Technical Paper No. 409

Alaska Subsistence Harvest of Birds and Eggs, 2013, Alaska Migratory Bird Co-Management Council

Liliana C. Naves

April 2015

Alaska Department of Fish and Game
Division of Subsistence

Alaska Migratory Bird
Co-Management Council

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the reports by the Division of Subsistence. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly-accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly-accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures)	first three letters (Jan,...,Dec)
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

TECHNICAL PAPER NO. 409

ALASKA SUBSISTENCE HARVEST OF BIRDS AND EGGS, 2013, ALASKA MIGRATORY BIRD CO-MANAGEMENT COUNCIL

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The Division of Subsistence Technical Paper series was established in 1979 and represents the most complete collection of information about customary and traditional uses of fish and wildlife resources in Alaska. The papers cover all regions of the state. Some papers were written in response to specific fish and game management issues. Others provide detailed, basic information on the subsistence uses of particular communities which pertain to a large number of scientific and policy questions.

Technical Paper series reports are available through the Alaska Resources Library and Information Services (ARLIS), the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/. This publication has undergone editorial and professional review.

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Front cover photo: Butch (Steve Hobson Jr.) from Nondalton singes mallards, November 2013. In traditional Alaska Native subsistence practices, besides the meat, many parts of birds such as skin, organs, bone marrow, and fat are eaten because they are sources of calories, vitamins, and other nutrients. Plucking and singeing feathers allow consumption of the skin and associated fat. Also, during cooking, the skin retains moisture in the meat. Photo by James M. Van Lanen, ADF&G Division of Subsistence.

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ABSTRACT

This report presents subsistence harvest estimates of birds and their eggs in Alaska for the data year 2013. Data were collected through the harvest assessment program of the Alaska Migratory Bird Co-Management Council. This program relies on collaboration among the U.S. Fish and Wildlife Service, the Alaska Department of Fish and Game, and a number of regional Alaska Native organizations. Information obtained by this program is used to evaluate federal subsistence harvest regulations, to document customary and traditional uses of migratory birds in Alaska, and to plan for the continued harvest and conservation of birds. Participation of communities and individual households in the harvest survey is voluntary. The survey covers spring, summer, and fall harvests in most regions. Some regions also have a winter survey. Harvest estimates are based on a stratified multistage clustered sample of communities and households. The sampling frame encompasses all households in regions eligible for the subsistence harvest of migratory birds and their eggs in Alaska. Households are the basic sampling unit. Data at the household level are confidential and data at the community level are considered sensitive. Communities with similar harvest patterns are grouped in subregions. Harvests reported by surveyed communities are expanded to nonsurveyed communities in the same subregion. Subregions are grouped into regions, which correspond to the designated migratory bird management regions. Within communities, households are stratified by harvest level. Communities and regions are surveyed on a rotating schedule, which is adjusted annually according to monitoring priorities and funding availability. In 2013, the harvest survey was conducted in only 1 region, the Yukon-Kuskokwim Delta.

Key words: Alaska Migratory Bird Co-Management Council, AMBCC, migratory birds, migratory bird eggs, subsistence harvest, subsistence hunting, subsistence harvest estimates, ducks, geese, swans, cranes, ptarmigans, grouses, seabirds, shorebirds, grebes, loons.

ACKNOWLEDGMENTS

This subsistence harvest survey would not have been possible without the local support of the Alaska communities. The Alaska Migratory Bird Co-Management Council (AMBCC) and the Alaska Department of Fish and Game (ADF&G) Division of Subsistence are most grateful to all households that agreed to report their subsistence harvests. The AMBCC and the ADF&G Division of Subsistence are very thankful for the collaboration of the many Alaska Native organizations, national wildlife refuges, village councils, local surveyors, and other partners that coordinated, facilitated, and conducted data collection. Dave Koster and staff of the Information Management Unit provided data entry and management support. Terri Lemons prepared maps and Adam Knight edited this report.

INTRODUCTION

In 1918, Canada and the United States ratified the Migratory Bird Treaty Act (the treaty) to protect migratory bird populations. Among other provisions, the treaty set an annual hunting closure between 10 March and 1 September. However, this provision failed to provide for the spring and summer harvest of migratory birds by northern peoples; these harvests have been historically necessary to their subsistence way of life. Despite the closure, customary and traditional bird hunting in spring and summer continued.

In 1997, the U.S. Congress ratified a treaty amendment recognizing traditional spring and summer subsistence bird harvests by northern peoples. The goal of the amendment was to promote conservation of migratory birds by including subsistence hunting in the regulatory process. The amendment authorized the U.S. Fish and Wildlife Service (USFWS) to open regulated spring and summer subsistence hunts of migratory birds in Alaska. The amendment also mandated that Alaska's Native people play a meaningful role in relevant management bodies. As a result of this direction, the Alaska Migratory Bird Co-Management Council (AMBCC) was formed in 2000. The AMBCC is composed of representatives from the USFWS, Alaska Department of Fish and Game (ADF&G), and regional Native entities (65 FR 16405–16409[1]). The AMBCC identified the need for harvest assessment to document traditional uses of migratory birds and levels of harvest. Harvest assessment is also needed to meet the intentions of the amended treaty: (1) subsistence harvests should remain at traditional levels relative to bird population sizes; (2) subsistence harvest data should be integrated with flyway and national harvest management programs; and (3) regulatory processes for all migratory bird hunting should be inclusive to users and responsive to conservation needs. The first legal spring–summer subsistence hunting season was in 2003.

Annual monitoring of bird and egg harvests happenend in 1985–2002 in the Yukon-Kuskokwim Delta region (Y-K Delta) (Copp 1985; Copp and Roy 1986; Wentworth 2007a) in the context of the Goose Management Plan (Zavaleta 1999). Similar surveys were conducted in the Bristol Bay region about every other year in 1995–2002 (Wentworth 2007b). These earlier surveys played an important role in refining survey methods, developing acceptance of harvest surveys in subsistence communities, engaging users in the management process, and together with the AMBCC harvest data (below) constitute a long dataset necessary for the understanding of highly variable harvests.

The AMBCC harvest assessment program was based on goose management plan surveys conducted in the Y-K Delta and Bristol Bay and expanded the geographic coverage of birds and eggs harvest monitoring to other Alaska regions (Reynolds 2007)[2]. The AMBCC survey has been conducted annually since 2004 relying on collaboration among USFWS, ADF&G, and Alaska Native partners. The USFWS and ADF&G have funded the survey program, which is currently coordinated by the ADF&G Division of Subsistence. Data collection is usually implemented by Native partners at the regional and local levels. Data collection in 2004–2009 followed methods described in Naves (2010rev.). In 2008–2009, the survey program was collaboratively revised to streamline program structure and data collection, analysis, and reporting (Naves et al. 2008). The revised survey has been implemented since 2010. The AMBCC also conducts outreach, education, and research to address specific management issues (Naves and Zeller 2013; Naves 2014a; Rothe et al. *In press*). This report is the seventh in a series presenting annual regional and subregional harvest estimates for birds and bird eggs based on data collected by the AMBCC harvest assessment program (Naves 2010rev.; Naves 2010; Naves 2011; Naves 2012; Naves 2014b; Naves and Braem 2014).

Harvest estimates from the AMBCC survey are available to Alaska rural communities (or villages), Native organizations, state and federal resource management and conservation agencies, the Pacific Flyway Council, and the general public. Some uses of the survey data are:

- Document the importance of customary and traditional uses of migratory birds by Alaska rural communities so that subsistence uses will be protected and conducted in a sustainable manner;
- Document subsistence harvest trends and track changes in harvests;
- Assist the USFWS in the evaluation of spring-summer migratory bird harvest regulations; and
- Assist in the development of management plans by state and federal agencies.

1. Federal Register Vol. 65, No. 60 (March 28, 2000) available online: http://www.gpo.gov/fdsys/pkg/FR-2000-03-28/pdf/00-7550.pdf.
2. See also AMBCC (Alaska Migratory Bird Co-Management Council). 2003. Recommendations for a statewide Alaska migratory bird subsistence harvest survey. Unpublished report by the Subsistence Harvest Survey Committee. U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Anchorage.

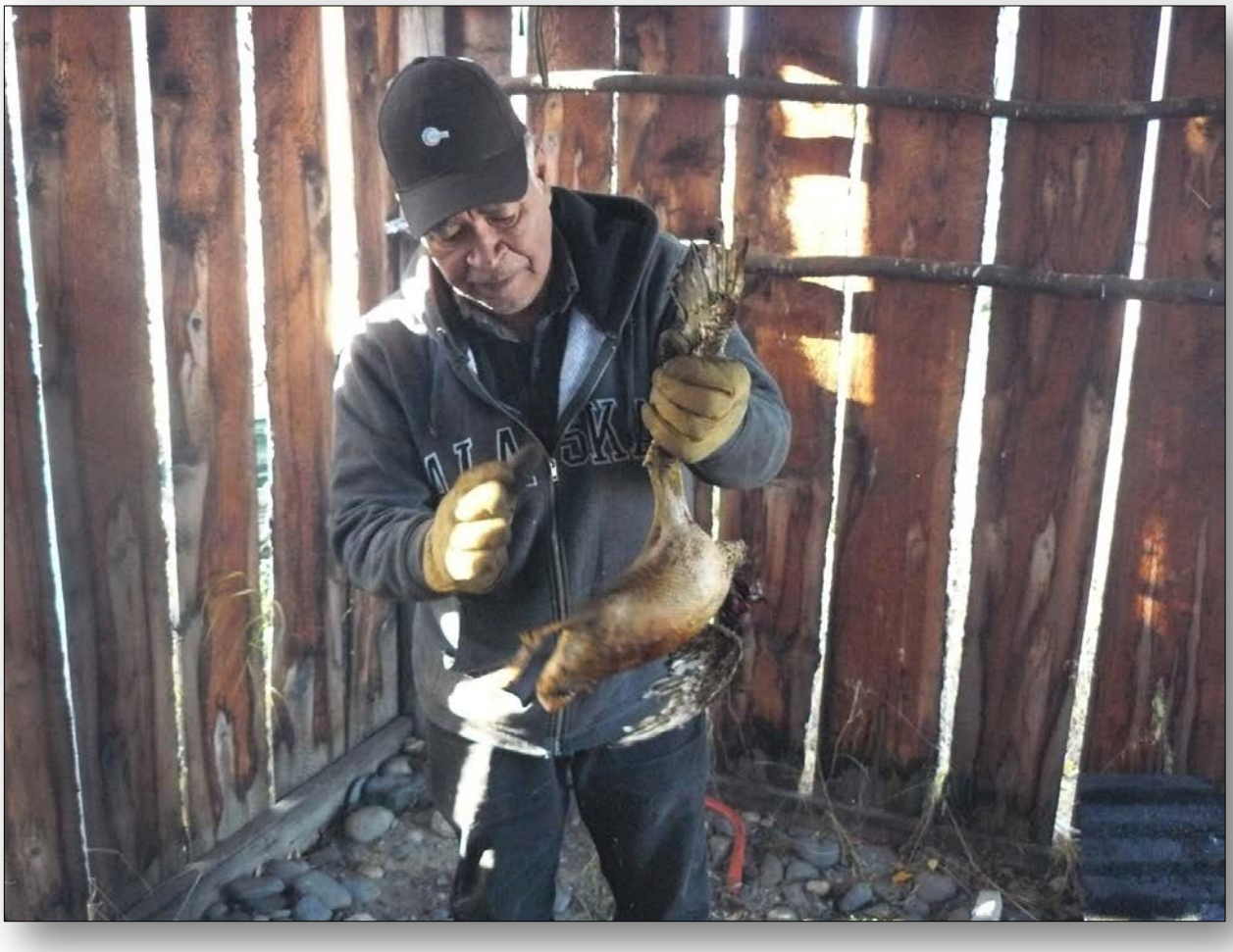

Figure 1.–Butch (Steve Hobson Jr.) from Nondalton plucks and singes mallards, November 2013. In traditional Alaska Native subsistence practices, besides the meat, many parts of birds such as skin, organs, bone marrow, and fat are eaten because they are sources of calories, vitamins, and other nutrients. Plucking and singeing feathers allow consumption of the skin and associated fat. Also, during cooking, the skin retains moisture in the meat. Photos by James M. Van Lanen, ADF&G Division of Subsistence.

METHODS

GENERAL SURVEY DESIGN

Current survey methods were described in detail in Naves (2012). The subsistence harvest survey area includes 202 remote communities in 10 survey and management regions (68 FR 43010–43030[3]). The Southeast Alaska region has not been surveyed (4 communities are eligible only for egg harvests). The survey regions were divided in 31 subregions to better account for geographical variation in harvest patterns (Figure 2). In 2010, the regions had a total population of 89,481 people (U.S. Census Bureau 2011). Regions have been surveyed depending on annual management priorities, funding availability, and factors affecting fieldwork logistics in remote Alaska (e.g., weather, communication, costs, local partnerships in place) (tables 1, 5, and 6).

In 2013, the survey was conducted in 5 out of 7 subregions in the Yukon-Kuskokwim region. The Yukon Delta and Togiak National Wildlife Refuges participated in data collection.

From a subsistence harvester's perspective, harvest surveys collect information that commonly is private and sensitive. Subsistence bird harvests are sensitive because spring and summer hunting was illegal until recently. Subsistence users fear that information provided in harvest surveys may be used to direct law enforcement efforts and to limit harvest practices that are essential for their diet and culture. To meet survey objectives, it is necessary to develop and maintain trust and collaboration between subsistence users and resource management agencies. Community and household participation in the survey were voluntary. Community consent to conduct surveys was granted as tribal council resolutions, and ethical principles for social science research were closely observed (Arctic Research Consortium of the United States (ARCUS) 1999:55–59; Naves 2012:7)[4]. Data at the household level are considered confidential, and data at the community level are sensitive. Archived materials did not include household names or other personal information for anonymity of household harvest reports. Household names were not used in harvest report forms and were not entered in the database (a numeric household identifier was used). Names on household lists were covered; lists not showing names were then photocopied and scanned for digital archiving together with other survey materials. Preliminary harvest estimates based on survey data are submitted to Alaska Native regional partners and other AMBCC partners for review before being adopted by the AMBCC in its annual spring meeting. Information from the survey is not to be used for punitive law enforcement purposes, nor has this been reported to have happened.

The household was the basic sampling unit. The sampling frame encompassed all occupied households in surveyed regions or subregions. At the community level, data collection relied on household lists including all resident households (appendices A and B). A household is considered resident if its members have lived in the community for at least the 12 months prior to the survey. Household lists did not include unoccupied dwellings, commercial buildings, and public buildings.

Local surveyors were trained by a regional partner or survey coordination staff. Harvest surveys were completed during face-to-face interviews conducted by a local surveyor. Survey respondents were instructed to report (1) all bird and egg harvests by all hunters in the household, including those given to other household(s); (2) to report the household's share of harvests done by a multi-individual harvesting party; and (3) not to report birds or eggs received from other household(s). A tracking sheet was used to document household contacts and participation (Appendix B). Alternate households were selected to replace households that declined to participate and households that could not be contacted after 3 reasonable attempts.

The harvest report form for Western Alaska was used to record the harvest of birds and eggs (Appendix C). The survey form included species important for subsistence uses or of management interest. Harvests of species not represented in the form can be reported in the field "other bird." Some species that are difficult to tell apart were combined in categories [teal, goldeneye, scaup, merganser, Canada/cackling goose, swan, grouse, ptarmigan, cormorant, tern, Bonaparte's/Sabine's gull, large gull, auklet, murre, guillemot, puffin, whimbrel/curlew, godwit, golden/black-bellied plover, turnstone, phalarope, small shorebird, Pacific loon, and grebe (Appendix D)]. The form had a sheet for each survey season (spring: 2 April–30 June, summer: 1 July–31 August, and fall: 1 September–31 October). The bird identification guide had color drawings of birds (Appendix E). A poster with color photographs

3. Federal Register Vol. 68, No. 139 (July 21, 2003) available online: http://www.gpo.gov/fdsys/pkg/FR-2003-07-21/pdf/03-18097.pdf.

4. See also Alaska Federation of Natives. 2013. "Alaska Federation of Natives Guidelines for Research." Alaska Native Knowledge Network. Accessed February 25, 2014. http://www.ankn.uaf.edu/IKS/afnguide.html.

of all species included in the survey assisted in species identification and outreach. On the poster, close to each photograph, appeared the species' English name and a blank field for writing Native and local names (Appendix F). Data collection staff used lists of local and Alaska Native species names to help in communicating with respondents and in species identification (Naves 2012; Naves and Zeller 2013).

Starting in 2012, loon species names were not displayed on the bird identification guide and harvest report form because of confusion generated by the English name "common loon," which is frequently understood as the locally most common species of loon, and because of differences between local ethnotaxonomy and Western taxonomy (Naves and Zeller 2013). A juvenile Pacific loon (*Gavia pacifica)* was added to represent nonbreeding plumages. Drawings depicted size differences among species. The common (*G. immer*) and the yellow-billed loons (*G. adamsii*) were presented side-by-side for comparison. Loon identification was based primarily on drawings related to numbers. The Pacific and Arctic (*G. arctica*) loons were combined, and adults in nonbreeding plumage and juveniles were treated as "nonbreeding" because these categories are difficult to tell apart. Data are presented using species names corresponding to the numeric labels [loon 1: Pacific-Arctic loon, loon 2: unidentified loon in nonbreeding plumage, loon 3: yellow-billed loon, loon 4: common loon, and loon 5: red-throated loon (*G. stellata*)].

Table 1.–Number of communities and households included in data analysis, 2004–2013.

Survey year	Communities included in harvest estimates	Households surveyed			
		Spring	Summer	Fall (or Fall–Winter)	Winter
2004	77	1,770	1,707	1,673	a
2005	75	2,226	2,251	1,742	a
2006	62	1,793	1,773	1,687	a
2007	74	2,076	2,051	1,491	a
2008	44	1,630	1,568	1,189	a
2009	27	923	909	762	a
2010	50	1,875	1,845	1,675	215
2011	25	1,335	1,176	1,197	36
2012	3	473	473	445	216
2013	20	600	600	599	b

Sources Survey results for 2004–2012 were reported in Naves (2010rev.; 2010; 2011; 2012; 2014b; Naves and Braem 2014).

a. In 2004–2009, for regions and subregions with a winter survey, data were recorded as fall–winter.

b. The only region surveyed (Yukon-Kuskokwim Delta) usually has no winter survey.

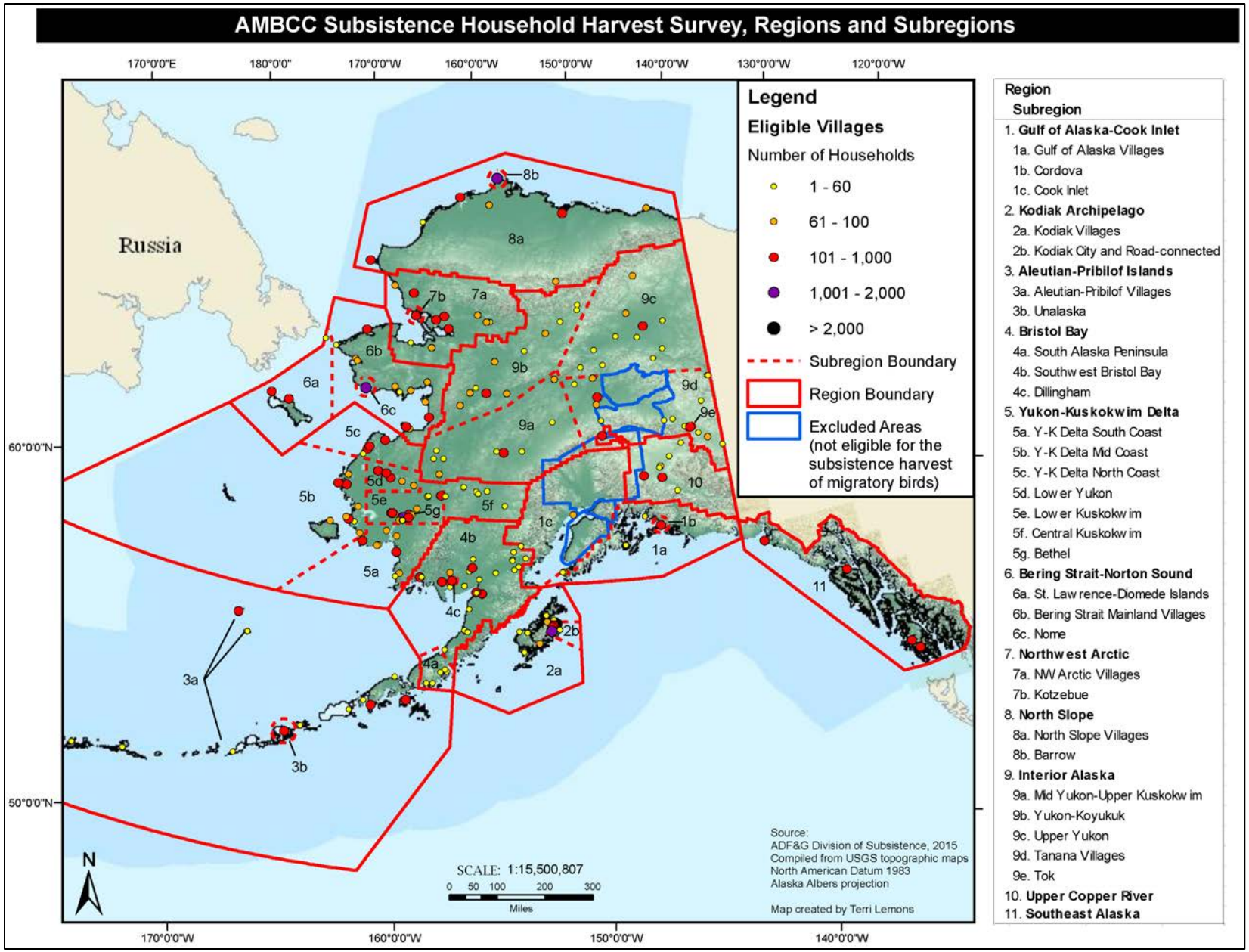

Figure 2.–Regions and subregions of the AMBCC harvest survey.

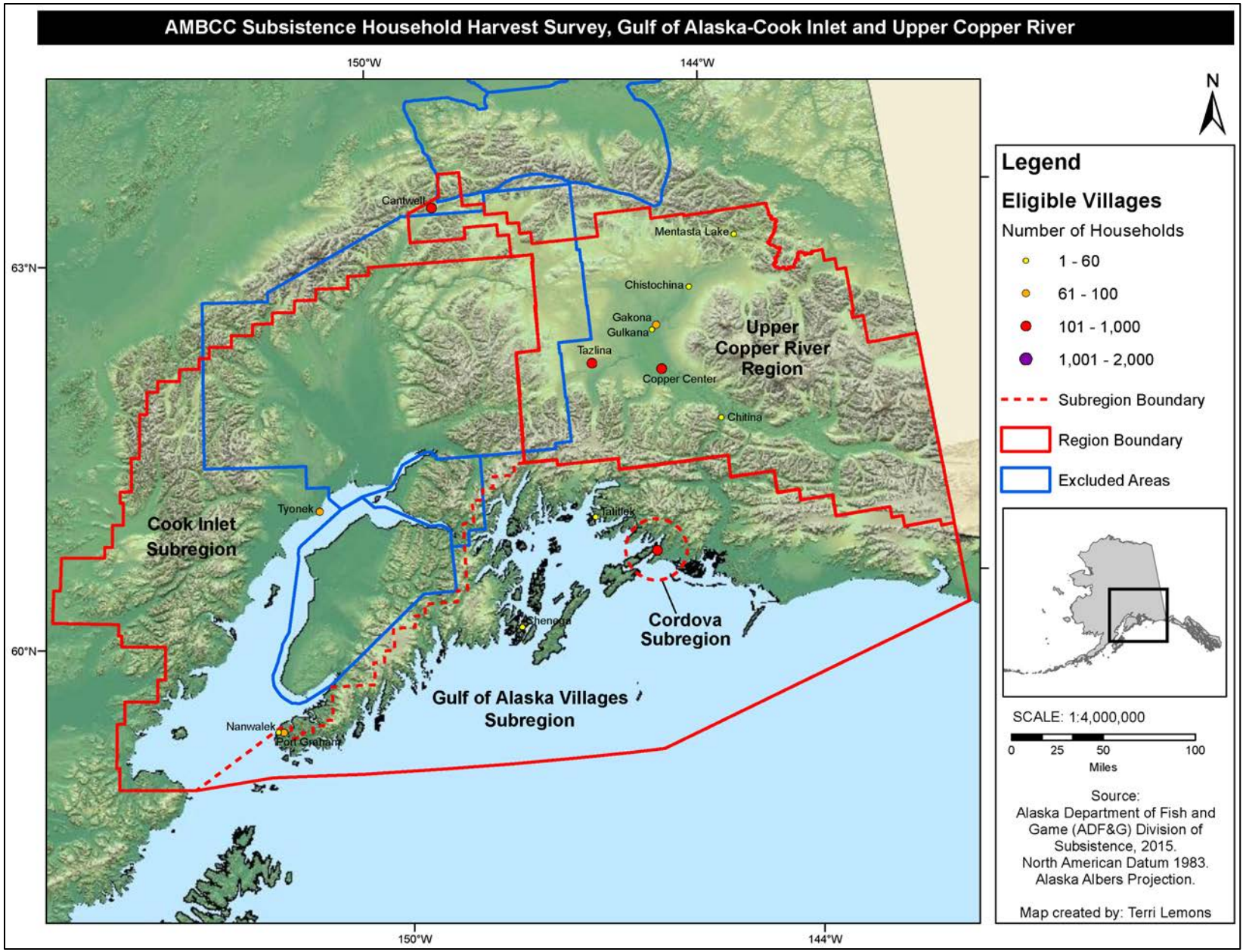

Figure 3.–Gulf of Alaska-Cook Inlet and Upper Copper River regions.

