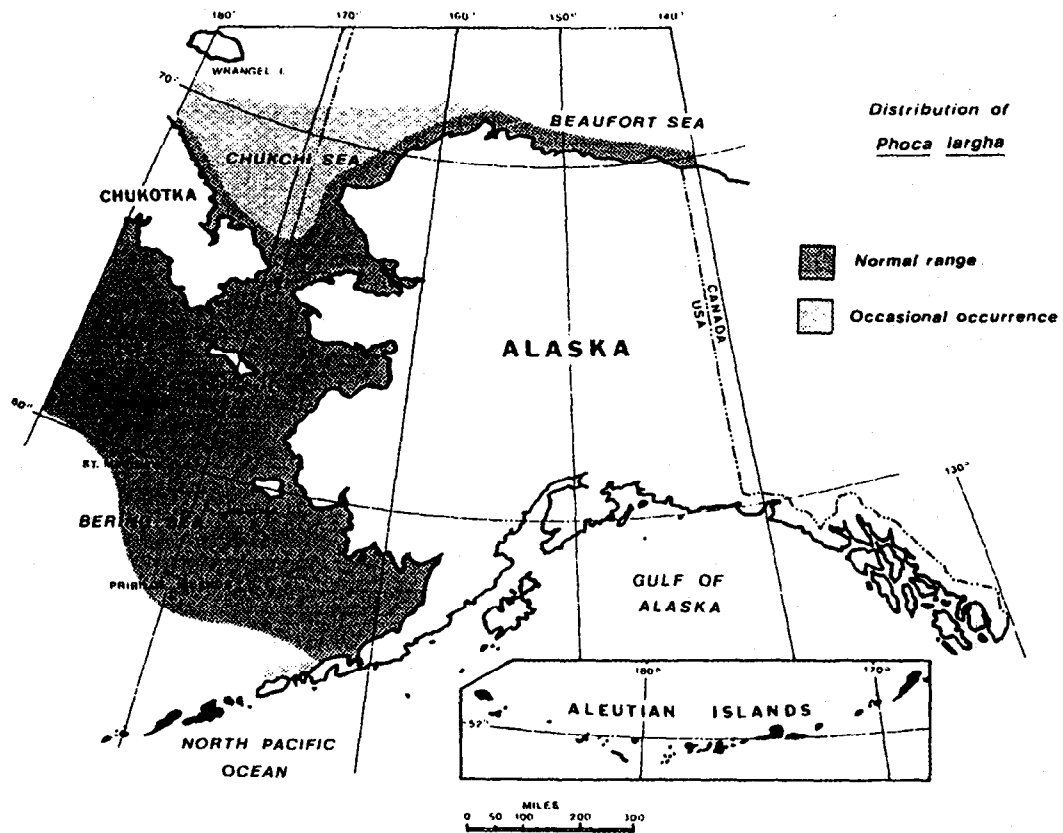
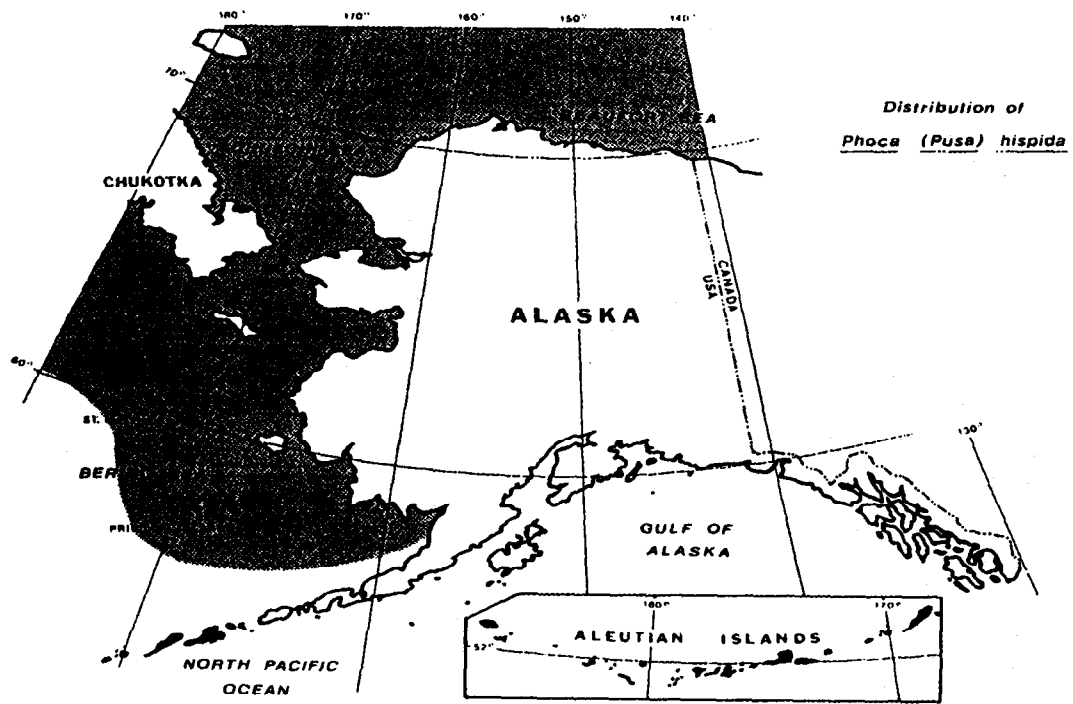


Fig. 3. [Top] General distribution of ringed seal (*Phoca hispida*) in Alaska. [Bottom] General distribution of spotted seal (*Phoca largha*) in Alaska. (Source: Burns, Frost, and Lowery 1985)

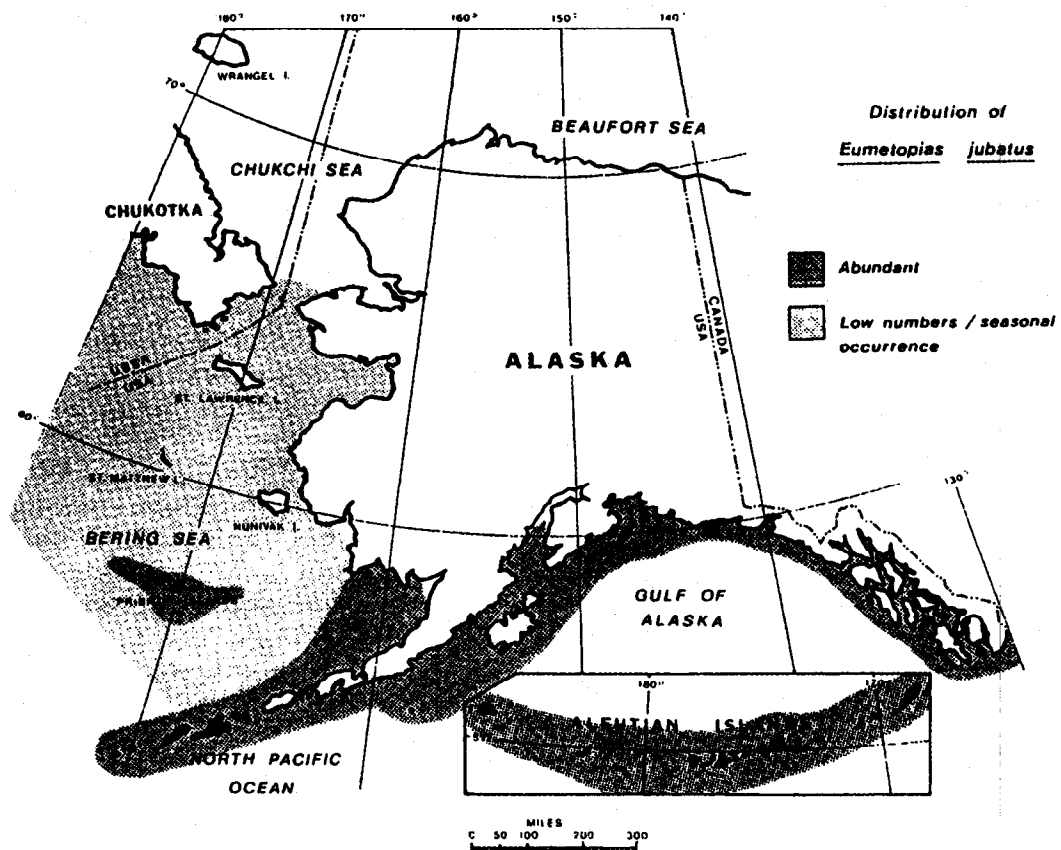
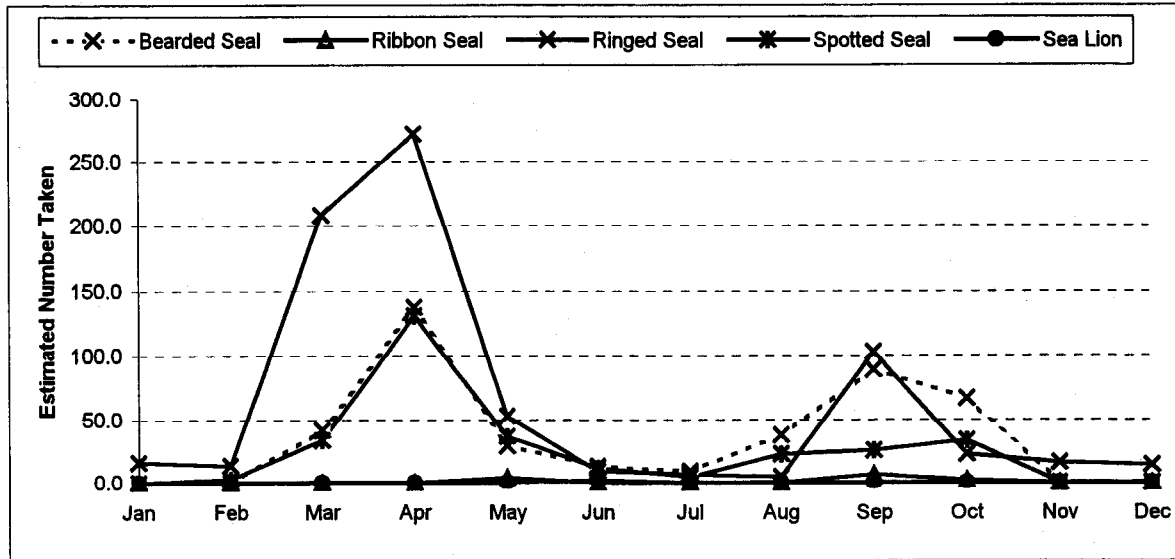


