

Alaska Subsistence Harvest of Birds and Eggs, 2018, Alaska Migratory Bird Co-Management Council

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Alaska Department of Fish and Game
Division of Subsistence



Alaska Migratory Bird
Co-Management Council



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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly-accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H_A
gram	g			base of natural logarithm	e
hectare	ha			catch per unit effort	CPUE
kilogram	kg	all commonly-accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	coefficient of variation	CV
kilometer	km			confidence interval	CI
liter	L	at	@	correlation coefficient (multiple)	R
meter	m	compass directions:		correlation coefficient (simple)	r
milliliter	mL	east	E	covariance	cov
millimeter	mm	north	N	degree (angular)	$^{\circ}$
		south	S	degrees of freedom	df
Weights and measures (English)		west	W	expected value	E
cubic feet per second	ft ³ /s	copyright	©	greater than	>
foot	ft	corporate suffixes:		greater than or equal to	≥
gallon	gal	Company	Co.	harvest per unit effort	HPUE
inch	in	Corporation	Corp.	less than	<
mile	mi	Incorporated	Inc.	less than or equal to	≤
nautical mile	nmi	Limited	Ltd.	logarithm (natural)	ln
ounce	oz	District of Columbia	D.C.	logarithm (base 10)	log
pound	lb	et alii (and others)	et al.	logarithm (specify base)	log ₂ , etc.
quart	qt	et cetera (and so forth)	etc.	minute (angular)	'
yard	yd	exempli gratia (for example)	e.g.	not significant	NS
		Federal Information Code	FIC	null hypothesis	H_0
Time and temperature		id est (that is)	i.e.	percent	%
day	d	latitude or longitude	lat. or long.	probability	P
degrees Celsius	°C	monetary symbols (U.S.)	\$, ¢	probability of a type I error (rejection of the null hypothesis when true)	α
degrees Fahrenheit	°F	months (tables and figures)	first three letters (Jan,...,Dec)	probability of a type II error (acceptance of the null hypothesis when false)	β
degrees kelvin	K	registered trademark	®	second (angular)	"
hour	h	trademark	™	standard deviation	SD
minute	min	United States (adjective)	U.S.	standard error	SE
second	s	United States of America (noun)	USA	variance	
		U.S.C.	United States Code	population	Var
Physics and chemistry		U.S. state	two-letter abbreviations (e.g., AK, WA)	sample	var
<i>all atomic symbols</i>					
alternating current	AC	Measures (fisheries)			
ampere	A	fork length	FL		
calorie	cal	mideye-to-fork	MEF		
direct current	DC	mideye-to-tail-fork	METF		
hertz	Hz	standard length	SL		
horsepower	hp	total length	TL		
hydrogen ion activity (negative log of)	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

TECHNICAL PAPER NO. 464

**ALASKA SUBSISTENCE HARVEST OF BIRDS AND EGGS, 2018,
ALASKA MIGRATORY BIRD CO-MANAGEMENT COUNCIL**

by

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Cover Photo:

The 137th annual meeting of the American Ornithological Society convened more than 1,000 ornithologists from 32 countries across the globe in Anchorage, AK, (June 24–28, 2019) with the theme “Birds on the Edge: Dynamic Boundaries.” The meeting program celebrated people’s diversity in bird research, conservation, and appreciation, and featured Alaska Native cultures in diverse events and presentations. Aaron Leggett (Native Village of Eklutna, Tribal Council President) welcomed meeting participants on behalf of the Dena’ina people. Two field trips offered opportunities to interact with Alaska Native peoples in their daily lives (Birding and Boating from Bethel, in Yup’ik Homeland and Alaska Native Heritage Center in Anchorage). The symposium “Permeable Boundaries in Biological and Social Sciences: Human Dimensions in Bird Research and Conservation” included presentations by Alaska Native speakers (William Naneng—Sea Lion Corporation of Hooper Bay and Crystal Leonetti—USFWS Alaska Native Affairs Specialist) and on collaboration with Alaska Native partners in bird research (goose banding by the U.S. Geological Survey and the Native Village of Chevak) and subsistence harvest research and monitoring (AMBCC Harvest Assessment Program). “Birds in Alaska Native Subsistence Cultures” was a public presentation at the Alaska Public Lands Information Center. Patty Schwalenberg (AMBCC Executive Director), Brandon Ahmasuk, Cyrus Harris, and Jack Fagerstrom (AMBCC Alaska Native representatives) delivered the plenary session “Alaskan Migratory Birds: Conservation Through Co-Management.” Cyrus, Brandon, Jack, and Patty also shared experiences in the AMBCC booth. In the meeting closing event at the Anchorage Museum, the band Pamyua and our beloved Marie Arnaq Meade entertained the flock with Yup’ik singing and dancing. Centered on a shared appreciation for birds, these genuine exchanges of diverse knowledge, experiences, and cultures bring us all together to realize that the well-being of birds as well as of human communities intrinsically depends on healthy ecosystems. Photo courtesy of the American Ornithological Society.

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ABSTRACT

This report presents subsistence harvest estimates of birds and their eggs in Alaska for the data year 2018. 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 regional and local Alaska Native organizations. Information obtained by this program is used to inform subsistence harvest regulations, to document customary and traditional uses of migratory birds in Alaska, and to support sustainable harvest opportunities and conservation of birds. Participation by communities and households in the harvest survey is voluntary. In 2018, the survey covered five migratory bird management regions: Bristol Bay, Yukon-Kuskokwim Delta, Bering Strait-Norton Sound, North Slope, and Interior Alaska. These regions represent more than 90% of the total subsistence bird harvest in Alaska and are used as an index to the Alaska-wide harvest. The sampling design treats regions as strata and uses two-stage sampling in each region. Within regions, communities are selected by systematic random sampling. Within communities, households are selected by simple random sampling. Harvest reported by surveyed communities is extrapolated to non-surveyed communities in the same region. Data are reported at the region and survey-wide levels. This report also includes harvest estimates for the Cordova spring bird and egg harvest in the Gulf of Alaska-Cook Inlet region, where a mail survey is administered to all households that register to participate in that harvest.

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, ptarmigan, grouse, seabirds, shorebirds, grebes, loons

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- Wassilie Guy (Napaskiak)

Bering Strait-Norton Sound

- Arley Nanouk (Unalakleet)
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- Clinton Booshu (Gambell)
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North Slope

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- Jack Fagerstrom and Brandon Ahmasuk (Bering Strait-Norton Sound)
- Randy Mayo (Interior Alaska)
- Taqulik Hepa (North Slope)

INTRODUCTION

In 1916, Canada and the United States ratified the Migratory Bird Treaty (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; this harvest has 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–summer subsistence bird harvest 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–summer subsistence hunts of migratory birds in Alaska. The amendment also mandated that Alaska’s Native peoples have a meaningful role in harvest management. As a result of this direction, the Alaska Migratory Bird Co-Management Council (AMBCC) was formed in 2000.¹ The AMBCC is composed of representatives from the USFWS, Alaska Department of Fish and Game (ADF&G), and regional Native organizations (65 FR 16405–16409²). The AMBCC identified the need for harvest assessment to document traditional uses of migratory birds and harvest amounts. Harvest assessment is also needed to meet the intentions of the amended treaty: (1) subsistence harvest 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 of users and responsive to conservation needs. The first legal spring–summer subsistence hunting season was in 2003.

Subsistence bird and egg harvest assessment occurred annually in 1985–2002 in the Yukon-Kuskokwim (Y-K) Delta region in the context of the Goose Management Plan (Copp 1985; Copp and Roy 1986; Wentworth 2007a; Zavaleta 1999). Surveys were also conducted in the Bristol Bay region every other year in 1995–2002 (Wentworth 2007b). These earlier surveys had 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 survey (below), they provide a long-term dataset needed for understanding harvest patterns.

The AMBCC Harvest Assessment Program (AMBCC-HAP) was originally based on the Goose Management Plan surveys conducted in the Y-K Delta and Bristol Bay and expanded the geographic coverage of bird and egg harvest monitoring to other regions in Alaska (Reynolds 2007)³. The AMBCC survey has been conducted annually since 2004, relying on collaboration among USFWS, ADF&G, and Alaska Native partners. The USFWS and the ADF&G have funded the AMBCC-HAP. The ADF&G Division of Subsistence currently coordinates the AMBCC-HAP on behalf of the AMBCC. Data collection includes participation of 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 underwent a first revision to streamline program structure and data collection, analysis, and reporting (Naves et al. 2008). Revised survey methods were implemented in 2010–2015 following methods described in Naves (2012). In 2014–2019, the survey program underwent a second revision, which addressed the distribution of sampling effort among regions and communities as well as data analysis (George et al. 2015; Otis et al. 2016). In 2016, the survey piloted the newly revised sampling design (Naves and Otis 2017). Based on results of the 2016 survey, an optimal allocation analysis was used to adjust the sampling design used in the 2017 survey (Otis et al. 2017). A second round of optimal allocation analysis based on 2017 survey results was used to adjust the sampling design used in the 2018 survey (Otis and Doherty 2018).

Information generated by the AMBCC-HAP is available to Alaska rural communities (or villages), Native organizations, state and federal resource management and conservation agencies, the Pacific Flyway Council, and the public. This report is the twelfth in a series presenting annual harvest estimates for birds and their eggs based on data collected by the AMBCC-HAP (Naves 2010rev.; 2010; 2011; 2012; 2014a; Naves and Braem 2014; Naves 2015b;

1. For more information, visit the websites of the AMBCC (<http://www.alaskamigratorybirds.com/>) and the U.S. Fish and Wildlife Service “Alaska Migratory Bird Co-Management Council” at <https://www.fws.gov/alaska/pages/alaska-migratory-bird-co-management-council-ambcc>.

2. 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>.

3. 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.

2015c; 2016; Naves and Otis 2017; Naves and Keating 2018). The AMBCC-HAP also conducts research, outreach, and education to address priority information needs and management issues (Naves and Zeller 2013; Naves 2014b; Rothe et al. 2015; Naves 2015a; Naves and Fall 2017; Naves and Zeller 2017; Naves 2018; Naves et al. 2019). Annual harvest reports, electronic data, program information, and other products are available at the webpage of the AMBCC-HAP⁴. Some uses of the data are:

- Document the importance of customary and traditional subsistence uses of migratory birds by Alaska communities so that these uses will be protected and conducted in a sustainable manner;
- Document subsistence harvest trends and track changes in harvest;
- Inform spring–summer migratory bird harvest regulations; and
- Assist in the development of management plans.

4. <http://www.adfg.alaska.gov/index.cfm?adfg=subsistence.AMBCC>

METHODS

ETHICAL STANDARDS

From the perspective of subsistence harvesters, harvest surveys collect information that commonly is private and sensitive. Subsistence bird harvest data 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 essential to develop and maintain trust and collaboration between subsistence users and resource management agencies. Community and household participation in the survey is voluntary. Community consent to conduct surveys is formally granted as tribal council resolutions, and ethical principles for social science research are closely observed (Naves 2012:7)^{5,6}. Data at the household level are confidential (A S 16.05.815). AMBCC-HAP data are usually reported at the region level, although specific data release agreements may allow data release at the community level (e.g., Naves and Zeller 2013; Naves 2014b; 2015c). Archived survey materials do not include household names or other personal information to maintain anonymity of household harvest reports (a numeric household identifier is used). Names on household lists are covered; lists not showing names are then scanned for digital archiving together with other survey materials. Preliminary harvest estimates are submitted to AMBCC partners for their review before being adopted. Information from subsistence harvest surveys is not to be used for punitive law enforcement purposes, and there are no known instances when this may have happened since regular bird harvest surveys started in the 1980s.

FIVE-REGIONS SURVEY: INDEX FOR THE ALASKA-WIDE HARVEST

Sampling Design

The revised sampling design was based on the objectives, priorities, and funding level for the survey program identified by AMBCC partners during the review process (George et al. 2015; Otis et al. 2016). Alaska-wide harvest estimates were considered the main priority and region-level harvest estimates were considered a secondary priority. Because of challenges in accurately estimating harvest for rarely-harvested species, optimal allocation analyses to distribute sampling effort were based on harvest estimates for commonly-harvested species (George et al. 2015:69–70; Table 1).

The sampling frame includes five regions, which together represent about 90% of the total subsistence bird harvest in Alaska: Yukon-Kuskokwim Delta, Bering Strait-Norton Sound, Interior Alaska, Bristol Bay, and North Slope (Appendix A). Harvest in these five regions serves as an index for the Alaska-wide harvest. The same regions are sampled each year (Otis et al. 2016). Harvest data for non-surveyed regions may be occasionally available depending on surveys conducted by other organizations, including Native organizations. The AMBCC-HAP provides technical assistance in harvest data collection and analysis upon request. Also, depending on priorities, the AMBCC-HAP may conduct dedicated studies to address specific data needs in non-surveyed regions. These additional data are not to be incorporated in the regular five-regions harvest estimates but may be provided as separate reports.

The survey uses a stratified, two-stage sampling design. Regions are considered strata. Within each region, communities are first-stage sampling units and households are second-stage sampling units. The clustering of communities into subregions (used in 2004–2015) was eliminated because harvest estimates at the region and Alaska-wide levels were considered a priority during the last survey revision, and providing accurate harvest estimates at the subregion level requires increased sampling effort at increased survey cost (Naves 2012; George et al. 2015).

5. See also National Science Foundation, Interagency Arctic Research Policy Committee (IARPC). 2018. “Principles for Conducting Research in the Arctic” Accessed June 26, 2020. <https://www.nsf.gov/geo/opp/arctic/conduct.jsp>

6. See also Alaska Federation of Natives. 2013. “Alaska Federation of Natives Guidelines for Research.” Alaska Native Knowledge Network. Accessed June 25, 2020. <http://www.ankn.uaf.edu/IKS/afnguide.html>

Table 1.–Commonly-harvested species used to define statistical precision goals for the survey.

Species	Scientific, Latin name
American widgeon ¹	<i>Anas americana</i>
Black brant ^{1,2,4}	<i>Branta bernicla</i>
Black scoter ^{1,2,4}	<i>Melanitta americana</i>
Cackling/Canada goose ¹	<i>Branta hutchinsi</i> and <i>B. canadensis</i>
Canvasback ²	<i>Aythya valisineria</i>
Common eider ^{3,4}	<i>Somateria mollissima</i>
Greater white-fronted goose ¹	<i>Anser albifrons</i>
King eider ^{1,4}	<i>Somateria spectabilis</i>
Long-tailed duck ²	<i>Clangula hyemalis</i>
Mallard ^{1,2}	<i>Anas platyrhynchos</i>
Northern pintail ¹	<i>Anas acuta</i>
Greater/lesser scaup ¹	<i>Aythya marila</i> and <i>A. affinis</i>
Snow goose ¹	<i>Chen caerulescens</i>
Surf scoter ²	<i>Melanitta perspicillata</i>
White-winged scoter ¹	<i>Melanitta fusca</i>

Source: George et al. (2015:69–70)

- 1: Important subsistence resources; >2% of the total subsistence harvest of birds in Alaska, based on 2004–2008 AMBCC harvest estimates.
- 2: Large proportion (>5%) of Alaska breeding population is harvested by subsistence users.
- 3: Large proportion (>5%) of Alaska breeding population is harvested by subsistence users and harvest during fall and winter includes birds breeding outside of Alaska (mixed populations).
- 4: Species of conservation concern that are harvested in significant numbers.

For each region and year, a systematic random sample of communities was selected to be surveyed. To obtain a geographically dispersed set of communities, in each region, communities were sequentially numbered following a geographic route (south to north, coastal to inland; figures 1–5). A starting-point community was randomly selected, which defined the other selected communities (e.g., every 4th community in the sequentially numbered route). Communities were selected randomly regardless of their total number of households. Based on results from the 2016 and 2017 surveys, an optimal allocation analysis was conducted to fine-tune the distribution of sampling effort among regions, i.e., the number of communities and households to be sampled in each region (Table 2) (Otis, George, and Doherty 2017; Otis and Doherty 2018).

To increase accuracy of harvest estimates, starting in the 2017 survey, communities with more than 200 households were divided into parcels so that individual parcels had a maximum of 200 households (Otis, George, and Doherty 2017). In the 2016 survey, large communities were divided into parcels of up to 300 households (Naves and Otis 2017). For purposes of sampling, each parcel was treated as an individual community. The number of parcels per community was based on the 2010 census; it was fixed across years and will be updated based on the 2020 census (Table 2). This approach was adopted to simplify the annual selection of communities/parcels to be surveyed, because using annual population estimates to derive number of parcels per community could lead to variation in the number of parcels across years. Communities with fewer than 10 households in the 2010 census and in the 2011–2015 population estimates were excluded from the sampling frame (U.S. Census Bureau n.d.; ADLWD n.d.) (Bristol Bay region: Ivanof Bay, Portage Creek, Ugashik, and Pope Vannoy Landing; Interior Alaska region: Lake Minchumina, Coldfoot, Wiseman, Livengood, Chicken, and Healy Lake).

Participation in the survey is voluntary for communities and households. If a selected community declined to participate or could not be surveyed because of a major logistical constraint, an alternate community was selected. Following the geographic route established for the systematic random sampling of communities, the first alternate community was the one immediately before the originally selected community (figures 1–5). If a first-alternate

community declined to participate or could not be surveyed because of a major logistical constraint, the community immediately after the originally selected community was selected as the second alternate. Within communities, if a selected household declined to participate or could not be contacted after three reasonable attempts (as described in Naves [2012]), an alternate household was randomly selected, and this process was repeated until the household sampling goal was met.

Starting in the 2016 survey (revised methods), harvest level stratification (harvester, non-harvester) is no longer used. This change was made to simplify data collection because of challenges in reliably assigning households to strata, especially in larger communities. Within each selected community, households were selected to be surveyed by simple random sampling. For the 2018 survey, based on optimal allocation and discussion with AMBCC partners, 10 households were to be surveyed in each selected community in the Yukon-Kuskokwim and Interior Alaska regions, 20 households were to be surveyed per community in the Bristol Bay and Bering Strait-Norton Sound regions, and 30 households were to be surveyed per community in the North Slope region (Otis and Doherty 2018) (Table 2). The number of households surveyed per community is lower in the revised AMBCC survey than in other surveys conducted in Alaska because Alaska-wide estimates were defined as a priority during the AMBCC survey revision (George et al. 2015). This change generated concerns among some AMBCC partners because a reduced sample size within communities may incur the possibility of missing some high harvesters, which would in turn result in underestimated harvest at the community level. However, the intent of the survey is to reflect a large-scale perspective of the subsistence bird harvest. Harvest estimates are only produced at the region and survey-wide levels. Harvest estimates at the region level are based on the total number of households sampled in the region, and this larger sample size accurately represents the true proportion of harvesters and nonharvesters at the region level.

Table 2.—Distribution of sampling effort, 2018 survey.

Region	Total communities/ parcels ¹	Communities/parcels to be surveyed	Households to be surveyed in each community/parcel	Total households to be surveyed
Bristol Bay	33	10	20	200
Yukon-Kuskokwim Delta	58	25	10	250
Bering Strait-Norton Sound	23	6	20	120
North Slope	14	4	30	120
Interior Alaska	43	6	10	60
Total	171	51	na	750

Source: Otis and Doherty (2018)

1: “Communities/parcels” refer to sampling units, accounting for (a) division of large communities into parcels and (b) communities with fewer than 10 households, which were excluded from the sampling frame. Total households per community based on 2010 census.

Dividing Large Communities into Parcels

Lists of addresses were obtained for communities with more than 200 households. Using the software Microsoft Excel⁷, a formula assigned a random number to each address. The lists were sorted from the smallest to the largest random number and divided into sequential parts according to the number of parcels defined for each community. Thus, parcels were composed of a random set of addresses within a community. This process ensures that parcels were not potentially biased by demographic characteristics of neighborhoods, such as ethnicity or age classes.

Utqiagvik—A list of residential addresses was obtained from the Planning Department of the North Slope Borough. The list included 1,223 residential addresses and was divided into 7 parcels of equal size. Based on the 2018 estimated community size, data analysis used parcel sizes of 193 households.

