

The Subsistence Harvest of Black Brant, Emperor Geese, and Eider Ducks in Alaska

Technical Paper No. 234

Robert J. Wolfe and **Amy W. Paige**
Principal Investigator Project Coordinator

Data Analysis Charles J. Utermohle, Louis Brown, Sarah Carpenter, Sandra Skaggs, Cheryl L. Scott **Southwest Region Research** James A. Fall, Lisa B. Hutchinson-Scarborough, Craig Mishler, Ronald T. Stanek, Vicki Vanek **Northwest Arctic Region Research** Elizabeth Andrews, Clarence Alexander, Dave B. Andersen, James S. Magdanz, James R. Marcotte

**Cooperative Agreement No. 1448-007-94-7729/ADF&G COOP-94-062
Migratory Bird Subsistence Harvest Survey
Prepared for the U.S. Fish and Wildlife Service**

**Alaska Department of Fish and Game
Division of Subsistence
Juneau, Alaska
May 1995
Printed June 2002**

The Alaska Department of Fish and Game conducts all programs and activities free from discrimination on the basis of sex, color, race, religion, national origin, age, marital status, pregnancy, parenthood, or disability. For information on alternative formats available for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-4120, (TDD) 1-800-478-3648 or (FAX) 907-586-6595. Any person who believes s/he has been discriminated against should write to: ADF&G, P.O. Box 25526, Juneau, Alaska 99802-5526; or O.E.O., U.S. Department of the Interior, Washington, D.C. 20240.

TABLE OF CONTENTS

Introduction.....	1
Methodology	2
State Harvest Estimates of Brant, Emperor, and Eiders	7
Discussion	8
References	35
Appendix 1. Subsistence Harvests of Black Brant.....	41
Appendix 2. Subsistence Harvests of Emperor	55
Appendix 3. Subsistence Harvests of Eiders	67
Appendix 4. Harvests by Community, Year, and Season	91

List of Tables

Table 1.	Yearly Harvests of Brant, Emperor Geese, and Eider Ducks (King, Common, Spectacled, and Steller's Eider) By Alaska Area, Circa Early 1990s	9
Table 2.	Yearly Brant Harvests in Alaska Estimated From Household Surveys and Expanded to Unsurveyed Places	10
Table 3.	Yearly Emperor Harvests in Alaska Estimated From Household Surveys and Expanded to Unsurveyed Places	13
Table 4.	Yearly Eider Harvests in Alaska Estimated From Household Surveys and Expanded to Unsurveyed Places	16

Appendix Tables

Appendix 4. Table 1	Brant Harvest Estimates by Season.....	93
Appendix 4. Table 2	Emperor Geese Harvest Estimates by Season	95
Appendix 4. Table 3	Eider Harvest Estimates (All Species) by Season	97
Appendix 4. Table 4	King Eider Harvest Estimates by Season.....	99
Appendix 4. Table 5	Common Eider Harvest Estimates by Season	101
Appendix 4. Table 6	Spectacled Eider Harvest Estimates by Season	103
Appendix 4. Table 7	Steller's Eider Harvest Estimates by Season	105
Appendix 4. Table 8	Eider Harvest Estimates (Unreported Species) by Season	107
Appendix 4. Table 9	Estimated Harvests of Brant, Emperor Geese, and Eider Ducks for Selected Surveyed Alaska Communities and Study Years	109

List of Figures

Figure 1.	Map of Communities Covered by the Report.....	3
Figure 2.	Map of Study Areas.....	4
Figure 3.	Map of Yukon-Kuskokwim Delta Area and Communities.....	5
Figure 4.	Brant Harvests by Alaska Area, Circa Early 1990s.....	21
Figure 5.	Emperor Harvests by Alaska Area, Circa Early 1990s.....	22
Figure 6.	Eider Harvests by Alaska Area, Circa Early 1990s	23
Figure 7.	King Eider Harvests by Alaska Area, Circa Early 1990s	24
Figure 8.	Common Eider Harvests by Alaska Area, Circa Early 1990s.....	25
Figure 9.	Spectacled Eider Harvests by Alaska Area, Circa Early 1990s.....	26
Figure 10.	Steller's Eider Harvests by Alaska Area, Circa Early 1990s.....	27
Figure 11.	Seasonal Harvests of Brant, Eider Ducks, and Emperor Geese in Rural Areas With Seasonal Information, Circa Early 1990s.....	28
Figure 12.	Brant Harvest Estimates in Rural Alaska (Yearly Harvests Circa Early 1990s).....	29
Figure 13.	Emperor Harvest Estimates in Rural Alaska (Yearly Harvests Circa Early 1990s).....	30

Figure 14.	King Eider Harvest Estimates in Rural Alaska (Yearly Harvests Circa Early 1990s).....	31
Figure 15.	Common Eider Harvest Estimates in Rural Alaska (Yearly Harvests Circa Early 1990s).....	32
Figure 16.	Spectacled Eider Harvest Estimates in Rural Alaska (Yearly Harvests Circa Early 1990s).....	33
Figure 17.	Steller's Eider Harvest Estimates in Rural Alaska (Yearly Harvests Circa Early 1990s).....	34
Figure 18.	Estimated Black Brant Harvests, Yukon-Kuskokwim Delta 1985-1993	50
Figure 19.	Estimated Emperor Geese Harvests, Yukon-Kuskokwim Delta 1985-1993	59
Figure 20.	Estimated Eider Duck Harvests, Yukon-Kuskokwim Delta 1985-1993	79
Figure 21.	Estimated King Eider Harvests, Yukon-Kuskokwim Delta 1985-1993	79
Figure 22.	Estimated Common Eider Harvests, Yukon-Kuskokwim Delta 1985-1993	80
Figure 23.	Estimated Sepctacled Eider Harvests, Yukon-Kuskokwim Delta 1985-1993	80

ACKNOWLEDGEMENTS

This project would not have been possible without local support in each of the communities where we conducted bird surveys. We wish to thank each tribal council and city council which facilitated this work. Jake Olanna of Kawerak, Inc., Art Ivanoff of Maniilaq Association and Tommy Ballot of the Selawik IRA Council deserve special mention for their efforts in seeing that the project was successfully completed. In addition, Moses Dirks, Mike Rearden, and Cynthia Wentworth of the U.S. Fish and Wildlife Service, Fred Tocktoo of the National Park Service, and Pippa Coiley, Molly Chythlook, Ida Roehl, and Tom Rothe of the Alaska Department of Fish and Game provided invaluable assistance during the course of the project. The National Geographic Society is thanked for permission to use color bird illustrations for the hunter survey, taken from the *Field Guide to Birds of North America*, 2nd Edition, 1987. Thanks also go to the many elders and local bird experts who allowed us to interview them at length about their lifelong use and observations of migratory birds, and to the many hunters who volunteered to report their subsistence harvests to our staff and to locally hired community resource specialists.

The 23 local community resource specialists who conducted household interviews deserve to be recognized individually for their high level of interest and work. We look forward to working with many again in the future:

Ray Golodoff, Atka
Denise Iyatunguk, Deering
Shirley Moto, Deering
Stanton Nakarak, Elim
Elmer Jackson, Kiana
Dolly Booth, Noatak
Bert Mitchell, Noatak
Bessie Monroe, Noatak
Agafangel Lekanoff, St. George
Antooney Melovidov, St. Paul
Pat Pletnikov, St. Paul
Vladimir Melovidov, St. Paul
Vernita Ballot, Selawik
William Takak, Shaktoolik
Wynona Jones, Shungnak
Cornelius Dan, Stebbins
Ted Katcheak, Stebbins
Brenda Tellman, Unalaska
Shawn Dickson, Unalaska
Jim Dickson, Unalaska
Frank Oxereck, Wales
Emma Weyapuk, Wales
Robert Charles, White Mountain

INTRODUCTION

This report describes the contemporary subsistence harvests of black brant (*Branta bernicla nigricans*), emperor geese (*Chen canagica*), and four species of eider ducks in Alaska -- common eider (*Somateria mollissima*), king eider (*Somateria spectabilis*), spectacled eider (*Somateria fischeri*), and Steller's eider (*Polysticta stelleri*). The subsistence harvests of brant, emperor geese, and eider ducks are presented for 133 rural Alaska communities, including the size, seasons, and geographic distributions of harvested birds (Figs. 1-3). The geographic area covered includes the coastal and near-coastal areas of Prince William Sound, South Kenai Peninsula, Kodiak Islands, Alaska Peninsula, Aleutian Islands, Pribilof Islands, Alaska Peninsula, Bristol Bay, Yukon-Kuskokwim Delta, Norton Sound, Seward Peninsula, St. Lawrence Island, Northwest Arctic, and the North Slope, as well as the inland areas of Lake Iliamna and the Northwest Arctic (Fig. 2).

The report presents information from subsistence studies conducted by the Division of Subsistence of the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service, and other researchers, in cooperation with Alaska Native organizations and local governments representing users of migratory birds in Alaska. The report was produced through a cooperative agreement between the Division of Subsistence and the U.S. Fish and Wildlife Service. The intent of the project was to produce a summary of available subsistence information on brant, emperor geese, and eider ducks, including a statewide harvest estimate, for management planning, population modeling, and population recovery programs by the Service. The documentation of customary and traditional patterns of use of migratory birds in Alaska also was important in the context of international treaty negotiations between the United States and Canada in 1995 to provide for legal spring subsistence hunting in rural Alaska areas.

The use of migratory birds by Alaska Natives for food and raw materials has a long tradition in Alaska, since before historic contact through to the present (Wolfe, Paige, and Scott 1990). The Alaska Native groups using migratory birds in the study area include the Aleut of the Aleutian and Pribilof islands, the Alutiiq and Eyak of the Pacific Gulf coast, the Yup'ik of western Alaska, and the Inupiat of northwest and arctic Alaska. In addition, some rural residents from Euroamerican and other cultural traditions hunt and use migratory birds for subsistence purposes. As shown in this report, brant, emperor geese, common eider, and king eider are commonly used in many communities, while spectacled eider and Steller's eiders are only occasionally harvested. The use of these birds can be compared with the general description of subsistence uses of migratory birds for Alaska presented in Wolfe, Paige, and Scott (1990).

The report is organized in several sections. The Methodology section describes the methods used to compile and analyze information. The State Harvest Estimates of Brant, Emperor, and Eiders and Discussion present harvest estimates of brant, emperor geese, and eider ducks in Alaska, shown at the community, region, and state levels. The three appendices that follow (Subsistence Harvests of Pacific Black Brant, Subsistence Harvests of Emperor Goose, and Subsistence Harvests of Eider Ducks)

present information on subsistence use patterns within each subregion, drawn from published accounts and local bird experts interviewed during the project. Appendix 4 contains additional harvest tables for communities with multiple survey years.

METHODOLOGY

For this report, information on subsistence harvests of brant, emperor geese, and eider ducks was compiled from records of the Division of Subsistence (67 communities), the U.S. Fish and Wildlife Service (Gambell, Savoonga, and 20 Yukon-Kuskokwim Delta communities) (Wentworth 1994a, 1994b), and S.R. Braund and Associates and the Institute of Social and Economic Research (2 communities -- Barrow and Wainwright) (see Fig. 1-3, Tables 3-5). In all, there are 91 communities which have systematic information on bird harvests. The available harvest information by place and year is presented in Appendix 4 Table 9. As shown, some communities have several years of harvest information, while others have only a single year's harvest data.

Bird harvest information was collected through retrospective, face-to-face interviews with hunters. Readers should consult Scott, Paige, Jennings, and Brown (1992) and Wentworth (1994a, 1994b) for descriptions of the specific methodologies used to collect harvest information within communities, as details vary between studies. In all communities, surveys were voluntary and hunter confidentiality was assured. In most surveys, hunters were asked to recall their household's bird harvests during the previous year. The surveys at Barrow and Wainwright used monthly recall periods, while surveys on the Yukon-Kuskokwim Delta used five recall periods of about five-weeks duration each. In many communities, surveys were done by local researchers, working within a network of local and regional researchers, while in other communities, surveys were done by teams of local and regional researchers. Surveys were conducted cooperatively with Alaska Native organizations and local governments. In most cases, permission to conduct surveys were secured from Native governments (Indian Reorganization Act Councils or Traditional Councils) or representative leaders. Local governments were extremely helpful during the course of projects, especially by reviewing project designs and preliminary findings, and by identifying Native households, potential local researchers, and bird experts in the community to contact.

In addition to compiling existing harvest information, bird harvests were documented in 13 new communities for the 1994 survey year. As part of this project, bird harvest surveys were conducted by the Division of Subsistence in Kiana, Selawik, and Shungnak (through cooperative agreements with Maniilaq Association and the Selawik IRA Council); in Elim, Shaktoolik, and Stebbins (through a cooperative agreement with Kawerak, Inc.); and in Atka, Unalaska, Saint Paul, and Saint George. Bird harvest information was collected by the Division of Subsistence in Deering, Noatak, and Wales in cooperation with the National Park Service through cooperative agreements with Derring IRA Council, Noatak IRA Council, Kawerak Inc., and the University of Washington.

Figure 1. Map of Communities Covered by the Report.
Communities with at least one year of bird survey information are in boxes; communities with no bird survey information are not in boxes.

Source: Robert J. Wolfe and Amy W. Paige, *The Subsistence Harvest of Black Brant, Emperor Geese, and Eider Ducks in Alaska*, Technical Paper No. 234, Division of Subsistence, Alaska Department of Fish and Game.

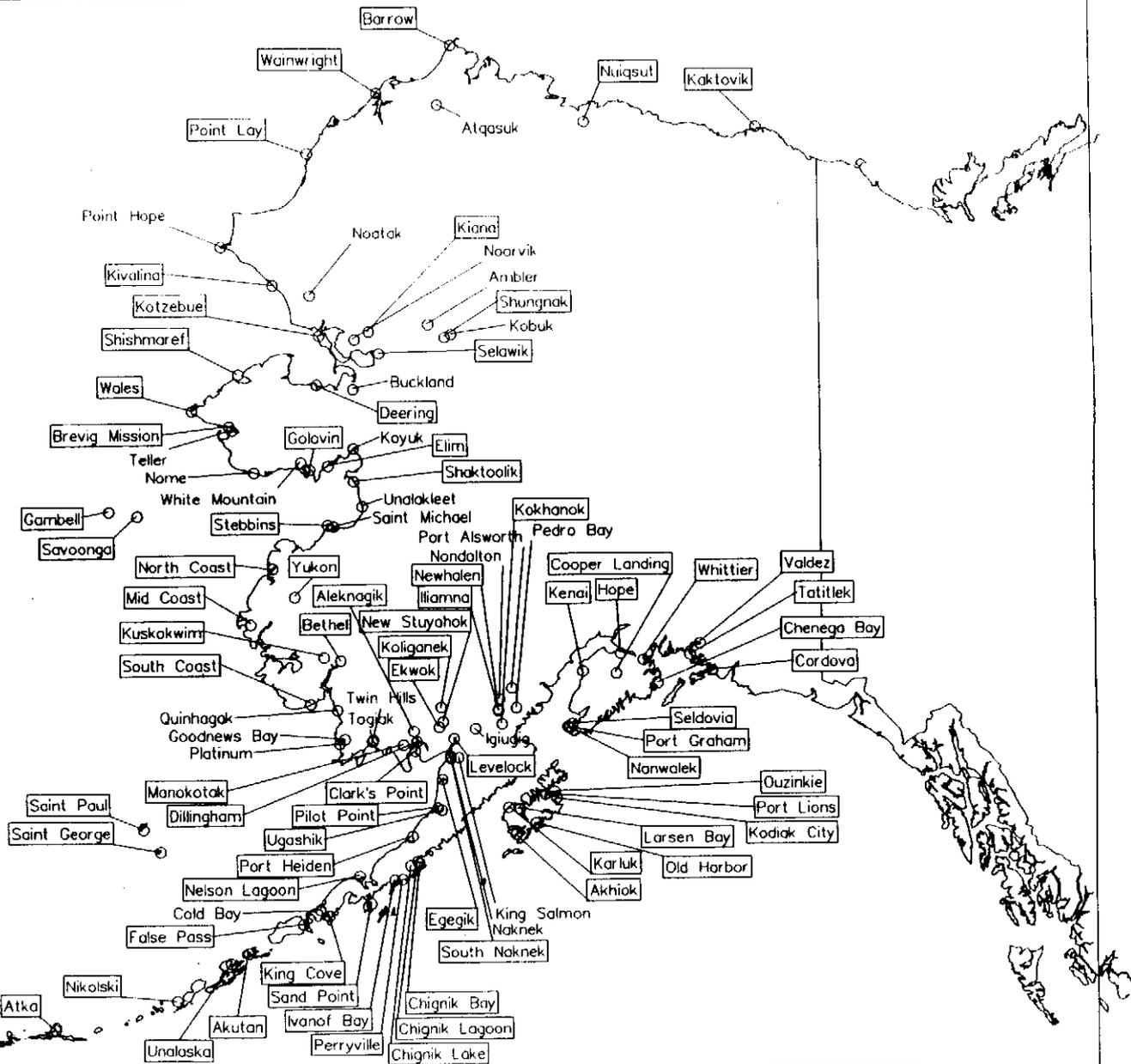
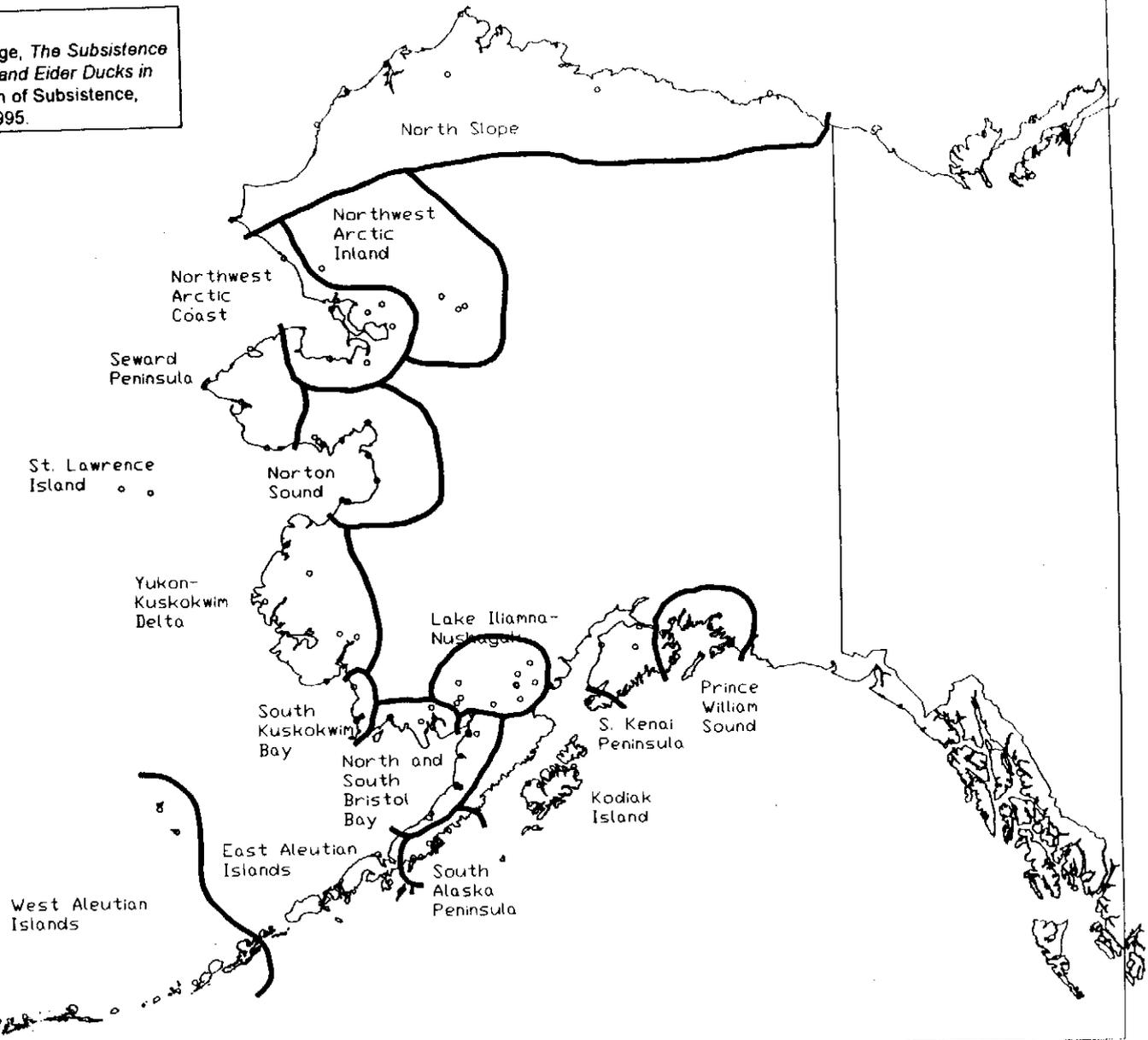


Figure 2. Map of Study Areas.

Source: Robert J. Wolfe and Amy W. Paige, *The Subsistence Harvest of Black Brant, Emperor Geese, and Eider Ducks in Alaska*, Technical Paper No. 234, Division of Subsistence, Alaska Department of Fish and Game, 1995.



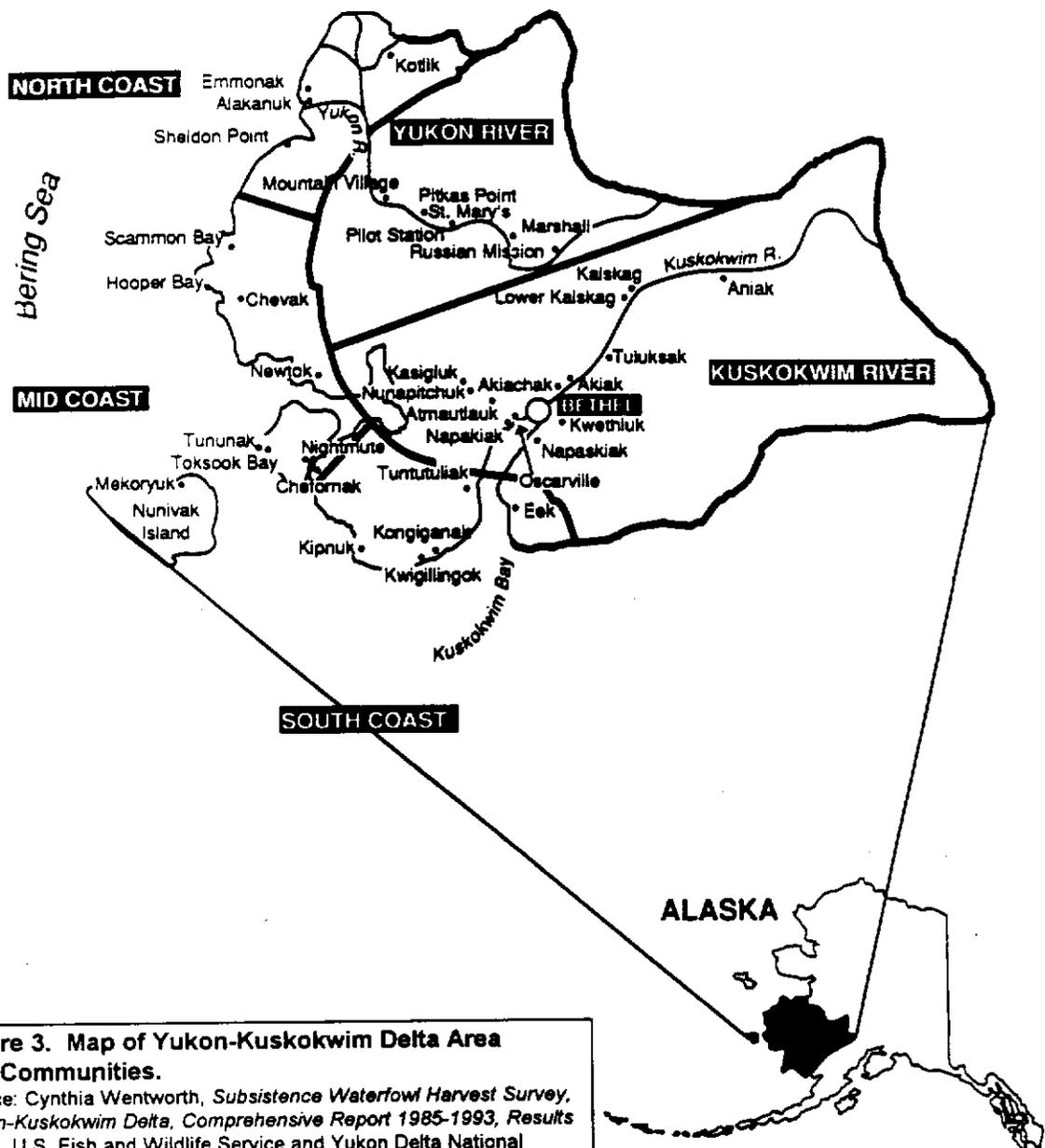


Figure 3. Map of Yukon-Kuskokwim Delta Area and Communities.
 Source: Cynthia Wentworth, *Subsistence Waterfowl Harvest Survey, Yukon-Kuskokwim Delta, Comprehensive Report 1985-1993, Results 1993*, U.S. Fish and Wildlife Service and Yukon Delta National Wildlife Refuge, December 1994.

There were an additional 42 unsurveyed communities in the study area for which systematic bird harvest information was unavailable. To produce statewide harvest estimates for brant, emperor geese, and eiders, harvest information was extrapolated from surveyed to unsurveyed communities, using several assumptions. First, with a few exceptions, the best estimate of a community's harvest was assumed to be the estimate for the most recent survey year with complete information (for the Yukon-Kuskokwim Delta area, a 3-year average of the three most recent years, 1991-93, was used as the best estimate). As stated above, there were 91 communities with at least one survey year. The most recent survey year by number of communities was as follows: 1983 (2 communities), 1984 (1), 1987 (8), 1988 (2), 1989 (9), 1990 (5), 1991 (8), 1992 (9), 1993 (34), 1994 (13).

Second, in many communities, harvests of "unknown eiders" were recorded during surveys. Harvests in the unknown eider category were apportioned to one of the four species based on the proportion of known eiders reported harvested by hunters in the community. Third, the per capita harvest level in a neighboring community was assumed to be the best estimate of per capita harvest level in an unsurveyed place. The per capita harvest was multiplied by the unsurveyed community's 1993 population to arrive at an estimate of the unsurveyed community's harvest. The community selected to represent an unsurveyed place is noted in the assumption column of the statewide harvest tables. Fourth, in 34 communities, eider harvests were not collected at the species level. For these communities, eider harvests were apportioned to the four eider species, using the composition of a neighboring community or key respondent information about species composition. The assumptions used about species composition also are noted in the statewide tables.

Qualitative information on harvests of brant, emperor geese, and eiders were extracted from the literature or key respondent materials held by the Division of Subsistence. The qualitative information is reported by geographic area, in the appendix section following the statewide harvest estimates.

There are inherent limitations to the existing data set. The chief limitation is the short time periods documented by the harvest surveys. The surveys at best cover only a few years. This means subsistence harvest estimates in most cases are based on single-year data points which cannot be compared with time series data. Bird harvests in a community are known to vary considerably from year to year because of natural variation in bird abundance, migration routes, and hunting conditions when birds are available in an area (Wolfe, Paige, and Scott 1990). The dynamic nature of subsistence patterns is not well represented by data sets of short duration. Key respondent materials can be used to assess the longer term patterns of use in a community or region. Harvests for communities with multiple survey years are presented in the appendix tables, which also can be used to assess variation. However, these are limited materials for determining the variations and trends in harvests. Along with additional surveys, developing a database of observations of local bird experts on harvest patterns and bird ecology would be a fruitful area for future subsistence research on these species (see Nakashima 1990).

STATE HARVEST ESTIMATES OF BRANT, EMPEROR, AND EIDERS

The estimated harvests of black brant, emperor geese, and eider ducks in rural Alaska areas and communities are presented in Tables 1-4. As shown in these tables, we estimate that there was a yearly harvest of about 10,990 black brant, 4,530 emperor geese, 11,138 king eider, 4,204 common eider, 896 spectacled eider, and 313 Steller's eiders in rural Alaska in the early 1990s. The total state harvest estimate for these species is somewhat uncertain because of the data limitations listed in the methodology section; however, these represent our best estimates of the numbers of birds taken annually during the early 1990s in rural Alaska communities.

The regional distribution of harvests are shown in Table 1 and Figs. 4-10. Harvests of brant, emperor geese, and eider ducks by community are shown in Figs. 12-17. Six areas showed significant brant harvests -- the North Slope (3,009 birds), Yukon-Kuskokwim Delta (2,519 birds), Seward Peninsula (1,905 birds), East Aleutian Islands (1,228 birds), Norton Sound (919 birds), and Northwest Arctic Coast (839 birds) (Fig. 4). These six areas accounted for 10,419 birds, or 95 percent of the total brant harvest.

By far, the area with the largest emperor geese harvests was the Yukon-Kuskokwim Delta, accounting for 2,555 birds, or about 56 percent of the total harvest (Fig. 5). Together, the communities of the Aleutian Island-Alaska Peninsula areas harvested another 19 percent, or about 870 emperors (East Aleutians, 492 birds; West Aleutians, 228 birds; South Alaska Peninsula, 150 birds). The remaining 25 percent of the emperor harvest was distributed among nine other areas.

Considering all types of eider ducks in Alaska, the areas with the largest yearly eider harvests were the North Slope (8,307 birds, or 50 percent of the harvest) and the Yukon-Kuskokwim Delta (3,977 birds, or 24 percent) (Fig. 6). For king eider, two areas accounted for 80 percent of the king eider harvest (8,915 birds) -- the North Slope area (5,577 birds) and the Yukon-Kuskokwim Delta (3,338 birds) (Fig. 7). The remaining 20 percent of the king eider harvest occurred in 10 other areas. For common eider, the North Slope (1,980 birds) accounted for 47 percent of the harvest (Fig. 8). Twelve other areas also reported harvests of common eider.

Harvests of spectacled eider and Steller's eiders were much less frequent in comparison with king and common eider harvests. Most spectacled eider harvests (604 birds, or 67 percent of the total) were reported from the North Slope area (Fig. 9). Other regions reporting spectacled eider harvests were the Yukon-Kuskokwim Delta (176 birds), Northwest Arctic Coast (92 birds), the Seward Peninsula (11 birds), St. Lawrence Island (9 birds), and Norton Sound (3 birds). Only five areas had reports of Steller's eider harvests -- the North Slope (146 birds), East Aleutian Islands (70 birds), St. Lawrence Island (42 birds), West Aleutian Islands (40 birds), and Yukon-Kuskokwim Delta (15 birds) (Fig. 10).

Harvests of brant, emperor geese, and eider ducks appear to be relatively uncommon in communities of the Gulf of Alaska (including Kodiak Island, the lower Kenai Peninsula, and Prince William Sound). Inland areas also reported infrequent harvests of these coastal birds. Surveyed communities along the Kobuk and Noatak

rivers in the Northwest Arctic area reported no harvests during the study period. The Lake Illiamna-Nushagak area reported harvests of eiders (assumed to be common eiders, although the species were not reported), as well as some brant and emperor geese.

The seasonal distribution of the statewide takes of brant, emperor geese, and eider ducks are depicted in Fig. 11. Brant, emperor geese, and eiders are primarily harvested during spring (April through May) and fall (August through October) migrations, with some harvest occurring during summer (June and July). A relatively small number of eiders and emperors are reported harvested during winter (November through March). Harvest seasons vary substantially between communities, depending principally on the seasonal availability of the birds in the community's local hunting area (see Appendix).

DISCUSSION

The analysis of available subsistence harvest information shows that brant, emperor, king eider, and common eider are commonly harvested in rural Alaska communities. Harvests occur principally in coastal communities north of and including the Alaska Peninsula-Aleutian Island chain (except that no emperor harvests are reported north of Kotzebue Sound). By comparison, reported harvests of spectacled eider and Steller's eider are much less frequent and more sporadic in rural Alaska communities, reflecting their smaller abundance. Inland communities and coastal communities west of the Alaska Peninsula report more occasional harvests of brant, emperor geese, or eider ducks.

Brant, emperor geese, and eider ducks are part of a wider breadth of wild resources that are seasonally harvested in rural communities. The subsistence harvests follow customary and traditional patterns of use which are grounded in both the culture and economy of a community. Most of the contemporary harvests of migratory birds are done by Alaska Native hunters. The birds are distributed among extended family groups for use as food and in some local crafted items. There has been relatively little systematic work to date which documents the customary and traditional patterns of use of brant, emperor geese, and eider ducks in Alaska Native communities, compared with the literature on other subsistence activities, such as whaling or caribou hunting. The materials available are summarized in the appendix of this report.

There may be two fruitful areas for future work. The first is documenting the dynamics of the subsistence harvest over a longer period of time for particular areas. Multiple-year harvest studies can be used to establish the normal range of harvests over time and possible trends in harvests by species and area. The second is documenting indigenous knowledge concerning the species in question. Local bird experts have much to contribute to the scientific knowledge of brant, emperor geese, and eider ducks. Working cooperatively with Native hunters, valuable historic observations on local bird ecology can be systematically collected and organized, representing data inaccessible through any other means. Through such collaborations, the ecology of these birds of common interest can be better understood.