Fig. 4. General distribution of Steller sea lion (*Eumetopias jubatus*) in Alaska. (Source: Burns, Frost, and Lowery 1985)

Fig. 5. Estimated Seasonally Adjusted Take of Seals and Sea Lions by Alaska Natives in Emmonak, Hooper Bay, and Quinhagak, 1997-98



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bearded Seal	0.0	0.0	41.5	136.9	28.8	13.1	8.9	37.6	88.9	66.6	0.0	0.0	422.4
Percentage	0.0%	0.0%	9.8%	32.4%	6.8%	3.1%	2.1%	8.9%	21.1%	15.8%	0.0%	0.0%	100.0%
Cum. Percent	0.0%	0.0%	9.8%	42.2%	49.1%	52.2%	54.3%	63.2%	84.2%	100.0%	100.0%	100.0%	
Ribbon Seal	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	6.6	2.2	0.0	0.0	12.9
Percentage	0.0%	0.0%	0.0%	0.0%	31.7%	0.0%	0.0%	0.0%	51.0%	17.3%	0.0%	0.0%	100.0%
Cum. Percent	0.0%	0.0%	0.0%	0.0%	31.7%	31.7%	31.7%	31.7%	82.7%	100.0%	100.0%	100.0%	
Ringed Seal	16.1	13.7	208.0	271.6	52.6	9.2	6.5	4.5	102.3	22.4	16.1	13.8	736.7
Percentage	2.2%	1.9%	28.2%	36.9%	7.1%	1.2%	0.9%	0.6%	13.9%	3.0%	2.2%	1.9%	100.0%
Cum. Percent	2.2%	4.0%	32.3%	69.2%	76.3%	77.5%	78.4%	79.0%	92.9%	96.0%	98.1%	100.0%	
Spotted Seal	0.0	2.3	33.6	130.6	36.5	11.4	4.3	22.4	25.7	33.7	0.0	0.0	300.5
Percentage	0.0%	0.8%	11.2%	43.5%	12.1%	3.8%	1.4%	7.5%	8.6%	11.2%	0.0%	0.0%	100.0%
Cum. Percent	0.0%	0.8%	11.9%	55.4%	67.5%	71.3%	72.8%	80.2%	88.8%	100.0%	100.0%	100.0%	
Sea Lion	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	2.1
Percentage	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
Cum. Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	
All Seals	16.1	16.0	283.1	539.2	121.9	35.7	19.8	64.5	223.5	124.9	16.1	13.8	1,474.5
Percentage	1.1%	1.1%	19.2%	36.6%	8.3%	2.4%	1.3%	4.4%	15.2%	8.5%	1.1%	0.9%	100.0%
Cum. Percent	1.1%	2.2%	21.4%	57.9%	66.2%	68.6%	70.0%	74.3%	89.5%	98.0%	99.1%	100.0%	

NOTE: Numbers on these tables and figures reflect a study period from March 1997 through February 1998 and includes the communities of Emmonak, Hooper Bay, and Quinhagak.

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

Fig. 6. Specialization in Bearded Seal Takes: Percent of Hunting Households by percent of Take, 1997-98

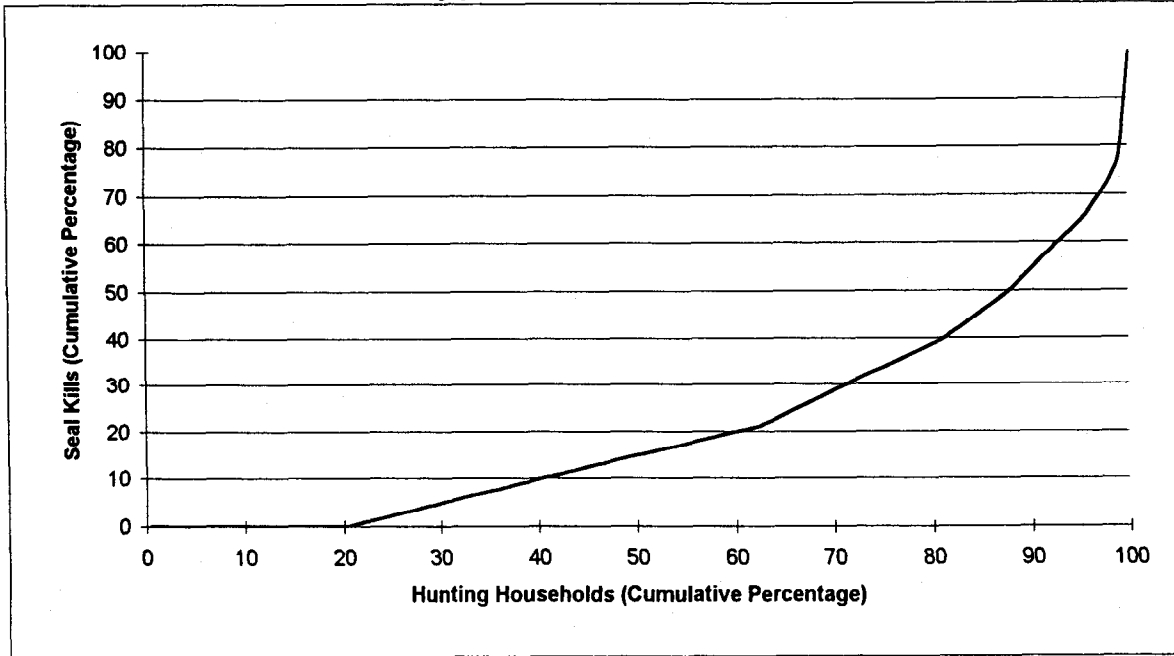
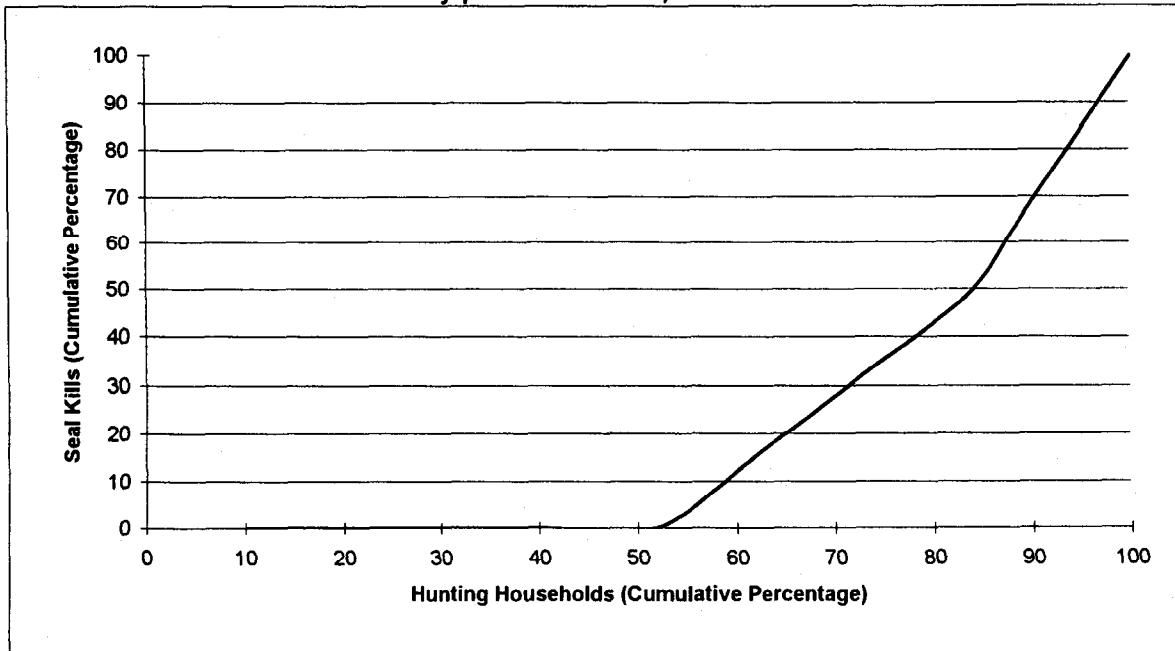


Fig. 7. Specialization in Ribbon Seal Takes: Percent of Hunting Households by percent of Take, 1997-98



Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

Fig. 8. Specialization in Ringed Seal Takes: Percent of Hunting Households by percent of Take, 1997-98

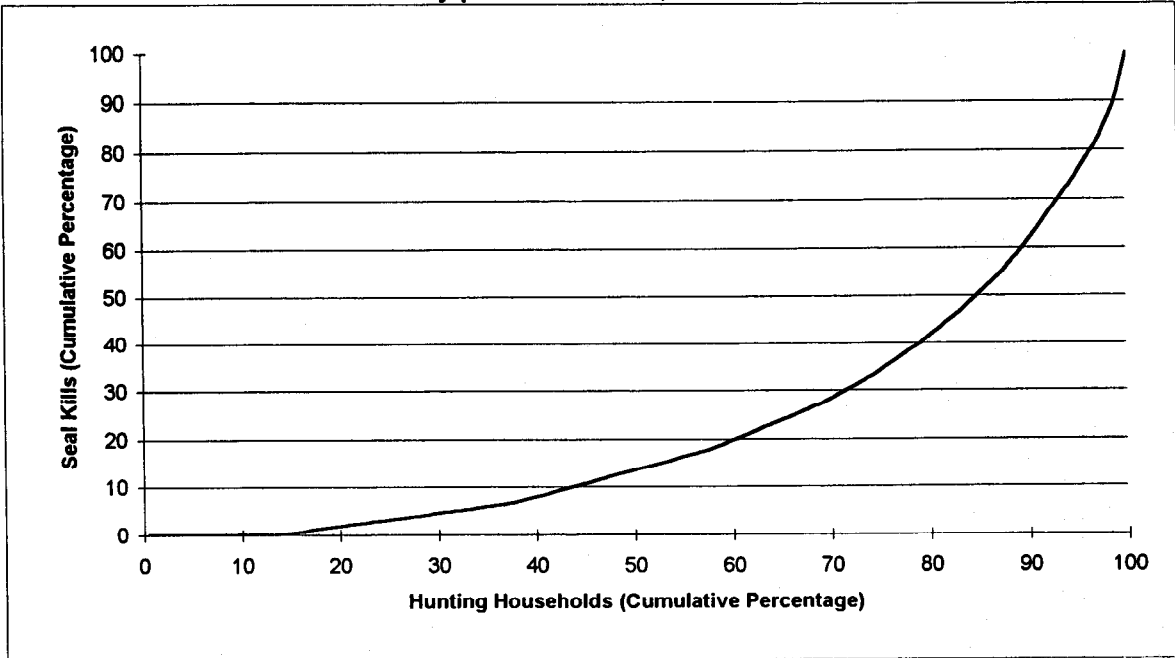
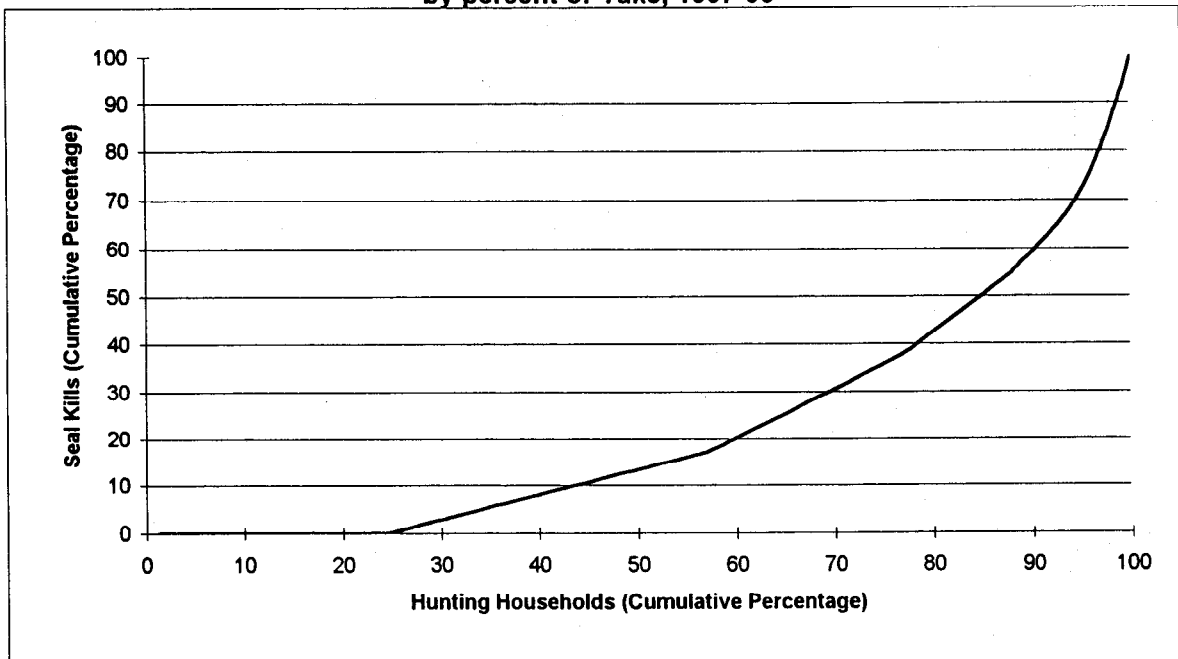


Fig. 9. Specialization in Spotted Seal Takes: Percent of Hunting Households by percent of Take, 1997-98



Source: Alaska Department of Fish and Game, Division of Subsistence, Household Surveys, 1998.

APPENDIX A.

**SEAL AND SEAL LION HARVEST SURVEY INSTRUMENT USED FOR
HOUSEHOLD INTERVIEWS, 1998**

COVER SHEET & BEARDED SEAL

Y-K DELTA SEAL SURVEY 1997

ARE ANY MEMBERS OF YOUR HOUSEHOLD ALASKA NATIVES?

NO: _____ Thank you for your cooperation. This survey is only relevant to Native households.

YES: _____ Please answer the following questions.

HOW MANY PEOPLE LIVED IN YOUR HOUSEHOLD IN 1997?

DID YOU OR MEMBERS OF YOUR HOUSEHOLD HUNT OR USE SEALS OR SEA LIONS IN 1997?

NO - THANK YOU. THAT COMPLETES THE SURVEY. _____

YES - WHICH SPECIES DID YOU HUNT OR USE? _____

BEARDED SEAL?	YES	NO
RINGED SEAL?		
SPOTTED SEAL?		
RIBBON SEAL?		
SEA LION?		

(Attach survey form for each yes)

BEARDED SEAL (maklak, maklaaq, maklassuk, nemercuk)

PLEASE ANSWER THE FOLLOWING QUESTIONS IF YOU ANSWERED YES FOR BEARDED SEAL

In 1997, did you or your household:	Yes	No
1. Use bearded seals (meat, hides, or oil)?		
2. Hunt bearded seals?		
3. Kill and retrieve bearded seals?		
4. Receive bearded seals from other households or communities?		
5. Give bearded seals to other households or communities?		

IF YES TO QUESTION 2 OR 3 ABOVE, GO TO QUESTION 6. IF NO, COMPLETE FORMS FOR OTHER SPECIES WHICH YOU HUNTED OR USED

6. How many bearded seals did your household kill and retrieve? [Enter in total box.] _____

7. In which months were they killed and retrieved? How many in (February, etc.)? [Enter the numbers by month.]

BEARDED SEAL	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
TOTAL														

8. Of the bearded seals killed and retrieved in (January, etc.), how many were male, female, and how many were pups, juveniles, or adults?

BEARDED SEAL (Detail)	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
ADULT														
MALE														
FEMALE														
UNKNOWN														
JUVENILE														
MALE														
FEMALE														
UNKNOWN														
PUP														
MALE														
FEMALE														
UNKNOWN														
UNKNOWN														
MALE														
FEMALE														
UNKNOWN														

During 1997, 8. How many bearded seal were struck and lost by your household? [Enter number in total box.] _____

10. In which months were they struck and lost? [Enter numbers by month.]

BEARDED SEAL	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
STRUCK AND LOST														

Community: _____ () HHID: _____

Interviewer: _____ Date: _____

Alaska Dept. of Fish and Game, Mike Coffing 543-3100

Y-K DELTA SEAL SURVEY 1997

RINGED SEAL

RINGED SEAL (nayiq, tegak)

PLEASE ANSWER THE FOLLOWING QUESTIONS IF YOU ANSWERED YES FOR RINGED SEAL in 1997, did you or your household:

1. Use ringed seals (meat, hides, or oil)?
2. Hunt ringed seals?
3. Kill and retrieve ringed seals?
4. Receive ringed seals from other households or communities?
5. Give ringed seals to other households or communities?

Yes	No

IF YES TO QUESTION 2 OR 3 ABOVE, GO TO QUESTION 6. IF NO, COMPLETE FORMS FOR OTHER SPECIES WHICH YOU HUNTED OR USED

6. How many ringed seals did your household kill and retrieve? [Enter in total box.]

7. In which months were they killed and retrieved? How many in (February, etc.)? [Enter the numbers by month.]

RINGED SEAL	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
TOTAL														

8. Of the ringed seals killed and retrieved in (January, etc.), how many were male, female, and how many were pups, juveniles, or adults? [Enter the numbers by month.]

RINGED SEAL (Detail)	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
ADULT														
MALE														
FEMALE														
UNKNOWN														
JUVENILE														
MALE														
FEMALE														
UNKNOWN														
PUP														
MALE														
FEMALE														
UNKNOWN														
UNKNOWN														
MALE														
FEMALE														
UNKNOWN														

During 1997, 9. How many ringed seal were struck and lost by your household? [Enter number in total box.]