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

Bethel—A list of addresses used for the salmon harvest survey in 2016 was obtained from the Division of Commercial Fisheries of the Alaska Department of Fish and Game. This list has been updated and ground-truthed over the years. The list included 2,130 addresses (most of them residential) and was divided into 10 parcels. Based on the 2018 estimated community size, data analysis used parcel sizes of 193 households.

Dillingham—A list of addresses was obtained from the Planning Department of the City of Dillingham. The list was last updated in 2014, and a more recent list was unavailable. The list included 1,109 addresses, of which 76 addresses were identified as non-residential and were excluded, resulting in 1,033 total addresses. The address list was divided into 5 parcels. Based on the 2018 estimated community size, data analysis used parcel sizes of 173 households.

Nome—A list including 2,204 addresses was obtained from the Planning Department of the City of Nome. A total of 1,472 addresses were identified as having a structure, and this list was divided into 7 parcels. Based on the 2018 estimated community size, data analysis used parcel sizes of 177 households.

Random Selection of Households

At the community level, data collection relied on household lists including all resident households, except for the largest communities, where the survey used lists of addresses as described above (Appendix B). A household was considered resident if its members had 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.

For small communities, a list of households based on family names was compiled or updated by the local surveyor, often with assistance of the local tribal council. People move between communities and households within communities, thus household lists need to be frequently updated. For large communities, it was impractical to compile household lists based on family names, and instead, surveys used lists of physical addresses. Address lists were obtained, for example, from the planning department, electrical company, or emergency services. For each community, all addresses identified as residential were considered for household selection. Addresses identified as non-residential were excluded from the selection. Address lists do not always distinguish between residential and non-residential units, and alternate addresses were used to replace selected non-residential addresses. Also, lists of addresses do not always identify individual units within multi-unit buildings (apartment buildings, duplexes, etc.), and in this case a secondary random selection was used to select individual housing units.

For small communities (up to 200 households), local surveyors were responsible for randomly selecting households from their local household list. Local surveyors most often used a manual process to randomly select households by writing household identification codes on paper and drawing selected households from a “hat.” For communities divided into parcels, addresses were electronically sorted based on a randomly assigned number. The top-listed addresses were selected to be surveyed as the original sample. Additional addresses were pre-selected as potential alternates to replace addresses of the original sample that were non-residential, unoccupied, could not be contacted, or declined to participate in the survey. Alternate addresses were used as needed following the random order in which they were listed.

Data Collection, Household Visits

Data collection followed methods described in Naves (2012). Local surveyors were trained by a regional partner or survey coordination staff. Harvest surveys were completed during in-person interviews conducted by a local surveyor. Survey respondents were instructed (1) to report all bird and egg harvests by all harvesters in the household, including those given to other household(s); (2) to report the household’s share of any harvest 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 C). Alternate households or addresses were selected to replace households that declined to participate and households that could not be contacted after three reasonable attempts. Alternate addresses were selected as needed until the household sampling goal was achieved.

The harvest report form was used to record the harvest of birds and eggs (appendices D–G). The survey form included species important for subsistence uses or of management interest. Harvest 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. The form had a sheet for each survey season (winter: 1 November–9 March, spring: 2 April–30 June, summer: 1 July–31 August, and fall: 1 September–31 October). Because of bird migration phenology, winter data were collected only in the Bristol Bay region, and in the North Slope region the survey included spring and summer data only. The bird identification guide had color drawings of birds (appendices G–K). A poster with color photographs of all species included in the survey assisted in species identification and outreach (appendices L–O). On the poster, the species’ English name and

a blank field for writing Native and local names appeared close to each photograph. Lists of local and Alaska Native species names were available to data collection staff to help in communicating with respondents and in species identification (Naves 2010rev.).

Since 2012, loon species names have not been displayed on the bird identification guide and harvest report form because of confusion with the English name “common loon,” which is frequently understood as the locally most common species of loon, and because of other differences between local ethnotaxonomy and Western taxonomy (Naves and Zeller 2013). Loon harvest data were presented in this report by species names corresponding to the numeric labels used in survey forms [loon 1: Pacific-Arctic loon (*Gavia pacifica* and *G. arctica*), loon 2: unidentified loon in nonbreeding plumage, loon 3: yellow-billed loon (*G. adamsii*), loon 4: common loon (*G. immer*), and loon 5: red-throated loon (*G. stellata*)].

Data Analysis

Electronic data entry of completed surveys was done using Microsoft Office Access forms. The raw data were stored in a Microsoft SQL Server Management Studio relational database. Double data entry and logic checks ensured accuracy of the data stored in the database (reported harvest, sample size, strata size). Logic checks and data analysis were done with IBM SPSS Statistics. Original survey forms were scanned and archived as digital files. To ensure anonymity of household harvest reports, household names and other personal information provided were covered prior to scanning, and the original forms were not archived.

Reported harvests from surveyed communities were extrapolated to non-surveyed communities in the same region. There are several alternative statistical methods to estimate total harvest for multi-stage sampling designs. During the survey review, the use of a simple unbiased estimator and a ratio estimator were explored (Cochran 1977; Otis et al. 2016). The unbiased estimator can have slightly larger variance than the ratio estimator in some applications. However, the unbiased estimator was chosen because of its simplicity in estimation of regional and survey-wide harvests, and because the ratio estimator is not unbiased (Appendix P).

For non-surveyed communities, the number of occupied households was calculated by dividing 2018 population estimates (ADLWD n.d.) by the number of people per household reported in the 2010 census (U.S. Census Bureau 2011). Harvest estimates and variances were calculated for each season, and annual estimates were calculated as the sum of seasonal harvest. Harvest estimates and their variances were calculated for each region and then summed to produce survey-wide harvest estimates and variances. Minor differences (if present) between annual harvest estimates and the sum of seasonal estimates or between Alaska-wide harvest estimates and the sum of regional estimates were due to rounding of decimal places. Decimal places were used in analyses but were not presented in this report to facilitate reading of results and avoid overstating the precision of harvest estimates. In 2018, a total of 49 communities/parcels were surveyed and 46 communities/parcels were included in data analysis (Table 3 and Appendix A; includes Cordova mail survey).

The subsistence harvest survey covers a large geographic area and 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 that used in the AMBCC survey cannot address both commonly- and rarely-harvested species with the same level of precision (Copp and Roy 1986:11, H-15; Otis et al. 2016). Few data points for rarely harvested species results in less accurate harvest estimates and wider confidence intervals as compared to commonly harvested species. Dedicated harvest surveys and specific analytical procedures are needed to accurately estimate harvest 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.

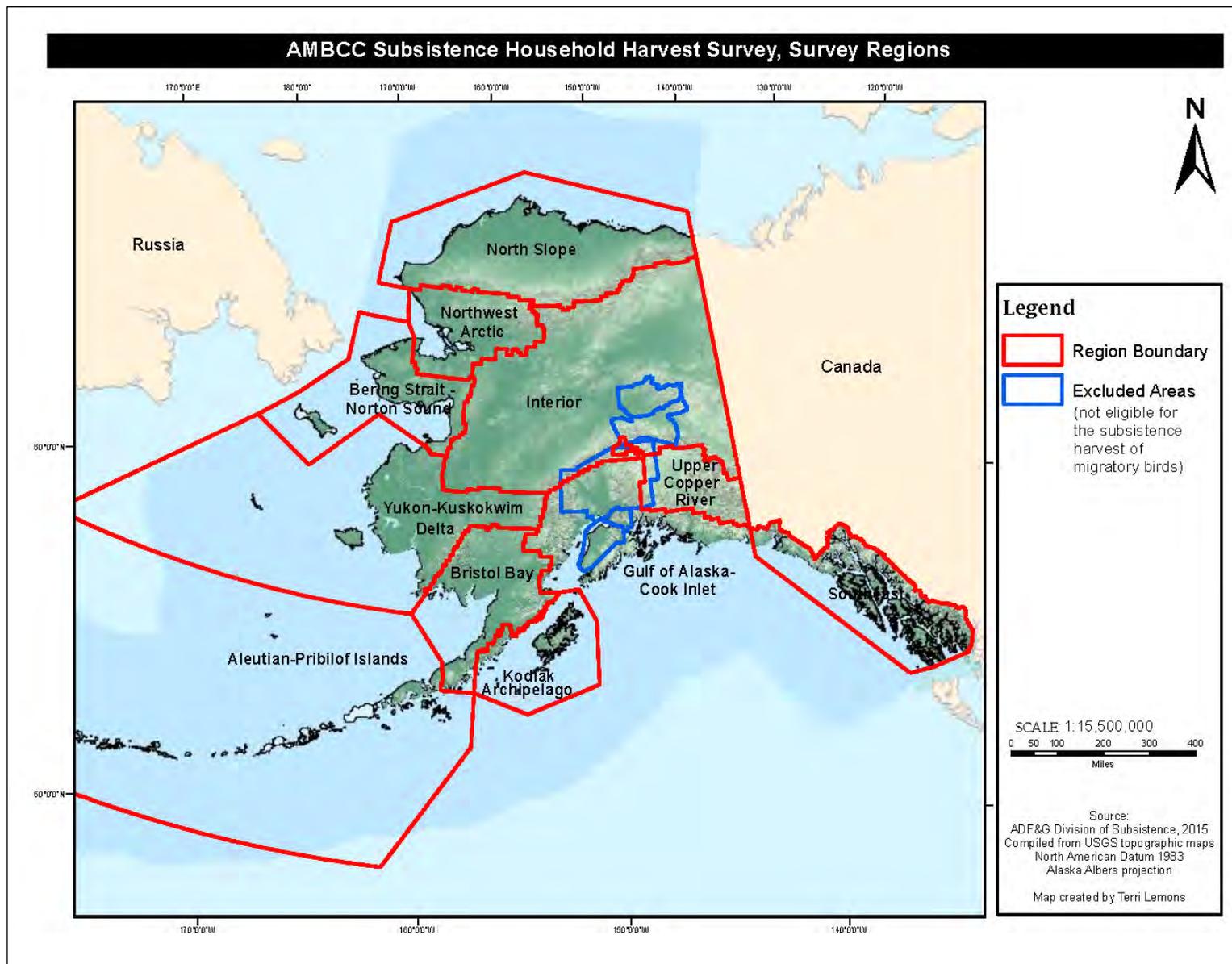


Figure 1.—Management regions for the Alaska migratory bird subsistence harvest.

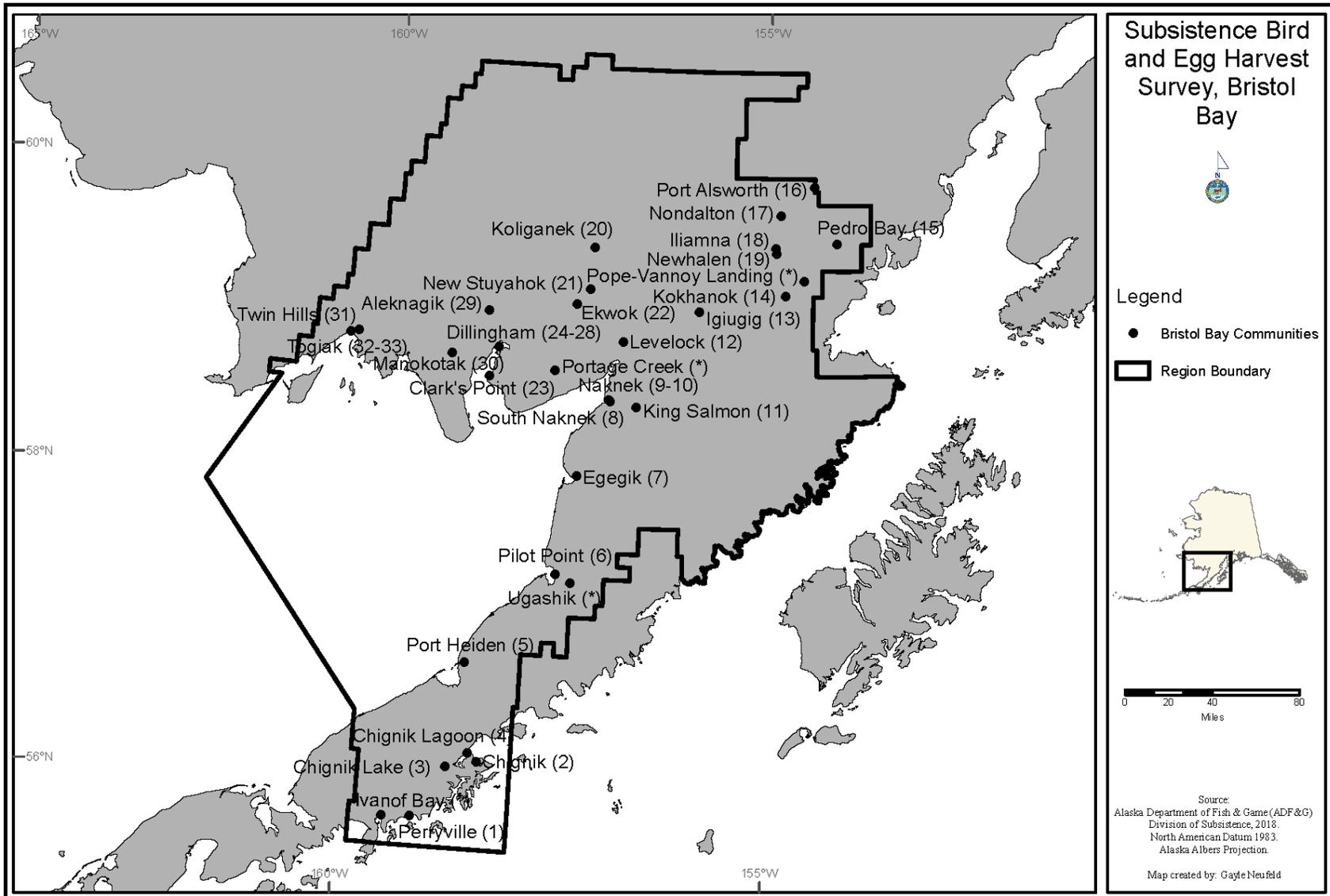


Figure 2.—Bristol Bay region with sequential numbering of communities for systematic random sampling. An asterisk “*” indicates communities with fewer than 10 households, which were excluded from the sampling frame.

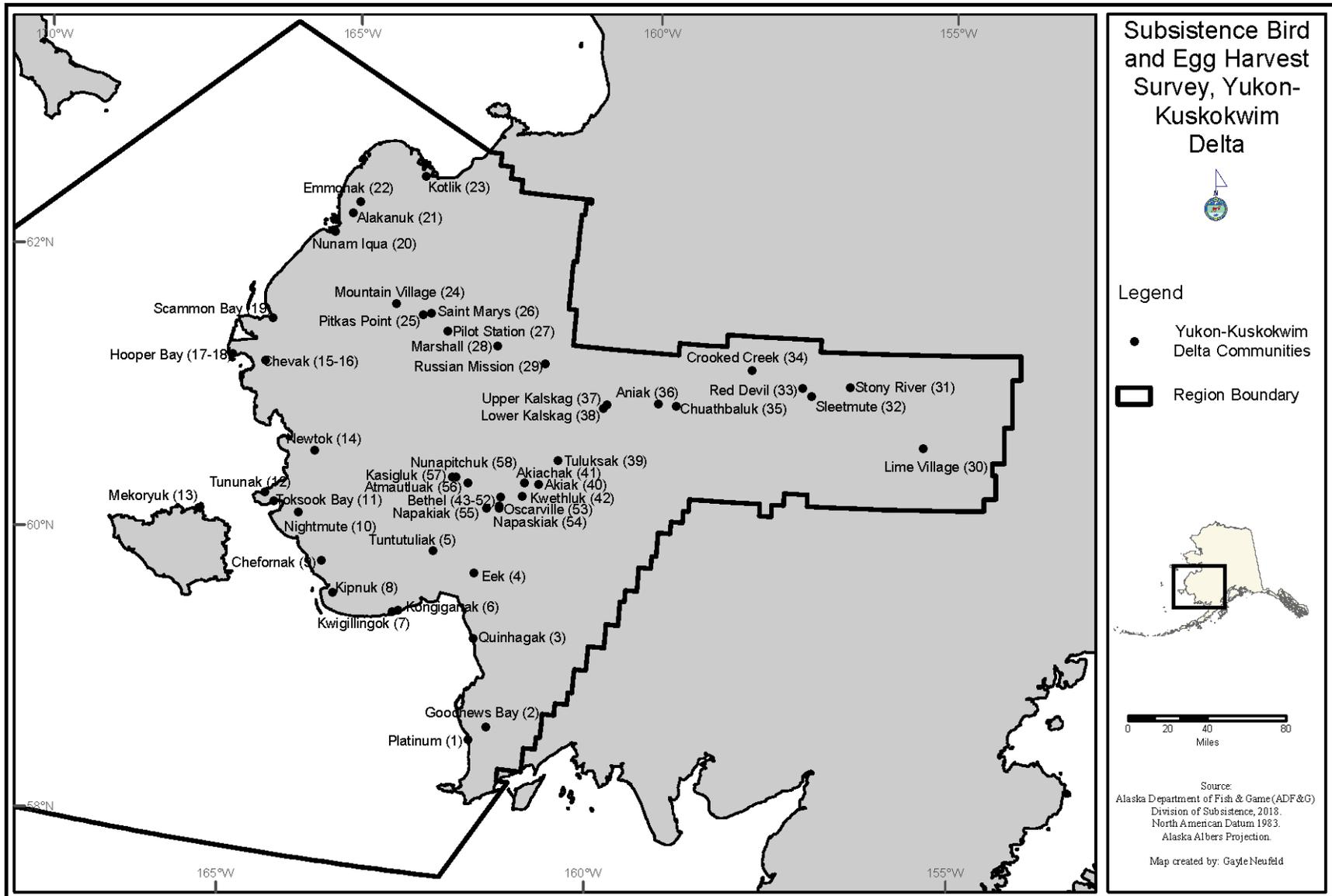


Figure 3.—Yukon-Kuskokwim Delta region with sequential numbering of communities for systematic random sampling.

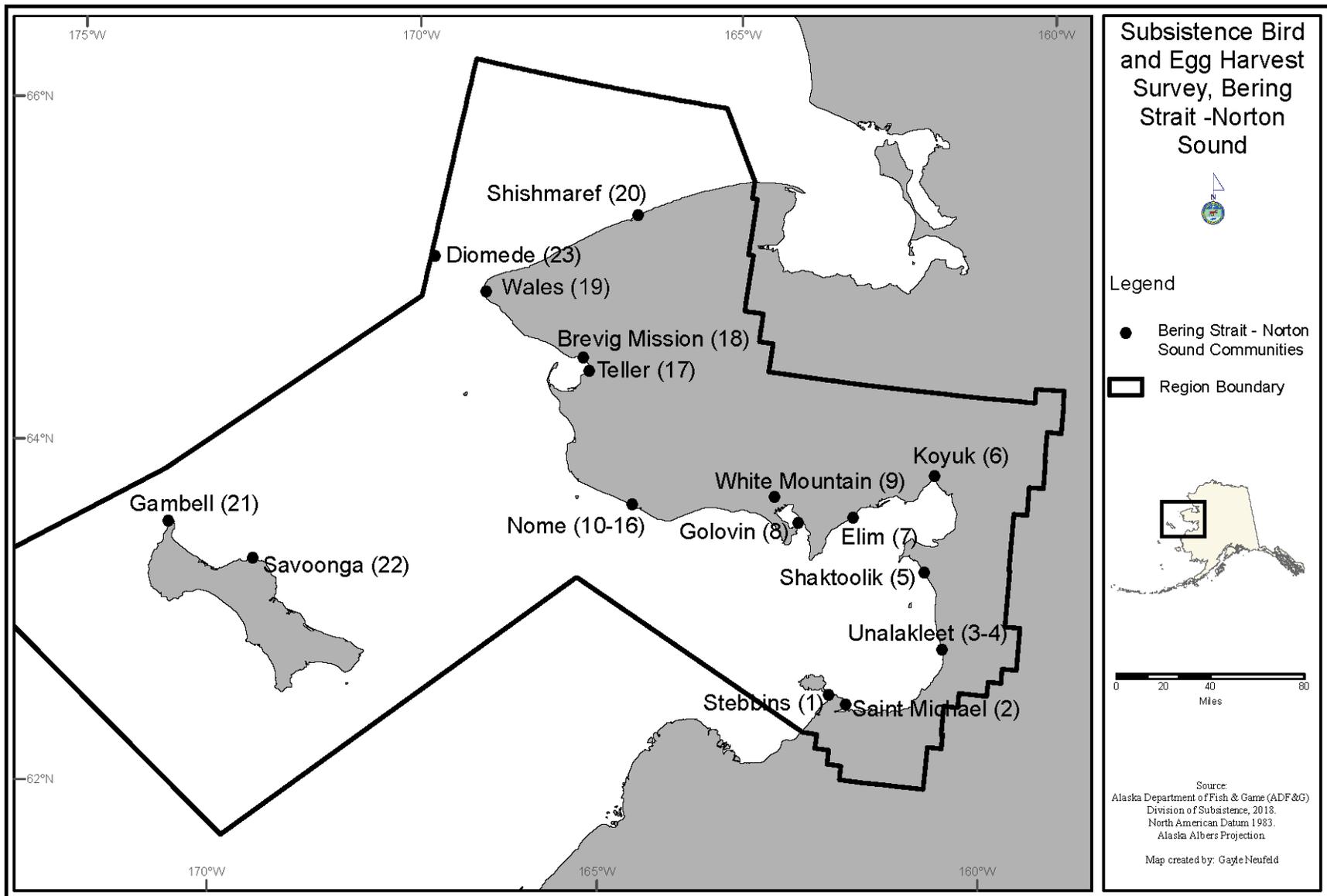


Figure 4.–Bering Strait-Norton Sound region with sequential numbering of communities for systematic random sampling.