Table 1
Yearly Harvests of Brant, Emperor Geese, and Eider Ducks
(King, Common, Spectacled, and Steller's Eider)
By Alaska Area, Circa Early 1990s

<u>Study Area</u>	<u>Brant</u>	<u>Emperor</u>	<u>All Eider</u>	<u>King Eider</u>	<u>Common Eider</u>	<u>Spectacled Eider</u>	<u>Steller's Eider</u>
North Slope	3,009	0	8,307	5,577	1,980	604	146
Northwest Arctic Coast	839	64	505	157	255	92	0
Northwest Arctic Inland	0	0	0	0	0	0	0
St. Lawrence Island	15	12	412	67	294	9	42
Seward Peninsula	1,905	122	411	210	190	11	0
Norton Sound	919	41	299	28	268	3	0
Yukon-Kuskokwim Delta	2,519	2,555	3,977	3,338	448	176	15
South Kuskokwim Bay	173	260	620	564	56	0	0
North Bristol Bay	288	325	835	641	194	0	0
South Bristol Bay	26	209	24	10	14	0	0
East Aleutian Islands	1,228	492	304	120	113	0	70
West Aleutian Islands	19	228	498	346	113	0	40
South Alaska Peninsula	21	150	57	28	29	0	0
Lake Iliamna-Nushagak	19	55	249	0	249	0	0
Kodiak Island	0	17	52	52	0	0	0
Kenai Peninsula	9	0	0	0	0	0	0
Prince William Sound	0	0	0	0	0	0	0
Total Rural Harvest	10,990	4,530	16,551	11,138	4,204	896	313

Source: Division of Subsistence, Alaska Department of Fish and Game

Table 2.
Yearly Brant Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places

<u>Community</u>	<u>1993</u>	<u>Survey</u>	<u>Survey Year</u>	<u>Per Capita</u>	<u>Total</u>	<u>Assumptions</u>
	<u>Population</u>	<u>Year</u>	<u>Year</u>	<u>Harvest</u>	<u>Brant</u>	
					<u>Harvest</u>	
North Slope						
Barrow	3,986	88		0.07	221	
Kaktovik	226	92		1.96	378	
Nuiqsut	386	93		0.82	296	
Point Lay	168	87		3.59	499	
Wainwright	535	89		1.70	700	
Atkasuk	240	none		0.82	197	Per capita harvest of Nuiqsut
Point Hope	704	none		1.02	718	Per capita harvest of Kivalina
Northwest Arctic Coast						
Kivalina	372	92		1.02	351	
Kotzebue	3,004	91		0.06	218	
Buckland	380	none		0.38	144	Per capita of Deering
Deering	159	94		0.38	60	
Kiana	403	94		0.02	8	
Noorvik	543	none		0.02	11	Per capita of Kiana
Selawik	640	94		0.08	46	
Northwest Arctic Inland						
Noatak	369	94		0.00	0	
Shungnak	236	94		0.00	0	
Kobuk	81	none		0.00	0	Per capita of Shungnak
Ambler	297	none		0.00	0	Per capita of Shungnak
St. Lawrence Island						
Gambell	562	93		0.01	7	
Savoonga	556	93		0.01	8	
Seward Peninsula						
Brevig Mission	243	89		2.53	464	
Shishmaref	533	89		0.89	421	
Council	8	none		0.00	0	Assumed to be zero
Port Clarence	28	none		0.00	0	Assumed to be zero
Solomon	6	none		0.00	0	Assumed to be zero
Teller	264	none		2.53	668	Per capita of Brevig Mission
Wales	147	94		0.92	135	
Nome	3,618	none		0.06	217	Per capita of Kotzebue
Norton Sound						
Golovin	152	89		2.04	345	
Elim	278	94		0.24	68	
Shaktolik	195	94		0.19	38	
Stebbins	453	94		0.03	14	
White Mountain	180	none		2.04	367	Per Capita of Golovin
St Michael	298	none		0.03	9	Per capita of Stebbins
Koyuk	281	none		0.20	55	Per capita of Shaktolik
Unalakleet	730	none		0.03	23	Per capita of Stebbins

Table 2 (Continued).
Yearly Brant Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places

<u>Community</u>	<u>1993 Population</u>	<u>Survey Year</u>	<u>Survey Year Per Capita Harvest</u>	<u>Total Brant Harvest</u>	<u>Assumptions</u>
Yukon-Kuskokwim Delta					
South Coast	1,703	91-93	0.16	273	3-Year Mean (1991-93)
Mid Coast	3,757	91-93	0.50	1,876	3-Year Mean (1991-93)
North Coast	2,008	91-93	0.08	170	3-Year Mean (1991-93)
Kuskokwim	4,193	91-93	0.04	158	3-Year Mean (1991-93)
Yukon	2,497	91-93	0.01	14	3-Year Mean (1991-93)
Bethel	5,009	91-93	0.01	28	3-Year Mean (1991-93)
South Kuskokwim Bay					
Goodnews Bay	238	none	0.22	52	Half of 1993 South Coast per capita
Platinum	49	none	0.22	11	Half of 1993 South Coast per capita
Quinhagak	501	none	0.22	110	Half of 1993 South Coast per capita
North Bristol Bay					
Aleknagik	181	89	0.01	1	
Clark's Point	53	89	0.38	21	
Dillingham	2,200	none	0.01	22	Per capita of Aleknagik
Manokotak	421	85	0.23	71	20% of geese are brant
Togiak	676	none	0.23	156	Per capita of Manokotak
Twin Hills	74	none	0.23	17	Per capita of Manokotak
South Bristol Bay					
Egegik	123	84	0.00	0	
Pilot Point	72	87	0.02	1	
South Naknek	147	92	0.00	0	
Ugashik	5	87	0.00	0	
King Salmon	805	none	0.00	0	Per capita of South Naknek
Naknek	621	none	0.00	0	Per capita of South Naknek
Port Heiden	132	87	0.24	25	
East Aleutian Islands					
Akutan	482	90	0.10	10	
False Pass	70	88	1.05	73	
King Cove	794	92	1.37	767	
Sand Point	1,002	92	0.35	214	
Nelson Lagoon	85	87	0.00	0	
Cold Bay	120		1.37	164	Per capita of King Cove
West Aleutian Islands					
Nikolski	32	90	0.00	0	
Atka	83	94	0.00	0	
Saint George	157	94	0.00	0	
Saint Paul	636	94	0.02	15	
Unalaska	3,337	94	0.00	4	
South Alaska Peninsula					
Chignik Bay	191	91	0.07	9	
Chignik Lagoon	88	89	0.00	0	
Chignik Lake	134	91	0.09	12	

Table 2 (Continued).
Yearly Brant Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places

<u>Community</u>	<u>1993</u> <u>Population</u>	<u>Survey Year</u>		<u>Per Capita</u> <u>Harvest</u>	<u>Total</u> <u>Brant</u> <u>Harvest</u>	<u>Assumptions</u>
		<u>Survey</u> <u>Year</u>	<u>Year</u>			
Ivanof Bay	30	89		0.00	0	
Perryville	103	89		0.00	0	
Lake Iliamna-Nushagak Area						
Ekwok	93	87		0.00	0	
Iliamna	98	91		0.07	7	
Kokhanok	158	92		0.00	0	
Koliganek	200	87		0.04	8	
Levelock	109	92		0.02	3	
New Stuyahok	416	87		0.00	0	
Newhalen	167	91		0.00	0	
Igiugig	41	92		0.03	1	
Nondalton	231	none		0.00	0	Median per capita of the region
Pedro Bay	42	none		0.00	0	Median per capita of the region
Port Alsworth	51	none		0.00	0	Median per capita of the region
Kodiak Island						
Akhiok	86	92		0.00	0	
Karluk	65	91		0.00	0	
Kodiak City	7,428	93		0.00	0	
Larsen Bay	153	93		0.00	0	
Old Harbor	311	91		0.00	0	
Ouzinkie	221	93		0.00	0	
Port Lions	264	93		0.00	0	
Kenai Peninsula						
Cooper Landing	261	90		0.00	0	
Hope	154	90		0.00	0	
Kenai	6,813	91		0.00	0	
South Kenai Peninsula						
Nanwalek	174	93		0.00	0	
Port Graham	177	93		0.00	0	
Seldovia	307	93		0.03	9	
Prince William Sound						
Chenega Bay	89	93		0.00	0	
Cordova	2,597	93		0.00	0	
Tatitlek	126	93		0.00	0	
Valdez	4,339	93		0.00	0	
Whittier	271	90		0.00	0	
Surveyed Rural Communities					7,977	
Unsurveyed Rural Communities					<u>3,013</u>	
Rural Total					10,990	

Table 3.
Yearly Emperor Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places

<u>Community</u>	<u>1993</u> <u>Population</u>	<u>Survey Year</u>		<u>Total</u>	<u>Assumptions</u>
		<u>Survey</u> <u>Year</u>	<u>Per Capita</u> <u>Harvest</u>	<u>Emperor</u> <u>Harvest</u>	
North Slope					
Barrow	3,986	89	0.00	0	
Kaktovik	226	92	0.00	0	
Nuiqsut	368	93	0.00	0	
Point Lay	168	87	0.00	0	
Wainwright	535	89	0.00	0	
Atkasuk	240	none	0.00	0	Per capita harvest of Nuiqsut
Point Hope	704	none	0.00	0	Per capita harvest of Kivalina
Northwest Arctic Coast					
Kivalina	372	92	0.00	0	
Kotzebue	3,004	91	0.00	10	
Buckland	380	none	0.00	0	Per capita of Deering
Deering	159	94	0.00	0	
Kiana	403	94	0.03	11	
Noorvik	543	none	0.03	15	Per capita of Kiana
Selawik	640	94	0.04	28	
Northwest Arctic Inland					
Noatak	369	94	0.00	0	
Shungnak	236	94	0.00	0	
Kobuk	81	none	0.00	0	Per capita of Shungnak
Ambler	297	none	0.00	0	Per capita of Shungnak
St. Lawrence Island					
Gambell	562	93	0.00	0	
Savoonga	556	93	0.02	12	
Seward Peninsula					
Brevig Mission	243	89	0.22	40	
Shishmaref	533	89	0.00	0	
Council	8	none	0.00	0	Assumed to be zero
Port Clarence	28	none	0.00	0	Assumed to be zero
Solomon	6	none	0.00	0	Assumed to be zero
Teller	264	none	0.22	58	Per capita of Brevig Mission
Wales	147	94	0.09	13	
Nome	3,618	none	0.00	12	Per capita of Kotzebue
Norton Sound					
Golovin	152	89	0.04	7	
Elim	278	94	0.00	0	
Shaktoolik	195	94	0.02	3	
Stebbins	453	94	0.01	5	
White Mountain	180	none	0.04	7	Per capita of Golovin
St Michael	298	none	0.01	4	Per capita of Stebbins
Koyuk	281	none	0.02	5	Per capita of Shaktoolik
Unalakleet	730	none	0.01	9	Per capita of Stebbins

**Table 3 (Continued).
Yearly Emperor Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places**

<u>Community</u>	<u>1993 Population</u>	<u>Survey Year</u>		<u>Total Emperor Harvest</u>	<u>Assumptions</u>
		<u>Survey Year</u>	<u>Per Capita Harvest</u>		
Yukon-Kuskokwim Delta					
South Coast	1,703	91-93	0.22	377	3-Year Mean (1991-93)
Mid Coast	3,757	91-93	0.48	1,803	3-Year Mean (1991-93)
North Coast	2,008	91-93	0.09	183	3-Year Mean (1991-93)
Kuskokwim	4,193	91-93	0.03	126	3-Year Mean (1991-93)
Yukon	2,497	91-93	0.03	64	3-Year Mean (1991-93)
Bethel	5,009	91-93	0.00	2	3-Year Mean (1991-93)
South Kuskokwim Bay					
Goodnews Bay	238	none	0.33	79	Half of 1993 South Coast per capita
Platinum	49	none	0.33	16	Half of 1993 South Coast per capita
Quinhagak	501	none	0.33	165	Half of 1993 South Coast per capita
North Bristol Bay					
Aleknagik	181	89	0.00	0	
Clark's Point	53	89	0.00	0	
Dillingham	2,200	84	0.04	81	
Manokotak	421	85	0.23	71	20% of geese are emperor
Togiak	676	none	0.23	156	Per capita of Manokotak
Twin Hills	74	none	0.23	17	Per capita of Manokotak
South Bristol Bay					
Egegik	123	84	0.00	0	
Pilot Point	72	87	1.01	65	
South Naknek	147	92	0.00	0	
Ugashik	5	87	1.00	10	
King Salmon	805	83	0.00	0	Per capita of South Naknek
Naknek	621	83	0.00	0	Per capita of South Naknek
Port Heiden	132	87	1.30	134	
East Aleutian Islands					
Akutan	482	90	1.55	160	
False Pass	70	88	0.42	29	
King Cove	794	92	0.06	32	
Sand Point	1,002	92	0.35	210	
Nelson Lagoon	85	87	0.92	61	
Cold Bay	120	none	0.00	0	Assumed to be zero.
West Aleutian Islands					
Nikolski	32	90	2.02	101	
Atka	83	94	1.07	89	
Saint George	157	94	0.00	0	
Saint Paul	636	94	0.01	8	
Unalaska	3,337	94	0.01	30	
South Alaska Peninsula					
Chignik Bay	191	89	0.28	36	
Chignik Lagoon	88	89	0.49	20	
Chignik Lake	134	91	0.23	30	

Table 3 (Continued).
Yearly Emperor Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places

<u>Community</u>	<u>1993 Population</u>	<u>Survey Year</u>		<u>Total Emperor Harvest</u>	<u>Assumptions</u>
		<u>Survey Year</u>	<u>Per Capita Harvest</u>		
Ivanof Bay	30	89	1.47	47	
Perryville	103	89	0.15	17	
Lake Iliamna-Nushagak Area					
Ekwok	93	87	0.00	0	
Iliamna	98	91	0.21	20	
Kokhanok	158	92	0.07	12	
Koliganek	200	87	0.10	19	
Levelock	109	92	0.00	0	
New Stuyahok	416	87	0.00	0	
Newhalen	167	91	0.03	4	
Igiugig	41	92	0.00	0	
Nondalton	231	none	0.00	0	Median per capita of the region
Pedro Bay	42	none	0.00	0	Median per capita of the region
Port Alsworth	51	none	0.00	0	Median per capita of the region
Kodiak Island					
Akhiok	86	92	0.21	17	
Karluk	65	91	0.00	0	
Kodiak City	7,428	93	0.00	0	
Larsen Bay	153	93	0.00	0	
Old Harbor	311	91	0.00	0	
Ouzinkie	221	93	0.00	0	
Port Lions	264	93	0.00	0	
Kenai Peninsula					
Cooper Landing	261	90	0.00	0	
Hope	154	90	0.00	0	
Kenai	6,813	91	0.00	0	
South Kenai Peninsula					
Nanwalek	174	93	0.00	0	
Port Graham	177	93	0.00	0	
Seldovia	307	93	0.00	0	
Prince William Sound					
Chenega Bay	89	93	0.00	0	
Cordova	2,597	93	0.00	0	
Tatitlek	126	93	0.00	0	
Valdez	4,339	93	0.00	0	
Whittier	271	90	0.00	0	
Surveyed rural communities				3,835	
Unsurveyed rural communities				695	
Rural Total				4,530	

**Table 4.
Yearly Eider Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places**

Community	1993 Population	Survey Year	Survey Year		Estimated Harvest by Species				Assumptions
			Per Capita Eider Harvest	Total Eider Harvest	King Eider Harvest	Common Eider Harvest	Spectacled Eider Harvest	Steller's Eider Harvest	
North Slope									
Barrow	3,986	89	1.40	4,499	2,967	1,363	28	141	3-yr ave used for species composition of unknowns
Kaktovik	226	92	1.28	248	138	110	0	0	
Nuiqsut	368	93	1.83	662	503	159	0	0	
Point Lay	168	87	5.05	702	524	19	158	2	Species composition of Wainwright
Wainwright	535	90	2.67	1,097	818	29	247	3	
Atkasuk	240	none	1.83	440	335	106	0	0	Per capita and species composition of Nuiqsut
Point Hope	704	none	0.94	659	293	195	172	0	Per capita and species composition of Kivalina
Northwest Arctic Coast									
Kivalina	372	92	0.94	322	143	95	84	0	
Kotzebue	3,004	91	0.01	32	14	9	8	0	Species composition of Kivalina
Buckland	380	none	0.29	109	0	109	0	0	Per capita and species composition of Deering
Deering	159	94	0.29	42	0	42	0	0	
Kiana	403	94	0.00	0	0	0	0	0	
Noorvik	543	none	0.00	0	0	0	0	0	Per capita of Kiana
Selawik	640	94	0.00	0	0	0	0	0	
Northwest Arctic Inland									
Noatak	369	94	0.00	0	0	0	0	0	
Shungnak	236	94	0.00	0	0	0	0	0	
Kobuk	81	none	0.00	0	0	0	0	0	Per capita of Shungnak
Ambler	297	none	0.00	0	0	0	0	0	Per capita of Shungnak
St. Lawrence Island									
Gambell	562	93	0.65	363	59	262	0	42	
Savoonga	556	93	0.09	49	8	32	9	0	

**Table 4 (Continued).
Yearly Eider Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places**

Community	1993 Population	Survey Year	Survey Year		Estimated Harvest by Species				Assumptions
			Per Capita Eider Harvest	Total Eider Harvest	King Eider Harvest	Common Eider Harvest	Spectacled Eider Harvest	Steller's Eider Harvest	
Seward Peninsula									
Brevig Mission	243	89	0.45	83	42	38	2	0	Species composition of Wales
Shishmaref	533	89	0.06	28	14	13	1	0	Species composition of Wales
Council	8	none	0.00	0	0	0	0	0	Assumed to be zero
Port Clarence	28	none	0.00	0	0	0	0	0	Assumed to be zero
Solomon	6	none	0.00	0	0	0	0	0	Assumed to be zero
Teller	264	none	0.45	119	61	55	3	0	Per capita and species composition of Brevig Mission
Wales	147	94	1.01	149	76	69	4	0	
Nome	3,618	none	0.01	32	16	15	1	0	Per capita of Kotzebue, species composition of Wales
Norton Sound									
Golovin	152	89	0.00	0	0	0	0	0	
Elim	278	94	0.04	12	0	12	0	0	
Shaktoolik	195	94	0.03	6	0	6	0	0	
Stebbins	453	94	0.33	155	17	136	2	0	
White Mountain	180	none	0.00	0	0	0	0	0	Per capita of Golovin
St Michael	298	none	0.33	98	11	86	1	0	Per capita and species composition of Stebbins
Koyuk	281	none	0.03	8	0	8	0	0	Per capita and species composition of Shaktoolik
Unalakleet	730	none	0.03	20	0	20	0	0	Per capita and species composition of Shaktoolik
Yukon-Kuskokwim Delta									
South Coast	1,703	93	0.54	927	840	83	4	0	3-Year Mean (1991-93)
Mid Coast	3,757	93	0.66	2,466	2,077	257	123	9	3-Year Mean (1991-93)
North Coast	2,008	93	0.01	12	0	6	7	0	3-Year Mean (1991-93)
Kuskokwim	4,193	93	0.10	404	302	56	42	4	3-Year Mean (1991-93)
Yukon	2,497	93	0.00	12	0	12	0	0	3-Year Mean (1991-93)
Bethel	5,009	93	0.03	155	119	34	0	2	3-Year Mean (1991-93)

**Table 4 (Continued).
Yearly Eider Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places**

Community	1993 Population	Survey Year		Total Eider Harvest	Estimated Harvest by Species				Assumptions
		Survey Year	Per Capita Eider Harvest		King Eider Harvest	Common Eider Harvest	Spectacled Eider Harvest	Steller's Eider Harvest	
South Kuskokwim Bay									
Goodnews Bay	238	none	0.79	188	170	17	0	0	Half the 1993 per capita, species composition of South Coast
Platinum	49	none	0.79	39	35	3	0	0	Half the 1993 per capita, species composition of South Coast
Quinhagak	501	none	0.79	396	359	35	0	0	Half the 1993 per capita, species composition of South Coast
North Bristol Bay									
Aleknagik	181	89	0.32	45	9	36	0	0	
Clark's Point	53	89	0.00	0	0	0	0	0	
Dillingham	2,200	84	0.19	392	314	78	0	0	15% of ducks are eiders; 80% king, 20% common
Manokotak	421	85	0.38	116	93	23	0	0	15% of ducks are eiders; 80% king, 20% common
Togiak	676	none	0.38	255	204	51	0	0	Per capita of Manokotak; 80% king, 20% common
Twin Hills	74	none	0.38	28	22	6	0	0	Per capita of Manokotak; 80% king, 20% common
South Bristol Bay									
Egegik	123	84	0.00	0	0	0	0	0	
Pilot Point	72	87	0.06	4	0	4	0	0	100% common eiders
South Naknek	147	92	0.00	0	0	0	0	0	
Ugashik	5	87	0.00	0	0	0	0	0	
King Salmon	805	none	0.00	0	0	0	0	0	Per capita of South Naknek
Naknek	621	none	0.00	0	0	0	0	0	Per capita of South Naknek
Port Heiden	132	87	0.19	20	10	10	0	0	50% common, 50% king eiders
East Aleutian Islands									
Akutan	482	90	2.32	236	87	78	0	70	
False Pass	70	88	0.00	0	0	0	0	0	
King Cove	794	92	0.05	29	14	15	0	0	50% common, 50% king eiders
Sand Point	1,002	92	0.06	39	19	20	0	0	50% common, 50% king eiders
Nelson Lagoon	85	87	0.00	0	0	0	0	0	
Cold Bay	120	none	0.00	0	0	0	0	0	Assumed to be zero.

**Table 4 (Continued).
Yearly Eider Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places**

Community	1993 Population	Survey Year		Total Eider Harvest	Estimated Harvest by Species				Assumptions
		Survey Year	Per Capita Eider Harvest		King Eider Harvest	Common Eider Harvest	Spectacled Eider Harvest	Steller's Eider Harvest	
West Aleutian Islands									
Nikolski	32	90	0.41	20	0	3	0	17	
Atka	83	94	0.48	40	0	40	0	0	
Saint George	157	94	0.00	0	0	0	0	0	
Saint Paul	636	94	0.53	335	318	6	0	11	
Unalaska	3,337	94	0.03	104	28	65	0	11	
South Alaska Peninsula									
Chignik Bay	191	89	0.22	26	13	13	0	0	50% common, 50% king eiders
Chignik Lagoon	88	89	0.10	4	2	2	0	0	50% common, 50% king eiders
Chignik Lake	134	91	0.16	21	10	11	0	0	50% common, 50% king eiders
Ivanof Bay	30	89	0.19	6	3	3	0	0	50% common, 50% king eiders
Perryville	103	89	0.00	0	0	0	0	0	50% common, 50% king eiders
Lake Iliamna-Nushagak Area									
Ekwok	93	87	0.00	0	0	0	0	0	
Iliamna	98	91	0.22	22	0	22	0	0	100% common eiders
Kokhanok	158	92	0.00	0	0	0	0	0	
Koliganek	200	87	0.09	17	0	17	0	0	100% common eiders
Levelock	109	92	0.00	0	0	0	0	0	
New Stuyahok	416	87	0.52	185	0	185	0	0	100% common eiders
Newhalen	167	91	0.16	25	0	25	0	0	100% common eiders
Igiugig	41	92	0.00	0	0	0	0	0	
Nondalton	231	none	0.00	0	0	0	0	0	Median per capita of the region
Pedro Bay	42	none	0.00	0	0	0	0	0	Median per capita of the region
Port Alsworth	51	none	0.00	0	0	0	0	0	Median per capita of the region

**Table 4 (Continued).
Yearly Eider Harvests in Alaska
Estimated From Household Surveys and
Expanded to Unsurveyed Places**

Community	1993 Population	Survey Year	Survey Year		Estimated Harvest by Species				Assumptions
			Per Capita Eider Harvest	Total Eider Harvest	King Eider Harvest	Common Eider Harvest	Spectacled Eider Harvest	Steller's Eider Harvest	
Kodiak Island									
Akhiok	86	92	0.00	0	0	0	0	0	
Karluk	65	91	0.00	0	0	0	0	0	
Kodiak City	7,428	93	0.00	0	0	0	0	0	
Larsen Bay	153	93	0.00	0	0	0	0	0	
Old Harbor	311	91	0.14	30	30	0	0	0	100% king eiders
Ouzinkie	221	92	0.09	22	22	0	0	0	100% king eiders
Port Lions	264	93	0.00	0	0	0	0	0	
Kenai Peninsula									
Cooper Landing	261	90	0.00	0	0	0	0	0	
Hope	154	90	0.00	0	0	0	0	0	
Kenai	6,813	91	0.00	0	0	0	0	0	
South Kenai Peninsula									
Nanwalek	174	93	0.00	0	0	0	0	0	Most recent survey; common eiders taken some years
Port Graham	177	93	0.00	0	0	0	0	0	Most recent survey; common eiders taken some years
Seldovia	307	93	0.00	0	0	0	0	0	
Prince William Sound									
Chenega Bay	89	93	0.00	0	0	0	0	0	
Cordova	2,597	93	0.00	0	0	0	0	0	
Tatitlek	126	93	0.00	0	0	0	0	0	
Valdez	4,339	93	0.00	0	0	0	0	0	
Whittier	271	90	0.00	0	0	0	0	0	
Surveyed rural communities				14,163	9,633	3,498	719	313	
Unsurveyed rural communities				2,390	1,505	705	177	0	
Rural Total				16,553	11,138	4,204	896	313	