10. In which months were they struck and lost? [Enter numbers by month.]

RINGED SEAL	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
STRUCK AND LOST														

Community: _____ () HHID: _____

Interviewer: _____ Date: _____

Y-K DELTA SEAL SURVEY 1997

SPOTTED SEAL (Issuing)

PLEASE ANSWER THE FOLLOWING QUESTIONS IF YOU ANSWERED YES FOR SPOTTED SEAL In 1997, did you or your household:

	Yes	No
1. Use spotted seals (meat, hides, or oil)?		
2. Hunt spotted seals?		
3. Kill and retrieve spotted seals?		
4. Receive spotted seals from other households or communities?		
5. Give spotted seals to other households or communities?		

1. Use spotted seals (meat, hides, or oil)?
2. Hunt spotted seals?
3. Kill and retrieve spotted seals?
4. Receive spotted seals from other households or communities?
5. Give spotted seals to other households or communities?

IF YES TO QUESTION 2 OR 3 ABOVE, GO TO QUESTION 6. IF NO, COMPLETE FORMS FOR OTHER SPECIES WHICH YOU HUNTED OR USED

6. How many spotted seals did your household kill and retrieve? [Enter in total box.]
7. In which months were they killed and retrieved? How many in (March, etc.)? [Enter the numbers by month.]

SPOTTED SEAL	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
TOTAL														

8. Of the spotted seals killed and retrieved in (March, etc.), how many were male, female, and how many were pups, juveniles, or adults? [Enter the numbers by month.]

SPOTTED SEAL (Detail)	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
ADULT														
MALE														
FEMALE														
UNKNOWN														
JUVENILE														
MALE														
FEMALE														
UNKNOWN														
PUP														
MALE														
FEMALE														
UNKNOWN														
UNKNOWN														
MALE														
FEMALE														
UNKNOWN														

During 1997, 9. How many spotted seal were struck and lost by your household? [Enter number in total box.]

10. In which months were they struck and lost? [Enter numbers by month.]

SPOTTED SEAL	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
STRUCK AND LOST														

Community: _____ () HHID: _____ Interviewer: _____ Date: _____

Y-K DELTA SEAL SURVEY 1997

RIBBON SEAL

RIBBON SEAL (qasruiliq)

PLEASE ANSWER THE FOLLOWING QUESTIONS IF YOU ANSWERED YES FOR RIBBON SEAL
 In 1997, did you or your household:

	Yes	No
1. Use ribbon seals (meat, hides, or oil)?		
2. Hunt ribbon seals?		
3. Kill and retrieve ribbon seals?		
4. Receive ribbon seals from other households or communities?		
5. Give ribbon seals to other households or communities?		

IF YES TO QUESTION 2 OR 3 ABOVE, GO TO QUESTION 6. IF NO, COMPLETE FORMS FOR OTHER SPECIES WHICH YOU HUNTED OR USED

6. How many ribbon seals did your household kill and retrieve? [Enter in total box.]

7. In which months were they killed and retrieved? How many in (March, etc.)? [Enter the numbers by month.]

RIBBON SEAL	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
TOTAL														

8. Of the ribbon seals killed and retrieved in (March, etc.), how many were male, female, and how many were pups, juveniles, or adults?
 [Enter the numbers by month.]

RIBBON SEAL (Detail)	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
ADULT														
MALE														
FEMALE														
UNKNOWN														
JUVENILE														
MALE														
FEMALE														
UNKNOWN														
PUP														
MALE														
FEMALE														
UNKNOWN														
UNKNOWN AGE														
MALE														
FEMALE														
UNKNOWN														

During 1997, 9. How many ribbon seal were struck and lost by your household? [Enter number in total box.]

10. In which months were they struck and lost? [Enter numbers by month.]

RIBBON SEAL	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
STRUCK AND LOST														

Community: _____ () HHID: _____ Interviewer: _____ Date: _____

Y-K DELTA SEAL SURVEY 1997

SEA LION (uginaq)

PLEASE ANSWER THE FOLLOWING QUESTIONS IF YOU ANSWERED YES FOR SEA LION In 1997, did you or your household:

1. Use sea lion (meat, hides, or oil)?
2. Hunt sea lion?
3. Kill and retrieve sea lion?
4. Receive sea lion from other households or communities?
5. Give sea lion to other households or communities?

Yes	No

IF YES TO QUESTION 2 OR 3 ABOVE, GO TO QUESTION 6. IF NO, COMPLETE FORMS FOR OTHER SPECIES WHICH YOU HUNTED OR USED

6. How many sea lion did your household kill and retrieve? [Enter in total box.]

7. In which months were they killed and retrieved? How many in (March, etc.)? [Enter the numbers by month.]

SEA LION	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
TOTAL														

8. Of the sea lion killed and retrieved in (March, etc.), how many were male, female, and how many were pups, juveniles, or adults?

[Enter the numbers by month.]

SEA LION (Detail)	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
ADULT														
MALE														
FEMALE														
UNKNOWN														
JUVENILE														
MALE														
FEMALE														
UNKNOWN														
PUP														
MALE														
FEMALE														
UNKNOWN														
UNKNOWN														
MALE														
FEMALE														
UNKNOWN														

During 1997, 9. How many sea lion were struck and lost by your household? [Enter number in total box.]

10. In which months were they struck and lost? [Enter numbers by month.]

SEA LION	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	UNKNOWN	TOTAL
STRUCK AND LOST														

Community: _____ () HHID: _____ Interviewer: _____ Date: _____

APPENDIX B.

SEAL AND SEAL LION

**KEY RESPONDENT INTERVIEW GUIDE,
YUKON-KUSKOKWIM DELTA, 1998**

Yukon-Kuskokwim Delta Seal/Sea Lion Survey, 1997-98
Division of Subsistence, 1998

Key Respondent Interview Guide Sheet

We are trying to learn about seals and sea lions along the coast of the Yukon-Kuskokwim Delta, including bearded seal, ribbon seal, ringed seal, spotted seal, and sea lion. In some parts of Alaska, harbor seals and sea lions have been declining in number. We are trying to learn about any changes hunters in this area have observed about seal populations.

1. Can you talk about bearded seals [ribbon seals, spotted seals, ringed seals, other seals?, sea lions] -- what do you know about them?
 - Are they seen in this area?
 - What times of year are they seen? What are their movements?
 - In what kinds of places are you most likely to find them?
 - Where and when do they have their pups?
 - What do they eat? How do they feed?
 - What are their Yup'ik names (by species, age, sex)? What are their distinctive features?
 - Have you noticed a change in their numbers?
 - Have you noticed a change in their health, size, or condition?
 - Have you noticed anything else unusual about them such as:
 - * number or health of pups,
 - * number of abandoned or starving pups,
 - * changes in the areas they use?
 - Which seals are most abundant? Which ones (species, sex, age) are preferred by hunters?
 - *With maps:* Can you mark places where seals [and sea lions] haul out?
 - At what time of year are these haulouts used? How large are these haul-outs? How many animals?

APPENDIX C.

**TOTAL SUBSISTENCE TAKE OF SEAL
AND SEA LION BY THREE COMMUNITIES IN THE
YUKON-KUSKOKWIM DELTA REGION**

1997-98

**SEAL AND SEA LION HARVEST AND TAKE ESTIMATES:
EMMONAK, HOOPER BAY, AND QUINHAGAK, 1997/98**

		<u>Active</u>	<u>Other</u>	<u>Total</u>
<i>SAMPLING DESIGN:</i>	Total Native Households	164	307	471
<i>STRATIFIED</i>	Surveyed Households	98	151	249
	Sampling Fraction	59.8%	49.2%	52.9%
	Sample Household Members	441	621	1062
	Estimated Household Members	721.0	1263.6	1984.6

SEAL AND SEA LION HARVEST AND USE INFORMATION

Percentage of Native Households:

	Seals				Sea Lion
	Bearded	Ribbon	Ringed	Spotted	
Used	67.8%	4.7%	63.5%	59.3%	3.0%
Hunted	45.0%	4.3%	43.3%	33.0%	1.3%
Harvested	34.7%	2.0%	37.1%	24.4%	0.4%
Received	46.4%	2.7%	36.5%	39.6%	2.6%
Gave Away	33.7%	2.5%	32.6%	19.7%	0.4%

Estimated Community Harvest and Take (Expanded):

	Seals				Sea Lion
	Bearded	Ribbon	Ringed	Spotted	
Total Number Harvested	377.7	12.9	679.5	263.4	2.1
Total Number Struck and Lost	<u>44.7</u>	<u>0.0</u>	<u>57.2</u>	<u>37.1</u>	<u>0.0</u>
Total Number Taken	422.4	12.9	736.7	300.5	2.1
Number Harvested Per Capita	0.19	0.01	0.34	0.13	0.00

SEAL AND SEA LION HARVEST BY AGE AND SEX - COMMUNITY ESTIMATE (EXPANDED)

	Seals								Sea Lion	
	Bearded		Ribbon		Ringed		Spotted		Number	%
	Number	%	Number	%	Number	%	Number	%		
Adult Male	77.4	20.5%	5.2	40.0%	187.3	27.6%	56.5	21.5%	0.0	0.0%
Adult Female	54.8	14.5%	1.1	8.2%	97.9	14.4%	25.3	9.6%	2.1	100.0%
Adult Unknown Sex	36.2	9.6%	0.0	0.0%	251.8	37.1%	96.6	36.7%	0.0	0.0%
Juvenile Male	48.1	12.7%	2.2	17.3%	38.5	5.7%	37.3	14.2%	0.0	0.0%
Juvenile Female	2.1	0.6%	0.0	0.0%	7.4	1.1%	5.4	2.0%	0.0	0.0%
Juvenile Unknown Sex	137.5	36.4%	4.5	34.6%	62.4	9.2%	24.3	9.2%	0.0	0.0%
Pup Male	13.0	3.5%	0.0	0.0%	2.2	0.3%	0.0	0.0%	0.0	0.0%
Pup Female	5.5	1.5%	0.0	0.0%	0.0	0.0%	1.1	0.4%	0.0	0.0%
Pup Unknown Sex	3.1	0.8%	0.0	0.0%	13.8	2.0%	4.3	1.6%	0.0	0.0%
Male Unknown Age	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Female Unknown Age	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Unknown Sex and Age	0.0	0.0%	0.0	0.0%	18.1	2.7%	12.8	4.8%	0.0	0.0%
Total	377.7	100.0%	12.9	100.0%	679.5	100.0%	263.4	100.0%	2.1	100.0%

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, 1998.

