Technical Paper No. 391

Subsistence Harvests of Birds and Eggs, Gambell and Savoonga, 2002–2010, Alaska Migratory Bird Co-Management Council

Liliana C. Naves

Photo by Tamara K. Zeller, USFWS
Photo by James Van Lanen, ADF&G Subsistence
Photo by Lili Naves, ADF&G Subsistence

March 2014

Alaska Department of Fish and Game
Division of Subsistence

Alaska Migratory Bird
Co-Management Council

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Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

all atomic symbols

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

General

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

Measures (fisheries)

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

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations

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

TECHNICAL PAPER NO. 391

SUBSISTENCE HARVESTS OF BIRDS AND EGGS, GAMBELL AND SAVOONGA, 2002–2010, ALASKA MIGRATORY BIRD CO-MANAGEMENT COUNCIL

by

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Front cover photo: Birds and eggs are a relatively small proportion of the total subsistence harvests by the communities of Gambell and Savoonga, but add diversity to the local diet and their harvesting and sharing are important cultural and social activities. Photographs by Tamara K. Zeller, U.S. Fish and Wildlife Service (left) and James Van Lanen (right top) and Liliana Naves (right bottom), ADF&G Division of Subsistence.

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ABSTRACT

This report presents bird and egg harvest estimates for the villages of Gambell and Savoonga, located on Saint Lawrence Island, for the years 2002, 2004, 2005, 2007, 2009, and 2010. Data for 2004–2010 have been included in regionwide harvest estimates for the Bering Strait-Norton Sound region as reported by the harvest assessment program of the Alaska Migratory Bird Co-Management Council. Recent data release agreements with the communities of Gambell and Savoonga have allowed reporting of community-level harvest estimates with the intent of clarifying usual harvest levels. Data for 2002 were also previously reported in another document; the objective of this new analysis was to provide seasonal harvest estimates not previously available. The household was the basic sampling unit, and stratified sampling was based on households' harvest level in previous years. Harvest reports were completed in face-to-face interviews. The birds harvested in the largest numbers were murre, auklet, cormorant, and common eider. Murre eggs represented the vast majority of egg harvests in both villages. Main differences between Gambell and Savoonga harvests were a higher contribution of auklets to Gambell bird harvests and higher harvests of murre eggs in Savoonga. Unusually high harvest estimates were identified for Savoonga in 2007 (78,994 birds; 118,360 eggs) and unusually low estimates were identified for Gambell in 2010 (786 birds; 388 eggs). Considering other available sources of data, usual bird harvest estimates ranged 4,658–21,042 birds per year for Gambell and 3,095–19,774 birds per year for Savoonga. Usual egg harvest estimates ranged 1,588–12,935 eggs per year for Gambell and 10,286–91,401 eggs per year for Savoonga.

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

ACKNOWLEDGMENTS

These subsistence harvest surveys would not have been possible without the local support of the Native villages of Gambell and Savoonga, and I am grateful for the opportunity to work in close collaboration with these communities. I thank the village councils for facilitating research work, discussion of results, and data release agreements. The Alaska Migratory Bird Co-Management Council (AMBCC) is most grateful to all households that have participated in the surveys along the years and shared information on their harvests. I thank the Kawerak, Inc., Subsistence Program staff, especially Eric Trigg, for their collaboration in data management and analyses for this report. The AMBCC program and its harvest survey are funded by the U. S. Fish and Wildlife Service. Dave Koster and staff of the Information Management Unit of the Alaska Department of Fish and Game Division of Subsistence provided data management support for the AMBCC Harvest Assessment Program. Mary Lamb and Adam Knight edited this report.

INTRODUCTION

This report presents bird and egg harvest estimates for the villages of Gambell and Savoonga, located on Saint Lawrence Island (Figure 1), for the years 2002, 2004, 2005, 2007, 2009, and 2010. The data for 2004–2010 have been included in region-wide harvest estimates for the Bering Strait-Norton Sound region as reported by the harvest assessment program of the Alaska Migratory Bird Co-Management Council (AMBCC) (Naves 2010; Naves 2011; Naves 2012). The AMBCC survey program usually reports harvest estimates at the region and subregion level as agreed with Native partners. Data for 2002 were previously presented in Kawerak, Inc. (2004); the objective of a new analysis in this study was to provide seasonal harvest estimates not previously available.

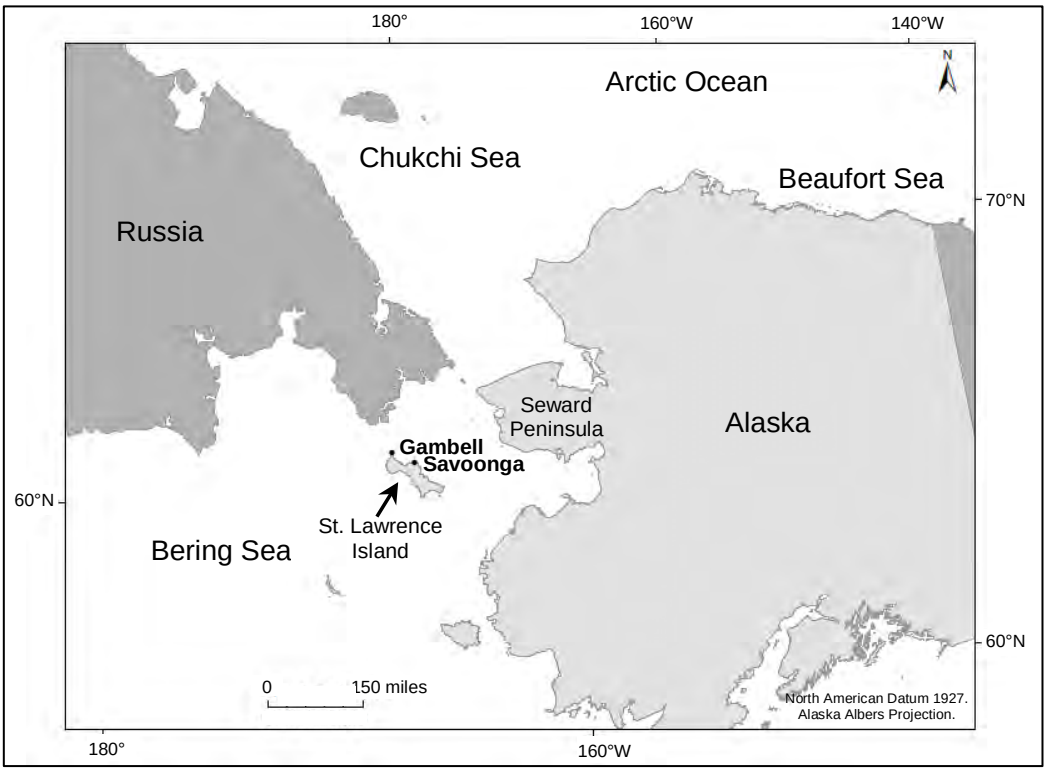

Figure 1.–Saint Lawrence Island, where the communities of Gambell and Savoonga are located, is in the Bering Sea.

In 2009, the yellow-billed loon *Gavia adamsii* was listed under the Endangered Species Act as a candidate species (74 FR 12932–12968).[1] The subsistence harvest in Alaska was identified as a threat, primarily based on 2007 harvest estimates for the Bering Strait-Norton Sound region (Naves 2010). In this region, yellow-billed loons occur in small numbers on the mainland and, at least in some years, relatively large numbers migrate across the Bering Sea, which brings them near Saint Lawrence Island (Schmutz and Rizzolo 2012). Harvest estimates seemed inconsistent with information on loon species composition and abundance on Saint Lawrence Island, raising concerns about the accuracy of estimated harvest amounts and issues with species identification (USFWS 2010[2]).

1. Federal Register Vol. 74, No. 56 available online: http://www.gpo.gov/fdsys/pkg/FR-2009-03-25/pdf/E9-6012.pdf#page=1.

2. U.S. Fish and Wildlife Service (USFWS). 2010. "Intra-Agency Conference for Proposed 2010 Alaska Migratory Bird Spring–Summer Subsistence Hunt, Candidate Species: Yellow-Billed Loon (*Gavia adamsii*) and Kittlitz's Murrelet (*Brachyramphus brevirostris*)." Anchorage: Unpublished report, Division of Migratory Bird Management, U.S. Fish and Wildlife Service. Cited in this report as USFWS 2010.

Following the yellow-billed loon listing, efforts were directed to better understand loon abundance, distribution, and harvest in the Bering Strait-Norton Sound region (Huntington 2009[3]; Omelak 2009[4]; Zeller et al. 2011) and dedicated harvest surveys were conducted in 2011–2012 (Naves and Zeller 2013). These efforts also included extensive community involvement and outreach. As part of this process, data review by the communities indicated unusual harvest estimates in 2007 for Savoonga and in 2010 for Gambell. Therefore, the communities of Gambell and Savoonga supported release of data at the community level for surveys conducted by the AMBCC between 2004 and 2010 with the intent of clarifying usual harvest levels and species identification issues (appendices A–D).

3. Huntington, Henry P. 2009. "Documentation of Subsistence Harvest of Yellow-Billed Loons in Western and Northern Alaska: A Literature Review." Eagle River, Alaska: Unpublished report commissioned by U.S. Fish and Wildlife Service on behalf of Alaska Migratory Bird Co-Management Council. Cited in this report as Huntington 2009.

4. Omelak, Jack. 2009. "DRAFT: Subsistence Uses of Yellow-Billed Loons on St. Lawrence Island." Nome, Alaska: Prepared by Kawerak Natural Resources, Subsistence Program for U.S. Fish and Wildlife Service, Region 7. Cited in this report as Omelak 2009.

METHODS

Data collection in 2002, 2004, 2005, 2007, and 2009 followed the original survey methods of the AMBCC harvest survey program, which were described in detail in Naves (2010). Harvest surveys were conducted in 2002 in the Bering Strait-Norton Sound region as a pilot project of the AMBCC harvest assessment program (Kawerak, Inc. 2004). Data collection in 2010 followed revised AMBCC survey methods as described in Naves (2012). Data collection was implemented by Alaska Native partners at the regional and local levels. Regional partners were trained by U.S. Fish and Wildlife Service (USFWS) and Alaska Department of Fish and Game (ADF&G) staff following standard survey methods. Regional partners then trained local partners and coordinated their work. Data management and analyses were performed by ADF&G Division of Subsistence.

Data collection employed the standard AMBCC harvest report form and bird identification guide for Western Alaska (appendices E–G). The household was the basic sampling unit. Stratified sampling was based on households' harvest levels in previous years: (a) 3 strata in 2004–2009 (none: nonharvester household; low: households that usually harvest 1–10 birds per year; and high: households that usually harvest 10-plus birds per year), and (b) 2 strata in 2010 (harvester and nonharvester). For 2004–2007, the sampling design called for random selection of households in each stratum with sampling proportions of 10% (none), 15% (low), and 40% (high). In 2009–2010, as part of dedicated efforts to clarify usual harvest levels of loons, the sampling design called for a census survey in Gambell and Savoonga: (a) 2009: all households in strata none, low, and high, and (b) 2010: all households in strata harvester and nonharvester.