**Fig. 4. Brant Harvests by Alaska Area,
Circa Early 1990s**

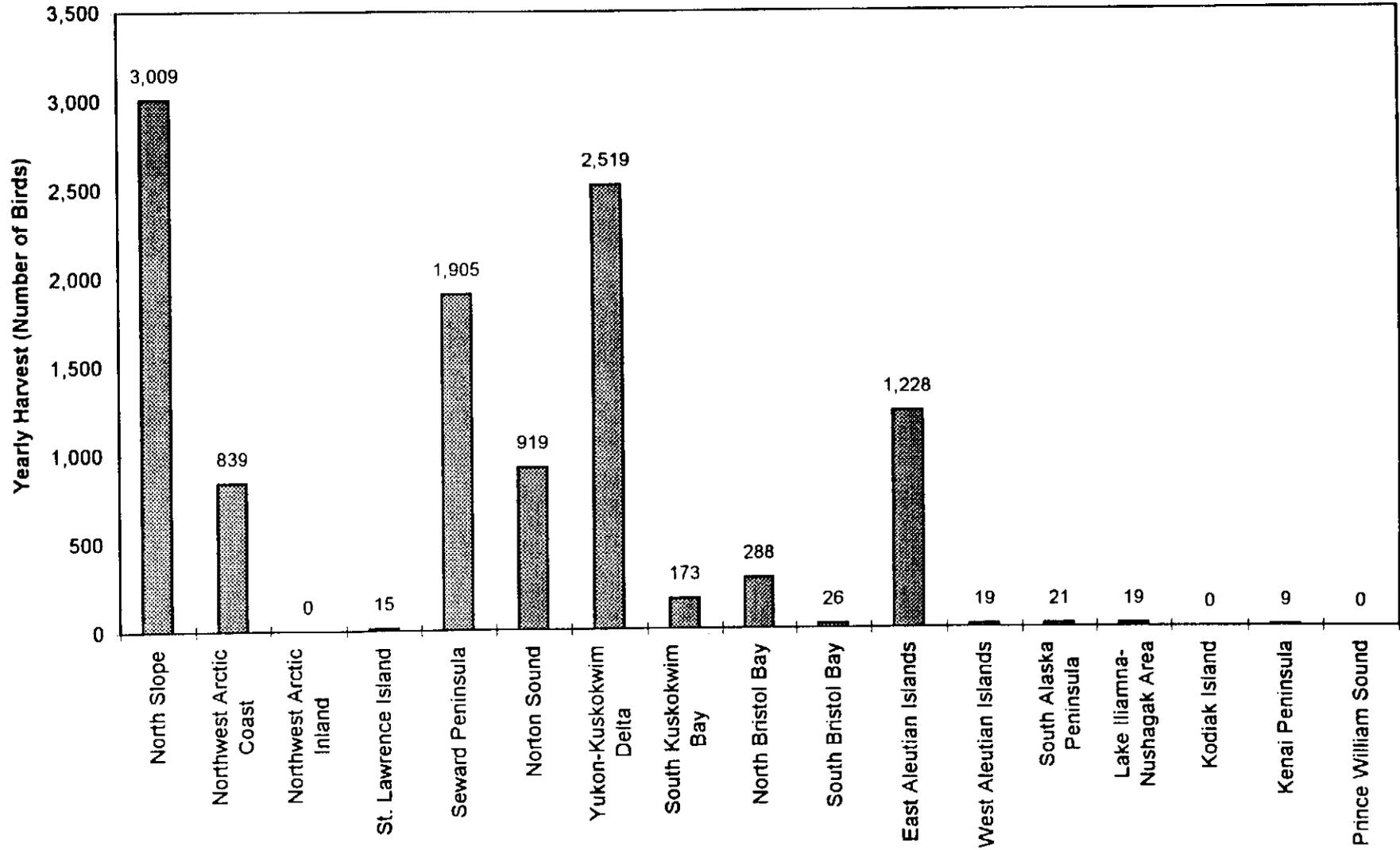


Fig. 5. Emperor Harvests by Alaska Area,
Circa Early 1990s

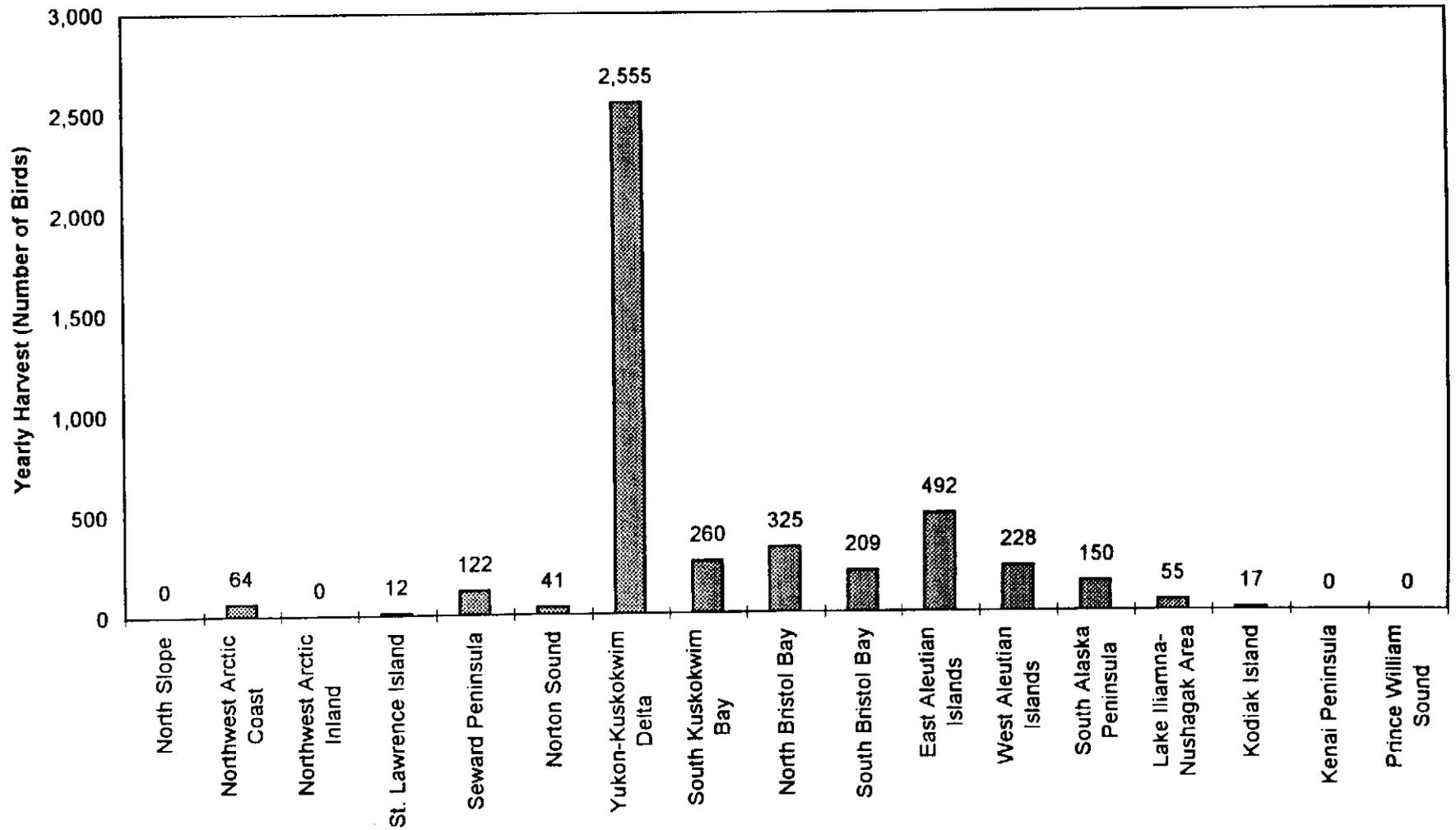


Fig. 6. Eider Harvests by Alaska Area,
Circa Early 1990s

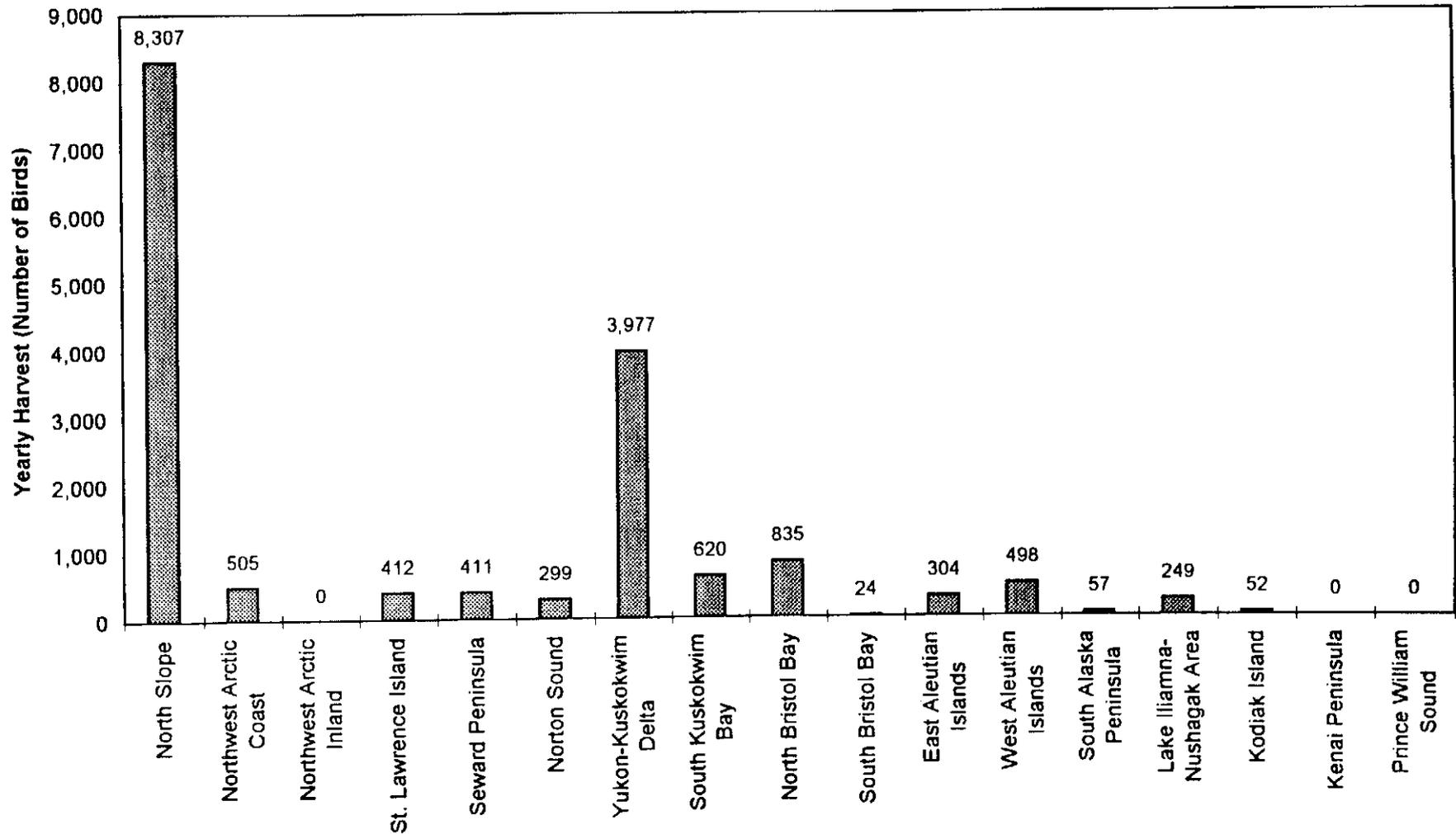
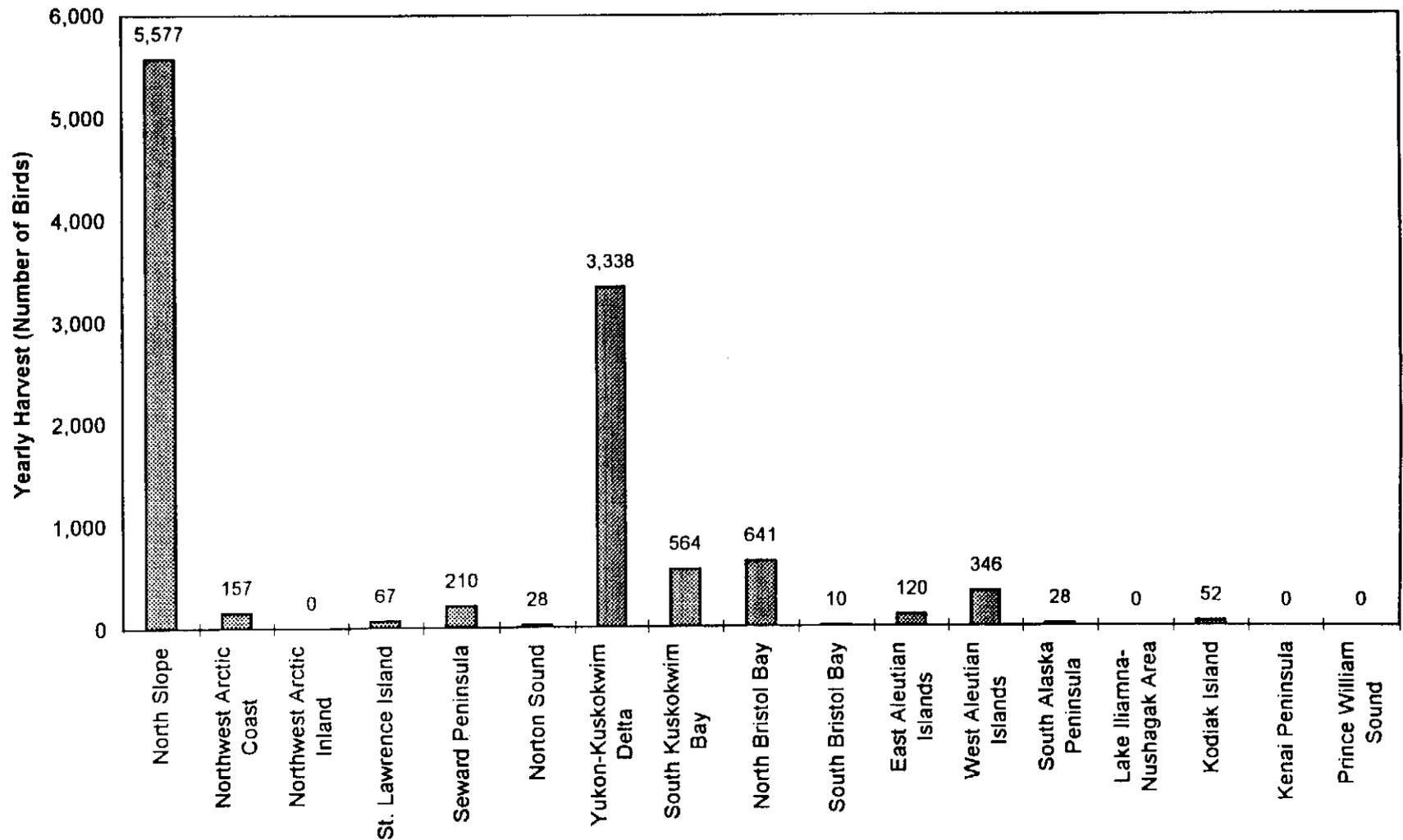
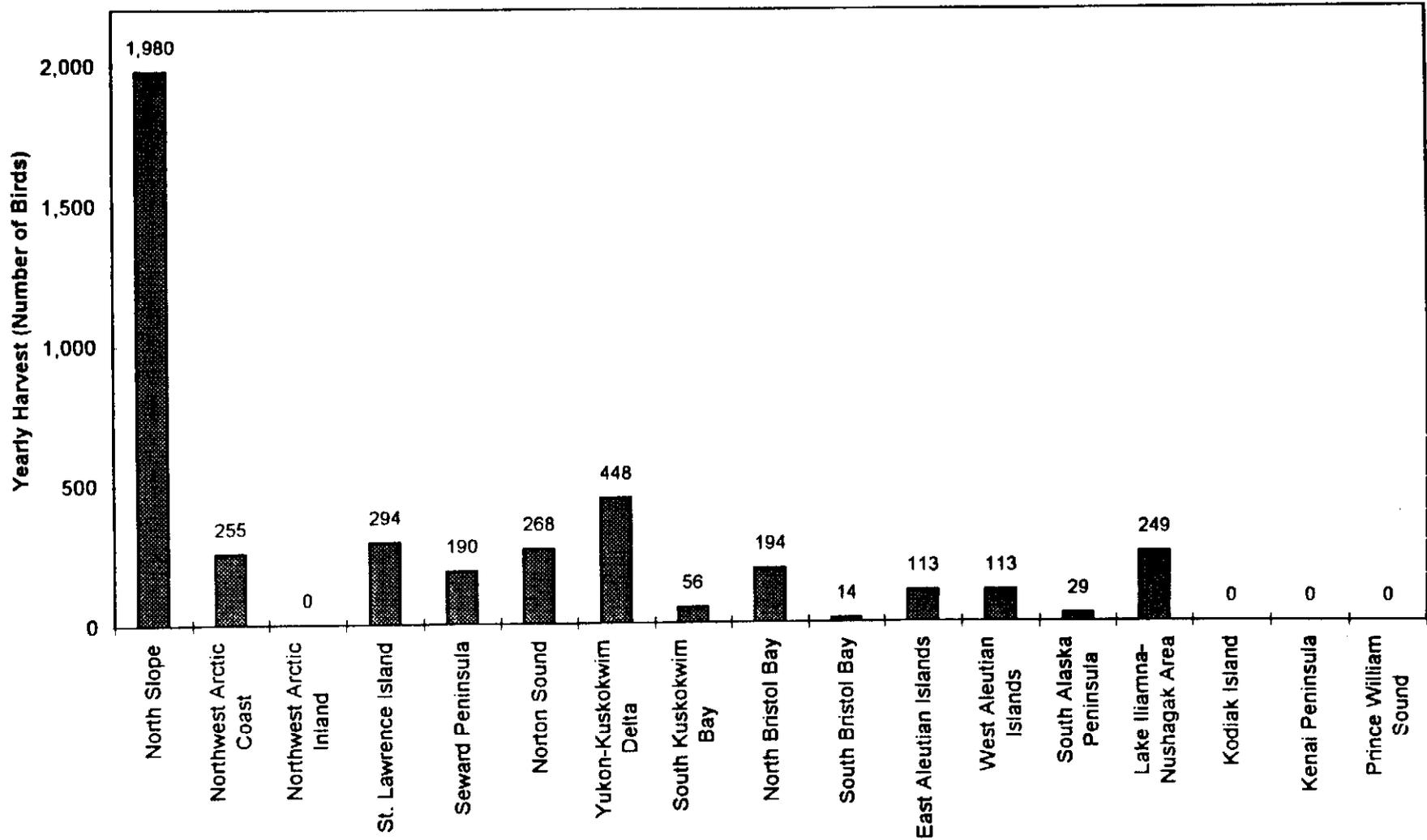


Fig. 7. King Eider Harvests by Alaska Area,
Circa Early 1990s



**Fig. 8. Common Eider Harvests by Alaska Area,
Circa Early 1990s**



**Fig. 9. Spectacled Eider Harvests by Alaska Area,
Circa Early 1990s**

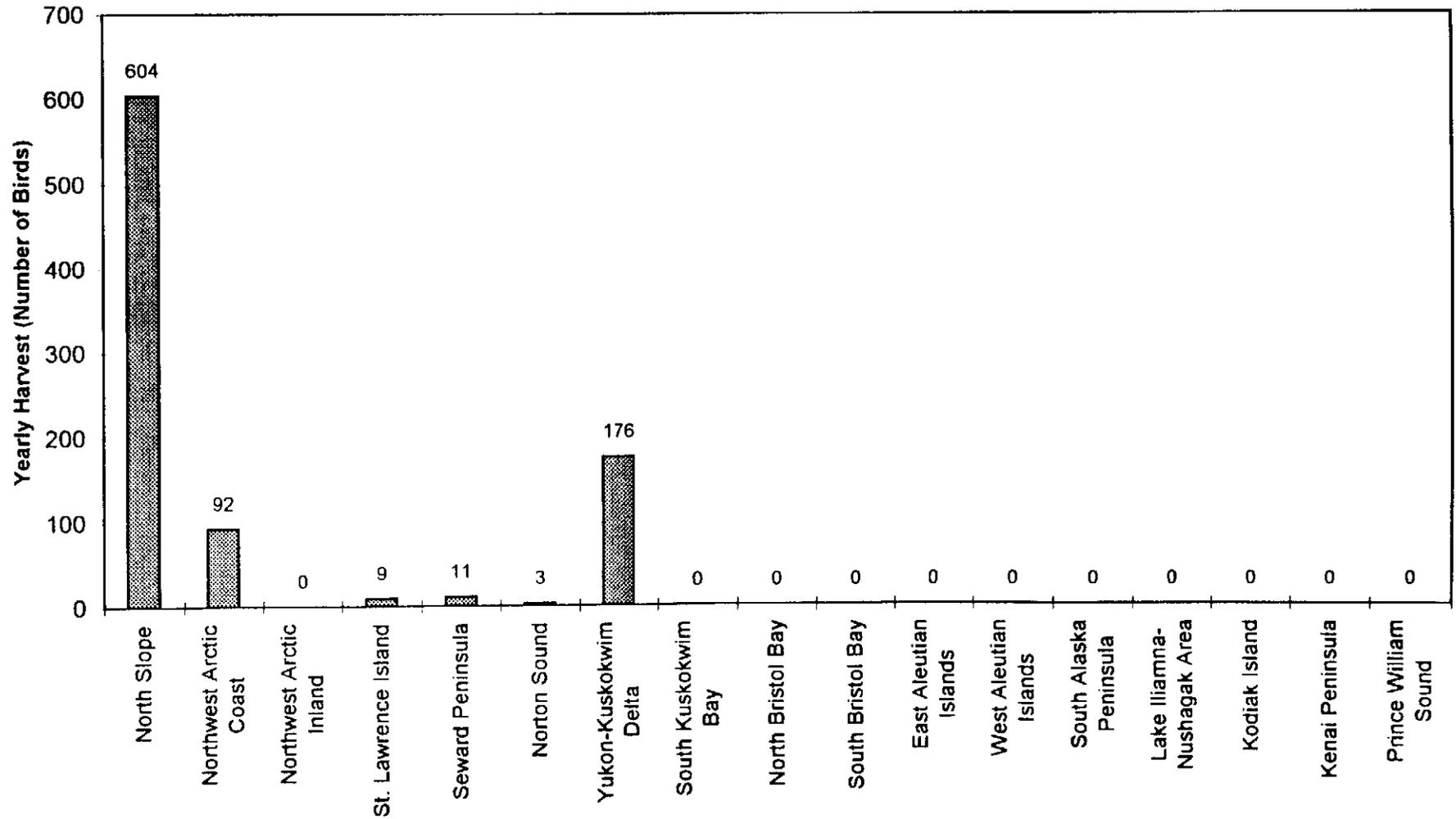
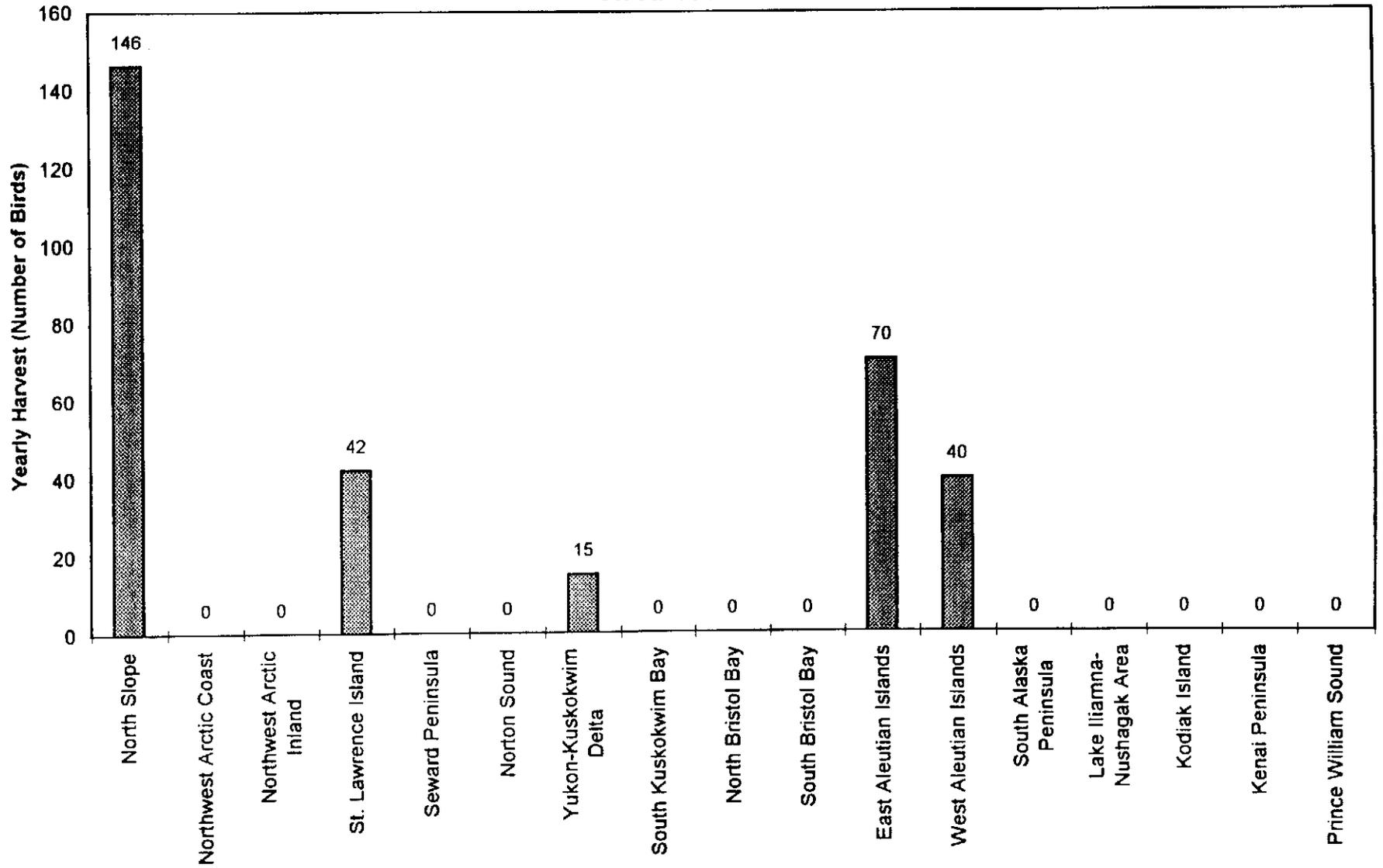
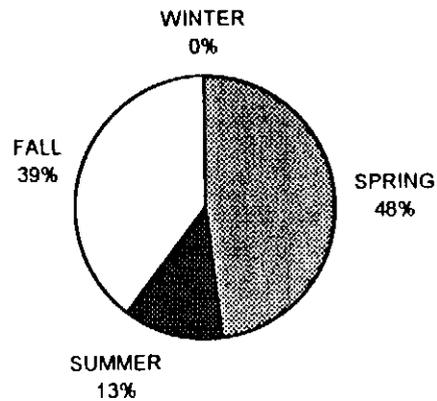


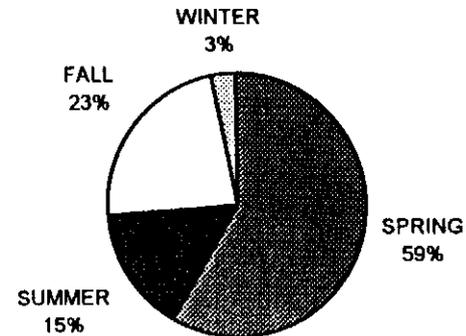
Fig. 10. Steller's Eider Harvests by Alaska Area, Circa 1990s



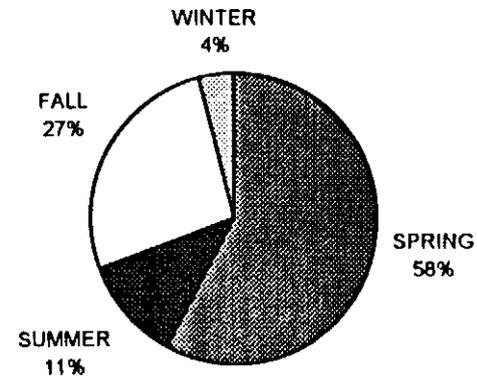
**Brant Harvests by Season,
For Areas With Seasonal Data, 1990s**



**Eider Harvests by Season,
For Areas With Seasonal Data, 1990s**



**Emperor Geese Harvests by Season,
For Areas With Seasonal Data, 1990s**

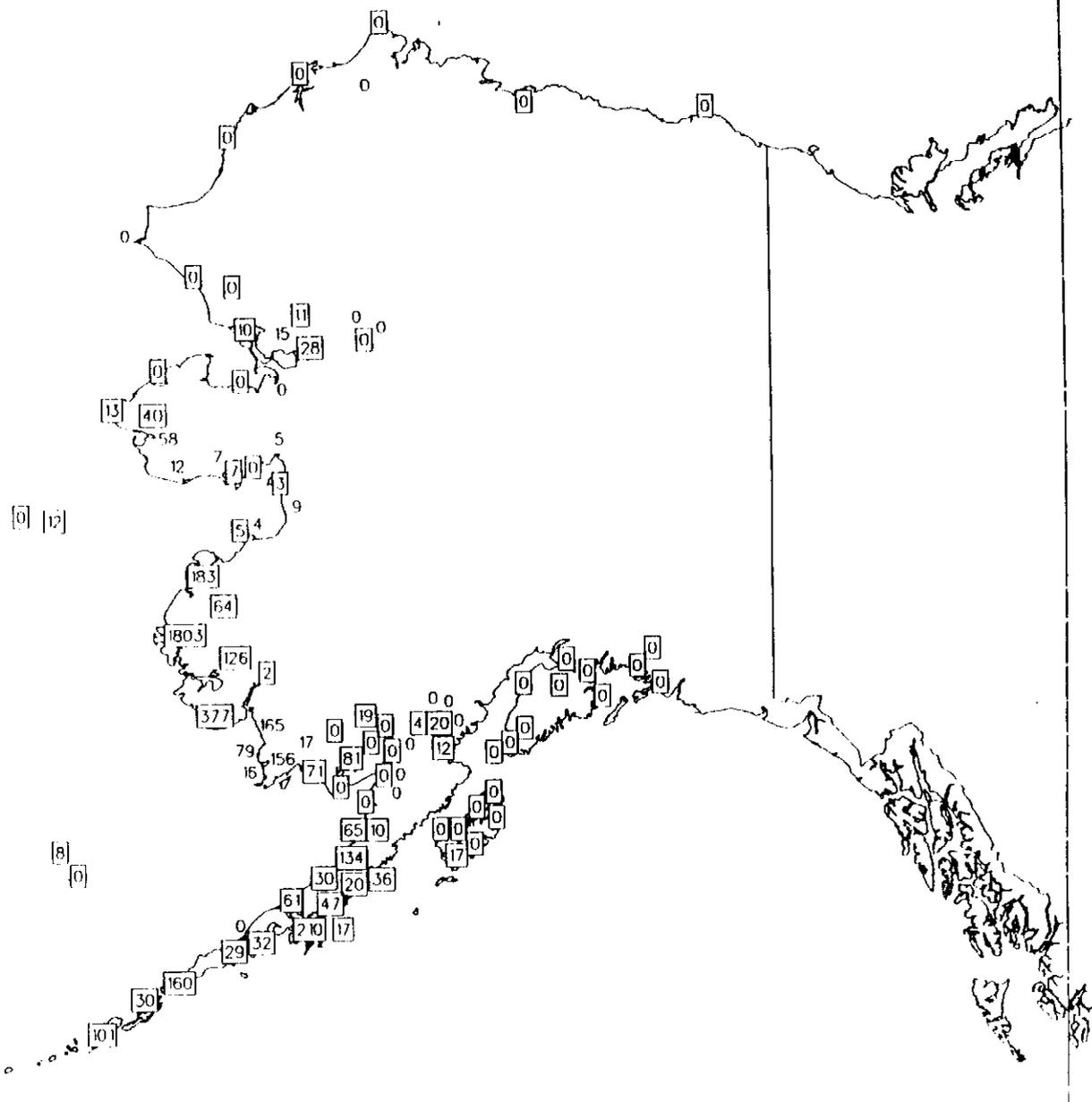


**Fig. 11. Seasonal Harvests of Brant, Eider Ducks,
and Emperor Geese in Rural Alaska Areas With
Seasonal Information, Circa Early 1990s**

**Fig. 13. Emperor Harvest Estimates
in Rural Alaska**
(Yearly Harvests Circa Early 1990s)
Surveyed Communities (Boxed Numbers) Extrapolated
to Unsurveyed Communities (Unboxed Numbers)

Shown as boxed numbers, this map presents emperor harvest information from communities where systematic household surveys of bird harvests have been conducted for at least one year (as of 6-1-95). In most cases, harvests for a single year have been chosen for a community where more than one survey year exists. For the Yukon-Kuskokwim Delta, a 3-year average is used (1991-93). Survey years differ between communities, but generally represent years since 1988. For unsurveyed communities, harvests have been estimated by extrapolating from surveyed communities assumed to be similar to unsurveyed communities, using per capita harvests. The extrapolated harvests of unsurveyed communities are shown as unboxed numbers. One limitation of the data summary is that it does not portray normal year-to-year variability or trends in harvests over time for communities. A second limitation is that errors in harvest estimates may occur in estimates for some unsurveyed communities because of the extrapolation method. Harvest estimates are subject to change as additional community surveys are conducted.

Data sources: Surveys from the Division of Subsistence, ADF&G; U.S. Fish and Wildlife Service (for the Yukon-Kuskokwim Delta and St. Lawrence Island); and Steven R. Braund and Associates (for Barrow and Wainwright)

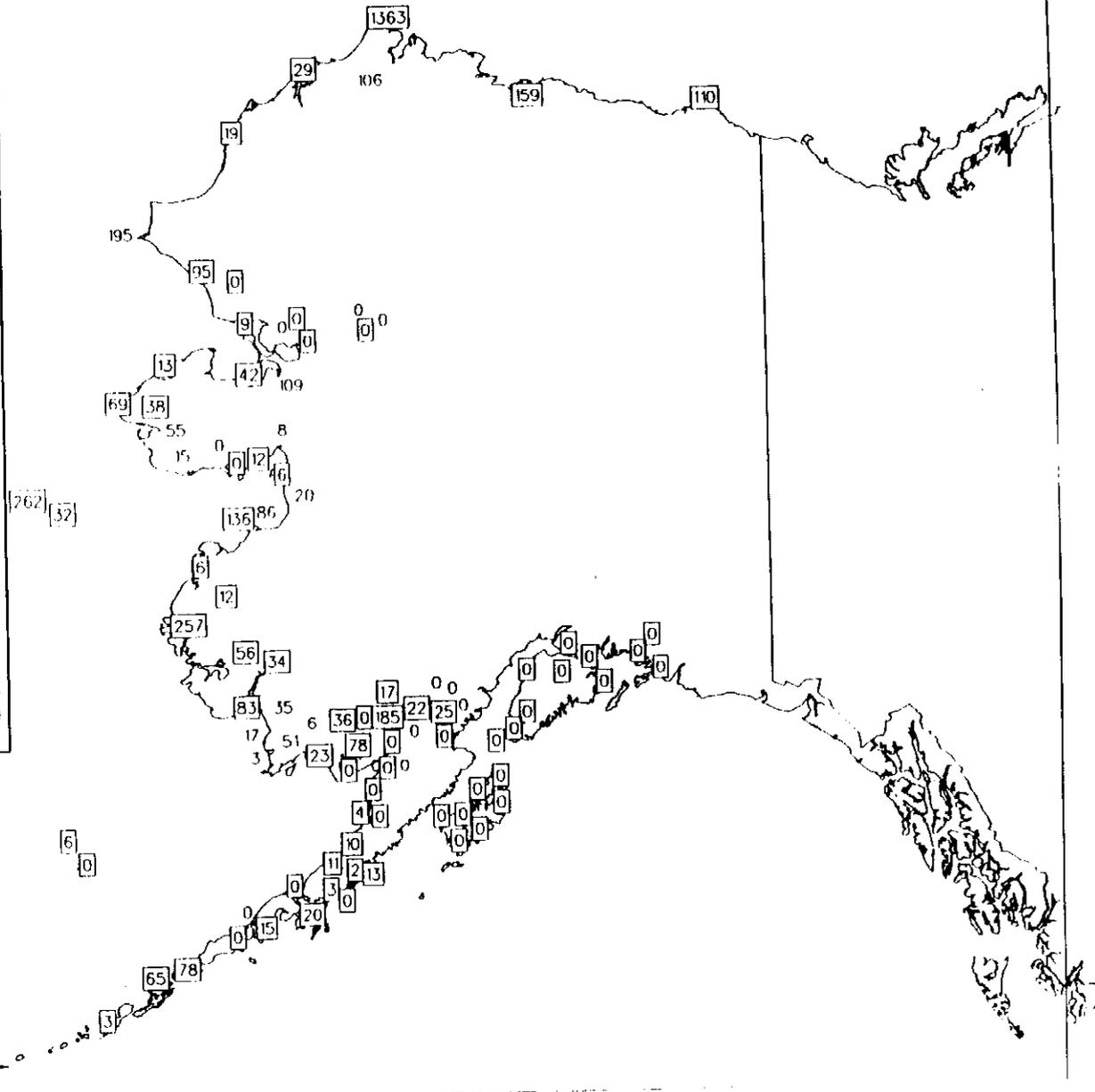


**Fig. 15. Common Eider Harvest Estimates
In Rural Alaska**

(Yearly Harvests Circa Early 1990s)
Surveyed Communities (Boxed Numbers) Extrapolated
to Unsurveyed Communities (Unboxed Numbers)

Shown as boxed numbers, this map presents common eider harvest information from communities where systematic household surveys of bird harvests have been conducted for at least one year (as of 6-1-95). In most cases, harvests for a single year have been chosen for a community where more than one survey year exists. For the Yukon-Kuskokwim Delta, a 3-year average is used (1991-93). Survey years differ between communities, but generally represent years since 1988. For unsurveyed communities, harvests have been estimated by extrapolating from surveyed communities, using per capita harvests. The extrapolated harvests of unsurveyed communities are shown as unboxed numbers. One limitation of the data summary is that it does not portray normal year-to-year variability or trends in harvests over time for communities. A second limitation is that errors in harvest estimates may occur in estimates for some unsurveyed communities because of the extrapolation method. Harvest estimates are subject to change as additional community surveys are conducted.

Data sources: Surveys from the Division of Subsistence, ADF&G; U.S. Fish and Wildlife Service (for the Yukon-Kuskokwim Delta and St. Lawrence Island); and Steven R. Braund and Associates (for Barrow and Wainwright)

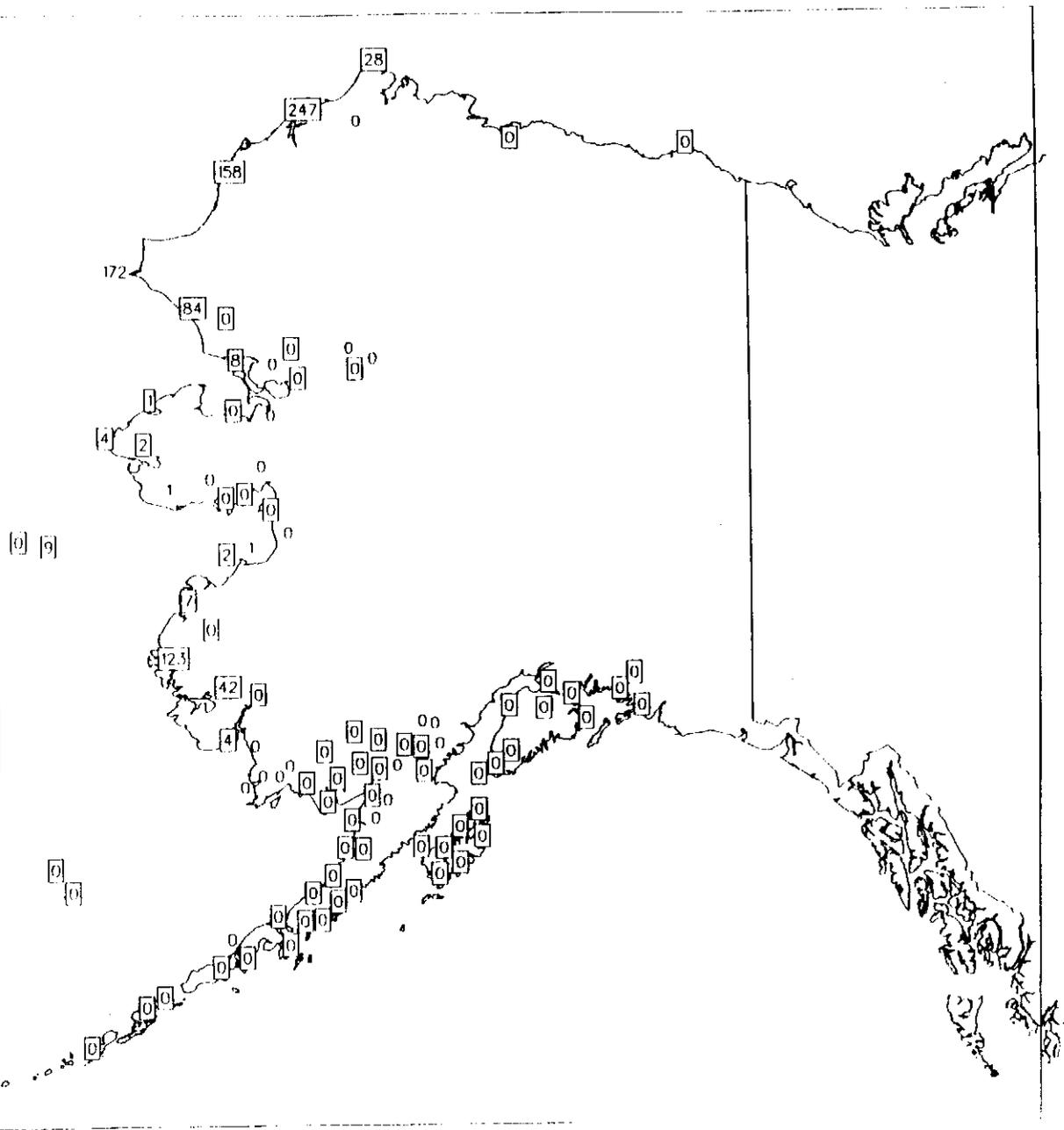


**Fig. 16. Spectacled Eider Harvest Estimates
in Rural Alaska**

(Yearly Harvests Circa Early 1990s)
Surveyed Communities (Boxed Numbers) Extrapolated
to Unsurveyed Communities (Unboxed Numbers)

Shown as boxed numbers, this map presents spectacled eider harvest information from communities where systematic household surveys of bird harvests have been conducted for at least one year (as of 6-1-95). In most cases, harvests for a single year have been chosen for a community where more than one survey year exists. For the Yukon-Kuskokwim Delta, a 3-year average is used (1991-93). Survey years differ between communities, but generally represent years since 1988. For unsurveyed communities, harvests have been estimated by extrapolating from surveyed communities, using per capita harvests. The extrapolated harvests of unsurveyed communities are shown as unboxed numbers. One limitation of the data summary is that it does not portray normal year-to-year variability or trends in harvests over time for communities. A second limitation is that errors in harvest estimates may occur in estimates for some unsurveyed communities because of the extrapolation method. Harvest estimates are subject to change as additional community surveys are conducted.