**Table 3. SEAL AND SEA LION HARVEST AND TAKE ESTIMATES:
EMMONAK, HOOPER BAY, AND QUINHAGAK, 1996/97 (Continued)**

<i>RINGED SEAL HARVEST BY MONTH</i>													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	7	6	103	147	20	4	3	2	41	9	7	6	21	376
Struck & Lost	0	0	6	14	4	0	0	0	6	2	0	0	6	38
Total Take	7	6	109	161	24	4	3	2	47	11	7	6	27	414
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	14.4	12.5	184.1	233.5	38.3	8.2	6.5	4.5	90.3	17.4	14.4	12.3	43.1	679.5
Struck & Lost	0.0	0.0	7.4	16.9	6.2	0.0	0.0	0.0	10.9	4.5	0.0	0.0	11.3	57.2
Total Take	14.4	12.5	191.5	250.4	44.5	8.2	6.5	4.5	101.2	21.9	14.4	12.3	54.4	736.7
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	16.1	13.7	198.4	250.2	42.1	9.2	6.5	4.5	91.0	17.9	16.1	13.8		679.5
Struck & Lost	0.0	0.0	9.6	21.4	10.4	0.0	0.0	0.0	11.3	4.5	0.0	0.0		57.2
Total Take	16.1	13.7	208.0	271.6	52.6	9.2	6.5	4.5	102.3	22.4	16.1	13.8		736.7
Total Take (%)	2.2%	1.9%	28.2%	36.9%	7.1%	1.2%	0.9%	0.6%	13.9%	3.0%	2.2%	1.9%		100.0%
Cum. Take	16.1	29.8	237.8	509.4	562.0	571.2	577.7	582.1	684.5	706.8	722.9	736.7		
Cum. Take (%)	2.2%	4.0%	32.3%	69.2%	76.3%	77.5%	78.4%	79.0%	92.9%	96.0%	98.1%	100.0%		

<i>SPOTTED SEAL HARVEST BY MONTH</i>													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	1	24	95	17	5	1	7	11	15	0	0	4	180
Struck & Lost	0	0	3	14	5	0	1	3	1	0	0	0	0	27
Total Take	0	1	27	109	22	5	2	10	12	15	0	0	4	207
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	2.1	29.7	112.7	27.0	10.6	2.1	15.5	22.7	33.0	0.0	0.0	8.2	263.4
Struck & Lost	0.0	0.0	3.2	15.8	7.3	0.0	2.1	6.7	2.1	0.0	0.0	0.0	0.0	37.1
Total Take	0.0	2.1	32.9	128.5	34.3	10.6	4.1	22.2	24.7	33.0	0.0	0.0	8.2	300.5
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	2.3	30.4	114.9	29.2	11.4	2.3	15.7	23.7	33.7	0.0	0.0		263.4
Struck & Lost	0.0	0.0	3.2	15.8	7.3	0.0	2.1	6.7	2.1	0.0	0.0	0.0		37.1
Total Take	0.0	2.3	33.6	130.6	36.5	11.4	4.3	22.4	25.7	33.7	0.0	0.0		300.5
Total Take (%)	0.0%	0.8%	11.2%	43.5%	12.1%	3.8%	1.4%	7.5%	8.6%	11.2%	0.0%	0.0%		100.0%
Cum. Take	0.0	2.3	35.9	166.5	203.0	214.3	218.7	241.1	266.8	300.5	300.5	300.5		
Cum. Take (%)	0.0%	0.8%	11.9%	55.4%	67.5%	71.3%	72.8%	80.2%	88.8%	100.0%	100.0%	100.0%		

<i>SEA LION HARVEST BY MONTH</i>													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Struck & Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	0	1	0	0	0	0	0	0	0	1
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0		2.1
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Take	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0		2.1
Total Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		100.0%
Cum. Take	0.0	0.0	0.0	0.0	0.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1		
Cum. Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		

NOTE: Numbers on these tables and figures reflect a study period from March 1997 through February 1998.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, 1998.

APPENDIX D.
SUBSISTENCE TAKES OF SEAL AND SEA LION
BY COMMUNITY, YUKON-KUSKOKWIM DELTA REGION
1997-98

Emmonak.....	40
Hooper Bay.....	43
Quinhagak.....	46

Appendix D Table 1. SEAL AND SEA LION HARVEST AND TAKE ESTIMATES: Emmonak, 1997/98

SAMPLING DESIGN:		Active	Other	Total
TWO-STRATA	Total Native Households	114	49	163
	Surveyed Households	51	24	75
	Sampling Fraction	44.7%	49.0%	46.0%
	Sample Household Members	215	81	296
	Estimated Household Members	480.6	165.4	646.0

SEAL AND SEA LION HARVEST AND USE INFORMATION

Percentage of Native Households:

	Seals				Sea Lion
	Bearded	Ribbon	Ringed	Spotted	
Used	85.6%	4.1%	62.9%	53.5%	1.3%
Hunted	55.4%	4.1%	40.7%	34.2%	0.0%
Harvested	40.8%	2.7%	28.4%	23.3%	0.0%
Received	63.8%	1.4%	43.8%	35.7%	1.3%
Gave Away	50.0%	4.1%	35.1%	23.1%	1.3%

Estimated Community Harvest and Take (Expanded):

	Seals				Sea Lion
	Bearded	Ribbon	Ringed	Spotted	
Total Number Harvested	198.4	6.7	151.4	60.4	0.0
Total Number Struck and Lost	<u>6.7</u>	<u>0.0</u>	<u>4.5</u>	<u>6.7</u>	<u>0.0</u>
Total Number Taken	205.1	6.7	155.9	67.1	0.0
Number Harvested Per Capita	0.31	0.01	0.23	0.09	0.00

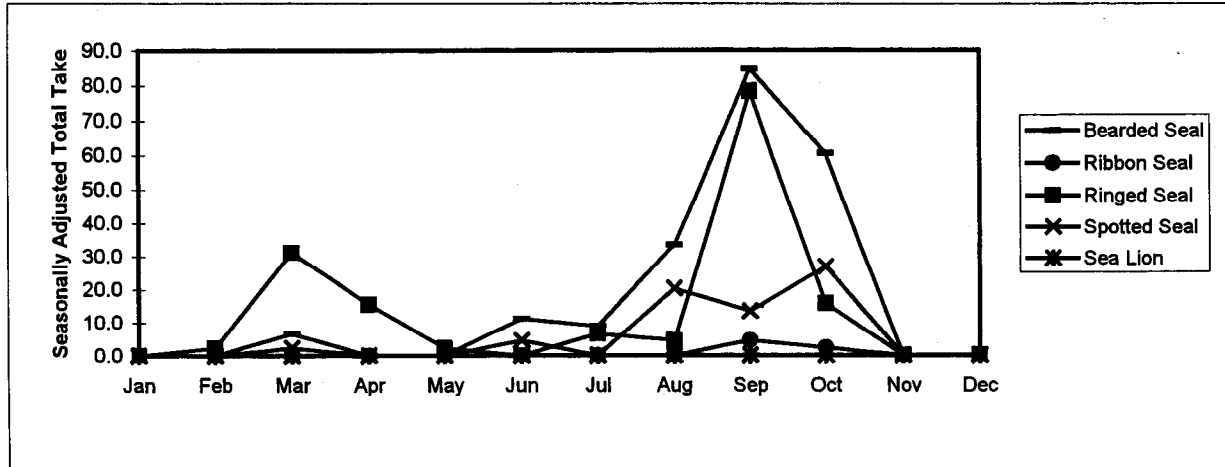
SEAL AND SEA LION HARVEST BY AGE AND SEX - COMMUNITY ESTIMATE (EXPANDED)

	Seals								Sea Lion	
	Bearded		Ribbon		Ringed		Spotted		Number	%
	Number	%	Number	%	Number	%	Number	%		
Adult Male	15.6	7.9%	0.0	0.0%	19.9	13.2%	8.9	14.8%	0.0	---
Adult Female	2.2	1.1%	0.0	0.0%	17.9	11.8%	0.0	0.0%	0.0	---
Adult Unknown Sex	15.6	7.9%	0.0	0.0%	76.0	50.2%	15.6	25.9%	0.0	---
Juvenile Male	28.5	14.4%	2.2	33.3%	17.9	11.8%	15.6	25.9%	0.0	---
Juvenile Female	0.0	0.0%	0.0	0.0%	4.3	2.8%	2.2	3.7%	0.0	---
Juvenile Unknown Sex	122.9	62.0%	4.5	66.7%	11.0	7.3%	17.9	29.6%	0.0	---
Pup Male	8.9	4.5%	0.0	0.0%	2.2	1.5%	0.0	0.0%	0.0	---
Pup Female	4.5	2.3%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	---
Pup Unknown Sex	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	---
Male Unknown Age	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	---
Female Unknown Age	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	---
Unknown Sex and Age	0.0	0.0%	0.0	0.0%	2.2	1.5%	0.0	0.0%	0.0	---
Total	198.4	100.0%	6.7	100.0%	151.4	100.0%	60.4	100.0%	0.0	---

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, with assistance from the community of Emmonak, 1998.