Harvest reports were completed in face-to-face interviews conducted by local surveyors. Survey respondents were instructed to report all birds and eggs harvested by all hunters in the household, including birds and eggs that were given to other households. If birds or eggs were harvested by a crew, respondents were instructed to report the household's harvest share. Respondents were instructed not to report birds or eggs received from other households. Households were asked to report harvests by season: spring (2 April–30 June), summer (1 July–31 August), and fall (1 September–31 October).

Harvest data were entered in Microsoft Office Access[5] forms designed to mimic survey forms. The raw data were stored in a Microsoft SQL Server relational database with metadata documentation. Double data entry and logic checks ensured data entry accuracy. Harvest estimates and confidence intervals were calculated based on Cochran (1977, 274) (Appendix H). Harvests reported by households sampled in each stratum (e.g., harvester and nonharvester) were expanded to all households in that stratum. Community-level harvest estimates were calculated as the sum of the estimates for each stratum. Annual harvest estimates were calculated as the sum of seasonal estimates. For wide confidence intervals, if the calculated low end of the range was less than the reported harvest, the reported harvest is presented instead. Household participation rates were calculated by dividing the number of households that agreed to participate by the number of households contacted (households that agreed to participate and households that did not agree to participate). Sampling rates were calculated by dividing the number of households sampled by the total number of resident households.

In 2004–2007, stratum sampling rates closely followed the sampling design (Table 1). The following points refer to inconsistencies detected in the implementation of sampling designs.

- In 2007, a priori stratification of Savoonga households was unusual as compared to previous years because no household was assigned to the "none" stratum.
- Although the 2009–2010 sampling design called for a census survey, relatively low sampling rates were obtained for some strata in those years. Sampling proportions of high harvesters were especially low in 2009: 13% in Gambell and 23% in Savoonga. Because of the original intent of conducting census surveys, a priori random sampling of households may not have been implemented. Therefore, it is unclear whether the 2009–2010 samples indeed represented the population.
- In 2010, sampling effort in Savoonga progressively decreased from spring to fall, and fall sampling rates were likely insufficient to reliably depict harvests. Household participation rates varied between 69% and 100%, except that in 2009 the Savoonga household participation rate was unusually low (33%) (Table 2).

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

Table 1.–Sampling information.

Year	Community	Stratum sampling proportion percentage	Stratum size	Sampling goal	Spring	Summer	Fall	Sampling rate
2002	Gambell	None (10%)	69	7	6	6	6	9%
		Low (15%)	32	5	8	8	8	25%
		High (40%)	30	12	15	15	15	50%
	Savoonga	None (10%)	38	4	5	5	5	13%
		Low (15%)	54	8	8	8	8	15%
		High (40%)	46	18	19	19	19	41%
2004	Gambell	None (10%)	45	5	5	5	5	11%
		Low (15%)	38	6	17	17	17	45%
		High (40%)	38	15	18	18	18	47%
	Savoonga	None (10%)	23	2	3	3	3	13%
		Low (15%)	45	7	13	13	13	29%
		High (40%)	62	25	24	24	24	39%
2005	Gambell	None (10%)	34	3	3	3	3	9%
		Low (15%)	22	3	3	3	3	14%
		High (40%)	62	25	25	25	25	40%
	Savoonga	None (10%)	18	2	3	3	3	17%
		Low (15%)	48	7	7	7	7	15%
		High (40%)	63	25	24	24	24	38%
2007	Gambell	None (10%)	64	6	5	5	5	8%
		Low (15%)	30	5	6	6	6	20%
		High (40%)	40	16	17	17	17	43%
	Savoonga	None (10%)	0	[b]	[b]	[b]	[b]	[b]
		Low (15%)	68	10	11	11	11	16%
		High (40%)	79	32	31	31	31	39%
2009[a]	Gambell	None (100%)	54	54	17	17	17	31%
		Low (100%)	40	40	10	10	10	25%
		High (100%)	40	40	5	5	5	13%
	Savoonga	None (100%)	66	66	26	26	26	39%
		Low (100%)	40	40	13	13	13	33%
		High (100%)	40	40	9	9	9	23%
2010[a]	Gambell	Harvester (100%)	76	76	49	49	49	64%
		Other (100%)	64	64	47	47	47	73%
	Savoonga	Harvester (100%)	86	86	77	61	15	[c]
		Other (100%)	55	55	38	25	12	[c]

Sources Kawerak, Inc. household surveys 2002; AMBCC Subsistence Harvest surveys 2004, 2005, 2007, 2009, and 2010.

a. The 2009 and 2010 sampling design called for census survey.

b. No households were assigned to the “none" stratum.

c. Number of households surveyed largely differed among seasons.

Table 2.–Household participation rates.

	Total households	Households contacted	Participation rate
Gambell			
2002	131	55	53%
2004	121	55	73%
2005	118	33	94%
2007	134	28	100%
2009	134	46	70%
2010	140	140	69%
Savoonga			
2002	138	68	46%
2004	130	55	78%
2005	129	42	81%
2007	147	46	91%
2009	146	145	33%
2010	141	141	82%

Sources Kawerak, Inc. household surveys 2002; AMBCC Subsistence Harvest surveys 2004, 2005, 2007, 2009, and 2010.

Note Participation rate equals (=) number households that agreed to participate divided by (÷) number of households contacted.

RESULTS AND DISCUSSION

Tables 3–26 present 2002, 2004, 2005, 2007, 2009, and 2010 annual harvest estimates for birds and eggs. In these tables, "CIP" means confidence interval percentile, and hyphens "-" indicate absence of CIP in cases where the harvest amount was zero. Harvest data for Saint Lawrence Island communities obtained in other studies (Paige et al. 1996; Georgette and Iknokinok 1997[6]; Kawerak, Inc. 2004; Ahmasuk and Trigg 2008; Naves and Zeller 2013) were considered together with the 2004–2010 AMBCC harvest assessment program data to discuss harvest levels (Figure 2[7], appendices I–L). Data available for 1993 (Paige et al. 1996) refer only to spring and fall harvests and therefore likely under-represent annual harvests.

The species of bird harvested in the largest numbers were murre, auklet, cormorant, and common eider. Murre eggs represented the vast majority of egg harvests in both villages. Main differences between Gambell and Savoonga harvests were a higher contribution of auklets to Gambell bird harvests and higher harvests of murre eggs in Savoonga.

Usual bird harvest estimates (all species combined) ranged 4,658–21,042 birds per year for Gambell and 3,095–19,774 birds per year for Savoonga. Usual egg harvest estimates ranged 1,588–12,935 eggs per year for Gambell and 10,286–91,401 eggs per year for Savoonga. However, an unusually high estimate of 78,994 birds is available for Savoonga in 2007 and an unusually low estimate of 786 birds is available for Gambell in 2010 (Figure 2, appendices I–L). Annual variation in harvest estimates may reflect actual variation of resource availability and harvest effort, or the use of different sampling methods, sampling coverage, and potential issues with implementation of sampling designs among studies. Actual variability in harvest effort and resource availability may have resulted in the unusual 2007 and 2010 harvest estimates. However, the data review conducted in the context of 2011–2012 surveys did not reveal ecological or socio-economic factors that could be associated with unusual estimates (Naves and Zeller 2013). Based on the considerations presented below, harvest estimates for Savoonga in 2007 and Gambell in 2010 are considered to not represent usual harvest levels in these villages.

Saint Lawrence Island communities largely rely on subsistence harvests. Sharing of information and gear, organization of hunting-gathering parties, and using and sharing of subsistence harvests are embedded in daily activities. The success of subsistence pursuits depends on the understanding of temporal and spatial variability of harvest conditions and those relationships with the outcome of harvest efforts. In this context, large annual variations in harvest levels are most likely noticeable and memorable events. In data review meetings conducted in Savoonga in 2013, local residents could not recollect unusually high bird and egg harvests anytime around 2007, which is when harvest estimates peaked. Gambell 2009 bird harvest estimates (21,042 birds; 12,935 eggs) were relatively high compared to other years while 2010 estimates (786 birds; 388 eggs) were the lowest on record. However, Gambell residents could not recollect low bird and egg harvests in recent years nor large differences in bird and egg harvest levels between years.

Gambell and Savoonga have very similar human population sizes, are geographically and culturally close, and also do not significantly differ in their subsistence practices and socio-economic context. It is likely that both communities similarly experience unusual events that affect harvest effort and availability of subsistence resources. Therefore, unusual bird harvest amounts are expected to simultaneously occur in both communities. Unusually high harvest estimates for Savoonga in 2007 did not find a counterpart in 2007 Gambell estimates. Similarly, unusually low harvest estimates for Gambell in 2010 did not find a counterpart in 2010 Savoonga estimates. These facts do not support that unusual 2007 and 2010 harvest estimates were associated with actual variation in resource availability or harvest effort.

Potential issues with 2007 Savoonga and 2010 Gambell harvest estimates may be related to issues in the implementation of the sampling design including failure (a) to properly assign households to strata (harvester, nonharvester); (b) to randomly sample households; (c) to achieve the sampling goal; (d) to correctly instruct and assist households about how to report harvests and complete the harvest report; and (e) to properly document, organize, review, and revise data collection work. These issues may simultaneously occur and are difficult to detect

6. Georgette, S., and S. Iknokinok. 1997. "St. Lawrence Island Migratory Bird Harvest Survey, 1996." Anchorage: Unpublished report by Alaska Department of Fish and Game Division of Subsistence. Hereinafter cited as Georgette and Iknokinok 1997.

7. Figure 2 source details: for 1993 data, the survey represented only spring and fall harvests (Paige et al. 1996); 1996 data (Georgette and Iknokinok 1997); 2002 data (Kawerak, Inc. 2004); 2006 data (Ahmasuk and Trigg 2008); 2004, 2005, 2007, 2009, and 2010 data (this study); 2011 and 2012 data (Naves and Zeller 2013).

and then to correct for once data collection is completed and survey forms are sent for data analysis. It is impossible to reconstruct the exact circumstances that led to these unusual harvest estimates.