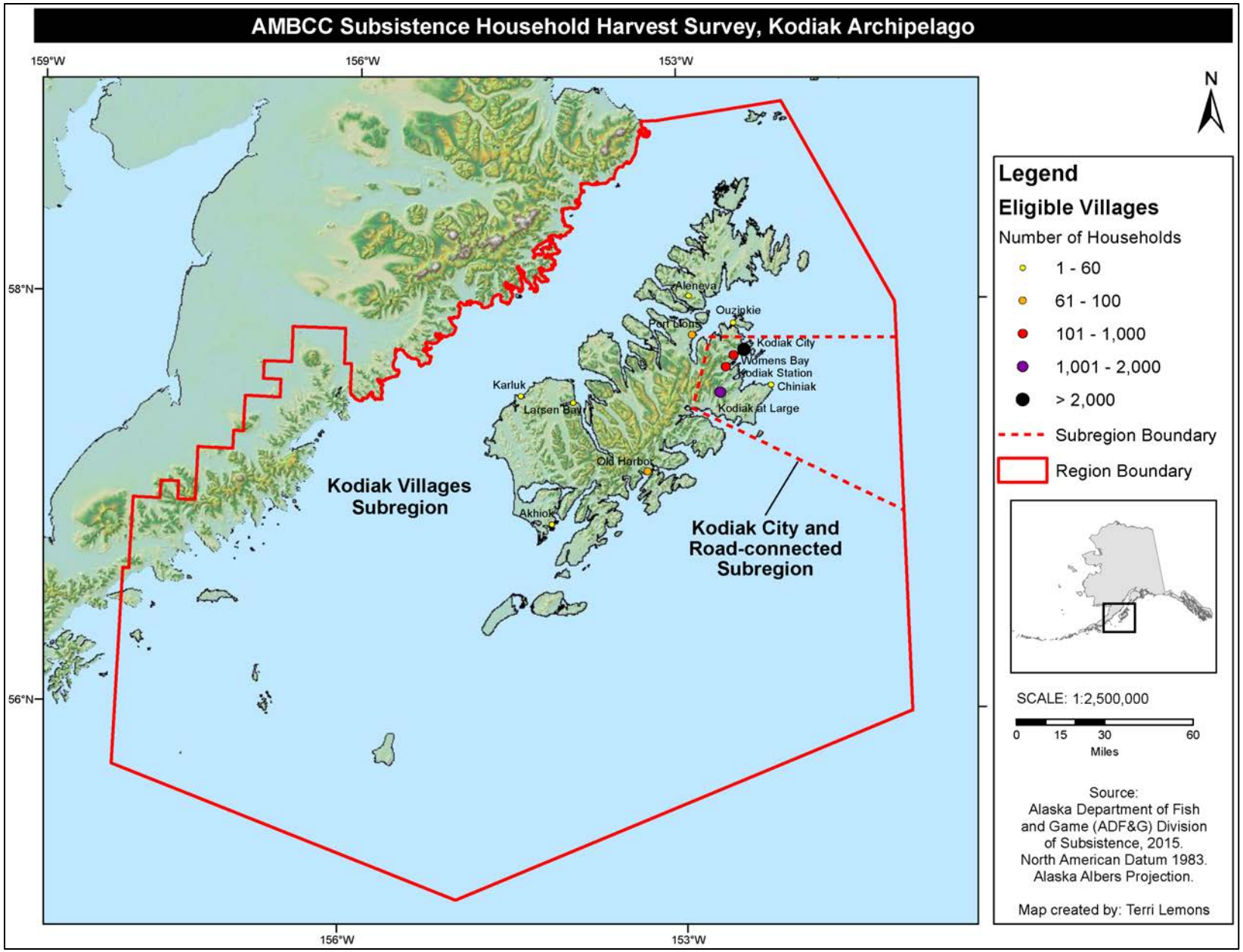

Figure 4.–Kodiak Archipelago region.

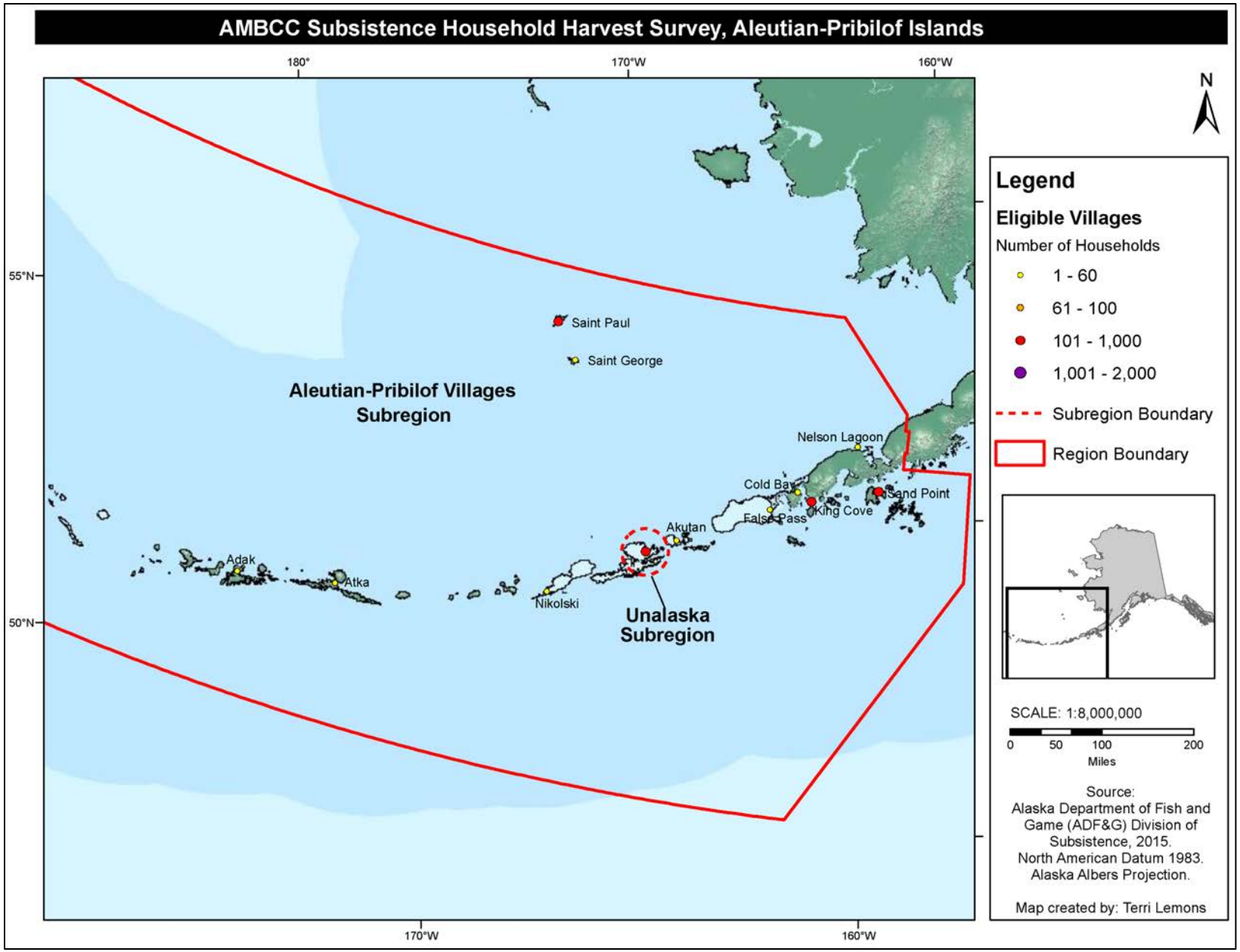

Figure 5.–Aleutian-Pribilof Islands region.

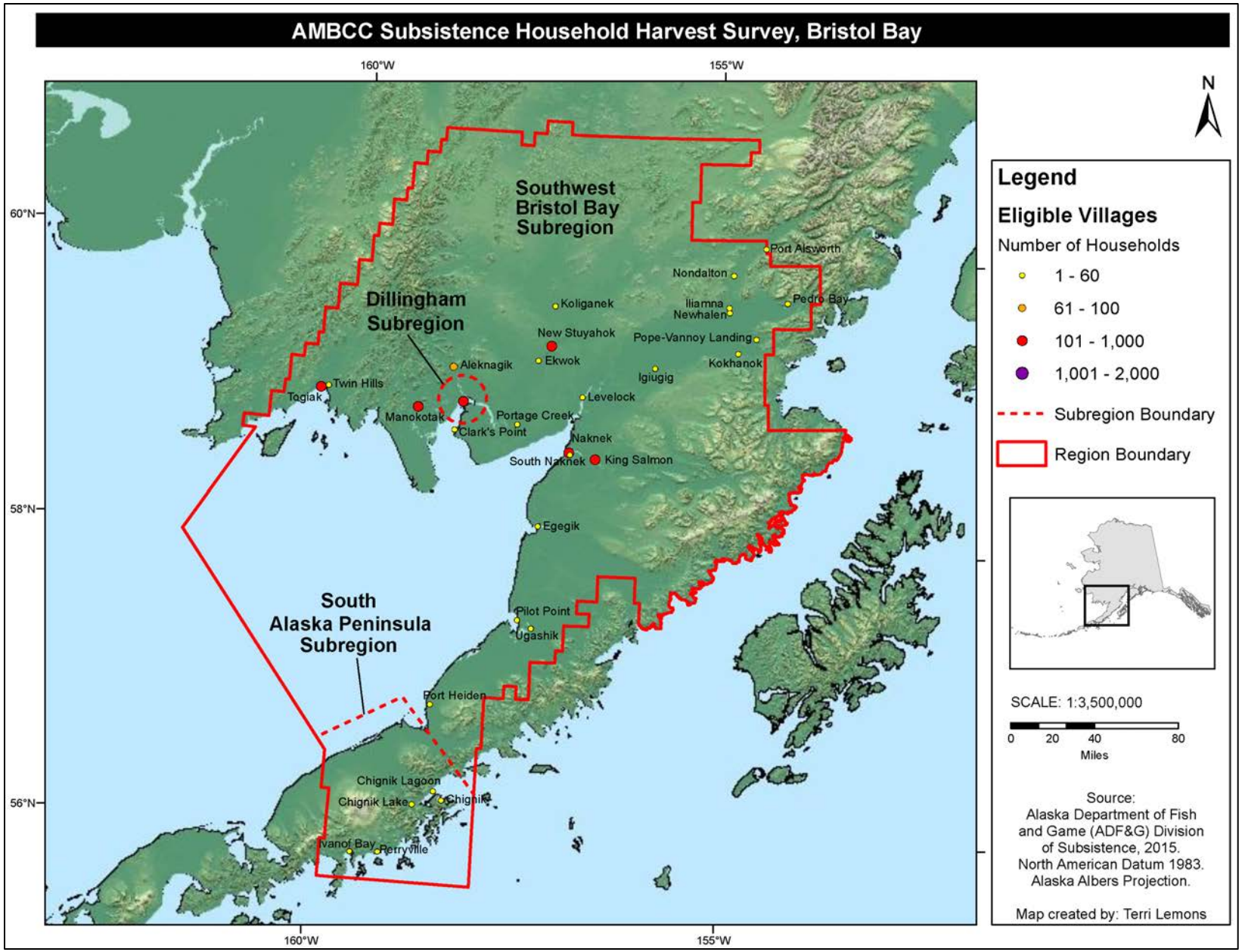

Figure 6.–Bristol Bay region.

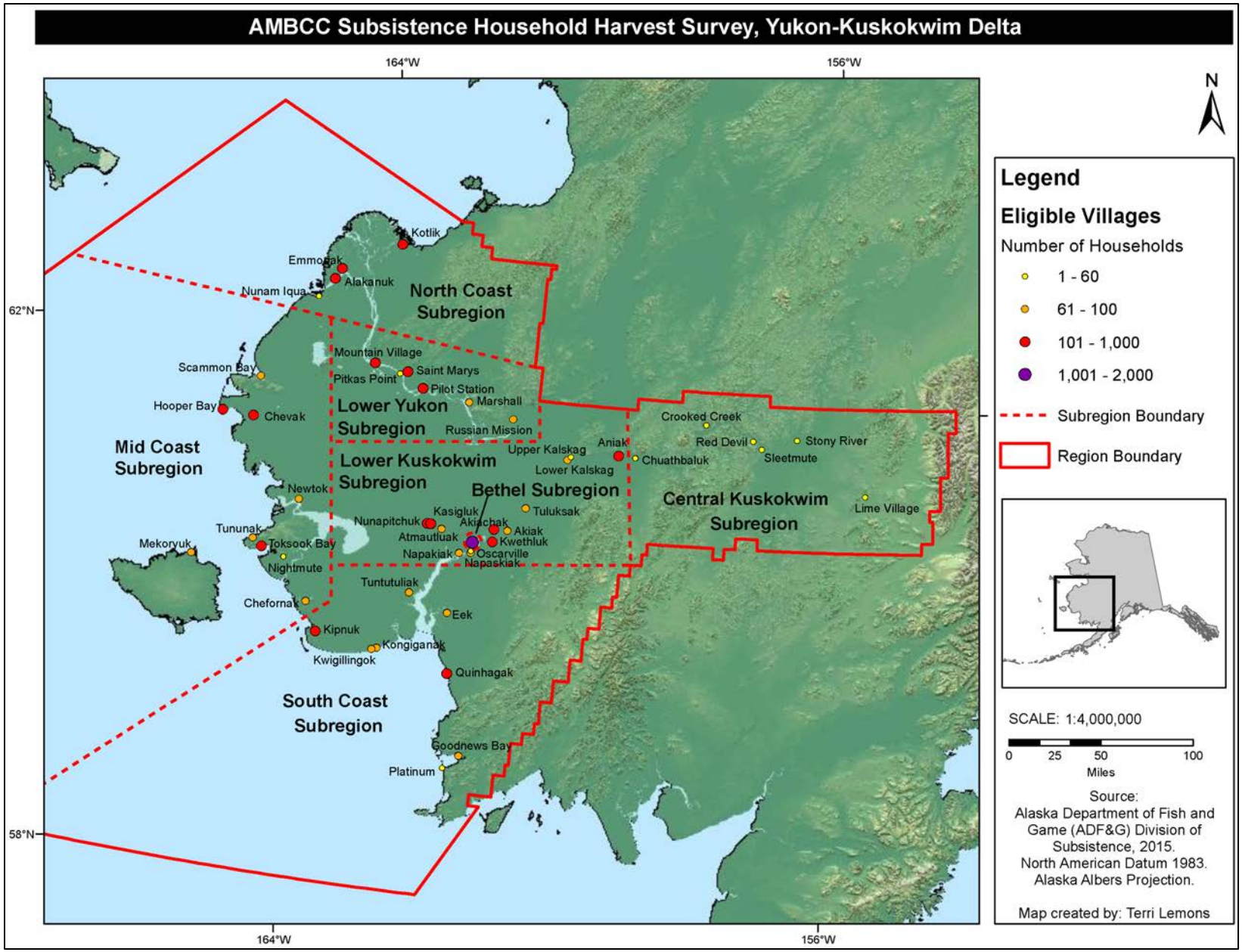

Figure 7.–Yukon-Kuskokwim Delta region.

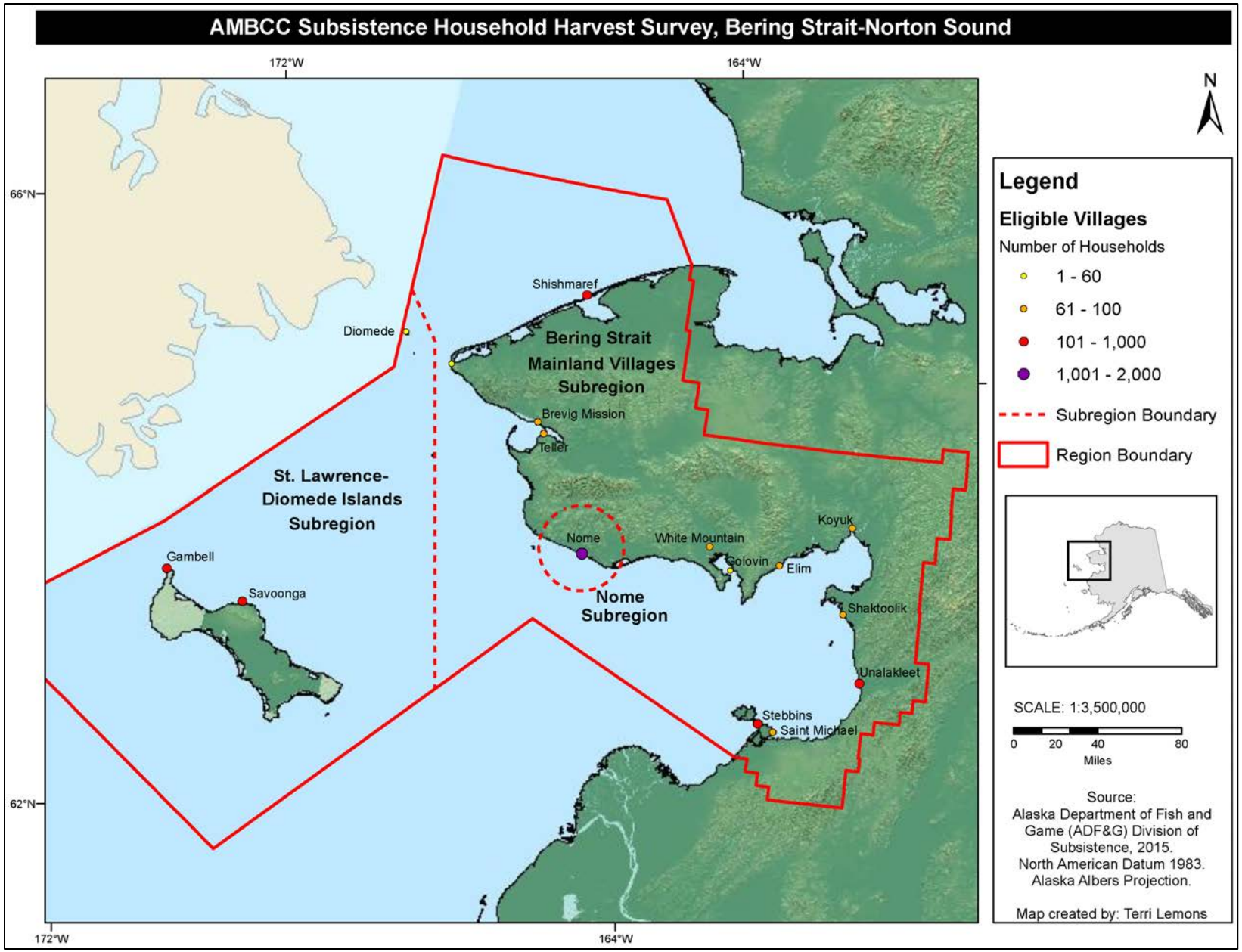

Figure 8.–Bering Strait-Norton Sound region.

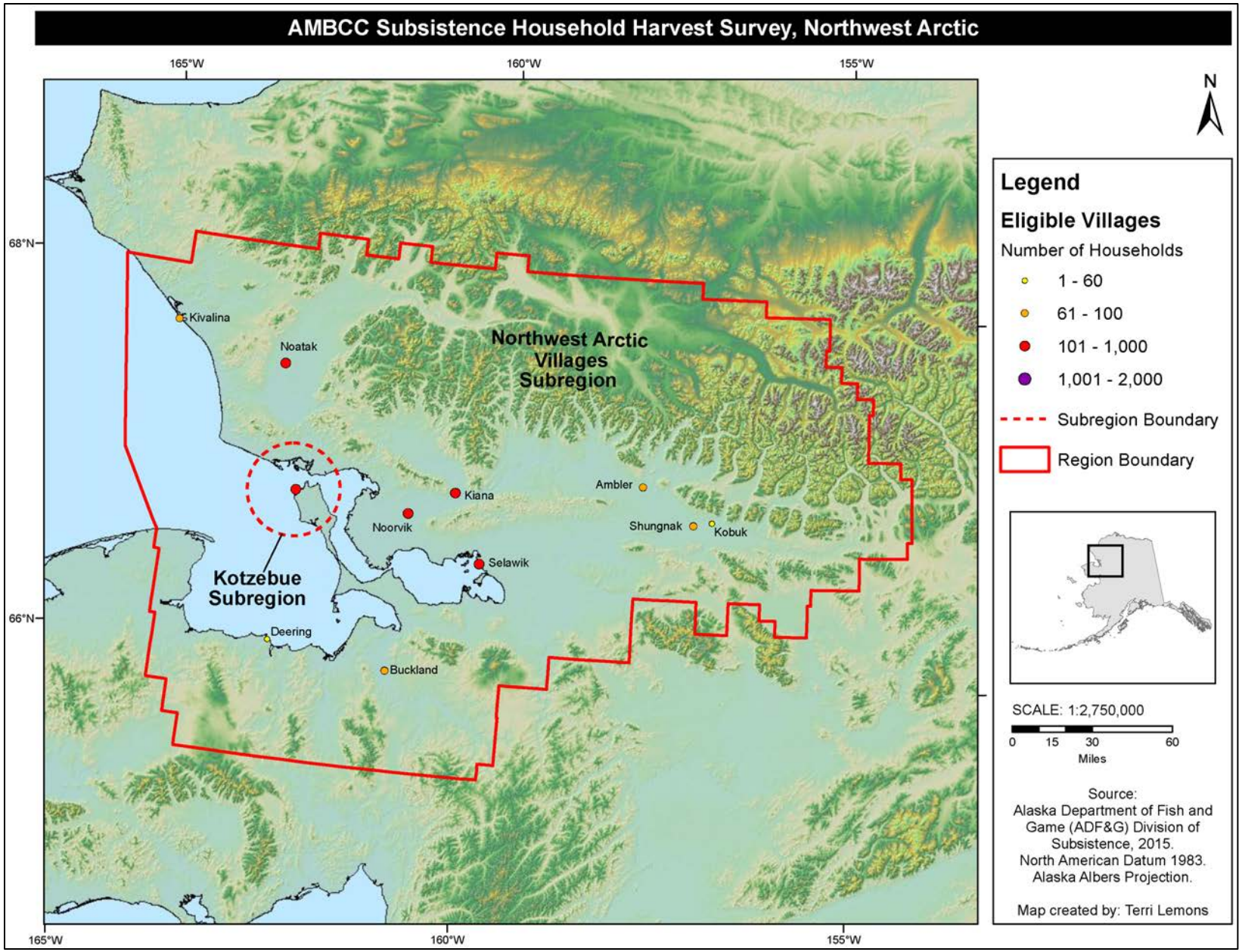

Figure 9.–Northwest Arctic region.