Table 1. SEAL AND SEA LION HARVEST AND TAKE ESTIMATES: Emmonak, 1997/98 (cont.)

SEASONALLY ADJUSTED TAKE BY MONTH



BEARDED SEAL HARVEST BY MONTH													Unknown Month	Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	3	0	0	5	4	14	37	26	0	0	0	89
Struck & Lost	0	0	0	0	0	0	0	1	1	1	0	0	0	3
Total Take	0	0	3	0	0	5	4	15	38	27	0	0	0	92
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	6.5	0.0	0.0	11.2	8.9	31.1	82.5	58.1	0.0	0.0	0.0	198.4
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2	0.0	0.0	0.0	6.7
Total Take	0.0	0.0	6.5	0.0	0.0	11.2	8.9	33.3	84.7	60.4	0.0	0.0	0.0	205.1
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	6.5	0.0	0.0	11.2	8.9	31.1	82.5	58.1	0.0	0.0		198.4
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2	0.0	0.0		6.7
Total Take	0.0	0.0	6.5	0.0	0.0	11.2	8.9	33.3	84.7	60.4	0.0	0.0		205.1
Total Take (%)	0.0%	0.0%	3.2%	0.0%	0.0%	5.5%	4.4%	16.3%	41.3%	29.4%	0.0%	0.0%		100.0%
Cum. Take	0.0	0.0	6.5	6.5	6.5	17.7	26.6	60.0	144.7	205.1	205.1	205.1		
Cum. Take (%)	0.0%	0.0%	3.2%	3.2%	3.2%	8.6%	13.0%	29.2%	70.6%	100.0%	100.0%	100.0%		

RIBBON SEAL HARVEST BY MONTH													Unknown Month	Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	0	0	0	2	1	0	0	0	3
Struck & Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	0	0	0	0	2	1	0	0	0	3
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	2.2	0.0	0.0	0.0	6.7
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	2.2	0.0	0.0	0.0	6.7
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	2.2	0.0	0.0		6.7
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	2.2	0.0	0.0		6.7
Total Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	66.7%	33.3%	0.0%	0.0%		100.0%
Cum. Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	6.7	6.7	6.7		
Cum. Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	66.7%	100.0%	100.0%	100.0%		

NOTE: Numbers on these tables and figures reflect a study period from March 1997 through February 1998.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, with assistance from the community of Emmonak, 1998.

Table 1. SEAL AND SEA LION HARVEST AND TAKE ESTIMATES: Emmonak, 1997/98 (cont.)

RINGED SEAL HARVEST BY MONTH													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	1	14	7	1	0	3	2	35	5	0	0	0	68
Struck & Lost	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Total Take	0	1	14	7	1	0	3	2	35	7	0	0	0	70
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	2.2	31.1	15.5	2.2	0.0	6.5	4.5	78.2	11.2	0.0	0.0	0.0	151.4
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0	4.5
Total Take	0.0	2.2	31.1	15.5	2.2	0.0	6.5	4.5	78.2	15.6	0.0	0.0	0.0	155.9
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	2.2	31.1	15.5	2.2	0.0	6.5	4.5	78.2	11.2	0.0	0.0		151.4
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0		4.5
Total Take	0.0	2.2	31.1	15.5	2.2	0.0	6.5	4.5	78.2	15.6	0.0	0.0		155.9
Total Take (%)	0.0%	1.4%	20.0%	9.9%	1.4%	0.0%	4.2%	2.9%	50.2%	10.0%	0.0%	0.0%		100.0%
Cum. Take	0.0	2.2	33.3	48.8	51.0	51.0	57.5	62.0	140.2	155.9	155.9	155.9		
Cum. Take (%)	0.0%	1.4%	21.4%	31.3%	32.7%	32.7%	36.9%	39.8%	90.0%	100.0%	100.0%	100.0%		

SPOTTED SEAL HARVEST BY MONTH													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	1	0	0	2	0	6	6	12	0	0	0	27
Struck & Lost	0	0	0	0	0	0	0	3	0	0	0	0	0	3
Total Take	0	0	1	0	0	2	0	9	6	12	0	0	0	30
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	2.2	0.0	0.0	4.5	0.0	13.4	13.4	26.8	0.0	0.0	0.0	60.4
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	6.7
Total Take	0.0	0.0	2.2	0.0	0.0	4.5	0.0	20.1	13.4	26.8	0.0	0.0	0.0	67.1
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	2.2	0.0	0.0	4.5	0.0	13.4	13.4	26.8	0.0	0.0		60.4
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0		6.7
Total Take	0.0	0.0	2.2	0.0	0.0	4.5	0.0	20.1	13.4	26.8	0.0	0.0		67.1
Total Take (%)	0.0%	0.0%	3.3%	0.0%	0.0%	6.7%	0.0%	30.0%	20.0%	40.0%	0.0%	0.0%		100.0%
Cum. Take	0.0	0.0	2.2	2.2	2.2	6.7	6.7	26.8	40.2	67.1	67.1	67.1		
Cum. Take (%)	0.0%	0.0%	3.3%	3.3%	3.3%	10.0%	10.0%	40.0%	60.0%	100.0%	100.0%	100.0%		

SEA LION HARVEST BY MONTH													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Struck & Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Take (%)	---	---	---	---	---	---	---	---	---	---	---	---		---
Cum. Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Cum. Take (%)	---	---	---	---	---	---	---	---	---	---	---	---		

NOTE: Numbers on these tables and figures reflect a study period from March 1997 through February 1998.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, with assistance from the community of Emmonak, 1998.

Appendix D Table 2. SEAL AND SEA LION HARVEST AND TAKE ESTIMATES: Hooper Bay, 1997/98

<i>SAMPLING DESIGN:</i> <i>RANDOM</i>	Total Native Households	195
	Surveyed Households	95
	Sampling Fraction	48.7%
	Sample Household Members	418
	Estimated Household Members	858.0

SEAL AND SEA LION HARVEST AND USE INFORMATION

Percentage of Native Households:

	Seals				Sea Lion
	Bearded	Ribbon	Ringed	Spotted	
Used	75.8%	7.4%	76.8%	61.1%	6.3%
Hunted	48.4%	6.3%	51.6%	30.5%	3.2%
Harvested	36.8%	2.1%	47.4%	18.9%	1.1%
Received	52.6%	5.3%	42.1%	45.3%	5.3%
Gave Away	29.5%	2.1%	35.8%	11.6%	0.0%

Estimated Community Harvest and Take (Expanded):

	Seals				Sea Lion
	Bearded	Ribbon	Ringed	Spotted	
Total Number Harvested	145.7	4.1	408.5	78.0	2.1
Total Number Struck and Lost	<u>36.9</u>	<u>0.0</u>	<u>20.5</u>	<u>8.2</u>	<u>0.0</u>
Total Number Taken	182.7	4.1	429.0	86.2	2.1
Number Harvested Per Capita	0.17	0.00	0.48	0.09	0.00

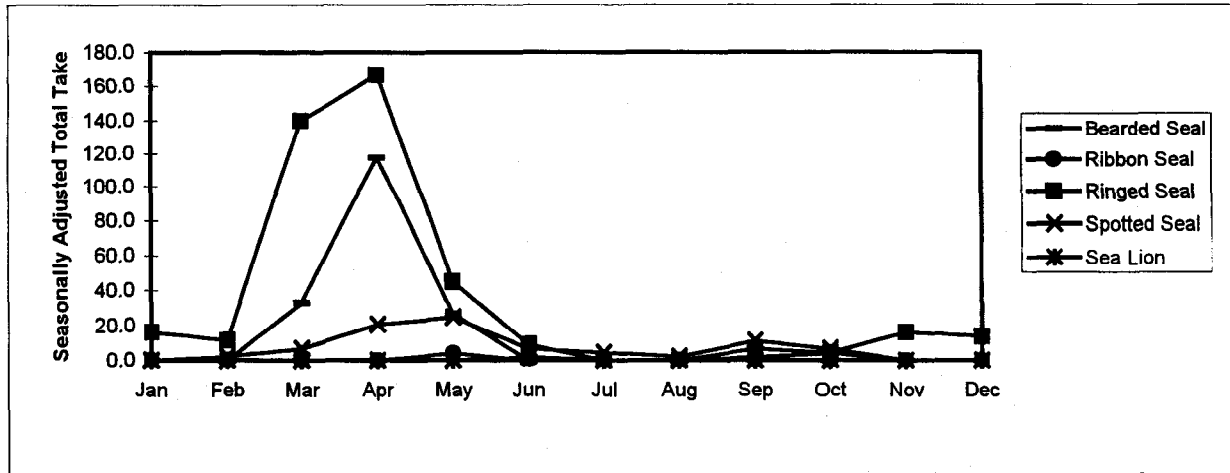
SEAL AND SEA LION HARVEST BY AGE AND SEX - COMMUNITY ESTIMATE (EXPANDED)