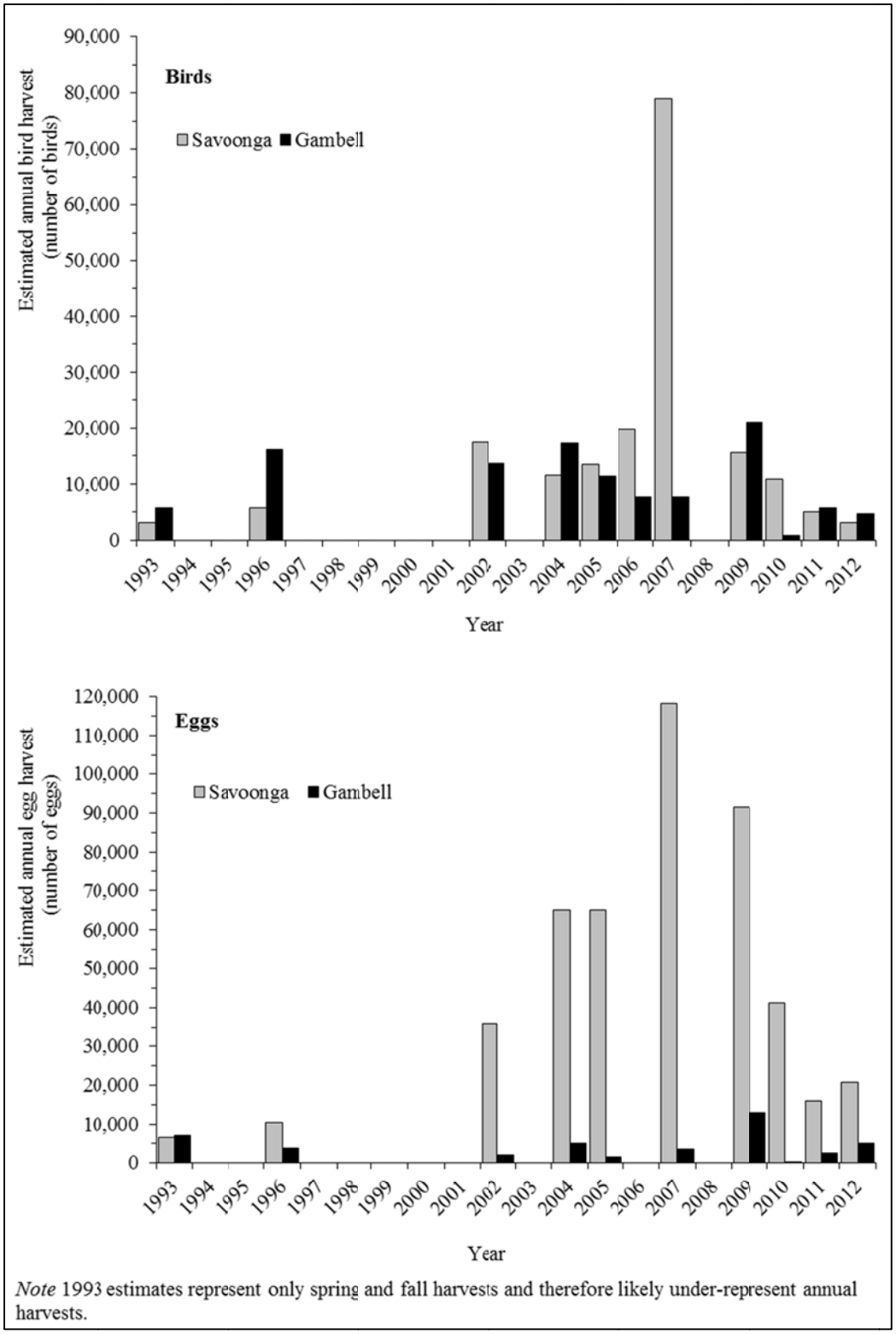

Figure 2.–Annual bird and egg harvest estimates for Gambell and Savoonga (species combined), 1993–2012.

The AMBCC recognizes the importance of the implementation of standard data collection methods, quality assurance and quality control protocols, and effective annual data review. The AMBCC has been continuously working to improve these processes in its harvest monitoring program. However, subsistence harvest data collection is a challenging enterprise. Logistics and communication are complex because of the remoteness of the areas studied and their particular cultural setting. Data collection depends on many partnerships, which can be fragile. Nevertheless, the subsistence harvest surveys generate data necessary for management and conservation as well as the protection of sustainable harvest opportunities. Harvest surveys also play a main role in engaging subsistence users in the management of natural resources they rely upon for their diet and culture. Informed uses of subsistence survey data for critical decision making, especially when dealing with questionable information, should rely on the in-depth evaluation of data using as much ancillary information as available and include the participation of the involved communities.

Table 3.–Reported and estimated bird harvest, Gambell, 2002.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	1	**2**	139%	1 – 5	2	134%	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	43	**86**	63%	43 – 140	34	85%	22	79%	30	89%
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	2	**4**	139%	2 – 10	4	139%	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	281	**1,055**	21%	836 – 1,274	606	21%	75	54%	374	26%
King eider	115	**271**	76%	115 – 475	154	67%	22	126%	95	88%
Spectacled eider	47	**176**	154%	47 – 447	0	-	0	-	176	154%
Steller's eider	0	**0**	-	-	0	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-	0	-
Long-tailed duck	51	**366**	54%	169 – 563	141	101%	225	58%	0	-
Merganser	0	**0**	-	-	0	-	0	-	0	-
Total ducks	540	**1,960**	26%	1,456 – 2,463	941	28%	344	37%	675	44%
Geese										
Black brant	105	**270**	32%	183 – 356	146	48%	12	139%	112	43%
Canada goose	11	**22**	114%	11 – 47	8	134%	14	98%	0	
Greater white-fronted goose	3	**6**	74%	3 – 10	6	74%	0		0	
Emperor goose	260	**1,068**	27%	774 – 1,361	290	36%	200	67%	578	25%
Snow goose	139	**638**	17%	527 – 749	58	66%	0	-	580	19%
Total geese	518	**2,004**	19%	1,629 – 2,377	508	30%	226	61%	1,270	17%
Tundra swan	19	**62**	81%	19 – 110	20	111%	20	63%	22	99%
Sandhill crane	48	**237**	31%	162 – 310	89	43%	136	56%	12	139%
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	261	**767**	47%	408 – 1,126	313	61%	92	81%	362	80%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-	0	-
Large gull	84	**487**	20%	392 – 581	8	89%	20	122%	459	30%
Auklet	1,076	**4,284**	21%	3,366 – 5,202	3,906	16%	378	119%	0	-
Murre	876	**3,263**	22%	2,535 – 3,991	2,922	24%	321	72%	20	139%
Guillemot	0	**0**	-	-	0	-	0	-	0	-
Puffin	4	**12**	122%	4 – 27	12	122%	0	-	0	-
Total seabirds	2,301	**8,813**	20%	7,090 – 10,535	7,161	18%	811	83%	841	40%
Shorebirds										
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-	0	-
Godwit	1	**2**	139%	1 – 5	0	-	2	139%	0	-
Golden/Black-bellied plover	18	**36**	139%	18 – 86	28	134%	0	-	8	134%
Turnstone	0	**0**	-	-	0	-	0	-	0	-
Phalarope	0	**0**	-	-	0	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-	0	-
Total shorebirds	19	**38**	131%	19 – 88	28	139%	2	139%	8	139%
Loons and grebes										
Common loon	30	**60**	115%	30 – 129	52	133%	4	139%	4	139%
Pacific loon	30	**205**	34%	135 – 273	31	146%	142	26%	32	88%
Red-throated loon	2	**4**	139%	2 – 10	4	139%	0	-	0	-
Yellow-billed loon	44	**198**	37%	125 – 270	98	49%	12	80%	88	49%
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	106	**466**	24%	354 – 577	185	46%	158	23%	123	32%
Total birds	3,551	**13,581**	16%	11,398 – 15,753	8,932	19%	1,697	43%	2,952	15%

Table 4.–Reported and estimated egg harvest, Gambell, 2002.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
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	12	**24**	-	12 – 57	24	134%	0	-
King eider	12	**24**	139%	12 – 57	24	134%	0	-
Spectacled eider	0	**0**	-	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	24	**48**	139%	24 – 115	48	139%	0	-
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	0	**0**	-	-	0	-	0	-
Tundra swan	0	**0**	-	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-
Large gull	0	**0**	-	-	0	-	0	-
Auklet	0	**0**	-	-	0	-	0	-
Murre	957	**1,914**	96%	957 – 3,743	1,914	90%	0	-
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	957	**1,914**	96%	957 – 3,743	1,914	96%	0	-
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Turnstone	0	**0**	-	-	0	-	0	-
Phalarope	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	0	**0**	-	-	0	-	0	-
Pacific loon	0	**0**	-	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	0	**0**	-	-	0	-	0	-
Total eggs	981	**1,962**	93%	981 – 3,785	1,962	93%	0	-

Table 5.–Reported and estimated bird harvest, Gambell, 2004.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	0	**0**	-	-	0	-	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	163	**512**	26%	381 – 643	433	25%	79	60%	0	-
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	0	**0**	-	-	0	-	0	-	0	-
Surf scoter	0	**0**	-	-	0	-	0	-	0	-
White-winged scoter	0	**0**	-	-	0	-	0	-	0	-
Bufflehead	0	**0**	-	-	0	-	0	-	0	-
Goldeneye	0	**0**	-	-	0	-	0	-	0	-
Canvasback	0	**0**	-	-	0	-	0	-	0	-
Scaup	0	**0**	-	-	0	-	0	-	0	-
Common eider	397	**1,156**	9%	1,053 – 1,258	428	19%	224	25%	504	14%
King eider	112	**264**	25%	198 – 332	116	29%	59	44%	89	35%
Spectacled eider	0	**0**	-	-	0	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-	0	-
Long-tailed duck	2	**4**	146%	2 – 11	0	-	4	146%	0	-
Merganser	0	**0**	-	-	0	-	0	-	0	-
Total ducks	674	**1,937**	10%	1,750 – 2,123	977	13%	366	24%	594	13%
Geese										
Black brant	64	**227**	34%	150 – 304	171	33%	2	146%	54	75%
Canada goose	27	**65**	38%	41 – 90	39	30%	4	101%	22	63%
Greater white-fronted goose	2	**4**	98%	2 – 8	4	98%	0	-	0	-
Emperor goose	411	**1,174**	9%	1,070 – 1,277	376	12%	183	36%	615	12%
Snow goose	359	**926**	14%	793 – 1,059	0	-	0	-	926	14%
Total geese	863	**2,397**	9%	2,177 – 2,616	590	11%	189	35%	1,618	9%
Tundra swan	13	**35**	61%	14 – 56	15	63%	20	90%	0	-
Sandhill crane	74	**249**	22%	193 – 304	100	32%	149	31%	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	341	**1,000**	20%	796 – 1,205	6	81%	27	100%	967	21%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-	0	-
Large gull	208	**562**	24%	425 – 699	0	-	13	61%	549	19%
Auklet	2,000	**5,966**	18%	4,868 – 7,065	3,678	17%	2,288	22%	0	-
Murre	1,467	**4,610**	7%	4,280 – 4,941	2,687	9%	1,919	12%	4	146%
Guillemot	0	**0**	-	-	0	-	0	-	0	-
Puffin	1	**2**	142%	1 – 5	2	142%	0	-	0	-
Total seabirds	4,017	**12,141**	11%	10,805 – 13,477	6,374	10%	4,247	15%	1,520	20%
Shorebirds										
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-	0	-
Loons and grebes										
Common loon	2	**18**	185%	2 – 51	18	185%	0	-	0	-
Pacific loon	141	**410**	14%	354 – 466	122	35%	42	86%	246	25%
Red-throated loon	1	**2**	146%	1 – 5	2	146%	0	-	0	-
Yellow-billed loon	48	**138**	25%	104 – 174	85	30%	31	71%	22	93%
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	192	**569**	15%	481 – 656	228	20%	73	47%	268	20%
Total birds	5,833	**17,324**	9%	15,793 – 18,860	8,282	8%	5,044	13%	3,998	11%

Table 6.–Reported and estimated egg harvest, Gambell, 2004.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
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	8	**17**	142%	8 – 41	17	142%	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	4	**9**	146%	4 – 22	0	-	9	146%
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	12	**26**	106%	12 – 53	17	142%	9	146%
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	0	**0**	-	-	0	-	0	-
Tundra swan	2	**4**	146%	2 – 11	0	-	4	146%
Sandhill crane	0	**0**	-	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-
Large gull	0	**0**	-	-	0	-	0	-
Auklet	0	**0**	-	-	0	-	0	-
Murre	1,889	**4,954**	39%	3,036 – 6,872	0	-	4,954	39%
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	1,889	**4,954**	39%	3,036 – 6,872	0	-	4,954	39%
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	0	**0**	-	-	0	-	0	-
Pacific loon	0	**0**	-	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	0	**0**	-	-	0	-	0	-
Total eggs	1,903	**4,984**	38%	3,069 – 6,900	17	142%	4,967	39%