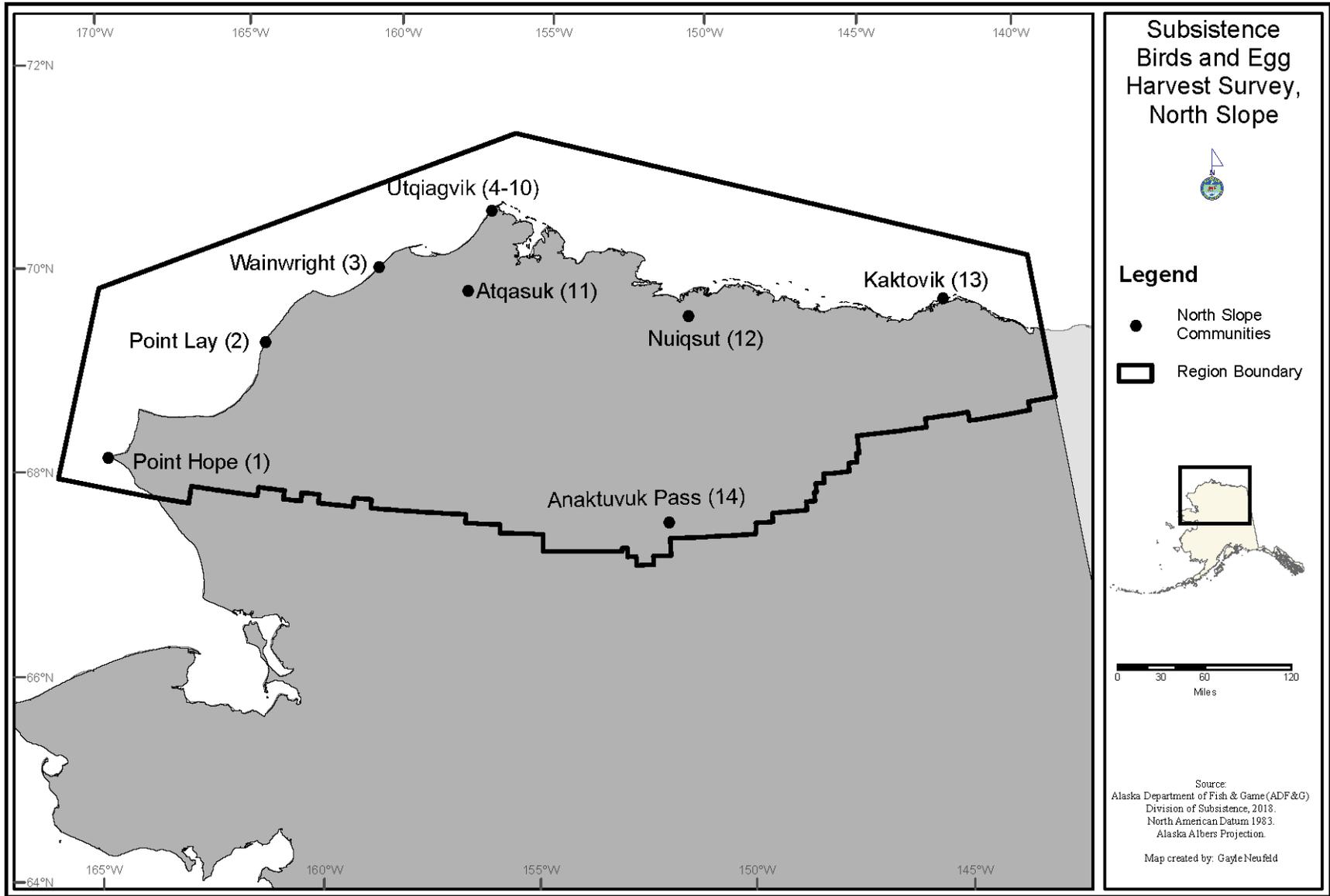


Figure 5.—North Slope region with sequential numbering of communities for systematic random sampling.

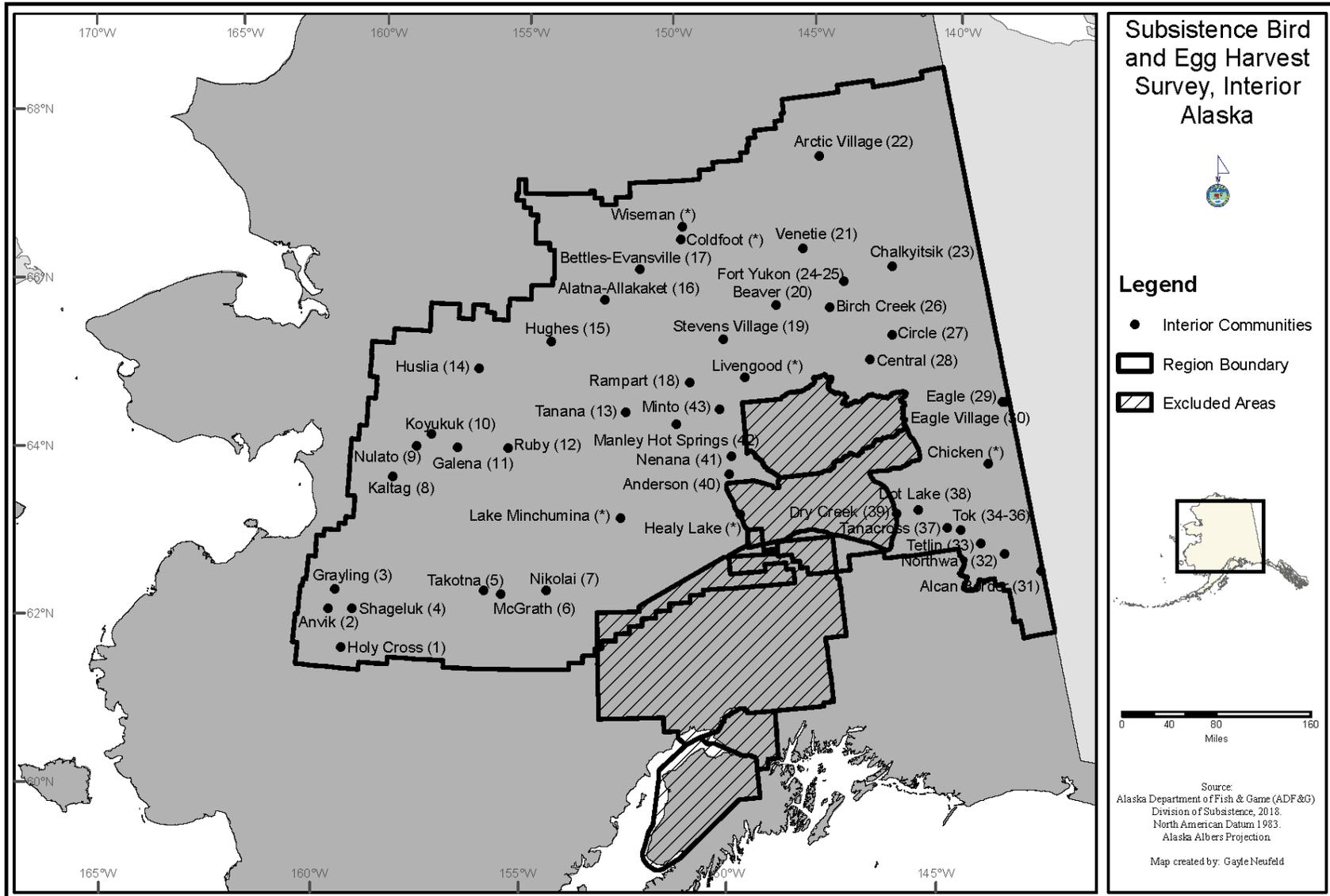


Figure 6.—Interior Alaska region with sequential numbering of communities for systematic random sampling. An asterisk “*” indicates communities with fewer than 10 households, which were excluded from the sampling frame.

CORDOVA HARVEST: MAIL SURVEY

The Cordova migratory bird subsistence harvest was first authorized in 2014⁸. The season was opened 2–30 April for waterfowl hunting and 1–31 May for gull egg harvesting, with a limited set of species opened to harvest. Households are required to register for this harvest. In 2018, a total of 41 households registered for this harvest. The ADF&G Division of Subsistence coordinated the household registration and mail survey in collaboration with the local partners (Eyak Tribe, U.S. Forest Service, Alaska Department of Fish and Game, Chugach Regional Resources Commission, Native Village of Chenega, and Native Village of Tatitlek).

Harvest surveys were mailed in June 2018 to all registered households (Appendix Q). Survey reminders were sent in July and August to registered households that had not yet provided a completed survey. The survey was conducted in the context of the AMBCC-HAP. A total of 33 surveys were completed (out of 41 registered households) resulting in a response rate of 81%. Harvests reported in completed surveys were extrapolated to registered households that have not completed a survey.

COMMUNITY AND HOUSEHOLD PARTICIPATION RATES

The community participation rate was calculated as the number of communities that agreed to participate divided by the number of communities where contact was attempted. The 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. No response from communities may suggest lack of interest or willingness to participate in the survey, but it also may also be related to conditions unrelated to the survey (e.g., tribal office not staffed, malfunction of local communication systems). Thus, as calculated, the community participation rates may underestimate communities' willingness to participate in the survey. Because it is often difficult to differentiate between reasons for non-response, a conservative approach was chosen to calculate community participation rates.

In regions surveyed by in-person interviews (five-regions survey), the household participation rate was calculated as the number of households that agreed to participate divided by the number of households contacted. Detailed information on calculation of household participation rates was presented in Naves (2015b:19–20). For the Cordova mail survey, the household participation rate was calculated as the proportion of registered households that provided a completed survey.

RESULTS AND DISCUSSION

In 2004–2015, sampling effort depended on funding, monitoring priorities, and size of the communities surveyed (Table 3). Starting in 2016, the same five regions were surveyed annually, and within regions, a fixed number of communities and households were surveyed. In 2018, 50 communities were invited to participate in the survey and 45 communities agreed to participate (Table 4). The 2018 household participation rates are presented in Table 5.

Annual harvest estimates (all species combined) were summarized in tables 6 (birds) and 7 (eggs), which also signal that estimates detailed by species and seasons are available in the following tables 8–20. Starting in 2016, the revised sampling design defined the annual geographic coverage of the survey to five regions. While the revised sampling design provides Alaska-wide harvest estimates with good precision through the five-regions index, estimates at the region level may be less accurate than in previous years. The 2016–2018 five-regions index were comparable to the 2004–2009, 2010–2015, and 2004–2015 averages at the same geographic scale (Tables 6 and 7). Comments provided by the North Slope Borough Fish and Game Management Committee to draft harvest estimates offer context to harvest numbers and limitations of the survey in depicting harvest patterns at the region level on an annual basis (Naves and Keating 2018:58). The current survey design prioritizes Alaska-wide harvest estimates and relies on multi-year data to depict harvest patterns. A summary was produced to facilitate data review and community communication regarding the Cordova harvest (Table 20, Appendix R).

8. Federal Register Vol. 79, No. 67 (April 8, 2014) available online: <https://www.gpo.gov/fdsys/pkg/FR-2014-04-08/pdf/FR-2014-04-08.pdf>.

Table 3.–Number of communities/parcels and households included in data analysis, 2004–2018.

Survey year	Communities/parcels included in harvest estimates	Households surveyed			
		Spring ^a	Summer ^c	Fall (or Fall–Winter)	Winter
2004	77	1,770	1,707	1,673	b
2005	75	2,226	2,251	1,742	b
2006	62	1,793	1,773	1,687	b
2007	74	2,076	2,051	1,491	b
2008	44	1,630	1,568	1,189	b
2009	27	923	909	762	b
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	c
2014	7	250	222	222	c
2015	20	907	892	892	c
2016	43	447	425	373	10 ^d
2017	46	664	639	489	101 ^e
2018	46	686	653	502	83 ^e

Sources Survey results for 2004–2017 were reported in Naves (2010rev.; 2010; 2011; 2012; 2014a; 2015b; 2015c; 2016), Naves and Braem (2014), Naves and Otis (2017), and Naves and Keating (2018).

- a. The Cordova survey covers April–May harvest only, and North Slope survey covers spring and summer only.
- b. In 2004–2009, for regions and subregions with a winter survey, data were recorded as fall–winter.
- c. The subregions and regions surveyed usually have no winter survey.
- d. Only one community had winter survey, thus winter data were not included in harvest expansion.
- e. Starting in 2017, winter surveys are conducted in all communities in the Bristol Bay region.

Table 4.–Community participation rate, 2018.

Regions	Total communities	Contacted communities	Communities that agreed to participate in the survey	Community participation rate
Bristol Bay	31	9	9	100%
Yukon-Kuskokwim Delta	47	27	22	82%
Bering Strait-Norton Sound	16	4	4	100%
North Slope	8	4	4	100%
Interior Alaska	48	5	5	100%
Gulf of Alaska-Cook Inlet, Cordova	1	1	1	100%
Total	151	50	45	90%

Note Community participation rates were calculated as the number of communities that agreed to participate divided by the number of communities contacted.

Table 5.–Household participation rate, 2004–2018.

Region Subregion	2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		
	Participation	N	Participation	N	Participation	N	Participation	N	Participation	N	Participation	N	Participation	N	Participation	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 and 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	-	-	76%	306	-	-	93%	312	98%	360	-	-	-	-	96%	407	-	-	-	-	-	-	-	-	-	95%	40	97%	105	98%	60
South Alaska Peninsula	*	*	-	-	-	-	-	93%	29	*	*	-	-	89%	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southwest Bristol Bay	77%	73	72%	170	62%	93	90%	166	96%	156	-	-	-	96%	243	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dillingham	-	-	81%	136	-	-	97%	117	100%	204	-	-	-	99%	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Yukon-Kuskokwim Delta	82%	704	88%	801	75%	883	71%	713	71%	463	67%	523	89%	609	96%	493	-	-	98%	521	-	-	95%	930	92%	232	97%	169	98%	260	
Y-K Delta South Coast	85%	168	100%	138	74%	186	93%	175	*	*	68%	95	97%	112	100%	115	-	-	99%	120	-	-	93%	128	-	-	-	-	-	-	
Y-K Delta Middle Coast	82%	214	81%	232	90%	175	77%	92	72%	111	61%	168	80%	155	90%	156	-	-	94%	90	-	-	85%	113	-	-	-	-	-	-	
Y-K Delta North Coast	100%	58	92%	38	58%	107	57%	92	79%	87	80%	99	100%	77	100%	56	-	-	100%	93	-	-	100%	122	-	-	-	-	-	-	
Lower Yukon	83%	42	86%	180	89%	72	67%	231	*	*	*	*	100%	65	99%	88	-	-	100%	101	-	-	100%	98	-	-	-	-	-	-	
Lower Kuskokwim	76%	222	90%	213	69%	270	55%	123	65%	238	63%	161	81%	186	96%	78	-	-	98%	117	-	-	99%	227	-	-	-	-	-	-	
Central Kuskokwim	*	*	-	-	74%	73	*	*	-	-	-	-	100%	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bethel	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-	-	-	-	-	-	-	92%	242	-	-	-	-	-	
Bering Strait-Norton Sound	71%	528	81%	347	-	-	90%	439	-	-	-	-	81%	489	-	-	-	-	-	-	-	-	-	-	96%	56	85%	121	93%	86	
St. Lawrence-Diomed 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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	52	99%	154	90%	140	
North Slope Villages	-	-	90%	395	-	-	*	*	*	*	*	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barrow	-	-	98%	224	-	-	*	*	*	*	*	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Interior	-	-	-	-	98%	544	-	-	-	-	-	-	99%	523	-	-	-	-	-	-	-	-	-	-	90%	80	94%	116	100%	52	
Middle Yukon-Upper Kuskokwim	*	*	*	*	*	*	-	-	-	-	-	-	100%	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Yukon-Koyukuk	*	*	*	*	90%	83	100%	52	100%	52	-	-	97%	132	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Upper Yukon	*	*	-	-	98%	274	100%	144	-	-	-	-	100%	109	-	-	-	-	-	-	99%	228	-	-	-	-	-	-	-	-	
Tanana Villages	99%	102	-	-	100%	127	-	-	-	-	-	-	100%	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tok	-	-	-	-	100%	60	-	-	-	-	-	-	100%	132	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Upper Copper River	100%	55	-	-	-	-	94%	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Note Household participation rates 2004–2017 updated to include historical data recently recovered.

Household participation rates were calculated as the number of households that agreed to participate divided by the number of households contacted.

N: Number of households contacted ("N" may differ from the number of households surveyed).

-: Subregion, region not surveyed. *: Household consent data not available for analysis.

‡: 2009 Reduced household participation in St. Lawrence-Diomed Islands subregion may have been related to other surveys being conducted in that year.

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

Table 6.—Annual estimated bird harvest (all birds, spring, summer, fall, and winter), AMBCC survey, 2004–2018.