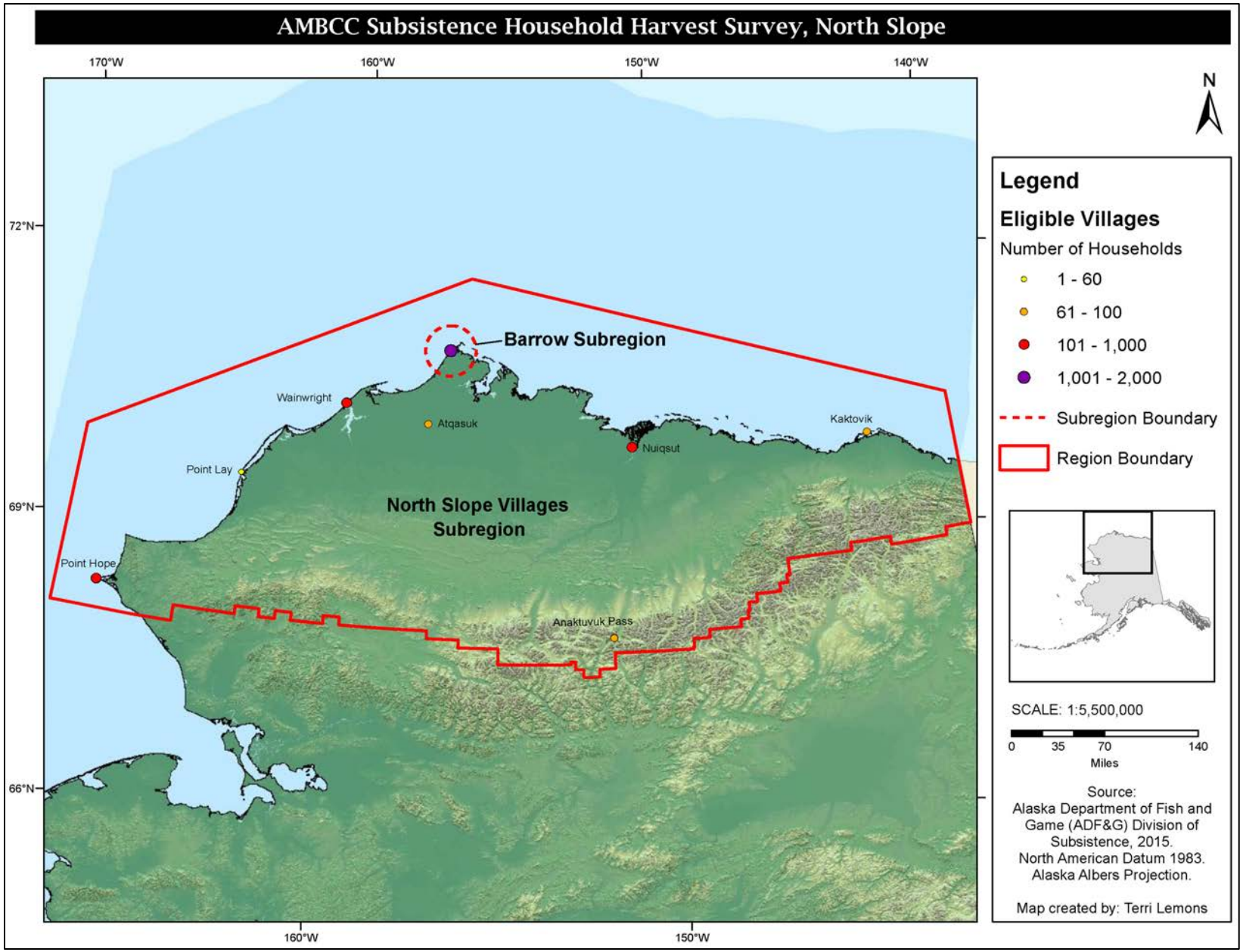

Figure 10.–North Slope region.

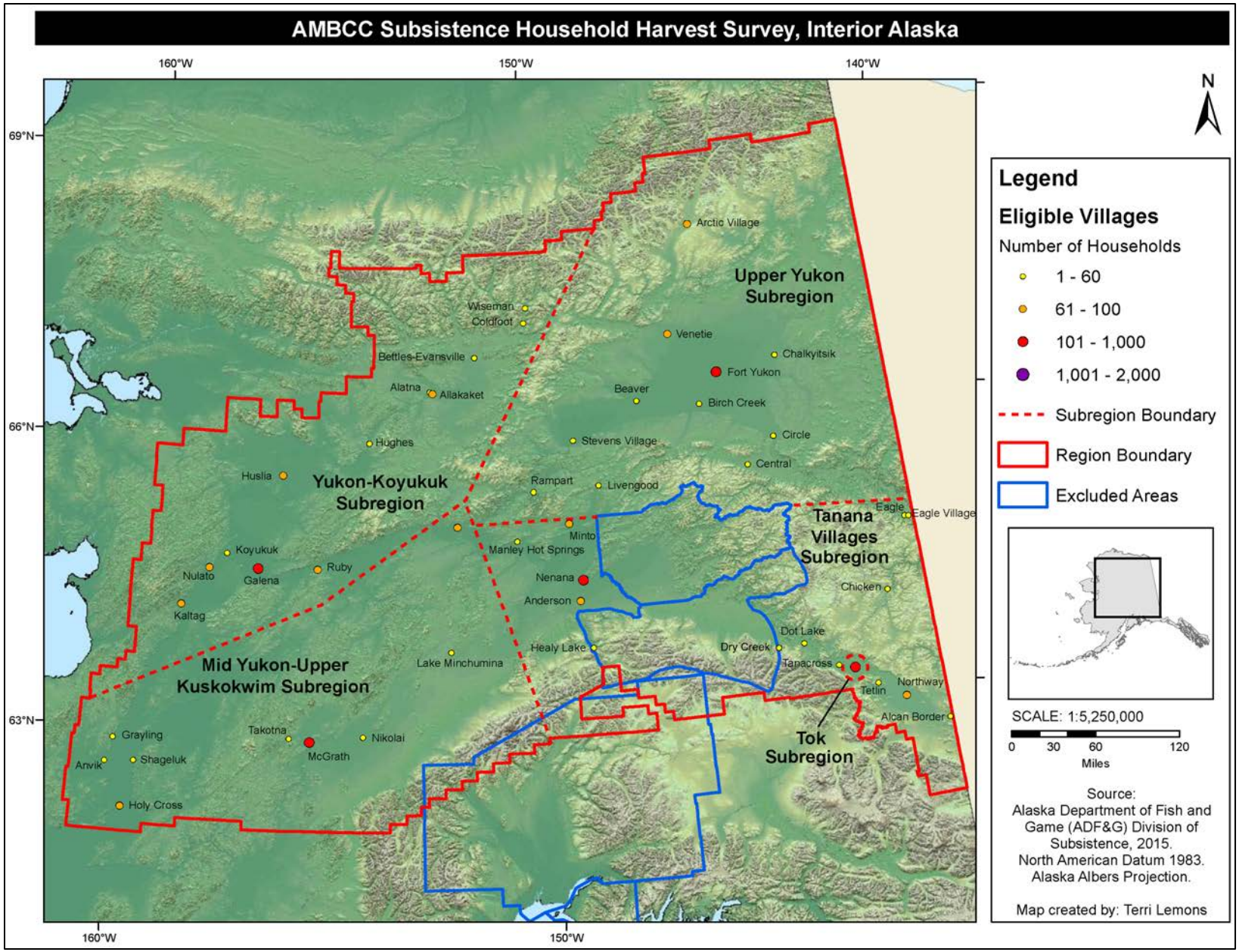

Figure 11.–Interior Alaska region.

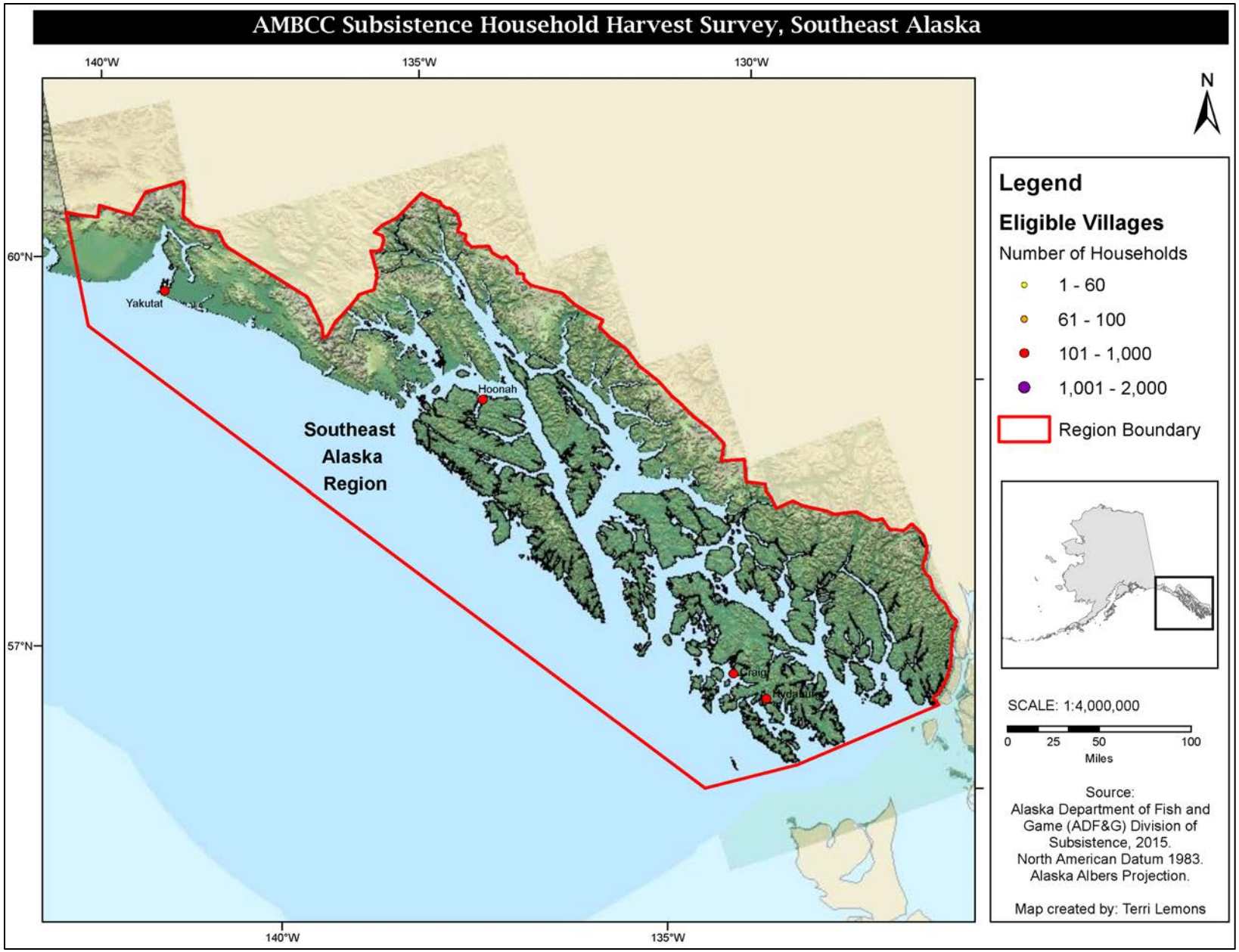

Figure 12.–Southeast Alaska region.

DATA ANALYSIS

Harvest Estimates

Data were entered in Microsoft Office Access 2010[5] forms designed to mimic survey forms. The raw data were stored in a Microsoft SQL Server Management Studio 2008 relational database. Double data entry and logic checks ensure accuracy of the data stored in the database (reported harvests, sampling method used, sample size, strata size). Logic checks and data analysis were done with IBM SPSS Statistics 19.0.0, 2010. Original survey forms were scanned and archived as digital files. To ensure anonymity of household harvest reports, household names or other personal information provided were covered prior to scanning and the original forms were not archived.

Reported harvests from surveyed communities were expanded to nonsurveyed communities in the same subregion. Harvest estimates and confidence intervals were based on Cochran (1977) and Bernard, Bingham, and Alexandersdottir (1998) (Appendix G). Harvest estimates were calculated for each season and annual estimates were calculated as the sum of seasonal harvests. For nonsurveyed communities, the number of occupied households was calculated by dividing 2013 population estimates (Alaska Department of Labor and Workforce Development 2014) by the number of people per household reported in the 2010 census (U.S. Census Bureau 2011). If the low end of the confidence intervals was less than the reported harvest, the calculated low end was replaced by the reported harvest. Data from communities for which sampling information was missing (e.g., household list, sampling method, or harvest level strata) were not included in analyses. In 2013, this was 1 out of 21 communities surveyed. Therefore, data analyses included 20 communities (Appendix H). Such cases were treated like nonsurveyed communities and were accounted for in the estimation of subregion harvests (average harvest of surveyed communities was applied to nonsurveyed communities).

Surveyors are instructed to assist households to report egg harvests in number of eggs. But occasionally, egg harvests are reported by volume and need to be converted to number of eggs. Five-gallon or 1-gallon buckets are containers commonly used in egg harvesting. Eggs of different sizes and shapes arrange differently in a given volume. The amount of empty space among eggs depends on egg size and shape and also on the shape of the container. Besides, people may use grass or moss between layers of eggs to prevent breaking them during transport. Therefore, the household can provide the best information on the number of eggs harvested. In the lack of this information, conversion of egg volume to numbers of eggs (Table 3) was done by relating the size of wild bird eggs to the size of large eggs of domestic chicken (J. Magdanz, Subsistence Resource Specialist, ADF&G, Kotzebue, Alaska, personal communication) considering that a 1-gallon bucket holds 48 large chicken eggs (24 oz per dozen, U.S. Department of Agriculture standard).

The subsistence harvest survey covers a large geographic area and a large number of species. Some species are abundant and harvested in relatively large numbers. Other species are harvested only occasionally because they have small populations, restricted distribution, or are not widely used for subsistence purposes. Wide-coverage sampling designs such as the AMBCC survey cannot address both commonly- and rarely-harvested species with the same level of precision (Copp and Roy 1986:11, H-15). Few data points for species rarely harvested may result in less accurate harvest estimates and wider confidence intervals as compared to species commonly harvested. Dedicated harvest surveys and specific analytical procedures would be required to accurately estimate harvests of species that have small populations, low densities, or limited distributions, and that are less likely to be precisely documented in the regular statewide subsistence harvest survey.

5. Product names are given for scientific completeness or because they are established standards for the State of Alaska; they do not constitute product endorsement.

Table 2.–Estimated conversion factors, egg volume to number of eggs.

Species	Number of eggs in 5-gallon bucket	Number of eggs in 1-gallon bucket	References for egg volumes
Mallard	261	52	Drilling, Titman, and Mckinney (2002)
Northern pintail	327	65	Austin and Miller (1995)
Murres	126	25	Ainley et al. (2002)
Mew gull	261	52	Moskoff and Bevier (2002)
Black-legged kittiwake	263	53	Hatch, Robertson, and Baird (1994)
Herring gull	147	29	Pierotti and Good (1994)
Glaucous-winged gull	147	29	Hayward and Verbeek (2008)
Glaucous gull	121	24	Weiser and Gilchrist (2012)
Arctic tern	716	143	Hatch (2002)
Large gull[a]	147	29	Weiser and Gilchrist (2012)
Greater white-fronted goose	105	21	Ely and Dzubin (1994)
Brant	136	27	Lewis et al. (2013)

a. Based on glaucous gull egg size.

Community Participation Rate

Community participation rate was calculated as the number of communities that agreed to participate divided by the total number of communities where contact was attempted. The total number of communities where contact was attempted included (a) communities that agreed to participate, (b) communities that did not agree to participate, and (c) communities where multiple contact attempts were made without a response (which may suggest lack of interest or willingness to participate in the survey).

Household Participation Rate

This report presents updated 2004–2013 household participation rates including data previously unavailable for analyses and improved analytical procedures. In 2004–2009, the survey used permission slip forms to document household participation in the survey. Issues in the use of permission slips have been identified and are listed in items a–d below (Naves et al. 2008:18–19; Naves 2010rev.:25, 178; Naves 2010:24, 60; Naves 2011:26, 48). In 2010–present, the survey has used a tracking sheet form to document household participation. The tracking sheet was developed to address issues identified with permission slips (Naves et al. 2008:18–19; Naves 2012:29, 32, 92). In the text below, a "community-year" refers to a survey conducted in a specific community and year.

a) Permission slips were not completed for a surveyed community-year or all slips completed were not submitted for data analysis. It is difficult to differentiate between these two cases;

b) Permission slips were not completed for some households in a surveyed community-year;

c) Permission slips were completed incorrectly ("no" represented "no harvest" or "no contact" rather than "no consent to conduct the survey"); and

d) The survey is to be conducted with multiple seasonal recall periods (spring, summer, fall, and in some regions, winter). Household consent is to be completed at the first household contact (before the spring data collection). However, data collection procedures do not allow for documenting whether individual households that initially agreed (or disagreed) to participate in the survey later declined (or agreed) to participate in one or more seasonal recall surveys.

Updated household participation rates presented here were calculated as follows:

1) Region and subregion household participation rates have been calculated based on the data available at the time of analysis. In this update, additional household participation data recently received were included, mainly for the Yukon-Kuskokwim Delta region;

2) Identified cases where "no" in permission slips could represent "no contact" or "no harvest" rather than "no consent" were not included in the analysis of household participation rates (16 community-years);

3) Standard survey methods are for contacting only households selected to participate in the survey. Identified cases where all households in a community-year were contacted to request household participation in the survey were not included in anlaysis because of potential effects of non-standard data collection procedures on participation rates (55 community-years);

4) Other cases involving diverse non-standard household participation data collection issues where identified and were also not included in data analysis (13 community-years);

5) After these considerations, the analysis of household participation in the survey included 322 community-years.

6) For community-years with available household consent information, household consent was considered as agreement for all households for which a harvest report form was provided for any season. This procedure was not implemented for communities for which household participation information was not available in order to not artificially inflate participation rates in the absence of information on cases of no consent;

7) Household participation rate was calculated as the number of households that agreed to participate divided by the total number of households contacted. The total number of households contacted included (a) households that agreed to participate and (b) households that did not agree to participate.

RESULTS AND DISCUSSION

Annual region and subregion harvest estimates (all species combined) were summarized in Table 5 (birds) and Table 6 (eggs), which indicate that estimates detailed by species and seasons are available in the following subregion tables (tables 7–16). Harvest estimate tables included all species represented in the harvest report form. The categories duck (unidentified), goose (unidentified), gull (unidentified), and other/unknown bird were included only if harvest in these categories was reported.

Information on sampling effort was presented as footnotes to harvest estimate tables. For subregion tables, "sampling effort" referred to the number of communities included in the analysis (Appendix H) and the proportion of subregion households represented in the sample (number of households in surveyed communities in relation to the total number of households in the subregion). Deviations from standard survey methods were also presented as table footnotes (e.g., incomplete geographic coverage or nonstandard community sampling approaches). Detected unusually high or low harvest estimates are indicated by an asterisk "*" in the respective tables.

In 2013, 24 communities were invited to participate in the survey, of which 2 commuinites declined to participate (Table 3). The 2013 household participation rates and updated rates for previous years are presented in Table 4.

In previous AMBCC harvest assessment program research (Naves and Zeller 2013, Naves 2014), St. Lawrence Island birds and eggs harvest estimates (1993–2012) have been compiled for data review. Recently, a handout was produced to facilitate communication and outreach with the local communities and it is documented in this report as Appendix I.

Table 3.–Community participation rate, AMBCC harvest survey 2013.

	Communities in subregion	Contacted communities	Communities that agreed to participate in the survey	Community participation rate
Yukon-Kuskokwim Delta region	47	23	21	91.3%

Note Community participation rate equals (=) number of communities that agreed to participate divided by (÷) number of communities contacted.

Table 4.–Household participation rate, AMBCC harvest survey 2004–2013.

Region	2004		2005		2006		2007		2008		2009		2010		2011		2012		2013	
Subregion	Partici-pation	N	Partici-pation	N	Partici-pation	N	Partici-pation	N	Partici-pation	N	Partici-pation	N	Partici-pation	N	Partici-pation	N	Partici-pation	N	Partici-pation	N
Gulf of Alaska-Cook Inlet	**98%**	**55**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gulf of Alaska Villages	100%	41	-	-	85%	26	-	-	-	-	-	-	100%	65	-	-	-	-	-	-
Cordova	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cook Inlet	93%	14	71%	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kodiak Archipelago	-	-	-	-	**85%**	**137**	-	-	-	-	-	-	**95%**	**289**	-	-	-	-	-	-
Kodiak Villages	100%	†65	-	-	99%	76	-	-	-	-	-	-	97%	115	-	-	-	-	-	-
Kodiak City & Road Connected	-	-	-	-	69%	61	-	-	-	-	-	-	93%	174	-	-	-	-	-	-
Aleutian-Pribilof Islands	-	-	-	-	-	-	-	-	**100%**	**226**	-	-	-	-	-	-	-	-	-	-
Aleutian-Pribilof Villages	-	-	98%	40	-	-	100%	25	99%	87	-	-	-	-	-	-	-	-	-	-
Unalaska	-	-	-	-	-	-	-	-	100%	139	-	-	-	-	-	-	-	-	-	-
Bristol Bay			**78%**	**249**	-	-	**93%**	**312**	**98%**	**360**	-	-	-	-	**96%**	**407**	-	-	-	-
South Alaska Peninsula	*	*	-	-	-	-	93%	29	*	*	-	-	-	-	89%	44	-	-	-	-
Southwest Bristol Bay	*	*	73%	113	*	*	90%	166	96%	156	-	-	-	-	96%	243	-	-	-	-
Dillingham	-	-	81%	136	-	-	97%	117	100%	204	-	-	-	-	99%	120	-	-	-	-
Yukon-Kuskokwim Delta	**84%**	**642**	**88%**	**787**	**75%**	**787**	**70%**	**682**	**72%**	**464**	**67%**	**523**	**89%**	**609**	**96%**	**493**	-	-	**98%**	**521**
Y-K Delta South Coast	95%	106	100%	124	78%	90	92%	144	*	*	68%	95	97%	112	100%	115	-	-	99%	120
Y-K Delta Mid Coast	82%	214	81%	232	90%	175	77%	92	72%	111	61%	168	80%	155	90%	156	-	-	94%	90
Y-K Delta North Coast	100%	58	92%	38	58%	107	57%	92	79%	87	80%	99	100%	77	100%	56	-	-	100%	93
Lower Yukon	83%	42	86%	180	89%	72	67%	231	*	*	*	*	100%	65	99%	88	-	-	100%	101
Lower Kuskokwim	76%	222	90%	213	69%	270	55%	123	65%	239	63%	161	81%	186	96%	78	-		98%	117
Central Kuskokwim	*	*	-	-	74%	73	*	*	-	-	-	-	100%	14	-	-	-	-	-	-
Bethel	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-	-	-	-
Bering Strait-Norton Sound	**71%**	**528**	**81%**	**347**	-	-	**90%**	**439**	-	-	-	-	**81%**	**489**	-	-	-	-	-	-
St. Lawrence-Diomede Islands	76%	112	87%	75	-	-	95%	86	-	-	42%	‡191	76%	308	94%	283	96%	272	-	-
Bering Strait Mainland Villages	84%	206	79%	142	-	-	93%	161	-	-	-	-	91%	181	-	-	-	-	-	-
Nome	57%	210	81%	130	-	-	86%	192	-	-	-	-	-	-	-	-	-	-	-	-
Northwest Arctic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northwest Arctic Villages	-	-	-	-	98%	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kotzebue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82%	266	-	-
North Slope	-	-	**93%**	**619**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North Slope Villages	-	-	90%	395	-	-	*	*	*	*	*	*	-	-	-	-	-	-	-	-
Barrow	-	-	98%	224	-	-	*	*	*	*	*	*	-	-	-	-	-	-	-	-
Interior	-	-	-	-	**98%**	**544**	-	-	-	-	-	-	**99%**	**523**	-	-	-	-	-	-
Mid Yukon-Upper Kuskokwin	*	*	*	*	*	*	-	-	-	-	-	-	100%	90	-	-	-	-	-	-
Yukon-Koyukuk	*	*	*	*	90%	83	100%	52	100%	52	-	-	97%	132	-	-	-	-	-	-
Upper Yukon	*	*	-	-	98%	274	100%	144	-	-	-	-	100%	109	-	-	-	-	-	-
Tanana Villages	99%	102	-	-	100%	127	-	-	-	-	-	-	100%	60	-	-	-	-	-	-
Tok	-	-	-	-	100%	60	-	-	-	-	-	-	100%	132	-	-	-	-	-	-
Upper Copper River	**100%**	**55**	-	-	-	-	**94%**	**33**	-	-	-	-	-	-	-	-	-	-	-	-

N: Number of households contacted. Household participation rate equals (=) number of households that agreed to participate divided by (÷) number of households contacted.