Table 7.–Reported and estimated bird harvest, Gambell, 2005.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	0	**0**	-	-	0	-	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	66	**164**	39%	100 – 227	149	44%	15	84%	0	-
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	0	**0**	-	-	0	-	0	-	0	-
Surf scoter	0	**0**	-	-	0	-	0	-	0	-
White-winged scoter	0	**0**	-	-	0	-	0	-	0	-
Bufflehead	0	**0**	-	-	0	-	0	-	0	-
Goldeneye	0	**0**	-	-	0	-	0	-	0	-
Canvasback	0	**0**	-	-	0	-	0	-	0	-
Scaup	0	**0**	-	-	0	-	0	-	0	-
Common eider	426	**1,057**	19%	852 – 1,261	454	20%	186	30%	417	28%
King eider	260	**644**	33%	430 – 860	280	53%	176	46%	188	34%
Spectacled eider	0	**0**	-	-	0	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-	0	-
Long-tailed duck	8	**20**	118%	8 – 43	5	151%	0	-	15	151%
Merganser	2	**5**	151%	2 – 12	5	107%	0	-	0	-
Total ducks	762	**1,890**	23%	1,455 – 2,324	893	30%	377	33%	620	28%
Geese										
Black brant	112	**278**	45%	152 – 404	191	45%	20	151%	67	86%
Canada goose	41	**102**	96%	41 – 199	77	65%	0	-	25	48%
Greater white-fronted goose	5	**12**	87%	5 – 23	12	87%	0	-	0	-
Emperor goose	285	**707**	15%	600 – 813	236	16%	203	19%	268	24%
Snow goose	461	**1,143**	30%	805 – 1,481	161	128%	89	111%	893	24%
Total geese	904	**2,241**	25%	1,682 – 2,802	677	51%	312	38%	1,252	24%
Tundra swan	9	**22**	76%	9 – 39	15	105%	5	105%	2	151%
Sandhill crane	31	**77**	47%	41 – 113	40	49%	30	52%	7	151%
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	251	**623**	19%	507 – 738	40	151%	20	151%	563	14%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-	0	-
Large gull	10	**25**	87%	10 – 46	0	-	0	-	25	52%
Auklet	1,459	**3,618**	14%	3,100 – 4,137	2,172	15%	1,446	19%	0	-
Murre	1,079	**2,676**	10%	2,397 – 2,954	1,567	14%	1,094	17%	15	111%
Guillemot	2	**5**	151%	2 – 12	0	-	0	-	5	151%
Puffin	8	**20**	151%	8 – 50	20	151%	0	-	0	-
Total seabirds	2,809	**6,966**	10%	6,258 – 7,674	3,799	10%	2,559	15%	608	14%
Shorebirds										
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-	0	-
Golden/Black-bellied plover	40	**99**	151%	40 – 249	99	151%	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-	0	-
Total shorebirds	40	**99**	151%	40 – 249	99	151%	0	-	0	-
Loons and grebes										
Common loon	23	**56**	54%	26 – 88	2	151%	17	96%	37	53%
Pacific loon	1	**2**	151%	1 – 6	0	-	0	-	2	151%
Red-throated loon	2	**5**	151%	2 – 12	5	151%	0	-	0	-
Yellow-billed loon	18	**44**	48%	23 – 66	37	53%	7	111%	0	-
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	44	**110**	36%	70 – 149	45	58%	25	72%	40	49%
Total birds	4,599	**11,404**	12%	10,090 – 12,721	5,567	14%	3,308	15%	2,529	18%

Table 8.–Reported and estimated egg harvest, Gambell, 2005.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
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	96	**238**	128%	96 – 542	238	128%	0	-
King eider	0	**0**	-	-	0	-	0	-
Spectacled eider	0	**0**	-	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	96	**238**	128%	96 – 542	238	128%	0	-
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	0	**0**	-	-	0	-	0	-
Tundra swan	8	**20**	151%	8 – 50	20	151%	0	-
Sandhill crane	6	**15**	151%	6 – 37	15	151%	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-
Large gull	14	**35**	151%	14 – 87	35	87%	0	-
Auklet	0	**0**	-	-	0	-	0	-
Murre	516	**1,280**	83%	516 – 2,337	1,280	83%	0	-
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	530	**1,314**	83%	530 – 2,408	1,314	83%	0	-
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	0	**0**	-	-	0	-	0	-
Pacific loon	0	**0**	-	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	0	**0**	-	-	0	-	0	-
Total eggs	640	**1,588**	87%	640 – 2,968	1,588	87%	0	-

Table 9.–Reported and estimated bird harvest, Gambell, 2007.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low - High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	2	**5**	149%	2 - 12	5	149%	0	-	0	-
Teal	0	**0**	-	-	0	-	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	10	**34**	73%	10 - 59	34	73%	0	-	0	-
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	0	**0**	-	-	0	-	0	-	0	-
Surf scoter	0	**0**	-	-	0	-	0	-	0	-
White-winged scoter	0	**0**	-	-	0	-	0	-	0	-
Bufflehead	0	**0**	-	-	0	-	0	-	0	-
Goldeneye	0	**0**	-	-	0	-	0	-	0	-
Canvasback	0	**0**	-	-	0	-	0	-	0	-
Scaup	0	**0**	-	-	0	-	0	-	0	-
Common eider	294	**955**	45%	527 - 1,382	381	52%	120	55%	454	52%
King eider	98	**347**	77%	98 - 613	170	87%	82	113%	95	66%
Spectacled eider	32	**76**	101%	32 - 151	24	149%	0	-	52	92%
Steller's eider	0	**0**	-	-	0	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-	0	-
Long-tailed duck	10	**24**	149%	10 - 58	24	149%	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-	0	-
Total ducks	446	**1,440**	48%	750 - 2,127	637	55%	202	74%	601	46%
Geese										
Black brant	66	**155**	91%	66 - 297	80	90%	0	-	75	95%
Canada goose	2	**5**	149%	2 - 12	5	105%	0	-	0	-
Greater white-fronted goose	22	**51**	101%	22 - 104	9	86%	0	-	42	125%
Emperor goose	70	**249**	68%	80 - 417	94	60%	26	188%	129	79%
Snow goose	92	**343**	63%	125 - 560	39	93%	5	149%	299	70%
Total geese	252	**802**	49%	406 - 1,199	226	44%	30	161%	546	58%
Tundra swan	1	**2**	149%	1 - 6	2	149%	0	-	0	-
Sandhill crane	15	**54**	57%	23 - 84	7	108%	47	62%	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	151	**435**	46%	234 - 635	40	175%	33	149%	362	53%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-	0	-
Large gull	42	**115**	82%	42 - 209	0	-	0	-	115	49%
Auklet	629	**2,266**	50%	1,129 - 3,403	1,877	57%	330	52%	59	149%
Murre	602	**2,300**	70%	682 - 3,918	2,059	78%	182	49%	59	121%
Guillemot	0	**0**	-	-	0	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-	0	-
Total seabirds	1,424	**5,115**	54%	2,357 - 7,873	3,976	66%	545	45%	594	47%
Shorebirds										
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-	0	-
Loons and grebes										
Common loon	45	**179**	92%	45 - 344	46	116%	30	161%	103	102%
Pacific loon	8	**71**	144%	8 - 174	10	175%	0	-	61	160%
Red-throated loon	2	**5**	149%	2 - 12	0	-	0	-	5	149%
Yellow-billed loon	3	**7**	80%	3 - 13	5	102%	2	149%	0	-
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	58	**263**	92%	58 - 503	61	116%	33	149%	169	92%
Total birds	2,196	**7,678**	50%	3,845 - 11,507	4,911	60%	857	41%	1,910	38%

Table 10.–Reported and estimated egg harvest, Gambell, 2007.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
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	30	**71**	108%	30 – 147	47	149%	24	149%
King eider	0	**0**	-	-	0	-	0	-
Spectacled eider	0	**0**	-	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	30	**71**	108%	30 – 147	47	149%	24	149%
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	0	**0**	-	-	0	-	0	-
Tundra swan	0	**0**	-	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-
Large gull	0	**0**	-	-	0	-	0	-
Auklet	0	**0**	-	-	0	-	0	-
Murre	1,525	**3,588**	86%	1,525 – 6,687	0	-	3,588	86%
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	1,525	**3,588**	86%	1,525 – 6,687	0	-	3,588	86%
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	0	**0**	-	-	0	-	0	-
Pacific loon	0	**0**	-	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	0	**0**	-	-	0	-	0	-
Total eggs	1,555	**3,659**	85%	1,555 – 6,772	47	149%	3,612	86%

Table 11.–Reported and estimated bird harvest, Gambell, 2009.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	4	**16**	170%	4 – 43	16	170%	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	14	**88**	104%	14 – 180	72	122%	6	162%	10	162%
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	0	**0**	-	-	0	-	0	-	0	-
Surf scoter	4	**16**	170%	4 – 43	16	170%	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	371	**1,441**	65%	501 – 2,382	847	52%	105	90%	489	108%
King eider	225	**793**	107%	225 – 1,639	408	80%	32	162%	353	146%
Spectacled eider	18	**64**	117%	18 – 139	64	117%	0	-	0	-
Steller's eider	10	**32**	162%	10 – 83	32	162%	0	-	0	-
Harlequin duck	6	**24**	170%	6 – 65	24	170%	0	-	0	-
Long-tailed duck	175	**572**	121%	175 – 1,265	474	114%	79	162%	19	162%
Merganser	0	**0**	-	-	0	-	0	-	0	-
Duck (unidentified)	2	**8**	170%	2 – 22	0	-	0	-	8	170%
Total ducks	829	**3,054**	81%	829 – 5,530	1,953	64%	223	118%	878	121%
Geese										
Black brant	119	**526**	62%	201 – 849	240	67%	51	152%	235	74%
Canada goose	18	**57**	102%	18 – 116	51	82%	6	115%	0	-
Greater white-fronted goose	6	**32**	125%	6 – 72	32	125%	0	-	0	-
Emperor goose	293	**967**	125%	293 – 2,173	151	71%	89	145%	727	141%
Snow goose	394	**1,608**	78%	394 – 2,869	172	73%	22	122%	1,414	84%
Total geese	830	**3,190**	83%	830 – 5,853	646	56%	168	144%	2,376	96%
Tundra swan	35	**120**	76%	35 – 210	35	86%	29	126%	56	141%
Sandhill crane	28	**98**	110%	28 – 207	22	139%	25	115%	51	152%
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	501	**1,696**	107%	501 – 3,504	184	115%	32	170%	1,480	122%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	16	**51**	126%	16 – 115	38	115%	0	-	13	115%
Sabine's gull	4	**16**	170%	4 – 43	16	170%	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-	0	-
Large gull	70	**223**	115%	70 – 482	6	94%	6	94%	211	72%
Auklet	1,402	**5,776**	55%	2,617 – 8,934	3,882	58%	1,576	112%	318	162%
Murre	1,493	**5,790**	75%	1,493 – 10,114	3,207	62%	2,039	131%	544	95%
Guillemot	156	**496**	156%	156 – 1,267	0	-	0	-	496	156%
Puffin	1	**3**	162%	1 – 8	3	162%	0	-	0	-
Total seabirds	3,643	**14,050**	71%	4,104 – 23,996	7,337	57%	3,653	115%	3,060	108%
Shorebirds										
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-	0	-
Golden/Black-bellied plover	28	**112**	170%	28 – 302	0	-	64	170%	48	170%
Small shorebird	0	**0**	-	-	0	-	0	-	0	-
Total shorebirds	28	**112**	170%	28 – 302	0	-	64	170%	48	170%
Loons and grebes										
Common loon	28	**90**	116%	28 – 194	19	162%	14	125%	57	112%
Pacific loon	27	**89**	115%	27 – 192	35	117%	10	162%	44	122%
Red-throated loon	31	**99**	126%	31 – 223	22	140%	13	126%	64	126%
Yellow-billed loon	43	**139**	145%	43 – 339	27	125%	10	162%	102	152%
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	129	**415**	125%	129 – 936	103	126%	45	137%	267	126%
Total birds	5,522	**21,042**	74%	5,522 – 36,567	10,095	53%	4,208	112%	6,739	103%

Table 12.–Reported and estimated egg harvest, Gambell, 2009.