Data sources: Surveys from the Division of Subsistence, ADF&G; U.S. Fish and Wildlife Service (for the Yukon-Kuskokwim Delta and St. Lawrence Island); and Steven R. Braund and Associates (for Barrow and Wainwright)



REFERENCES

- Alaska Department of Labor
1994 Alaska Population Overview, 1993 Estimates. Population for Alaska
Census Areas and Communities, 1990, 1993
- Andersen, David
1994 Field Notes attached to key respondent interview notes, 1994 and 1995.
Alaska Department of Fish and Game, Division of Subsistence.
- Bellrose, Frank C. and F.H. Kortright
1976 [1942] Ducks, Geese and Swans of North America. Harrisburg, Pennsylvania:
Stackpole Books.
- Braund, Stephen R. and Associates and LZH Associates
1986a Effects of Renewable Resource Harvest Disruptions on Community
Socioeconomic and Sociocultural Systems: King Cove. Final Technical
Report No. 123. (OCS Study MMS 86-0037. Contract 14-12-0001-
30172) Submitted to U.S. Department of the Interior, Minerals
Management Service, Alaska OCS Region, Anchorage, Alaska. May
1986
- Braund, Stephen R. and Associates and ResourcEcon, Patrick Burden & Associates,
Social Research Institute, and Kirkwood and Associates
1986b A Description of the Socioeconomic and Sociocultural Systems of the
Aleutian-Pribilof Islands Region. Final Technical Report No. 118.
(Contract 14-12-0001-30229). Submitted to U.S. Department of the
Interior, Minerals Management Service, Alaska OCS Region, Anchorage,
Alaska. April 1986
- Braund, Stephen R. and Associates
1993a North Slope Subsistence Study: Barrow, 1987, 1988 and 1989. Final
Technical Report No. 149. (OCS Study MMS 91-0086. Contract No. 14-
12-0001-30284). Submitted to U.S. Department of the Interior, Minerals
Management Service, Alaska OCS Region, Anchorage, Alaska. April
1993
- Braund, Stephen R. and Associates
1993b North Slope Subsistence Study: Wainwright, 1988 and 1989. Final
Technical Report No. 147. (OCS Study MMS 91-0073. Contract No. 14-
12-0001-30284). Submitted to U.S. Department of the Interior, Minerals
Management Service, Alaska OCS Region, Anchorage, Alaska. April
1993
- Burch, Ernest S. Jr.
1985 Subsistence Production in Kivalina, Alaska: A Twenty - Year
Perspective. Alaska Department of Fish and Game, Division of
Subsistence, Technical Paper No. 128.

- Conger, Annie Olanna and James Magdanz
 1990 The Harvest of Fish and Wildlife in Three Alaska Communities: Brevig Mission, Golovin, and Shishmaref, Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 188.
- Dau, C. P. and S.A. Kistchinski
 1977 'Seasonal movements and distribution of the Spectacled Eider', Wildfowl, Vol. 28, pp. 65-75.
- Fall, James A., Janet C. Schichnes, Molly Chythlook, and Robert J. Walker
 1986 Patterns of Wild Resource Use in Dillingham: Hunting and Fishing in an Alaskan Regional Center. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 135.
- Fall, James A. and Judith M. Morris
 1987 Fish and Wildlife Harvests in Pilot Point, Ugashik, Port Heiden, Alaska Peninsula, Southwest Alaska, 1986-1987. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 158
- Fall, James A., David B. Andersen, Louis Brown, Michael Coffing, Gretchen Jennings, Craig Mishler, Amy Paige, Charles J. Utermohle, and Vicki Vanek
 1993 Noncommercial Harvests and Uses of Wild Resources in Sand Point, Alaska, 1992. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 226
- Fall, James A., Rachael Mason, Terry Haynes, Vicki Vanek, Louis Brown, Gretchen Jennings, Craig Mishler, and Charles Utermohle
 1993b Noncommercial Harvests and Uses of Wild Resources in King Cove, Alaska, 1992. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 227
- Fall, James A. and Charles J. Utermohle, editors.
 1995 An Investigation of the Sociocultural Consequences of Outer Continental Shelf Development in Alaska. Vols I-V. Technical Report No. 160. (Cooperative Agreement No. 14-35-001-30622) Submitted by Division of Subsistence, Alaska Department of Fish & Game to U.S. Department of the Interior, Minerals Management Service, Alaska OCS Region, Anchorage, Alaska, March 1995.
- Georgette, Susan and Hannah Loon
 1999 Subsistence Use of Fish and Wildlife in Kotzebue, A Northwest Alaska Regional Center, Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 167.
- Jacobson, Michael J. and Cynthia Wentworth
 1982 Kaktovik Subsistence: Land Use Values through Time in the Arctic National Wildlife Refuge Area. U.S. Fish and Wildlife Service, Northern Alaska Ecological Service (NAES 82-01) Fairbanks. 1982

- Johnson, Larry L.
1971 The Migration, Harvest and Importance of Waterfowl at Barrow, Alaska. M.S. Thesis submitted to the Univ. of Alaska , May 1971. Unpublished.
- Kari, Priscilla Russell
1985 Wild Resource Use and Economy of Stony River. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper No.108.
- Kertell, Kenneth
1991 "Disappearance of the Steller's Eider from the Yukon-Kuskokwim Delta, Alaska," Arctic, 44:3, pp.177-187.
- Kramer, Gary. "Sea Goose Elusive; Unraveling the mysteries of Brant migration", Birder's World, June 1994
- Little, Ronald L. and Lynn A. Robbins
1984 Effects of Renewable Resource Harvest Disruptions on Socioeconomic and Sociocultural Systems: St. Lawrence Island. Technical Report Number 89 (Contract No. AA851-CT1-59) Alaska Outer Continental Shelf Office, Minerals Management Service, Anchorage, Alaska.
- Luton, H.H.
1985 Effects of Renewable Resource Disruptions on Socioeconomic and Sociocultural Systems: Chukchi Sea. Technical Report No. 91. Prepared by the John Muir Institute, Inc. for Alaska Outer Continental Shelf Office, Social and Economic Studies Program, Minerals Management Service, Anchorage, Alaska
- Mishler, Craig
1993 Sea Duck Hunting, Kodiak Island. Memorandum to James Fall, dated March 9, 1993. Alaska Department of Fish and Game, Division of Subsistence.
- 1994 Migratory Birds, Kodiak Island. Fieldnotes from Kodiak Island, December 15, 1994. Alaska Department of Fish and Game, Division of Subsistence.
- Morris, Judith M.
1985 The Use of Fish and Wildlife Resources by Residents of the Bristol Bay Borough, Alaska. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper No.123.
- 1986 Subsistence Production and Exchange in the Iliamna Lake Region, Southwest Alaska, 1982-1983. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper No.136.
- 1987 Fish and Wildlife Uses in Six Alaska Peninsula Communities: Egegik, Chignik, Chignik Lagoon, Chignik Lake, Perryville, and Ivanof Bay. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper No. 151.

- Nakashima, Douglas J.
 1990 Application of Native Knowledge in EIA: Inuit, Eiders and Hudson Bay Oil. A Report Prepared for the Canadian Environmental Assessment Research Council, September 1990. Department of Geography, McGill University. 23pp.
- National Geographic Society
 1987 Field Guide to the Birds of North America, Second Edition, Washington, D.C.
- O'Hara, Doug
 1995 In Search of Spectacled Eiders. We Alaskans, H-6 - H-13, Anchorage Daily News, May 21, 1995.
- Pacific Flyway Council
 1994 Pacific Flyway management plan for emperor geese. Emperor Goose Subcomm., Pacific Flyway Study Comm. c/o USFWS, Portland, Oregon. Unpublished report 27 pp. + appendices.
- Petersen, M.R., J.A. Schmutz, and R.F. Rockwell
 1994 Emperor Goose (*Chen canagica*). In The Birds of North America, No, 97 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington D.C.: The American Ornithologists' Union.
- Schichnes, Janet and Molly Chythlook
 1988 Use of Fish and Wildlife in Manokotak, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 152.
- Scott, Sir Peter
 1972 A Coloured Key to the Waterfowl of the World, London: W.R. Royle and Son Ltd, revised.
- Smith, Robert B.
 1991 Steller's Eider Closure. Memorandum to Tom Rothe, dated August 29, 1991. Alaska Department of Fish and Game, Division of Wildlife Conservation.
- Sobelman, Sandra S.
 1985 The Economics of Wild Resource Use In Shishmaref, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No.112.
- Stickney, Alice A.
 1984 Coastal Ecology and Wild Resource Use in the Central Bering Sea Area: Hooper Bay and Kwigillingok. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 85.

- Stokes, Jeff
1985 Natural Resource Utilization of Four Upper Kuskokwim Communities. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No.86.
- Subcommittee on Pacific Brant
1992 Pacific Flyway management plan for Pacific brant. Pacific Flyway Study Committee. [c/o USFWS, MBMO] Portland, Oreg. Unpubl. report.
- Thomas, Daniel C.
1982 The Role of Local Fish and Wildlife Resources in the Community of Shaktoolik, Alaska. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper No. 13.
- Veltre, Douglas W. and Mary J. Veltre
1981 A Preliminary Baseline Study of Subsistence Resource Utilization in the Pribilof Islands. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper No. 57
- 1982 Resource Utilization in Unalaska, Aleutian Islands, Alaska. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper No. 58.
- 1983 Resource Utilization in Atka, Aleutian Islands, Alaska. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper No. 88.
- Wentworth, Cynthia
1994a Subsistence Waterfowl Harvest Survey. Yukon-Kuskokwim Delta. Comprehensive Report 1985-1993; Results 1993. U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska, December.
- Wentworth, Cynthia
1994b Subsistence Migratory Bird Harvest Survey. Saint Lawrence Island. Results, 1993. U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage, Alaska, July.
- Wolfe, Robert J., Amy W. Paige, and Cheryl L. Scott
1990 The Subsistence Harvest of Migratory Birds in Alaska. Division of Subsistence, Alaska Department of Fish and Game, Technical Paper No. 197.
- Wolfe, Robert J., Joseph J. Gross, Steven J. Langdon, John M. Wright, George K. Sherrod, Linda J. Ellanna, Valerie Sumida, and Peter Usher
1984 Subsistence-Based Economies in Coastal Communities of Southwest Alaska. Division of Subsistence, Alaska Department of Fish and Game, Technical Paper No. 89.
- Wright, John M., Judith Morris, and Robert Schroeder
1985 Bristol Bay Regional Subsistence Profile. Alaska Department of Fish and Game, Division of Subsistence. Technical Paper No. 114.

APPENDIX 1. SUBSISTENCE HARVESTS OF BLACK BRANT

Geographic Distribution

The Pacific black brant is a small, dark goose weighing about three pounds (Bellrose 1976:172). Most brant winter in Mexico, principally in coastal regions of Baja California, beginning a migration north toward nesting areas as early as January. The migration extends through early June, when breeding adults finally reach nesting grounds as far north as the Arctic coast of Alaska and Canada. Non-breeding juveniles follow the breeding adults. During the coastal migration, brant gather at key staging areas, such as Izembek Lagoon on the Alaska Peninsula, Safety Lagoon on Norton Sound, and Shishmaref Lagoon on the Seward Peninsula, among others. Approximately 80 percent of all Pacific flyway brant nest at four areas on the Yukon-Kuskokwim delta. The others head further north to nesting areas on the Arctic coastal plain, at Meade River delta, Teshekpuk Lake area, the Colville, Kuparuk, Sagvanirktok, Shaviovik, and Kadleroshilik river deltas, and the Canadian high arctic (Subcommittee on Pacific Brant 1992:8).

Following breeding, nesting, and brood rearing, brant congregate at several locations during the flightless molting period, particularly at molting sites on the near coastal areas of the Yukon-Kuskokwim Delta. Brant on the North Slope molt in July. Not all birds molt simultaneously, so early-molters may be present in late June and late-molting birds may still be present in early August (Miller 1994). From molting locations the brant family units form flocks, and then make the flight south, following the coast. The brant population aggregates at Izembek Lagoon during September and October. In late October or early November, brant leave Izembek Lagoon for a 3,000 mile, over-water flight toward their wintering grounds. While most head south, some brant remain in Alaska for the winter, dispersed along the Alaska Peninsula and Aleutian Islands.

North Slope -- Brant

More black brant appear to be harvested yearly on the North Slope than any other study area during the early 1990s -- the yearly harvest for the North Slope was estimated at 3,009 birds. Called *Ninglingaq* in Inupiaq, brant are a major goose species seasonally present on the North Slope, along with snow and Canada geese. Brant are available to all seven coastal communities. Relatively large per capita harvests were recorded at Point Lay (3.59 birds per person), Kaktovik (1.96), and Wainwright (1.70). Patterns of use have been described for a few communities.

The people of Kaktovik appear to use the entire coast line and river shores from Demarcation Point to Flaxman Island for bird hunting. Spring brant hunting occurs from mid-May to mid-June.

Black brant is the main species hunted in the spring. Brant are prized for their freshness and flavor... Some Kaktovik people say the best time for brant hunting is during foggy weather because the birds fly low to the ground. Hunters cannot see a great distance then, but they hear the brant coming, and when the birds appear through the fog they are at close range. (*Kaktovik*) (Jacobson and Wentworth 1982:58)

Good brant hunting places for Kaktovik people include the area around the spit on the east side of Simpson Cove in Camden Bay, the western side of Camden Bay at Konganevik Point, and the small bay directly to the south. Other popular areas include Griffin Point east of Barter Island, including Oruktalik Lagoon up to Tapkaurak Point, and all around the narrow spit and coastline from Griffin Point to Pokok Lagoon, close to Barter Island, the south end of Manning Point spit, Arey Island, lakes southwest of Barter Island, and the banks of the Okpilak and Hulahula rivers just south of the delta (Jacobson and Wentworth, 1982). The black brant westward migration passed over Barter Island between August 15 and August 30 in 1978 (Jacobson and Wentworth, 1982:58-59). Based on a 1992 survey, 32 percent of Kaktovik households were involved in harvesting brant in that year, while 57 percent of households used brant.

Harvest studies have been conducted at Nuiqsut in 1985 and 1993. 1985 was a very poor year for brant -- only an estimated total harvest of 6 brant were taken. In 1993, an estimated 296 brant were harvested, comprising 20.3 percent of all the geese taken. Canada and white-fronted geese provided the major portion of the geese taken in that year -- 31.2 and 47.4 percent respectively. No Canada or snow geese were recorded for 1985, only white-fronted and brant. In 1993, according to Pedersen, the "spring was late and cold, and when the birds finally arrived in the Nuiqsut area access was quite limited because of rapid melt-off of the snow-cover needed in the snowmachine transport of hunters to productive hunting areas" (Pedersen, in Fall and Utermohle, eds. 1995:V-XXII-12). In 1993, 37.1 percent of Nuiqsut households harvested black brant, and 48.4 percent of households used brant. In 1985 only 2.5 percent of Nuiqsut households harvested or used brant (Fall and Utermohle, eds. 1995:V-XXII-31).

Barrow bird hunters, like Kaktovik hunters, harvest brant during spring and fall migrations. The spring harvest initially occurs in conjunction with whaling activity, along the coast and along the shore ice. A three-year harvest study indicates most brant were harvested in May (21 percent) and June (64 percent), with additional harvest in August (10 percent) and September (4 percent) (Braund 1993b). Barrow hunters begin to take brant when they arrive in late May, while out on the ice at whaling camp. Later, hunting shifts to shore-based camps.

In June, geese camp is often a family affair as children and grandchildren are out of school for the year. The more active geese hunters average about two weeks in camp....Geese hunting locations are scattered throughout the Barrow hunting range, with the heaviest concentrations along the Meade, Topagoruk and Inaru rivers... Those hunting along the coast typically also harvest eiders. (*Barrow*) (Braund 1993b:55)

Brant harvests at Barrow varied over the three year study period -- 127 (1987), 221 (1988), and 973 (1989), for an average of 440 birds. Harvests increased each study year. The number of hunters and the time period involved in hunting decreased during that same period -- fewer hunters harvested more geese in a shorter period of time than in prior years. In 1988, only 5 percent of Barrow households participated in the brant harvest (Braund 1993a:B28). The 1988 harvest, the median harvest year of the 3-year study, is used in the statewide harvest estimate of this report.

At Wainwright, a two-year survey documented brant harvests of 567 birds (1988) and 700 birds (1989). Wainwright bird hunters target black brant both during their north

(May through mid-July) and south (August-September) seasonal migrations (Braund 1993b:157).

After whaling, hunters traveled by snowmachine, by ATV, or by foot down the coast from Wainwright to favored spots between Wainwright and Mitliktavik (about five miles south of Kilimantavi) to hunt brants (and eiders). After the lagoon broke up, people would load their snowmachines or three- or four-wheelers into their boats, ferry them across the lagoon, and continue south on land by snowmachine or ATV. Next, when the ice along the coast broke up, people could then travel down the coast by boat to brant hunting locations. Brant hunting during the fall migration took place at Thomas Point (at the mouth of the Kuk Lagoon) and around the mouth of the Sinararuk River (the small inlet... between Wainwright and Ataniq). The prime fall brant hunting area, however was by the mouth of the Avak River (near Icy Cape) where brants could be found feeding in large flocks in the Kasegaluk Lagoon. People who traveled there in the fall to hunt brants usually were very successful. However, several residents explained that once the brants had been feeding on the marine vegetation for several days, their flesh tastes "stinky". Therefore, some people limited their lagoon harvesting to within the first few days after the birds arrived at the lagoon. (*Wainwright*) (Braund 1993a:157-8)

Wainwright hunters got an average of 634 brants annually for a total of 1,901 pounds each year. Despite the lower harvest totals for brant than for white-fronted geese, more households participated in successful brant harvests: 32 percent on average. Higher participation in successful brant harvests is related to access; the brants migrate right in front of Wainwright, whereas hunters usually have to travel inland to intercept white-fronted geese. (*Wainwright*) (Braund 1993a:158)

Northwest Arctic Coast -- Brant

Brant are harvested by seven coastal communities of the Northwest Arctic area. The estimated yearly harvest was 839 brant during the 1990s. The use of brant varies among communities, apparently related to proximity of a community to flyway corridors and resting areas.

Kivalina, on the Chuckchi Sea coast south of Point Hope, reported the largest takes of brant for the area -- 352 birds in 1992 (about 1.02 birds per person). Estimated brant harvests a decade earlier (111 birds in 1982 and 54 birds in 1983) reportedly under-estimated the actual harvest those years (Burch 1985:95-96).

Brant and Canada geese pass through the Kivalina area in May and June, on their way north.

Ducks and geese are sought by Kivalina hunters primarily just before and during the breakup process. Before breakup the birds are shot out on the ice by men taking a break from seal hunting. After breakup some are shot by seal hunters, but most are killed by hunters stationed at several different locations along the beach known to be right on the birds' customary flightpath. The same stations have been used for centuries. (*Kivalina*) (Burch 1985:97)

Brant harvests were recorded through the third week in June in 1982, when major sea mammal hunting and char fishing was occurring, according the Burch's records. In that year brant harvests had stopped by the fourth week of June. In 1983, a few brant were harvested as early as the first week of May, although by the third week of May it

appeared that the waterfowl numbers were lower than usual. In 1983 brant harvests continued into the last week of June. No harvests of brant were recorded during the fall migrations in 1982 or 1983 (Burch 1985).

Based on a subsistence harvest survey in 1992, 43.5 percent of all households reported harvesting brant in that year. Brant comprised the most plentiful goose species in 1992, representing 18.6 percent (by weight) of the waterfowl harvested, followed by white-fronted geese (16.6 percent), snow geese (15.3 percent), and Canada geese (15.1 percent). Asked to compare their 1992 household's use of brant with ten years earlier, 27.1 percent of households answered that use of brant was less in 1992, 28.2 percent said it was about the same, while 15.3 percent of households said they used more brant in 1992 than ten years earlier (Fall and Utermohle, eds. 1995:V-XX-47).

Brant are one of the several species of geese which pass through the Kotzebue area in the spring. They are harvested by residents of Kotzebue, along with the white-fronted goose, the lesser Canada goose, and the snow goose. The per capita harvest of brant at Kotzebue in 1991 (.06 birds per person) was considerably lower than its neighbor Kivalina to the north (1.02 birds). Areas used by Kotzebue residents for waterfowl hunting, and most likely brant hunting, include the lower Noatak River and the many sloughs, lagoons, and creek mouths along the Chukchi Sea shore north of Kotzebue to Cape Krusenstern, where many households maintain seasonal camps (Georgette and Loon 1993).

Brant are not considered common near Deering, just south of Kotzebue on Kotzebue Sound. Deering and Buckland apparently are not close to resting areas to the west along the north coast of the Seward Peninsula. A respondent at Deering reported that he had only seen sizable flocks of brant near Deering three times in his life. These sightings were always in spring in years of early break-up. The flocks were flying very high and headed north. He recognizes brant by the very distinct sharp call. He reported that he had never seen brant in the fall, and assumed they took a different route on their southern migration. Approximately 16 percent of Deering households reported harvesting brant in 1994. Sixty percent of the brant harvest took place in the spring.

Kiana and Selawik, communities just inland to the east and southeast from Kotzebue, have few opportunities to harvest brant, since most birds are flying high during their northward spring migration. But hunters are able to harvest some:

The brant come later, around the last part of May or first week of June. Hardly any stop around Kiana. They may spend a few days by the lake. They come in flocks of more than 100 in V formation. They fly many miles that way. Even though they are flying very high, it is possible to get some. Once you shoot at them, they dive down, and then you can get them... I have seen flocks of brant numbering in the thousands, passing over all day long. They go through Kobuk Lake and stop in the lakes south between Kiana and Noorvik. (*Kiana*)

Kiana hunters use decoys of birds already shot. You push stick up the neck of the killed goose. But foxes may try to get these real decoys, so you have to watch out carefully. Hunters also use blinds. In the early spring when the ground is still frozen, you need to stand in the grass -- in grassy meadows; you bend willow branches and hang dead grass to make a blind. (*Kiana*)

Respondents in Selawik reported that black brant fly over the Selawik area in big flocks in the spring, but do not stop locally.

There are just a few of these around sometimes. We hardly ever see them here. (Selawik)

We see them fly over us in a V shape, with one bird always in the middle. They don't land here. (Selawik)

We used to see more black brant in the past, but they always just fly by -- no nesting here. (Selawik)

In 1994, hunters accounted for capita brant harvests of only .08 birds per person in Selawik and .02 birds per person in Kiana, about the same levels as Kotzebue in 1991.

Northwest Arctic Inland -- Brant

One would not expect to find significant harvests of brant by residents of inland communities of the Kobuk or Noatak rivers. Surveys conducted in inland communities in 1994 confirmed this -- no brant were reported harvested in Noatak or Shungnak that year. Respondents in Shungnak indicate that they occasionally see flocks of brant flying high toward the ocean, out of shooting range, for a short period at the end of May and early June.

We see brant passing through, flying toward the ocean. They fly in big flocks of 200-300. They are like a big black cloud, flying high. They may land for the night. We don't get them.... They do not come down in this area, and people do not get brant around here.... Brant may fly high over head -- too high to get. (Shungnak)

St. Lawrence Island -- Brant

Harvest surveys conducted in 1993 by the U.S. Fish and Wildlife Service documented a small fall harvest of brant at Gambell (7 birds) and Savoonga (8 birds) (Wentworth 1994b). Brant were identified as one of three geese species (brant, emperor, and snow geese) used on St. Lawrence Island in the early 1980s (Little and Robbins 1984:232-232). Reportedly, geese were hunted "most often... in conjunction with other subsistence pursuits such as fishing and seal hunting... (and) are taken in about the same way and under the same circumstances as ducks: summer camping hunts and some solitary hunts from the villages" (Little and Robbins 1984:232-232). Savoonga people use summer camps and locations east of the village from 5 to 50 miles. The most important summer camping sites for Savoonga residents, offering the full range of summer resources, were identified as Kialegak Point, at Southwest Cape, Eevwak Point, five miles west of Savoonga, and Alngeeyak Point (Little and Robbins 1984:202-203). For Gambell residents, Powoiliak Lagoon, from the western end of Powoiliak Lagoon to Silook Camp, and Koozata Lagoon were reported to be camping sites, offering a full range of resources, including ducks and geese. "These two lagoons are open and easy to traverse, with campers traveling along the narrow strip on ARCs or in the lagoons by aluminum boats and inflatable rafts" (Little and Robbins 1984:196). Many Gambell families use camp sites along the northwest shore of the island from

Gambell to Taphook Point, and along the west coast from Gambell to Boxer Bay (Little and Robbins 1984:196-200).

Seward Peninsula -- Brant

Brant is a major species harvested by several Seward Peninsula communities. Three surveyed communities reported significant per capita harvests of brant -- Brevig Mission (2.53 birds per person), Wales (.92 birds), and Shishmaref (.89 birds). Of all study areas, the Seward Peninsula ranked third in the estimated yearly take of brant -- about 1,905 birds. Brant are easily available to hunters at Brevig Mission, Wales, and Shishmaref because of major staging areas along the south and north shores of the Seward Peninsula. Port Clarence and the Lopp, Ikpek, Arctic and Shishmaref lagoons are stops on both the spring and fall migration for large segments of the brant population using nesting sites further north (Subcommittee on Pacific Brant, 1992:45).

In Shishmaref, on the north shore of the Seward Peninsula, brant was the most commonly used bird in 1988-89 (by 67 percent of the households) (Conger 1990:28). Brant were harvested in spring, summer, and fall, with 84 percent of the total brant harvest reported occurring in the fall in 1988. Brant, pintail, emperor, and Canada geese were hunted as part of fall camping activities, which also included moose hunting, berry picking, and fishing (Sobelman 1985:86).

Especially popular areas for waterfowl hunting are around Shishmaref and Cowpack inlets and along the Arctic and Serpentine rivers. The hunting of waterfowl occurs to a much lesser extent in the spring. Residents have noted that since 1974 when a major storm occurred, waterfowl on their migration northward in the spring appear to be traveling further inland. (*Shishmaref*) (Sobelman 1985:86-7)

At Wales brant were taken in both spring (44.4 percent of the harvest) and fall (55.6 percent). At Brevig Mission, just south of the western tip of the peninsula, all of the brant harvest was reported in the spring during 1989.

Norton Sound -- Brant

Norton Sound was ranked fifth among study areas in brant harvests -- about 919 brant. Two communities (Golovin and White Mountain) are particularly well suited to take brant in nearby Safety and Golovin lagoons, which are resting areas used by brant on their route north in the spring. Golovin hunters conduct most of their brant hunting in the spring, with a lesser number taken in the fall (Conger and Magdanz 1990). At Golovin, 84.5 percent of households used brant in 1989, the most commonly-used bird. The per capita brant harvest was 2.04 birds per person at Golovin that year (Conger and Magdanz, 1990). Other surveyed communities along Norton Sound (Elim, Shaktoolik, and Stebbins) appear to be less well situated to harvest brant. The brant migrations pass more quickly through their hunting areas. The per capita brant harvests are lower than at Golovin -- Elim (.24 birds per person), Shaktoolik (.19 birds), and Stebbins (.03 birds). Interviews with bird experts at White Mountain, Elim, Shaktoolik, and Stebbins provide some details about brant in the Norton Sound area.

Brant are the most abundant and most hunted bird in the White Mountain area. Large flocks of several hundreds pass through the Golovin Bay area in the spring:

In the White Mountain area the first birds to arrive are a few white-fronted geese which show up around April 20. These are followed shortly by fairly significant numbers of Canada geese. Swans arrive next in pairs and small flocks. Pintails, mallards, shovelers, and snow geese pass through the area about mid- to late May just prior to the arrival of black brant which show up the last week of May. The few eiders that are seen (common eider) are seen about the first of June, a time when the brant are still here. Mergansers and scoters are the last birds to arrive and show up about June 10 or 15 after the ice is all gone. Most of the birds that pass through the area in the spring are never seen in the fall, except for Canada geese and swans. Swans are the last birds to leave the area before freeze-up. (*White Mountain*)

Black brant arrive in the White Mountain area about the last week of May or the first week of June. Of all the waterfowl, they are relatively late arrivals. White Mountain is on their spring migration route, but we don't see them in the fall. We only get them here for about two weeks in the spring. When they arrive in the spring they are fat and good to eat. They don't nest around here, they go somewhere up north. (*White Mountain*)

Black brant arrive in large flocks in late May. Flocks may be several hundred birds and remain in the area about two weeks. There are two sizes or "types" of brant recognizable -- the bigger ones show up first. Then the smaller ones show up. The breast feathers of the small ones are a little lighter in color and kinda brownish. Brant feed in coastal areas around pans of bottom ice that bring plants and weeds to the surface. Brant are not seen in the fall, only in the spring. (*White Mountain*)

Shore ice that has frozen to the muddy bottom of Golovin Bay has popped up to the surface by the time these birds arrive. These floating pans of dirty ice contain weeds and roots of marine plants that are a favorite food of brant. Brant congregate around these floating or grounded pans of ice and eat these roots and weeds. The roots are light green or almost white in color, several inches long, and sweet to the taste. Flocks of several hundred brant may arrive and congregate around these ice pans just off shore. (*White Mountain*)

Hunters travel by boat down the Fish River to Golovin Bay to hunt brant. This is about a 20 or 30 minute trip to reach the flats. Hunters seek out floating pans of dirty ice where the birds have congregated to feed. Many of these ice pans are large enough to walk on and set up a hunting blind on. These ice pans are generally located within several hundred yards of the muddy shore. On large pans of ice -- perhaps 30 or 40 yards across -- a blind is made on one end of the ice flow by turning over the canoe or small skiff. Sometimes mud is spread on the boat to make it blend in with the mud-colored ice. Hunters crouch behind this as a blind. On the other end of the ice flow, decoys are often set out to attract brant. Hunting parties are usually young to middle aged males. Usually these are day trips but sometimes hunters camp overnight or for several days. Harvested birds are often distributed widely in the community when hunters return. Seal hunting is often carried out in conjunction with hunting brant. (*White Mountain*)

At White Mountain, brant are usually eaten fresh (roasted or made into soup). If preserved, they are commonly frozen. Prior to electric refrigerators and freezers birds were also preserved by salting. Hearts and gizzards are also eaten, fried, baked, or boiled.

When butchering birds, wings are cut at the last joint to save the meat present on the lower wing. Birds are kept whole and plucked. Some people let brant hang 3 to 4 days

with the entrails inside for added flavor. The aged birds are then cleaned and prepared by boiling, and eaten by dipping the meat in seal oil. Another method of preparing birds is to clean them in the field (removing only the intestines, while the heart, gizzard, and lungs remain in the bird for eating) and these whole birds are cooked by boiling, roasting, or cutting into pieces for baking as "pot roast". Birds are usually eaten fresh, though a few may be frozen. (*White Mountain*)

Down from all spring ducks and geese (mostly brant and Canada geese) is saved by some hunters in plastic garbage bags. They are used in making pillows and quilts. Not many people do this, but it is something some like to do. Only spring down feathers are saved because in the fall the birds have too many pin-feathers. (*White Mountain*)

Elim is located on the coast of Norton Sound at the mouth of a small creek with steep hills rising quickly behind the town. The townsite itself is not a prime waterfowl hunting area. Most waterfowl hunting takes place at a low coastal delta area about 10 miles east of Elim in the vicinity of Moses Point. Behind the Moses Point spit (inland) the Kwik, Tubutulik, and Kwiniuk Rivers enter the ocean through a broad area of lakes and flats and lagoons. These flats and the coastal approaches to them are common waterfowl hunting areas for Elim residents.

Brant are very wary birds in the spring. A few big flocks pass through the Elim area in the spring, but more of them go through the Golovin Bay area just to the west. They do not nest locally. There are two kinds of brant. The big ones come in flocks first, then small ones arrive. The small ones fly different -- very fast and lively. Brant don't pass through Elim in the fall. They go south, straight out over the ocean. (*Elim*)

The big ones arrive first and taste the best. Smaller ones arrive second about a week later. They taste fishy, so we don't hunt them as much. We use to get brant by the sled-load in the old days when I was young. We brined them up in 60 gallon barrels for the winter. Brant are only seen here in the spring when they pass through the area headed north. A few of the small ones may nest locally. The fall south migration route for brant is through Shishmaref and out over the ocean. I have heard they winter in Mexico. Brant don't seem to eat much when they stop here in the spring. (*Elim*)

Hunters in Elim observe brant eating grass roots and seeds around the lakes. Later on, around the first part of June, brant are observed eating salmon fingerlings swimming on the surface, at the mouth of the Kwik River.

Shaktoolik bird hunters reported seeing brant in the spring on their migration north, but noted that they did not nest in the area and remained just a few days.