Note: The number of households contacted may differ from the number of households actually surveyed.

Gray background: surveyed subregions and regions. -: Subregion, region not surveyed. *: Household consent data not available for analysis.

‡: 2009 Household participation in St. Lawrence-Diomede Islands subregion may have been affected by interference with other surveys being conducted in that year.

†: 2004 Data collection not completed in Kodiak Villages subregion, harvest data not available although household participation data was provided.

Table 5.–Annual estimated bird harvest, all subregions and regions (total birds), AMBCC survey, 2004–2013.

Regions, subregions	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Gulf of Alaska-Cook Inlet[e]	**2,995**	*****	*****	**-**	**-**	**-**	*****	**-**	**-**	**-**
Gulf of Alaska Villages	2,756	-	596	-	-	-	1,049	-	-	-
Cordova	-	-	-	-	-	-	-	-	-	-
Cook Inlet	239	13	-	-	-	-	-	-	-	-
Kodiak Archipelago	**-**	**-**	*****	**-**	**-**	**-**	**6,926**	**-**	**-**	**-**
Kodiak Villages	-	-	5,552	-	-	-	1,947	-	-	-
Kodiak City & Road-connected	-	-	a	-	-	-	4,979	-	-	-
Aleutian-Pribilof Islands	**-**	*****	**-**	*****	**8,401**	**-**	**-**	**-**	**-**	**-**
Aleutian-Pribilof Villages	-	16,876	-	(7,371)	7,642	-	-	-	-	-
Unalaska	-	-	-	-	760	-	-	-	-	-
Bristol Bay	*****	**47,336**	*****	**28,285**	**32,995**	**-**	**-**	**30,081**	**-**	**-**
South Alaska Peninsula	801	-	-	968	(115)	-	-	833	-	-
Southwest Bristol Bay	14,955	32,769	(26,715)	20,169	(29,352)	-	-	26,601	-	-
Dillingham	-	11,769	-	7,148	3,527	-	-	2,650	-	-
Yukon-Kuskokwim Delta	**130,343**	**114,514**	**171,856**	**148,715**[b]	**79,088**	**195,082**	**142,834**	**110,611**	**-**	*****
Y-K Delta South Coast	25,764	35,508	31,918	33,927	19,999	35,203	17,537	37,834	-	33,417
Y-K Delta Mid Coast	34,480	17,546	(61,998)	43,737	17,160	82,654	37,363	13,899	-	58,770
Y-K Delta North Coast	8,806	11,206	4,493	1,206	4,867	13,637	4,920	-	-	5,839
Lower Yukon	(6,201)	6,815	10,269	3,988	4,727	6,904	(7,748)	-	-	10,863
Lower Kuskokwim	46,033	16,557	48,849	58,983	22,813	44,934	(7,1317)	(32,826)		- (65,081)
Central Kuskokwim	440	-	1,167	219	-	-	(659)	-	-	-
Bethel[c]	8,618	23,954	13,163	6,654[b]	7,789	7,478	3,290	2,539	-	-
Bering Strait-Norton Sound	**53,576**	**74,115**	**-**	**123,257**	**-**	*****	*****	*****	*****	**-**
St. Lawrence-Diomede Is.	‡	‡	-	‡	-	41,176	14,054	12,077	8,848	-
Bering Strait Mainland Villages	‡	‡	-	‡	-	-	20,719	-	-	-
Nome	‡	‡	-	‡	-	-	-	-	-	-
Northwest Arctic	**-**	**-**	*****	**-**	**-**	**-**	**-**	**-**	*****	**-**
Northwest Arctic Villages	-	-	9,676	-	-	-	-	-	-	-
Kotzebue	-	-	-	-	-	-	-	-	4,437	-
North Slope	**-**	**15,615**	**-**	**44270**[d]	**45,123**	**19,075**	**-**	**-**	**-**	**-**
North Slope Villages	-	‡	-	‡	‡	‡	-	-	-	-
Barrow	-	‡	-	‡	‡	‡	-	-	-	-
Interior Alaska	**50,995**	*****	**37,068**	*****	*****	**-**	**32,611**	**-**	**-**	**-**
Mid Yukon-Upper Kuskokwim	(3,086)	2,744	697	-	-	-	(786)	-	-	-
Yukon-Koyukuk	3,108	(930)	(1,764)	(3,031)	(6,908)	-	4,532	-	-	-
Upper Yukon	(14,418)	-	10,927	18,402	-	-	(12,692)	-	-	-
Tanana Villages	20,388	-	17,358	-	-	-	(14,086)	-	-	-
Tok	-	-	6,321[d]	-	-	-	515[d]	-	-	-
Upper Copper River[e]	**1,120**	-	-	**247**	-	-	-	-	-	-

Source Survey results for 2004–2012 were reported in Naves (2010a; 2010b; 2011; 2012; 2014b; 2014c).

-: Region/subregion not surveyed. *****: Less than 75% of region households represented in sample, region harvest estimates not produced.

(In parenthesis): Less than 30% of subregion households represented in the sample and/or only 1 out of several subregion villages surveyed.

‡: Subregion harvest estimates not released.

a: Fall-winter bird harvest data not available for Kodiak City and Road-connected subregion; annual harvest estimates calculated for eggs only.

b: Does not include fall bird harvest for Bethel subregion.

c: Bethel harvest expansions assume that harvester households account for 30% of the total village households (village size estimates).

d: Barrow subregion harvest estimates assumed simple random sampling.

e: A subsistence bird hunt was first authorized in Cordova in 2014. Therefore, 2004 region harvest estimates do not include this subregion.

Table 6.–Annual estimated egg harvest, all subregions and regions (total eggs), AMBCC survey, 2004–2013.

Regions, subregions	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Gulf of Alaska-Cook Inlet[e]	**2,178**	*	*	-	-	-	*	-	-	-
Gulf of Alaska Villages	2,173	-	102	-	-	-	1,366	-	-	-
Cordova	-	-	-	-	-	-	-	-	-	-
Cook Inlet	5	0	-	-	-	-	-	-	-	-
Kodiak Archipelago	-	-	**5,222**	-	-	-	**803**	-	-	-
Kodiak Villages	-	-	4,545	-	-	-	771	-	-	-
Kodiak City & Road-connected	-	-	(677[a])	-	-	-	32	-	-	-
Aleutian-Pribilof Islands	-	*	-	*	**4,778**	-	-	-	-	-
Aleutian-Pribilof Villages	-	11,733	-	6,127	4,018	-	-	-	-	-
Unalaska	-	-	-	-	760	-	-	-	-	-
Bristol Bay	*	**47,799**	*	**30,801**	**47,653**	-	-	**25,211**	-	-
South Alaska Peninsula	409	-	-	651	(106)	-	-	392	-	-
Southwest Bristol Bay	54,437	39,206	(31,292)	25,118	(37,630)	-	-	21,105	-	-
Dillingham	-	5,768	-	5,032	9,917	-	-	3,716	-	-
Yukon-Kuskokwim Delta	**27,288**	**22,268**	**30,723**	**19,153**	**31,195**	**58,995**	**26,965**	**54,075**	-	*
Y-K Delta South Coast	7,768	13,424	7,406	1,746	8,442	29,065	6,208	26,492	-	21,605
Y-K Delta Mid Coast	14,598	2,140	(21,354)	11,930	16,195	24,640	19,137	15,213	-	7,963
Y-K Delta North Coast	2,466	3,921	188	22	554	345	1,619	-	-	8,240
Lower Yukon	(191)	652	232	565	0	386	(0)	-	-	1,392
Lower Kuskokwim	2,265	1,302	1,498	4,891	5,298	3,087	(0)	(877)	-	(6,995)
Central Kuskokwim	0	-	15	0	-	-	(0)	-	-	-
Bethel[b]	0	261	29	0	23	179	0	0	-	-
Bering Strait-Norton Sound	**99,494**	**113,082**	-	**146,557**	-	*	*	*	*	-
St. Lawrence-Diomede Is.	‡	‡	-	‡	-	117,174	55,682	20,999	29,701	-
Bering Strait Mainland Villages	‡	‡	-	‡	-	-	13,910	-	-	-
Nome	‡	‡	-	‡	-	-	-	-	-	-
Northwest Arctic	-	-	*	-	-	-	-	-	*	-
Northwest Arctic Villages	-	-	10,081	-	-	-	-	-	-	-
Kotzebue	-	-	-	-	-	-	-	-	5,896	-
North Slope	-	**4,705**	-	**2388**[c]	**858**	**2,430**	-	-	-	-
North Slope Villages	-	‡	-	‡	‡	‡	-	-	-	-
Barrow	-	‡	-	‡	‡	‡	-	-	-	-
Interior Alaska	**1,009**	*	**911**	*	*	-	**65**	-	-	-
Mid Yukon-Upper Kuskokwim	(0)	2	0	-	-	-	(0)	-	-	-
Yukon-Koyukuk	11	(0)	(0)	(0)	(0)	-	22	-	-	-
Upper Yukon	(40)	-	0	0	-	-	(0)	-	-	-
Tanana Villages	760	-	875	-	-	-	(43)	-	-	-
Tok	-	-	36[c]	-	-	-	0	-	-	-
Upper Copper River[d]	**82**	-	-	**0**	-	-	-	-	-	-

Source Survey results for 2004–2012 were reported in Naves (2010a; 2010b; 2011; 2012; 2014b; 2014c).

-: Region/subregion not surveyed. *****: Less than 75% of region households represented in sample, region harvest estimates not produced.

‡: Subregion harvest estimates not released.

(In parenthesis): Less than 30% of subregion households represented in the sample and/or only 1 out of several subregion villages surveyed.

a: Harvest estimates based on a sample of only known harvester households.

b: Bethel harvest expansions assume that harvester households account for 30% of the total village households (village size estimates).

c: Barrow subregion harvest estimates assumed simple random sampling.

d: Sampling and harvest expansions represent Alaska Native households only.

e: A subsistence bird hunt was first authorized in Cordova in 2014. Therefore, 2004 region harvest estimates do not include this subregion.

Table 7.–Estimated bird harvest, Yukon-Kuskokwim Delta region, South Coast subregion, 2013.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported number	Estimated number	Confidence Interval		Spring		Summer		Fall	
			CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
American wigeon	31	536	47%	284 – 789	246	121%	0		291	103%
Teal	51	214	38%	132 – 295	48	83%	0		165	56%
Mallard	152	1,424	29%	1,012 – 1,835	554	82%	16	130%	854	53%
Northern pintail	224	2,070	32%	1,405 – 2,735	1,194	76%	0		876	70%
Northern shoveler	52	470	32%	320 – 620	239	70%	0		231	73%
Black scoter	98	502	30%	349 – 654	253	55%	0		249	59%
Surf scoter	15	35	150%	15 – 89	35	150%	0		0	
White-winged scoter	36	160	53%	75 – 245	95	92%	0		65	90%
Bufflehead	0	0		-	0		0		0	
Goldeneye	80	599	39%	367 – 832	324	62%	0		275	110%
Canvasback	23	86	60%	34 – 138	53	81%	0		33	122%
Scaup	123	1,212	35%	786 – 1,638	459	72%	0		753	81%
Common eider	31	73	123%	31 – 163	66	135%	0		7	150%
King eider	77	278	82%	77 – 507	278	87%	0		0	
Spectacled eider	0	0		-	0		0		0	
Steller's eider	4	9	106%	4 – 20	5	150%	0		5	150%
Harlequin duck	0	0		-	0		0		0	
Long-tailed duck	6	33	77%	8 – 58	30	117%	0		3	130%
Merganser	79	793	35%	514 – 1,072	553	61%	0		240	124%
Total ducks	1,082	8,494	28%	6,112 – 10,877	4,433	61%	16	130%	4,046	67%
Geese										
Black brant	371	1,348	27%	980 – 1,717	819	37%	7	150%	522	64%
Cackling/Canada goose	798	5,039	17%	4,198 – 5,880	2,938	26%	24	104%	2,077	45%
Greater white-fronted goose	685	5,925	23%	4,560 – 7,289	3,686	41%	12	117%	2,227	67%
Emperor goose	57	196	36%	125 – 267	111	51%	0		85	77%
Snow goose	34	190	54%	88 – 293	48	74%	0		142	95%
Total geese	1,945	12,698	18%	10,367 – 15,029	7,602	29%	43	86%	5,053	53%
Tundra swan	90	925	26%	680 – 1,170	376	44%	0		549	61%
Sandhill crane	27	189	33%	126 – 252	184	54%	0		5	106%
Seabirds										
Cormorant	0	0		-	0		0		0	
Tern	20	64	119%	20 – 139	64	130%	0		0	
Black-legged kittiwake	0	0		-	0		0		0	
Bonaparte's/Sabine's gull	0	0		-	0		0		0	
* Mew gull	112	356	82%	112 – 649	356	89%	0		0	
* Large gull	70	414	84%	70 – 762	414	117%	0		0	
Auklet	0	0		-	0		0		0	
Murre	0	0		-	0		0		0	
Guillemot	0	0		-	0		0		0	
Puffin	0	0		-	0		0		0	
Total seabirds	202	834	60%	332 – 1,336	834	75%	0		0	
Shorebirds										
Whimbrel/Curlew	25	59	150%	25 – 148	0		0		59	150%
Godwit	0	0		-	0		0		0	
Golden/Black-bellied plover	0	0		-	0		0		0	
Turnstone	0	0		-	0		0		0	
Phalarope	0	0		-	0		0		0	
Small shorebird	0	0		-	0		0		0	
Total shorebirds	25	59	150%	25 – 148	0		0		59	150%
Loons and grebes										
Common loon	0	0		-	0		0		0	
Pacific loon	0	0		-	0		0		0	
Red-throated loon	0	0		-	0		0		0	
Yellow-billed loon	0	0		-	0		0		0	
Loon (non-breeding plumage)	0	0		-	0		0		0	
Grebe	0	0		-	0		0		0	
Total loons and grebes	0	0		-	0		0		0	
Total migratory birds	3,371	23,199	21%	18,317 – 28,081	13,429	37%	59	82%	9,711	58%
Ptarmigans and grouses										
Grouse	0	0		-	0		0		0	
Ptarmigan	1,993	10,218	35%	6,678 – 13,758	10,120	41%	24	150%	74	112%
Total ptarmigans and grouses	1,993	10,218	35%	6,678 – 13,758	10,120	41%	24	150%	74	112%
Total birds	5,364	33,417	20%	26,779 – 40,055	23,549	32%	82	72%	9,785	58%

Sampling effort (Yukon-Kuskokwim South Coast subregion, 2013): 4 out of 8 villages in this subregion were included in analysis; 42% of subregion households were represented in the sample. -: Reported harvest = 0. *: Detected unusually high or low harvest estimates. Note on mew gull and large gull: during data review, regional partners indicated that gulls are not usually harvested for human consumption in this subregion; reported harvest may refer to unusual harvests or harvests of gull eggs rather than birds.

Table 8.–Estimated egg harvest, Yukon-Kuskokwim Delta region, South Coast subregion, 2013.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	Estimated	Confidence Interval		Spring		Summer	
	number	number	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
American wigeon	0	0		-	0		0	
Teal	0	0		-	0		0	
Mallard	8	19	150%	8 – 47	19	150%	0	
Northern pintail	30	161	57%	69 – 253	161	78%	0	
Northern shoveler	16	51	119%	16 – 111	51	130%	0	
Black scoter	0	0		-	0		0	
Surf scoter	8	25	119%	8 – 56	25	130%	0	
White-winged scoter	1	3	119%	1 – 7	3	130%	0	
Bufflehead	0	0		-	0		0	
Goldeneye	0	0		-	0		0	
Canvasback	0	0		-	0		0	
Scaup	0	0		-	0		0	
Common eider	7	22	119%	7 – 49	22	130%	0	
King eider	9	29	119%	9 – 63	29	130%	0	
Spectacled eider	0	0		-	0		0	
Steller's eider	0	0		-	0		0	
Harlequin duck	0	0		-	0		0	
Long-tailed duck	11	35	119%	11 – 76	35	130%	0	
Merganser	0	0		-	0		0	
Total ducks	90	345	63%	127 – 564	345	72%	0	
Geese								
Black brant	0	0		-	0		0	
Cackling/Canada goose	115	526	44%	293 – 760	526	54%	0	
Greater white-fronted goose	135	693	48%	361 – 1,025	693	64%	0	
Emperor goose	14	45	119%	14 – 97	45	130%	0	
Snow goose	0	0		-	0		0	
Total geese	264	1,264	41%	747 – 1,781	1,264	52%	0	
Tundra swan	56	240	65%	85 – 394	240	76%	0	
Sandhill crane	13	59	75%	14 – 103	59	92%	0	
Seabirds								
Cormorant	0	0		-	0		0	
Jaeger (unidentified)	2	5	150%	2 – 12	5	150%	0	
Tern	695	1,678	66%	695 – 2,792	1,678	66%	0	
Black-legged kittiwake	35	154	73%	41 – 266	154	96%	0	
Bonaparte's/Sabine's gull	0	0		-	0		0	
Mew gull	440	1,418	55%	642 – 2,193	1,418	59%	0	
Large gull	340	1,136	69%	357 – 1,916	1,136	71%	0	
Auklet	0	0		-	0		0	
Murre	3,950	14,872	33%	10,022 – 19,722	14,872	37%	0	
Guillemot	0	0		-	0		0	
Puffin	0	0		-	0		0	
Total seabirds	5,462	19,263	30%	13,418 – 25,107	19,263	33%	0	
Shorebirds								
Whimbrel/Curlew	0	0		-	0		0	
Godwit	6	35	84%	6 – 65	35	117%	0	
Golden/Black-bellied plover	38	90	94%	38 – 174	90	94%	0	
Turnstone	0	0		-	0		0	
Phalarope	0	0		-	0		0	
Small shorebird	38	168	58%	71 – 265	168	72%	0	
Total shorebirds	82	293	54%	133 – 453	293	60%	0	
Loons and grebes								
Common loon	0	0		-	0		0	
Pacific loon	1	6	84%	1 – 11	6	117%	0	
Red-throated loon	0	0		-	0		0	
Yellow-billed loon	0	0		-	0		0	
Grebe	0	0		-	0		0	
Total loons and grebes	1	6	84%	1 – 11	6	117%	0	
Total migratory birds	5,968	21,469	28%	15,412 – 27,526	21,469	31%	0	
Ptarmigans and grouses								
Grouse	0	0		-	0		0	
Ptarmigan	29	136	74%	35 – 237	136	100%	0	
Total ptarmigans and grouses	29	136	74%	35 – 237	136	100%	0	
Total eggs	5,997	21,605	28%	15,531 – 27,678	21,605	31%	0	

Sampling effort (Yukon-Kuskokwim South Coast subregion, 2013): 4 out of 8 villages in this subregion were included in analysis; 42% of subregion households were represented in the sample. -: Reported harvest = 0.

Table 9.–Estimated bird harvest, Yukon-Kuskokwim Delta region, Mid-Coast subregion, 2013.

	Species	Annual bird harvest				Seasonal estimated bird harvest					
		Reported	Estimated	Confidence Interval		Spring		Summer		Fall	
		number	number	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks											
	American wigeon	322	1,766	22%	1,380 – 2,153	587	38%	460	29%	719	70%
	Teal	83	655	36%	416 – 894	266	46%	0		389	91%
	Mallard	390	2,249	13%	1,951 – 2,547	1,328	22%	320	29%	601	34%
	Northern pintail	1,342	6,018	20%	4,794 – 7,242	1,505	48%	2,359	26%	2,154	65%
	Northern shoveler	140	504	28%	363 – 645	73	67%	332	41%	100	55%
	Black scoter	0	0		-	0		0		0	
	Surf scoter	0	0		-	0		0		0	
	White-winged scoter	0	0		-	0		0		0	
	Bufflehead	0	0		-	0		0		0	
	Goldeneye	0	0		-	0		0		0	
	Canvasback	0	0		-	0		0		0	
	Scaup	43	215	52%	104 – 325	0		0		215	73%
	Common eider	95	332	25%	247 – 416	332	28%	0		0	
*	King eider	1,864	7,345	18%	6,010 – 8,679	7,285	20%	10	118%	49	117%
	Spectacled eider	0	0		-	0		0		0	
	Steller's eider	0	0		-	0		0		0	
	Harlequin duck	0	0		-	0		0		0	
	Long-tailed duck	389	1,181	24%	903 – 1,459	516	33%	214	55%	451	39%
	Merganser	0	0		-	0		0		0	
	Duck (unidentified)	4	30	58%	13 – 48	12	120%	0		19	117%
	Total ducks	4,672	20,295	12%	17,837 – 22,754	11,903	17%	3,695	26%	4,698	37%
Geese											
	Black brant	974	5,668	12%	4,997 – 6,339	5,175	14%	74	106%	419	51%
	Cackling/Canada goose	1,160	8,105	11%	7,218 – 8,992	4,438	15%	249	59%	3,417	24%
	Greater white-fronted goose	1,317	7,601	11%	6,737 – 8,466	6,074	15%	122	61%	1,406	37%
	Emperor goose	360	1,743	14%	1,493 – 1,993	1,693	15%	0		51	121%
	Snow goose	94	1,073	58%	446 – 1,701	0		0		1,073	92%
	Total geese	3,905	24,191	10%	21,700 – 26,681	17,379	11%	446	48%	6,366	33%
Tundra swan		118	814	19%	658 – 970	791	20%	0		23	120%
Sandhill crane		273	1,684	17%	1,396 – 1,972	1,620	21%	18	91%	46	93%
Seabirds											
	Cormorant	0	0		-	0		0		0	
	Tern	0	0		-	0		0		0	
	Black-legged kittiwake	0	0		-	0		0		0	
	Bonaparte's/Sabine's gull	0	0		-	0		0		0	
	Mew gull	0	0		-	0		0		0	
	Large gull	0	0		-	0		0		0	
	Auklet	0	0		-	0		0		0	
	Murre	0	0		-	0		0		0	
	Guillemot	0	0		-	0		0		0	
	Puffin	0	0		-	0		0		0	
	Total seabirds	0	0		-	0		0		0	
Shorebirds											
	Whimbrel/Curlew	0	0		-	0		0		0	
	Godwit	640	1,926	28%	1,385 – 2,466	90	132%	120	93%	1,715	30%
	Golden/Black-bellied plover	0	0		-	0		0		0	
	Turnstone	0	0		-	0		0		0	
	Phalarope	0	0		-	0		0		0	
	Small shorebird	0	0		-	0		0		0	
	Total shorebirds	640	1,926	28%	1,385 – 2,466	90	132%	120	93%	1,715	30%
Loons and grebes											
	Common loon	0	0		-	0		0		0	
	Pacific loon	0	0		-	0		0		0	
	Red-throated loon	0	0		-	0		0		0	
	Yellow-billed loon	0	0		-	0		0		0	
	Loon (non-breeding plumage)	0	0		-	0		0		0	
	Grebe	0	0		-	0		0		0	
	Total loons and grebes	0	0		-	0		0		0	
	Total migratory birds	9,608	48,910	10%	44,129 – 53,691	31,783	12%	4,279	25%	12,847	28%
Ptarmigans and grouses											
	Grouse	0	0		-	0		0		0	
	Ptarmigan	1,441	9,860	16%	8,280 – 11,441	9,761	19%	69	120%	30	132%
	Total ptarmigans and grouses	1,441	9,860	16%	8,280 – 11,441	9,761	19%	69	120%	30	132%
	Total birds	11,049	58,770	10%	53,003 – 64,537	41,544	13%	4,348	25%	12,878	28%

Sampling effort (Yukon-Kuskokwim Delta Mid-Coast subregion, 2013): 5 out of 9 villages in this subregion were included in analysis; 42% of subregion households were represented in the sample. -: Reported harvest = 0. *: Detected unusually high or low harvest estimates.