	Seals								Sea Lion	
	Bearded		Ribbon		Ringed		Spotted		Number	%
	Number	%	Number	%	Number	%	Number	%		
Adult Male	57.5	39.4%	4.1	100.0%	160.1	39.2%	32.8	42.1%	0.0	0.0%
Adult Female	47.2	32.4%	0.0	0.0%	80.1	19.6%	6.2	7.9%	2.1	100.0%
Adult Unknown Sex	12.3	8.5%	0.0	0.0%	125.2	30.7%	18.5	23.7%	0.0	0.0%
Juvenile Male	16.4	11.3%	0.0	0.0%	18.5	4.5%	18.5	23.7%	0.0	0.0%
Juvenile Female	0.0	0.0%	0.0	0.0%	2.1	0.5%	2.1	2.6%	0.0	0.0%
Juvenile Unknown Sex	6.2	4.2%	0.0	0.0%	18.5	4.5%	0.0	0.0%	0.0	0.0%
Pup Male	4.1	2.8%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Pup Female	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Pup Unknown Sex	2.1	1.4%	0.0	0.0%	2.1	0.5%	0.0	0.0%	0.0	0.0%
Male Unknown Age	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Female Unknown Age	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Unknown Sex and Age	0.0	0.0%	0.0	0.0%	2.1	0.5%	0.0	0.0%	0.0	0.0%
Total	145.7	100.0%	4.1	100.0%	408.5	100.0%	78.0	100.0%	2.1	100.0%

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, with assistance from the community of Hooper Bay, 1998.

Table 2. SEAL AND SEA LION HARVEST AND TAKE ESTIMATES: Hooper Bay, 1997/98 (cont.)

SEASONALLY ADJUSTED TAKE BY MONTH



BEARDED SEAL HARVEST BY MONTH

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unknown Month	Total
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	14	48	6	0	0	0	1	2	0	0	0	71
Struck & Lost	0	0	2	9	7	0	0	0	0	0	0	0	0	18
Total Take	0	0	16	57	13	0	0	0	1	2	0	0	0	89
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	28.7	98.5	12.3	0.0	0.0	0.0	2.1	4.1	0.0	0.0	0.0	145.7
Struck & Lost	0.0	0.0	4.1	18.5	14.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.9
Total Take	0.0	0.0	32.8	117.0	26.7	0.0	0.0	0.0	2.1	4.1	0.0	0.0	0.0	182.7
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	28.7	98.5	12.3	0.0	0.0	0.0	2.1	4.1	0.0	0.0	0.0	145.7
Struck & Lost	0.0	0.0	4.1	18.5	14.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.9
Total Take	0.0	0.0	32.8	117.0	26.7	0.0	0.0	0.0	2.1	4.1	0.0	0.0	0.0	182.7
Total Take (%)	0.0%	0.0%	18.0%	64.0%	14.6%	0.0%	0.0%	0.0%	1.1%	2.2%	0.0%	0.0%	0.0%	100.0%
Cum. Take	0.0	0.0	32.8	149.8	176.5	176.5	176.5	176.5	178.6	182.7	182.7	182.7	182.7	182.7
Cum. Take (%)	0.0%	0.0%	18.0%	82.0%	96.6%	96.6%	96.6%	96.6%	97.8%	100.0%	100.0%	100.0%	100.0%	100.0%

RIBBON SEAL HARVEST BY MONTH

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unknown Month	Total
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Struck & Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	2	0	0	0	0	0	0	0	0	2
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1
Total Take (%)	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Cum. Take	0.0	0.0	0.0	0.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Cum. Take (%)	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

NOTE: Numbers on these tables and figures reflect a study period from March 1997 through February 1998.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, with assistance from the community of Hooper Bay, 1998.

Table 2. SEAL AND SEA LION HARVEST AND TAKE ESTIMATES: Hooper Bay, 1997/98 (cont.)

<i>RINGED SEAL HARVEST BY MONTH</i>													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	7	5	59	69	16	4	0	0	3	2	7	6	21	199
Struck & Lost	0	0	1	2	2	0	0	0	0	0	0	0	5	10
Total Take	7	5	60	71	18	4	0	0	3	2	7	6	26	209
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	14.4	10.3	121.1	141.6	32.8	8.2	0.0	0.0	6.2	4.1	14.4	12.3	43.1	408.5
Struck & Lost	0.0	0.0	2.1	4.1	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3	20.5
Total Take	14.4	10.3	123.2	145.7	36.9	8.2	0.0	0.0	6.2	4.1	14.4	12.3	53.4	429.0
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	16.1	11.5	135.4	158.3	36.7	9.2	0.0	0.0	6.9	4.6	16.1	13.8		408.5
Struck & Lost	0.0	0.0	4.1	8.2	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0		20.5
Total Take	16.1	11.5	139.5	166.6	44.9	9.2	0.0	0.0	6.9	4.6	16.1	13.8		429.0
Total Take (%)	3.7%	2.7%	32.5%	38.8%	10.5%	2.1%	0.0%	0.0%	1.6%	1.1%	3.7%	3.2%		100.0%
Cum. Take	16.1	27.5	167.0	333.6	378.5	387.7	387.7	387.7	394.6	399.2	415.2	429.0		
Cum. Take (%)	3.7%	6.4%	38.9%	77.8%	88.2%	90.4%	90.4%	90.4%	92.0%	93.0%	96.8%	100.0%		

<i>SPOTTED SEAL HARVEST BY MONTH</i>													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	1	3	9	9	3	1	1	4	3	0	0	4	38
Struck & Lost	0	0	0	0	2	0	1	0	1	0	0	0	0	4
Total Take	0	1	3	9	11	3	2	1	5	3	0	0	4	42
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	2.1	6.2	18.5	18.5	6.2	2.1	2.1	8.2	6.2	0.0	0.0	8.2	78.0
Struck & Lost	0.0	0.0	0.0	0.0	4.1	0.0	2.1	0.0	2.1	0.0	0.0	0.0	0.0	8.2
Total Take	0.0	2.1	6.2	18.5	22.6	6.2	4.1	2.1	10.3	6.2	0.0	0.0	8.2	86.2
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	2.3	6.9	20.6	20.6	6.9	2.3	2.3	9.2	6.9	0.0	0.0		78.0
Struck & Lost	0.0	0.0	0.0	0.0	4.1	0.0	2.1	0.0	2.1	0.0	0.0	0.0		8.2
Total Take	0.0	2.3	6.9	20.6	24.8	6.9	4.3	2.3	11.2	6.9	0.0	0.0		86.2
Total Take (%)	0.0%	2.7%	8.0%	23.9%	28.7%	8.0%	5.0%	2.7%	13.0%	8.0%	0.0%	0.0%		100.0%
Cum. Take	0.0	2.3	9.2	29.8	54.6	61.5	65.8	68.1	79.3	86.2	86.2	86.2		
Cum. Take (%)	0.0%	2.7%	10.6%	34.6%	63.3%	71.3%	76.3%	79.0%	92.0%	100.0%	100.0%	100.0%		

<i>SEA LION HARVEST BY MONTH</i>													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Struck & Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	0	1	0	0	0	0	0	0	0	1
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0		2.1
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Take	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0		2.1
Total Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		100.0%
Cum. Take	0.0	0.0	0.0	0.0	0.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1		
Cum. Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		

NOTE: Numbers on these tables and figures reflect a study period from March 1997 through February 1998.
 SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, with assistance from the community of Hooper Bay, 1998

Appendix D Table 3. SEAL AND SEA LION HARVEST AND TAKE ESTIMATES: Quinhagak, 1997/98

SAMPLING DESIGN:		Active	Other	Total
TWO-STRATA	Total Native Households	50	63	113
	Surveyed Households	47	32	79
	Sampling Fraction	94.0%	50.8%	69.9%
	Sample Household Members	226	122	348
	Estimated Household Members	240.4	240.2	480.6

SEAL AND SEA LION HARVEST AND USE INFORMATION

Percentage of Native Households:

	Seals				Sea Lion
	Bearded	Ribbon	Ringed	Spotted	
Used	28.3%	0.9%	41.4%	64.5%	0.0%
Hunted	24.1%	0.9%	32.7%	35.5%	0.0%
Harvested	22.2%	0.9%	31.7%	35.5%	0.0%
Received	10.6%	0.0%	16.1%	35.4%	0.0%
Gave Away	17.6%	0.9%	23.4%	28.9%	0.0%

Estimated Community Harvest and Take (Expanded):

	Seals				Sea Lion
	Bearded	Ribbon	Ringed	Spotted	
Total Number Harvested	33.6	2.1	119.6	125.1	0.0
Total Number Struck and Lost	<u>1.1</u>	<u>0.0</u>	<u>32.2</u>	<u>22.2</u>	<u>0.0</u>
Total Number Taken	34.6	2.1	151.8	147.2	0.0
Number Harvested Per Capita	0.07	0.00	0.25	0.26	0.00