The brant go through in June, when it's calm and there's a southerly wind. When it's windy they don't by-pass, they stay across there for days sometimes. That's when we used to hunt them. Now we don't hardly ever see them anymore. In the 1940s-1950s the flocks were 200-300. They seemed like a black cloud over there; they used to be that thick! It's unbelievable, but it used to be like that. They go northwest, across when they leave. (*Shaktoolik*)

They don't nest around here, they still go through here, but not that much. You just got to be there when they go through, very few flocks, not flock after flock, like there used to be. These birds like to hang around mud. Maybe there's little plants that they eat in the mud, probably mud grass. There are mud flats to the north of the village, around Malikfik Bay and Sineak Creek. (*Shaktoolik*)

There are two species of brant. The bigger ones come after the smaller ones. The smaller ones used to be real thick, not the bigger ones. They look alike, only thing is one is bigger than the other. They come about the same time, the bigger ones come just a bit later. They are two different species. The bigger ones are paler. Sometimes, those smaller ones when we used to hunt, you shoot lots of them with one shot, ten-twelve with one shot. Years ago. Only ones you see now are the bigger ones. Them smaller ones, I don't know what happened to them. They don't go through no more. (*Shaktoolik*)

Brant will stay closer to sea water. If there's shore ice they'll be out there. They fly in and out of sloughs, over water, and feed in the main streams, rather than the tributaries. Brant eat crustaceans -- little mussels, clams that float up. They're fast, especially when they arrive late. Some may nest around Shaktoolik. I hear them during the nesting season. But I don't notice when they're leaving. Brants are not all that hardy. They wait until there is open water -- they prefer warmer time, and wait until things open up. (*Shaktoolik*)

Interviews conducted with bird experts in 1994 confirm the general picture presented by Thomas (1982) for that community in 1980, in terms of the areas used for waterfowl hunting, and the seasons:

The areas hunted have changed very little over the remembered past and are generally the same for spring and fall, concentrating around the Sineak, Malikfik, and Shaktoolik drainages, up around Little Mountain and Ungalik, and south along the coast from Shaktoolik to the foothills. (Thomas 1982:118-9)

Hunters in Stebbins report seeing small flocks of about 20 or more brant in early May, staying only a few weeks on their way north. They are seen along the coastal flats south of Stebbins. They are not thought to nest in the area. In spring they are feeding on grass, roots, and young shoots. Small numbers of brant are seen in the fall, beginning in September, on their southward migration. The 1994 survey documented a relatively small fall harvest of brant by Stebbins bird hunters, in comparison to snow geese, Canada geese, and white-fronted geese.

I've noticed more and more brant in flocks, than I've seen of emperors. A little more numerous than the emperors. Flocks of about 20 or more in a bunch. I saw just one flock just last spring. That's about the same. I don't think they hang around too. Just come in and go to other areas. They would stay around a couple of weeks maybe. They come later in early May. (*Stebbins*)

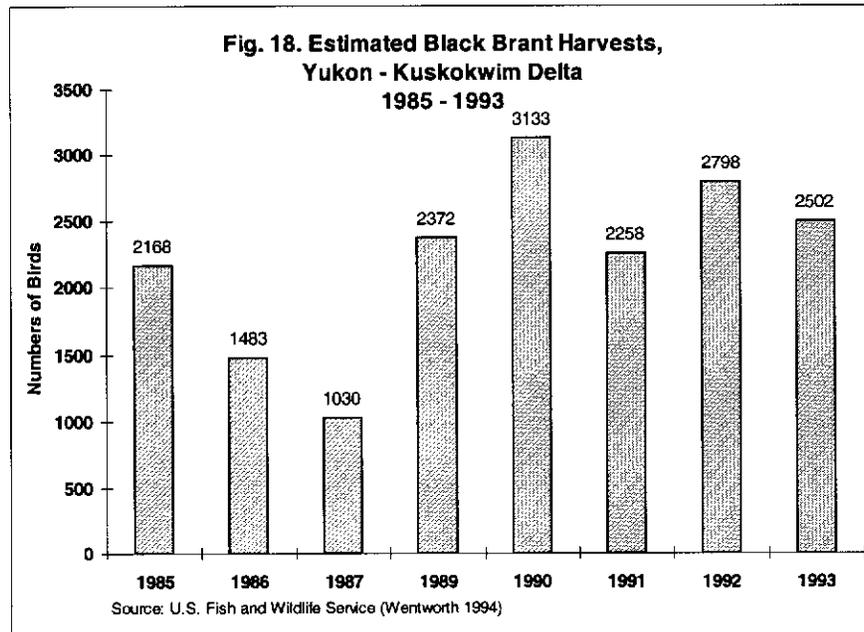
We see those brant in the spring, down the coast, down the flats, south of Stebbins. They're eating same as the rest of them. Eating grass, roots, young sprouts. In my life time I've never seen big bunches. (*Stebbins*)

It's not the most common bird. We spot them, spring and fall. That's when I see them. Fall time. Seems like the only time they're flying is night time. I don't think they nest around here. (*Stebbins*)

We see black brant once in a while. In the fall time beginning in September they're coming south again. They stage here in the flats in September, but we don't see too many of them. They don't travel together. They molt in June. They mostly concentrate in the Yukon delta, further south. Hooper Bay has lots of this kind. (*Stebbins*)

Yukon-Kuskokwim Delta -- Brant

Black brant is an important species harvested by residents of the Yukon-Kuskokwim Delta. After the North Slope, the communities of the Yukon-Kuskokwim Delta area harvested more brant than any other Alaska area in the early 1990s -- about 2,519 birds, based on a three-year average of harvests (1991-93) documented through hunter surveys conducted by the U.S. Fish and Wildlife Service (Wentworth 1994a). The annual brant harvest has ranged between 1,030 to 3,133 birds between 1985 and 1993 on the Yukon-Kuskokwim Delta. There were no obvious trends in harvest levels during that period (see Fig. 18).



Brant are seasonally available in large numbers in the coastal areas of the delta as they migrate to nesting areas. The coastal areas from Cape Romanzoff to Nelson Island, including the Kokechik River, Tutakoke River, Kigigak Island, and Baird Inlet, are major nesting grounds for brant. The communities in the mid coast and south coast zones harvest brant in the greatest numbers. In 1993, the mid coast villages accounted for 58 percent of the estimated brant harvest by villages of the Yukon-Kuskokwim delta, while the south coast villages accounted for another 28 percent of the harvest. The per capita brant harvests were .42 brant per person for south coast communities and .39 birds per person mid coast communities.

In the early 1980s, brant and emperor hunting was described for Kwigillingok, on Kuskokwim Bay:

Brant and emperor geese are among the first species to arrive (following departure of eiders to their northern nesting grounds) and are encountered closer to the beach than the eiders. The initial harvest of summer migrant waterfowl occurs on the water along the coast, but shifts inland as the snow melts and the birds move ashore to their nesting areas. Thereafter hunting activity can take place anywhere from the Ishkowiik River to over 30 miles west of Kwigillingok. Most hunting occurs in a band a few miles wide extending inland from the beach along the coast. Other harvest areas are several miles inland along the myriad sloughs and lakes that lace this section of the coastal plain. (Stickney 1984:91)

Boats, and subsequently snowmachines, are used in the initial hunting period, depending on ice and snow conditions. As soon as the waterways are free of ice, hunting is resumed by boat, with hunters often camping for one or more days (Stickney 1984:95). Brant and emperor geese are less common in this area during the fall. Harvests documented by the U.S. Fish and Wildlife Survey show only relatively low numbers of brant harvested in the late summer and fall. Brant start their southward migration from the delta by mid to late August.

North and South Bristol Bay -- Brant

Brant is one of the geese species available to some communities along the shores of Bristol Bay. Brant are taken in modest numbers by communities in northern Bristol Bay (estimated harvests of about 288 birds in the 1990s). They are reported harvested in spring, on their migration north, and in the fall on their migration south, to their staging areas on the north side of the Alaska Peninsula (Schichnes and Chythlook 1988:56). Brant hunting is done in spring in conjunction with seal hunting by subsistence harvesters of Manokotak and Dillingham in western Nushagak Bay, Nushagak Peninsula, Kululak Bay, and nearby coastal rivers (Schichnes and Chythlook, 1988:56). Brant are less accessible to hunters along southern Bristol Bay. They do not commonly pass through the south Bristol Bay area on their spring and summer migrations. Bird surveys at Port Heiden recorded 25 brant harvested (.24 birds per capita), while surveys at Egegik (1984), Pilot Point (1987), South Naknek (1992), and Ugashik (1983) documented only a single brant taken (at Pilot Point).

East Aleutians Islands -- Brant

Several communities of the East Aleutian Islands area harvest brant in significant numbers. The East Aleutian Islands area ranked fourth in brant harvests among study areas -- an estimated 1,228 brant in the early 1990s. Izembek Lagoon along the northern Alaska Peninsula provides a major staging area for brant traveling to wintering grounds in California and Mexico. Some hunting of brant continues through the winter after the fall migration, since several thousand brant remain in the area of Izembek Lagoon, the Shumagin Islands, and Sanak Islands (Braund and Associates 1986:7-33; Subcommittee on Pacific Brant Appendix A:46). Relatively large per capita brant harvests were documented for King Cove (1.37 birds per person) and False Pass (1.05 birds). Smaller per capita harvests occurred at Sand Point (.35 birds), Port Heiden (.24 birds), and Akutan (.10 birds). Port Heiden hunters harvested brant, with emperor and other ducks, at several coastal locations north and south from the community -- Reindeer, Birthday, Highland, and Charles creeks.

West Aleutian-Pribilof Islands -- Brant

Brant are occasional visitors to the western Aleutian and Pribilof islands. Recent surveys in the area's five communities documented only 19 brant harvested. A hunter at Atka stated that brant are "not very common -- they are rarely seen out this far."

Another indicated he had heard little about the brant. A third respondent at Atka stated that brant might have been more common in the past:

Old people used to tell me there were once lots, but after fox came, no more. Old days they used to catch them by throwing something on top of them; they weren't afraid. (*Atka*)

An Unalaska hunter reported that he sees up to ten black brant mixed in with the emperor geese in the flocks around Atka throughout the winter. Brant are seen occasionally at Unalaska. An Unalaska hunter reported finding a few brant at Cold Bay during the fall of 1994.

Brant are just passing through the Pribilof Islands in the fall. Brant are seen in small flocks and are occasionally harvested near ponds and tidal areas. Wind direction must be considered by hunters on saltwater so that downed birds are not blown away from shore. The brant rest in lakes and near-beach marsh areas. The brant are gone by November. Brant are the most numerous of the geese species seen in the Pribilofs, but are not a preferred species.

We have quite a bit of brant. I shot some and tried them. I don't like them. Black brant taste like seaweed. There is something about the meat of the brant which we don't like. I have seen flocks of 5 to 6. Whatever it is they eat, even the snow goose, I could taste it. We probably like a wilder taste. They just come here and leave. We see them around the end of September, heading south. The wind brings them here. (*Saint Paul*)

I think mostly we're sea duck eaters. We don't care too much about your mallards, your geese, brant. (*Saint Paul*)

Not lots, five, six. And they just come and go. They're just migrating. The majority of these are migratory birds.... The brant come through about September, end of September. They are going south, just passing through here. The wind just brings them. (*Saint Paul*)

Maybe just the ones that got blown off-course... we get lots of bad wind storms here in the fall. They don't feed much when they are here, I think they are just resting. (*Saint Paul*)

Sometimes I used to see black brant, which we call *ligix*. They would come up here in September. They were pretty hard birds to get because they would stay in the swamps. They would start eating blackberries (mossberries). You have to find a good hiding place because there's always one standing by as a sentry. I don't think I ever killed any, but I know my dad used to go over and bring some when I was a boy. (*Saint George*)

Other Areas -- Brant

Brant are occasionally taken in the South Alaska Peninsula area, where recent surveys indicated an annual harvest of about 21 brant among three communities (Chignik Lake, Chignik Bay, and Chignik Lagoon). The most harvests are reported at Chignik Lake, where small numbers of brant were harvested during each of three survey years -- 8 (1984), 24 (1989), and 12 (1991). No brant were reported taken at Ivanof Bay or Perryville during two survey years (1984, 1989).

Small numbers of brant appear in the Lake Iliamna-Nushagak area during the spring migration (Morris 1986:117). Several communities reported small harvests of

brant, including Iliamna, Koliganek, and Levelock. The area's estimated yearly brant harvest was 19 birds.

Brant apparently stop to rest at various Kodiak Island locations on their migration north in the spring. Respondents interviewed in 1994 at Old Harbor, on the south end of Kodiak Island, reported that black brant come through in the spring, but are too skinny to hunt (Mishler 1994). They are occasionally seen in McDonald's Lagoon, a resting and feeding area for many other species of birds. Similarly, respondents at Port Lions, on the northeast part of Kodiak Island, reported that black brant migrate through their area during spring when the weather is bad, but are not hunted because they are so skinny. They come into the lagoons and eat leaf kelp, and that is what they are reported to taste like. Respondents stated that if brant came through in the fall when they were fat, they might be good to eat, but they are never seen during fall. Surveys in 1989 in Akhiok, Larsen Bay, Ouzinki, and Port Lions, in 1991 in Karluk and Old Harbor, and in 1993 in Kodiak City confirm that brant were not harvested.

Hunters from the south Kenai Peninsula community of Seldovia reported small harvests of brant -- 26 birds (1991), 8 birds (1992), and 9 birds (1993). No brant harvests were reported in nearby Nanwalek or Port Graham during five survey years. In Prince William Sound, Tatitlek households reported four brant harvested in 1991. However, no brant were reported harvested in Chenega Bay, Cordova, Tatitlek, or Valdez during a series of recent survey years.

Brant are not unknown in the Yukon Flats in the interior of Alaska. Hunters indicate that they are occasionally seen. Some North Slope or MacKenzie Delta birds may migrate through the area. Harvest surveys being conducted by the Council of Athabaskan Tribal Governments in 1994 may assess more about the relative abundance and use of brant in this part of the state.

APPENDIX 2. SUBSISTENCE HARVESTS OF EMPEROR GEESE

Geographic Distribution

The emperor goose is a maritime bird whose range is primarily restricted to the coastal areas of the Bering Sea (Pacific Flyway Council 1994; Bellrose, 1976:136). It is a medium-sized, short-necked, stocky goose with gray plumage barred with black and white. Its distinctive white head and hindneck contrasting with the dark foreneck make it easily identifiable. While about 2,000 to 3,000 emperor geese winter along the coast of Kodiak and Afognak islands, most of the population winters along the ice-free areas of the Aleutian Islands, from about Port Moller west (Petersen et al 1994). In the early 1970s a few were regularly reported found in winter along the Oregon coast, Humboldt Bay and the Klamath basin and the Sacramento Valley in California, as well as the southeast coast of Alaska and British Columbia (Bellrose 1976:138).

By mid-March, emperor geese leave the western Aleutian wintering range and migrate eastward along the Aleutians, appearing along the tip of the Alaska Peninsula in early in April, where they stage around Izembek Bay, Port Moller, Nelson Lagoon, Seal Island, Port Heiden, and Cinder Lagoon (Petersen et al. 1994). After two to three weeks on the north Alaska Peninsula, the emperor geese move north to nesting areas primarily on the Yukon-Kuskokwim delta by mid to late May. Between 80 and 90 percent of the total population of emperor geese are estimated to nest and molt along the coastal areas of the Yukon-Kuskokwim delta. Some emperor geese continue on to nesting areas on the north Seward Peninsula by late May-early June, or to coastal lagoons of the Chukotski Peninsula. On the northward route, emperor geese fly over Bristol Bay to Hagemester Strait, the lagoons near Cape Newenham, Chagvan Bay, and Nunivak Island.

Within a week of hatching, families with goslings move to the coastal salt marshes to feed. Then they move to the larger rivers for the annual molt, where they are joined by nonbreeders. A migration of subadults, and probably failed breeders, occurs in mid-June from the Yukon-Kuskokwim Delta and Russian nesting areas to St. Lawrence Island and coastal lagoons of the Chukotski Peninsula. Breeding emperor geese and their young begin leaving for fall staging areas about mid-August, with most arriving on the Alaska Peninsula by late September (Bellrose 1976:139). Here they use the intertidal areas, eating blue mussels, and macoma clams during the low tide, as well as algae such as sea lettuce, kelp, shoots of sedges and grasses, and eelgrass. By late October or November, emperors disperse to wintering areas in the central and western Aleutians, and in smaller numbers to Kodiak Island.

North Slope and Northwest Arctic -- Emperor Geese

No harvests of emperor geese were reported by surveyed hunters from communities north of Kotzebue, including communities of the North Slope area. The most northerly communities reporting emperor harvests in the 1990s were in the Kotzebue Sound area, which is just north of the nesting areas of the north Seward

Peninsula. A yearly harvest is estimated to be about 64 emperor geese in the Northwest Arctic area in the early 1990s.

Respondents in Selawik indicated that emperor geese are not commonly seen in the Selawik area, and in Kiana, respondents did not mention emperor geese. Household surveys for 1994 indicate that some emperor geese were taken in spring by hunters from both those communities that year. Residents of Kotzebue take an occasional emperor goose. Emperor geese are not seen in the immediate vicinity of Deering, on the south shore of Kotzebue Sound. However, a local respondent reported he has seen small numbers of them on occasion in the Buckland River flats about 40 miles to the east.

St. Lawrence Island -- Emperor Geese

Emperor geese are present on Saint Lawrence Island, along with brant and snow geese. A small harvest of emperor geese (12 birds) was reported for Savoonga in the fall in 1993, according to a U.S. Fish and Wildlife Service survey (Wentworth 1994b). No emperor geese harvests were recorded by residents of Gambell. Little and Robbins (1984) reported that most ducks and geese were taken from June to early September on St. Lawrence Island; recent surveys by the U.S. Fish and Wildlife Service documented the emperor goose harvest in the fall, when the post-molt migration brought birds to the island. Some hunting areas for ducks and geese on St. Lawrence Island were described in the previous section on brant.

Seward Peninsula -- Emperor Geese

Emperor geese migrate along the Seward Peninsula coast. The north shore of the Seward Peninsula, from Goodhope Bay in the east to Lopp Lagoon in the west, is a nesting area for an estimated 1,000 emperor geese. Emperor geese are available to some Seward Peninsula communities, including Brevig Mission, Shishmaref, Teller, and Wales. A yearly harvest for the Seward Peninsula area is estimated to be about 122 emperor geese during the early 1990s. In the early 1980s, emperor geese were identified as one of the most commonly hunted birds by residents of Shishmaref, along with brants, pintails and Canada geese (Sobelman, 1985:86). A 1989 survey in Shishmaref documented no harvest of emperors that year. Brevig Mission residents reported a harvest of about 40 emperor geese during spring 1989. A 1994 survey at Wales, at the tip of the Seward Peninsula, recorded about 13 emperor geese harvested, split between spring and fall.

Norton Sound -- Emperor Geese

Small numbers of emperor geese are taken by subsistence hunters in the Norton Sound area. A yearly harvest for Norton Sound communities is estimated to be about 41 emperor geese in the early 1990s. Hunters at Elim, on the north side of Norton Bay, reported that emperor geese were not common, and there were no harvests of emperor geese documented by a survey there in 1994.

Very few emperors are seen in the Elim area. They are seen just once in a while and they seem very tame. They seem to be more of an ocean bird, that's where I have seen them, out on the ocean. (*Elim*)

Once in a great while you see emperor geese in this area. They are too easy to hunt. You can walk right up to them. (*Elim*)

At Shaktoolik, further south on Norton Sound, a few emperor geese were reported taken in the fall. The weather conditions may have an important influence on opportunities to get emperor geese in the spring. Local hunters varied somewhat in their assessment of the relative abundance of emperor in the Shaktoolik area.

The emperors come mid April. Some stay here, others migrate on. Emperors are the earliest to arrive. They land on the mud flats, and any place where there is bare ground. Most stop only for a few days. Others stay around. They eat berries -- frozen blueberries and blackberries. There seem to be more emperors now than in the past. There are 75 to 100 in a flock, but it varies from 200 to 100. In July, the young are in the surrounding lakes. They gather into flocks after the molt. They leave mid September to early October. We don't see them after early October. (*Shaktoolik*)

Another hunter stated:

We see some emperors here. Maybe two flocks of 20-30. But I can't always tell how many in the flocks. They fly high, usually after April 20th, depending on the weather. Their numbers seem about the same. They don't stay right around Shaktoolik. They'll be out on the flats adjacent to the village, and toward Cape Denbigh. They head to the hills and higher plains. They head inland to drier areas at night. I don't think this area is very good for emperors. (*Shaktoolik*)

An older respondent, who no longer hunts, stated:

They don't usually go through here. You don't even see them now. I don't think I ever get one in my life, because I never had a chance to. When we see them long ago, we get them, but you don't even see them now. We call them *nacaullek*. We see them in the spring time, in late April, early May. When we see them, we have quite a bit of southerly wind, that has quite a bit to do with it, the ones that go through here. Otherwise maybe they go further out. They don't nest in this area, never did that I know. I haven't seen one for many years. Last time I saw one was when we were hunting with dog teams, that was long time ago. I don't know what they eat. They don't stay, they just go through. They fly low, and just keep going. Maybe when they're tired they land, but I never seen them on the land around here. (*Shaktoolik*)

At Stebbins, on the southern shore of Norton Sound, emperor geese are commonly present in the spring, arriving in small flocks of seven to twelve by early May, before all the ice and snow are gone. Few are seen in the fall. Emperor geese are more abundant in the area than brant; however, it is estimated that only five emperor geese were harvested by Stebbins hunters in 1994. Several hunters at Stebbins remarked on changes in emperor geese populations.

I've never really seen them in great big flocks, in the hundreds or thousands like the snow goose. It seems like since the (goose) management plan went into effect down there in the Y-K delta, you start noticing more. I think it's because they're increasing down there and they need to go to other places, and come up this way. (*Stebbins*)

The emperor geese, when I was young, they used to lay their eggs out in the flats, out in the tundra. It's been a long time since... we hardly see them around for a while, but they're coming back again. The last three years, I began to see a few more flocks of these birds. And I'm sure they're nesting too, again out in the flats, a very few of them though, but there was a time when you hardly see any at all, in the spring, but now they're beginning to show up again. *(Stebbins)*

Emperors come in May, (but) they don't lay eggs around here. They probably head back south again, and lay their eggs down there in the Yukon delta. *(Stebbins)*

When the emperors get here in May they're feeding on the same food as the white (snow) goose is eating -- grass roots. A lot of them like to feed around the edges of rivers, the small creeks where tall grasses are. They eat grass roots and those plants that grow in lakes, and frozen berries from the previous year... They go right around lakes, riverbanks, mudflats, along the coast. They're eating grass and grass roots, probably bugs and insects, some young sprouts, berries and stuff. *(Stebbins)*

We see the emperor geese first in spring, in May. They come in small flocks of two to four. We don't see emperors in the fall. There never really have been any. They don't nest here. Maybe a few might nest here. In the fall they come from somewhere else. We don't know where they go. *(Stebbins)*

Well, I think there are some that nest and stay in the area. I had one person in the village tell me he ran into a bunch of young emperor geese, when he was cruising around in a skiff, and he just let them be, left them alone, and that's a pretty good indication they're nesting in this area. That's probably July. Young ones that are just born. *(Stebbins)*

It's been a while since we've caught some. Last one we got was pretty healthy. Right in our area, here in Stebbins, there are some, but they're not numerous. You might see them around Stuart Island. They like to hang out along the coast. You might see them around Stuart Island. *(Stebbins)*

Yukon-Kuskokwim Delta -- Emperor Geese

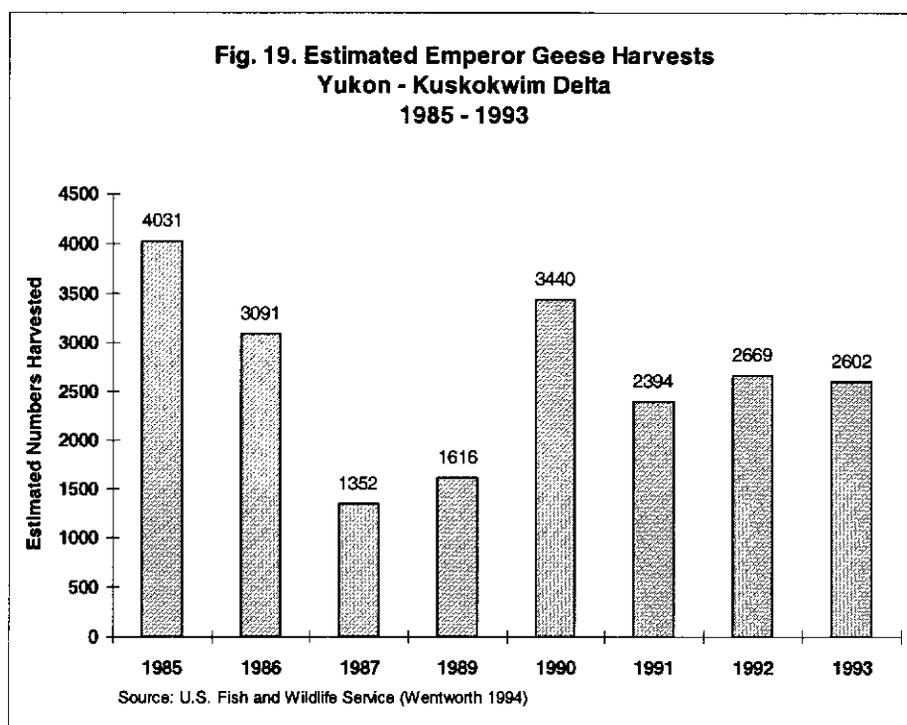
By far, the area reporting the largest harvests of emperor geese are the coastal communities of the Yukon-Kuskokwim Delta. The harvest of emperor geese for the Yukon-Kuskokwim Delta was estimated to be about 2,555 birds, based on a three-year average of harvests (1991-93), from hunter surveys conducted by the U.S. Fish and Wildlife Service. Emperor geese harvests have ranged from 1,352 to 4,031 birds between 1985 to 1993 in the Yukon-Kuskokwim Delta area. The reported emperor harvests show no obvious continuous trends during that period (see Fig. 19). Over two-thirds of the delta's emperor geese harvest occurs in the spring.

Communities along the mid- and south-coastal areas of the delta report the highest levels of emperor geese harvests (2,274 birds or 87 percent of the delta's harvest in 1993). The other 13 percent were taken in communities of the north coast and lower Yukon River. Intermittent participation by south-coast communities in surveys from 1985-93 may result in an underestimate of harvests for certain years in that area, according to Wentworth (1994:86):

In the south coast region, none of the three villages that are in prime emperor habitat participated in the survey in any year from 1986 through 1992. One of these villages (Kipnuk) did participate in 1985, and not again until 1993. In 1985 and 1993, the south

coast estimate for emperors was about ten times higher than in any other year. (Wentworth 1994:86)

There are relatively smaller emperor geese harvests reported in the lower Kuskokwim area, extending from Napakiak below Bethel to Aniak. There may be a few emperor geese harvested from communities above Aniak. Emperors are listed as one of three goose species utilized at Chuathbaluk and Sleetmute in the early 1980s (along with whitefronted and Canada geese) (Charnley 1985:247). Emperor geese are not listed among the birds utilized farther upriver at Stony River (Kari 1985).



North and South Bristol Bay -- Emperor Geese

Emperor geese migrate through the Bristol Bay area in spring and fall. They are accessible to some communities during the migrations, although details of these patterns are not documented in the literature. A combined harvest for north and south Bristol Bay is estimated at about 534 emperor geese for the early 1990s.

Togiak Bay and associated mud flats and wetlands provide habitat for waterfowl and other shore birds during migration and nesting, and emperor geese are one of two preferred species of waterfowl reported used in the Togiak area (the other being eider duck) (Wolfe et al, 1984:86, 332). A harvest of about 81 emperor geese was estimated for Dillingham in 1984. Surveys in two Nushagak Bay area villages, Alegnagik and Clark's Point showed no harvest of emperors by hunters from those two communities in 1988-89. The general hunting pattern for north Bristol Bay was described as follows:

Spring harvests begin with the arrival of eiders and emperor geese and the emergence of brown bears and 'parky' squirrels. Hunters travel to coastal sites primarily to catch waterfowl and marine mammals." (Wright et al 1985:313)

Many hunters travel down the (Nushagak) bay to intercept flights of eiders and emperor geese. Seals are hunted at the same time. (Wright et al, 1985:345)

In the spring, geese and ducks were hunted primarily around Nushagak Bay and along the rivers, particularly in conjunction with seal hunting. Most fall waterfowl hunting took place around Nushagak Bay, but some Dillingham residents preferred to fly to the Alaska Peninsula for goose hunting. (Fall et. al. 1986:114)

Fall and Morris (1987:126) described two distinct periods of waterfowl hunting for the south Bristol Bay. The first occurred as the birds passed through the area in April and May, most enroute to northern nesting areas. Bird hunting was timed after caribou hunting and before salmon fishing. A second bird hunting period occurred when the birds passed through the region to wintering areas. September and October were the predominant months of this harvest, although birds could be present in late August as well. Hunters from Naknek, South Naknek, and King Salmon were reported to travel down the peninsula to reach higher concentrations of birds. No emperor geese were reported harvested at South Naknek along southern Bristol Bay in 1992.

In the south Bristol Bay area, significant per capita emperor geese harvests were reported at Pilot Point (1.01 birds per person), Port Heiden (1.30 birds), and Ugashik (1.00 birds). This suggests emperor geese are more available to hunters along this section of the coast. Port Heiden residents have ready access to areas used by emperor geese as staging grounds for several weeks in the spring and fall, such as Reindeer, Birthday, Highland and Charles creeks, and the Ilnik area. Emperors are harvested in the fall from the Seal islands as well. In the survey year 1986-87, all the emperor harvest occurred in the fall at Ugashik, and 82.2 percent occurred in fall at Pilot Point. At Port Heiden, the emperor geese harvest was distributed between spring (41.8 percent) and fall (58.2 percent) in 1987. About 19 percent of Port Heiden households took part in spring hunting for emperors (Fall and Morris 1987:129). Pilot Point and Ugashik residents used the Dago Creek, Muddy Point, Dog Salmon Peninsula, South Spit, and the Cinder River areas for bird hunting (Fall and Morris 1987:116-152).

East Aleutian Islands -- Emperor Geese

Emperor geese, called "beach geese", are a highly valued subsistence resource in the East Aleutian Islands area. The East Aleutian area had an estimated harvest of about 492 emperor geese in the early 1990s. Significant per capita emperor geese harvests have been documented at Akutan (1.55 birds per person), Nelson Lagoon (.92 birds), False Pass (.42 birds), and Sand Point (.35 birds).

Emperors leave the area in the spring, staging at Izembek and the other lagoons on the north side of the Alaska Peninsula in mid-April for their migration to northern nesting areas, and return to north-shore peninsula lagoons by late September. The staging area at Izembek Lagoon is used by emperors as well as many species of geese and ducks. By late October or November and through the winter, emperors are dispersed along the intertidal zones of the western Aleutians, and the Shumagin, Sanak and Kodiak islands. During mild winters some emperors remain on the Alaska Peninsula. Harvests of emperors by residents of east Aleutian island communities occur during the period between October and April, probably primarily in fall (Wright et

al:84-85); however, most bird surveys in the area have not gathered detailed seasonal harvest information.

Some hunting areas were described as follows:

Waterfowl hunting [by King Cove residents] is concentrated during [the] fall migration (September and October). The majority of waterfowl hunting occurs in the large lagoons and bays of the Alaska Peninsula that provide King Cove residents access to the coastal estuaries on the north side. The shores and lagoons of Bechevin, Morzhovoi and Cold bays were commonly noted as good waterfowl harvest areas during the fall migration. The three lagoons adjacent to the northern and western shores of Morzhovoi Bay represent one of the most important waterfowl hunting areas for King Cove residents. This concentrated use area is a result of the ideal waterfowl habitat provided by the lagoons. Izembek Lagoon in an area used when visiting friends and relatives in Cold Bay. (Braund and Associates 1986:7-31)

Akutan residents hunt ducks and geese along coastal areas of Akutan Bay and near streams, lakes, and ponds of Akutan and Akun islands. The east end of Tigalda Island is an important location for the harvest of emperor geese that migrate through Unimak Pass. (Braund 1986b:4-99)

In the past, emperor goose was customarily served at Christmas and other holidays at Sand Point. Some hunters in Sand Point asserted that emperor goose populations had increased and that regulations should be changed to allow some limited subsistence hunting during traditional seasons.

West Aleutian-Pribilof Islands -- Emperor Geese

The emperor goose is the only goose which remains in the West Aleutian Islands area in the winter months. Emperors move into the area in the fall during October and November. Some stay in the area in the winter, while most move on farther into the Aleutians. The geese are more occasional visitors to the Pribilof Islands.

Emperor geese are a highly valued food in West Aleutian area communities, but less so on the Pribilof Islands. The emperor geese harvest is estimated at 228 birds for the West Aleutian-Pribilof Islands area. Significant per capita emperor geese harvests have been documented for Nikolski (2.02 birds per capita) and Atka (1.07 birds). Fifty percent of the households in Nikolski harvested emperors in 1990, sharing their harvest among 93 percent of the households in the community. All but two of the geese harvested at Nikolski that year were emperor geese, contributing almost two thirds of the total edible pounds of waterfowl harvested that year. The Alaska Native segment of Unalaska harvested about 30 emperor geese in 1994, or about 0.12 birds per capita. Some Unalaska hunters have felt constrained by current regulations closing the season for emperors and would like to see an open season for emperors:

I would love to hunt and eat emperor geese, but can't because they are illegal to hunt. (Unalaska)

We like to hunt these but can't, this is illegal. Fall time the best time to hunt them if we could. (Unalaska)

I would like to see a emperor goose season start up again. The numbers of birds are increasing. December, January would be ideal legal months, and February and March. (They) can make a village or household quota for emperor geese for Alaska Natives. If not a season for everyone, then let Alaska Natives get a few a year. *(Unalaska)*

At Unalaska, a key respondent described emperor geese populations and movements.