Regions, subregions (all birds, all seasons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2004- 2009 Average	2010- 2015 Average	2004- 2015 Average	2016	2017	2018	
Gulf of Alaska-Cook Inlet	2,995												1,802	1,196	1,614				
Gulf of Alaska Villages	2,756		596				1,049						1,676	1,049	1,467				
Cordova										42		0		21	21	80	174	42	
Cook Inlet	239	13											126		126				
Kodiak Archipelago							6,926						10,531	6,926	8,729				
Kodiak Villages			5,552				1,947						5,552	1,947	3,750				
Kodiak City and Road-connected							4,979							4,979	4,979				
Aleutian-Pribilof Islands					8,401								11,390		11,390				
Aleutian-Pribilof Villages		16,876		7,371	7,642								10,630		10,630				
Unalaska					760								760		760				
Bristol Bay*	47,336		28,285	32,995			30,081						32,901	30,084	32,046	63,880	53,464	29,476	
South Alaska Peninsula	801			968	115			833					628	833	679				
Southwest Bristol Bay	14,955	32,769	26,715	20,169	29,352			26,601					24,792	26,601	25,094				
Dillingham		11,769		7,148	3,527			2,650					7,481	2,650	6,273				
Yukon-Kuskokwim Delta*	130,343	114,514	171,856	148,715	79,088	195,082	142,834	110,611					110,836	138,748	134,723	137,152	78,602	70,942	140,381
Y-K Delta South Coast	25,764	35,508	31,918	33,927	19,999	35,203	17,537	37,834		33,417			21,381	30,387	27,542	29,249			
Y-K Delta Middle Coast	34,480	17,546	61,998	43,737	17,160	82,654	37,363	13,899		58,770			21,164	42,929	32,799	38,877			
Y-K Delta North Coast	8,806	11,206	4,493	1,206	4,867	13,637	4,920			5,839			10,121	7,369	6,960	7,233			
Lower Yukon	6,201	6,815	10,269	3,988	4,727	6,904	7,748			10,863			17,114	6,484	11,908	8,292			
Lower Kuskokwim	46,033	16,557	48,849	58,983	22,813	44,934	71,317	32,826		65,081			26,450	39,695	48,919	43,384			
Central Kuskokwim	440		1,167	219			659						609	659	621				
Bethel	8,618	23,954	13,163	^{6,654}	7,789	7,478	3,290	2,539				11,978	11,276	5,936	9,496				
Bering Strait-Norton Sound*	53,576	74,115		123,257									83,649	32,379	39,758	36,458	27,429	98,568	
St. Lawrence-Diomede Is.						41,176	14,054	12,077	8,848				41,176	11,660	19,039				
Bering Strait Mainland Villages							20,719							20,719	20,719				
Nome																			
Northwest Arctic															14,113				
Northwest Arctic Villages			9,676										9,676		9,676				
Kotzebue									4,437					4,437	4,437				
North Slope*		15,615		44,270	45,123	19,075							31,021		31,021	76,315	16,383	38,240	
North Slope Villages																			
Barrow																			
Interior Alaska*	50,995		37,068				32,611						45,100	30,957	39,067	108,742	24,794	30,412	
Middle Yukon-Upper Kuskokwim	3,086	2,744	697				786						2,176	786	1,828				
Yukon-Koyukuk	3,108	930	1,764	3,031	6,908		4,532						3,148	4,532	3,379				
Upper Yukon	14,418		10,927	18,402			12,692			9,384			14,582	11,038	13,165				
Tanana Villages	20,388		17,358				14,086						18,873	14,086	17,277				
Tok			6,321				515						6,321	515	3,418				
Upper Copper River	1,120			247									684		684				
Alaska-wide (all regions)													355,827	279,358	301,460				
Five-regions index (regions indicated by •)													331,420	259,163	279,044	363,998	193,012	337,077	

Source: Survey results for 2004–2017 were reported in Naves (2010a; 2010b; 2011; 2012; 2014b; 2015b; 2015c; 2016), Naves and Braem (2014), Naves and Otis (2017), Naves and Keating (2018). Region-level averages calculated as the sum of the averages for the subregions. Empty cells denote lack of data.

Table 7.—Annual estimated egg harvest (all eggs), AMBCC survey, 2004–2018.

Regions, subregions (all eggs)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2004-2009 Average	2010- 2015 Average	2004- 2015 Average	2016	2017	2018	
Gulf of Alaska-Cook Inlet	2,178												1,140	1,566	1,413				
Gulf of Alaska Villages	2,173		102				1,366						1,137	1,366	1,214				
Cordova											131	263		197	197	105	113	171	
Cook Inlet	5	0											3		3				
Kodiak Archipelago			5,222				803						5,222	803	3,012				
Kodiak Villages			4,545				771						4,545	771	2,658				
Kodiak City and Road-connected			677				32						677	32	355				
Aleutian-Pribilof Islands					4,778								8,053		8,053				
Aleutian-Pribilof Villages		11,733		6,127	4,018								7,293		7,293				
Unalaska					760								760		760				
Bristol Bay*	47,799		30,801	47,653			25,211						44,831	25,213	41,296	69,367	28,029	6,005	
South Alaska Peninsula	409			651	106			392					389	392	390				
Southwest Bristol Bay	54,437	39,206	31,292	25,118	37,630			21,105					37,537	21,105	34,798				
Dillingham		5,768		5,032	9,917			3,716					6,906	3,716	6,108				
Yukon-Kuskokwim Delta*	27,288	22,268	30,723	19,153	31,195	58,995	26,965	54,075					56,767	31,182	45,372	36,282	35,450	35,970	43,886
Y-K Delta South Coast	7,768	13,424	7,406	1,746	8,442	29,065	6,208	26,492		21,605		15,424	11,309	17,432	13,758				
Y-K Delta Middle Coast	14,598	2,140	21,354	11,930	16,195	24,640	19,137	15,213		7,963		13,400	15,143	13,928	14,657				
Y-K Delta North Coast	2,466	3,921	188	22	554	345	1,619			8,240		14,654	1,249	8,171	3,557				
Lower Yukon	191	652	232	565	0	386	0			1,392		3,902	338	1,765	813				
Lower Kuskokwim	2,265	1,302	1,498	4,891	5,298	3,087	0	877		6,995		6,873	3,057	3,686	3,309				
Central Kuskokwim	0		15	0			0						5	0	4				
Bethel	0	261	29	0	23	179	0	0				1,169	82	390	185				
Bering Strait-Norton Sound*	99,494	113,082		146,557									119,711	49,371	69,799	37,072	120,926	32,091	
St. Lawrence-Diomedes Is.						117,174	55,682	20,999	29,701				117,174	35,461	55,889				
Bering Strait Mainland Villages							13,910							13,910	13,910				
Nome																			
Northwest Arctic																			
Northwest Arctic Villages			10,081										10,081		10,081				
Kotzebue									5,896					5,896	5,896				
North Slope*	4,705		2,388	858	2,430								2,595		2,595	26,745	2,121	11,168	
North Slope Villages																			
Barrow																			
Interior Alaska*	1,009		911				65						870	65	662	888	0	17	
Middle Yukon-Upper Kuskokwim	0	2	0				0						1	0	1				
Yukon-Koyukuk	11	0	0	0	0		22						2	22	6				
Upper Yukon	40		0	0			0				110		13	55	30				
Tanana Villages	760		875				43						817	43	559				
Tok			36				0						36	0	18				
Upper Copper River	82			0									41		41				
Alaska-wide (all regions)													213,645	133,078	163,153				
Five-regions index (regions indicated by *)													199,189	122,616	150,634	169,521	187,047	93,167	

Source: Survey results for 2004–2017 were reported in Naves (2010a; 2010b; 2011; 2012; 2014b; 2015b; 2015c; 2016), Naves and Braem (2014), Naves and Otis (2017), Naves and Keating (2018).

Region-level averages calculated as the sum of the averages for the subregions. Empty cells denote lack of data.

Table 8.—Estimated bird harvest, Alaska-wide (five-regions index), 2018.

Species	Yearly bird harvest			Spring		Summer		Fall		Winter‡	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks											
* American wigeon	293	7,594	68%	4,200	74%	392	122%	3,001	92%	0	
Teal	229	5,889	79%	2,777	99%	91	137%	3,020	92%	0	
* Mallard	590	15,250	38%	9,679	48%	419	99%	5,063	54%	89	120%
* Northern pintail	880	20,023	69%	7,374	61%	5,779	133%	6,788	87%	82	92%
Northern shoveler	172	3,476	112%	683	93%	1,384	160%	1,409	124%	0	
* Black scoter	374	9,414	70%	7,608	66%	0		1,806	131%	0	
* Surf scoter	120	2,726	88%	2,337	98%	0		389	141%	0	
* White-winged scoter	74	1,606	81%	1,559	80%	0		47	196%	0	
Bufflehead	89	1,986	143%	1,067	140%	208	197%	711	196%	0	
Goldeneye	174	3,120	94%	2,095	90%	0		1,025	107%	0	
* Canvasback	17	297	166%	297	166%	0		0		0	
* Scaup	448	12,088	71%	8,159	69%	369	179%	3,561	100%	0	
* Common eider	592	13,222	95%	9,227	87%	1,999	141%	1,997	184%	0	
* King eider	1,096	26,798	65%	20,658	67%	3,319	99%	2,822	186%	0	
Spectacled eider	119	2,409	113%	1,514	115%	27	193%	868	198%	0	
Steller's eider	1	14	193%	0		14	193%	0		0	
Eider (unidentified)	6	95	194%	95	194%	0		0		0	
Harlequin duck	44	1,165	116%	1,055	119%	0		110	196%	0	
* Long-tailed duck	329	10,754	133%	9,858	136%	0		895	129%	0	
Merganser	46	1,227	158%	649	144%	0		578	188%	0	
Duck (unidentified)	13	468	113%	380	133%	0		88	197%	0	
Total ducks	5,706	139,623	47%	91,271	47%	14,002	85%	34,179	61%	171	84%
Geese											
* Black brant	444	8,868	57%	7,321	60%	1,034	87%	513	163%	0	
* Cackling/Canada goose	1,207	28,933	44%	18,770	49%	1,139	87%	8,984	48%	39	118%
* Greater white-fronted goose	2,237	52,445	38%	41,965	43%	2,094	100%	8,344	51%	42	190%
Emperor goose	351	9,718	95%	7,080	83%	417	151%	2,221	154%	0	
* Snow goose	363	7,471	56%	6,986	58%	316	93%	169	91%	0	
Goose (unidentified)	4	35	136%	14	193%	0		21		0	
Total geese	4,606	107,469	32%	82,136	33%	4,999	70%	20,252	45%	81	141%
Swan	136	3,377	55%	2,696	57%	101	172%	580	89%	0	
Sandhill crane	115	3,278	56%	2,828	61%	26	188%	424	101%	0	
Seabirds											
Cormorant	150	6,512	183%	3,994	184%	434	198%	2,084	184%	0	
Tern	0	0		0		0		0		0	
Black-legged kittiwake	12	521	189%	260	198%	0		260	198%	0	
Red-legged kittiwake	0	0		0		0		0		0	
Bonaparte's/Sabine's gull	0	0		0		0		0		0	
Mew gull	10	300	197%	300	197%	0		0		0	
Large gull	149	6,001	168%	4,265	162%	0		1,737	186%	0	
Auklet	643	27,914	187%	16,757	186%	5,904	191%	5,253	188%	0	
Murre	312	13,489	182%	9,192	183%	2,127	190%	2,171	187%	0	
Guillemot	6	260	198%	260	198%	0		0		0	
Puffin	0	0		0		0		0		0	
Total seabirds	1,282	54,998	181%	35,028	178%	8,465	188%	11,504	185%	0	
Shorebirds											
Black oystercatcher	0	0		0		0		0		0	
Whimbrel/Curlew	0	0		0		0		0		0	
Godwit	90	1,661	166%	0		0		1,661	166%	0	
Golden/Black-bellied plover	0	0		0		0		0		0	
Turnstone	0	0		0		0		0		0	
Phalarope	0	0		0		0		0		0	
Small shorebird	0	0		0		0		0		0	
Total shorebirds	90	1,661	166%	0		0		1,661	166%	0	
Loons and grebes											
Common loon	3	130	198%	130	198%	0		0		0	
Pacific loon	10	212	97%	168	111%	43	198%	0		0	
Red-throated loon	0	0		0		0		0		0	
Yellow-billed loon	11	478	190%	217	198%	0		260	198%	0	
Loon (non-breeding plumage)	3	130	198%	0		43	198%	87	198%	0	
Grebe	3	84	145%	29	197%	0		55	196%	0	
Total loons and grebes	30	1,034	143%	545	131%	87	189%	402	168%	0	
Snowy owl	0	0		0		0		0		0	
Other/unknown bird	1	47	198%	0		0		47	198%	0	
* Total commonly-harvested species	9,064	217,490	34%	155,998	34%	16,860	68%	44,380	48%	252	97%
Total migratory birds	11,966	311,486	56%	214,505	52%	27,680	81%	69,049	66%	252	97%
Ptarmigans and grouses											
Grouse	414	9,513	78%	633	106%	0		8,862	82%	18	189%
Ptarmigan	616	16,078	83%	13,870	94%	0		1,970	144%	238	120%
Total ptarmigans and grouses	1,030	25,591	61%	14,503	91%	0		10,831	79%	257	113%
Total birds	12,996	337,077	52%	229,008	50%	27,680	81%	79,881	58%	509	80%

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

‡ : Winter estimates only reflect harvest in the Bristol Bay region.

Table 9.—Estimated egg harvest, Alaska-wide (five-regions index), 2018.

Species	Yearly egg harvest			Spring		Summer	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks							
* American wigeon	16	383	196%	383	196%	0	
Teal	10	300	197%	300	197%	0	
* Mallard	46	1,100	140%	1,100	140%	0	
* Northern pintail	65	1,951	117%	1,951	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	2	55	196%	55	196%	0	
* Canvasback	0	0		0		0	
* Scaup	100	2,368	196%	2,368	196%	0	
* Common eider	207	5,721	94%	5,721	94%	0	
* King eider	15	568	182%	568	182%	0	
Spectacled eider	10	136	193%	136	193%	0	
Steller's eider	8	191	196%	191	196%	0	
Harlequin duck	0	0		0		0	
* Long-tailed duck	0	0		0		0	
Merganser	0	0		0		0	
Duck (unidentified)	12	105	188%	105	188%	0	
Total ducks	491	12,878	70%	12,878	70%	0	
Geese							
* Black brant	213	4,101	114%	2,534	125%	1,567	156%
* Cackling/Canada goose	401	8,319	75%	7,643	74%	676	136%
* Greater white-fronted goose	674	12,510	66%	11,956	65%	554	195%
Emperor goose	140	2,815	116%	2,508	113%	307	195%
* Snow goose	0	0		0		0	
Goose (unidentified)	0	0		0		0	
Total geese	1,428	27,745	69%	24,642	66%	3,103	136%
Swan	70	1,446	86%	1,446	86%	0	
Sandhill crane	33	712	92%	712	92%	0	
Seabirds							
Cormorant	0	0		0		0	
Tern	104	2,342	113%	2,096	124%	245	195%
Black-legged kittiwake	100	2,018	139%	2,018	139%	0	
Red-legged kittiwake	0	0		0		0	
Bonaparte's/Sabine's gull	0	0		0		0	
Mew gull	276	5,676	72%	5,399	69%	277	195%
Large gull	662	15,270	86%	14,900	86%	369	195%
Gull (unidentified)	369	2,657	175%	2,657	175%	0	
Auklet	0	0		0		0	
Murre	505	15,290	145%	8,506	129%	6,784	182%
Guillemot	0	0		0		0	
Puffin	0	0		0		0	
Total seabirds	2,016	43,252	56%	35,577	48%	7,675	162%
Shorebirds							
Black oystercatcher	0	0		0		0	
Whimbrel/Curlew	12	287	196%	287	196%	0	
Godwit	4	95	196%	95	196%	0	
Golden/Black-bellied plover	74	1,610	132%	1,446	146%	164	195%
Turnstone	2	22	190%	22	190%	0	
Phalarope	10	237	196%	237	196%	0	
Small shorebird	20	422	93%	422	93%	0	
Total shorebirds	122	2,672	105%	2,508	111%	164	195%
Loons and grebes							
Common loon	2	17	188%	17	188%	0	
Pacific loon	8	191	196%	191	196%	0	
Red-throated loon	8	191	196%	191	196%	0	
Yellow-billed loon	4	120	137%	120	137%	0	
Grebe	0	0		0		0	
Total loons and grebes	22	519	128%	519	128%	0	
Snowy owl	0	0		0		0	
Other/unknown bird	8	373	198%	373	198%	0	
* Total commonly-harvested species	1,737	37,021	51%	34,225	49%	2,796	134%
Total migratory birds	4,190	89,597	44%	78,655	42%	10,942	124%
Ptarmigans and grouses							
Grouse	100	2,386	196%	2,386	196%	0	
Ptarmigan	50	1,184	196%	1,184	196%	0	
Total ptarmigans and grouses	150	3,570	146%	3,570	146%	0	
Total eggs	4,340	93,167	45%	82,225	44%	10,942	124%

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

Table 10.—Estimated bird harvest, Bristol Bay region, 2018.

Species	Yearly bird harvest			Spring		Summer		Fall		Winter	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks											
* American wigeon	29	541	160%	453	196%	17	188%	71	185%	0	
Teal	78	1,769	168%	1,128	188%	52	188%	589	154%	0	
* Mallard	122	2,352	96%	1,759	118%	35	188%	469	62%	89	120%
* Northern pintail	140	2,861	95%	2,438	111%	35	188%	306	73%	82	92%
Northern shoveler	13	350	130%	350	130%	0		0		0	
* Black scoter	94	2,551	122%	2,168	121%	0		382	154%	0	
* Surf scoter	8	213	196%	213	196%	0		0		0	
* White-winged scoter	0	0		0		0		0		0	
Bufflehead	0	0		0		0		0		0	
Goldeneye	23	629	153%	519	146%	0		110	196%	0	
* Canvasback	0	0		0		0		0		0	
* Scaup	0	0		0		0		0		0	
* Common eider	6	165	189%	165	189%	0		0		0	
* King eider	212	7,471	128%	7,471	128%	0		0		0	
Spectacled eider	0	0		0		0		0		0	
Steller's eider	0	0		0		0		0		0	
Harlequin duck	13	358	189%	248	188%	0		110	196%	0	
* Long-tailed duck	0	0		0		0		0		0	
Merganser	36	990	190%	413	196%	0		578	188%	0	
Duck (unidentified)	0	0		0		0		0		0	
Total ducks	774	20,251	77%	17,324	81%	140	188%	2,616	115%	171	84%
Geese											
* Black brant	15	185	125%	106	196%	0		78	183%	0	
* Cackling/Canada goose	241	3,973	95%	2,408	136%	143	185%	1,384	62%	39	118%
* Greater white-fronted goose	74	1,529	107%	1,293	129%	0		194	110%	42	190%
Emperor goose	11	183	88%	83	196%	0		101	103%	0	
* Snow goose	2	55	196%	55	196%	0		0		0	
Goose (unidentified)	3	21	185%	0		0		21	185%	0	
Total geese	346	5,947	94%	3,945	130%	143	185%	1,778	56%	81	141%
Swan	7	192	163%	192	163%	0		0		0	
Sandhill crane	13	277	108%	242	128%	26	188%	9	188%	0	
Seabirds											
Cormorant	0	0		0		0		0		0	
Tern	0	0		0		0		0		0	
Black-legged kittiwake	0	0		0		0		0		0	
Red-legged kittiwake	0	0		0		0		0		0	
Bonaparte's/Sabine's gull	0	0		0		0		0		0	
Mew gull	0	0		0		0		0		0	
Large gull	20	550	196%	550	196%	0		0		0	
Auklet	0	0		0		0		0		0	
Murre	0	0		0		0		0		0	
Guillemot	0	0		0		0		0		0	
Puffin	0	0		0		0		0		0	
Total seabirds	20	550	196%	550	196%	0		0		0	
Shorebirds											
Black oystercatcher	0	0		0		0		0		0	
Whimbrel/Curlew	0	0		0		0		0		0	
Godwit	0	0		0		0		0		0	
Golden/Black-bellied plover	0	0		0		0		0		0	
Turnstone	0	0		0		0		0		0	
Phalarope	0	0		0		0		0		0	
Small shorebird	0	0		0		0		0		0	
Total shorebirds	0	0		0		0		0		0	
Loons and grebes											
Common loon	0	0		0		0		0		0	
Pacific loon	0	0		0		0		0		0	
Red-throated loon	0	0		0		0		0		0	
Yellow-billed loon	0	0		0		0		0		0	
Loon (non-breeding plumage)	0	0		0		0		0		0	
Grebe	2	55	196%	0		0		55	196%	0	
Total loons and grebes	2	55	196%	0		0		55	196%	0	
Other/unknown bird	0	0		0		0		0		0	
* Total commonly-harvested species	943	21,897	71%	18,530	84%	230	123%	2,885	52%	252	97%
Total migratory birds	1,162	27,271	73%	22,253	83%	309	120%	4,457	78%	252	97%
Ptarmigans and grouses											
Grouse	42	1,118	183%	275	196%	0		825	189%	18	189%
Ptarmigan	60	1,086	144%	550	196%	0		298	179%	238	120%
Total ptarmigans and grouses	102	2,204	162%	825	189%	0		1,123	186%	257	113%
Total birds	1,264	29,476	75%	23,078	84%	309	120%	5,580	97%	509	80%

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

Table 11.—Estimated egg harvest, Bristol Bay region, 2018.