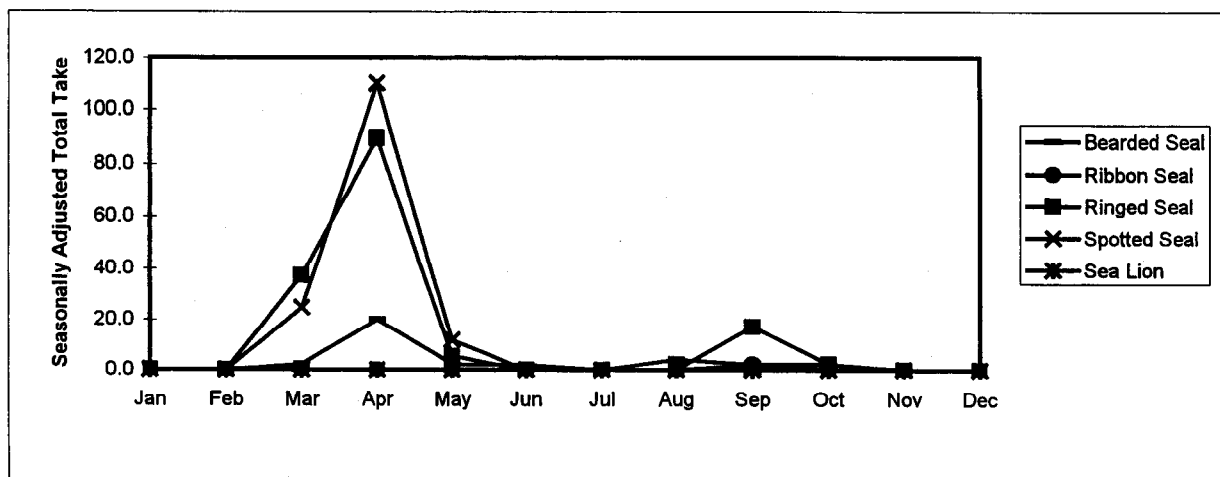
SEAL AND SEA LION HARVEST BY AGE AND SEX - COMMUNITY ESTIMATE (EXPANDED)

	Seals								Sea Lion	
	Bearded		Ribbon		Ringed		Spotted		Number	%
	Number	%	Number	%	Number	%	Number	%		
Adult Male	4.3	12.7%	1.1	50.0%	7.3	6.1%	14.7	11.8%	0.0	---
Adult Female	5.3	15.8%	1.1	50.0%	0.0	0.0%	19.1	15.3%	0.0	---
Adult Unknown Sex	8.2	24.4%	0.0	0.0%	50.6	42.3%	62.4	49.9%	0.0	---
Juvenile Male	3.2	9.5%	0.0	0.0%	2.1	1.8%	3.2	2.6%	0.0	---
Juvenile Female	2.1	6.3%	0.0	0.0%	1.1	0.9%	1.1	0.9%	0.0	---
Juvenile Unknown Sex	8.4	24.9%	0.0	0.0%	33.0	27.6%	6.4	5.1%	0.0	---
Pup Male	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	---
Pup Female	1.1	3.2%	0.0	0.0%	0.0	0.0%	1.1	0.9%	0.0	---
Pup Unknown Sex	1.1	3.2%	0.0	0.0%	11.7	9.8%	4.3	3.4%	0.0	---
Male Unknown Age	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	---
Female Unknown Age	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	---
Unknown Sex and Age	0.0	0.0%	0.0	0.0%	13.8	11.6%	12.8	10.2%	0.0	---
Total	33.6	100.0%	2.1	100.0%	119.6	100.0%	125.1	100.0%	0.0	---

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, with assistance from the community of Quinhagak, 1998.

Table 3. SEAL AND SEA LION HARVEST AND TAKE ESTIMATES: Quinhagak, 1997/98 (cont.)

SEASONALLY ADJUSTED TAKE BY MONTH



BEARDED SEAL HARVEST BY MONTH													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	2	17	1	1	0	4	2	2	0	0	0	29
Struck & Lost	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total Take	0	0	2	17	2	1	0	4	2	2	0	0	0	30
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	2.1	19.9	1.1	2.0	0.0	4.3	2.1	2.1	0.0	0.0	0.0	33.6
Struck & Lost	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Total Take	0.0	0.0	2.1	19.9	2.1	2.0	0.0	4.3	2.1	2.1	0.0	0.0	0.0	34.6
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	2.1	19.9	1.1	2.0	0.0	4.3	2.1	2.1	0.0	0.0	0.0	33.6
Struck & Lost	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Total Take	0.0	0.0	2.1	19.9	2.1	2.0	0.0	4.3	2.1	2.1	0.0	0.0	0.0	34.6
Total Take (%)	0.0%	0.0%	6.1%	57.5%	6.1%	5.7%	0.0%	12.3%	6.1%	6.1%	0.0%	0.0%	0.0%	100.0%
Cum. Take	0.0	0.0	2.1	22.0	24.2	26.1	26.1	30.4	32.5	34.6	34.6	34.6	34.6	34.6
Cum. Take (%)	0.0%	0.0%	6.1%	63.6%	69.7%	75.4%	75.4%	87.7%	93.9%	100.0%	100.0%	100.0%	100.0%	100.0%

RIBBON SEAL HARVEST BY MONTH													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Struck & Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	0	0	0	0	2	0	0	0	0	2
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	2.1
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	2.1
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	2.1
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	2.1
Total Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Cum. Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1	2.1	2.1	2.1	2.1
Cum. Take (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

NOTE: Numbers on these tables and figures reflect a study period from March 1997 through February 1998.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, with assistance from the community of Quinhagak, 1998.

Table 3. SEAL AND SEA LION HARVEST AND TAKE ESTIMATES: Quinhagak, 1997/98 (cont.)

<i>RINGED SEAL HARVEST BY MONTH</i>													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	30	71	3	0	0	0	3	2	0	0	0	109
Struck & Lost	0	0	5	12	2	0	0	0	6	0	0	0	1	26
Total Take	0	0	35	83	5	0	0	0	9	2	0	0	1	135
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	31.9	76.4	3.2	0.0	0.0	0.0	5.9	2.1	0.0	0.0	0.0	119.6
Struck & Lost	0.0	0.0	5.3	12.8	2.1	0.0	0.0	0.0	10.9	0.0	0.0	0.0	1.1	32.2
Total Take	0.0	0.0	37.2	89.2	5.3	0.0	0.0	0.0	16.8	2.1	0.0	0.0	1.1	151.8
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	31.9	76.4	3.2	0.0	0.0	0.0	5.9	2.1	0.0	0.0		119.6
Struck & Lost	0.0	0.0	5.5	13.2	2.2	0.0	0.0	0.0	11.3	0.0	0.0	0.0		32.2
Total Take	0.0	0.0	37.4	89.6	5.4	0.0	0.0	0.0	17.2	2.1	0.0	0.0		151.8
Total Take (%)	0.0%	0.0%	24.7%	59.1%	3.6%	0.0%	0.0%	0.0%	11.3%	1.4%	0.0%	0.0%		100.0%
Cum. Take	0.0	0.0	37.4	127.1	132.4	132.4	132.4	132.4	149.6	151.8	151.8	151.8		
Cum. Take (%)	0.0%	0.0%	24.7%	83.7%	87.3%	87.3%	87.3%	87.3%	98.6%	100.0%	100.0%	100.0%		

<i>SPOTTED SEAL HARVEST BY MONTH</i>													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	20	86	8	0	0	0	1	0	0	0	0	115
Struck & Lost	0	0	3	14	3	0	0	0	0	0	0	0	0	20
Total Take	0	0	23	100	11	0	0	0	1	0	0	0	0	135
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	21.3	94.2	8.5	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	125.1
Struck & Lost	0.0	0.0	3.2	15.8	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.2
Total Take	0.0	0.0	24.5	110.0	11.7	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	147.2
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	21.3	94.2	8.5	0.0	0.0	0.0	1.1	0.0	0.0	0.0		125.1
Struck & Lost	0.0	0.0	3.2	15.8	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0		22.2
Total Take	0.0	0.0	24.5	110.0	11.7	0.0	0.0	0.0	1.1	0.0	0.0	0.0		147.2
Total Take (%)	0.0%	0.0%	16.6%	74.7%	7.9%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%		100.0%
Cum. Take	0.0	0.0	24.5	134.5	146.2	146.2	146.2	146.2	147.2	147.2	147.2	147.2		
Cum. Take (%)	0.0%	0.0%	16.6%	91.3%	99.3%	99.3%	99.3%	99.3%	100.0%	100.0%	100.0%	100.0%		

<i>SEA LION HARVEST BY MONTH</i>													Unknown	Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Month		
REPORTED HARVEST AND TAKE BY SAMPLED HOUSEHOLDS (UNEXPANDED)														
Harvest	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Struck & Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Take	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESTIMATED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESTIMATED SEASONALLY ADJUSTED HARVEST AND TAKE BY COMMUNITY (EXPANDED)														
Harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Struck & Lost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Take (%)	--	--	--	--	--	--	--	--	--	--	--	--		--
Cum. Take	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Cum. Take (%)	--	--	--	--	--	--	--	--	--	--	--	--		

NOTE: Numbers on these tables and figures reflect a study period from March 1997 through February 1998.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, The Subsistence Harvest of Seals and Sea Lions by Alaska Natives in Three Communities of the Yukon Kuskokwim Delta, Alaska, with assistance from the community of Quinhagak, 1998.