Species	Yearly egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
Wigeon	0	**0**	-	-	0	-	0	-
Teal	0	**0**	-	-	0	-	0	-
Mallard	1	**3**	162%	1 – 8	0	-	3	162%
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	211	**790**	78%	211 – 1,408	631	69%	159	162%
King eider	102	**334**	155%	102 – 850	175	148%	159	162%
Spectacled eider	0	**0**	-	-	0	-	0	-
Steller's eider	10	**32**	162%	10 – 83	32	162%	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	100	**318**	162%	100 – 833	159	162%	159	162%
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	424	**1,476**	111%	424 – 3,108	996	90%	480	161%
Geese								
Black brant	10	**40**	170%	10 – 108	40	170%	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	10	**40**	170%	10 – 108	40	170%	0	-
Tundra swan	6	**19**	162%	6 – 50	0	-	19	162%
Sandhill crane	8	**25**	162%	8 – 67	0	-	25	162%
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	55	**175**	162%	55 – 458	175	162%	0	-
Large gull	100	**318**	162%	100 – 833	159	94%	159	94%
Auklet	50	**159**	162%	50 – 417	159	162%	0	-
Murre	2,787	**10,541**	109%	2,787 – 21,987	7,120	102%	3,421	150%
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	2,992	**11,192**	108%	2,992 – 23,314	7,612	100%	3,580	151%
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	15	**48**	162%	15 – 125	48	162%	0	-
Pacific loon	15	**48**	162%	15 – 125	48	162%	0	-
Red-throated loon	13	**41**	162%	13 – 108	41	162%	0	-
Yellow-billed loon	14	**44**	162%	14 – 117	44	162%	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	57	**181**	162%	57 – 475	181	162%	0	-
Total eggs	3,497	**12,935**	107%	3,497 – 26,832	8,831	96%	4,104	152%

Table 13.–Reported and estimated bird harvest, Gambell, 2010.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	6	**9**	86%	6 – 17	0	-	3	117%	6	117%
Mallard	7	**11**	76%	7 – 18	3	101%	8	96%	0	-
Northern pintail	14	**22**	89%	14 – 41	0	-	16	117%	6	117%
Northern shoveler	2	**3**	117%	2 – 7	0	-	3	117%	0	-
Black scoter	1	**2**	117%	1 – 3	0	-	2	117%	0	-
Surf scoter	1	**2**	117%	1 – 3	0	-	2	117%	0	-
White-winged scoter	0	**0**	-	-	0	-	0	-	0	-
Bufflehead	0	**0**	-	-	0	-	0	-	0	-
Goldeneye	2	**3**	117%	2 – 7	0	-	3	117%	0	-
Canvasback	0	**0**	-	-	0	-	0	-	0	-
Scaup	0	**0**	-	-	0	-	0	-	0	-
Common eider	10	**16**	117%	10 – 34	0	-	16	117%	0	-
King eider	37	**57**	81%	37 – 102	3	101%	11	117%	43	103%
Spectacled eider	0	**0**	-	-	0	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-	0	-
Harlequin duck	6	**9**	117%	6 – 20	0	-	9	117%	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-	0	-
Merganser	1	**2**	117%	1 – 3	0	-	2	117%	0	-
Duck (unidentified)	4	**6**	117%	4 – 13	0	-	0	-	6	117%
Total ducks	91	**139**	64%	91 – 229	5	101%	73	107%	61	75%
Geese										
Black brant	14	**22**	89%	14 – 41	6	117%	16	117%	0	-
Canada goose	3	**5**	117%	3 – 10	0	-	5	117%	0	-
Greater white-fronted goose	1	**2**	117%	1 – 3	0	-	2	117%	0	-
Emperor goose	0	**0**	-	-	0	-	0	-	0	-
Snow goose	4	**6**	82%	4 – 11	3	117%	0	-	3	117%
Total geese	22	**34**	78%	22 – 61	9	86%	22	117%	3	117%
Tundra swan	0	**0**	-	-	0	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	132	**200**	44%	132 – 288	20	78%	73	84%	107	50%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-	0	-
Large gull	16	**23**	77%	16 – 41	0	-	0	-	23	77%
Auklet	134	**200**	51%	134 – 302	34	80%	87	88%	79	82%
Murre	54	**80**	79%	54 – 141	33	93%	47	117%	0	-
Guillemot	16	**25**	117%	16 – 54	0	-	25	117%	0	-
Puffin	0	**0**	-	-	0	-	0	-	0	-
Total seabirds	352	**527**	48%	352 – 779	87	78%	231	92%	209	50%
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	44	**68**	82%	44 – 124	0	-	31	117%	37	117%
Small shorebird	0	**0**	-	-	0	-	0	-	0	-
Total shorebirds	44	**68**	82%	44 – 124	0	-	31	117%	37	117%
Loons and grebes										
Common loon	2	**3**	117%	2 – 7	0	-	3	117%	0	-
Pacific loon	0	**0**	-	-	0	-	0	-	0	-
Red-throated loon	5	**8**	117%	5 – 17	0	-	8	117%	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-	0	-
Grebe	1	**2**	117%	1 – 3	0	-	2	117%	0	-
Total loons and grebes	8	**12**	117%	8 – 27	0	-	12	117%	0	-
Total birds	517	**786**	51%	517 – 1,179	102	72%	374	99%	310	44%

Table 14.–Reported and estimated egg harvest, Gambell, 2010.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
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	0	**0**	-	-	0	-	0	-
King eider	0	**0**	-	-	0	-	0	-
Spectacled eider	0	**0**	-	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	0	**0**	-	-	0	-	0	-
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	0	**0**	-	-	0	-	0	-
Tundra swan	0	**0**	-	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-
Large gull	0	**0**	-	-	0	-	0	-
Auklet	0	**0**	-	-	0	-	0	-
Murre	250	**388**	117%	250 – 841	155	117%	233	117%
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	250	**388**	117%	250 – 841	155	117%	233	117%
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Turnstone	0	**0**	-	-	0	-	0	-
Phalarope	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	0	**0**	-	-	0	-	0	-
Pacific loon	0	**0**	-	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	0	**0**	-	-	0	-	0	-
Total eggs	250	**388**	117%	250 – 841	155	117%	233	117%

Table 15.–Reported and estimated bird harvest, Savoonga, 2002.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	0	**0**	-	-	0	-	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	0	**0**	-	-	0	-	0	-	0	-
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	0	**0**	-	-	0	-	0	-	0	-
Surf scoter	0	**0**	-	-	0	-	0	-	0	-
White-winged scoter	6	**25**	126%	6 – 56	10	150%	15	183%	0	-
Bufflehead	0	**0**	-	-	0	-	0	-	0	-
Goldeneye	0	**0**	-	-	0	-	0	-	0	-
Canvasback	2	**5**	150%	2 – 12	5	150%	0	-	0	-
Scaup	0	**0**	-	-	0	-	0	-	0	-
Common eider	131	**627**	53%	295 – 960	286	94%	321	53%	20	181%
King eider	117	**510**	50%	257 – 763	280	51%	194	69%	36	169%
Spectacled eider	65	**289**	70%	85 – 491	90	88%	185	81%	14	181%
Steller's eider	2	**5**	150%	2 – 12	5	150%	0	-	0	-
Harlequin duck	10	**24**	150%	10 – 61	24	150%	0	-	0	-
Long-tailed duck	10	**24**	150%	10 – 61	24	150%	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-	0	-
Total ducks	343	**1,508**	39%	925 – 2,091	723	47%	715	49%	70	114%
Geese										
Black brant	134	**562**	37%	353 – 771	138	68%	129	52%	295	75%
Canada goose	5	**28**	153%	5 – 70	0	-	28	140%	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-	0	-
Emperor goose	123	**544**	29%	387 – 701	156	50%	151	61%	237	70%
Snow goose	222	**961**	37%	603 – 1,319	203	58%	226	75%	532	43%
Total geese	484	**2,096**	27%	1,535 – 2,657	498	48%	535	39%	1,063	51%
Tundra swan	9	**30**	68%	10 – 51	16	85%	14	112%	0	-
Sandhill crane	10	**37**	60%	15 – 59	37	60%	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	701	**3,289**	22%	2,554 – 4,023	696	60%	1,593	25%	1,000	38%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	175	**773**	54%	358 – 1,189	205	115%	568	47%	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	10	**24**	150%	10 – 61	24	150%	0	-	0	-
Large gull	32	**77**	56%	34 – 121	5	146%	7	146%	65	60%
Auklet	439	**1,637**	43%	926 – 2,346	1,520	44%	76	183%	41	181%
Murre	1,677	**6,275**	28%	4,511 – 8,037	6,077	27%	198	183%	0	
Guillemot	249	**903**	42%	521 – 1,285	0	-	82	65%	821	46%
Puffin	0	**0**	-	-	0	-	0	-	0	-
Total seabirds	3,283	**12,976**	20%	10,422 – 15,532	8,526	25%	2,524	28%	1,926	36%
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	223	**843**	36%	538 – 1,148	129	92%	214	57%	500	38%
Pacific loon	1	**7**	181%	1 – 19	7	181%	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	224	**849**	36%	541 – 1,158	135	88%	214	57%	500	38%
Total birds	4,353	**17,499**	18%	14,340 – 20,655	9,937	24%	4,001	25%	3,561	36%

Table 16.–Reported and estimated egg harvest, Savoonga, 2002

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
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	0	**0**	-	-	0	-	0	-
King eider	41	**125**	74%	41 – 217	125	68%	0	-
Spectacled eider	7	**17**	150%	7 – 42	17	146%	0	-
Steller's eider	0	**0**	-	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	48	**142**	73%	48 – 246	142	73%	0	-
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	0	**0**	-	-	0	-	0	-
Tundra swan	0	**0**	-	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	30	**73**	150%	30 – 182	73	146%	0	-
Large gull	0	**0**	-	-	0	-	0	-
Auklet	0	**0**	-	-	0	-	0	-
Murre	9,204	**35,836**	40%	21,468 – 50,205	35,836	33%	0	-
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	9,234	**35,909**	40%	21,535 – 50,283	35,909	40%	0	-
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Turnstone	0	**0**	-	-	0	-	0	-
Phalarope	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	0	**0**	-	-	0	-	0	-
Pacific loon	0	**0**	-	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	0	**0**	-	-	0	-	0	-
Total eggs	9,282	**36,051**	40%	21,646 – 50,457	36,051	40%	0	-