Table 10.–Estimated egg harvest, Yukon-Kuskokwim Delta region, Mid-Coast subregion, 2013.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	Estimated	Confidence Interval		Spring		Summer	
	number	number	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
American wigeon	0	0		-	0		0	
Teal	0	0		-	0		0	
Mallard	15	146	52%	71 – 222	146	81%	0	
Northern pintail	24	148	83%	25 – 271	148	117%	0	
Northern shoveler	0	0		-	0		0	
Black scoter	0	0		-	0		0	
Surf scoter	0	0		-	0		0	
White-winged scoter	0	0		-	0		0	
Bufflehead	0	0		-	0		0	
Goldeneye	0	0		-	0		0	
Canvasback	0	0		-	0		0	
Scaup	0	0		-	0		0	
Common eider	0	0		-	0		0	
King eider	0	0		-	0		0	
Spectacled eider	0	0		-	0		0	
Steller's eider	0	0		-	0		0	
Harlequin duck	0	0		-	0		0	
Long-tailed duck	0	0		-	0		0	
Merganser	0	0		-	0		0	
Total ducks	39	295	49%	150 – 439	295	71%	0	
Geese								
Black brant	22	113	65%	40 – 187	113	83%	0	
Cackling/Canada goose	1,047	3,394	24%	2,577 – 4,212	3,394	24%	0	
Greater white-fronted goose	1,001	3,312	24%	2,524 – 4,101	3,312	24%	0	
Emperor goose	9	52	61%	20 – 83	52	84%	0	
Snow goose	0	0		-	0		0	
Total geese	2,079	6,872	23%	5,288 – 8,455	6,872	23%	0	
Tundra swan	0	0		-	0		0	
Sandhill crane	2	10	90%	2 – 20	10	118%	0	
Seabirds								
Cormorant	0	0		-	0		0	
Tern	0	0		-	0		0	
Black-legged kittiwake	0	0		-	0		0	
Bonaparte's/Sabine's gull	0	0		-	0		0	
Mew gull	20	103	90%	20 – 196	103	118%	0	
Large gull	220	683	39%	419 – 948	683	40%	0	
Auklet	0	0		-	0		0	
Murre	0	0		-	0		0	
Guillemot	0	0		-	0		0	
Puffin	0	0		-	0		0	
Total seabirds	240	787	37%	492 – 1,081	787	41%	0	
Shorebirds								
Whimbrel/Curlew	0	0		-	0		0	
Godwit	0	0		-	0		0	
Golden/Black-bellied plover	0	0		-	0		0	
Turnstone	0	0		-	0		0	
Phalarope	0	0		-	0		0	
Small shorebird	0	0		-	0		0	
Total shorebirds	0	0		-	0		0	
Loons and grebes								
Common loon	0	0		-	0		0	
Pacific loon	0	0		-	0		0	
Red-throated loon	0	0		-	0		0	
Yellow-billed loon	0	0		-	0		0	
Grebe	0	0		-	0		0	
Total loons and grebes	0	0		-	0		0	
Total migratory birds	2,360	7,963	22%	6,198 – 9,728	7,963	22%	0	
Ptarmigans and grouses								
Grouse	0	0		-	0		0	
Ptarmigan	0	0		-	0		0	
Total ptarmigans and grouses	0	0		-	0		0	
Total eggs	2,360	7,963	22%	6,198 – 9,728	7,963	22%	0	

Sampling effort (Yukon-Kuskokwim Delta Mid-Coast subregion, 2013): 5 out of 9 villages in this subregion were included in analysis; 42% of subregion households were represented in the sample. -: Reported harvest = 0.

Table 11.–Estimated bird harvest, Yukon-Kuskokwim Delta region, North Coast subregion, 2013.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	Estimated	Confidence Interval		Spring		Summer		Fall	
	number	number	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
American wigeon	29	167	32%	113 – 221	95	61%	0		71	89%
Teal	0	0		-	0		0		0	
Mallard	26	134	34%	88 – 180	86	63%	0		48	97%
Northern pintail	37	198	27%	145 – 251	143	50%	0		55	79%
Northern shoveler	12	65	40%	39 – 91	26	117%	0		39	73%
Black scoter	0	0		-	0		0		0	
Surf scoter	0	0		-	0		0		0	
White-winged scoter	0	0		-	0		0		0	
Bufflehead	0	0		-	0		0		0	
Goldeneye	0	0		-	0		0		0	
Canvasback	4	19	52%	9 – 29	5	134%	0		14	99%
Scaup	0	0		-	0		0		0	
Common eider	1	5	85%	1 – 9	0		0		5	134%
King eider	0	0		-	0		0		0	
Spectacled eider	0	0		-	0		0		0	
Steller's eider	0	0		-	0		0		0	
Harlequin duck	0	0		-	0		0		0	
Long-tailed duck	0	0		-	0		0		0	
Merganser	0	0		-	0		0		0	
Duck (unidentified)	64	322	25%	243 – 401	187	49%	0		135	55%
Total ducks	173	908	20%	728 – 1,089	542	39%	0		367	47%
Geese										
Black brant	80	412	17%	340 – 484	270	34%	0		142	32%
Cackling/Canada goose	185	922	17%	762 – 1,083	745	29%	0		177	33%
Greater white-fronted goose	178	872	22%	676 – 1,068	767	36%	0		105	40%
Emperor goose	12	65	30%	45 – 84	43	61%	0		22	68%
Snow goose	39	193	40%	115 – 271	179	66%	0		14	141%
Total geese	494	2,464	17%	2,049 – 2,878	2,004	28%	0		459	31%
Tundra swan	65	333	15%	284 – 381	191	28%	0		141	29%
Sandhill crane	47	242	16%	204 – 280	127	31%	0		115	31%
Seabirds										
Cormorant	0	0		-	0		0		0	
Tern	0	0		-	0		0		0	
Black-legged kittiwake	0	0		-	0		0		0	
Bonaparte's/Sabine's gull	0	0		-	0		0		0	
Mew gull	0	0		-	0		0		0	
Large gull	0	0		-	0		0		0	
Auklet	0	0		-	0		0		0	
Murre	0	0		-	0		0		0	
Guillemot	0	0		-	0		0		0	
Puffin	0	0		-	0		0		0	
Total seabirds	0	0		-	0		0		0	
Shorebirds										
Whimbrel/Curlew	0	0		-	0		0		0	
Godwit	0	0		-	0		0		0	
Golden/Black-bellied plover	0	0		-	0		0		0	
Turnstone	0	0		-	0		0		0	
Phalarope	0	0		-	0		0		0	
Small shorebird	0	0		-	0		0		0	
Total shorebirds	0	0		-	0		0		0	
Loons and grebes										
Common loon	0	0		-	0		0		0	
Pacific loon	0	0		-	0		0		0	
Red-throated loon	0	0		-	0		0		0	
Yellow-billed loon	0	0		-	0		0		0	
Loon (non-breeding plumage)	0	0		-	0		0		0	
Grebe	0	0		-	0		0		0	
Total loons and grebes	0	0		-	0		0		0	
Total migratory birds	779	3,947	14%	3,380 – 4,513	2,865	25%	0		1,082	31%
Ptarmigans and grouses										
Grouse	0	0		-	0		0		0	
Ptarmigan	389	1,892	35%	1,235 – 2,549	1,806	56%	0		87	94%
Total ptarmigans and grouses	389	1,892	35%	1,235 – 2,549	1,806	56%	0		87	94%
Total birds	1,168	5,839	19%	4,751 6,926	4,670	33%	0		1,168	30%

Sampling effort (Yukon-Kuskokwim Delta North Coast subregion, 2013): 2 out of 4 villages in this subregion were included in analysis; 62% of subregion households were represented in the sample. -: Reported harvest = 0.

Table 12.–Estimated egg harvest, Yukon-Kuskokwim Delta region, North Coast subregion, 2013.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	Estimated	Confidence Interval		Spring		Summer	
	number	number	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
American wigeon	58	302	39%	184 – 419	302	60%	0	
Teal	0	0		–	0		0	
Mallard	26	152	54%	69 – 235	152	89%	0	
Northern pintail	43	230	44%	128 – 331	230	70%	0	
Northern shoveler	9	43	85%	9 – 80	43	134%	0	
Black scoter	0	0		-	0		0	
Surf scoter	0	0		-	0		0	
White-winged scoter	0	0		-	0		0	
Bufflehead	0	0		-	0		0	
Goldeneye	0	0		-	0		0	
Canvasback	0	0		-	0		0	
Scaup	0	0		-	0		0	
Common eider	0	0		-	0		0	
King eider	0	0		-	0		0	
Spectacled eider	0	0		-	0		0	
Steller's eider	0	0		-	0		0	
Harlequin duck	0	0		-	0		0	
Long-tailed duck	0	0		-	0		0	
Merganser	0	0		-	0		0	
Duck (unidentified)	667	3,418	22%	2,670 – 4,166	3,418	30%	0	
Total ducks	803	4,145	21%	3,277 – 5,013	4,145	28%	0	
Geese								
* Black brant	134	699	26%	516 – 883	699	38%	0	
Cackling/Canada goose	228	1,219	23%	940 – 1,499	1,219	32%	0	
Greater white-fronted goose	85	432	30%	300 – 563	432	45%	0	
Emperor goose	16	77	62%	29 – 125	77	96%	0	
Snow goose	8	39	85%	8 – 71	39	134%	0	
Total geese	471	2,466	23%	1,905 – 3,027	2,466	32%	0	
Tundra swan	120	659	26%	486 – 831	659	38%	0	
Sandhill crane	66	349	27%	255 – 443	349	39%	0	
Seabirds								
Cormorant	0	0		-	0		0	
Tern	0	0		-	0		0	
Black-legged kittiwake	0	0		-	0		0	
Bonaparte's/Sabine's gull	0	0		-	0		0	
Mew gull	27	168	65%	58 – 279	168	107%	0	
Large gull	40	215	63%	79 – 351	215	101%	0	
Auklet	0	0		-	0		0	
Murre	0	0		-	0		0	
Guillemot	0	0		-	0		0	
Puffin	0	0		-	0		0	
Total seabirds	67	383	54%	176 – 591	383	87%	0	
Shorebirds								
Whimbrel/Curlew	0	0		-	0		0	
Godwit	0	0		-	0		0	
Golden/Black-bellied plover	0	0		-	0		0	
Turnstone	0	0		-	0		0	
Phalarope	0	0		-	0		0	
Small shorebird	5	35	85%	5 – 65	35	141%	0	
Total shorebirds	5	35	85%	5 – 65	35	141%	0	
Loons and grebes								
Common loon	0	0		-	0		0	
Pacific loon	0	0		-	0		0	
Red-throated loon	0	0		-	0		0	
Yellow-billed loon	0	0		-	0		0	
Grebe	0	0		-	0		0	
Total loons and grebes	0	0		-	0		0	
Total migratory birds	1,532	8,038	21%	6,376 – 9,699	8,038	28%	0	
Ptarmigans and grouses								
Grouse	0	0		-	0		0	
Ptarmigan	34	202	61%	78 – 326	202	100%	0	
Total ptarmigans and grouses	34	202	61%	78 – 326	202	100%	0	
Total eggs	1,566	8,240	21%	6,535 – 9,945	8,240	28%	0	

Sampling effort (Yukon-Kuskokwim Delta North Coast subregion, 2013): 2 out of 4 villages in this subregion were included in analysis; 62% of subregion households were represented in the sample. -: Reported harvest = 0. *: Detected unusually high or low harvest estimates.

Table 13.–Estimated bird harvest, Yukon-Kuskokwim Delta region, Lower Yukon subregion, 2013.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	Estimated	Confidence Interval		Spring		Summer		Fall	
	number	number	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
American wigeon	58	192	39%	117 – 268	176	65%	0		17	90%
Teal	56	228	59%	94 – 363	184	114%	0		44	89%
Mallard	214	955	17%	796 – 1,114	568	32%	57	100%	330	42%
Northern pintail	179	737	18%	602 – 872	483	36%	50	80%	205	40%
Northern shoveler	48	197	27%	144 – 251	87	59%	36	137%	75	54%
Black scoter	41	93	52%	44 – 141	93	62%	0		0	
Surf scoter	34	138	57%	59 – 216	131	94%	0		6	119%
White-winged scoter	7	14	74%	7 – 24	14	81%	0		0	
Bufflehead	0	0		-	0		0		0	
Goldeneye	10	38	63%	14 – 62	3	119%	26	134%	9	134%
Canvasback	12	57	40%	34 – 81	33	98%	5	137%	19	80%
Scaup	13	20	74%	13 – 35	11	91%	0		9	119%
Common eider	0	0		-	0		0		0	
King eider	1	5	85%	1 – 9	5	137%	0		0	
Spectacled eider	0	0		-	0		0		0	
Steller's eider	0	0		-	0		0		0	
Harlequin duck	7	17	64%	7 – 27	8	98%	0		9	134%
Long-tailed duck	21	44	56%	21 – 68	44	67%	0		0	
Merganser	0	0		-	0		0		0	
Duck (unidentified)	2	9	85%	2 – 16	9	134%	0		0	
Total ducks	703	2,744	17%	2,291 – 3,197	1,848	32%	173	78%	723	28%
Geese										
Black brant	0	0		-	0		0		0	
Cackling/Canada goose	449	2,029	12%	1,785 – 2,273	1,450	19%	61	103%	517	33%
Greater white-fronted goose	888	3,751	11%	3,334 – 4,167	2,658	16%	44	127%	1,049	25%
Emperor goose	1	5	85%	1 – 9	0		0		5	137%
Snow goose	180	875	19%	711 – 1,038	759	29%	10	137%	106	82%
Total geese	1,518	6,659	10%	5,972 – 7,347	4,867	14%	115	94%	1,678	25%
Tundra swan	188	822	14%	707 – 936	747	19%	10	137%	64	48%
Sandhill crane	33	145	26%	107 – 183	135	41%	0		9	96%
Seabirds										
Cormorant	1	4	85%	1 – 8	0		0		4	134%
Tern	0	0		-	0		0		0	
Black-legged kittiwake	0	0		-	0		0		0	
Bonaparte's/Sabine's gull	0	0		-	0		0		0	
Mew gull	0	0		-	0		0		0	
Large gull	0	0		-	0		0		0	
Auklet	0	0		-	0		0		0	
Murre	0	0		-	0		0		0	
Guillemot	0	0		-	0		0		0	
Puffin	0	0		-	0		0		0	
Total seabirds	1	4	85%	1 – 8	0		0		4	134%
Shorebirds										
Whimbrel/Curlew	0	0		-	0		0		0	
Godwit	0	0		-	0		0		0	
Golden/Black-bellied plover	0	0		-	0		0		0	
Turnstone	0	0		-	0		0		0	
Phalarope	0	0		-	0		0		0	
Small shorebird	0	0		-	0		0		0	
Total shorebirds	0	0		-	0		0		0	
Loons and grebes										
Common loon	0	0		-	0		0		0	
Pacific loon	0	0		-	0		0		0	
Red-throated loon	0	0		-	0		0		0	
Yellow-billed loon	0	0		-	0		0		0	
Loon (non-breeding plumage)	1	7	85%	1 – 13	7	142%	0		0	
Grebe	0	0		-	0		0		0	
Total loons and grebes	1	7	85%	1 – 13	7	142%	0		0	
Total migratory birds	2,444	10,381	10%	9,302 – 11,460	7,604	15%	299	72%	2,478	22%
Ptarmigans and grouses										
Grouse	10	26	72%	10 – 46	14	142%	0		13	119%
Ptarmigan	141	456	34%	302 – 610	381	49%	0		75	84%
Total ptarmigans and grouses	151	482	33%	323 – 642	395	49%	0		87	80%
Total birds	2,595	10,863	11%	9,710 – 12,017	7,999	15%	299	72%	2,565	22%

Sampling effort (Yukon-Kuskokwim Delta Lower Yukon subregion, 2013): 4 out of 6 villages in this subregion were included in analysis; 64% of subregion households were represented in the sample. -: Reported harvest = 0.

Table 14.–Estimated egg harvest, Yukon-Kuskokwim Delta region, Lower Yukon subregion, 2013.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	Estimated	Confidence Interval		Spring		Summer	
	number	number	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
American wigeon	0	0		-	0		0	
Teal	0	0		-	0		0	
Mallard	12	61	85%	12 – 113	61	137%	0	
Northern pintail	33	168	52%	81 – 254	86	95%	81	137%
Northern shoveler	9	46	85%	9 – 84	0		46	137%
Black scoter	0	0		-	0		0	
Surf scoter	0	0		-	0		0	
White-winged scoter	0	0		-	0		0	
Bufflehead	0	0		-	0		0	
Goldeneye	0	0		-	0		0	
Canvasback	6	30	85%	6 – 56	30	137%	0	
Scaup	0	0		-	0		0	
Common eider	0	0		-	0		0	
King eider	0	0		-	0		0	
Spectacled eider	0	0		-	0		0	
Steller's eider	0	0		-	0		0	
Harlequin duck	0	0		-	0		0	
Long-tailed duck	0	0		-	0		0	
Merganser	0	0		-	0		0	
Duck (unidentified)	21	100	60%	39 – 160	100	96%	0	
Total ducks	81	404	50%	201 – 607	277	99%	127	137%
Geese								
Black brant	0	0		-	0		0	
Cackling/Canada goose	18	91	50%	46 – 137	91	77%	0	
Greater white-fronted goose	44	223	51%	109 – 338	168	99%	56	137%
Emperor goose	0	0		-	0		0	
Snow goose	0	0		-	0		0	
Total geese	62	315	48%	163 – 466	259	87%	56	137%
Tundra swan	40	116	39%	71 – 161	96	56%	20	137%
Sandhill crane	4	6	119%	4 – 14	6	119%	0	
Seabirds								
Cormorant	0	0		-	0		0	
Tern	12	19	89%	12 – 35	19	88%	0	
Black-legged kittiwake	0	0		-	0		0	
Bonaparte's/Sabine's gull	0	0		-	0		0	
Mew gull	16	25	87%	16 – 47	25	86%	0	
Large gull	13	64	54%	29 – 99	49	106%	15	137%
Auklet	0	0		-	0		0	
Murre	0	0		-	0		0	
Guillemot	0	0		-	0		0	
Puffin	0	0		-	0		0	
Total seabirds	41	108	48%	56 – 159	93	69%	15	137%
Shorebirds								
Whimbrel/Curlew	0	0		-	0		0	
Godwit	0	0		-	0		0	
Golden/Black-bellied plover	0	0		-	0		0	
Turnstone	0	0		-	0		0	
Phalarope	0	0		-	0		0	
Small shorebird	4	18	85%	4 – 32	18	134%	0	
Total shorebirds	4	18	85%	4 – 32	18	134%	0	
Loons and grebes								
Common loon	3	13	85%	3 – 24	13	134%	0	
Pacific loon	0	0		-	0		0	
Red-throated loon	0	0		-	0		0	
Yellow-billed loon	0	0		-	0		0	
Grebe	2	3	119%	2 – 7	3	119%	0	
Total loons and grebes	5	16	72%	5 – 28	16	110%	0	
Total migratory birds	237	983	39%	601 – 1,364	764	68%	218	137%
Ptarmigans and grouses								
Grouse	0	0		-	0		0	
Ptarmigan	102	409	37%	259 – 559	302	59%	107	137%
Total ptarmigans and grouses	102	409	37%	259 – 559	302	59%	107	137%
Total eggs	339	1,392	37%	875 – 1,908	1,067	63%	325	137%

Sampling effort (Yukon-Kuskokwim Delta Lower Yukon subregion, 2013): 4 out of 6 villages in this subregion were included in analysis; 64% of subregion households were represented in the sample. -: Reported harvest = 0.

Table 15.–Estimated bird harvest, Yukon-Kuskokwim Delta region, Lower Kuskokwim subregion, 2013.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	Estimated	Confidence Interval		Spring		Summer		Fall	
	number	number	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
American wigeon	66	641	33%	427 – 855	440	48%	0		202	76%
Teal	195	1,785	21%	1,409 – 2,160	749	31%	42	114%	994	35%
Mallard	380	5,418	19%	4,373 – 6,463	2,509	39%	0		2,909	26%
Northern pintail	236	2,805	16%	2,366 – 3,245	1,625	19%	0		1,180	27%
Northern shoveler	67	809	26%	596 – 1,023	483	53%	0		326	50%
Black scoter	565	4,519	19%	3,676 – 5,363	4,015	22%	0		505	42%
Surf scoter	267	1,849	27%	1,358 – 2,339	1,410	34%	0		439	48%
White-winged scoter	66	629	35%	411 – 847	497	44%	0		132	76%
Bufflehead	91	992	30%	692 – 1,291	619	53%	0		373	66%
Goldeneye	247	2,185	23%	1,680 – 2,689	1,643	34%	0		542	40%
Canvasback	128	1,080	27%	783 – 1,377	970	33%	0		110	73%
Scaup	1,101	12,241	17%	10,130 – 14,353	8,539	20%	42	114%	3,661	36%
Common eider	2	22	83%	4 – 40	22	102%	0		0	
King eider	23	170	81%	32 – 307	170	88%	0		0	
Spectacled eider	0	0		-	0		0		0	
Steller's eider	0	0		-	0		0		0	
Harlequin duck	0	0		-	0		0		0	
Long-tailed duck	212	1,784	21%	1,409 – 2,159	1,444	25%	0		340	43%
Merganser	19	104	85%	19 – 191	104	86%	0		0	
Total ducks	3,665	37,033	16%	31,271 – 42,794	25,237	19%	83	114%	11,712	24%
Geese										
Black brant	26	227	50%	114 – 341	205	63%	0		22	102%
Cackling/Canada goose	692	7,900	20%	6,342 – 9,458	7,622	25%	108	114%	170	46%
* Greater white-fronted goose	611	5,879	17%	4,863 – 6,894	5,555	19%	83	114%	241	47%
Emperor goose	0	0		-	0		0		0	
Snow goose	79	623	83%	107 – 1,139	623	92%	0		0	
Total geese	1,408	14,629	18%	12,048 – 17,209	14,006	21%	191	114%	432	45%
Tundra swan	104	769	20%	614 – 925	620	23%	0		149	47%
Sandhill crane	101	923	23%	712 – 1,133	923	25%	0		0	
Seabirds										
Cormorant	0	0		-	0		0		0	
Tern	0	0		-	0		0		0	
Black-legged kittiwake	0	0		-	0		0		0	
Bonaparte's/Sabine's gull	0	0		-	0		0		0	
Mew gull	0	0		-	0		0		0	
* Large gull	2	101	58%	43 – 159	0		0		101	93%
Auklet	0	0		-	0		0		0	
Murre	0	0		-	0		0		0	
Guillemot	0	0		-	0		0		0	
Puffin	0	0		-	0		0		0	
Total seabirds	2	101	58%	43 – 159	0		0		101	93%
Shorebirds										
Whimbrel/Curlew	0	0		-	0		0		0	
Godwit	0	0		-	0		0		0	
Golden/Black-bellied plover	0	0		-	0		0		0	
Turnstone	0	0		-	0		0		0	
Phalarope	0	0		-	0		0		0	
Small shorebird	8	88	83%	15 – 161	88	102%	0		0	
Total shorebirds	8	88	83%	15 – 161	88	102%	0		0	
Loons and grebes										
Common loon	0	0		-	0		0		0	
Pacific loon	2	16	73%	4 – 28	16	84%	0		0	
Red-throated loon	0	0		-	0		0		0	
* Yellow-billed loon	1	51	58%	21 – 80	0		0		51	93%
Loon (non-breeding plumage)	0	0		-	0		0		0	
Grebe	3	16	143%	3 – 40	16	147%	0		0	
Total loons and grebes	6	83	47%	44 – 122	33	84%	0		51	93%
Total migratory birds	5,294	53,625	15%	45,796 – 61,455	40,907	16%	274	114%	12,445	24%
Ptarmigans and grouses										
Grouse	0	0		-	0		0		0	
Ptarmigan	1,256	11,455	20%	9,195 – 13,716	10,657	23%	0		798	46%
Total ptarmigans and grouses	1,256	11,455	20%	9,195 – 13,716	10,657	23%	0		798	46%
Total birds	6,550	65,081	15%	55,437 – 74,725	51,564	16%	274	114%	13,243	24%

Sampling effort (Yukon-Kuskokwim Delta Lower Kuskokwim subregion, 2013): 5 out of 13 villages in this subregion were included in analysis; 23% of subregion households were represented in the sample. -: Reported harvest = 0. *: Detected unusually high or low harvest estimates. Note on "Large gull": during data review, regional partners indicated that gulls are not usually harvested for human consumption in this subregion; reported harvest may refer to unusual harvests or harvests of gull eggs rather than birds.