The emperor geese start arriving in November or whenever the first ice up north comes. They stay until March. The emperors are increasing by the thousands. From last year to this year, there are twice as many. We fish around the whole island (Unalaska Island) and anchor in different bays, such as Makushin Bay, Skan Bay, Chernofski, Usof Bay, and Beaver Inlet. Sixty percent of the bays have 3-4 flocks of emperor geese. There are 70-100 geese in a flock. When they start migrating, they all flock up. They are in the bays where they are feeding. *(Unalaska)*

Emperors fly arrive when the Aleutian Canada geese are leaving. They fly lower than the Aleutian Canada geese, and the emperors fly around the land, around the shore, rather than overland like the Aleutians. *(Unalaska)*

Emperor geese go underneath the Alyeska docks at the southwest end of Iliuliuk Bay at the entrance to Iliuliuk Harbor. I don't know what they're eating. Only at night they come in. They keep us awake at night. Our boat is tied to the Alyeska dock when in port. I saw 50-60 way under Crowley's Dock, in Captain's Bay on the east shore, today when we were out hunting. *(Unalaska)*

The birds stay on the calm side of the bay in big storms. If it blows south, they are on the south side of the bay. When commercial fishing we're targeting a depth of 50 fathoms and fish under three miles from shore. We don't see emperor geese offshore. They stay in towards the beach area. *(Unalaska)*

There are many more now this winter (1994-95) than in the last few years. In Unalaska Bay this winter I must (have) seen about a thousand or so, whereas the last few years there has been more like a hundred. *(Unalaska)*

At Unalaska, the fatty broth made from emperor goose has a medicinal use as a sore throat remedy. Some hunters may prefer adult emperors over juveniles, which can be distinguished from adults by the black spot behind the eye:

The younger ones are the skinniest ones around. I like the adult ones to eat. When we used to hunt geese, if we can tell it is young we won't hunt it because they are changing feathers. *(Unalaska)*

When geese start eating snails in the spring around March, they aren't good to eat. This probably applies to the ducks too, at least sea ducks. Ducks taste differently in summer, plumper, because they are feeding on different foods. *(Unalaska)*

Most of the emperors seen in the Atka area are the adult birds, or those just coming into adult plumage. Some flocks are mixed young and adult birds. Goose hunting at Atka was described in the early 1980s.

The common hunting strategy is to camp at a cabin and wait for the geese to fly from the ocean to the island for fresh water. They are usually shot while flying, although some may be killed if they are seen on offshore rocks. If hunting is good, it is possible to obtain between 20 and 30 geese per hunting trip. The main hunting time for geese is in

December and January, when the birds are flying westward. However, they may also be killed in February on their eastward migration. (Veltre and Veltre 1983:137).

Common hunting areas for geese include the coast and near shore areas surrounding Korovin Bay on the north side of Atka Island, from Egg Bay in the west to the bays north of Martin Harbor in the east, the coast and near shore areas south from Atka village along Amelia Pass to Cape Utalug and west to Vasilief Bay, Vasilief Island, and Amtagis, Sadatanak, and Sagchudak islands south of Kobakov Bay on the south side of Atka Island (Veltre and Veltre 1983).

In 1995, respondents at Atka indicated that emperors are hunted in the winter months when the geese are staying around the island.

They aren't around during most of the rest of the year. Emperors are the only ones taken, since there aren't any Aleutian Canada geese which stay around the area. (*Atka*)

The best hunting, according to Atka informants, is when the weather is rough. The birds come into protected bays, shorelines, and lakes around Atka. They fly along the shorelines, and are moved around by the windy weather. They are quite easy to get close to out among the islands.

For the Pribilof islands, the emperor geese are reported to be available occasionally in lakes on Saint Paul and Saint George islands in the fall (Veltre and Veltre 1981:162). Local hunters in 1995 reported that a few emperor geese are seen during the spring migration, and more arrive in the Pribilof Islands in September, October, and November as fall migrants. They eat seaweed and green algae in the lakes. Young birds can be identified from slight plumage differences.

We see the emperor geese first in April -- sometimes earlier. Last year we saw some in February over by Zapadni. There were 8 to 12 of them. They stay together on the beach and are easy to scare. They always have one to serve as a watchman on guard. They would be eating seaweed in the tidal pools. We used to see more of them. We would see them in the lakes in the fall. (*Saint George*)

Emperors are much less common (than brant)... perhaps just one flock of a dozen or so passing through in the fall. A handful of emperors will sometimes hang around the island all winter. (*Saint Paul*)

Eight emperors were reported taken by surveyed hunters on Saint Paul and none on Saint George in 1994. By the report of some hunters, emperor geese are not particularly favored:

The Aleut name for emperor is *qamgangix*. We call them *qamгаа*. The best time to hunt them would be... they start coming in November, December, until now (January). But the Aleuts here don't care too much for them. We don't like them. They've got a seaweed taste. The Aleuts here don't care even for freshwater ducks. They don't care too much for goose. They're scared of the bugs. They're not parasites, they're bugs. They'd be plucking, they'd be climbing right up your arms! We don't like it. On the outside. Lice, pretty good size bugs... all lake ducks have them. But I haven't seen it on the emperor. If we did kill it nobody would want it, so we don't care to. (*Saint Paul*)

If I had to do serious hunting, I'd get a lot of them. When they start coming into the lakes I just don't care to hunt them. They're not too big. When you pluck them, he's about the

same size as a common eider. Probably just has a longer pelvis -- longer drumstick. (Saint Paul)

I could see them eating green type seaweed. That's why they taste the way they do. I've seen them on the rocks, like right now (January). If it's frozen like now for long time them probably eat anything now. They probably leave here in January. I think the food source is low. They're not fat at this time of year. You've got a lot of them here now. (Saint Paul)

Quite a few of them are here now (January). I shot some. I tried them. I didn't like them. What ever they eat here, I don't know if it's seaweed. Even the Snow goose. It's something about the meat. I could taste it. We probably like that wilder tast, but I could sense a strong... in the emperor. (Saint Paul)

A similar sentiment was reported by a hunter on Saint George Island:

We used to hunt the emperor geese but now we don't bother them. We hunted them in mid-winter, but they start coming here in big flocks in May. When they start eating kelp, their meat tastes like that. The taste used to be bad. If they stay here two or three weeks, maybe a month, the meat used to taste different. Our Aleut name for them is *qaamgaang*. You can roast them in the oven, but we never made soup out of them. And these we never put in water. We just pluck them dry. (Saint George)

South Alaska Peninsula -- Emperor Geese

The estimated yearly harvest of emperor geese was about 150 birds in the South Alaska Peninsula area in the early 1990s. Moderate harvests of emperor geese have been recorded on surveys conducted in all five communities of the Alaska Peninsula -- Chignik Bay (.28 birds per capita), Chignik Lagoon (.49 birds), Chignik Lake (.23 birds), Perryville (.15 birds), and Ivanoff Bay (1.47 birds). Birds are taken during fall hunting trips in September and October, when the ducks and geese are migrating south:

Hunting parties often traveled in commercial fishing vessels along the coastal areas looking for signs of moose or caribou. Once a potential site was selected, hunters traveled inland by foot or with three wheelers, which had been carried aboard the boats, to continue the hunting effort. (Morris 1987:89)

Other Areas -- Emperor Geese

Small numbers of emperor geese have been reported harvested on surveys conducted between 1987 and 1992 with households in four Nushagak River villages -- Iliamna (1987), Kokhanok (1992), Koliganek (1987) and Newhalen (1991). The yearly harvest by hunters from the Lake Iliamna-Nushagak area is estimated at about 55 emperor geese. According to Morris (1986), based on survey work in the area in 1982-84, hunters with kinship ties to the Alaska Peninsula and access to private aircraft journeyed south and took advantage of the larger waterfowl populations passing through the Pilot Point area (Morris 1986:53). The origins of the emperor geese documented for Iliamna hunters, whether local or from the Alaska Peninsula, was not ascertained during surveys.

Except for Akhiok, surveys in Kodiak Island communities have not documented a local harvest of emperor geese. According to respondents interviewed by Mishler (1994) at Old Harbor in southwest Kodiak Island, emperor geese are seen during winter on the outside of Sitkalidak island. They come into Shearwater Bay during the early evening to drink fresh water and feed offshore during the day. They are seen only singly as stragglers or in pairs -- no flocks. There are also a few found at the head of McDonald's Lagoon (Fox Lagoon), in Rolling Bay, at Sheep Island, and on the beach at Bush Point when it is blowing northeast. Respondents at Port Lions, northeast Kodiak Island, reported that emperor geese are not abundant near Port Lions. They sometimes land right in Settlers Cove during the spring. Emperors are not hunted at Port Lions. Emperor geese are hunted at Akhiok, where they are more abundant. For two survey years, Akhiok hunters reported a harvest of 16 (1986) and 17 (1989) emperor geese.

Emperor geese apparently are not harvested in rural Alaska communities east of Kodiak Island. Hunters have reported no emperor geese taken during a number of survey years in communities of the Lower Kenai Peninsula or Prince William Sound.

APPENDIX 3. SUBSISTENCE HARVESTS OF EIDER

Geographic Distribution

The two largest species of Alaskan eider are the common and the king eider. Most Pacific common eiders winter in the waters of the Bering Sea and Aleutian Islands. Small numbers may winter as far north as Point Hope and as far south as Vancouver Island in Canada. The common eider breeds in eastern Siberia and along much of the Alaskan coast, from Sitka in the south to the Beaufort Sea coast in the north, including the Aleutian Islands and many of the islands in the Bering Sea (Bellrose 1976; Larned et al. 1992). It is the most abundant eider species breeding in Alaska. The coast of the Yukon-Kuskokwim Delta is a principal breeding area in Alaska, which they share with smaller numbers of king and spectacled eider. Other breeding areas include the Beaufort Sea coast eastward into Canada, around Cape Espenberg, the northwest coast of the Seward Peninsula, along Norton Sound coast, St. Lawrence Island, and south around Bristol Bay, Nunivak Island, and St. Matthew Island. Some Pacific common eider migrate around to the Canadian high arctic to breed and nest.

King eider from the western and central Arctic primarily winter at sea along the Alaska Peninsula and Aleutian Islands (Bellrose 1976:368). Some king eider winter farther north, as open water permits, offshore St. Lawrence, Saint Paul, and Saint George islands. Few king eider are seen south of the Kenai Peninsula. Compared with the wide breeding distribution of common eider, king eider breed more sparingly along the arctic coast of Alaska from Point Hope to Demarcation Point and at arctic coastal locations of the Northwest Territories (Bellrose 1976:366).

Groups of common and king eider migrate long distances along the Alaska coastline between wintering and breeding areas, flying among the open leads in the spring ice. The migrations take the birds past many coastal communities in spring. Some communities also see eiders in summer and fall, as migrating groups move between areas. For instance, male king eiders, which do not stay with their mates after incubation starts, migrate past Barrow beginning in early July (Bellrose 1976:368). Because of their abundance and great geographic range, common and king eider are among the most frequently reported birds taken by rural Alaska hunters.

By comparison, the two smaller eider species -- the spectacled eider and Steller's eider -- are much less evident in the rural subsistence harvest. The spectacled eider apparently winters among the remote leads of the central Bering Sea ice, while Steller's eider winter along the south side of the Alaska Peninsula and the east Aleutian Islands (Kertell 1991:183; O'Hara 1995). The breeding areas of the spectacled eider are scattered along a narrow strip along the Bering Sea coast from the mouth of the Kuskokwim River north to the Arctic Ocean and east to the Colville River delta, and along the coasts of northeast Siberia. Steller's eider nest at locations scattered along the coast from the Alaska Peninsula to Demarcation Point. Nesting sites have been observed on the north coast of the Seward Peninsula, the west side of the Alaska Peninsula, St. Lawrence Island, Nunivak Island, the arctic coastal plain near Barrow, the New Siberian Islands, Lena Delta east to the Chukotski Peninsula, including Wrangel

Island, and areas west to the Kheta River (Kertell, 1991:177). Steller's eider molt in fall along the north side of the Alaska Peninsula, primarily at Nelson and Izembek lagoons, and then move to wintering areas (Kertell 1991:183). Compared with king and common eider, less is known about the migration patterns of spectacled and Steller eiders between summer and winter ranges. The Alaska breeding populations of both the spectacled and Steller's eiders appear to have significantly declined in recent decades, based on trend indices.

North Slope -- Eider

Eider ducks are important subsistence resources used by North Slope residents, according surveys conducted in the late 1980s. The yearly harvest of eiders (all species combined) for the North Slope area was estimated at about 8,308 eiders during the early 1990s. This estimated harvest was the largest for any study area. The estimated harvest by species was as follows: king eider (5,577 birds), common eider (1,980 birds), spectacled eider (604 birds), and Steller's eider (146 birds). Significant per capita eider harvests have been documented in all communities: Point Lay (5.05 eiders per person), Wainwright (2.67 eiders), Nuiqsut (1.83 eiders), Barrow (1.40 eiders), and Kaktovik (1.40 eiders).

The harvest estimates for the North Slope area are based on surveys conducted for a variety of years in Barrow (1987, 1988, and 1989), Kaktovik (1987, 1992), Nuiqsut (1985, 1993), Wainwright (1988, 1989), and Point Lay (1987). Unfortunately, the species composition of the North Slope eider harvest is particularly difficult to determine from the survey information because of missing species information from Barrow, where more eiders were harvested than any other surveyed community. Almost all of the eiders harvested at Barrow were not reported at the species level by hunters. The species composition of Barrow's take was assumed, based on the three-year average of the small numbers of harvested eiders that were reported at the species level at Barrow -- king (66.03 percent), common (30.16 percent), spectacled (0.63 percent), and Steller's (3.17 percent). However, this assumed species composition is based on thin information, derived from the species identification of only 92 birds (of 5,973 birds) in 1987, 44 birds (of 4,499 birds) in 1988, and 179 birds (of 8,590 birds) in 1989. The reported species composition at Barrow for the three survey years showed substantial variation between years: king (90.22 percent, 56.82 percent, 55.87 percent), common (7.61 percent, 43.18 percent, 38.55 percent), spectacled (2.17 percent, 0.00 percent, 0.00 percent), Steller's (0.00 percent, 0.00 percent, 5.59 percent). That is, of the small numbers of eiders identified at the species level by hunters, no spectacled or Steller's eiders were reported in two of the three surveyed years, and the composition of common eiders ranged from 7.61 to 56.82 percent of the identified take. Because of this incomplete data, there is room for considerable error in the estimate used in this report. The estimate depends upon how closely the reported species composition matched the total community pattern for the surveyed years. The mean for all three years was used to estimate species composition at Barrow in order to reduce the reporting error that might exist within any particular year.

The short time series of data for eider harvests on the North Slope present an additional problem for identifying the size of the takes of the less abundant spectacled and Steller's eiders. Relatively complete data on species composition exists for only

single years at Kaktovik (1992), Nuiqsut (1993), and Wainwright (1989). Whether these single-year data sets adequately represent the longer-term harvests for the two less-abundant eider species is uncertain. These problems plague the data on eiders from other areas as well, and should be kept in mind when interpreting the significance of the findings.

The common eider and the king eider were the two eider species commonly hunted at Kaktovik in the late 1970s, according to Jacobson and Wentworth (1983). Camps and hunting sites along the coast from Flaxman Island to Demarcation Bay were used for hunting eiders. Coastal lagoons, narrow spits and points, near shore islands, and river deltas were favorable bird hunting sites. The arrival of eiders, brant, snow geese, and Canada geese occurred in May:

[It] coincides with the end of school... it is easy for waterfowl hunting to be a family activity. Extended families camp together. Stays at the camps range from a few days to over a month, but are most commonly one to two weeks. Virtually the entire village goes spring waterfowl hunting. (Jacobsen and Wentworth 1983:58)

King and common eiders were the two eider species reported harvested in Kaktovik in 1992-93. Together, king and common eiders comprised 25.5 percent of the total pounds of birds harvested that year. Thirty-four percent of Kaktovik households harvested king eiders, and 27.7 percent harvested common eiders. The sharing by those hunting households made it possible for additional households to use king and common eider -- 48.9 and 46.8 percent respectively. The only other ducks used at Kaktovik were oldsquaw and a very few pintails.

Eider ducks are important to people at Nuiqsut. In 1993, eider ducks made up 85 percent of the total ducks harvested. King and common eider were the two species reported. Thirty-five percent of Nuiqsut households harvested and 50.0 percent used king eiders; 16.0 percent harvested and 35.5 percent used common eiders. The 1993 survey asked respondents to compare their household's use of eider ducks in 1993 with ten years earlier. Approximately 43.1 percent of the respondents judged the numbers to be the same, 15.7 percent considered the numbers used to be less, and 15.7 percent considered the numbers used to be more than ten years ago. Twenty-five percent did not know.

King and common eider are the first of the eider to arrive at nesting grounds near Barrow and Wainwright, arriving by late April or early May. In 1989, Steller's eider had arrived near Barrow in May, according to the reports of small numbers harvested in May, and at least some remained into August (Braund 1993a:C-40). Spectacled eider reportedly arrive in the vicinity of Wainwright in June, accompanied by double-breasted cormorants, and they leave together in late August or early September (Luton 1985:387). Eider hunting around Barrow and Wainwright was described for the late 1980s by Braund (1993b):

Migrating along the open leads, king and common eiders were the first waterfowl to arrive (late April) but usually were not harvested until May when hunters were able to get out on the ice. The returning eiders fly in such concentrations that at times they appear to be large black clouds drifting across the horizon; this migration continues into July. (Braund 1993b:155)

In April and May, while out on the ice, Barrow whaling crews engage in eider hunting among the open leads as opportunity, weather, and time permit during the bowhead whaling season. Eider harvests may increase as whaling activity decreases. Sometimes the winds influence the whaling crews to move camp away from the lead edge for safety, and away from the heaviest flights of eider.

Later, Barrow eider hunters "travel along the coast in either direction... traditionally hunting as far as Wainwright to the southwest and the Colville River delta to the southeast" (Braund 1993a:48). Braund further describes the hunting strategies used by shore-based Barrow hunters:

From spring to fall, the coast provides an advantageous position for hunting migrating waterfowl. Likely the most important waterfowl hunting area for Barrow residents is *Pigniq*, also called the "shooting station." *Pigniq* is on the road to the point a few miles north of Barrow, and is situated on a narrow strip of land with the Chukchi Sea to the west and Elson Lagoon to the east. People have duck hunting blinds there, and some people also have cabins. *Pigniq* is accessible enough from Barrow by car or all terrain vehicle (ATV) that many hunters go there in the evenings after work to hunt birds or check their fishnets that they set in the lagoon. (Braund 1993a:48)

At the shooting station, or *Pigniq*... activity increases significantly (in July) as people combine eider hunting with fishing in the lagoon. Additionally, families who have cabins at *Pigniq* move out from town and camp there all summer, commuting into Barrow for work. Some families just spend weekends at their *Pigniq* cabins. By the end of July, eiders begin their post-breeding, southwesterly migration. Flocks ranging in size from 50 to 200 birds fly over Point Barrow at fairly regular intervals making easy targets for Barrow hunters. (Braund 1993a:56-57).

In describing eider harvests at Barrow over a three year period (1987-89) Braund notes that "the peak eider harvests usually occurred in May (associated with whaling), when 26 percent of the harvest typically is taken, and again in August when 37 percent of the harvest occurred" (Braund 1993a:188). Poor ice conditions hampered whaling activity in the spring of the third year, "giving whaling crew members more time to hunt eiders while out on the ice" (Braund 1993a:189), resulting in an eider harvest almost double the previous year. Good summer weather also contributed to greater harvest activity and higher harvests in the third year.

Wainwright marine mammal and bird hunters may travel as far as Barrow to the northeast and Cape Sabine to the southwest, but concentrate their harvests in the offshore areas between Point Franklin and Icy Cape (Luton 1985). Eiders are hunted from blinds along the coast and by boat along the ocean shore and on waterways a few miles inland.

They (eiders) are hunted intensely during the spring and sporadically during the summer and fall. Eider duck hunting often begins immediately after the end of whaling. For a short time, it may involve a whaling crew or part of a whaling crew. (Luton 1985:365)

Luton (1985) noted that eider hunting by Wainwright hunters at whale camp "has always been a supplemental activity, one inversely related to levels of whaling":

Not only might noise from the shotguns scare off the much larger prey, the camps must be located to the best advantage for whaling. Location is tied to the shape of the ice lead on its shorefast side: best locations are in "bays" formed by irregularities in the ice edge...

On the other hand, eider ducks usually stay way out in the lead, often closer to the pack ice side. Generally, they come close to the shorefast side only when they pass the irregular ice points which form the bays. Thus, eiders tend to remain well out of shotgun range of the whalers. Johnson notes of Barrow whalers, "To get within range, the hunters had to position their boats in the lead; and they would not do this when whales were in the vicinity" (Johnson, 1971:13). The same problem exists for Wainwright whalers. (Luton 1985:365)

After the whale quota has been met, eider hunting at Wainwright shifts to smaller groups of hunters, using boats in the ice leads. In these circumstances no blinds are used, and birds are lured into shooting range with bird calls. In the case of land-based eider hunting at Wainwright:

Eiders are taken by men hunting singly or in small groups.... Bird calls are used. Men often sit behind driftwood or snow blinds or behind their snow machines and three-wheelers... Because it is close to town and easily accessible, one popular shooting spot is near the mouth of the Kuk. To the north of Wainwright, areas around Atanik and Peard Bay are considered especially good... The start of the evening's hunting was generally tied to job schedules and the need to eat dinner before such a long hunt (rather than to periods of greatest bird movement). (Luton 1985:367-368)

The harvesting of birds is an activity in which many households, and people of all ages are involved. In the two years covered by Braund's study in Wainwright (1988-89), an average of 56 percent of the households participated in successful bird harvests each year (Braund 1993b). For eider, an average of 40 percent of the households participated in successful harvests. Braund describes the eider hunting in the context of the seasonal round of harvest activities at Wainwright in the period 1988-89:

The spring migration of eiders and geese increases in May, and consequently the harvests of these birds also increases... Two kinds of bird harvests occur in the spring months (generally April through June). Harvests of eiders and brants take place on the coast, usually associated with whaling activity. (Braund 1993b:34)

At Wainwright the eider harvest in the two years covered by Braund's study (1988 and 1989) took place primarily in May and June (eider harvests in those months represented almost 85 percent of the year's eider harvest) with harvests continuing into July at much lower levels. Ice and snow conditions in May can affect travel conditions for waterfowl hunting. Eider harvest levels in the two years covered by Braund's study showed substantial variation. Poor whaling conditions were associated with the higher harvest levels of eiders in the second year (Braund 1993b:171). The Wainwright harvest of eiders in the second year of Braund's study was fairly evenly distributed across a three-month period (May-July), with the majority of the July harvest occurring in the first two weeks of the month in association with intensive walrus hunting; when the ice left and marine mammal hunting virtually ceased, eider hunting also stopped (Braund 1993b:175). Another feature of the eider harvest at Wainwright during the second year of the Braund study, was that it occurred much further from shore, as the ocean lead during whaling was farther offshore the second year. Additionally, hunters went farther offshore to harvest walrus, and during these trips they also harvested eiders (Braund 1993b:175).

The reported harvests of eiders at Barrow and Wainwright show differences in species composition. While king eiders were harvested in highest numbers by both

communities, at Barrow the common eider provided the next largest harvest, followed by small numbers of Steller's and spectacled eider. At Wainwright, the second-ranked eider species was spectacled eider, followed by smaller numbers of common and Steller's eiders (Braund 1993a:173; 1993b:154). The species composition at Wainwright resembles that of Kivalina to the south, described in the next section. Johnson (1971) reported that the king and common eider accounted for the overwhelming majority of eiders harvested by Barrow duck hunters between mid-July and early September in 1971. Only four Steller's and five spectacled eider were observed in hunters' harvest, compared to some 2,080 king eider and 102 common eider for the same 7 week period. A similar distribution of the eider harvest among the four species characterizes the findings for Barrow in the late 1980s.

At Wainwright, ducks and geese are hung or left on the ground several days to age before they are stored, whole, unplucked and ungutted, in ice cellars or electric freezers (Luton 1985). Eiders are prepared for cooking by plucking (which preserves the fat), or skinning. Duck soup is a favorite dish in Wainwright:

The meat is boiled in salted water to make a rich broth. Flour is usually used as a thickener; rice is often added as well. Less commonly, noodles are included with or without the rice. Usually onions are added, fresh when available but otherwise dehydrated. A product called "Soup Starter," made from salt, dehydrated vegetables, and species, is also fairly popular. (Luton 1985:372)

Early in the season, many eiders can be taken in a single day. Forty is not an uncommon amount; in 1981 one whaling crew took sixty in a few hours. In boat hunting, the birds are divided equally among the crew members. On land, men take what they shoot. Eiders may be the most preferred of all game birds in Wainwright. For this reason, few are stored. They are consumed immediately or gifted, usually to close relatives. (Luton 1985:368)

Northwest Arctic Coast and Inland -- Eider

Relatively modest numbers of eiders are harvested by coastal communities in the Northwest Arctic area. The Northwest Arctic Coast area had an estimated yearly harvest of about 505 eiders of all species during the early 1990s. The estimated harvest by species was as follows: king eider (157 birds), common eider (255 birds), spectacled eider (92 birds), and no Steller's eider. Significant per capita eider harvests have been documented at Kivalina in 1992 (0.94 eiders per capita), while no eider ducks were reported harvested at Kiana, Selawik, Shungnak, and Noatak in 1994.

Kivalina hunters reported the largest eider harvests in the region, about 322 birds in 1992. The three eider duck species (king, common, and spectacled) contributed the largest portion of the community's waterfowl harvest by weight. The estimated harvest included 143 king eider, 95 common eider, and 84 spectacled eider. Forty one percent of Kivalina households harvested eider ducks, while 46.8 percent of households used eider ducks.

Eider hunting patterns were described at Kivalina for 1982-84:

Ducks and geese begin to arrive in Northwest Alaska in late April or early May, usually remaining some distance offshore where there are open leads and cracks in the sea ice.

Gradually their numbers grow and, as the ice breaks up, they come closer to the beach. After the ice has broken, but while it is still around, many species fly right along the beach, often only a few feet above it. (Burch, 1985:96)

Ducks and geese are sought by Kivalina hunters primarily just before and during the breakup process. Before breakup the birds are shot out on the ice by men taking a break from seal hunting. After breakup some are shot by seal hunters, but most are killed by hunters stationed at several locations along the beach known to be right on the birds' customary flightpath. The same stations have been used for centuries. This is the main duck and goose hunting season. Finally a few birds are shot during the summer, mostly as targets of opportunity by men or boys who are traveling up the rivers for some other reason, such as caribou hunting or berry picking. (Burch 1985:97)

Weekly harvest logs maintained at Kivalina in 1984 chronicle eider hunting in early May, along with brant, Canada, and snow geese, in associated with lulls in seal hunting (Burch 1985:324-325).

Eider ducks are relatively late arrivals in the Deering area, according to local respondents in 1994. They arrive with some of the other "open water birds" such as mergansers, harlequins, and oldsquaws in very late May or early June. All four species of eider are seen in the vicinity of the community, but only the common eider are seen in any numbers. In 1994, Derring hunters harvested 42 common eiders and 1 spectacled eider; the per capita eider harvest was .29 eiders per person.

Residents of communities located away from the migration route and shoreline habitat of eider do not see them, except accidentally. Selawik respondents observed:

We hardly ever see eiders here, they are a coastal bird and stay right along the shore. I shot a common eider once a long time ago and didn't even know what it was. (*Selawik*)

An eider will "accidentally" fly by once in a while. I think they are found more on the coast. (*Selawik*)

Hunters at Kotzebue reported low numbers of harvested eiders in 1991 -- about 32 eiders -- compared with other duck species (1,747 mallards and 1,489 pintails). None of the eider species are available to the inland communities of the Northwest Arctic area. Eiders do not venture far inland during their migration. No eiders were reported harvested at Shungnak, Kiana, and Noatak in 1994.

St. Lawrence Island -- Eider

A total of 412 eiders were reported taken by hunters at Gambell and Savoonga on St. Lawrence Island in 1993, based on a U.S. Fish and Wildlife survey (Wentworth 1994b). Most eiders were taken at Gambell (363 eiders, or .65 birds per person). Common eider were the principal species harvested, representing 71.4 percent (294 birds) of all eiders taken on St. Lawrence Island. Hunters also reported a harvest of 67 king eider, 42 Steller's eider, and 9 spectacled eider. After Barrow and Akutan, Gambell ranked third among Alaska communities in the harvest of Steller's eider. General duck and geese hunting patterns at St. Lawrence Island are described in the previous section on brant.

Seward Peninsula -- Eider

Relatively modest annual harvests of eiders are estimated to occur in the Seward Peninsula area -- about 411 birds in the early 1990s. Of these, it is estimated that 210 were king eider (51.1 percent), 190 were common eider (46.2 percent), and 11 were spectacled eider (2.7 percent). However, in the Seward Peninsula area, information on the species composition of the eider harvest has only been collected at Wales in 1994, so the species breakdown of the harvest is based on limited information. Significant per capita eider harvests have been documented at Wales (1.01 eiders per person) and Brevig Mission (.45 birds per person).

Norton Sound -- Eider

Eider do not figure prominently in the bird harvests of the eight communities of the Norton Sound area. The estimated eider harvest for the Norton Sound area was about 299 eiders in the early 1990s -- 28 king eider, 268 common eider, 3 spectacled eider, and no Steller's eider. Significant per capita eider harvests were reported by hunters of Stebbins (.33 eiders per person) along southern Norton Sound, while in surveyed communities of northern Norton Sound, per capita eider harvests were considerably lower -- Elim (.04 birds per person), Shaktoolik (.03 birds), and Golovin (0.00 birds).

Respondents at Elim report the following about common eider in their area:

We call the eider *amauligaaluk*. We see them in springtime, usually in pairs -- male and female. We hardly see any singles. We see them in the bay, six or so together. Some stay all winter. We see them in big flocks, maybe 20 or so, in the January thaws, even in December when there's open water along the shore ice. We see them when we hunt seal, along the shore ice. They are mostly brown. We hardly ever see them in their other colors. We see the common eider in spring plumage where they nest along the creeks and the flats of the Kwik River and around Moses Point. (*Elim*)

Common eider nesting in the area feed on *amozak* (a black clam with white spots resembling a razor clam) and barnacles.

When the ducklings hatch, the mother brings them down to Cape Darby to get clams. They disappear after the young ones can fly around the last part of July. (*Elim*)

Another resident believed common eider were increasing in numbers compared to several years ago. He had heard that long ago they were a major food resource. Local hunters perception is that current harvest levels are not as high as in the past. Their numbers have been down for a while but they now appear to be "coming back". He sees them up above their camp at Caches (near Moses Point). According to a local hunter, there are no Steller's or spectacled eider in this area, and king eider go through Norton Sound in March headed north but they are way out on the ocean, not along the coast. Another respondent noted that king eiders go through the Nome vicinity. King eiders are reported to pass through Elim in flocks of 20 to 40, in April. According to one Elim resident, there used to be more king eider about 25 years ago, and "there are not many out there these years."

A few Elim people consider common eiders especially tasty, and report that they used to be eaten more commonly, but they are not a preferred duck for most in the community these days:

I try to get 5 or 6 common eider each spring just for a taste. I have a special way of preparing them. I bone out the meat and grind it up in a meat grinder with chopped onion and then make patties out of this mixture. Eider are very hard to pluck. Their numbers appear to be stable, not too many but not declining. *(Elim)*

Some Elim households also gather common eider eggs. Common eiders were described as "late layers", waiting until early June to lay their eggs.

If you find a nest with just 3 or 4 eider eggs it is a pretty new nest and the eggs are probably fresh. We'll take those eggs. If you find a nest with 6 or 8 eggs it's an old nest and the eggs are probably too far along. If you take those they may not be good and the birds might not lay more so we leave those alone. *(Elim)*

At White Mountain, the following was reported about eiders:

We see a few common eider here in the spring but people don't shoot them. They fly very low off the water (2 or 3 feet) in small flocks of 2 to 12 birds. We only see them in the spring so I don't think they have their nests around here. *(White Mountain)*

Eiders are around here but nobody bothers them. Growing up in Koyuk, my mother would always ask me to try and get her one male eider each spring and I would. She would boil it up and eat it with seal oil. They are not around here in the fall time, they leave early. I have seen them as late as mid August but not after that. *(White Mountain)*

At Shaktoolik, further south along Norton Sound, common eider are reported to be numerous. They arrive in the latter part of April, coming a few days after the snow geese. Those migrating on rest around Shaktoolik for a week or so, feeding on smolt, small flat fish, and plankton.

Those which are staging here stay just a week or so, then fly on. You see them around Solomon, and west of Cape Darby and Rocky Point. When the ice thaws and there is more open water, they move on. They head straight out to coastal waters. *(Shaktoolik)*

I think the common eider are numerous in this area, especially in the springtime. We can see flocks of them going in the evening, flying toward the flats from the sea. *(Shaktoolik)*

Now, today, we only got this kind -- common eider. We call them *ayut* or *metraq*. Last two seasons they seem to be increasing. When I first started to hunt there used to be lots of them and we hunted them quite a bit. When all the other birds start to get real skinny, that's when we used to hunt them. Usually they don't stay long, they just go through. Seems like they eat clams, and maybe shrimp. They go out in the ocean and dive down for food. They have a gizzard and it is full of sand and rocks. *(Shaktoolik)*

Some common eider are reported to nest in the area. Nesting may start by June or when there is no snow and the ground has thawed. The common eider which nest and rear their brood in the vicinity of Shaktoolik depart "right after salmonberry season":

I don't see them fly away. They swim out with their young ones; right after salmonberry season they all disappear. They always go out every time when the young ones hatch, it

seems like, they always disappear, they always go out some place. Probably they molt out there. After the young ones hatch only, you could see them. Up around Teller they sure hunt them up there, flocks of them. (*Shaktoolik*)

A Shaktoolik resident noted that people on Saint Lawrence Island see common eiders in summer. He thought they fly from Shaktoolik with their young to Saint Lawrence Island for molting. While they appear to be increasing in numbers, very few people hunt common eider in Shaktoolik. Fall, from the first to the middle of September, is thought to be the best time to hunt them.