Table 17.–Reported and estimated bird harvest, Savoonga, 2004.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	0	**0**	-	-	0	-	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	0	**0**	-	-	0	-	0	-	0	-
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	0	**0**	-	-	0	-	0	-	0	-
Surf scoter	0	**0**	-	-	0	-	0	-	0	-
White-winged scoter	0	**0**	-	-	0	-	0	-	0	-
Bufflehead	0	**0**	-	-	0	-	0	-	0	-
Goldeneye	0	**0**	-	-	0	-	0	-	0	-
Canvasback	0	**0**	-	-	0	-	0	-	0	-
Scaup	0	**0**	-	-	0	-	0	-	0	-
Common eider	126	**377**	38%	233 – 520	137	49%	181	66%	59	72%
King eider	45	**118**	44%	66 – 170	63	49%	26	80%	29	67%
Spectacled eider	2	**5**	153%	2 – 13	5	153%	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-	0	-
Harlequin duck	90	**240**	45%	132 – 347	5	153%	65	72%	170	48%
Long-tailed duck	2	**5**	153%	2 – 13	0	-	5	153%	0	-
Merganser	48	**124**	60%	49 – 199	0	-	36	58%	88	56%
Total ducks	313	**867**	31%	602 – 1,135	210	41%	312	47%	345	42%
Geese										
Black brant	68	**181**	44%	101 – 261	5	153%	113	51%	63	60%
Canada goose	0	**0**	-	-	0	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-	0	-
Emperor goose	83	**227**	39%	139 – 316	79	60%	78	46%	70	53%
Snow goose	53	**156**	64%	56 – 256	8	183%	5	153%	143	69%
Total geese	204	**564**	36%	361 – 768	92	54%	196	42%	276	50%
Tundra swan	27	**73**	44%	41 – 106	0	-	37	49%	36	65%
Sandhill crane	4	**20**	139%	4 – 49	15	183%	5	106%	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	710	**2,053**	24%	1,554 – 2,554	0	-	211	77%	1,842	28%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	238	**664**	35%	432 – 896	0	-	138	86%	526	28%
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-	0	-
Large gull	32	**83**	56%	37 – 130	0	-	23	66%	60	42%
Auklet	221	**616**	36%	397 – 834	616	36%	0	-	0	-
Murre	1,928	**5,646**	42%	3,261 – 8,031	5,221	43%	415	165%	10	153%
Guillemot	125	**410**	58%	172 – 648	0	-	21	165%	389	61%
Puffin	7	**18**	153%	7 – 46	0	-	0	-	18	153%
Total seabirds	3,261	**9,491**	30%	6,677 – 12,305	5,836	39%	809	92%	2,846	24%
Shorebirds										
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-	0	-
Loons and grebes										
Common loon	112	**319**	43%	180 – 457	0	-	50	83%	269	49%
Pacific loon	6	**16**	153%	6 – 39	0	-	0	-	16	153%
Red-throated loon	7	**20**	91%	7 – 38	0	-	0	-	20	91%
Yellow-billed loon	47	**132**	38%	82 – 182	0	-	23	85%	109	42%
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	172	**486**	28%	351 – 622	0	-	73	63%	413	32%
Total birds	3,981	**11,503**	25%	8,617 – 14,391	6,154	37%	1,432	52%	3,917	20%

Table 18.–Reported and estimated egg harvest, Savoonga, 2004.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low - High	Number	CIP	Number	CIP
Ducks								
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	0	**0**	-	-	0	-	0	-
King eider	0	**0**	-	-	0	-	0	-
Spectacled eider	0	**0**	-	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	0	**0**	-	-	0	-	0	-
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	0	**0**	-	-	0	-	0	-
Tundra swan	0	**0**	-	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	20	**52**	153%	20 - 131	0	-	52	109%
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-
Large gull	57	**156**	93%	57 - 302	35	95%	121	65%
Auklet	45	**116**	153%	45 - 295	116	153%	0	-
Murre	21,019	**64,754**	20%	51,782 - 77,726	24,234	47%	40,520	29%
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	21,141	**65,078**	20%	52,093 - 78,062	24,385	47%	40,693	29%
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	4	**10**	153%	4 - 26	0	-	10	153%
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	4	**10**	153%	4 - 26	0	-	10	153%
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	3	**8**	153%	3 - 20	0	-	8	153%
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	3	**8**	153%	3 - 20	0	-	8	153%
Total eggs	21,148	**65,096**	20%	52,101 - 78,090	24,385	47%	40,711	29%

Table 19.–Reported and estimated bird harvest, Savoonga, 2005.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	0	**0**	-	-	0	-	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	0	**0**	-	-	0	-	0	-	0	-
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	0	**0**	-	-	0	-	0	-	0	-
Surf scoter	0	**0**	-	-	0	-	0	-	0	-
White-winged scoter	0	**0**	-	-	0	-	0	-	0	-
Bufflehead	0	**0**	-	-	0	-	0	-	0	-
Goldeneye	0	**0**	-	-	0	-	0	-	0	-
Canvasback	0	**0**	-	-	0	-	0	-	0	-
Scaup	0	**0**	-	-	0	-	0	-	0	-
Common eider	531	**1,435**	24%	1,083 – 1,786	821	30%	393	32%	221	54%
King eider	138	**370**	37%	234 – 507	197	41%	147	52%	26	107%
Spectacled eider	19	**67**	82%	19 – 122	62	86%	0	-	5	154%
Steller's eider	2	**12**	179%	2 – 33	12	179%	0	-	0	-
Harlequin duck	447	**1,195**	22%	929 – 1,460	417	36%	462	35%	316	63%
Long-tailed duck	0	**0**	-	-	0	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-	0	-
Total ducks	1,137	**3,079**	20%	2,467 – 3,690	1,509	25%	1,002	23%	568	46%
Geese										
Black brant	0	**0**	-	-	0	-	0	-	0	-
Canada goose	53	**148**	55%	67 – 229	5	109%	111	48%	32	66%
Greater white-fronted goose	0	**0**	-	-	0	-	0	-	0	-
Emperor goose	152	**421**	31%	290 – 554	94	88%	49	72%	278	43%
Snow goose	153	**402**	30%	282 – 521	0	-	0	-	402	30%
Total geese	358	**970**	23%	750 – 1,192	99	83%	160	57%	711	28%
Tundra swan	49	**128**	45%	71 – 186	60	72%	47	73%	21	87%
Sandhill crane	0	**0**	-	-	0	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	766	**2,279**	13%	1,971 – 2,586	18	179%	0	-	2,261	14%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	882	**2,344**	21%	1,863 – 2,825	0	-	0	-	2,344	21%
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-	0	-
Large gull	332	**880**	30%	615 – 1,145	0	-	0	-	880	23%
Auklet	429	**1,164**	18%	956 – 1,373	1,164	18%	0	-	0	-
Murre	646	**1,850**	18%	1,526 – 2,175	1,814	18%	36	179%	0	-
Guillemot	0	**0**	-	-	0	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-	0	-
Total seabirds	3,055	**8,518**	15%	7,218 – 9,817	2,997	15%	36	179%	5,485	18%
Shorebirds										
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-	0	-
Loons and grebes										
Common loon	299	**801**	20%	644 – 958	0	-	65	100%	736	19%
Pacific loon	0	**0**	-	-	0	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	299	**801**	20%	644 – 958	0	-	65	100%	736	19%
Total birds	4,898	**13,496**	15%	11,439 – 15,554	4,664	17%	1,310	21%	7,522	17%

Table 20.–Reported and estimated egg harvest, Savoonga, 2005.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
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	0	**0**	-	-	0	-	0	-
King eider	0	**0**	-	-	0	-	0	-
Spectacled eider	0	**0**	-	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	0	**0**	-	-	0	-	0	-
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	0	**0**	-	-	0	-	0	-
Tundra swan	0	**0**	-	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-
Large gull	0	**0**	-	-	0	-	0	-
Auklet	0	**0**	-	-	0	-	0	-
Murre	23,231	**65,077**	23%	50,075 – 80,079	64,303	23%	774	179%
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	23,231	**65,077**	23%	50,075 – 80,079	64,303	23%	774	179%
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	0	**0**	-	-	0	-	0	-
Pacific loon	0	**0**	-	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	0	**0**	-	-	0	-	0	-
Total eggs	23,231	**65,077**	23%	50,075 – 80,079	64,303	23%	774	179%

Table 21.–Reported and estimated bird harvest, Savoonga, 2007.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low - High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	0	**0**	-	-	0	-	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	0	**0**	-	-	0	-	0	-	0	-
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	0	**0**	-	-	0	-	0	-	0	-
Surf scoter	0	**0**	-	-	0	-	0	-	0	-
White-winged scoter	0	**0**	-	-	0	-	0	-	0	-
Bufflehead	0	**0**	-	-	0	-	0	-	0	-
Goldeneye	0	**0**	-	-	0	-	0	-	0	-
Canvasback	0	**0**	-	-	0	-	0	-	0	-
Scaup	0	**0**	-	-	0	-	0	-	0	-
Common eider	1,381	**3,581**	20%	2,876 - 4,286	1,451	26%	1,073	30%	1,057	31%
King eider	1,080	**2,818**	24%	2,155 - 3,480	1,208	21%	787	31%	823	32%
Spectacled eider	302	**788**	37%	496 - 1,079	352	46%	196	56%	240	73%
Steller's eider	0	**0**	-	-	0	-	0	-	0	-
Harlequin duck	781	**1,990**	47%	1,047 - 2,933	1,228	65%	469	82%	293	95%
Long-tailed duck	245	**625**	72%	245 - 1,071	344	63%	8	153%	273	107%
Merganser	36	**124**	88%	36 - 234	12	127%	25	108%	87	83%
Total ducks	3,825	**9,925**	21%	7,876 - 11,975	4,595	28%	2,558	31%	2,772	30%
Geese										
Black brant	328	**836**	46%	455 - 1,216	178	87%	268	59%	390	47%
Canada goose	3	**8**	153%	3 - 19	0	-	0	-	8	108%
Greater white-fronted goose	0	**0**	-	-	0	-	0	-	0	-
Emperor goose	367	**934**	41%	548 - 1,323	20	87%	499	47%	415	52%
Snow goose	375	**956**	25%	713 - 1,199	23	89%	87	74%	846	27%
Total geese	1,073	**2,735**	28%	1,977 - 3,492	222	70%	854	36%	1,659	31%
Tundra swan	234	**611**	29%	437 - 785	387	31%	163	55%	61	79%
Sandhill crane	9	**23**	122%	9 - 51	5	153%	0	-	18	153%
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	3,829	**10,423**	21%	8,224 - 12,621	13	153%	315	89%	10,095	22%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	894	**2,347**	56%	1,035 - 3,660	0	-	393	41%	1,954	49%
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-	0	-
Large gull	427	**1,161**	38%	722 - 1,600	0	-	115	48%	1,046	26%
Auklet	5,518	**14,491**	18%	11,882 - 17,099	14,491	18%	0	-	0	-
Murre	12,303	**33,530**	17%	27,702 - 39,357	32,054	17%	260	83%	1,216	71%
Guillemot	0	**0**	-	-	0	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-	0	-
Total seabirds	22,971	**61,950**	15%	52,866 - 71,035	46,557	16%	1,082	58%	14,311	20%
Shorebirds										
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-	0	-
Loons and grebes										
Common loon	873	**2,312**	21%	1,817 - 2,807	120	75%	529	56%	1,663	23%
Pacific loon	2	**5**	153%	2 - 13	0	-	0	-	5	153%
Red-throated loon	106	**361**	66%	121 - 601	0	-	27	163%	334	72%
Yellow-billed loon	420	**1,070**	46%	580 - 1,561	0	-	359	92%	711	43%
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	1,401	**3,749**	24%	2,833 - 4,664	120	75%	916	67%	2,713	24%
Total birds	29,513	**78,994**	14%	67,695 - 90,291	51,886	15%	5,573	30%	21,535	17%