Table 16.–Estimated egg harvest, Yukon-Kuskokwim Delta region, Lower Kuskokwim subregion, 2013.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	Estimated	Confidence Interval		Spring		Summer	
	number	number	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
American wigeon	0	0		-	0		0	
Teal	82	717	54%	330 – 1,104	717	63%	0	
Mallard	5	27	104%	5 – 55	27	106%	0	
Northern pintail	40	579	47%	309 – 848	579	69%	0	
Northern shoveler	0	0		-	0		0	
Black scoter	0	0		-	0		0	
Surf scoter	0	0		-	0		0	
White-winged scoter	0	0		-	0		0	
Bufflehead	0	0		-	0		0	
Goldeneye	0	0		-	0		0	
Canvasback	0	0		-	0		0	
Scaup	16	87	134%	16 – 204	87	138%	0	
Common eider	0	0		-	0		0	
King eider	0	0		-	0		0	
Spectacled eider	0	0		-	0		0	
Steller's eider	0	0		-	0		0	
Harlequin duck	0	0		-	0		0	
Long-tailed duck	0	0		-	0		0	
Merganser	0	0		-	0		0	
Total ducks	143	1,410	36%	900 – 1,921	1,410	42%	0	
Geese								
Black brant	6	66	83%	11 – 121	66	102%	0	
Cackling/Canada goose	59	399	49%	204 – 594	399	51%	0	
Greater white-fronted goose	22	120	102%	22 – 242	120	104%	0	
Emperor goose	0	0		-	0		0	
Snow goose	0	0		-	0		0	
Total geese	87	585	47%	308 – 862	585	50%	0	
Tundra swan	21	114	67%	38 – 191	114	68%	0	
Sandhill crane	14	87	61%	34 – 140	87	63%	0	
Seabirds								
Cormorant	0	0		-	0		0	
Tern	74	662	37%	414 – 910	662	47%	0	
Black-legged kittiwake	9	99	83%	16 – 181	99	102%	0	
Bonaparte's/Sabine's gull	0	0		-	0		0	
Mew gull	48	439	45%	243 – 634	439	51%	0	
Large gull	40	262	56%	117 – 408	262	59%	0	
Auklet	0	0		-	0		0	
Murre	0	0		-	0		0	
Guillemot	0	0		-	0		0	
Puffin	0	0		-	0		0	
Total seabirds	171	1,462	33%	981 – 1,942	1,462	37%	0	
Shorebirds								
Whimbrel/Curlew	0	0		-	0		0	
* Godwit	47	256	59%	106 – 406	256	59%	0	
* Golden/Black-bellied plover	47	295	50%	146 – 444	295	53%	0	
Turnstone	5	72	59%	30 – 115	72	78%	0	
Phalarope	46	611	46%	329 – 893	611	67%	0	
Small shorebird	126	1,114	36%	707 – 1,520	1,114	45%	0	
Total shorebirds	271	2,348	35%	1,536 – 3,161	2,348	44%	0	
Loons and grebes								
Common loon	0	0		-	0		0	
Pacific loon	0	0		-	0		0	
Red-throated loon	0	0		-	0		0	
Yellow-billed loon	0	0		-	0		0	
Grebe	1	5	143%	1 – 13	5	147%	0	
Total loons and grebes	1	5	143%	1 – 13	5	147%	0	
Total migratory birds	708	6,012	28%	4,321 – 7,704	6,012	33%	0	
Ptarmigans and grouses								
Grouse	0	0		-	0		0	
Ptarmigan	164	982	44%	546 – 1,419	982	45%	0	
Total ptarmigans and grouses	164	982	44%	546 – 1,419	982	45%	0	
Total eggs	872	6,995	28%	5,023 8,966	6,995	32%	0	

Sampling effort (Yukon-Kuskokwim Delta Lower Kuskokwim subregion, 2013): 5 out of 13 villages in this subregion were included in analysis; 23% of subregion households were represented in the sample. -: Reported harvest = 0. *: Detected unusually high or low harvest estimates.

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APPENDICES

Appendix A.–Household list and selection form (original size 8.5x11 in).

AMBCC Harvest Survey. Household Names are Confidential. page ____ / ____

Household List & Selection Form

Village:_____ **Surveyor:**_____ **Harvest Year:**_____

Total resident households: _____

Sampling method [a]***:*** ☐ ***Census (up to 30 households in total)***
☐ ***75% Simple Random Sampling (31-60 households in total)***
☐ ***"Harvester/Other" Stratification (61+ households in total)***

[a] *After counting the total number of resident households, checkmark the sampling method to be used.*
[b] *Classify households as "**harvester" or "other" only if using harvest/other stratification.***
[c] ***Harvester**: households that usually harvest birds or eggs.* [d] ***Other:** non-harvesters and households of unknown harvest pattern.*

Household ID	Household Name *List only households resident in the village since at least 12 months.*	*Select only one* [b]*:* Harvester [c]	Other [d]	Selected	Alternate	No contact/ consent

Appendix B.–Tracking sheet and household consent form (original size 8.5x11 in).

AMBCC Harvest Survey
OMB Control No. 1018-0124 Expires 04/30/2013.

page ____ / ____

Tracking Sheet & Household Consent Form

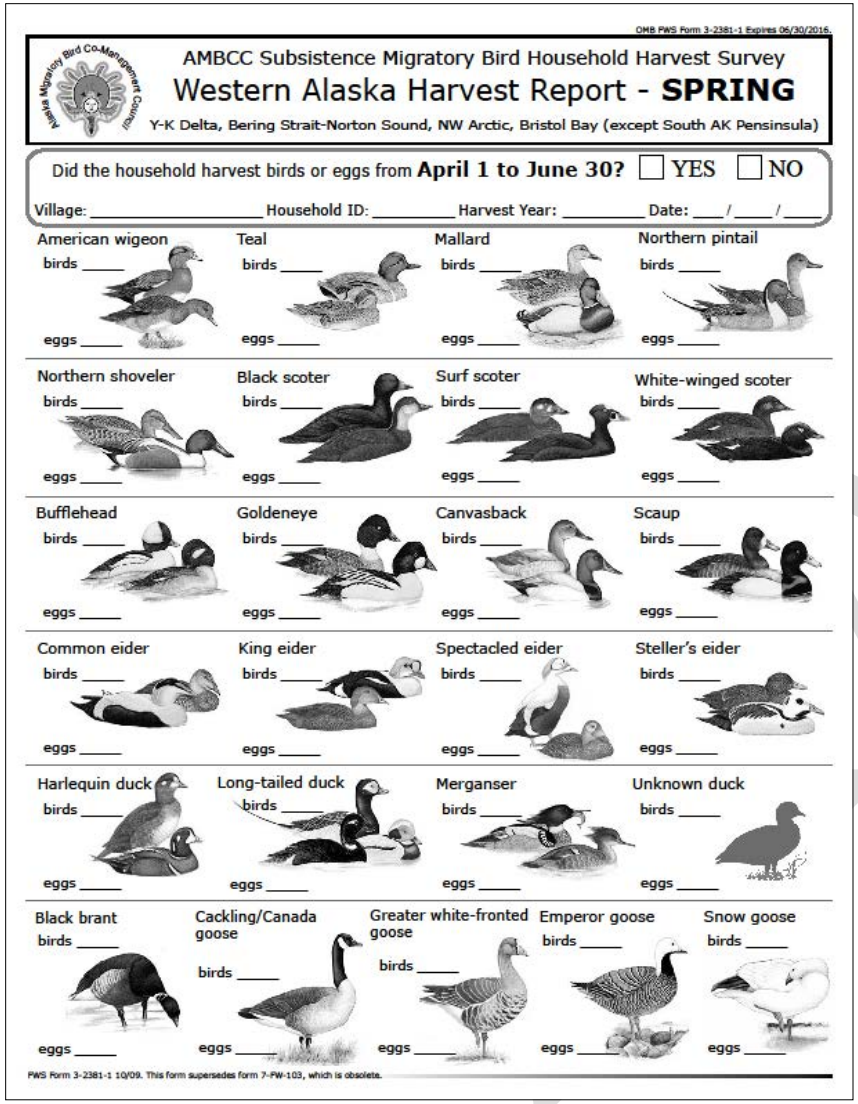
Village: _____ Harvest Year: _____ Surveyor:_____

Copy here only the household IDs **selected to be surveyed.*

House-hold ID*	Household name	Household Consent *1st hh visit*				Harvest report *2nd hh visit*	Harvest report *3rd hh visit*	Comments *(Why no contact? Moved?)*
		Agreed	Refu-sed	No contact	Date completed	Date completed	Date completed	

FWS Form 3-2380 10/09. This form supersedes form R7-102, which is obsolete.

Appendix C.–Harvest report form, Western Alaska (spring sheet, both sides, original size 8.5x11 in each side).



OMB FWS Form 3-2381-1 Expires 06/30/2016

AMBCC Subsistence Migratory Bird Household Harvest Survey

Western Alaska Harvest Report - **SPRING**

Y-K Delta, Bering Strait-Norton Sound, NW Arctic, Bristol Bay (except South AK Pensinsula)

Did the household harvest birds or eggs from **April 1 to June 30?** ☐ YES ☐ NO

Village: _____ Household ID: _____ Harvest Year: _____ Date: ___/___/___

American wigeon — birds ____ eggs ____

Teal — birds ____ eggs ____

Mallard — birds ____ eggs ____

Northern pintail — birds ____ eggs ____

Northern shoveler — birds ____ eggs ____

Black scoter — birds ____ eggs ____

Surf scoter — birds ____ eggs ____

White-winged scoter — birds ____ eggs ____

Bufflehead — birds ____ eggs ____

Goldeneye — birds ____ eggs ____

Canvasback — birds ____ eggs ____

Scaup — birds ____ eggs ____

Common eider — birds ____ eggs ____

King eider — birds ____ eggs ____

Spectacled eider — birds ____ eggs ____

Steller's eider — birds ____ eggs ____

Harlequin duck — birds ____ eggs ____

Long-tailed duck — birds ____ eggs ____

Merganser — birds ____ eggs ____

Unknown duck — birds ____ eggs ____

Black brant — birds ____ eggs ____

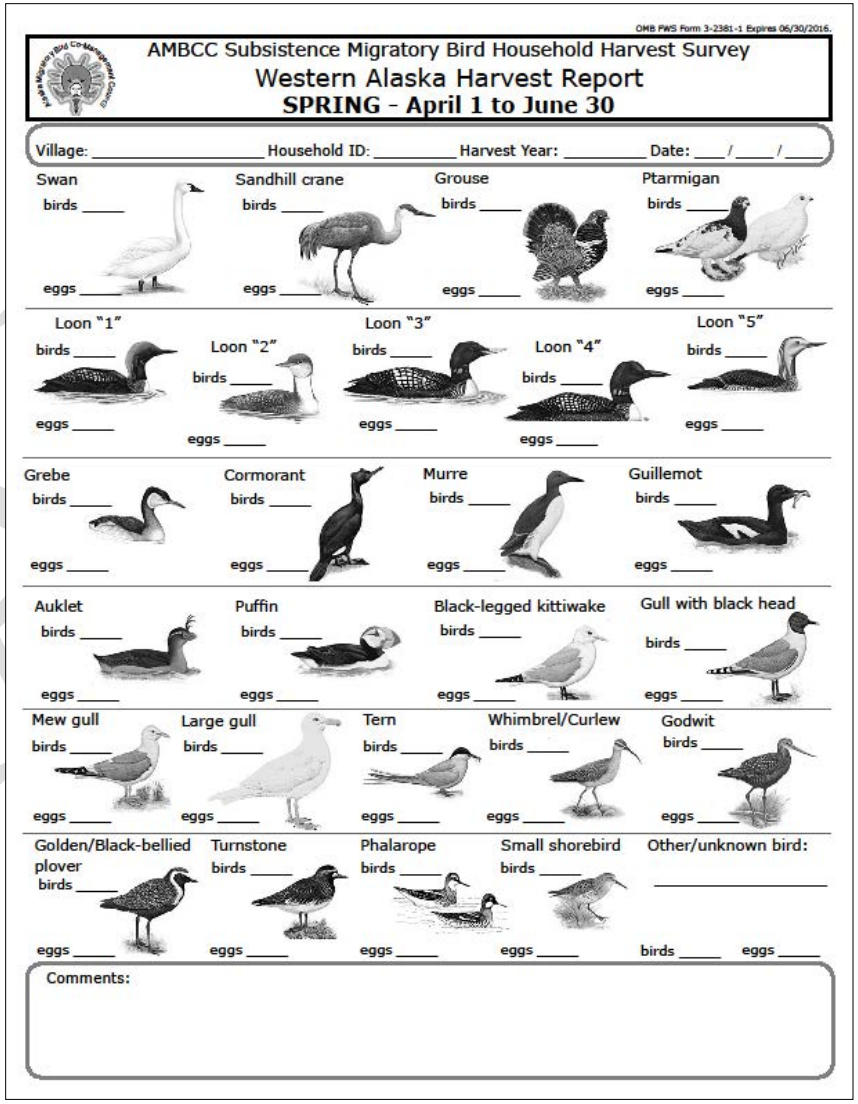
Cackling/Canada goose — birds ____ eggs ____

Greater white-fronted goose — birds ____ eggs ____

Emperor goose — birds ____ eggs ____

Snow goose — birds ____ eggs ____

FWS Form 3-2381-1 10/09. This form supersedes form 7-FW-103, which is obsolete.



OMB FWS Form 3-2381-1 Expires 06/30/2016

AMBCC Subsistence Migratory Bird Household Harvest Survey

Western Alaska Harvest Report

SPRING - April 1 to June 30

Village: _____ Household ID: _____ Harvest Year: _____ Date: ___/___/___

Swan — birds ____ eggs ____

Sandhill crane — birds ____ eggs ____

Grouse — birds ____ eggs ____

Ptarmigan — birds ____ eggs ____

Loon "1" — birds ____ eggs ____

Loon "2" — birds ____ eggs ____

Loon "3" — birds ____ eggs ____

Loon "4" — birds ____ eggs ____

Loon "5" — birds ____ eggs ____

Grebe — birds ____ eggs ____

Cormorant — birds ____ eggs ____

Murre — birds ____ eggs ____

Guillemot — birds ____ eggs ____

Auklet — birds ____ eggs ____

Puffin — birds ____ eggs ____

Black-legged kittiwake — birds ____ eggs ____

Gull with black head — birds ____ eggs ____

Mew gull — birds ____ eggs ____

Large gull — birds ____ eggs ____

Tern — birds ____ eggs ____

Whimbrel/Curlew — birds ____ eggs ____

Godwit — birds ____ eggs ____

Golden/Black-bellied plover — birds ____ eggs ____

Turnstone — birds ____ eggs ____

Phalarope — birds ____ eggs ____

Small shorebird — birds ____ eggs ____

Other/unknown bird: _____ birds ____ eggs ____

Comments:

Appendix D.–Species represented in the Western Alaska harvest report form and their distribution range.

	Western Alaska harvest report form			
	Bristol Bay	Yukon-Kuskokwim Delta	Bering Strait-Norton Sound	Northwest Arctic
Ducks				
American wigeon *Anas americana*	x	x	x	x
Teal	x	x	x	x
Green-winged teal *A. crecca* (1)	(1)	(1)	(1)	(1)
Blue-winged teal *A. discors* (2)				
Mallard *A. platyrhynchos*	x	x	x	x
Northern pintail *A. acuta*	x	x	x	x
Northern shoveler *A. clypeata*	x	x	x	x
Black scoter *Melanitta nigra*	x	x	x	x
Surf scoter *M. perspicillata*	x	x	x	x
White-winged scoter *M. fusca*	x	x	x	x
Bufflehead *Bucephala albeola*	x	x	x	x
Goldeneye	x	x	x	x
Common goldeneye *Bucephala clangula* (1)	(1, 2)	(1, 2)	(1)	(1)
Barrow's gondeneye *B. islandica* (2)				
Canvasback *Aythya valisineria*	x	x	x	x
Scaup	x	x	x	x
Greater scaup *Aythya marila* (1)	(1, 2)	(1, 2)	(1, 2)	(1, 2)
Lesser scaup *A. affinis* (2)				
Common eider *Somateria mollissima*	x	x	x	x
King eider *S. spectabilis*	x	x	x	x
Spectacled eider *S. fischeri**	x	x	x	x
Steller's eider *Polysticta stelleri**	x	x	x	x
Harlequin duck *Histrionicus histrionicus*	x	x	x	x
Long-tailed duck *Clangula hyemalis*	x	x	x	x
Merganser	x	x	x	x
Common merganser *Mergus merganser* (1)	(1, 2)	(1, 2)	(1, 2)	(1, 2)
Red-breasted merganser *M. serrator* (2)				
Duck (unidentified)	x	x	x	x
Geese				
Black brant *Branta bernicla*	x	x	x	x
Canada/cackling goose	x	x	x	x
Taverner's Canada goose *Branta hutchinsii taverneri* (1)	(2, 4)	(1, 2, 4)	(1, 4)	(1, 4)
Cackling Canada goose *B. h. minima* (2)				
Aleutian Canada goose *B. h. leucopareia* (3)				
Lesser Canada goose *B. canadensis parvipes* (4)				
Dusky Canada goose *B. c. occidentalis* (5)				
Greater white-fronted goose *Anser albifrons*	x	x	x	x
Emperor goose *Chen canagica**	x	x	x	x
Lesser snow goose *C. caerulescens*	x	x	x	x
Swans				
Swan	x	x	x	x
Tundra swan *Cygnus columbianus* (1)	(1)	(1)	(1)	(1)
Trumpeter swan *C. buccinator** (2)				
Cranes				
Sandhill crane *Grus canadensis*	x	x	x	x

-continued-

	Western Alaska harvest report form			
	Bristol Bay	Yukon-Kuskokwim Delta	Bering Strait-Norton Sound	Northwest Arctic
Ptarmigans and grouses				
Grouse	x	x	x	x
Spruce grouse *Falcipennis canadensis* (1)	(1)	(1, 2)	(1)	(1)
Ruffed grouse *Bonasa umbellus* (2)				
Sharp-tailed grouse *Tympanuchus phasianellus* (3)				
Ptarmigan	x	x	x	x
Willow ptarmigan *Lagopus lagopus* (1)	(1, 2)	(1, 2, 3)	(1, 2)	(1, 2)
Rock ptarmigan *L. muta* (2)				
White-tailed ptarmigan *L. leucura* (3)				
Seabirds				
Cormorant	x	x	x	x
Pelagic cormorant *Phalacrocorax pelagicus* (1)	(1, 2, 3)	(1, 2, 3)	(1)	(1)
Double-crested cormornat *P. auritus* (2)				
Red-faced cormorant *P. urile** (3)				
Tern	x	x	x	x
Arctic tern *Sterna paradisea* (1)	(1, 2)	(1, 2)	(1, 2)	(1, 2)
Aleutian tern *Onychoprion aleutica* (2)				
Black-legged kittiwake *Rissa tridactyla*	x	x	x	x
Bonaparte's/Sabine's gull	x	x	x	x
Bonaparte's gull *Larus philadelphia* (1)	(1, 2)	(1, 2)	(2)	(2)
Sabine's gull *Xema sabini* (2)				
Mew gull *Larus canus*	x	x	x	x
Large gull	x	x	x	x
Glaucous-winged gull *L. glaucescens* (1)	(1, 2)	(2)	(2, 3)	(2)
Glaucous gull *L. hyperboreus* (2)				
Herring gull *L. argentatus* (3)				
Auklet	x	x	x	x
Cassin's auklet *Ptychoramphus aleuticus* (1)	(1, 2, 3, 4, 6)	(2, 3, 4, 6)	(2, 3, 4, 6)	(2, 3, 4, 6)
Crested auklet *Aethia cristatella* (2)				
Least auklet *A. pusilla* (3)				
Parakeet auklet *A. psittacula* (4)				
Whiskered auklet *A. pygmaea* (5)				
Rhinoceros auklet *Cerorhinca monocerata* (6)				
Murre	x	x	x	x
Common murre *Uria aalge* (1)	(1, 2)	(1, 2)	(1, 2)	(1, 2)
Thick-billed murre *U. lomvia* (2)				
Guillemot	x	x	x	x
Pigeon guillemot *Cepphus columba* (1)	(1)	(1)	(1)	(1, 2)
Black guillemot *C. grylle* (2)				
Puffin	x	x	x	x
Tufted puffin *Fratercula cirrhata* (1)	(1, 2)	(1, 2)	(1, 2)	(1, 2)
Horned puffin *F. corniculata* (2)				
Shorebirds				
Whimbrel/curlew	x	x	x	x
Whimbrel *Numenius phaeopus** (1)	(1)	(1, 2)	(1, 2)	(1)
Bristle-thighed curlew *N. tahitiensis** (2)				
Godwit	x	x	x	x
Bar-tailed godwit *Limosa lapponica* (1)	(1, 2, 3)	(1, 2)	(1, 2)	(1, 2)
Hudsonian godwit *L. haemastica** (2)				
Marbled godwit *L. fedoa** (3)				

-continued-

	Western Alaska harvest report form			
	Bristol Bay	Yukon-Kuskokwim Delta	Bering Strait-Norton Sound	Northwest Arctic
Shorebirds, continued				
Golden/black-bellied plover	x	x	x	x
American golden plover *Pluvialis dominica** (1)	(1, 2, 3)	(1, 2, 3)	(1, 2, 3)	(1, 3)
Pacific golden plover *P. squatarola** (2)				
Black-bellied plover *P. fulva* (3)				
Turnstone	x	x	x	x
Ruddy turnstone *Arenaria interpres* (1)	(1, 2)	(1, 2)	(1, 2)	(1, 2)
Black turnstone *A. melanocephala** (2)				
Phalarope	x	x	x	x
Red-necked phalarope *Phalaropus lobatus* (1)	(1, 2)	(1, 2)	(1, 2)	(1, 2)
Red phalarope *P. fulicaria* (2)				
Small shorebird	x	x	x	x
Dunlin *Calidris alpina* (1)	(1, 2, 3,	(1, 2, 3, 4, 5, 6,	(1, 2, 3, 4, 5,	(1, 2, 3, 4,
Pectoral sandpiper *C. melanotos** (2)	4, 5, 6, 7,	7, 11, 12, 13, 14,	6, 7, 11, 12,	5, 6, 7, 11,
Rock sandpiper *C. ptilocnemis** (3)	11, 13,	15, 16, 17, 18,	13, 14, 15,	12, 13, 14,
Western sandpiper *C. mauri* (4)	14, 15,	19, 22, 23, 24)	16, 17, 18,	15, 16, 17,
Semipalmated sandpiper *C. pusilla* (5)	16, 17,		19, 22, 23,	18, 19, 22,
Least sandpiper *C. minutilla* (6)	18, 19,		24)	23, 24)
Baird's sandpiper *C. bairdii* (7)	22, 23,			
White-rumped sandpiper *C. fuscicollis** (8)	24)			
Stilt sandpiper *C. himantopus** (9)				
Red-necked stint *C. ruficollis** (10)				
Sanderling *C. alba** (11)				
Sharp-tailed sandpiper *C. acuminata* (12)				
Semipalmated plover *Charadrius semipalmatus** (13)				
Lesser yellowlegs *Tringa flavipes* (14)				
Greater yellowlegs *T. melanoleuca* (15)				
Solitary sandpiper *T. solitaria** (16)				
Spotted sandpiper *Actitis macularia* (17)				
Surfbird *Aphirza virgata** (18)				
Wandering tatler *Heteroscelus incanus** (19)				
Upland sandpiper *Bartramia longicauda** (20)				
Buff-breasted sandpiper *Tryngites subruficolis**(21)				
Short-billed dowitcher *Limnodromus griseus** (22)				
Long-billed dowitcher *L. scolopaceus* (23)				
Wilson's snipe *Gallinago delicata* (24)				
Loons and grebes				
Common loon *Gavia immer*	x	x	x	x
Pacific loon	x	x	x	x
Pacific loon *G. pacifica* (1)	(1)	(1, 2)	(1, 2)	(1, 2)
Arctic loon *G. arctica* (2)				
Red-throated loon *G. stellata*	x	x	x	x
Yellow-billed loon *G. adamsii**	x	x	x	x
Grebe	x	x	x	x
Red-necked grebe *Podiceps griseana* (1)	(1, 2)	(1, 2)	(1, 2)	(1, 2)
Horned grebe *P. auritus* (2)				

-continued-

Sources For information on distribution range of species: Johnson and Herter (1989);Timm and Rothe (2008), MacIntosh (2000); Pearce et al. (2000); Banks et al. (2004); Sibley (2010); Sea Duck Joint Venture (2003–2005); Denlinger (2006); Warren (2006); Johnson et al. (2007); Alaska Shorebird Group (2008); Bowman and Alaska Sea Grant College Program (2008); Pacific Flyway Council (1986 [rev. 1999]); and also personal Lanctot (R. Lanctot, USFWS Migratory Bird Management, Anchorage, personal communication), Taylor (E. Taylor, USFWS Migratory Bird Management, Anchorage, personal communication), Dewhurst (D. Dewhurst, USFWS Migratory Bird Management, Anchorage, personal communication), Irons (D. Irons, USFWS Migratory Bird Management, Anchorage, personal communication), Dau (C. Dau, USFWS Migratory Bird Management, Anchorage, personal communication), Rosenberg (D. Rosenberg, ADF&G Division of Wildlife Conservation, Anchorage, personal communication).