Steller's eider, king eiders, and spectacled eiders have been observed in the Shaktoolik area. Only a few Steller's eiders are seen. King eider are observed in the spring on their migration north. They come in flocks of 10 to 40 usually, sometimes even 100-200. They are in the area for several weeks, but are not considered common in the Shaktoolik area:

But the other eiders, like the king eiders, I rarely ever see any in this area. Seems like they are more toward the capes and on the western coast of Alaska. We saw those king eiders when I was a kid at Nunivak Island, but when we came here they told us that the eiders that we were getting in the spring here -- the common eiders -- were the only eiders we see here. Since 1956 I must have seen just one flock of those king eider. (*Shaktoolik*)

A decline in the spectacled eider population was observed by one respondent in Shaktoolik:

When I was a teen I used to get lots of these spectacled eider between mouth of Sineak Creek and Malikfik, on the sand bars of the Malikfik Bay. There used to be hundreds of them, big flocks sitting around on the sand bar, but they didn't hang around, they just go through here. This kind (spectacled), long ago, some used to lay eggs in the flats. We call them *igvaluk*, "one with glasses". They don't come through here at all now. They disappeared. We only used to see them in the spring. We didn't see them in the fall. (*Shaktoolik*)

On the south shore of Norton Sound, common eider are abundant in the Stebbins area, arriving in the latter part of April or early May. Common eider are the earliest birds to arrive and the latest to leave, and were referred to as "pretty sturdy birds", following the ice edge. Some nest in the area and some migrate further north.

They'll be out there, out in the open water, out at the edge of the ice. They'll probably be the first to come in. We see them when we're out seal hunting, right about that time, seal hunting. We spot them out there. That's the best time to hunt them. (*Stebbins*)

The common eider come in the spring time, probably in May. Some nest around here. They nest out in the flats and down on the island, Stuart Island. But I think the majority of them probably nest somewhere else. But a few of them do nest in the flats and around Stuart Island. (*Stebbins*)

In the spring, when they're passing through, we probably only see them for a week and a half, or so, and then most of them are gone. I would think they head down south again. I think most of them head down south again. Because even when you go up north toward Unalakleet or Golovin, I don't see very many of them up that way. I think the majority of them go back further south, to nest somewhere down there somewhere. When they arrive, they're coming from the south usually. Well, they hit from all directions I guess,

when they get here, but they don't stay here long, but I always think they head back down further south to lay their eggs. *(Stebbins)*

They're probably eating small needlefish, small smelts, snails. In the spring, they're out on the tundra. But a lot of them, they like to hang around the island, Stuart Island. I think that's where most of their feed is at, anyway. Out on the island. I don't know, I know they probably live off small fish. *(Stebbins)*

They're eating snails. I know that for a fact. When below the mean high tide, right on them rocks, they got these small snails. So I've been told by my Dad, that's what they eat, snails. They probably eat some plants too, like grass roots, and insects. I know they might even eat small fish too, sardines (needlefish). They're diving birds. They're sea birds. They dive. They do live out in the open, on the coast. Right on the island, up along the coast. I think their (nesting) territory is along the coast from St. Michael across to Stuart Island, the whole area -- mostly in rocky areas. Just about all of Stuart Island, and up and down the coast. Around the shore line, around St. Michael, and in the lakes. *(Stebbins)*

I think they're one of the last birds to leave in the fall. I think some of them start leaving in September and then depending on the ice out there you can still see a few of them in late September. *(Stebbins)*

Another respondent thought they might stay around Stuart Island until just before freeze-up, the latter part of October, and recounted seeing a flock of females pass over a neighbors house just a couple of weeks earlier, when the temperature was pretty low already.

Respondents reported that the common eider were increasing in the Stebbin's area. One observed that he sees more and more of them in July and August around Stuart Island.

King and spectacled eiders also are reported around Stebbins, but not Steller's eider.

I've never seen Steller's around here. Spectacled eider, yes, but not very many of them. They are fewer than the common eider, that's for sure. And I've never seen them increase or anything. We just see a few flocks here and there, and that's about it, and I don't even see them nest around here, only the common eider. Not very many spectacled eider in the flocks we see, maybe seven, eight. Small flocks. *(Stebbins)*

As far as I can remember there was never an abundance of spectacled eider around here; just a few flocks here and there. They seem to be about that level you can still see them around, but there has never been an abundance of spectacled eider. I have no idea why this is. *(Stebbins)*

People at Stebbins hunt common eider in the spring when they first arrive and in the fall, which was the higher of the two seasons in 1994. Common eider are said to be fatter when they first arrive.

Boats are used mostly in hunting the eider ducks. And if we do get any eiders, it's usually for my mother-in-law. She's elderly, and that's one of her favorite birds. Hunting happens when I'm doing something else, like when hauling wood in summer, and they're around, I get one or two. I use a 20 or 16 gauge shotgun. *(Stebbins)*

We stop hunting them after they start to nest. Right about that time. They probably start nesting last part of May, first part of June, I think. I just leave them alone in the summer. People used to get them in the summer. *(Stebbins)*

Well, as far as the old people here, they like it, you know, they skin the eider, and then scrape the fat off the skin. That's what they used to do. Yeah, they like the fat, and scrape it off the hide and eat it. But now days, our elders are dying out, and hardly any of the young generation do that, you know, eat the eider fat like the elders used to. *(Stebbins)*

They used to use it for parkies too. The skin, the hide with the fur (feathers) on it; they'd dry it out and used to use it for parkies. *(Stebbins)*

Well, let's see, like in the old days, she didn't pluck them, she skinned them. And they like to eat it medium rare, boiled medium rare. It's OK. It's all right. A stew, but medium rare! Maybe because they're ocean birds, and they have that fishy taste to them, maybe that's why they like them medium rare. *(Stebbins)*

Many years ago they used to do a lot of salting in barrels before freezers came along. They used to save a lot of down in those days, make pillows out of them. They even used to make parkas; they just pluck off the main feathers, and keep the down attached to the skin. They used swan, snow goose, and the eider. Those three I think. And then the loon too, they also used to use the loon to make parkas. *(Stebbins)*

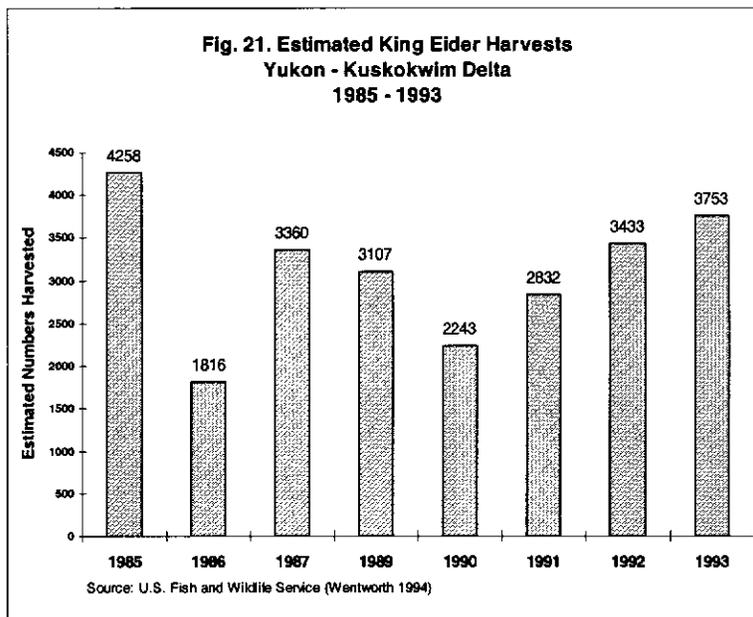
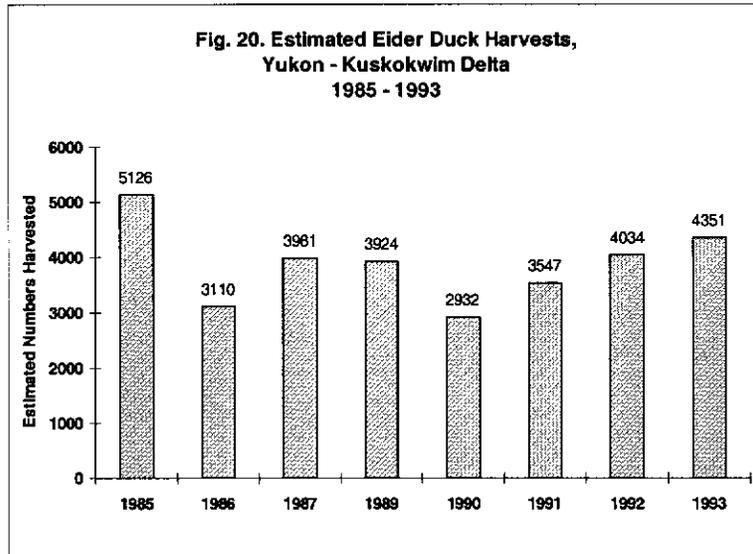
Eggs of common eider were reported to be gathered and used by Stebbins residents in 1994.

We cook them and eat them. We like all of them. We used to eat all of them we find. On the islands. The eider eggs are found in little nests in islands, and in the flats. *(Stebbins)*

I've seen the nests. I'd like to see them increase more, so I don't pick eggs. I discourage my family from picking eggs, too. They have been getting more numerous in the past five years. They would begin nesting beginning in May, begin seeing them again in June and July. They probably molt right around the island here. *(Stebbins)*

Yukon-Kuskokwim Delta -- Eider

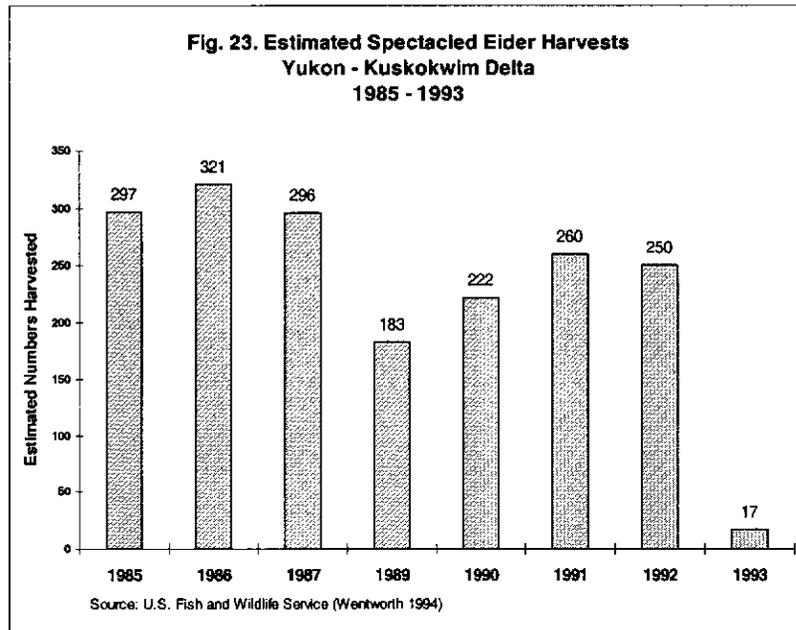
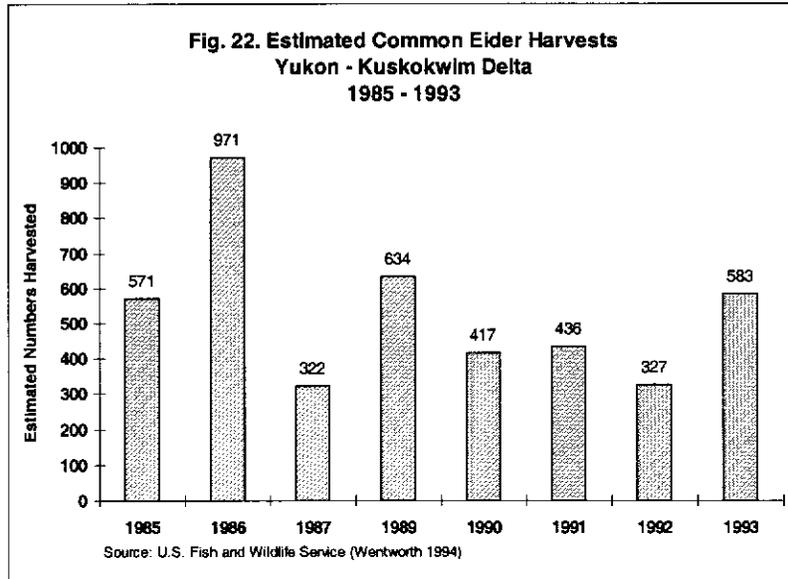
After the North Slope area, the Yukon-Kuskokwim Delta area is estimated to have the largest annual harvest of eiders, about 3,977 eiders of all species based on a three-year average harvest (1991-93) -- 3,338 king eider, 448 common eider, 176 spectacled eider, and 15 Steller's eider (Wentworth 1994a). Total eider harvests have ranged between 2,932 to 5,126 birds from 1985 to 1993 on the Yukon-Kuskokwim Delta. Harvest ranges for the same period by species were as follows: king eiders (1,816 to 4,258 birds), common eiders (322 to 971 birds), spectacled eiders (28 to 493 birds), and Steller's eider (0 to 24 birds, for 1991-93; prior to 1991, surveys did not ask about Steller's eider harvests). No obvious trends in harvests by species are evident from 1985-93 (Figs. 20-23).



Significant per capita eider harvests have been documented for the south coast area (1.58 eiders per person in 1993) and mid coast area (.30 eiders per person), while the per capita harvests are considerably less for the Kuskokwim (.08 eiders) and Bethel (.04 eiders) areas. No eiders were reported taken in north coast or lower Yukon communities in 1993. Almost all the eider harvest occurred in spring (4,045 birds, or 92.7 percent) on the delta.

Eider were reported to winter along the ice edge in the Kwigillingok vicinity:

As eider winter along the leading edge of the pack ice, they usually can be found near the shorefast ice around Kwigillingok by January or February, depending on the ice conditions of any given year. In a normal year the edge of the shorefast ice may be five to seven miles or more out from land. (Stickney, 1984:91)



King eider tend to move into the area in force when the ice starts receding during break up of the ocean ice. There is occasional harvest of eiders that takes place during the late winter months. However the intensity of hunting activity picks up during break-up about late April when seal hunters encounter large flocks of eiders as they search the edge of the shorefast ice and floating ice for seals. As break-up progresses and the ice recedes, eiders intensify their migration northward and are replaced by summer migrant waterfowl. (Stickney, 1984:91).

North and South Bristol Bay -- Eider

Eider are seasonally abundant in parts of the Bristol Bay area; however, their use has not been well documented for the area. Surveys in Dillingham (1984) and Manokotak (1985) recorded harvests of "ducks", and did not break out harvests by

species. Key respondents assert that king eider are more frequently harvested than common eider in the Dillingham area. A survey at Aleknagik (1989) recorded 45 eiders harvested, of which 9 were king eider and 36 were common eider. No harvest surveys have been conducted at Togiak or Twin Hills, where eider was reported to be a preferred species (Wolfe et al 1984:332).

The estimated annual eider harvest for the 1990s in northern Bristol Bay is particularly suspect because of these incomplete data sets -- about 835 eider, of which 641 are assumed to be king eider and 194 assumed to be common eider (with no spectacled or Steller's eider). This is based on very loose assumptions for the duck harvests reported at Dillingham and Manokotak -- that 15 percent of the ducks were eiders, and of the eider harvest, 80 percent were king eiders and 20 percent were common eiders. Additional research needs to be done in the north Bristol Bay area to reassess these estimates.

Very few eider ducks were reported harvested by hunters from communities in the southern parts of Bristol Bay. Only 4 eider were taken at Pilot Point in 1984 and 20 eider at Port Heiden in 1987 (the species were not ascertained by the surveys). No eiders were reported on harvest surveys at Egegik (1984), Ugashik (1987), and South Naknek (1992).

East Aleutian Islands -- Eider

A yearly harvest of about 304 eider is estimated for the East Aleutian Island area during the 1990s. In the East Aleutians, significant eider harvests have been documented only for hunters at Akutan (about 236 birds, or 2.32 eiders per person in 1990). This harvest was about equally split between king, common, and Steller's eiders. The estimated take of 70 Steller's eider at Akutan was the largest recorded in the state, except for the estimated harvest at Barrow (which was based on several uncertain assumptions discussed previously). Residents of King Cove and Sand Point also have reported harvests of eider, although the species have not been ascertained. The eggs of king and Steller's eider were reportedly used at Akutan; egg gathering takes place in spring over a large area, including the cliffs along the shores of Akutan and Akun islands as well as islands in Akun Pass, Avatanak Strait, and Ugamak Strait (Braund 1986b:4-98).

West Aleutian-Pribilof Islands -- Eider

The yearly estimated harvest of eiders in the West Aleutian and Pribilof islands was about 499 birds in the early 1990s -- 346 king eiders, 113 common eiders, 40 Steller's eiders, and no spectacled eiders. Significant per capita eider harvests were reported at St. George (.66 eiders per person), St. Paul (.53 eiders), Atka (.48 eiders), and Nikolski (.41 eiders). The per capita harvest by the Alaska Native segment of Unalaska was .42 eiders per person in 1994. No eiders were reported taken by non-Native households surveyed in Unalaska.

At Unalaska, common eider were most commonly harvested, followed by king eider and Steller's eider. King eiders were harder to find because they ranged farther offshore, while Steller's eiders were not present in large numbers.

Common eiders are here all year. In winter they are a little more offshore, but still not out of range for a skiff. *(Unalaska)*

In the summer months, we get common eiders and surf scoters. We get them from the skiff in the bay, or if we wait for them and are on shore, then we keep the skiff ready so we can retrieve them. *(Unalaska)*

I only hunt for common eider (of the eider). I'm not used to eating the others. They taste different. I was raised with common eider [at Atka]. We don't get the other three -- king, Steller's, and spectacled down by Atka. I think the common eiders are going down a little in numbers. Last time when hunting them, I had a hard time finding (any). In Atka, I go to Amelia Island to hunt. (In Unalaska) I see them in Beaver Inlet, and Constantine Bay on northeast side of Unalaska Bay, and Makushin Bay. Any time of year you can find them out there. We hunt year round except when (they're) changing feathers. You can tell when the birds are changing -- the colors are a bit duller and may have streaks of black in the white areas. I hunt eiders in the spring mostly. In spring, I travel around a lot so run into them more. I mostly got male common eiders this past year. *(Unalaska)*

I saw a king eider this year right in the harbor by the APL dock (in Iliuliuk Bay). It was blowing northeast. We usually see them after a storm. King eiders are hard to find. They stay way offshore. If a bad storm, we'll then find some near land. *(Unalaska)*

The eggs of both common and king eider are sometimes gathered. The egg white of eider eggs is harder than that of sea gull eggs. Common eider eggs may be found while hunting for gull eggs. An Unalaska respondent noted that they were mixed up with the gull eggs. It was reported that many of the elders at Unalaska eat eider eggs.

At Atka, common eiders are known to nest on Amelia Island, where there are no foxes or rats. They are reported to nest on some of the islands of the Atka area. They winter in the area, but their numbers have reportedly declined in recent years.

You see them in some large flocks wintering out here. I haven't seen any lately, but they do nest here. I don't know if they are as high (in numbers) as they used to be. It seems like there aren't as many as there used to be any more. There are a couple of areas where we would see their nests. Nowadays we go out to those areas, on Amelia Island, where we used to pick a lot of eider eggs, years ago, and you don't see a lot of birds nesting there anymore. Maybe four years ago or so, and we found only one bird nesting there. That's the only place I've noticed where their numbers have gone down drastically. *(Atka)*

There are a few (common) eider nesting areas on Askunaq Island and on Chagula Island. There are some eiders nesting on the islands right out in front of Atka, and some on a few other islands around the area. I'm sure rats would destroy the nests, but there are not rats on those islands. We've never seen foxes on those islands. *(Atka)*

A lot of (the eiders) have the small tiny urchins or sea snails, sand fleas (in their stomachs). They eat those crustaceans, little tiny crabs. Sea urchins too. They are probably competing with the sea otters. Ever since the sea otters started exploding around here, I think they're competing directly with the eiders. They are on the same food chain, that's why I think the sea otters are winning the battle getting more food than the

eiders. Unless there is somewhere else they can get better access to food. I doubt that the eider can dive as deep as the sea otter can. (*Atka*)

At Atka, common eiders are subject to predation by sea otters, eagles and foxes:

Sea otters come into their nesting area. I couldn't believe it until I saw them going up to get their eggs. Common eider, ones that nest here. I see eagles catch their young ones as they are swimming around. (*Atka*)

In the competition for food there is a lot of pressure from eagles. A large, large number of eagles. I seriously doubt that the gathering of eggs has caused a problem. There hasn't been any serious gathering of eggs in the past four to six years. Most of the people are busy commercial fishing. We fish commercial halibut during that time when the gathering should be occurring. Very few people pick eider eggs any more. But we still see the decline. The birds just aren't as many as they used to be. (*Atka*)

There used to be a major nesting area on one of the islands, but it has foxes on it. (Foxes) can swim there (from Atka), it is real close. Just recently they (went) across -- about two to three years ago. When I went on that island looking for eggs, I thought there was something behind me. I turned around and there was an arctic blue fox. That island used to be an eider and gull nesting area. (*Atka*)

Respondents at Atka report that king eiders used to be around in winter, but their numbers have declined in the last eight years.

The king eider used to hang around the passes in the winter time. We had some out in the bay right here in Old Harbor. That was about 20 years ago (in my early 30s). They used to be in great abundance until about eight years ago. I noticed the change then. In the winter time I used to see large flocks of them out there. We would go out hunting and see hundreds of birds. Now we hardly see them anymore. We used to hunt them constantly out here.

Veltre and Veltre (1983) described common eiders as "likely the single most frequently hunted bird" at Atka in the early 1980s:

Unlike most other ducks, common eiders are hunted more frequently in summer than in winter. This is probably due in part to the fact that they are one of the few ducks on the island in the summer. They are also relatively easy to hunt. On Round Island, and other islands (Bolshoi, Vasilief, Amtagis, Sadatanak, and in the area of Hungry Bay on Amelia Island and along the north tip of Amelia Island), these birds are caught without the use of guns. Hunters can often sneak up in the tall grasses where the eiders nest and grab the birds before they have a chance to take off. Most of the time, however, eiders are killed with shotguns. (Veltre and Veltre, 1983, p. 137-139)

Hunting for most birds is done with 12- and 16-gauge shotguns, although before the war 20-gauge shotguns were more popular... Much bird hunting is done either from boats or from the coast of Atka and Amelia Islands... Like most hunting on Atka, bird hunting is almost exclusively done by men. Also, like the products of most hunting, birds are shared within the community. (Veltre and Veltre, 1983, pp. 136-37)

Females are preferred over males, since they have already plucked their own down for their nests (and hence, are easier for the hunter to clean). In the pre-war years, eider skin blankets were used with reindeer skins for camping bedrolls. (Veltre and Veltre, 1983, p. 139).

People at Atka have traditionally gathered seabird eggs. A number of traditional rules governed the harvest of eggs in the past and have been passed along to the contemporary residents of Atka, although the number of people gathering eggs has apparently declined in the last four to six years.

We took (eggs) from... mid to late June. You had to pick them just right otherwise they were too (far along in their development), otherwise they still got young in them... They have the chick in them at that time so we don't bother them at that time. So if you test a few eggs in a tide pool and they float, they aren't ready, and you put them back. We just don't bother at all. If they were good you would take the whole thing. If you catch them with three or four eggs you take them all. If you find them at the right time, then the birds would lay another nest, they would double clutch. And if there are two or three in the nest, that means they are pretty.... They usually have a maximum of four or five eggs, some of them have eight. Three to four is usually what they have. Where there is six to eight that means they are probably pretty well incubated, but if you catch them with three or four eggs they will double clutch anyway. (*Atka*)

King eiders are the most prevalent species of eider on Saint Paul Island. They are known simply as "eider ducks", or *saakan*. A few pairs of king eider are thought to winter there. They are seen around St. Paul Island in greater numbers from November through April, as the ice pack gets closer. King eiders are said to "like the cold". They are present in fairly large numbers and are commonly hunted. They do not nest locally, but according to one Saint Paul respondent, a few immature birds might stay on the island through the summer.

Some king eider will stay here all year, but very few are here in summer, maybe five, two, three, four of them. Some might nest here. I've never seen a nest. I've seen immature ones right down at the breakwater, the ones that stay during the summer, that don't migrate. They go north to nest. They just come here, the ice just brings them down. But mostly they start coming in November, end of October, early November. Young king eiders can be seen from the end of November. The females come first. Then later toward the middle or end of December I start seeing the males. The ones with the smaller nose, the immature ones, not yet fully mature, we see in March, April; the big enormous nose, the real mature ones will be coming in the end of February, March. We see the mature eiders beginning in March. We usually see them singly, but, it depends on the wind. Like when the ice is coming in, you'll see bigger flocks. There are flocks of from 20-30. The bigger flocks (50-60) don't come close to land. They're way out. I've never seen the king eider nesting on Saint Paul Island. As the ice retreats, they go back up north again. So by May they're gone. By May you don't see (hardly any) kings around Saint Paul. (*Saint Paul*)

According to local observers, king eiders seem to hang around the edge of the pack ice, and daily movements are influenced by the ice pack. Early in the morning they fly north to the ice edge where they feed in the ocean and use the ice edge to rest on. They dive down off the ice edge or through open leads to feed on small clams and snails. In the evenings they fly south to coastal areas to "bed down".

I've seen what they're eating. They're eating snails. King eiders eat small snails (smaller than the commercially targeted snails), and sea anemones, probably when they're out of snails. They don't have to dive down to get the snails. If I miss the early morning hunt, I go out and catch them while they're feeding near shore. That's the only thing I've seen them eat. They're really all snail eaters. In the winter when the ice comes in, when there's an opening in the ice, they'll just come right down. In the summer time I haven't

seen them eating, but I'm pretty sure that's all they'll eat. There's a lot of snails up here. Even the little Chinese heads... china caps. (Saint Paul)

The king eider stay along the edge of the ice. They probably want to stay close to their feeding ground; they feel more secure along the ice edge, which provides a place to land, a place to sleep. Even if the ice is here, you'll see them landing on the ice. We see them flying, going north in the morning to feed in the ocean near shore, and returning south in the evening to roost on land. They've got sleeping areas and feeding areas. (Saint Paul)

In general, flocks of king eider around St. Paul are reported to be segregated, with large flocks of females and young birds flying together and smaller flocks of males flying together. King eiders reportedly have declined since the mid 1980s. They used to arrive in huge flocks but their numbers seem less now.

Common eiders are also seen around St. Paul occasionally, probably just passing through. The Aleut name for the male common eider, *kasiimax*, implies a slightly higher rank than king eider because they are bigger and better eating. Male common eider are difficult to get and somewhat prized. The Aleut name reflects their rarity. They have lots of white meat and are much bigger than king eiders. They are generally found farther out on the ocean farther from shore.

I have seen a common eider only occasionally. They're just passing through here. One year when I was going after mallards, I found one in the lakes, a female. I couldn't believe it. I assume she was nesting, but I didn't see the little ducklings. Certain times of the year, last year around March, we were starting to hunt murrelets and I noticed them. The majority of the concentration is Southwest Point. When I went over in the boat I would get them from there. Southwest, Ridgewall, and around Zapadni Bay. I think that's their main feeding areas. (Saint Paul)

Local observers from Saint George Island report seeing fewer common eider now than in the past:

I used to go for *kasiimax* (the bigger ones -- the common eider) when I was young. We would start hunting them in November. They come in from the south side of the island first, then they would come around the village. That was a great food for us, but now where are they? They disappeared.

A few Steller's eider are seen around St. Paul -- mostly females, very few males. They begin to show up around Saint Paul in October:

The Aleut name for Steller's is *kachitaax*. They're not much bigger than a duck, a harlequin or oldsquaw. We see Steller's eider beginning in October, in the salt lagoons north side of the island -- Maroonik. They're dumb ducks. They bunch up. They flock together in the water and when they're flying. They make a formation like a raft. So when I was hunting them, they're so close that if I shot, I probably get six with one shot they're so close. We get fewer Steller's eider than king eider. We only started seeing Steller's eider in the 80s. When they first come in the fall they are in the lagoons, then they go out to the ocean where there are shellfish and clams. (Saint Paul)

There may be less of the Steller's, a little drop in them. We never used to see them. Back in the eighties seemed like they just appeared here. We never had them. In the 70s I never hunted, so I probably don't know about them. In the 60s and 70s we didn't care (to hunt them). Finally I got some and tasted them. Now, every October I'll try to get some. But I've noticed them only in certain parts of the island. In the lagoon here,

they're here first in the lagoon. Then all of a sudden they disappear, they go out to the open ocean. But I know a lot of them feed out at Herb Point and Marulik. I think where there are shellfish, where the clams are. The lagoon has it too. *(Saint Paul)*

I think they're eating shellfish. If they go into the lagoon, it's the same. Marulik has sands, so they would feed there. Herb Point has clams. And Northeast Point. *(Saint Paul)*

Spectacled eider are hardly ever seen on the Pribilof Islands.

I look at it and give it my own name -- *saak-much-kay*. That means "spectacled". I've seen very, very few. Haven't seen those in many, many years. In my lifetime, I've probably seen only two. They fly in a flock (with other eider) They're smaller too. The first time I got one, they were flying with the eider (kings?) flock. I have only got two spectacled eider. They were males. *(Saint Paul)*

At Saint Paul, king eider hunters look for correct wind conditions and hunting sites where the birds will be flying low. These are special places where the land forms a narrow point between two bodies of water, since king eider generally fly low over water, but will fly high over land.

We hunt them in the morning and evening when they're moving around. We used to use boats to hunt the eider, and with boats you don't care which direction the wind comes from, but now (when) we hunt them on land, we try to have the surf or the wind blowing toward shore, where it will blow them to us. We don't shoot off shore where we can't get them. So where there's a surf or wind, any part of a point on the island, where they'll fly close to it or over it, like Zolotoi Sands, or Gorbach. Over the water they fly real low, but when they reach land they'll pick up. Let's say, when they're going over the beach here, they're probably 100 feet up. So there are some places along the coast where the wind and surf conditions combine to keep them low over the land. *(Saint Paul)*

End of October, November I start shooting them (king eider) down. I mean they're not big flocks, just one or two, three will come out when I'm hunting. When they fly in flocks, it is possible to drop five at a time. There was times I got thirty in one day; that was probably two years ago. They are good eating from November through April when they have lots of fat on them. By gosh, they're enormous (the mature males). Good eating too. *(Saint Paul)*

Hunting for king eider in the winter requires considerable endurance:

When the main pack comes in, then I could hunt anywhere. I'd start from Point Gorbach and then over here at night. Very seldom at night they're not doing anything, but if the island is covered completely (with fog and ice) they will. They (the king eider) can't see (when it's blowing conditions). It's too... Oh, my face...! almost froze. Every once in a while, some years, we'll have just like an ice dock going out to Reef Point, and we'll walk across that ice, right over. *(Saint Paul)*

At Saint George, hunters use boats to harvest king eiders:

We use boats to hunt them. We see more king eiders as the ice pack get closer. If you shoot and kill some, we use a tool with hooks attached to a rope to retrieve them. Each hunter makes his own. The hooks are attached to a piece of wood connected to a line

which is them thrown out to snag the bird so it can be pulled from the water, before they sink. (*Saint George*)

At Saint Paul, birds are plucked for cooking, either oven-roasted, pot-roasted, or made into soup. Large birds such as geese or common eider are considered large enough to roast. Smaller birds may be pot-roasted or used in soup with vegetables and rice added. Bird gizzards, hearts, and livers are also cooked and eaten or used to make gravy or stuffing. The heads of king eiders are plucked and then boiled or roasted. The fatty "nose" of the king eider and brains are eaten. Bird wings are generally cut at the second joint and discarded, saving only the small upper-arm "drum stick" attached to the carcass.

Both male and female king eider are good to eat. Usually we go for the males. We like the males. I like the male eider because it has a big gizzard. We eat the heart, liver and brains. Some people even eat the heads. We don't skin them, we pluck them. The easy way to pluck eiders is to first dip them in very hot water. The only thing you'd probably throw away is the stomach, not the stomach but the intestines. We eat the rest. We make soup, roast. I used to love ... The thing about the big nose is all the fatty tissue right here, so when you boil it, you peel the skin off. It will take six eiders to feed my family one meal. (*Saint Paul*)

They (Steller's eider) are good eating. We eat the eiders as soup, oven roasts (like you'd cook a chicken or turkey) or pot roasts (on top of the stove). I put it with onions, butter, and burn the butter just a little bit, oh my gosh, burnt onion taste, my mouth is watering. We keep the skins on for soups. For soup the skins got to be on. The fat that's on there. We usually cut the wings off right at the joint and don't eat that part. It's not like a chicken wing. So right at the joint where it attached to the small end... you cut it to leave on the little drumstick. The head goes in the soup too. It's not only the brains, its the fat, the face and the jaw has meat. We do the same with common eider, scoters. (*Saint Paul*)

Kodiak Island Area -- Eider

In the Kodiak Island area, relatively small numbers of eider ducks were reported harvested by two communities -- Old Harbor (30 eiders in 1991) and Ouzinkie (22 eiders in 1992). No eiders were reported taken by surveyed households in other communities during recent survey years. Ouzinkie residents reported the most regular harvests of eiders (most likely king eiders) -- 41 (1989), 54 (1990), 48 (1991), 22 (1992), and 0 (1993). Surveyed households in other villages reported either no eider harvests or small, irregular harvests of eiders.