Table 22.–Reported and estimated egg harvest, Savoonga, 2007.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
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	0	**0**	-	-	0	-	0	-
King eider	20	**51**	91%	20 – 97	13	153%	38	112%
Spectacled eider	0	**0**	-	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	20	**51**	91%	20 – 97	13	153%	38	112%
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	11	**28**	91%	11 – 53	5	153%	23	107%
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	11	**28**	91%	11 – 53	5	153%	23	107%
Tundra swan	0	**0**	-	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-
Large gull	0	**0**	-	-	0	-	0	-
Auklet	0	**0**	-	-	0	-	0	-
Murre	41,830	**118,281**	15%	100,622 – 135,939	118,281	15%	0	-
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	41,830	**118,281**	15%	100,622 – 135,939	118,281	15%	0	-
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	0	**0**	-	-	0	-	0	-
Pacific loon	0	**0**	-	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	0	**0**	-	-	0	-	0	-
Total eggs	41,861	**118,360**	15%	100,685 – 136,034	118,299	15%	61	89%

Table 23.–Reported and estimated bird harvest, Savoonga, 2009.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	0	**0**	-	-	0	-	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	0	**0**	-	-	0	-	0	-	0	-
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	0	**0**	-	-	0	-	0	-	0	-
Surf scoter	0	**0**	-	-	0	-	0	-	0	-
White-winged scoter	9	**40**	173%	9 – 109	0	-	0	-	40	173%
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	230	**704**	48%	365 – 1,043	143	52%	335	96%	226	50%
King eider	31	**82**	58%	34 – 131	30	90%	32	91%	20	94%
Spectacled eider	22	**64**	93%	22 – 124	46	86%	3	161%	15	161%
Steller's eider	0	**0**	-	-	0	-	0	-	0	-
Harlequin duck	3	**9**	161%	3 – 24	0	-	0	-	9	161%
Long-tailed duck	0	**0**	-	-	0	-	0	-	0	-
Merganser	5	**15**	98%	5 – 30	4	122%	0	-	11	84%
Total ducks	300	**914**	48%	477 – 1,352	224	48%	369	87%	321	46%
Geese										
Black brant	19	**62**	71%	19 – 107	23	118%	13	153%	26	123%
Canada goose	0	**0**	-	-	0	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-	0	-
Emperor goose	62	**177**	72%	62 – 306	9	161%	94	126%	74	69%
Snow goose	137	**374**	55%	169 – 579	0	-	0	-	374	55%
Total geese	218	**614**	49%	312 – 916	33	96%	107	129%	474	48%
Tundra swan	38	**107**	41%	63 – 151	107	41%	0	-	0	-
Sandhill crane	3	**9**	122%	3 – 19	9	122%	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	1,280	**3,970**	23%	3,042 – 4,899	183	130%	381	121%	3,406	26%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	17	**43**	107%	17 – 90	0	-	0	-	43	77%
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-	0	-
Large gull	98	**258**	65%	98 – 427	0	-	59	51%	199	49%
Auklet	724	**2,373**	26%	1,750 – 2,995	2,373	26%	0	-	0	-
Murre	2,106	**6,547**	26%	4,831 – 8,263	6,467	26%	0	-	80	123%
Guillemot	157	**520**	66%	175 – 866	0	-	0	-	520	66%
Puffin	0	**0**	-	-	0	-	0	-	0	-
Total seabirds	4,382	**13,713**	21%	10,837 – 16,587	9,024	24%	440	104%	4,249	26%
Shorebirds										
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-	0	-
Loons and grebes										
Common loon	40	**125**	50%	62 – 187	18	173%	5	153%	102	56%
Pacific loon	2	**5**	153%	2 – 13	0	-	0	-	5	153%
Red-throated loon	44	**128**	56%	56 – 200	4	173%	0	-	124	59%
Yellow-billed loon	4	**11**	92%	4 – 21	3	161%	0	-	8	112%
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	90	**268**	49%	137 – 400	25	153%	5	153%	238	54%
Total birds	5,031	**15,623**	19%	12,646 – 18,603	9,419	24%	922	61%	5,282	23%

Note Savoonga 2009 harvest was estimated as 6,731 birds in Tahbone and Trigg (2011).[8] The difference compared with this study may be related to different sampling and data collection methods and was within the annual variation of estimates.

8. Tahbone, Sandra T., and Eric W. Trigg. 2011. "2009 Comprehensive Subsistence Harvest Survey: Savoonga, Alaska." Nome, Alaska: Kawerak, Inc., Subsistence Resources. Final Report for Agreement NA07NMF4720082, CFDA No. 11.472. Hereinafter cited as Tahbone and Trigg 2011.

Table 24.–Reported and estimated egg harvest, Savoonga, 2009.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
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	0	**0**	-	-	0	-	0	-
King eider	9	**23**	153%	9 – 58	23	153%	0	-
Spectacled eider	0	**0**	-	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	9	**23**	153%	9 – 58	23	153%	0	-
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	0	**0**	-	-	0	-	0	-
Tundra swan	0	**0**	-	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-
Large gull	0	**0**	-	-	0	-	0	-
Auklet	16	**41**	153%	16 – 103	41	153%	0	-
Murre	29,563	**91,337**	24%	69,617 – 113,056	91,337	24%	0	-
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	29,579	**91,377**	24%	69,642 – 113,112	91,377	24%	0	-
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	0	**0**	-	-	0	-	0	-
Pacific loon	0	**0**	-	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	0	**0**	-	-	0	-	0	-
Total eggs	29,588	**91,401**	24%	69,656 – 113,144	91,401	24%	0	-

Note Savoonga 2009 harvest was estimated as 45,599 eggs in Tahbone and Trigg (2011). The difference compared with this study may be related to different sampling and data collection methods and was within the annual variation of estimates.

Table 25.–Reported and estimated bird harvest, Savoonga, 2010.

Species	Annual bird harvest				Seasonal estimated bird harvest					
	Reported	**Estimated**	Confidence Interval		Spring		Summer		Fall	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP	Number	CIP
Ducks										
Wigeon	0	**0**	-	-	0	-	0	-	0	-
Teal	0	**0**	-	-	0	-	0	-	0	-
Mallard	0	**0**	-	-	0	-	0	-	0	-
Northern pintail	0	**0**	-	-	0	-	0	-	0	-
Northern shoveler	0	**0**	-	-	0	-	0	-	0	-
Black scoter	0	**0**	-	-	0	-	0	-	0	-
Surf scoter	0	**0**	-	-	0	-	0	-	0	-
White-winged scoter	0	**0**	-	-	0	-	0	-	0	-
Bufflehead	0	**0**	-	-	0	-	0	-	0	-
Goldeneye	7	**32**	24%	24 – 40	0	-	1	106%	31	113%
Canvasback	0	**0**	-	-	0	-	0	-	0	-
Scaup	0	**0**	-	-	0	-	0	-	0	-
Common eider	223	**501**	9%	455 – 546	58	23%	218	14%	225	41%
King eider	23	**52**	22%	40 – 63	1	63%	28	37%	23	121%
Spectacled eider	20	**45**	25%	34 – 57	3	63%	19	43%	23	121%
Steller's eider	11	**19**	55%	11 – 30	1	109%	18	56%	0	-
Harlequin duck	30	**44**	43%	30 – 63	7	47%	37	47%	0	-
Long-tailed duck	61	**169**	20%	135 – 204	1	63%	74	44%	94	92%
Merganser	0	**0**	-	-	0	-	0	-	0	-
Total ducks	375	**864**	9%	786 – 939	72	20%	396	15%	396	44%
Geese										
Black brant	3	**4**	126%	3 – 10	3	109%	1	106%	0	-
Canada goose	0	**0**	-	-	0	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-	0	-
Emperor goose	25	**76**	25%	57 – 94	3	109%	27	51%	46	178%
Snow goose	10	**32**	41%	19 – 44	6	109%	3	106%	23	178%
Total geese	38	**112**	29%	79 – 143	12	109%	31	49%	69	178%
Tundra swan	0	**0**	-	-	0	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-	0	-
Seabirds										
Pelagic cormorant	835	**2,172**	6%	2,045 – 2,298	12	109%	978	10%	1,182	25%
Tern	0	**0**	-	-	0	-	0	-	0	-
Black-legged kittiwake	2	**3**	122%	2 – 6	0	-	3	106%	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-	0	-
Mew gull	7	**10**	178%	7 – 28	10	109%	0	-	0	-
Large gull	69	**181**	19%	147 – 216	10	109%	78	39%	93	71%
Auklet	830	**1,052**	21%	830 – 1,275	1,049	12%	3	106%	0	-
Murre	2,759	**3,363**	13%	2,911 – 3,815	3,359	7%	4	145%	0	-
Guillemot	1,244	**3,005**	6%	2,834 – 3,176	0	-	1,557	9%	1,448	23%
Puffin	0	**0**	-	-	0	-	0	-	0	-
Total seabirds	5,746	**9,787**	7%	9,130 – 10,442	4,440	6%	2,624	9%	2,723	19%
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	24	**46**	25%	35 – 58	0	-	35	33%	11	121%
Pacific loon	0	**0**	-	-	0	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-	0	-
Total loons and grebes	24	**46**	25%	35 – 58	0	-	35	33%	11	121%
Total birds	6,183	**10,806**	6%	10,115 – 11,498	4,523	7%	3,084	8%	3,199	21%

Table 26.–Reported and estimated egg harvest, Savoonga, 2010.