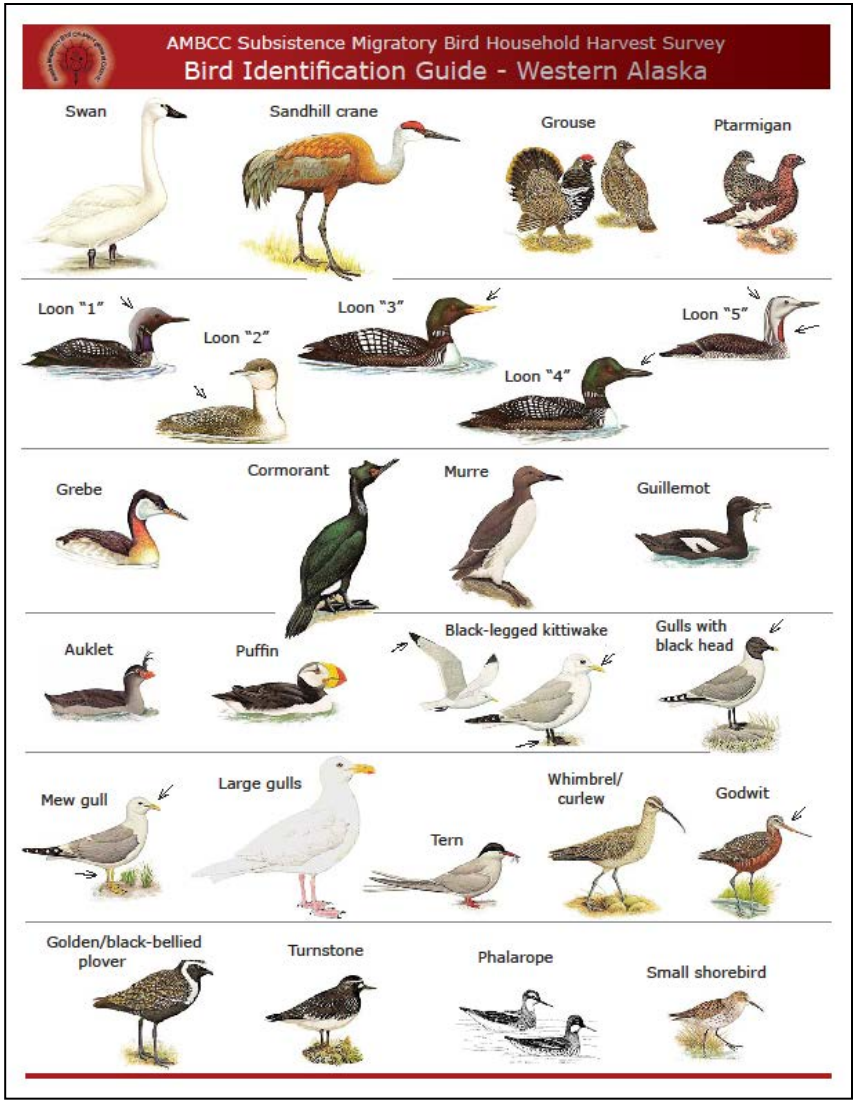
Note If more than one species is presented, the category name is used on the harvest survey form.

Note The South Alaska Peninsula is a subregion of the Bristol Bay region; most of the Bristol Bay region is surveyed with the Western Alaska Form, but the South Alaska Peninsula is surveyed with the Southern Coastal Alaska form.

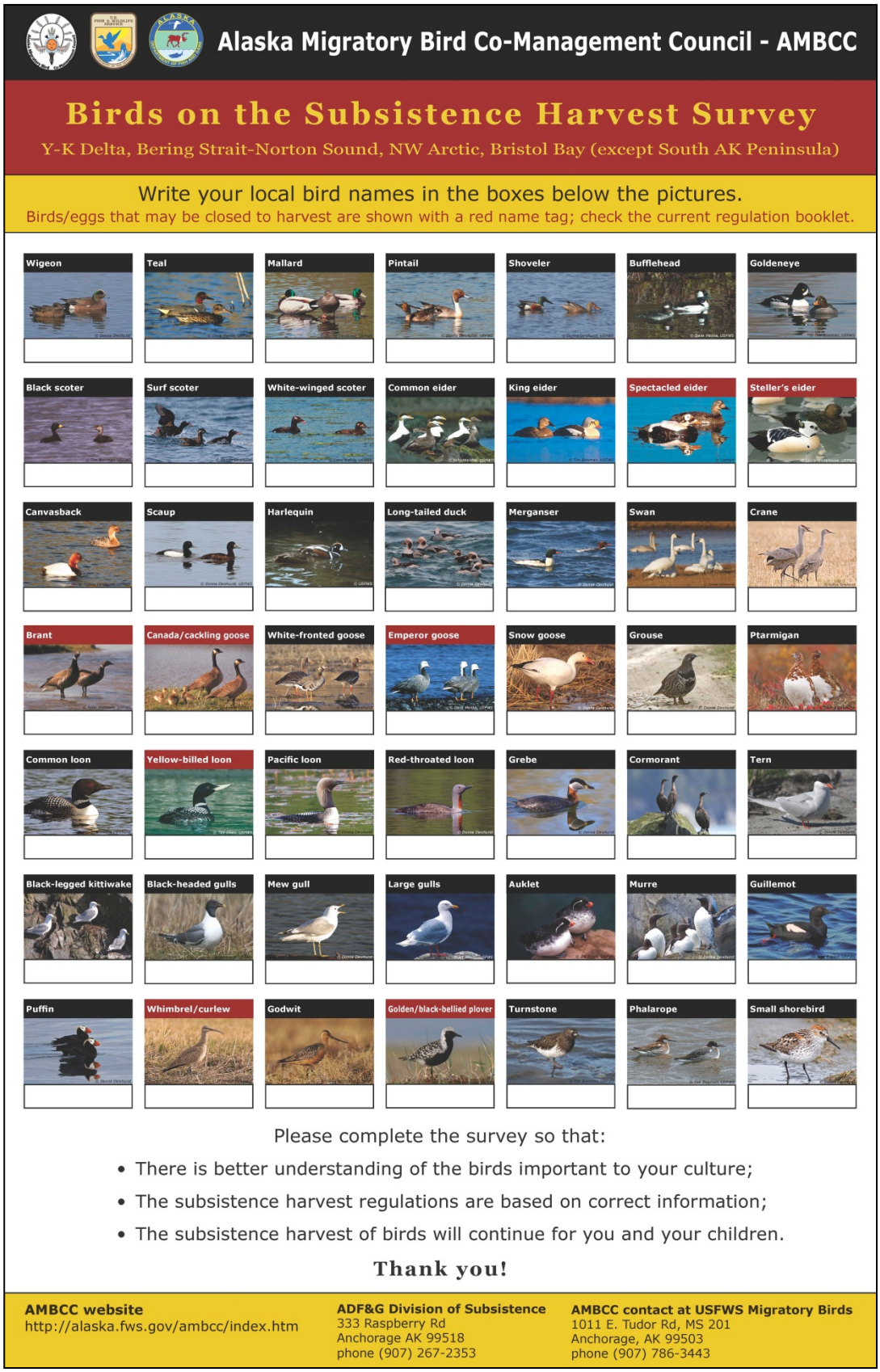
Note "x" indicates the species is included in the harvest report form used in the region. Numbers in parenthesis indicate the species likely to occur in each region.

Note "*" indicates species closed to bird or egg harvests at least in some management units.

Appendix E.–Bird identification guide, Western Alaska (both sides, original size 8.5x11 in each side).



Appendix F.–Bird poster, Western Alaska (original size 23 x 36 in).



Appendix G.–Formulas to calculate subregion estimated harvests, variances, and confidence intervals (3-stage stratified cluster sampling).

$$X_s = \frac{N_{1s}}{n_{1s}} \left\{ \sum_{i=1}^{h} \frac{N_{2si}}{n_{2si}} \left[\sum_{j=1}^{h_i} \frac{N_{3sij}}{n_{3sij}} \left(\sum_{k=1}^{n_{3sij}} x_{sijk} \right) \right] \right\}$$

$$Var(X_s) = N_{1s}^2 \left[\left(1 - \frac{n_{1s}}{N_{1s}} \right) \times \frac{s_{1s}^2}{n_{1s}} \right] + \frac{N_{1s}}{n_{1s}} \left\{ \sum_{i=1}^{h} N_{2si}^2 \left[\left(1 - \frac{n_{2si}}{N_{2si}} \right) \times \frac{s_{2si}^2}{n_{2si}} \right] \right\} + \frac{N_{1s}}{n_s} \left\{ \sum_{i=1}^{h} \frac{N_{2si}}{n_{2si}} \left[\sum_{j=1}^{h_i} N_{3sij}^2 \left[\left(1 - \frac{n_{3sij}}{N_{3sij}} \right) \times \frac{s_{3sij}^2}{n_{3sij}} \right] \right] \right\}$$

$$CI(X_s) = t_{\alpha/2} \times \sqrt{\text{var}(X_s)} \qquad CIP(X_s) = \frac{CI(X_s)}{X_s}$$

$$s_{1s}^2 = \frac{\sum_{i=1}^{h} \left\{ \sum_{j=1}^{h_i} \left[\left[\sum_{k=1}^{n_{3sij}} \left(x_{sijk} - \bar{x}_s \right)^2 \right] + p_{3sij} \times (\bar{x}_{sij} - \bar{x}_s)^2 \right] \right\}}{n_{1s}} \qquad p_{3sij} = N_{3sij} - n_{3sij}$$

$$s_{2si}^2 = \frac{\sum_{j=1}^{h_i} \left\{ \left[\sum_{k=1}^{n_{3sij}} \left(x_{sijk} - \bar{x}_{si} \right)^2 \right] + p_{3sij} \times (\bar{x}_{sij} - \bar{x}_{si})^2 \right\}}{n_{2si}} \qquad s_{3sij}^2 = \frac{\sum_{k=1}^{n_{3sij}} \left(x_{sijk} - \bar{x}_{sij} \right)^2}{n_{3sij}}$$

$$\bar{x}_s = \frac{\frac{N_{1s}}{n_{1s}} \left\{ \sum_{i=1}^{h} \frac{N_{2si}}{n_{2si}} \left[\sum_{j=1}^{h_i} \frac{N_{3sij}}{n_{3sij}} \left(\sum_{k=1}^{n_{3sij}} x_{sijk} \right) \right] \right\}}{N_{1s}}$$

$$\bar{x}_{si} = \frac{\frac{N_{2si}}{n_{2si}} \left[\sum_{j=1}^{h_i} \frac{N_{3sij}}{n_{3sij}} \left(\sum_{k=1}^{n_{3sij}} x_{sijk} \right) \right]}{N_{2si}}$$

$$\bar{x}_{sij} = \frac{\frac{N_{3sij}}{n_{3sij}} \left(\sum_{k=1}^{n_{3sij}} x_{sijk} \right)}{N_{3sij}}$$

X_S = subregion estimated harvest. This formula accounts for missing strata, but it does not account for missing seasons. If a whole season is missing for any community, analytical procedures are necessary to fill out missing data with average harvests.

$Var(X_s)$ = variance of subregional harvest estimate.

$CI(X_s)$ = confidence interval around the harvest estimate (confidence level 95%).

$CIP(X_s)$ = confidence interval as a percentage of the harvest estimate.

s = first-stage units (subregion).

i = second-stage units (sampled harvest level strata).

j = third-stage unit (harvest level strata).

k = households.

h = number of communities sampled in a subregion.

hi = number of strata sampled in the community.

N_{1s} = total number of households in subregion s.

n_{1s} = total number of households in sampled communities in subregion s.

N_{2si} = total number of households in all strata of a community in subregion s.

n_{2si} = number of households in sampled strata of a community in subregion s.

N_{3sij} = total number of households in each stratum of a community in subregion s.

n_{3sij} = number of households sampled in each stratum of a community in subregion s.

x_{sijk} = individual household reported harvest.

s_1^2 = first-stage sample variance.

s_2^2 = second-stage sample variance.

s_3^2 = third-stage sample variance (harvest level strata).

$\bar{x}$ = weighted household harvest average.

$\bar{x}_s$ = average subregional household harvest.

$\bar{x}_{si}$ = average community household harvest.

$\bar{x}_{sij}$ = average household harvest for harvest level strata.

P_{3sij} = factor to account for variance of non-sampled households for which the average harvest was applied.

$t_{\alpha/2}$ = Student's t distribution value with significance level (tail area probability) $\alpha = 0.05$.

Note: the term "N_{2si}/n_{2s}" accounts for missing stratum at the community level; this term equals 1 if all strata in the community have been surveyed. For instance:

	Harvester	Other	
Total households	40	50	$N_{2si} = 90$
Sampled households	40	0	$n_{2si} = 40$

Appendix H.–Communities included in the 2004–2013 harvest estimates.

Region, ***subregion***, community	House-holds¶	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Gulf of Alaska-Cook Inlet											
Gulf of Alaska Villages											
Chenega	31	-	-	x	-	-	-	x	-	-	-
Nanwalek	55	x	-	-	-	-	-	x	-	-	-
Port Graham	79	x	-	x	-	-	-	-	-	-	-
Tatitlek	36	x	-	-	-	-	-	-	-	-	-
Cordova†	922	-	-	-	-	-	-	-	-	-	-
Cook Inlet											
Tyonek	70	x	x	-	-	-	-	-	-	-	-
Kodiak Archipelago											
Kodiak Villages											
Akhiok	19	-	-	x	-	-	-	x	-	-	-
Karluk	12	-	-	x	-	-	-	x	-	-	-
Larsen Bay	34	-	-	x	-	-	-	x	-	-	-
Old Harbor	84	-	-	x	-	-	-	-	-	-	-
Ouzinkie	56	-	-	x	-	-	-	-	-	-	-
Port Lions	77	-	-	-	-	-	-	x	-	-	-
Kodiak City and Road-connected											
Aleneva	9	-	-	-	-	-	-	-	-	-	-
Chiniak	20	-	-	-	-	-	-	-	-	-	-
Kodiak City	2,039	-	-	x	-	-	-	-	-	-	-
Kodiak Station	332	-	-	-	-	-	-	-	-	-	-
Womens Bay	283	-	-	-	-	-	-	x	-	-	-
Balance of Kodiak Is. Borough	1,665	-	-	-	-	-	-	x	-	-	-
Aleutian-Pribilof Islands											
Aleutian-Pribilof Villages											
Adak	44	-	-	-	-	-	-	-	-	-	-
Akutan	40	-	x	-	x	x	-	-	-	-	-
Atka	24	-	x	-	-	-	-	-	-	-	-
Cold Bay	46	-	x	-	-	-	-	-	-	-	-
False Pass	15	-	-	-	-	x	-	-	-	-	-
King Cove	181	-	x	-	-	x	-	-	-	-	-
Nelson Lagoon	22	-	-	-	-	-	-	-	-	-	-
Nikolski	13	-	-	-	-	-	-	-	-	-	-
Sand Point	246	-	-	-	-	x	-	-	-	-	-
Saint George	42	-	-	-	-	-	-	-	-	-	-
Saint Paul	162	-	-	-	-	-	-	-	-	-	-
Unalaska	927	-	-	-	-	x	-	-	-	-	-
Bristol Bay											
South Alaska Peninsula											
Chignik	41	x	-	-	x	-	-	-	x	-	-
Chignik Lagoon	29	x	-	-	-	-	-	-	-	-	-
Chignik Lake	27	x	-	-	-	x	-	-	-	-	-

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Region, ***subregion***, community	House-holds¶	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Ivanof Bay	2	-	-	-	-	-	-	-	-	-	-
Perryville	38	x	-	-	x	-	-	-	x	-	-
Southwest Bristol Bay											
Aleknagik	71	x	-	-	x	x	-	-	x	-	-
Clark's Point	24	x	x	-	x	x	-	-	-	-	-
Egegik	29	-	x	-	x	-	-	-	-	-	-
Ekwok	37	x	-	-	x	x	-	-	x	-	-
Igiugig	16	-	-	-	-	-	-	-	-	-	-
Iliamna	39	-	x	-	x	-	-	-	-	-	-
King Salmon	157	-	x	-	-	-	-	-	-	-	-
Kokhanok	52	x	x	-	x	x	-	-	x	-	-
Koliganek	55	-	x	-	x	-	-	-	-	-	-
Levelock	27	x	x	-	-	x	-	-	x	-	-
Manokotak	121	-	x	-	x	-	-	-	x	-	-
Naknek	231	x	-	-	x	-	-	-	x	-	-
New Stuyahok	114	-	x	-	x	-	-	-	-	-	-
Newhalen	50	x	x	-	-	x	-	-	-	-	-
Nondalton	57	x	x	-	-	-	-	-	-	-	-
Pedro Bay	19	-	x	-	-	-	-	-	-	-	-
Pilot Point	27	-	x	-	-	-	-	-	-	-	-
Pope-Vannoy Landing‡	3	-	-	-	-	-	-	-	-	-	-
Portage Creek‡	1	-	-	-	-	-	-	-	-	-	-
Port Heiden	35	-	x	-	-	-	-	-	x	-	-
Port Alsworth‡	44	-	-	-	-	-	-	-	-	-	-
South Naknek	35	-	x	-	x	-	-	-	-	-	-
Togiak	231	x	-	x	x	-	-	-	x	-	-
Twin Hills	29	x	x	-	x	-	-	-	-	-	-
Ugashik‡	7	-	-	-	-	-	-	-	-	-	-
Dillingham	855	-	x	-	x	x	-	-	x	-	-
Yukon-Kuskokwim Delta											
Y-K Delta South Coast											
Eek	91	x	x	-	x	x	-	x	x	-	-
Goodnews Bay	76	-	-	x	-	-	-	x	-	-	x
Kipnuk	153	-	x	x	x	-	x	-	x	-	-
Kongiganak	94	-	x	x	x	x	-	-	-	-	-
Kwigillingok	82	-	-	-	-	-	-	-	-	-	-
Platinum	19	-	x	x	-	-	-	x	-	-	x
Quinhagak	165	x	x	x	x	-	-	-	x	-	x
Tuntutuliak	96	x	-	x	-	x	x	x	-	-	x
Y-K Delta Mid Coast											
Chefornak	92	x	-	x	x	-	x	x	-	-	x
Chevak	209	x	-	-	-	-	x	x	-	-	-
Hooper Bay	256	x	x	-	-	x	-	-	x	-	-

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Region, *subregion*, community	House-holds¶	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Mekoryuk	70	-	x	-	x	x	-	-	x	-	-
Newtok	70	-	x	x	-	x	x	-	-	-	x
Nightmute	59	x	-	x	x	-	x	-	x	-	-
Scammon Bay	96	-	-	x	-	x	x	x	-	-	x
Toksook Bay	125	x	x	-	x	-	-	-	-	-	x
Tununak	84	x	x	-	x	x	-	-	x	-	x
Y-K Delta North Coast											
Alakanuk	160	x	-	x	-	-	x	x	-	-	x
Emmonak	185	-	x	x	x	x	x	-	-	-	x
Kotlik	128	x	x	-	-	-	-	-	-	-	-
Nunam Iqua	43	-	x	x	-	x	x	x	-	-	-
Lower Yukon											
Marshall	100	x	x	-	x	x	-	x	-	-	x
Mountain Village	184	-	x	-	x	x	-	-	-	-	x
Pilot Station	121	-	x	x	-	x	x	-	-	-	-
Pitkas Point	31	x	-	x	x	-	x	x	-	-	x
Russian Mission	73	-	x	x	-	x	x	-	-	-	-
Saint Mary's	151	-	x	-	x	-	x	-	-	-	x
Lower Kuskokwim											
Akiachak	150	-	-	x	-	-	x	-	-	-	-
Akiak	90	-	x	x	x	-	-	x	-	-	-
Aniak	166	x	x	-	-	x	-	-	-	-	-
Atmautluak	63	x	-	-	x	x	-	-	-	-	x
Kasigluk	113	x	-	x	x	-	x	-	-	-	x
Kwethluk	172	x	x	x	x	-	x	x	-	-	-
Lower Kalskag	75	x	-	x	x	x	x	x	-	-	-
Napakiak	96	-	-	-	x	-	-	-	-	-	x
Napaskiak	94	-	x	x	x	x	x	-	x	-	-
Nunapitchuk	124	x	x	-	x	x	-	-	x	-	-
Oscarville	15	-	-	x	x	-	x	x	-	-	x
Tuluksak	92	-	x	x	-	x	-	-	x	-	-
Upper Kalskag	60	-	x	x	-	-	-	-	x	-	x
Central Kuskokwim											
Chuathbaluk	36	x	-	-	-	-	-	-	-	-	-
Crooked Creek	38	x	-	x	-	-	-	-	-	-	-
Lime Village	11	-	-	x	-	-	-	x	-	-	-
Red Devil	12	-	-	-	x	-	-	-	-	-	-
Sleetmute	36	-	-	x	x	-	-	-	-	-	-
Stony River	20	x	-	x	-	-	-	-	-	-	-
Bethel	1,896	x	x	x	x	x	x	x	x	-	-
Bering Strait-Norton Sound											
St. Lawrence-Diomede Islands											
Diomede	38	-	x	-	x	-	-	x	-	-	-

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Region, *subregion*, community	House-holds¶	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Gambell	164	x	x	-	x	-	x	x	x	x	-
Savoonga	166	x	x	-	x	-	x	x	x	x	-
Bering Strait Mainland Villages											
Brevig Mission	93	x	-	-	x	-	-	x	-	-	-
Elim	89	x	x	-	-	-	-	-	-	-	-
Golovin	49	-	x	-	x	-	-	x	-	-	-
Koyuk	89	-	x	-	x	-	-	x	-	-	-
Shaktoolik	64	-	-	-	x	-	-	x	-	-	-
Shishmaref	141	x	x	-	-	-	-	-	-	-	-
Saint Michael	96	x	-	-	x	-	-	-	-	-	-
Stebbins	134	-	x	-	x	-	-	x	-	-	-
Teller	72	x	x	-	-	-	-	-	-	-	-
Unalakleet	225	x	-	-	x	-	-	-	-	-	-
Wales	43	x	x	-	-	-	-	-	-	-	-
White Mountain	65	x	-	-	x	-	-	-	-	-	-
Nome	1,216	x	x	-	x	-	-	-	-	-	-
Northwest Arctic											
Northwest Arctic Villages											
Ambler	75	-	-	-	-	-	-	-	-	-	-
Buckland	98	-	-	x	-	-	-	-	-	-	-
Deering	44	-	-	-	-	-	-	-	-	-	-
Kiana	101	-	-	-	-	-	-	-	-	-	-
Kivalina	85	-	-	-	-	-	-	-	-	-	-
Kobuk	36	-	-	x	-	-	-	-	-	-	-
Noatak	114	-	-	-	-	-	-	-	-	-	-
Noorvik	153	-	-	-	-	-	-	-	-	-	-
Selawik	186	-	-	x	-	-	-	-	-	-	-
Shungnak	62	-	-	x	-	-	-	-	-	-	-
Kotzebue	954	-	-	-	-	-	-	-	-	x	-
North Slope											
North Slope Villages											
Anaktuvuk Pass	99	-	x	-	x	-	-	-	-	-	-
Atqasuk	64	-	x	-	x	-	-	-	-	-	-
Kaktovik	72	-	x	-	x	x	x	-	-	-	-
Nuiqsut	114	-	-	-	-	x	x	-	-	-	-
Point Hope	186	-	x	-	-	x	-	-	-	-	-
Point Lay	60	-	x	-	-	-	-	-	-	-	-
Wainwright	147	-	x	-	x	x	x	-	-	-	-
Barrow	1,280	-	x	-	x	x	x	-	-	-	-
Interior Alaska											
Mid Yukon-Upper Kuskokwim											
Anvik	33	x	x	x	-	-	-	x	-	-	-
Grayling	55	-	x	x	-	-	-	-	-	-	-

-continued-

Appendix H.–Page 5 of 6.