Species	Yearly egg harvest			Spring		Summer	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks							
* American wigeon	0	0		0		0	
Teal	0	0		0		0	
* Mallard	3	23	186%	23	186%	0	
* Northern pintail	0	0		0		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	2	55	196%	55	196%	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)	12	105	188%	105	188%	0	
Total ducks	17	183	110%	183	110%	0	
Geese							
* Black brant	0	0		0		0	
* Cackling/Canada goose	3	23	186%	23	186%	0	
* Greater white-fronted goose	0	0		0		0	
Emperor goose	0	0		0		0	
* Snow goose	0	0		0		0	
Total geese	3	23	186%	23	186%	0	
Swan	3	26	188%	26	188%	0	
Sandhill crane	0	0		0		0	
Seabirds							
Comorant	0	0		0		0	
Tem	6	52	188%	52	188%	0	
Black-legged kittiwake	0	0		0		0	
Red-legged kittiwake	0	0		0		0	
Bonaparte's/Sabine's gull	0	0		0		0	
Mew gull	41	991	120%	991	120%	0	
Large gull	84	2,056	157%	2,056	157%	0	
Gull (unidentified)	369	2,657	175%	2,657	175%	0	
Auklet	0	0		0		0	
Murre	0	0		0		0	
Guillemot	0	0		0		0	
Puffin	0	0		0		0	
Total seabirds	500	5,756	84%	5,756	84%	0	
Shorebirds							
Black oystercatcher	0	0		0		0	
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	2	17	188%	17	188%	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	2	17	188%	17	188%	0	
Other/unknown bird	0	0		0		0	
* Total commonly-harvested species	6	46	186%	46	186%	0	
Total migratory birds	525	6,005	78%	6,005	78%	0	
Ptarmigans and grouses							
Grouse	0	0		0		0	
Ptarmigan	0	0		0		0	
Total ptarmigans and grouses	0	0		0		0	
Total eggs	525	6,005	78%	6,005	78%	0	

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

Table 12.—Estimated bird harvest, Yukon-Kuskokwim Delta region, 2018.

Species	Yearly bird harvest			Spring		Summer		Fall	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks									
* American wigeon	212	5,441	88%	2,237	108%	375	128%	2,829	97%
Teal	115	3,090	111%	754	180%	39	197%	2,297	114%
* Mallard	348	8,621	46%	4,320	55%	297	125%	4,004	67%
* Northern pintail	598	12,639	103%	1,254	101%	5,657	136%	5,727	101%
Northern shoveler	145	2,801	137%	75	135%	1,384	160%	1,342	129%
* Black scoter	264	5,854	95%	4,430	89%	0		1,424	161%
* Surf scoter	75	1,399	75%	1,010	81%	0		389	141%
* White-winged scoter	69	1,456	87%	1,409	86%	0		47	196%
Bufflehead	80	1,715	163%	796	175%	208	197%	711	196%
Goldeneye	150	2,411	114%	1,496	114%	0		915	118%
* Canvasback	17	297	166%	297	166%	0		0	
* Scaup	428	11,486	74%	7,557	73%	369	179%	3,561	100%
* Common eider	42	775	156%	775	156%	0		0	
* King eider	277	5,426	131%	5,303	134%	123	195%	0	
Spectacled eider	0	0		0		0		0	
Steller's eider	0	0		0		0		0	
Harlequin duck	18	244	192%	244	192%	0		0	
* Long-tailed duck	138	2,702	107%	2,240	109%	0		461	166%
Merganser	10	237	196%	237	196%	0		0	
Duck (unidentified)	13	468	113%	380	133%	0		88	197%
Total ducks	2,999	67,060	61%	34,813	58%	8,452	129%	23,795	70%
Geese									
* Black brant	178	3,368	93%	2,846	94%	522	119%	0	
* Cackling/Canada goose	746	19,523	57%	12,029	65%	607	106%	6,887	61%
* Greater white-fronted goose	867	23,631	45%	14,708	45%	1,391	134%	7,532	55%
Emperor goose	233	4,948	83%	4,538	87%	113	162%	297	197%
* Snow goose	5	155	115%	155	115%	0		0	
Total geese	2,029	51,626	46%	34,277	47%	2,632	108%	14,716	50%
Swan	103	2,729	61%	2,062	64%	87	197%	580	89%
Sandhill crane	64	1,702	72%	1,461	73%	0		241	107%
Seabirds									
Comorant	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	10	300	197%	300	197%	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	10	300	197%	300	197%	0		0	
Shorebirds									
Whimbrel/Curlew	0	0		0		0		0	
Godwit	90	1,661	166%	0		0		1,661	166%
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	90	1,661	166%	0		0		1,661	166%
Loons and grebes									
Common loon	0	0		0		0		0	
Pacific loon	9	168	111%	168	111%	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	1	29	197%	29	197%	0		0	
Total loons and grebes	10	197	97%	197	97%	0		0	
Other/unknown bird	1	47	198%	0		0		47	198%
* Total commonly-harvested species	4,264	102,773	47%	60,570	43%	9,340	110%	32,862	52%
Total migratory birds	5,306	125,322	48%	73,110	43%	11,171	112%	41,041	55%
Ptarmigans and grouses									
Grouse	57	1,269	147%	154	182%	0		1,115	166%
Ptarmigan	444	13,789	96%	12,298	106%	0		1,492	186%
Total ptarmigans and grouses	501	15,058	90%	12,452	105%	0		2,607	177%
Total birds	5,807	140,381	47%	85,562	47%	11,171	112%	43,647	54%

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

Table 13.—Estimated egg harvest, Yukon-Kuskokwim Delta region, 2018.

Species	Yearly egg harvest			Spring		Summer	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks							
* American wigeon	16	383	196%	383	196%	0	
Teal	10	300	197%	300	197%	0	
* Mallard	43	1,077	143%	1,077	143%	0	
* Northern pintail	65	1,951	117%	1,951	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	100	2,368	196%	2,368	196%	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)	0	0		0		0	
Total ducks	234	6,079	113%	6,079	113%	0	
Geese							
* Black brant	205	3,943	118%	2,439	129%	1,504	162%
* Cackling/Canada goose	373	7,794	80%	7,118	79%	676	136%
* Greater white-fronted goose	316	6,422	89%	5,868	86%	554	195%
Emperor goose	140	2,815	116%	2,508	113%	307	195%
* Snow goose	0	0		0		0	
Total geese	1,034	20,973	87%	17,933	84%	3,040	139%
Swan	26	608	135%	608	135%	0	
Sandhill crane	16	356	137%	356	137%	0	
Seabirds							
Cormorant	0	0		0		0	
Tem	73	1,693	141%	1,447	162%	245	195%
Black-legged kittiwake	50	1,184	196%	1,184	196%	0	
Bonaparte's/Sabine's gull	0	0		0		0	
Mew gull	196	3,649	100%	3,373	97%	277	195%
Large gull	254	5,455	108%	5,086	107%	369	195%
Auklet	0	0		0		0	
Murre	0	0		0		0	
Guillemot	0	0		0		0	
Puffin	0	0		0		0	
Total seabirds	573	11,982	88%	11,090	88%	891	149%
Shorebirds							
Whimbrel/Curlew	12	287	196%	287	196%	0	
Godwit	4	95	196%	95	196%	0	
Golden/Black-bellied plover	62	1,365	154%	1,201	174%	164	195%
Turnstone	2	22	190%	22	190%	0	
Phalarope	10	237	196%	237	196%	0	
Small shorebird	16	326	106%	326	106%	0	
Total shorebirds	106	2,332	118%	2,168	127%	164	195%
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	
Other/unknown bird	8	373	198%	373	198%	0	
* Total commonly-harvested species	1,118	23,937	71%	21,204	69%	2,733	137%
Total migratory birds	1,997	42,702	68%	38,607	67%	4,095	137%
Ptarmigans and grouses							
Grouse	0	0		0		0	
Ptarmigan	50	1,184	196%	1,184	196%	0	
Total ptarmigans and grouses	50	1,184	196%	1,184	196%	0	
Total eggs	2,047	43,886	69%	39,791	68%	4,095	137%

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

Table 14.—Estimated bird harvest, Bering Strait-Norton Sound region, 2018.

Species	Yearly bird harvest			Spring		Summer		Fall	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks									
* American wigeon	8	347	189%	347	189%	0		0	
Teal	9	354	119%	354	119%	0		0	
* Mallard	17	542	124%	301	124%	87	198%	154	119%
* Northern pintail	65	2,481	142%	1,840	132%	87	198%	554	176%
Northern shoveler	4	67	194%	0		0		67	194%
* Black scoter	4	174	189%	174	189%	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	0	0		0		0		0	
* Common eider	149	6,468	182%	4,124	183%	347	187%	1,997	184%
* King eider	147	6,382	185%	3,560	185%	0		2,822	186%
Spectacled eider	25	1,085	192%	217	198%	0		868	198%
Steller's eider	0	0		0		0		0	
Harlequin duck	13	564	190%	564	190%	0		0	
* Long-tailed duck	173	7,510	186%	7,076	186%	0		434	198%
Merganser	0	0		0		0		0	
Duck (unidentified)	0	0		0		0		0	
Total ducks	614	25,974	176%	18,558	175%	521	185%	6,896	179%
Geese									
* Black brant	119	3,660	100%	3,096	99%	130	198%	434	190%
* Cackling/Canada goose	55	1,551	58%	1,386	67%	0		165	87%
* Greater white-fronted goose	72	2,543	84%	2,195	75%	0		347	198%
Emperor goose	107	4,586	180%	2,459	178%	304	198%	1,823	185%
* Snow goose	127	3,749	79%	3,494	83%	87	198%	169	91%
Total geese	480	16,090	87%	12,630	74%	521	193%	2,939	164%
Swan	1	43	198%	43	198%	0		0	
Sandhill crane	27	997	124%	824	147%	0		174	198%
Seabirds									
Cormorant	150	6,512	183%	3,994	184%	434	198%	2,084	184%
Tern	0	0		0		0		0	
Black-legged kittiwake	12	521	189%	260	198%	0		260	198%
Bonaparte's/Sabine's gull	0	0		0		0		0	
Mew gull	0	0		0		0		0	
Large gull	124	5,383	186%	3,647	187%	0		1,737	186%
Auklet	643	27,914	187%	16,757	186%	5,904	191%	5,253	188%
Murre	310	13,458	183%	9,160	183%	2,127	190%	2,171	187%
Guillemot	6	260	198%	260	198%	0		0	
Puffin	0	0		0		0		0	
Total seabirds	1,245	54,049	184%	34,079	183%	8,465	188%	11,504	185%
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	3	130	198%	130	198%	0		0	
Pacific loon	1	43	198%	0		43	198%	0	
Red-throated loon	0	0		0		0		0	
Yellow-billed loon	11	478	190%	217	198%	0		260	198%
Loon (non-breeding plumage)	3	130	198%	0		43	198%	87	198%
Grebe	0	0		0		0		0	
Total loons and grebes	18	781	187%	347	198%	87	189%	347	192%
Other/unknown bird	0	0		0		0		0	
* Total commonly-harvested species	936	35,407	132%	27,593	121%	738	184%	7,076	172%
Total migratory birds	2,385	97,935	162%	66,481	154%	9,594	187%	21,860	179%
Ptarmigans and grouses									
Grouse	29	484	188%	83	194%	0		400	190%
Ptarmigan	9	150	188%	0		0		150	188%
Total ptarmigans and grouses	38	634	186%	83	194%	0		550	187%
Total birds	2,423	98,568	161%	66,564	153%	9,594	187%	22,410	174%

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

Table 15.—Estimated egg harvest, Bering Strait-Norton Sound region, 2018.

Species	Yearly egg harvest			Spring		Summer	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks							
* American wigeon	0	0		0		0	
Teal	0	0		0		0	
* Mallard	0	0		0		0	
* Northern pintail	0	0		0		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	192	5,530	98%	5,530	98%	0	
* King eider	12	521	198%	521	198%	0	
Spectacled eider	0	0		0		0	
Steller's eider	8	191	196%	191	196%	0	
Harlequin duck	0	0		0		0	
* Long-tailed duck	0	0		0		0	
Merganser	0	0		0		0	
Duck (unidentified)	0	0		0		0	
Total ducks	212	6,242	95%	6,242	95%	0	
Geese							
Black brant	4	95	196%	95	196%	0	
* Cackling/Canada goose	23	471	120%	471	120%	0	
* Greater white-fronted goose	8	191	196%	191	196%	0	
* Emperor goose	0	0		0		0	
* Snow goose	0	0		0		0	
Total geese	35	758	74%	758	74%	0	
Swan	22	503	167%	503	167%	0	
Sandhill crane	17	355	124%	355	124%	0	
Seabirds							
Cormorant	0	0		0		0	
Tern	25	597	189%	597	189%	0	
Black-legged kittiwake	50	834	188%	834	188%	0	
Bonaparte's/Sabine's gull	0	0		0		0	
Mew gull	38	1,019	135%	1,019	135%	0	
Large gull	294	7,199	155%	7,199	155%	0	
Auklet	0	0		0		0	
Murre	265	11,504	185%	5,036	186%	6,468	190%
Guillemot	0	0		0		0	
Puffin	0	0		0		0	
Total seabirds	672	21,153	95%	14,685	80%	6,468	190%
Shorebirds							
Whimbrel/Curlew	0	0		0		0	
Godwit	0	0		0		0	
Golden/Black-bellied plover	4	95	196%	95	196%	0	
Turnstone	0	0		0		0	
Phalarope	0	0		0		0	
Small shorebird	4	95	196%	95	196%	0	
Total shorebirds	8	191	196%	191	196%	0	
Loons and grebes							
Common loon	0	0		0		0	
Pacific loon	8	191	196%	191	196%	0	
Red-throated loon	8	191	196%	191	196%	0	
Yellow-billed loon	4	120	137%	120	137%	0	
Grebe	0	0		0		0	
Total loons and grebes	20	502	133%	502	133%	0	
Other/unknown bird	0	0		0		0	
* Total commonly-harvested species	239	6,809	82%	6,809	82%	0	
Total migratory birds	986	29,705	85%	23,236	81%	6,468	190%
Ptarmigans and grouses							
Grouse	100	2,386	196%	2,386	196%	0	
Ptarmigan	0	0		0		0	
Total ptarmigans and grouses	100	2,386	196%	2,386	196%	0	
Total eggs	1,086	32,091	86%	25,622	88%	6,468	190%

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

Table 16.—Estimated bird harvest, North Slope region, 2018.

Species	Yearly bird harvest			Spring		Summer	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks							
* American wigeon	0	0		0		0	
Teal	0	0		0		0	
* Mallard	2	32	194%	32	194%	0	
* Northern pintail	0	0		0		0	
Northern shoveler	3	47	194%	47	194%	0	
* Black scoter	0	0		0		0	
* Surf scoter	0	0		0		0	
* White-winged scoter	0	0		0		0	
* Scaup	0	0		0		0	
* Common eider	395	5,814	72%	4,162	63%	1,652	166%
* King eider	460	7,520	56%	4,323	57%	3,196	103%
Spectacled eider	94	1,324	131%	1,297	131%	27	193%
Steller's eider	1	14	193%	0		14	193%
Eider (unidentified)	6	95	194%	95	194%	0	
* Long-tailed duck	0	0		0		0	
Merganser	0	0		0		0	
Duck (unidentified)	0	0		0		0	
Total ducks	961	14,844	49%	9,956	62%	4,889	99%
Geese							
* Black brant	132	1,655	93%	1,273	127%	382	155%
* Cackling/Canada goose	56	477	101%	449	98%	28	185%
* Greater white-fronted goose	1,074	16,365	73%	16,083	76%	282	153%
* Snow goose	227	3,351	88%	3,122	92%	229	104%
Goose (unidentified)	1	14	193%	14	193%	0	
Total geese	1,490	21,861	59%	20,940	63%	921	90%
Swan	25	412	173%	399	179%	14	193%
Sandhill crane	2	31	125%	31	125%	0	
Seabirds							
Tern	0	0		0		0	
Bonaparte's/Sabine's gull	0	0		0		0	
Large gull	5	68	193%	68	193%	0	
Murre	2	32	194%	32	194%	0	
Guillemot	0	0		0		0	
Total seabirds	7	100	135%	100	135%	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							
Pacific loon	0	0		0		0	
Red-throated loon	0	0		0		0	
Yellow-billed loon	0	0		0		0	
Loon (non-breeding plumage)	0	0		0		0	
Total loons and grebes	0	0		0		0	
Snowy owl	0	0		0		0	
Other/unknown bird	0	0		0		0	
* Total commonly-harvested species	2,346	35,212	47%	29,443	51%	5,769	79%
Total migratory birds	2,485	37,248	47%	31,424	52%	5,824	77%
Ptarmigans and grouses							
Grouse	0	0		0		0	
Ptarmigan	101	992	102%	992	102%	0	
Total ptarmigans and grouses	101	992	102%	992	102%	0	
Total birds	2,586	38,240	44%	32,417	48%	5,824	77%

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

Table 17.—Estimated egg harvest, North Slope region, 2018.

Species	Yearly egg harvest			Spring		Summer	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks							
* American wigeon	0	0		0		0	
Teal	0	0		0		0	
* Mallard	0	0		0		0	
* Northern pintail	0	0		0		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	
* Scaup	0	0		0		0	
* Common eider	15	191	104%	191	104%	0	
* King eider	3	47	194%	47	194%	0	
Spectacled eider	10	136	193%	136	193%	0	
Steller's eider	0	0		0		0	
* Long-tailed duck	0	0		0		0	
Merganser	0	0		0		0	
Duck (unidentified)	0	0		0		0	
Total ducks	28	374	114%	374	114%	0	
Geese							
* Black brant	4	63	194%	0		63	194%
* Cackling/Canada goose	2	32	194%	32	194%	0	
* Greater white-fronted goose	350	5,897	101%	5,897	101%	0	
* Snow goose	0	0		0		0	
Goose (unidentified)	0	0		0		0	
Total geese	356	5,991	99%	5,928	100%	63	194%
Swan	19	309	125%	309	125%	0	
Sandhill crane	0	0		0		0	
Seabirds							
Tem	0	0		0		0	
Bonaparte's/Sabine's gull	0	0		0		0	
Large gull	30	559	195%	559	195%	0	
Murre	240	3,786	165%	3,470	165%	315	194%
Guillemot	0	0		0		0	
Total seabirds	270	4,345	141%	4,029	139%	315	194%
Shorebirds							
Whimbrel/Curlew	0	0		0		0	
Godwit	0	0		0		0	
Golden/Black-bellied plover	8	149	195%	149	195%	0	
Turnstone	0	0		0		0	
Phalarope	0	0		0		0	
Small shorebird	0	0		0		0	
Total shorebirds	8	149	195%	149	195%	0	
Loons and grebes							
Pacific loon	0	0		0		0	
Red-throated loon	0	0		0		0	
Yellow-billed loon	0	0		0		0	
Total loons and grebes	0	0		0		0	
Snowy owl	0	0		0		0	
Other/unknown bird	0	0		0		0	
* Total commonly-harvested species	374	6,229	93%	6,166	95%	63	194%
Total migratory birds	681	11,168	71%	10,790	71%	379	185%
Ptarmigans and grouses							
Grouse	0	0		0		0	
Ptarmigan	0	0		0		0	
Total ptarmigans and grouses	0	0		0		0	
Total eggs	681	11,168	71%	10,790	71%	379	185%

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

Table 18.—Estimated bird harvest, Interior Alaska region, 2018.