The principal eiders present on Kodiak Island are king eider and Steller's eider. Steller's eider were reported to be relatively abundant birds wintering in Kodiak waters in the early 1990s, while king eider populations were reported to be present but in decline. Spectacled and common eiders were rare, if seen at all on Kodiak Island.

According to local respondents interviewed by Mishler (1994), king eider populations were declining in the Port Lions area in the northeast part of Kodiak Island. King eider were found in the Whale Pass area. There used to be thousands of king eiders, but now there were only a couple hundred. It is believed that many king eiders

die each year by hitting the lights of crab boats at night. King eiders were sometimes hunted for subsistence use in the Port Lions area, according to respondents.

Local residents interviewed by Mishler (1994) reported that king eider numbers were decreasing in the Old Harbor area in the southwest part of Kodiak Island. There were fewer birds and smaller flocks. King eiders (*kayallik*, *kayarik*) were seen in the Sitkalidak Narrow, McDonald's Lagoon, and Newman's Bay. The king eiders arrived in December or early January. They mixed in with black scoters. Most of the king eiders seen were juveniles, with only one or two mature drakes.

King eiders were taken by some hunters at Old Harbor for subsistence use, however, they were not sought after because of their taste. Hunter preferences concerning sea ducks were solicited by Mishler (1993, 1994) at two Kodiak villages in 1994 -- Old Harbor and Port Lions. None of the eiders was rated highly, and some respondents said they were specifically avoided. One respondent said that king eiders had an iodine-like taste. The most important sea ducks traditionally hunted for subsistence uses were the black scoters (better known as whistlers, or *kugumyaq*) and the goldeneyes (both common and Barrow's).

At Old Harbor, one young hunter said no one hunted Steller's eider at present because of their bad taste, even though Steller's eiders were reported to be abundant in the Old Harbor area. They were easy to confuse with rock ducks (harlequins) from a distance. There were about 100 in McDonald's Lagoon, another 60 or so in the Sitkalidak Narrows, and some in Three Saints Bay, Port Otto, Kaiganak Bay, and Natalia Bay. According to respondents, in the 1930s and 1940s Steller's eiders were more plentiful in the Sitkalidak Straits. Elder respondents reported that they used to be heavily hunted there, suggesting that taste preferences for eiders may have changed over the last half century. Respondents reported that there were no common eiders or spectacled eiders around Old Harbor. One respondent reported seeing a few spectacled eiders north of Ugak Bay, and another said there used to be some spectacled eiders in McDonald's Lagoon before the 1964 earthquake and tidal wave.

Steller's eiders currently were not hunted for subsistence in the Port Lions area, according to local respondents. The old people called them "kelp ducks" and said they were not good to eat -- they would give a person diarrhea ("the runs"). Steller's eiders were reported to be very abundant in the Port Lions area, with growing populations. There were big flocks in front of the Old Afognak village. Some come right into the Port Lions boat harbor. By contrast, common eiders were reported to be rare in the Port Lions area. A few have been seen on occasion just off a rocky island at the end of the Kodiak City airport runway. According to respondents, spectacled eiders have never been seen in the Port Lions area.

In the Kodiak City area in eastern Kodiak Island, a fall-early winter sport hunt for eiders had developed prior to 1991, according to Smith (1991):

Over the past ten years Kodiak has had slowly growing non-resident interest in sea duck hunting. A flat-lander [non-resident] has been virtually guaranteed of adding the Steller's eider to his collection, with lesser chances at common and king eiders. At least two guides conducted sea duck hunts out of Kodiak City in 1990-91. Guides and transporters at remote locations have also begun taking more sea duck hunters in the last few years.

A group of French taxidermists have been hunting here annually for several years. There has also been increasing pursuit of sea ducks by local Kodiak city hunters.

Smith "guesstimated" that about 75-125 Steller's eiders were harvested by non-residents annually on Kodiak Island, with another 75-100 by Kodiak road system residents. However, random surveys of Kodiak City area households in 1991, 1992, and 1993 did not document many eiders harvested by Kodiak City residents -- expanded estimates of all eider harvests were 31 eiders (species unreported) in 1991, no eiders in 1992, and no eiders in 1993. By comparison, based on the same sample of surveyed households, expanded harvest estimates of goldeneye ducks were 946 (1991), 508 (1992), and 1,129 (1993), and expanded harvests for mallard were 1,042 (1991), 684 (1992), and 1,196 (1993). These comparisons suggest that eider harvests by residents are relatively uncommon in the Kodiak City area.

King eider also were highly prized by non-resident duck hunters in the Old Harbor area. One local duck hunting guide reported he imposed his own bag limit of one adult pair for each hunter in his group, even though state regulations allowed up to 15 a day, because he believed the king eiders were a limited local stock.

Other Areas -- Eider

Relatively small numbers of eider ducks have been reported harvested in the south Alaska Peninsula area. A yearly eider harvest is estimated at about 57 birds for the area. Surveys have not gathered information on the species of eiders harvested. Both king and common eider are reported in the area. The harvest breakdown into species (half common eiders and half king eiders) needs assesment with additional research.

Hunters from some of the surveyed communities of the Lake Iliamna-Nushagak area have reported harvests of eider ducks -- Iliamna (1991), Koliganek (1987), New Stuyahok (1987), and Newhalen (1991). Based on these surveys, a yearly harvest by hunters from the area is estimated to be 249 eiders. The precise locations of these harvests were not ascertained by the surveys. These are most likely to be common eiders, but information at the species level was not collected. There was no recorded harvest of eiders at other area communities in recent years -- Ekwok (1987), Igiugig (1992), Kokhanok (1992), and Levelock (1992).

Eiders are only occasionally reported taken for subsistence use by hunters from villages in the south Kenai Peninsula area, including Nanwalek, Port Graham, and Seldovia. No surveyed households reported any eider harvests in six survey years at Nanwalek (1987, 1989-93) or in three survey years at Seldovia (1991-93). At Port Graham, eiders were occasionally reported harvested -- 41 (1987), 1 (1989), 0 (1990), 6 (1991), 0 (1992), and 0 (1993). These were most likely common eiders (called *qaanillqaacak*), which are reported to frequent the area year-round (Stanek 1985:113). If a hunter encounters a group of eiders, a few may be taken. Historically, Windy Bay and Rocky Bay were known as good locations for hunting eider ducks and collecting their eggs (Stanek 1985:81). To the south of the Kenai area, no subsistence harvest of eider ducks has been documented for the communities of Prince William Sound.

**APPENDIX 4. ADDITIONAL HARVEST TABLES BY
COMMUNITY, YEAR, AND SEASON**

Appendix 4. Table 1
Brant Harvest Estimates by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY</u> <u>YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON</u> <u>UNKNOWN</u>
North Slope							
Barrow	88	221	113	50	58	0	0
Wainwright	89	700	20	262	418	0	0
Northwest Arctic Coast							
Kivalina	83	54	47	7	0		
Deering	94	60	53	0	7	0	0
Kiana	94	8	8	0	0	0	0
Selawik	94	46	40	6	0	0	0
Northwest Arctic Inland							
Noatak	94	0		0	0	0	0
Shungnak	94	0	0	0	0	0	0
St. Lawrence Island							
Gambell	93	7	0	0	7	0	0
Savoonga	93	8	0	0	8	0	0
Seward Peninsula							
Brevig Mission	89	464	464	0	0	0	0
Shishmaref	89	422	34	34	354	0	0
Wales	94	135	60	0	75	0	0
Norton Sound							
Golovin	89	345	322	0	23	0	0
Elim	94	68	68	0	0	0	0
Shaktolik	94	38	37	0	1	0	0
Stebbins	94	15	0	0	13	0	2
Yukon-Kuskokwim Delta [1]							
Six Areas	93	2,502	1,226	302	974	0	0
North Bristol Bay							
Aleknagik	89	1	1				0
Clark's Point	89	21	3		18		0
South Bristol Bay							
Pilot Point	87	1	0		1		
Ugashik	87	0	0		0		
East Aleutian Islands							
False Pass	88	73	0		73		
Nelson Lagoon	87	0					

Appendix 4. Table 1
Brant Harvest Estimates by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY</u> <u>YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON</u> <u>UNKNOWN</u>
West Aleutian - Pribilof Islands							
Atka	94	0	0	0	0	0	
Saint George	94	0	0	0	0	0	
Saint Paul	94	15	4	0	11	0	
Unalaska	94	4	0	0	4	0	
South Alaska Peninsula							
Chignik Bay	89	0	0				0
Chignik Lagoon	89	0	0				0
Chignik Lake	89	24	19				5
Ivanof Bay	89	0					0
Perryville	89	0	0				0
Port Heiden	87	25	0		25		0
Iliamna Lake							
Ekwok	87						
Koliganek	87	8	8		0		
Levelock	88	19	13		6		
New Stuyahok	87	0	0		0		
South Kenai Peninsula							
Nanwalek	87	0	0				
Port Graham	87	0	0		0		
Total – All Reporting Areas		5,284	2,540	661	2,076	0	7

[1] For Y-K Delta - Spring=Apr 8-May20; Summer=May 21-July29; Fall=July30-Oct 15.

Appendix 4. Table 2.
Emperor Geese Harvest Estimates by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY</u> <u>YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON</u> <u>UNKNOWN</u>
North Slope							
Barrow	88	0	0	0	0	0	0
Wainwright	89	0	0	0	0	0	0
Northwest Arctic Coast							
Kivalina	83						
Deering	94	0	0	0	0	0	0
Kiana	94	11	11	0	0	0	0
Selawik	94	28	28	0	0	0	0
Northwest Arctic Inland							
Noatak	94	0		0	0	0	0
Shungnak	94	0	0	0	0	0	0
St. Lawrence Island							
Gambell	93	0	0	0	0	0	0
Savoonga	93	12	0	0	12	0	0
Seward Peninsula							
Brevig Mission	89	40	40	0	0	0	0
Shishmaref	89	0	0	0	0	0	0
Wales	94	13	5.85	0	7.02	0	0
Norton Sound							
Golovin	89	7	7	0	0	0	0
Elim	94	0	0	0	0	0	0
Shaktolik	94	3	0	0	3	0	0
Stebbins	94	5	5	0	0	0	0
Yukon-Kuskokwim Delta [1]							
Six Areas	93	2602	1724	365	513	0	0
North Bristol Bay							
Aleknagik	89	0	0				0
Clark's Point	89	0	0		0		0
South Bristol Bay							
Pilot Point	87	64	8		56		
Ugashik	87	10	0		10		
East Aleutian Islands							
False Pass	88	29	0		29		
Nelson Lagoon	87	61	0		61		

**Appendix 4. Table 2.
Emperor Geese Harvest Estimates by Season
Selected Communities and Study Years**

<u>COMMUNITY</u>	<u>SURVEY YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON UNKNOWN</u>
West Aleutian - Pribilof Islands							
Atka	94	118	0	0	29	89.1	
Saint George	94	0	0	0	0	0	
Saint Paul	94	15	0	0	7.5	7.5	
Unalaska	94	30	0	0	0	29.6	
South Alaska Peninsula							
Chignik Bay	89	36			9		27
Chignik Lagoon	89	20			0		20
Chignik Lake	89	51			23		28
Ivanof Bay	89	47			37		10
Perryville	89	17			0		17
Port Heiden	87	134	56		78		0
Iliamna Lake							
Ekwok	87						
Koliganek	87	19	19		0		
Levelock	88	2	0		2		
New Stuyahok	87	0	0		0		
South Kenai Peninsula							
Nanwalek	87	0	0				
Port Graham	87	0	0		0		
Total -- All Reporting Areas		371	1,904	365	877	126	102

[1] For Y-K Delta - Spring=Apr 8-May20; Summer=May 21-July29; Fall=July30-Oct 15.

**Appendix 4. Table 3.
Eider Harvest Estimates (All Species) by Season
Selected Communities and Study Years**

<u>COMMUNITY</u>	<u>SURVEY YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON UNKNOWN</u>
North Slope							
Barrow	88	4,499	1,649	691	2,159	0	0
Wainwright	89	1,097	385	712	0	0	0
Northwest Arctic Coast							
Kivalina	83	168	152	14	2		
Deering	94	42	21	0	21	0	0
Kiana	94	0	0	0	0	0	0
Selawik	94	0	0	0	0	0	0
Northwest Arctic Inland							
Noatak	94	0	0	0	0	0	0
Shungnak	94	0	0	0	0	0	0
St. Lawrence Island							
Gambell	93	363	182	0	181	0	0
Savoonga	93	49	0	0	49	0	0
Seward Peninsula							
Brevig Mission	89	83	69	0	14	0	0
Shishmaref	89	56	28	0	0	0	0
Wales	94	149	114	14	14	0	7
Norton Sound							
Golovin	89	0	0	0	0	0	0
Elim	94	12	12	0	0	0	0
Shaktolik	94	6	6	0	0	0	0
Stebbins	94	157	51	16	88	0	2
Yukon-Kuskokwim Delta [1]							
Six Areas	93	4,364	4,045	245	74	0	0
North Bristol Bay							
Aleknagik	89	45	0				45
Clark's Point	89	0	0				0
South Bristol Bay							
Pilot Point	87	4	4		0		
Ugashik	87	0	0		0		
East Aleutian Islands							
False Pass	88	0	0		0		
Nelson Lagoon	87	0					

Appendix 4. Table 3.
Eider Harvest Estimates (All Species) by Season
Selected Communities and Study Years

West Aleutian - Pribilof Islands							
Atka	94	40	35	0	5	0	
Saint George	94	0	0	0	0	0	
Saint Paul	94	335	0	0	13	322	
Unalaska	94	103	0	65	6	33	
South Alaska Peninsula							
Chignik Bay	89	26			9	17	
Chignik Lagoon	89	4			0	4	
Chignik Lake	89	76			20	56	
Ivanof Bay	89	6			6	0	
Perryville	89	13			0	13	
Port Heiden	87	20	20		0	0	
Iliamna Lake							
Ekwok	87	0				0	
Koliganek	87	17				17	
Levelock	88	0	0		0		
New Stuyahok	87	185				185	
South Kenai Peninsula							
Nanwalek	87	0	0				
Port Graham	87	41	29		12		
Total -- All Reporting Area		11,959	6,801	1,757	2,673	355	346

[1] For Y-K Delta - Spring=Apr 8-May20; Summer=May 21-July29; Fall=July30-Oct 15.

Appendix 4. Table 4.
King Eider Harvest Estimates by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON UNKNOWN</u>
North Slope							
Barrow	88	25	1	11	13	0	0
Wainwright	89	816	380	436	0	0	0
Northwest Arctic Coast							
Kivalina	83						
Deering	94	0	0	0	0	0	0
Kiana	94	0	0	0	0	0	0
Selawik	94	0	0	0	0	0	0
Northwest Arctic Inland							
Noatak	94	0	0	0	0	0	0
Shungnak	94	0	0	0	0	0	0
St. Lawrence Island							
Gambell	93	59	35	0	24	0	0
Savoonga	93	8	0	0	8	0	0
Seward Peninsula							
Brevig Mission	89		0	0	0	0	0
Shishmaref	89		0	0	0	0	0
Wales	94	76	70	0	2	0	4
Norton Sound							
Golovin	89	0	0	0	0	0	0
Elim	94	0	0	0	0	0	0
Shaktolik	94	0	0	0	0	0	0
Stebbins	94	18	0	2	16	0	0
Yukon-Kuskokwim Delta [1]							
Six Areas	93	3753	3509	230	14	0	0
North Bristol Bay							
Aleknagik	89	9					9
Clark's Point	89	0					0
South Bristol Bay							
Pilot Point	87						
Ugashik	87						
East Aleutian Islands							
False Pass	88						
Nelson Lagoon	87						

Appendix 4. Table 4.
King Eider Harvest Estimates by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON UNKNOWN</u>
West Aleutian - Pribilof Islands							
Atka	94	0	0	0	0	0	0
Saint George	94	0	0	0	0	0	0
Saint Paul	94	318	0	0	13	305	
Unalaska	94	28	0	0	0	28	
South Alaska Peninsula							
Chignik Bay	89						
Chignik Lagoon	89						
Chignik Lake	89						
Ivanof Bay	89						
Perryville	89						
Port Heiden	87						
Iliamna Lake							
Ekwok	87						
Koliganek	87						
Levelock	88						
New Stuyahok	87						
South Kenai Peninsula							
Nanwalek	87						
Port Graham	87						
Total – All Reporting Area		5110	3995	679	91	332	13

Appendix 4. Table 5.
Common Eider Harvest Estimates by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY</u> <u>YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON</u> <u>UNKNOWN</u>
North Slope							
Barrow	88	19	0	19	0	0	0
Wainwright	89	29	5	24	0	0	0
Northwest Arctic Coast							
Kivalina	83						
Deering	94	42	21	0	21	0	0
Kiana	94	0	0	0	0	0	0
Selawik	94	0	0	0	0	0	0
Northwest Arctic Inland							
Noatak	94	0	0	0	0	0	0
Shungnak	94	0	0	0	0	0	0
St. Lawrence Island							
Gambell	93	262	117	0	145	0	0
Savoonga	93	32	0	0	32	0	0
Seward Peninsula							
Brevig Mission	89		0	0	0	0	0
Shishmaref	89		0	0	0	0	0
Wales	94	69	42	12	12	0	4
Norton Sound							
Golovin	89	0	0	0	0	0	0
Elim	94	12	12	0	0	0	0
Shaktolik	94	6	6	0	0	0	0
Stebbins	94	137	49	14	72	0	2
Yukon-Kuskokwim Delta [1]							
Six Areas	93	583	512	15	56	0	0
North Bristol Bay							
Aleknagik	89	36					36
Clark's Point	89	0					0
South Bristol Bay							
Pilot Point	87						
Ugashik	87						
East Aleutian Islands							
False Pass	88						
Nelson Lagoon	87						

**Appendix 4. Table 5.
Common Eider Harvest Estimates by Season
Selected Communities and Study Years**

<u>COMMUNITY</u>	<u>SURVEY YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON UNKNOWN</u>
West Aleutian - Pribilof Islands							
Atka	94	40	0	35	5	0	
Saint George	94	0	0	0	0	0	
Saint Paul	94	6	0	0	0	6	
Unalaska	94	65	0	65	0	0	
South Alaska Peninsula							
Chignik Bay	89						
Chignik Lagoon	89						
Chignik Lake	89						
Ivanof Bay	89						
Perryville	89						
Port Heiden	87						
Iliamna Lake							
Ekwok	87						
Koliganek	87						
Levelock	88						
New Stuyahok	87						
South Kenai Peninsula							
Nanwalek	87						
Port Graham	87						
Total – All Reporting Area		1,337	764	184	343	6	42

[1] For Y-K Delta - Spring=Apr 8-May20; Summer=May 21-July29; Fall=July30-Oct 15.

Appendix 4. Table 6.
Spectacled Eider Harvest Estimates by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY</u> <u>YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON</u> <u>UNKNOWN</u>
North Slope							
Barrow	88	0	0	0	0	0	0
Wainwright	89	246	0	246	0	0	0
Northwest Arctic Coast							
Kivalina	83						
Deering	94	0	0	0	0	0	0
Kiana	94	0	0	0	0	0	0
Selawik	94	0	0	0	0	0	0
Northwest Arctic Inland							
Noatak	94	0	0	0	0	0	0
Shungnak	94	0	0	0	0	0	0
St. Lawrence Island							
Gambell	93	0	0	0	0	0	0
Savoonga	93	9	0	0	9	0	0
Seward Peninsula							
Brevig Mission	89		0	0	0	0	0
Shishmaref	89		0	0	0	0	0
Wales	94	4	1	2	0	0	0
Norton Sound							
Golovin	89	0	0	0	0	0	0
Elim	94	0	0	0	0	0	0
Shaktoolik	94	0	0	0	0	0	0
Stebbins	94	2	2	0	0	0	0
Yukon-Kuskokwim Delta [1]							
Six Areas	93	28	24	0	4	0	0
North Bristol Bay							
Aleknagik	89	0					0
Clark's Point	89	0					0
South Bristol Bay							
Pilot Point	87						
Ugashik	87						
East Aleutian Islands							
False Pass	88						
Nelson Lagoon	87						

Appendix 4. Table 6.
Spectacled Eider Harvest Estimates by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY</u> <u>YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON</u> <u>UNKNOWN</u>
West Aleutian - Pribilof Islands							
Atka	94	0	0	0	0	0	
Saint George	94	0	0	0	0	0	
Saint Paul	94	0	0	0	0	0	
Unalaska	94	0	0	0	0	0	
South Alaska Peninsula							
Chignik Bay	89						
Chignik Lagoon	89						
Chignik Lake	89						
Ivanof Bay	89						
Perryville	89						
Port Heiden	87						
Iliamna Lake							
Ekwok	87						
Koliganek	87						
Levelock	88						
New Stuyahok	87						
South Kenai Peninsula							
Nanwalek	87						
Port Graham	87						
Total -- All Reporting Areas		289	27	248	13	0	0

[1] For Y-K Delta - Spring=Apr 8-May20; Summer=May 21-July29; Fall=July30-Oct 15.

Appendix 4. Table 7.
Steller's Eider Harvest Estimates by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON UNKNOWN</u>
North Slope							
Barrow	88	0	0	0	0	0	0
Wainwright	89	3	0	3	0	0	0
Northwest Arctic Coast							
Kivalina	83						
Deering	94	0	0	0	0	0	0
Kiana	94	0	0	0	0	0	0
Selawik	94	0	0	0	0	0	0
Northwest Arctic Inland							
Noatak	94	0	0	0	0	0	0
Shungnak	94	0	0	0	0	0	0
St. Lawrence Island							
Gambell	93	42	30	0	12	0	0
Savoonga	93	0	0	0	0	0	0
Seward Peninsula							
Brevig Mission	89		0	0	0	0	0
Shishmaref	89		0	0	0	0	0
Wales	94	0	0	0	0	0	0
Norton Sound							
Golovin	89	0	0	0	0	0	0
Elim	94	0	0	0	0	0	0
Shaktoolik	94	0	0	0	0	0	0
Stebbins	94	0	0	0	0	0	0
Yukon-Kuskokwim Delta [1]							
Six Areas	93	0	0	0	0	0	0
North Bristol Bay							
Aleknagik	89	0					0
Clark's Point	89	0					0
South Bristol Bay							
Pilot Point	87						
Ugashik	87						
East Aleutian Islands							
False Pass	88						
Nelson Lagoon	87						

Appendix 4. Table 7.
Steller's Eider Harvest Estimates by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON UNKNOWN</u>
West Aleutian - Pribilof Islands							
Atka	94	0	0	0	0	0	
Saint George	94	0	0	0	0	0	
Saint Paul	94	11	0	0	0	11.3	
Unalaska	94	11	0	0	5.5	5.5	
South Alaska Peninsula							
Chignik Bay	89						
Chignik Lagoon	89						
Chignik Lake	89						
Ivanof Bay	89						
Perryville	89						
Port Heiden	87						
Iliamna Lake							
Ekwok	87						
Koliganek	87						
Levelock	88						
New Stuyahok	87						
South Kenai Peninsula							
Nanwalek	87						
Port Graham	87						
Total – All Reporting Areas		67	30	3	18	17	0

[1] For Y-K Delta - Spring=Apr 8-May20; Summer=May 21-July29; Fall=July30-Oct 15.

Appendix 4. Table 8.
Eider Harvest Estimates (Unreported Species) by Season
Selected Communities and Study Years

<u>COMMUNITY</u>	<u>SURVEY YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON UNKNOWN</u>
North Slope							
Barrow	88	4,455	1,648	661	2,146	0	0
Wainwright	89	3	0	3	0	0	0
Northwest Arctic Coast							
Kivalina	83	168	152	14	2		
Deering	94	0	0	0	0	0	0
Kiana	94	0	0	0	0	0	0
Selawik	94	0	0	0	0	0	0
Northwest Arctic Inland							
Noatak	94	0	0	0	0	0	0
Shungnak	94	0	0	0	0	0	0
St. Lawrence Island							
Gambell	93	0	0	0	0	0	0
Savoonga	93	0	0	0	0	0	0
Seward Peninsula							
Brevig Mission	89	83	69	0	14	0	0
Shishmaref	89	28	28	0	0	0	0
Wales	94	0	0	0	0	0	0
Norton Sound							
Golovin	89	0	0	0	0	0	0
Elim	94	0	0	0	0	0	0
Shaktoolik	94	0	0	0	0	0	0
Stebbins	94	0	0	0	0	0	0
Yukon-Kuskokwim Delta [1]							
Six Areas	93	0	0	0	0	0	0
North Bristol Bay							
Aleknagik	89	0	0				0
Clark's Point	89	0	0				0
South Bristol Bay							
Pilot Point	87	4	4		0		
Ugashik	87	0	0		0		
East Aleutian Islands							
False Pass	88	0	0		0		
Nelson Lagoon	87	0					

**Appendix 4. Table 8.
Eider Harvest Estimates (Unreported Species) by Season
Selected Communities and Study Years**

<u>COMMUNITY</u>	<u>SURVEY YEAR</u>	<u>TOTAL</u>	<u>SPRING</u>	<u>SUMMER</u>	<u>FALL</u>	<u>WINTER</u>	<u>SEASON UNKNOWN</u>
West Aleutian - Pribilof Islands							
Atka	94	0	0	0	0		
Saint George	94	0	0	0	0		
Saint Paul	94	0	0	0	0		
Unalaska	94	0	0	0	0		
South Alaska Peninsula							
Chignik Bay	89	26			9		17
Chignik Lagoon	89	4			0		4
Chignik Lake	89	76			20		56
Ivanof Bay	89	6			6		0
Perryville	89	13			0		13
Port Heiden	87	20	20		0		0
Iliamna Lake							
Ekwok	87	0					0
Koliganek	87	17					17
Levelock	88	0	0		0		
New Stuyahok	87	185					185
South Kenai Peninsula							
Nanwalek	87	0	0				
Port Graham	87	41	29		12		
Total -- All Reporting Areas		5,129	1,950	678	2,209	0	292

[1] For Y-K Delta - Spring=Apr 8-May20; Summer=May 21-July29; Fall=July30-Oct 15.

Appendix 4. Table 9.
Estimated Harvests of Brant, Emperor Geese, and Eider Ducks
for Selected Surveyed Alaska Communities and Study Years

Area and Community	Study Year	Brant	Emperor	All Eider	King	Common	Spectacled	Steller's	Unknown
									Eider
ARCTIC SLOPE									
Barrow	87	127	0	5173	83	7	2		5080
Barrow	88	221	0	4499	25	19			4455
Barrow	89	973	0	8590	100	69		10	8411
Kaktovik	87	172	0	105					
Kaktovik	92	378	0	248	138	110			0
Nuiqsut	85	6	0	0					
Nuiqsut	93	296	0	662	465	147			50
Wainwright	88	567	0	560	100	57	64	2	337
Wainwright	89	700	0	1097	818	29	247	3	3
NORTHWEST ARCTIC									
Kivalina	82	111	0	37					37
Kivalina	83	54	0	168					168
Kivalina	92	351	0	322	101	67	59	0	95
YUKON-KUSKOKWIM DELTA									
South Coast	93	715	1066	2687	2466	221	0	0	0
South Coast	92	103	64	74	34	29	11	0	
South Coast	91	0	0	20	20	0	0	0	
South Coast	90	11	87	0	0	0	0	0	
South Coast	89	61	151	20	20	0	0	0	
South Coast	87	0	51	437	437	0	0	0	
South Coast	86	96	80	612	435	177	0	0	
South Coast	85	751	934	3080	3047	33	0	0	
Mid Coast	93	1453	1208	1120	891	216	13	0	0
Mid Coast	92	2126	2076	3650	3209	205	219	17	
Mid Coast	91	2050	2124	2629	2132	349	138	10	
Mid Coast	90	2794	2896	2545	2046	354	145		
Mid Coast	89	2140	1248	3756	3031	582	143		
Mid Coast	87	827	909	2294	1746	280	268		
Mid Coast	86	1134	2642	1818	808	750	260		
Mid Coast	85	1225	2975	2042	1211	534	297		
North Coast	93	146	108	0	0	0	0	0	0
North Coast	92	291	262	20	0	0	20	0	
North Coast	91	72	180	17	0	17	0	0	
North Coast	90	133	325	38	0	10	28		
North Coast	89	107	77	48	0	8	40		
North Coast	87	24	75	28	0	0	28		
North Coast	86	170	218	67	0	30	37		
North Coast	85	146	112	4	0	4	0		

Appendix 4. Table 9.
Estimated Harvests of Brant, Emperor Geese, and Eider Ducks
for Selected Surveyed Alaska Communities and Study Years

Area and Community	Study Year	Brant	Emperor	All Eider	King	Common	Spectacled	Steller's	Unknown
									Eider
Kuskokwim	93	135	136	351	238	109	4	0	0
Kuskokwim	92	204	222	187	127	60	0	0	
Kuskokwim	91	134	20	674	541	0	122	11	
Kuskokwim	90	172	82	106	38	19	49		
Kuskokwim	89	0	18	26	0	26	0		
Kuskokwim	87	176	170	854	842	12	0		
Kuskokwim	86	0	59	358	350	8	0		
Kuskokwim	85	21	6	0	0	0	0		
Yukon	93	0	84	0	0	0	0	0	0
Yukon	92	43	45	6	0	6	0	0	
Yukon	91	0	64	31	0	31	0	0	
Yukon	90	18	29	0	0	0	0		
Yukon	89	33	72	5	5	0	0		
Yukon	87	4	81	16	0	16	0		
Yukon	86	13	38	27	5	7	15		
Yukon	85	25	4	0	0	0	0		
Bethel	93	53	0	193	158	35	0	0	0
Bethel	92	29	0	97	63	27	0	7	
Bethel	91	2	5	176	137	39	0	0	
Bethel	90	6	21	194	159	35	0		
Bethel	89	30	48	69	50	19	0		
Bethel	87	0	66	352	336	16	0		
Bethel	86	70	55	228	220	0	8		
Bethel	85	0	0	0	0	0	0		
ALASKA PENINSULA									
Chignik Bay	84	0	29	0					
Chignik Bay	89	0	36	26					
Chignik Bay	91	9	0	29					29
Chignik Lagoon	84	8	39	0					
Chignik Lagoon	89	0	20	4					
Chignik Lake	84	8	13	0					
Chignik Lake	89	24	51	76					
Chignik Lake	91	12	30	21					21
Ivanof Bay	84	0	30	0					
Ivanof Bay	89	0	47	6					
Perryville	84	0	0	13					
Perryville	89	0	17	0					
ILIAMNA LAKE									
Levelock	88	20	2	0					
Levelock	92	3	0	0					

Appendix 4. Table 9.
Estimated Harvests of Brant, Emperor Geese, and Eider Ducks
for Selected Surveyed Alaska Communities and Study Years

Area and Community	Study Year	Brant	Emperor	All Eider	King	Common	Spectacled	Steller's	Unknown Eider
KODIAK ISLAND									
Akhiok	89	0	16	0					
Akhiok	92	0	17	0					
Kartuk	89	0	0	0					
Kartuk	90	0	0	3					
Kartuk	91	0	0	0					
Kodiak City	91	0	0	31					31
Kodiak City	92	123	0	0					
Kodiak City	93	0	0	0					
Larsen Bay	89	0	0	0					
Larsen Bay	90	0	0	0					
Larsen Bay	91	0	0	0					
Larsen Bay	92	0	0	0					
Larsen Bay	93	0	0	0					
Old Harbor	89	0	0	6					
Old Harbor	91	0	0	30					
Ouzinkie	89	0	0	41					
Ouzinkie	90	0	0	54					
Ouzinkie	91	0	0	48					48
Ouzinkie	92	0	0	22					22
Ouzinkie	93	0	0	0	0	0	0	0	0
Port Lions	89	0	0	32					
Port Lions	93	0	0	0	0	0	0	0	0
KENAI PENINSULA									
Kenai	90	0		0					
Kenai	92	0		0		0			0
Kenai	93	0		0	0	0	0	0	0
LOWER KENAI PENINSULA									
Nanwalek	87	0	0	0					
Nanwalek	89	0	0	0					
Nanwalek	90	0	0	0					
Nanwalek	91	0	0	0					
Nanwalek	92	0	0	0		0			
Nanwalek	93	0	0	0	0	0	0	0	0
Port Graham	87	0	0	41					
Port Graham	89	0	0	1					
Port Graham	90	0	0	0					
Port Graham	91	0	0	6		6			
Port Graham	92	0	0	0					0

Appendix 4. Table 9.
Estimated Harvests of Brant, Emperor Geese, and Eider Ducks
for Selected Surveyed Alaska Communities and Study Years

Area and Community	Study Year	Brant	Emperor	All Eider	King	Common	Spectacled	Steller's	Unknown Eider
Port Graham	93	0	0	0	0	0	0	0	0
Seldovia	91	26	0	0					
Seldovia	92	8	0	0		0			0
Seldovia	93	9	0	0	0	0	0	0	0
PRINCE WILLIAM SOUND									
Chenega Bay	89	0	0	0					
Chenega Bay	91	0	0	0					
Chenega Bay	92	0	0	0					
Chenega Bay	93	0	0	0	0	0	0	0	0
Cordova	88	0	0	42					
Cordova	91	0	0	0					
Cordova	92	0	0	0					
Cordova	93	0	0	0	0	0	0	0	0
Tatitlek	88	0	0	0					
Tatitlek	89	0	0	0					
Tatitlek	91	4	0	0					
Tatitlek	93	0	0	0	0	0	0	0	0
Valdez	91	0	0	0					
Valdez	92	0	0	0					
Valdez	93	0	0	0	0	0	0	0	0