Region, ***subregion***, community	House-holds¶	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Holy Cross	64	x	x	x	-	-	-	x	-	-	-
Lake Minchumina	6	x	-	x	-	-	-	-	-	-	-
McGrath	147	-	-	-	-	-	-	-	-	-	-
Nikolai	37	x	x	x	-	-	-	-	-	-	-
Shageluk	36	-	x	-	-	-	-	-	-	-	-
Takotna	22	-	x	-	-	-	-	x	-	-	-
Tanana	100	-	-	-	-	-	-	-	-	-	-
Yukon-Koyukuk											
Alatna	12	x	-	x	x	x	-	x	-	-	-
Allakaket	62	x	-	x	x	x	-	x	-	-	-
Bettles-Evansville	21	-	-	x	-	-	-	-	-	-	-
Coldfoot	6	-	-	-	-	-	-	x	-	-	-
Galena	190	x	-	-	-	-	-	-	-	-	-
Hughes	31	x	-	-	-	-	-	-	-	-	-
Huslia	91	x	-	-	-	-	-	x	-	-	-
Kaltag	70	x	-	-	-	-	-	-	-	-	-
Koyukuk	42	x	x	-	-	-	-	-	-	-	-
Nulato	92	x	x	-	-	-	-	-	-	-	-
Ruby	62	x	x	-	-	-	-	x	-	-	-
Wiseman	5	-	-	-	-	-	-	x	-	-	-
Upper Yukon											
Arctic Village	65	-	-	x	-	-	-	-	-	-	-
Beaver	36	-	-	x	x	-	-	x	-	-	-
Birch Creek	17	-	-	-	x	-	-	-	-	-	-
Central	53	-	-	x	-	-	-	x	-	-	-
Chalkyitsik	24	-	-	x	x	-	-	x	-	-	-
Circle	40	-	-	x	x	-	-	-	-	-	-
Fort Yukon	246	x	-	x	x	-	-	-	-	-	-
Livengood‡	7	-	-	-	-	-	-	-	-	-	-
Rampart	10	-	-	-	-	-	-	x	-	-	-
Stevens Village	26	-	-	-	-	-	-	-	-	-	-
Venetie	61	-	-	x	x	-	-	x	-	-	-
Tanana Villages											
Alcan Border‡		-	-	-	-	-	-	-	-	-	-
Anderson‡	90	-	-	-	-	-	-	-	-	-	-
Chicken‡	5	-	-	-	-	-	-	-	-	-	-
Dot Lake	26	x	-	-	-	-	-	-	-	-	-
Dry Creek	29	-	-	-	-	-	-	-	-	-	-
Eagle	41	x	-	-	-	-	-	-	-	-	-
Eagle Village	31	x	-	-	-	-	-	-	-	-	-
Healy Lake	7	-	-	-	-	-	-	-	-	-	-
Manley Hot Springs	41	x	-	-	-	-	-	-	-	-	-
Minto	65	-	-	x	-	-	-	x	-	-	-

-continued-

Region, *subregion*, community	House-holds¶	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nenana‡	185	x	-	x	-	-	-	-	-	-	-
Northway	77	x	-	-	-	-	-	-	-	-	-
Tanacross	53	-	-	x	-	-	-	-	-	-	-
Tetlin	43	-	-	-	-	-	-	x	-	-	-
Tok	532	-	-	x	-	-	-	x	-	-	-
Upper Copper River											
Cantwell	104	-	-	-	x	-	-	-	-	-	-
Chistochina	36	x	-	-	x	-	-	-	-	-	-
Chitina	52	x	-	-	-	-	-	-	-	-	-
Copper Center	123	x	-	-	x	-	-	-	-	-	-
Gakona	86	x	-	-	x	-	-	-	-	-	-
Gulkana	36	x	-	-	x	-	-	-	-	-	-
Mentasta Lake	46	x	-	-	x	-	-	-	-	-	-
Tazlina	111	-	-	-	-	-	-	-	-	-	-
Southeast Alaska[a]											
Craig	470	-	-	-	-	-	-	-	-	-	-
Hoonah	305	-	-	-	-	-	-	-	-	-	-
Hydaburg	128	-	-	-	-	-	-	-	-	-	-
Yakutat	270	-	-	-	-	-	-	-	-	-	-

*Source*s Survey results for 2004–2012 were reported in Naves (2010rev.; 2010; 2011; 2012; 2014b; Naves and Braem 2014).

Total number of occupied households based on 2010 Census

Note a. Communities eligible only to harvest of glaucous-winged gull eggs (FR vol. 75, No. 70, pp. 18764–18773, April 13, 2010).

Note ‡: The communities of Alcan Border, Anderson, Chicken, Livengood, Pope-Vanoy Landing, Portage Creek, Port Alswort, and Ugashik were added to the sampling universe in 2014. Also at this revision, the Four Mile Road CDP was added to the community of Nenana.

Note †The subregion Cordova was included in 2014 when the spring hunt was first authorized.

Note Allakaket includes Allalaket City and New Allakaket CDP.

Note Dot Lake includes Dot Lake Village and Dot Lake CDP.

Note Bettles-Evansville includes Bettles and Evansville

Note Northway includes Northway Village, Northway Junction, and Northway CDP.

Note Nenana includes Nenana City and Four Mile Road CDP.

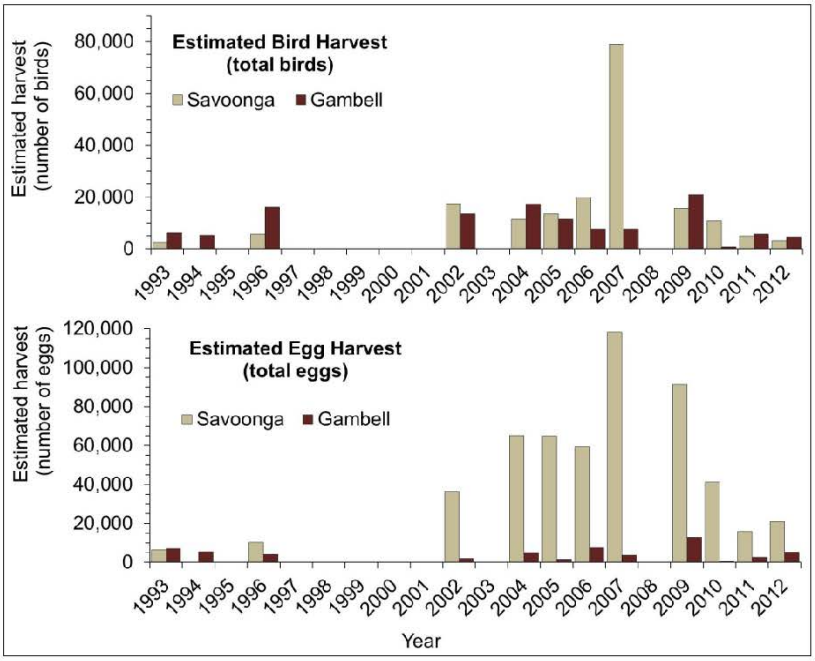
Note Balance of Kodiak Island Borough previously listed as Kodiak at Large.

Appendix I.–Harvest information summary for St. Lawrence Island produced for outreach and communication.

Alaska Migratory Bird Co-Management Council (AMBCC), Harvest Assessment Program

Saint Lawrence Island Bird and Egg Harvests
Compilation of Available Data

February, 2015



Harvest of murres and their eggs account for a large proportion of bird and egg harvests on St. Lawrence Island.

Harvest surveys are important to document subsistence harvests and help maintain sustainable bird populations.

Harvest data sources: [1993, 1994] Wentworth and Seim (1995); [1996] Georgette and Iknokinok (1997); [2002] Kawerak (2004); [2004, 2005, 2007, 2009, 2010] Naves (2014); [2006] Ahmasuk and Trigg (2008); [2011, 2012] Naves and Zeller (2013).

Note: In community data review, 2007 bird and egg harvest estimates for Savoonga were considered excessively high and not representing usual harvest levels for this community. 2010 Harvest estimates for Gambell were considered excessively low.

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Table 1. Gambell bird harvest estimates 1993–2012.

Species	1993	1994	1996	2002	2004	2005	2006	2007	2009	2010	2011	2012	Mean
Teal	0	0	0	2	0	0	0	0	16	9	2	3	2
Mallard	0	0	13	0	0	0	33	0	0	11	6	3	5
Northern pintail	12	30	49	86	512	164	23	34	88	22	62	58	102
Scoters	2	13	0	4	0	0	3	0	16	5	5	2	4
Common eider	262	186	1,071	1,055	1,156	1,057	510	955	1,441	16	360	260	756
King eider	59	81	377	271	264	644	76	347	793	57	101	55	279
Spectacled eider	0	1	0	176	0	0	69	76	64	0	45	20	41
Steller's eider	42	0	0	0	0	0	0	0	32	0	4	0	7
Harlequin duck	47	26	8	0	0	0	2	0	24	9	4	2	10
Long-tailed duck	60	17	1,075	366	4	20	0	24	572	0	50	0	219
Black brant	7	29	97	270	227	278	115	155	526	22	45	27	161
Canada goose	1	2	6	22	65	102	46	5	57	5	40	6	32
White-fronted goose	0		0	6	4	12	21	51	32	2	7	7	14
Emperor goose	0	3	110	1,068	1,174	707	86	249	967	0	60	128	414
Snow goose	118	160	243	638	926	1,143	306	343	1,608	6	18	21	502
Swan	5	5	15	62	35	22	3	2	120	0	12	6	26
Sandhill crane	3	6	21	237	249	77	12	54	98	0	5	1	69
Short-tailed shearwater	0	0	0	0	0	0	0	0	0	0	0	0	0
Cormorant	500	601	1,432	767	1,000	623	746	435	1,696	200	690	458	813
Black-legged kittiwake	21	9	36	0	0	0	0	0	51	0	0	17	12
Large gulls	182	64	472	487	562	25	0	115	223	23	314	128	234
Auklets	2,836	1,811	5,862	4,284	5,966	3,618	2,116	2,266	5,776	200	2,137	2,537	3,564
Murres	1,945	2,047	5,029	3,263	4,610	2,676	3,377	2,300	5,790	80	1,635	908	3,053
Guillemots	12	24	0	0	0	5	0	0	496	25	12	0	50
Puffins	4	0	36	12	2	20	20	0	3	0	0	0	9
Loons	75	173	203	467	568	107	166	262	417	11	27	8	225
Other birds	1	0	19	38	0	104	4	5	136	84	42	1	32
Total birds	6,194	5,288	16,174	13,581	17,324	11,404	7,734	7,678	21,042	787	5,683	4,656	10,636

Table 2. Gambell egg harvest estimates 1993–2012.

Species	1993	1994	1996	2002	2004	2005	2006	2007	2009	2010	2011	2012	Mean
Common eider	10	0	174	24	17	238	196	71	790	0	225	31	155
King eider	6	0	0	24	0	0	20	0	334	0	0	0	35
Spectacled eider	0	0	0	0	0	0	0	0	0	0	0	0	0
Steller's eider	0	0	0	0	0	0	0	0	32	0	0	0	3
Emperor goose	0	0	0	0	0	0	0	0	0	0	24	0	2
Swan	0	0	0	0	4	20	0	0	19	0	0	0	4
Sandhill crane	0	0	0	0	0	15	0	0	25	0	5	0	4
Cormorant	0	0	34	0	0	0	0	0	0	0	0	0	3
Mew gull	0	0	0	0	0	0	0	0	175	0	0	0	16
Black-legged kittiwake	0	0	0	0	0	0	0	0	0	0	0	0	0
Large gulls	0	0	0	0	0	35	224	0	318	0	57	0	70
Auklets	0	0	0	0	0	0	0	0	159	0	0	0	14
Murres	7,027	5,372	3,730	1,914	4,954	1,280	6,829	3,588	10,541	388	2,174	5,165	4,489
Loons	0	0	0	0	0	0	0	0	181	0	0	0	16
Other eggs	0	0	0	0	0	0	163	0	321	0	36	0	18
Total eggs	7,043	5,372	3,938	1,962	4,984	1,588	7,439	3,659	12,935	388	2,681	5,196	4,879

Harvest data sources: [1993, 1994] Wentworth and Seim (1995); [1996] Georgette and Iknokinok (1997); [2002] Kawerak (2004); [2004, 2005, 2007, 2009, 2010] Naves (2014); [2006] Ahmasuk and Trigg (2008); [2011, 2012] Naves and Zeller (2013).

Note: 2010 Harvest estimates not included in Gambel bird and egg 1993–2012 mean, see note on front page.

Table 3. Savoonga bird harvest estimates 1993–2012.

Species	1993	1996	2002	2004	2005	2006	2007	2009	2010	2011	2012	Mean
Teal	0	0	0	0	0	0	0	0	0	0	0	0
Mallard	0	0	0	0	0	0	0	0	0	0	0	0
Northern pintail	0	0	0	0	0	0	0	0	0	0	7	1
Scoters	0	0	25	0	0	94	0	40	0	24	25	21
Common eider	32	159	627	377	1,435	937	3,581	704	501	183	157	511
King eider	8	0	510	118	370	603	2,818	82	52	38	26	181
Spectacled eider	9	0	289	5	67	290	788	64	45	15	25	81
Steller's eider	0	0	5	0	12	23	0	0	19	13	17	9
Harlequin duck	4	0	24	240	1,195	229	1,990	9	44	5	4	175
Long-tailed duck	0	126	24	5	0	9	625	0	169	5	0	34
Black brant	8	0	562	181	0	398	836	62	4	53	49	132
Canada goose	0	6	28	0	148	27	8	0	0	34	0	24
White-fronted goose	0	0	0		0	0	0	0	0	1	0	0
Emperor goose	12	0	544	227	421	352	934	177	76	44	62	192
Snow goose	15	48	961	156	402	749	956	374	32	181	7	293
Swan	0	6	30	73	128	4	611	107	0	5	0	35
Sandhill crane	0	0	37	20	0	4	23	9	0	6	9	9
Short-tailed shearwater	0	0	0	0	0	0	0	0	0	17	48	7
Cormorant	494	853	3,289	2,053	2,279	2,807	10,423	3,970	2,172	899	452	1,927
Black-legged kittiwake	4	13	773	664	2,344	723	2,347	43	3	9	8	458
Large gulls	94	270	77	83	880	301	1,161	258	181	171	99	241
Auklets	470	536	1,637	616	1,164	2,502	14,491	2,373	1,052	567	233	1,115
Murres	1,301	3,490	6,275	5,646	1,850	7,836	33,530	6,547	3,363	2,541	1,676	4,053
Guillemots	0	0	903	410	0	413	0	520	3,005	22	13	529
Puffins	0	0	0	18	0	0	0	0	0	0	0	2
Loons	110	223	850	487	801	1,462	3,748	269	46	124	171	454
Other birds	12	0	29	124	0	12	124	15	42	25	8	27
Total birds	2,573	5,730	17,499	11,503	13,496	19,775	78,994	15,623	10,806	4,982	3,096	10,508

Table 4. Savoonga egg harvest estimates 1993–2012.

Species	1993	1996	2002	2004	2005	2006	2007	2009	2010	2011	2012	Mean
Common eider	0	0	0	0	0	0	0	0	3	52	1	6
King eider	0	0	125	0	0	0	51	23	0	0	0	15
Spectacled eider	0	0	17	0	0	0	0	0	0	0	0	2
Steller's eider	0	0	0	0	0	0	0	0	0	0	0	0
Emperor goose	0	0	0	0	0	0	28	0	0	0	0	0
Swan	0	0	0	0	0	0	0	0	0	0	10	1
Sandhill crane	0	0	0	0	0	0	0	0	0	0	0	0
Cormorant	0	0	0	0	0	1,434	0	0	0	0	0	143
Mew gull	0	0	0	52	0	0	0	0	0	0	0	5
Black-legged kittiwake	0	0	73	0	0	0	0	0	0	0	34	11
Large gulls	0	0	0	156	0	0	0	0	0	54	32	24
Auklets	15	0	0	116	0	0	0	41	0	0	12	17
Murres	6,517	10,286	35,836	64,754	65,077	57,994	118,281	91,337	41,140	15,750	20,746	40,944
Loons	0	0	0	8	0	0	0	0	0	0	0	1
Other eggs	0	0	0	10	0	0	0	0	0	0	0	1
Total eggs	6,532	10,286	36,051	65,096	65,077	59,428	118,360	91,401	41,143	15,856	20,835	41,171

Harvest data sources: [1993, 1994] Wentworth and Seim (1995); [1996] Georgette and Iknokinok (1997); [2002] Kawerak (2004); [2004, 2005, 2007, 2009, 2010] Naves (2014); [2006] Ahmasuk and Trigg (2008); [2011, 2012] Naves and Zeller (2013).

Note: 2007 Harvest estimates not included in Savoonga bird and egg 1993–2012 mean, see note on front page.

Birds that may be harvested or mentioned in harvest surveys on St. Lawrence Island

(Saint Lawrence Island/Siberian Yupik names shown in red)

Ducks	
wigeons (Eurasian wigeon, American wigeon):	mallard:
northern pintail: ngiikaq, nqiikaaq, quulvekesiiq	northern shoveler: pekutaghraak
common eider: metghaq(pik), gatepak, tagrapak, uskulla	king eider: qengalek
Steller's eider: aglekeseqaq	spectacled eider: iyegaatelek, livghaan
common goldeneye:	harlequin duck: qagingik
scoters (black scoter, white-winged scoter): metghasaak	long-tailed duck: aahaangwliq, uyangsaq, kangghwaak (female), ugeyiighaq (male)
greater scaup:	red-breasted merganser: aqfasuk (also grebe?), iikaaq
Geese, Swan, Crane, Owl, Ptarmigan	
brant: teghqillkak, qefteq	emperor goose: leghlleq
Canada goose: qefteq, teghqilkagpak	snow goose: kaanguq, kaangu
greater white-fronted goose: wilwitu	sandhill crane: satelgaq
tundra swan: quuk	ptarmigan: aqergiiq
snowy owl: anipa	
Seabirds	
northern fulmar: aghqulluk	short-tailed shearwater: kaputaghaq
pelagic cormorant: ngelqaq	Arctic tern: tekeyiighaq
black-legged kittiwake: qaqsungiq	Sabine's gull: nasallenguq
Ross's gull: kulusim qawaaga (iceberg, polar ice bird)	mew gull: naghuya, ungazim naghuyangi (other gulls?)
large gulls: naghuyapik (glaucous gull?), ugraaq (herring gull), (glaucous-winged gull?)	auklets: amaaghaq (auklet chick), sukilpaq (crested auklet), akmaliighaq (least auklet), suklugraq (parakeet auklet), (rhinoceros auklet?)
murres (common murre, thick-billed murre): alpa, kuwaaq, aqevgaghnak, alpapiget, alpapik, quwaaghet	guillemots (pigeon guillemot, black guillemot): samseghhaghaq (adult), sipelaaghhaq (young)
dovekie: quqiiq	puffins: pagrugaq (tufted puffin), quprughaq (horned puffin)
Shorebirds	
large shorebirds with long beak: sugtuvak (whimbrel?, curlew?, bar-tailed godwit?, long-billed dowitcher?)	large shorebirds: turiighpak (Pacific golden plover?, American golden plover?, black-bellied plover?)
turnstones (ruddy turnstone, black turnstone): sagelmak	phalaropes (red phalarope, red-necked phalarope): qulighya, sughmeghaq
small, other shorebirds: turiighaq; teraateriiq (dunlin?, pectoral sandpiper?), qalmesam teraateriiq (rock sandpiper?), iglagllengiiq (western sandpiper?), qalmesam qawaaga (gray-tailed tatler?, wandering tatler?)	
Loons and Grebes: yuwayu (loon, small loon, breeding plumage), yuwayaaghaq (nonbreeding plumage, juvenile)	
red-throated loon: eghqaaq (breeding plumage)	Pacific loon, Arctic loon: melqupak (breeding plumage)
yellow-billed loon: nangqwalek (breeding plumage), nangqwalgaaghaq (nonbreeding plumage, juvenile). Also used for the common loon, which is locally rather uncommon.	grebes (red-necked grebe, horned grebe): aqfasuget, aqfasuq (also merganser?)

Sources: Ehrlich et al. (1993), Paige et al. (1996), Romanenko et al. (1997), Badten et al. (2008), Tahbone and Trigg (2011), Naves and Zeller (2013).

Note: this list did not intend to represent all bird species occurring on St. Lawrence Island. For comments, corrections, and updates to this list, please see contact information at bottom of the front page.

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A NOTE ON THE AMBCC LOGO

Indigenous Yup'ik peoples live in Western, Southwestern, and Southcentral Alaska, as well as in the Russian Far East. In the traditional Yup'ik universe, each animal species has its own world, where they live in communities, like people, and which shamans can visit. Historically, artists carved masks to represent the shaman's spirit helpers and the spirits of fish and wildlife. The different levels of the universe inhabited by the spirits of the animals were represented by rings around a mask. Masks were used during a winter ceremony called *Kelek*, or "Inviting-In Feast." The host community invited people of other communities, as well as the spirits of people who had died and the spirits of the animals, to participate in the ceremony. During Kelek, people sang, drummed, and danced with masks to ask for plentiful harvests in the coming year, to appease animal spirits that may have been offended, and to avoid misfortune in the relationship between people and animals. The masks also could be funny, abstract, fearsome, representations of human faces, and very small or very large. Most Kelek masks were destroyed after the ceremony. Today, masks are important items in Native art and economies and are designed to be displayed rather than worn. Yup'ik animal masks are beautiful materializations of the Yup'ik appreciation and respect for the natural resources they depend upon. To learn more about Kelek and Yup'ik masks see Fienup-Riordan (1983, 1996) and Pete (1989).

The logo of the Alaska Migratory Bird Co-Management Council (AMBCC) incorporates the drawing of a Yup'ik mask by artist Katie Curtis from Toksook Bay, Alaska. Some people refer to this drawing as "The Goose Mask." The U.S. Fish and Wildlife Service commissioned this drawing in the late 1990s during the process of creating the AMBCC. An actual mask was not carved. The original drawing is black and white; the colors used here were added in 2009 when new outreach materials were produced for the AMBCC subsistence harvest survey. The choice of colors was based on historical and current Yup'ik artwork. Katie Curtis was consulted during this process and agreed with the use of the colors. The mask depicts a Canada goose surrounded by 8 feathers. The feathers represent the 8 steps to implement a legal, regulated spring subsistence bird hunt: 1) Notify people of the intent to form management bodies; 2) Meet to share ideas; 3) Send out ideas and listen; 4) Choose the form of management bodies; 5) Start rule-making; 6) Recommend rules for Alaska; 7) Link with management in other U.S. flyways; and 8) Link with the nation. Since its inception, this new regulatory framework has been designed to promote true collaboration among a diversity of stakeholders as cultures intermingle in the history of wildlife management and conservation in Alaska.

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