Species	Yearly bird harvest			Spring		Summer		Fall	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks									
* American wigeon	44	1,264	130%	1,164	142%	0		100	190%
Teal	27	676	148%	542	190%	0		134	166%
* Mallard	101	3,704	96%	3,267	104%	0		437	124%
* Northern pintail	77	2,043	113%	1,842	129%	0		201	194%
Northern shoveler	7	211	197%	211	197%	0		0	
* Black scoter	12	836	190%	836	190%	0		0	
* Surf scoter	37	1,114	189%	1,114	189%	0		0	
* White-winged scoter	5	151	197%	151	197%	0		0	
Bufflehead	9	271	197%	271	197%	0		0	
Goldeneye	1	80	199%	80	199%	0		0	
* Canvasback	0	0		0		0		0	
* Scaup	20	602	192%	602	192%	0		0	
Harlequin duck	0	0		0		0		0	
* Long-tailed duck	18	542	190%	542	190%	0		0	
Merganser	0	0		0		0		0	
Duck (unidentified)	0	0		0		0		0	
Total ducks	358	11,493	109%	10,621	119%	0		872	147%
Geese									
* Cackling/Canada goose	109	3,408	145%	2,498	135%	361	197%	548	166%
* Greater white-fronted goose	150	8,378	138%	7,686	148%	421	197%	271	194%
* Snow goose	2	161	199%	161	199%	0		0	
Total geese	261	11,946	118%	10,344	126%	783	197%	819	175%
Swan	0	0		0		0		0	
Sandhill crane	9	271	188%	271	188%	0		0	
Seabirds									
Tem	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	
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	
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	
Loon (non-breeding plumage)	0	0		0		0		0	
Grebe	0	0		0		0		0	
Total loons and grebes	0	0		0		0		0	
Other/unknown bird	0	0		0		0		0	
* Total commonly-harvested species	575	22,201	107%	19,862	110%	783	197%	1,557	105%
Total migratory birds	628	23,710	107%	21,236	111%	783	197%	1,691	104%
Ptarmigans and grouses									
Grouse	286	6,642	102%	120	197%	0		6,522	105%
Ptarmigan	2	60	191%	30	197%	0		30	197%
Total ptarmigans and grouses	288	6,702	101%	151	197%	0		6,552	104%
Total birds	916	30,412	81%	21,387	111%	783	197%	8,243	94%

* : Commonly-harvested species.

CIP: Confidence interval as percentage of the estimated harvest.

Table 19.—Estimated egg harvest, Interior Alaska region, 2018.

Species	Yearly egg harvest			Spring		Summer	
	Reported	Estimated	CIP	Estimated	CIP	Estimated	CIP
Ducks							
* American wigeon	0	0		0		0	
Teal	0	0		0		0	
* Mallard	0	0		0		0	
* Northern pintail	0	0		0		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	
Harlequin duck	0	0		0		0	
* Long-tailed duck	0	0		0		0	
Merganser	0	0		0		0	
Duck (unidentified)	0	0		0		0	
Total ducks	0	0		0		0	
Geese							
* Cackling/Canada goose	0	0		0		0	
* Greater white-fronted goose	0	0		0		0	
* Snow goose	0	0		0		0	
Total geese	0	0		0		0	
Swan	0	0		0		0	
Sandhill crane	0	0		0		0	
Seabirds							
Tern	0	0		0		0	
Bonaparte's/Sabine's gull	0	0		0		0	
Mew gull	1	17	194%	17	194%	0	
Large gull	0	0		0		0	
Total seabirds	1	17	194%	17	194%	0	
Shorebirds							
Whimbrel/Curlew	0	0		0		0	
Godwit	0	0		0		0	
Golden/Black-bellied plover	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	
Grebe	0	0		0		0	
* Total loons and grebes	0	0		0		0	
Other/unknown bird	0	0		0		0	
Total commonly-harvested species	0	0		0		0	
Total migratory birds	1	17	194%	17	194%	0	
Ptarmigans and grouses							
Grouse	0	0		0		0	
Ptarmigan	0	0		0		0	
Total ptarmigans and grouses	0	0		0		0	
Total eggs	1	17	194%	17	194%	0	

* : Commonly-harvested species. CIP: Confidence interval as percentage of the estimated harvest.

Table 20.—Estimated April–May Cordova bird and egg harvest, 2014–2018.

Species	2014			2015			2016			2017			2018		
	Reported	Estimated	CIP												
Bird harvest															
American wigeon	1	1	97%	0	0		1	1	82%	5	5	40%	0	0	
Gadwall	0	0		0	0		0	0		1	1	56%	0	0	
Teal	1	1	97%	0	0		0	0		14	15	25%	1	1	90%
Mallard	11	14	43%	0	0		16	19	36%	42	45	22%	8	10	65%
Northern pintail	12	15	47%	0	0		56	66	31%	82	89	28%	1	1	90%
Northern shoveler	0	0		0	0		2	2	82%	0	0		0	0	
Black scoter	0	0		0	0		0	0		0	0		0	0	
Surf scoter	0	0		0	0		0	0		0	0		0	0	
White-winged scoter	0	0		0	0		0	0		0	0		0	0	
Bufflehead	0	0		0	0		0	0		0	0		0	0	
Goldeneye	0	0		0	0		0	0		4	4	56%	0	0	
Canvasback	0	0		0	0		0	0		0	0		0	0	
Scaup	0	0		0	0		0	0		0	0		0	0	
Common eider	0	0		0	0		0	0		0	0		0	0	
King eider	0	0		0	0		0	0		0	0		0	0	
Harlequin duck	0	0		0	0		0	0		0	0		0	0	
Long-tailed duck	0	0		0	0		0	0		0	0		0	0	
Merganser	0	0		0	0		0	0		0	0		0	0	
Total ducks	25	32	38%	0	0		75	89	29%	147	159	24%	10	12	64%
Greater white-fronted goose	4	5	67%	0	0		0	0		7	8	30%	4	5	54%
Snow goose	4	5	57%	0	0		5	6	67%	3	3	56%	20	25	65%
Total geese	8	10	49%	0	0		5	6	67%	10	11	29%	24	30	62%
Sandhill crane	0	0		0	0		0	0		3	3	56%	0	0	
Total birds	33	42	37%	0	0		80	95	27%	161	174	23%	34	42	56%
Egg harvest															
Gull (unidentified)	102	131	37%	197	263	51%	105	124	47%	105	113	27%	138	171	48%
Total eggs	102	131	37%	197	263	51%	105	124	47%	105	113	27%	138	171	48%

CIP: confidence interval as percentage of the estimated harvest.

REFERENCES CITED

- ADLWD (Alaska Department of Labor and Workforce Development). n.d. "Research and Analysis Homepage: Population and Census." Juneau: State of Alaska Department of Labor and Workforce Development. <http://live.laborstats.alaska.gov/pop/index.cfm>.
- Cochran, William G. 1977. *Sampling Techniques*. 3rd ed. New York: John Wiley & Sons.
- Copp, John D. 1985. "Critique and Analysis of Eskimo Waterfowl Hunter Surveys Conducted by the U.S. Fish and Wildlife Service on the Yukon-Kuskokwim Delta, Alaska, 1980-1984." Corvallis, OR: Oregon State University, Department of Fisheries and Wildlife: report to the U.S. Fish and Wildlife Service, Region 7.
- Copp, John D., and Gloria M. Roy. 1986. "Results of the 1985 Survey of Waterfowl Hunting on the Yukon Kuskokwim Delta, Alaska." Anchorage: U.S. Fish and Wildlife Service.
- George, T. Luke, David Otis, and Paul Doherty. 2015. "Review of Subsistence Harvest Survey, Alaska Migratory Bird Co-Management Council." Fort Collins, CO: Colorado State University. Department of Fish, Wildlife, and Conservation Biology.
- Naves, Liliana C. 2010rev. "[2009] Alaska Migratory Bird Subsistence Harvest Estimates, 2004–2007, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 349. <http://www.adfg.alaska.gov/techpap/TP349.pdf>.
- . 2010. "Alaska Migratory Bird Subsistence Harvest Estimates, 2008, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 353. <http://www.adfg.alaska.gov/techpap/tp353.pdf>.
- . 2011. "Alaska Migratory Bird Subsistence Harvest Estimates, 2009, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 364. <http://www.adfg.alaska.gov/techpap/TP%20364.pdf>.
- . 2012. "Alaska Migratory Bird Subsistence Harvest Estimates, 2010, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 376. <http://www.adfg.alaska.gov/techpap/TP%20376.pdf>.
- . 2014a. "Alaska Subsistence Harvests of Birds and Eggs, 2011, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 395. <http://www.adfg.alaska.gov/techpap/TP395.pdf>.
- . 2014b. "Subsistence Harvests of Birds and Eggs, Gambell and Savoonga, 2002–2010, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 391. <http://www.adfg.alaska.gov/techpap/TP391.pdf>.
- . 2015a. "Alaska Subsistence Bird Harvest, 2004–2014 Data Book, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence Special Publication No. 2015-05. http://www.adfg.alaska.gov/specialpubs/SP2_SP2015-005.pdf.
- . 2015b. "Alaska Subsistence Harvest of Birds and Eggs, 2013, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 409. <http://www.adfg.alaska.gov/techpap/TP409.pdf>.
- . 2015c. "Alaska Subsistence Harvest of Birds and Eggs, 2014, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 415. <http://www.adfg.alaska.gov/techpap/TP415.pdf>.
- . 2016. "Alaska Subsistence Harvest of Birds and Eggs, 2015, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 422. <http://www.adfg.alaska.gov/techpap/TP422.pdf>.
- . 2018. "Geographic and Seasonal Patterns of Seabird Subsistence Harvest in Alaska." *Polar Biology* 41 (6): 1217–36. <https://doi.org/10.1007/s00300-018-2279-4>.
- Naves, Liliana C., and Nicole M. Braem. 2014. "Alaska Subsistence Harvest of Birds and Eggs, 2012, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 397.
- Naves, Liliana C., and James A. Fall. 2017. "Calculating Food Production in the Subsistence Harvest of Birds and Eggs + Supplementary Appendices S1 and S2." *ARCTIC* 70 (1): 86. <https://doi.org/10.14430/arctic4630>.
- Naves, Liliana C., and Jacqueline M. Keating. 2018. "Alaska Subsistence Harvest of Birds and Eggs, 2017, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 433.

- Naves, Liliana C., Jacqueline M. Keating, T Lee Tibbits, and Daniel R. Ruthrauff. 2019. "Shorebird Subsistence Harvest and Indigenous Knowledge in Alaska: Informing Harvest Management and Engaging Users in Shorebird Conservation." *Condor* 121 (2): 1–19.
- Naves, Liliana C., David Koster, Marianne G. See, Bridget Easley, and Lisa Olson. 2008. "Alaska Migratory Bird Co-Management Council Migratory Bird Subsistence Harvest Survey: Assessment of the Survey Methods and Implementation." Anchorage: Alaska Department of Fish and Game Division of Subsistence, Special Publication No. 2008-05.
- Naves, Liliana C., and David Otis. 2017. "Alaska Subsistence Harvest of Birds and Eggs, 2016, Alaska Migratory Bird Co-Management Council." Anchorage: Alaska Department of Fish and Game Division of Subsistence Technical Paper No. 434. <http://www.adfg.alaska.gov/techpap/TP%20434.pdf>.
- Naves, Liliana C., and Tamara K. Zeller. 2013. "Saint Lawrence Island Subsistence Harvest of Birds and Eggs, 2011–2012, Addressing Yellow-Billed Loon Conservation Concerns." Anchorage: Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 384. <http://www.adfg.alaska.gov/techpap/TP384.pdf>.
- . 2017. "Yellow-Billed Loon Subsistence Harvest in Alaska: Challenges in Harvest Assessment of a Conservation Concern Species." *Journal of Fish and Wildlife Management* 8 (1): 114–124. <https://doi.org/10.3996/112016-JFWM-086>.
- Otis, David, and Paul Doherty. 2018. "Results from the 2017 Subsistence Harvest Survey of the Alaska Migratory Bird Co-Management Council and Proposed Updates to the Sampling Design for 2018." Fort Collins, CO: Colorado State University. Department of Fish, Wildlife, and Conservation Biology.
- Otis, David, Luke George, and Paul Doherty. 2017. "Proposed Sampling Design for 2017 Subsistence Harvest Survey of the Alaska Migratory Bird Co-Management Council." Fort Collins, CO: Colorado State University. Department of Fish, Wildlife, and Conservation Biology.
- Otis, David, T. Luke George, and Paul Doherty. 2016. "Comparison of Alternative Designs for the Alaska Migratory Bird Subsistence Harvest Survey." Fort Collins, CO: Colorado State University. Department of Fish, Wildlife, and Conservation Biology.
- Reynolds, Joel H. 2007. "Investigating the Impact of Sampling Effort on Annual Migratory Bird Subsistence Harvest Survey Estimates. Final Report for USFWS MBM Order No. 701812M816." Anchorage: Solutions Statistical Consulting.
- Rothe, Thomas C., Paul I. Padding, Liliana C. Naves, and Gregory J. Robertson. 2015. "Harvest of Sea Ducks in North America: A Contemporary Summary." In *Ecology and Conservation of North American Sea Ducks*, 419–469. London: CRC Press.
- U.S. Census Bureau. n.d. "Explore Census Data." Washington, D.C.: U.S. Department of Commerce, Bureau of the Census, American FactFinder Homepage. <https://data.census.gov/cedsci/>.
- . 2011. "2010 Census." Washington, D.C.: U.S. Census Bureau. <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.
- Wentworth, Cynthia. 2007a. "Subsistence Migratory Bird Harvest Survey, Bristol Bay, 2001–2005 with 1995–2005 Species Tables." Anchorage: U.S. Fish and Wildlife Service, Migratory Birds and State Programs.
- . 2007b. "Subsistence Migratory Bird Harvest Survey, Bristol Bay, 2001–2005 with 1995–2005 Species Tables." Anchorage: U.S. Fish and Wildlife Service, Migratory Birds and State Programs.
- Zavaleta, Erika. 1999. "The Emergence of Waterfowl Conservation among Yup'ik Hunters in the Yukon-Kuskokwim Delta, Alaska." *Human Ecology* 27 (2): 231–266.

APPENDICES

Appendix A.—Regions and communities included in the 2004–2018 harvest estimates.

Region, community	House-	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
	holds ^a															
Gulf of Alaska-Cook Inlet																
Chenega	31	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-
Cordova†	922	-	-	-	-	-	-	-	-	-	-	x	x	x	x	x
Nanwalek	55	x	-	-	-	-	-	x	-	-	-	-	-	-	-	-
Port Graham	79	x	-	x	-	-	-	-	-	-	-	-	-	-	-	-
Tatitlek	36	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tyonek	70	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Kodiak Archipelago																
Akhiok	19	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-
Aleneva	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balance of Kodiak Is. Borough	1,665	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-
Chiniak	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karluk	12	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-
Kodiak City	2,039	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-
Kodiak Station	332	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Larsen Bay	34	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-
Old Harbor	84	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-
Ouzinkie	56	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-
Port Lions	77	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-
Womens Bay	283	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-
Aleutian-Pribilof Islands																
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saint George	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saint Paul	162	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand Point	246	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-
Unalaska	927	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-
Bristol Bay																
Aleknagik	71	x	-	-	x	x	-	-	x	-	-	-	-	-	-	x
Chignik	41	x	-	-	x	-	-	-	x	-	-	-	-	-	x	-
Chignik Lagoon	29	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-
Chignik Lake	27	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-
Clarks Point	24	x	x	-	x	x	-	-	-	-	-	-	-	-	-	x
Dillingham	855	-	x	-	x	x	-	-	x	-	-	-	-	x	x	-
Egegik	29	-	x	-	x	-	-	-	-	-	-	-	-	-	-	-
Ekwok	37	x	-	-	x	x	-	-	x	-	-	-	-	-	-	-

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Region, community	House-	holds ^a	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Igiugig	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iliamna	39	-	x	-	x	-	-	-	-	-	-	-	-	x	x	-	-
Ivanof Bay	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
King Salmon	157	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kokhanok	52	x	x	-	x	x	-	-	x	-	-	-	-	-	-	-	-
Koliganek	55	-	x	-	x	-	-	-	-	-	-	-	-	-	-	-	-
Levelock	27	x	x	-	-	x	-	-	x	-	-	-	-	x	x	-	-
Manokotak	121	-	x	-	x	-	-	-	x	-	-	-	-	-	x	x	-
Naknek	231	x	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-
New Stuyahok	114	-	x	-	x	-	-	-	-	-	-	-	-	-	x	-	-
Newhalen	50	x	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-
Nondalton	57	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedro Bay	19	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perryville	38	x	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-
Pilot Point	27	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x
Pope-Vannoy Landing‡	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Port Alsworth‡	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Port Heiden	35	-	x	-	-	-	-	-	x	-	-	-	-	-	x	x	-
Portage Creek‡	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Naknek	35	-	x	-	x	-	-	-	-	-	-	-	-	-	-	x	-
Togiak	231	x	-	x	x	-	-	-	x	-	-	-	-	-	-	x	x
Twin Hills	29	x	x	-	x	-	-	-	-	-	-	-	-	-	-	-	-
Ugashik‡	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yukon-Kuskokwim Delta																	
Akiachak	150	-	-	x	-	-	x	-	-	-	-	-	x	x	-	-	-
Akiak	90	-	x	x	x	-	-	x	-	-	-	-	x	x	-	x	-
Alakanuk	160	x	-	x	-	-	x	x	-	-	x	-	x	-	x	x	-
Aniak	166	x	x	-	-	x	-	-	-	-	-	-	x	x	x	-	-
Atmautluak	63	x	-	-	x	x	-	-	-	-	x	-	-	x	-	x	-
Bethel	1,896	x	x	x	x	x	x	x	x	-	-	-	x	x	x	x	x
Chefornak	92	x	-	x	x	-	x	x	-	-	x	-	-	-	x	x	-
Chevak	209	x	-	-	-	-	x	x	-	-	-	-	x	-	x	-	-
Chuathbaluk	36	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	x
Crooked Creek	38	x	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x
Eek	91	x	x	-	x	x	-	x	x	-	-	-	x	-	-	-	-
Emmonak	185	-	x	x	x	x	x	-	-	-	x	-	-	x	-	x	-
Goodnews Bay	76	-	-	x	-	-	-	x	-	-	x	-	-	-	-	-	x
Hooper Bay	256	x	x	-	-	x	-	-	x	-	-	-	x	x	x	x	x
Kasigluk	113	x	-	x	x	-	x	-	-	-	x	-	-	-	-	-	-
Kipnuk	153	-	x	x	x	x	-	x	-	x	-	-	-	-	-	-	-
Kongiganak	94	-	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-
Kotlik	128	x	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-
Kwethluk	172	x	x	x	x	-	x	x	-	-	-	-	-	x	x	x	x

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Region, community	House-	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kwigillingok	82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lime Village	11	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-
Lower Kalskag	75	x	-	x	x	x	x	x	-	-	-	-	-	-	-	-
Marshall	100	x	x	-	x	x	-	x	-	-	-	-	x	-	-	x
Mekoryuk	70	-	x	-	x	x	-	-	x	-	-	-	-	x	-	-
Mountain Village	184	-	x	-	x	x	-	-	-	-	x	-	-	-	-	x
Napakiaik	96	-	-	-	x	-	-	-	-	-	x	-	-	-	-	-
Napaskiak	94	-	x	x	x	x	x	-	x	-	-	-	x	x	x	x
Newtok	70	-	x	x	-	x	x	-	-	-	x	-	-	-	-	-
Nightmute	59	x	-	x	x	-	x	-	x	-	-	-	-	x	-	-
Nunam Iqua	43	-	x	x	-	x	x	x	-	-	-	-	x	x	-	-
Nunapitchuk	124	x	x	-	x	x	-	-	x	-	-	-	-	x	-	x
Oscarville	15	-	-	x	x	-	x	x	-	-	x	-	-	x	-	-
Pilot Station	121	-	x	x	-	x	x	-	-	-	-	-	x	-	x	-
Pitkas Point	31	x	-	x	x	-	x	x	-	-	x	-	-	-	-	-
Platinum	19	-	x	x	-	-	-	x	-	-	x	-	-	-	-	-
Quinhagak	165	x	x	x	x	-	-	-	x	-	x	-	x	x	-	-
Red Devil	12	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-
Russian Mission	73	-	x	x	-	x	x	-	-	-	-	-	x	-	x	-
Saint Marys	151	-	x	-	x	-	x	-	-	-	x	-	-	-	-	x
Scammon Bay	96	-	-	x	-	x	x	x	-	-	x	-	-	-	-	-
Sleetmute	36	-	-	x	x	-	-	-	-	-	-	-	-	-	-	-
Stony River	20	x	-	x	-	-	-	-	-	-	-	-	-	x	x	x
Toksook Bay	125	x	x	-	x	-	-	-	-	-	x	-	x	x	-	x
Tuluksak	92	-	x	x	-	x	-	-	x	-	-	-	x	-	x	-
Tuntutuliak	96	x	-	x	-	x	x	x	-	-	x	-	x	x	x	x
Tununak	84	x	x	-	x	x	-	-	x	-	x	-	-	-	x	x
Upper Kalskag	60	-	x	x	-	-	-	-	x	-	x	-	-	x	-	x
Bering Strait-Norton Sound																
Brevig Mission	93	x	-	-	x	-	-	x	-	-	-	-	-	-	x	x
Diomedes	38	-	x	-	x	-	-	x	-	-	-	-	-	x	-	-
Elim	89	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Gambell	164	x	x	-	x	-	x	x	x	x	-	-	-	-	-	x
Golovin	49	-	x	-	x	-	-	x	-	-	-	-	-	-	-	-
Koyuk	89	-	x	-	x	-	-	x	-	-	-	-	-	-	-	-
Nome	1,216	x	x	-	x	-	-	-	-	-	-	-	-	x	x	-
Saint Michael	96	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-
Savoonga	166	x	x	-	x	-	x	x	x	x	-	-	-	-	x	-
Shaktoolik	64	-	-	-	x	-	-	x	-	-	-	-	-	x	-	-
Shishmaref	141	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Stebbins	134	-	x	-	x	-	-	x	-	-	-	-	-	-	-	-
Unalakleet	225	x	-	-	x	-	-	-	-	-	-	-	-	-	x	x
Teller	72	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-

-continued-

Region, community	House-	holds ^a	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Wales	43	x	x	-	-	-	-	-	-	-	-	-	-	-	x	x	-
White Mountain	65	x	-	-	x	-	-	-	-	-	-	-	-	-	x	-	x
Northwest Arctic																	
Ambler	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Buckland	98	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Deering	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kiana	101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kivalina	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kobuk	36	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Kotzebue	954	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-
Noatak	114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Noorvik	153	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selawik	186	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Shungnak	62	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
North Slope																	
Anaktuvuk Pass	99	-	x	-	x	-	-	-	-	-	-	-	-	-	-	x	-
Atkasuk	64	-	x	-	x	-	-	-	-	-	-	-	-	-	-	x	-
Kaktovik	72	-	x	-	x	x	x	-	-	-	-	-	-	x	-	x	-
Nuiqsut	114	-	-	-	-	x	x	-	-	-	-	-	-	-	-	-	-
Point Hope	186	-	x	-	-	x	-	-	-	-	-	-	-	x	-	x	-
Point Lay	60	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-
Utqiagvik (Barrow)	1,280	-	x	-	x	x	x	-	-	-	-	-	-	x	x	x	-
Wainwright	147	-	x	-	x	x	x	-	-	-	-	-	-	x	-	x	-
Interior Alaska																	
Alatna	12	x	-	x	x	x	-	x	-	-	-	-	-	-	-	-	-
Alcan Border‡		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x
Allakaket	62	x	-	x	x	x	-	x	-	-	-	-	-	-	-	-	-
Allakaket-Alatna	74	-	-	-	-	-	-	-	-	-	-	-	-	x	-	x	-
Anderson‡	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anvik	33	x	x	x	-	-	-	x	-	-	-	-	-	x	x	-	-
Arctic Village	65	-	-	x	-	-	-	-	-	-	-	x	-	-	-	-	-
Beaver	36	-	-	x	x	-	-	x	-	-	-	x	-	-	-	-	-
Bettles-Evansville	21	-	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-
Birch Creek	17	-	-	-	x	-	-	-	-	-	-	-	-	x	-	-	-
Central	53	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-
Chalkyitsik	24	-	-	x	x	-	-	x	-	-	-	x	-	-	-	-	-
Chicken‡	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circle	40	-	-	x	x	-	-	-	-	-	-	-	x	-	-	x	-
Coldfoot	6	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-
Dot Lake	26	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dry Creek	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x
Eagle Village	31	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-
Eagle	41	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-

-continued-

Region, community	House-	holds ^a	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Fort Yukon	246	x	-	x	x	-	-	-	-	-	-	-	x	-	x	x	x
Galena	190	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grayling	55	-	x	x	-	-	-	-	-	-	-	-	-	-	-	-	x
Healy Lake	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy Cross	64	x	x	x	-	-	-	x	-	-	-	-	-	-	-	-	-
Hughes	31	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Huslia	91	x	-	-	-	-	-	-	x	-	-	-	-	-	-	x	-
Kaltag	70	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x
Koyukuk	42	x	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-
Lake Minchumina	6	x	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Livengood‡	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manley Hot Springs	41	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
McGrath	147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-
Minto	65	-	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-
Nenana‡	185	x	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-
Nikolai	37	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Northway	77	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nulato	92	x	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-
Rampart	10	-	-	-	-	-	-	-	x	-	-	-	-	-	-	x	-
Ruby	62	x	x	-	-	-	-	-	x	-	-	-	-	-	-	-	-
Shageluk	36	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stevens Village	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Takotna	22	-	x	-	-	-	-	-	x	-	-	-	-	-	x	-	-
Tanacross	53	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Tanana	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetlin	43	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-
Tok	532	-	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-
Venetie	61	-	-	x	x	-	-	-	x	-	-	-	x	-	-	-	-
Wiseman	5	-	-	-	-	-	-	-	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^b																	
Craig	470	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hoonah	305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yakutat	270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydaburg	128	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-continued-

Sources Survey results for 2004–2017 were reported in Naves (2010rev.; 2010; 2011; 2012; 2014a; 2015b; 2016), Naves and Braem (2014), Naves and Otis (2017) and Naves and Keating (2018).

- a. Households: Total number of occupied households based on 2010 Census. b.
- b. 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 Alsworth, and Ugashik were added to the sampling frame in 2014. Also at this revision, the Four Mile Road CDP was combined to the community of Nenana for the purposes of this survey.

Note † Starting in 2014, a mail survey has been conducted in Cordova.

Note Allakaket includes Allalaket City and New Allakaket CDP. Starting in 2016, the communities of Alatna and Allakaket were combined for the purposes of this survey.

Note Dot Lake includes Dot Lake Village and Dot Lake CDP for the purposes of this survey.

Note Bettles-Evansville includes both Bettles and Evansville for the purposes of this survey.

Note Northway includes Northway Village, Northway Junction, and Northway CDPs for the purposes of this survey.

Note Nenana includes Nenana City and Four Mile Road CDP for the purposes of this survey.

Note Balance of Kodiak Island Borough listed as Kodiak at Large in previous AMBCC documents.

Appendix C.–Tracking sheet and household consent form (original size 8.5x11 inches).



AMBCC Harvest Survey
 (MBE Form Form # 2200) Expires 10/01/2019

page ____ / ____

Tracking Sheet & Household Consent Form

Copy here only the households selected to be surveyed.

Village: _____ Harvest Year: _____ Surveyor: _____

Household ID	Household name	Household consent				Harvest report completed Date (mm/dd/yy)	Comments (Why no contact? Moved?)
		Attempt	Date (mm/dd/yy)	Agreed	Refused		
		1 st	/ /				/ /
		2 nd	/ /				/ /
		3 rd	/ /				/ /
		1 st	/ /				/ /
		2 nd	/ /				/ /
		3 rd	/ /				/ /
		1 st	/ /				/ /
		2 nd	/ /				/ /
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		3 rd	/ /				/ /
		1 st	/ /				/ /
		2 nd	/ /				/ /
		3 rd	/ /				/ /
		1 st	/ /				/ /
		2 nd	/ /				/ /
		3 rd	/ /				/ /

Appendix D.—Harvest report form, Western Alaska (spring sheet, both sides, original size 8.5x11 inches).

OMB FWS Form 3-2391-1 Expires 3/31/2014

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 Peninsula)

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 3-2391-1 10-00 Your copy: adjustwidth=17.75, 90, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

OMB FWS Form 3-4381-1 Expires 10/31/2014

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 _____	Bonaparte's/Sabine's Gull 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 E.-Harvest report form, southern coastal Alaska (spring sheet, both sides, original size 8.5x11 inches).

45

AMB FWS Form 5-2301-3 Expires 10/31/2016

AMBC Subistence Migratory Bird Household Harvest Survey
Southern Coastal Alaska Harvest Report - WINTER
 Gulf of Alaska-Cook Inlet, Kodiak Archipelago, Aleutian-Pribilof Is., South AK Peninsula

Did the household harvest birds or eggs from **November 1 to March 9**? YES NO

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

American wigeon birds _____ 	Teal birds _____ 	Mallard birds _____ 	Northern pintail birds _____
Northern shoveler birds _____ 	Black scoter birds _____ 	Surf scoter birds _____ 	White-winged scoter birds _____
Bufflehead birds _____ 	Goldeneye birds _____ 	Canvasback birds _____ 	Scaup birds _____
Common eider birds _____ 	King eider birds _____ 	Steller's eider birds _____ 	Harlequin duck birds _____
Long-tailed duck birds _____ 	Merganser birds _____ 	Unknown duck birds _____ 	Black brant birds _____
Cackling/Canada goose birds _____ 	Greater white-fronted goose birds _____ 	Emperor goose birds _____ 	Snow goose birds _____
Swan birds _____ 	Sandhill crane birds _____ 	Grouse birds _____ 	Ptarmigan birds _____

FWS Form 5-2301-3 10/09 This form supersedes form 7-FW 5/03, which is obsolete.

AMB FWS Form 5-2301-3 Expires 10/31/2016

AMBC Subistence Migratory Bird Household Harvest Survey
Southern Coastal Alaska Harvest Report
WINTER - November 1 to March 9

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

"Loon 1" birds _____ 	"Loon 2" birds _____ 	"Loon 3" birds _____ 	"Loon 4" birds _____ 	"Loon 5" birds _____
eggs _____ 	eggs _____ 	eggs _____ 	eggs _____ 	eggs _____
Grebe birds _____ 	Cormorant birds _____ 	Murre birds _____ 	Guillemot birds _____ 	
Auklet birds _____ 	Puffin birds _____ 	Black-legged kittiwake birds _____ 	Red-legged kittiwake birds _____ 	
Bonaparte's/Sabine's Gull birds _____ 	Mew gull birds _____ 	Large gull birds _____ 	Tern birds _____ 	
Black oystercatcher birds _____ 	Whimbrel/Curlew birds _____ 	Godwit birds _____ 	Golden/Black-bellied plover birds _____ 	
Turnstone birds _____ 	Phalarope birds _____ 	Small shorebird birds _____ 	Other/unknown bird: birds _____ 	

Comments: _____

Appendix F.—Harvest report form, North Slope (spring sheet, both sides, original size 8.5x11 inches).

OMB EWS Form 3-738J-4 Expires 10/31/2019

AMBCS Subsistence Migratory Bird Household Harvest Survey
North Slope Harvest Report - SPRING

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

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

Northern 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 _____	
Scaup birds _____ eggs _____	Common elder birds _____ eggs _____	King elder birds _____ eggs _____	Spectacled elder birds _____ eggs _____	
Steller's elder 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 _____	Snow goose birds _____ eggs _____	Unknown goose birds _____ eggs _____

PHS Form 3-228J-4 1/2019. This form supersedes form 3-738J(02), which is obsolete.

OMB EWS Form 3-738J-4 Expires 10/31/2019

AMBCS Subsistence Migratory Bird Household Harvest Survey
North Slope 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 5" birds _____ eggs _____	
Tern birds _____ eggs _____	Sabine's gull birds _____ eggs _____	Large gull birds _____ eggs _____	Murre birds _____ eggs _____	Guillemot 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 _____	Snowy owl birds _____ eggs _____	Other/unknown bird: birds _____ eggs _____	

Comments: _____

Appendix G.-Harvest report form, Interior Alaska (spring sheet, both sides, original size 8.5x11 inches).

47

AMB FWS Form 3-2381-3 Expires 10/31/2019

AMBCC Subsistence Migratory Bird Household Harvest Survey
Interior Alaska Harvest Report - SPRING
 Upper Copper River and Interior Alaska

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 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 _____
Harlequin duck birds _____ eggs _____	Long-tailed duck birds _____ eggs _____	Merganser birds _____ eggs _____	Unknown duck birds _____ eggs _____
Cackling/Canada goose birds _____ eggs _____	Greater white-fronted goose birds _____ eggs _____	Snow goose birds _____ eggs _____	Swan birds _____ eggs _____
Sandhill crane birds _____ eggs _____			

FWS Form 3-2381-3 10/09, Third Form Submitted Date 2-20-10 by: WAFB/RS/Alaska

AMB FWS Form 3-2381-3 Expires 10/31/2019

AMBCC Subsistence Migratory Bird Household Harvest Survey
Interior Alaska Harvest Report
SPRING - April 1 to June 30

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

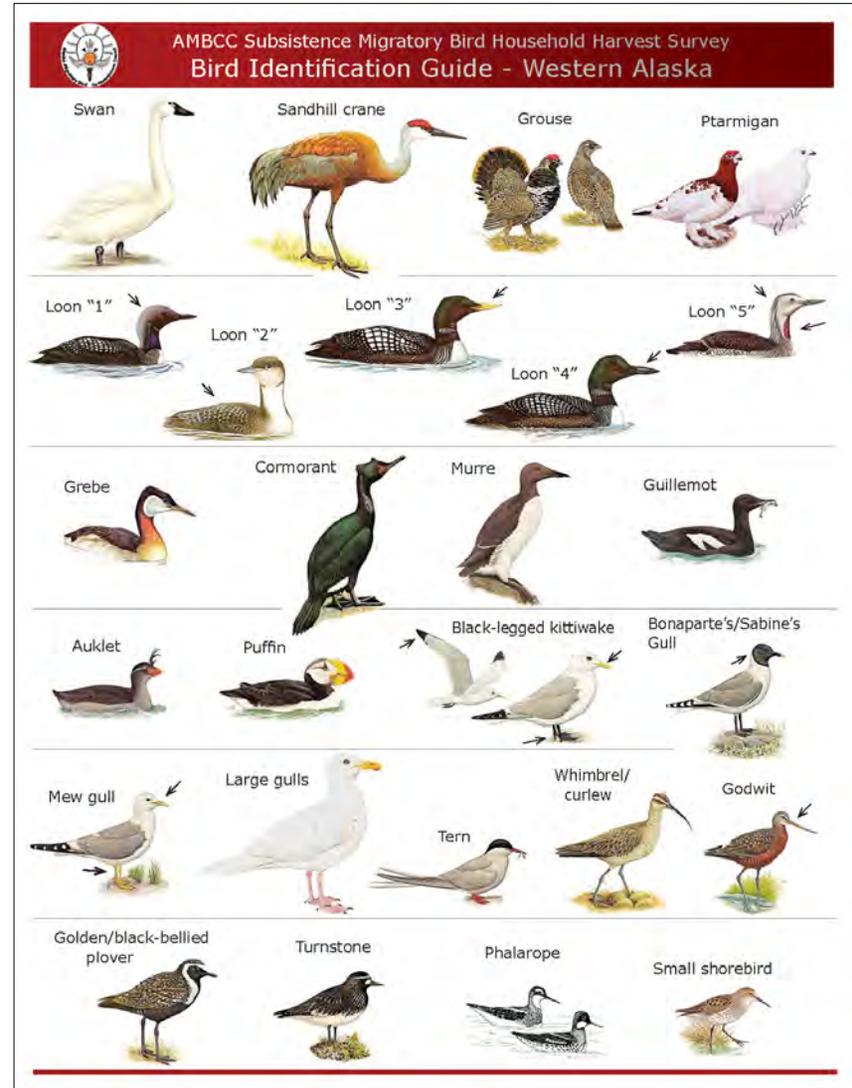
Loon "1" birds _____ eggs _____	Loon "2" birds _____ eggs _____	Loon "4" birds _____ eggs _____	Loon "5" birds _____ eggs _____
Grebe birds _____ eggs _____	Tern birds _____ eggs _____	Bonaparte's gull birds _____ eggs _____	Mew gull birds _____ eggs _____
Large gull birds _____ eggs _____	Grouse birds _____ eggs _____	Ptarmigan birds _____ eggs _____	Whimbrel/Curlew birds _____ eggs _____
Godwit birds _____ eggs _____	Golden/Black-bellied plover birds _____ eggs _____	Phalarope birds _____ eggs _____	Small shorebird birds _____ eggs _____

Other/unknown bird: _____

Comments:

birds _____ eggs _____

Appendix H.—Bird identification guide, Western Alaska (both sides, original size 8.5x11 inches).



Appendix I.–Bird identification guide, southern coastal Alaska (both sides, original size 8.5x11 inches).



Appendix J.—Bird identification guide, North Slope (both sides, original size 8.5x11 inches).

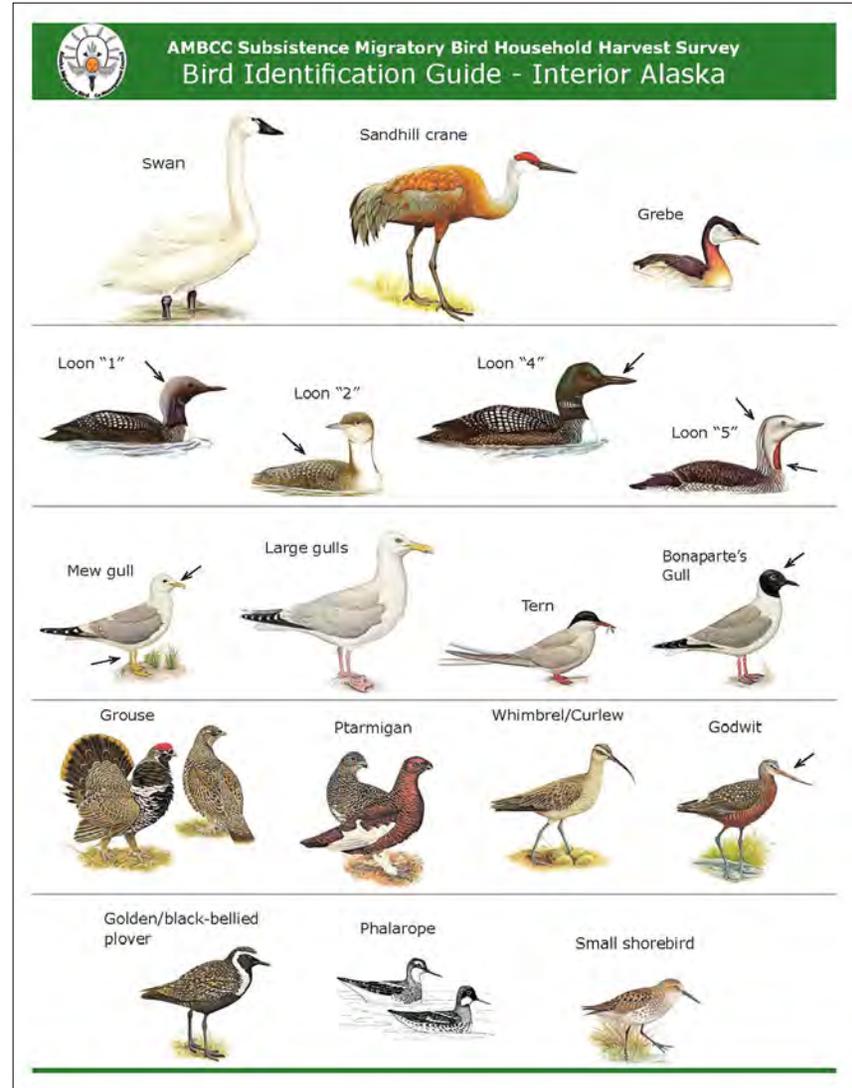
AMBCC Subsistence Migratory Bird Household Harvest Survey
Bird Identification Guide - North Slope

American Wigeon, Teal, Mallard, Northern Pintail, Northern Shoveler, Black Scoter, Surf Scoter, White-winged Scoter, Scaup, Long-tailed Duck, Merganser, Spectacled Eider, Common Eider, King Eider, Steller's Eider, Black Brant, Cackling/Canada Goose, Greater White-fronted Goose, Snow Goose

AMBCC Subsistence Migratory Bird Household Harvest Survey
Bird Identification Guide - North Slope

Swan, Sandhill Crane, Grouse, Ptarmigan, Loon "1", Loon "2", Loon "3", Loon "5", Tern, Sabine's Gull, Large Gull, Murre, Guillemot, Whimbrel/Curlew, Godwit, Turnstone, Snowy Owl, Golden/Black-bellied Plover, Phalarope, Small Shorebird

Appendix K.-Bird identification guide, Interior Alaska (both sides, original size 8.5x11 inches).



Appendix L.–Bird poster, Western Alaska (original size 23x36 inches).



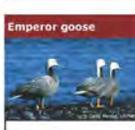
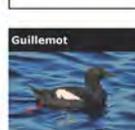
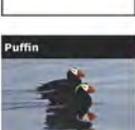
Alaska Migratory Bird Co-Management Council - AMBCC

Birds on the Subsistence Harvest Survey

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

Write your local bird names in the boxes below the pictures.

Birds/eggs that may be closed to harvest are shown with a red name tag; check the current regulation booklet.

Wigeon  <input type="text"/>	Teal  <input type="text"/>	Mallard  <input type="text"/>	Pintail  <input type="text"/>	Shoveler  <input type="text"/>	Bufflehead  <input type="text"/>	Goldeneye  <input type="text"/>
Black scoter  <input type="text"/>	Surf scoter  <input type="text"/>	White-winged scoter  <input type="text"/>	Common eider  <input type="text"/>	King eider  <input type="text"/>	Spectacled eider  <input type="text"/>	Steller's eider  <input type="text"/>
Canvasback  <input type="text"/>	Scaup  <input type="text"/>	Harlequin  <input type="text"/>	Long-tailed duck  <input type="text"/>	Merganser  <input type="text"/>	Swan  <input type="text"/>	Crane  <input type="text"/>
Brant  <input type="text"/>	Canada/cackling goose  <input type="text"/>	White-fronted goose  <input type="text"/>	Emperor goose  <input type="text"/>	Snow goose  <input type="text"/>	Grouse  <input type="text"/>	Ptarmigan  <input type="text"/>
Common loon  <input type="text"/>	Yellow-billed loon  <input type="text"/>	Pacific loon  <input type="text"/>	Red-throated loon  <input type="text"/>	Grebe  <input type="text"/>	Cormorant  <input type="text"/>	Tern  <input type="text"/>
Black-legged kittiwake  <input type="text"/>	Black-headed gulls  <input type="text"/>	Mew gull  <input type="text"/>	Large gulls  <input type="text"/>	Auklet  <input type="text"/>	Murre  <input type="text"/>	Gullinot  <input type="text"/>
Puffin  <input type="text"/>	Whimbrel/curlew  <input type="text"/>	Godwit  <input type="text"/>	Golden/black-bellied plover  <input type="text"/>	Turnstone  <input type="text"/>	Phalarope  <input type="text"/>	Small shorebird  <input type="text"/>

Please complete the survey so that:

- There is better understanding of the birds important to your culture;
- The subsistence harvest regulations are based on correct information;
- The subsistence harvest of birds will continue for you and your children.

Thank you!

AMBCC website
<http://alaska.fws.gov/ambcc/index.htm>

ADF&G Division of Subsistence
333 Raspberry Rd
Anchorage AK 99518
phone (907) 267-2353

AMBCC contact at USFWS Migratory Birds
1011 E. Tudor Rd, MS 201
Anchorage, AK 99503
phone (907) 786-3443

Appendix M.–Bird poster, southern coastal Alaska (original size 23x36 inches).

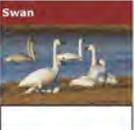
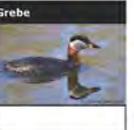


Alaska Migratory Bird Co-Management Council - AMBCC

Birds on the Subsistence Harvest Survey

Gulf of Alaska-Cook Inlet, Kodiak Archipelago, Aleutian-Pribilof Islands, South Alaska Peninsula (Bristol Bay Region)

Write your local bird names in the boxes below the pictures.
Birds/eggs that may be closed to harvest are shown with a red name tag; check the current regulation booklet.

 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
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 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>

Please complete the survey so that:

- There is better understanding of the birds important to your culture;
- The subsistence harvest regulations are based on correct information;
- The subsistence harvest of birds will continue for you and your children.

Thank you!

AMBCC website
<http://alaska.fws.gov/ambcc/index.htm>

ADF&G Division of Subsistence
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phone (907) 267-2353

AMBCC contact at USFWS Migratory Birds
1011 E. Tudor Rd., MS 201
Anchorage, AK 99503
phone (907) 786-3443

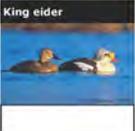
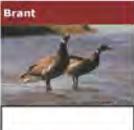
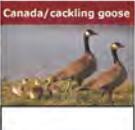
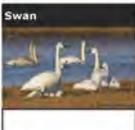
Appendix N.–Bird poster, North Slope (original size 23x36 inches).



Alaska Migratory Bird Co-Management Council - AMBCC

Birds on the Subsistence Harvest Survey North Slope

Write your local bird names in the boxes below the pictures.
Birds/eggs that may be closed to harvest are shown with a red name tag; check the current regulation booklet.

 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
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 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
 <input type="text"/>					
 <input type="text"/>					

Please complete the survey so that:

- There is better understanding of the birds important to your culture;
- The subsistence harvest regulations are based on correct information;
- The subsistence harvest of birds will continue for you and your children.

Thank you!

AMBCC website
<http://alaska.fws.gov/ambcc/index.htm>

ADF&G Division of Subsistence
333 Raspberry Rd
Anchorage, AK 99518
phone (907) 267-2353

**AMBCC contact at
USFWS Migratory Birds**
1011 E. Tudor Rd, MS 201
Anchorage, AK 99503
phone (907) 786-3443

Appendix O.–Bird poster, Interior Alaska (original size 23x36 inches).



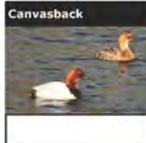
Alaska Migratory Bird Co-Management Council - AMBCC

Birds on the Subsistence Harvest Survey

Interior Alaska & Upper Copper River

Write your local bird names in the boxes below the pictures.

Birds/eggs that may be closed to harvest are shown with a red name tag; check the current regulation booklet.

 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>
 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	 <input type="text"/>	

Please complete the survey so that:

- There is better understanding of the birds important to your culture;
- The subsistence harvest regulations are based on correct information;
- The subsistence harvest of birds will continue for you and your children.

Thank you!

AMBCC website
<http://alaska.fws.gov/ambcc/index.htm>

ADF&G Division of Subsistence
333 Raspberry Rd
Anchorage, AK 99518
phone (907) 267-2353

**AMBCC contact at
USFWS Migratory Birds**
1011 E. Tudor Rd, MS 201
Anchorage, AK 99503
phone (907) 786-3443

Appendix P.–Formulas used to calculate estimated harvest, variance, and confidence interval percentage.

Community estimated harvest

$$(Equation 1) \quad \hat{Y}_i = \frac{M_i}{m_i} \times \sum_{j=1}^{m_i} y_{ij}$$

Region estimated harvest

$$(Equation 2) \quad \hat{Y}_{reg} = \frac{N}{n} \sum_{i=1}^n \hat{Y}_i$$

Region variance

$$(Equation 3.a) \quad v(\hat{Y}_{reg}) = \frac{N^2(1-f_1)}{n} s_u^2 + \frac{N}{n} \sum_{i=1}^n \frac{M_i^2(1-f_{2i})s_i^2}{m_i}$$

$$(Equation 3.b) \quad s_u^2 = \frac{1}{n-1} \sum_{i=1}^n (\hat{Y}_i - \hat{\bar{Y}})^2$$

$$(Equation 3.c) \quad s_i^2 = \frac{1}{m_i-1} \sum_{j=1}^{m_i} (y_{ij} - \bar{y}_i)^2$$

$$(Equation 3.d) \quad \bar{y}_i = \frac{\sum_{j=1}^{m_i} y_{ij}}{m_i}$$

$$(Equation 3.e) \quad \hat{\bar{Y}} = \frac{\sum_{i=1}^n \hat{Y}_i}{n}$$

Alaska-wide estimated harvest

$$(Equation 4) \quad \hat{Y}_{AK} = \sum_{R=1}^{reg} \hat{Y}_{reg}$$

Alaska-wide variance

$$(Equation 5) \quad v(\hat{Y}_{AK}) = \sum_{R=1}^{reg} v(\hat{Y}_{reg})$$

Confidence interval at region and Alaska-wide levels

$$(Equation 6.a) \quad CIP(\hat{Y}) = 2 \times CV \quad (Equation 6.b) \quad CV(\hat{Y}) = \frac{\sqrt{v(\hat{Y})}}{\hat{Y}}$$

Note: In equation 6.a, “2” is a Z score, which corresponds to a confidence level of 97.72%.

i = communities in a region (primary sampling units)

j = households in a community (secondary sampling units)

reg = region

AK = Alaska-wide

\hat{Y} = estimated harvest

y_{ij} = harvest reported by j^{th} surveyed household in the i^{th} community

\hat{Y}_{reg} = average community harvest in a region

\bar{y}_i = mean household harvest in sampled community i

m = sampled households

M = total households

n = sampled communities in region

N = total communities in region

R = number of regions

$v(\hat{Y})$ = variance of harvest estimate

f_1 = sampling fraction in regions (n/N)

f_{2i} = sampling fraction in communities (m_i/M_i)

s_i^2 = variance among households in a community

s_u^2 = variance among communities in a region

$CIP(\hat{Y})$ = confidence interval as a percentage of the harvest estimate

$CV(\hat{Y})$ = coefficient of variation

Appendix Q.–Harvest report form and bird identification guide, Cordova mail survey (original size 8.5x11 inches).

Alaska Migratory Bird Co-Management Council (AMBCC)
Subsistence Household Harvest Survey, Cordova Harvest Report – **SPRING 2018**

1. Household registration #: _____ 2. Date survey was completed: ____/____/2018
(2 letters followed by 3 numbers)

3. How many people listed under this household registration tried to harvest: birds (_____) eggs (_____)

4. Did the household harvest birds or eggs from 2 April to 31 May, 2018? (checkmark) YES NO

Below, please report numbers of birds and eggs harvested by your household:

American wigeon birds _____ 	Teal birds _____ 	Mallard birds _____ 	Northern pintail birds _____ 
Northern shoveler birds _____ 	Black scoter birds _____ 	Surf scoter birds _____ 	White-winged scoter birds _____ 
Bufflehead birds _____ 	Goldeneye birds _____ 	Canvasback birds _____ 	Scaup birds _____ 
Common eider birds _____ 	King eider birds _____ 	Harlequin duck birds _____ 	Long-tailed duck birds _____ 
Merganser birds _____ 	Greater white-fronted goose birds _____ 	Snow goose birds _____ 	Sandhill crane birds _____ 
Gull eggs _____ 	Other/unknown bird: birds: _____ eggs: _____	Comments: <div style="border: 1px solid black; height: 60px; width: 100%;"></div>	

FWS Form 3-281-2 10/09. This form supersedes form 7-FW-103b, which is obsolete.

Instructions for Birds and Eggs Household Harvest Survey

TO AVOID FUTURE NOTIFICATIONS, PLEASE COMPLETE AND RETURN THIS SURVEY NOW.
It is very important that you participate even if your household did not harvest.

Harvest estimates from this survey are used to:

- Show the importance of subsistence uses of migratory birds.
- Protect subsistence harvests.
- Assess whether harvest regulations are appropriate.
- Plan for the conservation of birds.

1. Please complete one survey per household including harvests by all household members listed in your registration.
2. Respond to questions 1 through 4 at top of survey form.
3. In the fields provided close to bird drawings, report numbers of all birds and eggs harvested by your household, including those that you gave to other household(s).
4. Do not report in your survey birds or eggs received from other household(s).
5. If you harvested with people from other household(s), report in your survey only your household's share of the harvest.
6. Report numbers of birds and eggs as individual units. For instance, if you harvested eggs using a 5-gal bucket or other kind of container, specify how many eggs.
7. Write comments in the box provided at the bottom of the survey form (weather, hunting conditions, access to hunting areas, unusual birds seen, household registration and survey process, etc.).
8. Fold this survey and put it in the pre-stamped envelope provided, close it, and mail it to the pre-printed address.

Thank you for participating in this survey! We'll distribute survey results in your community.

Questions about this survey? Give us a call:

Division of Subsistence, Alaska Department of Fish and Game: 907-267-2302 (Anchorage)
Migratory Birds Management Division, U.S. Fish and Wildlife Service: 907-786-3499 (Anchorage)



Paperwork Reduction Act Statement

In accordance with the Paperwork Reduction Act (44 U.S.C. 3501 et seq.), please note the following information:
This survey is authorized by the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.) and the Migratory Bird Treaty Act Protocol Amendment (1995) and its letter of submission from the Department of State to the White House, which specifies the need for harvest monitoring.
Your participation in the survey is voluntary. We will use the information your household provides to estimate subsistence migratory bird harvest in subsistence eligible areas of Alaska. Household harvest reports are anonymous and no names are used on harvest report forms. Harvest estimates are calculated at the regional and subregional levels. With help of a surveyor, we estimate it will take about 5 minutes each to provide household consent and to report your seasonal bird/egg harvest.
The Office of Management and Budget has approved this information collection and assigned control number 1018-0124, which expires 3/31/2019. We may not conduct or sponsor and you are not required to respond to a survey unless it displays a current OMB control number.
You may provide comments on the estimated burden or any other aspect of FWS Forms 3-2380, 3-2381-1, 3-2381-2, 3-2581-3, and 3-2381-4 to the Information Collection Officer, Mail Stop 2042-PDM, U.S. Fish and Wildlife Service, 4401 N Fairfax Dr., Arlington, VA 22203.

Appendix R.–Summary of 2014–2018 Cordova bird and egg harvest estimates produced for community communication.



Alaska Migratory Bird Co-Management Council (AMBCC) Cordova Bird and Egg Subsistence Harvest Estimates April–May 2014–2018

The Cordova migratory bird subsistence harvest was opened 2–30 April for waterfowl hunting and 1–31 May for gull egg harvesting. A limited list of species was opened to harvest.

Participants were required to obtain a registration issued at the Cordova offices of the U.S. Forest Service and Native Village of Eyak, and at the tribal councils of the communities of Chenega and Tatitlek. The Division of Subsistence of the Alaska Department of Fish and Game (ADF&G) coordinated the registration process and the mail harvest survey in collaboration with the local partners.

Many thanks to all households that participated in the survey!

John Whissel (Native Village of Eyak), Milo Burcham (U.S. Forest Service), Patty Brown-Schwalenberg (Chugach Regional Resources Commission), Charlotte Westing (ADF&G Wildlife Conservation), Tracy Totemoff (community of Tatitlek), and Travis King (community of Chenega) assisted in household registration and community communication.



Participation	2014	2015	2016	2017	2018
Registered households	36	20	26	27	41
Surveys completed	28	15	22	25	33
Survey participation	78%	75%	85%	93%	81%

Harvest estimates, number of birds and eggs	2014			2015			2016			2017			2018		
	Re-ported	Esti-mated	CIP												
Bird harvest															
American wigeon	1	1	97%	0	0		1	1	82%	5	5	40%	0	0	
Gadwall	0	0		0	0		0	0		1	1	56%	0	0	
Teal	1	1	97%	0	0		0	0		14	15	25%	1	1	90%
Mallard	11	14	43%	0	0		16	19	36%	42	45	22%	8	10	65%
Northern pintail	12	15	47%	0	0		56	66	31%	82	89	28%	1	1	90%
Northern shoveler	0	0		0	0		2	2	82%	0	0		0	0	
Black scoter	0	0		0	0		0	0		0	0		0	0	
Surf scoter	0	0		0	0		0	0		0	0		0	0	
White-winged scoter	0	0		0	0		0	0		0	0		0	0	
Bufflehead	0	0		0	0		0	0		0	0		0	0	
Goldeneye	0	0		0	0		0	0		4	4	56%	0	0	
Canvasback	0	0		0	0		0	0		0	0		0	0	
Scaup	0	0		0	0		0	0		0	0		0	0	
Common eider	0	0		0	0		0	0		0	0		0	0	
King eider	0	0		0	0		0	0		0	0		0	0	
Harlequin duck	0	0		0	0		0	0		0	0		0	0	
Long-tailed duck	0	0		0	0		0	0		0	0		0	0	
Merganser	0	0		0	0		0	0		0	0		0	0	
Greater white-fronted goose	4	5	67%	0	0		0	0		7	8	30%	4	5	54%
Snow goose	4	5	57%	0	0		5	6	67%	3	3	56%	20	25	65%
Sandhill crane	0	0		0	0		0	0		3	3	56%	0	0	
Total birds	33	42	37%	0	0		80	95	27%	161	174	23%	34	42	56%
Egg harvest															
Gull (unidentified)	102	131	37%	197	263	51%	105	124	47%	105	113	27%	138	171	48%
Total eggs	102	131	37%	197	263	51%	105	124	47%	105	113	27%	138	171	48%

CIP: confidence interval as percentage of the estimated harvest.

For more information on subsistence harvest of birds and eggs see <https://www.fws.gov/alaska/pages/co-management>.

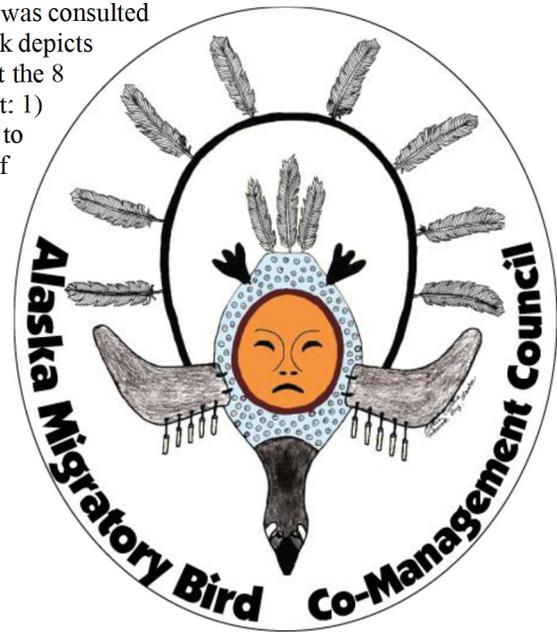
For information about the household registration and survey please email liliana.naves@alaska.gov, call 907-267-2302, and/or see http://www.adfg.alaska.gov/index.cfm?adfg=subsistence_b_surveys. This summary was updated 30 March 2020.

For a copy of the Alaska Department of Fish and Game OEO statement see <http://www.adfg.alaska.gov/index.cfm?adfg=home.oestatement>

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 a plentiful harvest 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.



References

- Fienup-Riordan, Ann. 1983. *The Nelson Island Eskimo: Social Structure and Ritual Distribution*. The Alaskan Book Series no. 40. Alaska Pacific University Press, Anchorage. Cited in this report as Fienup-Riordan 1983.
- Fienup-Riordan, Ann. 1996. *The Living Tradition of Yup'ik Masks: Agayuliyarput = Our Way of Making Prayer*. University of Washington Press, Seattle. Cited in this report as Fienup-Riordan 1996.
- Pete, Mary C. 1989. "The Universe in a Mask." *Alaska Fish and Game* 21 (6): 38–39. Alaska Department of Fish and Game, Juneau. Cited in this report as Pete 1989.