Species	Annual egg harvest				Seasonal estimated egg harvest			
	Reported	**Estimated**	Confidence Interval		Spring		Summer	
	number	**number**	CIP	Low – High	Number	CIP	Number	CIP
Ducks								
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	3	**3**	154%	3 - 8	3	63%	0	-
King eider	0	**0**	-	-	0	-	0	-
Spectacled eider	0	**0**	-	-	0	-	0	-
Steller's eider	0	**0**	-	-	0	-	0	-
Harlequin duck	0	**0**	-	-	0	-	0	-
Long-tailed duck	0	**0**	-	-	0	-	0	-
Merganser	0	**0**	-	-	0	-	0	-
Total ducks	3	**3**	154%	3 - 8	3	63%	0	-
Geese								
Black brant	0	**0**	-	-	0	-	0	-
Canada goose	0	**0**	-	-	0	-	0	-
Greater white-fronted goose	0	**0**	-	-	0	-	0	-
Emperor goose	0	**0**	-	-	0	-	0	-
Snow goose	0	**0**	-	-	0	-	0	-
Total geese	0	**0**	-	-	0	-	0	-
Tundra swan	0	**0**	-	-	0	-	0	-
Sandhill crane	0	**0**	-	-	0	-	0	-
Ptarmigans and grouses	0	**0**	-	-	0	-	0	-
Seabirds								
Pelagic cormorant	0	**0**	-	-	0	-	0	-
Tern	0	**0**	-	-	0	-	0	-
Black-legged kittiwake	0	**0**	-	-	0	-	0	-
Sabine's gull	0	**0**	-	-	0	-	0	-
Mew gull	0	**0**	-	-	0	-	0	-
Large gull	0	**0**	-	-	0	-	0	-
Auklet	0	**0**	-	-	0	-	0	-
Murre	34,192	**41,140**	18%	34,192 – 48,610	41,140	9%	0	-
Guillemot	0	**0**	-	-	0	-	0	-
Puffin	0	**0**	-	-	0	-	0	-
Total seabirds	34,192	**41,140**	18%	34,192 – 48,610	41,140	9%	0	-
Shorebirds								
Whimbrel/Curlew	0	**0**	-	-	0	-	0	-
Godwit	0	**0**	-	-	0	-	0	-
Golden/Black-bellied plover	0	**0**	-	-	0	-	0	-
Turnstone	0	**0**	-	-	0	-	0	-
Phalarope	0	**0**	-	-	0	-	0	-
Small shorebird	0	**0**	-	-	0	-	0	-
Total shorebirds	0	**0**	-	-	0	-	0	-
Loons and grebes								
Common loon	0	**0**	-	-	0	-	0	-
Pacific loon	0	**0**	-	-	0	-	0	-
Red-throated loon	0	**0**	-	-	0	-	0	-
Yellow-billed loon	0	**0**	-	-	0	-	0	-
Grebe	0	**0**	-	-	0	-	0	-
Total loons and grebes	0	**0**	-	-	0	-	0	-
Total eggs	34,195	**41,143**	18%	34,195 – 48,613	41,143	9%	0	-

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APPENDICES

Appendix A.–Letter from the Native Village of Gambell in support of 2011 data release.

Gambell, September 26, 2012

Patty Brown-Schwalenberg
Alaska Migratory Bird Co Management Council (AMBCC), Acting Executive Director
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cc:

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Dear Ms. Brown-Schwalenberg,

In 2011 the Native Village of Gambell partnered with the Division of Subsistence of the Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS) to conduct the 2011 Loon Dedicated Survey in response to conservation concerns regarding the yellow-billed loon. This survey had the following objectives:

- To continue building communication among the local community and resource management agencies regarding loon conservation concerns;
- To provide accurate information on the species and number of loons and other birds harvested for subsistence uses;
- To improve understanding by resource management agencies of local systems for identification and naming of loons and therefore improve communication between local harvesters, biologists, and resource managers; and
- To obtain information on the composition and abundance of loons and other birds potentially available as subsistence resources in the St. Lawrence Island area.

On 23 May 2012, Liliana Naves (ADF&G) and Tamara Zeller (USFWS) met with the Gambell Tribal Council and community members to discuss 2011 survey results and options to release the harvest data. A written draft report was provided and the results were also presented at the meeting. Tribal Council and community members reviewed survey results, asked questions, and offered comments to (a) further improve survey methods in upcoming surveys, (b) clarify data presentation in the written report, and (c) clarify the local identification and naming of loons. We also discussed the need to expedite release of these data and the pros and cons of reporting harvest data at the village, island, and sub-regional level. The options discussed are explained below.

1. Timing for release of 2011 Gambell bird harvest estimates

Option A. Expedite data release in relation to AMBCC 2-year regular process for data release: this will enable managers, agency staff, and villages to use the data in a timelier manner, especially the loon harvest data. Accurate loon harvest data are currently much needed in the ongoing processes of the yellow-billed loon listing evaluation and revision. It is important to ensure that the most recent and accurate information is available, which may help alleviate conservation concerns based on older, unreliable data. Under this option, 2011 data could be released in summer 2012.

Option B. Release the data under the regular AMBCC process, according to which adoption of 2011 harvest estimates is scheduled to occur in the spring of 2013.

2. Geographical level of harvest estimates

Option A. Report the data at the village level. AMBCC harvest data have been reported at the regional and subregional level because Native Partners, at least in the past, had concerns that village harvest data could be used to focus law enforcement efforts or to limit harvest. However, the main objective and goal for collecting harvest data is to document and protect subsistence uses and to ensure that resources will be available in the long-term. Village-level data make it easier to obtain effective data reviews from knowledgeable local residents. Also, village-level data are more useful for local communities than subregional or regional data.

Option B. Report the data at the St. Lawrence Island level (Gambell and Savoonga together).

Option C. Report data under the regular AMBCC survey sub-region, including Savoonga, Gambell, and Diomede (not surveyed in 2011).

The Tribal Council of the Native Village of Gambell met again on Oct 2, 2012 to discuss 2011 bird harvest data release options, this time without the participation of agency staff. At this meeting, the Tribal Council decided to:

1) Support reporting data at the village level for our community (Option 2.A). We agree that data reported at the village level can be more effective in alleviating yellow-billed loon conservation concerns caused by past unreliable harvest estimates at the regional level, which could not be properly reviewed at that level. Harvest estimates presented at the village level for all kinds of birds are more useful for our community because it is easier for us to understand and review results at the local level. Also, we will have the bird harvest data for our community readily available for use in other situations. We understand past concerns that bird harvest data at the village level data could be used to focus law enforcement efforts or to limit harvest. However, over the years, village-level data from other surveys have not been used for this purpose in our community. Data reported at the appropriate geographic scale are more effective for protecting and managing subsistence uses and harvests.

2) Support the immediate release of data from the 2011 Loon Dedicated Survey (Option 1.A) based on the fact that our community has already reviewed the survey results. We are looking forward to the publication of the final report in the short term including modifications to account for the comments and suggestions offered by our community.

It is our understanding that the Native Village of Savoonga also has made a decision to support immediate release of their 2011 Loon Dedicated Survey at the village level and you will hear from them on this matter.

Recently, the Gambell Tribal Council partnered again with ADF&G and USFWS to conduct a second year of the Loon Dedicated Survey in 2012. We hope that the detailed information provided by these efforts will help clarify and alleviate conservation concerns regarding loons and will help to protect our subsistence culture and harvests in the short and long term. Please contact me if you have comments or questions.

Sincerely,

Eddie Ungott

Native Village of Gambell, President
P.O. Box 90, Gambell AK 99742
907-985-5346 ext # 3 (phone), 907-985-5014 (fax)

Appendix B.–Letter from the Native Village of Gambell in support of 2012 data release.

Gambell, 20 February, 2013

Patty Brown-Schwalenberg
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Dear Ms. Brown-Schwalenberg,

In 2012 the Native Village of Gambell partnered again with the Division of Subsistence of the Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS) to conduct the 2012 Loon Dedicated Survey in response to conservation concerns regarding the yellow-billed loon. This survey had the following objectives:

- To continue building communication among the local community and resource management agencies regarding loon conservation concerns;
- To provide accurate information on the species and number of loons and other birds harvested for subsistence uses;
- To improve understanding by resource management agencies of local systems for identification and naming of loons and therefore improve communication between local harvesters, biologists, and resource managers; and
- To obtain information on the composition and abundance of loons and other birds potentially available as subsistence resources in the St. Lawrence Island area.

On 20 February 2013, Liliana Naves (ADF&G) met with the Gambell Tribal Council and community members to discuss 2012 survey results and options to release the harvest data. A written draft report was provided and the results were presented at the meeting. Tribal Council and community members reviewed survey results, asked questions, and offered comments. We also discussed the need to expedite release of these data and the pros and cons of reporting harvest data at the village, island, and sub-regional level. The options discussed are explained below.

1. Timing for release of 2012 Gambell bird harvest estimates

Option A. Expedite data release in relation to AMBCC 2-year regular process for data release: this will enable managers, agency staff, and villages to use the data in a timelier manner, especially the loon harvest data. Accurate loon harvest data are currently much needed in the ongoing processes of the yellow-billed loon listing evaluation and revision. It is important to ensure that the most recent and accurate information is available, which may help alleviate conservation concerns based on older, unreliable data. Under this option, 2012 data could be released in winter 2013.

Option B. Release the data under the regular AMBCC process, according to which adoption of 2012 harvest estimates is scheduled to occur in the spring of 2014.

2. Geographical level of harvest estimates

Option A. Report the data at the village level. AMBCC harvest data have been reported at the regional and subregional level because Native Partners, at least in the past, had concerns that village harvest data could be mis-used to focus law enforcement efforts. However, the main objective and goal for collecting harvest data is to document and protect subsistence uses and to ensure that resources will be available in the long-term. Village-level data make it easier to obtain effective data reviews from knowledgeable local residents. Also, village-level data are more useful for local communities than subregional or regional data.

Option B. Report the data at the St.Lawrence Island level (Gambell and Savoonga together).

Option C. Report data under the regular AMBCC survey sub-region, including Savoonga, Gambell, and Diomede (not surveyed in 2012).

The Tribal Council of the Native Village of Gambell decided to:

1) Support reporting data at the village level for our community (Option 2.A). We agree that data reported at the village level can be more effective in alleviating yellow-billed loon conservation concerns caused by past unreliable harvest estimates at the regional level, which could not be properly reviewed at that level. Harvest estimates presented at the village level for all kinds of birds are more useful for our community because it is easier for us to understand and review results at the local level. Also, we will have the bird harvest data for our community readily available for use in other situations. We understand past concerns that bird harvest data at the village level data could be used to focus law enforcement efforts. However, over the years, village-level data from other surveys have not been used for this purpose in our community. Data reported at the appropriate geographic scale are more effective for protecting and managing subsistence uses and harvests.

2) Support the immediate release of data from the 2012 Loon Dedicated Survey (Option 1.A) based on the fact that we have already reviewed the survey results. We are looking forward to the publication of the final report in the short term including modifications to account for the comments and suggestions offered by our community.

3) Support re-consideration of harvest estimates for years prior to 2011, especially 2009 and 2010. On the 20 Feb, 2013 meeting we also discussed results of previous AMBCC harvest surveys. 2009 Harvest estimates are excessively high and 2010 are excessively low; these years are incorrect and do not represent bird harvests in our village.

4) Support 2011 and 2012 as the most representative harvest estimates for our village. These surveys included a very high proportion of households and data was collected in collaboration among local surveyors, biologists, and anthropologists.

5) Support reporting data at the village level for our community in all surveys done by the AMBCC including previous years. We would like a report with previous years of the AMBCC survey to be produced for our village.

6) Request that all harvest surveys are done with adequate training of local surveyors and survey materials to help correctly identifying bird species and reporting of harvest.

We hope that the detailed information provided by these efforts will help clarify and alleviate conservation concerns regarding loons and will help to protect our subsistence culture and harvests in the short and long term. Please contact me if you have comments or questions.

Sincerely,

Eddie Ungott

Eddie Ungot+
Native Village of Gambell, President
P.O. Box 90, Gambell AK 99742
907-985-5346 ext 83 (phone), 907-985-5014 (fax)

Appendix C.–Letter from the Native Village of Savoonga in support of 2011 data release.

Savoonga, August 20, 2012

Patty Brown-Schwalenberg
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doug_alcorn@fws.gov

Dear Ms. Brown-Schwalenberg,

In 2011 the Native Village of Savoonga partnered with the Division of Subsistence of the Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS) to conduct the 2011 Loon Dedicated Survey in response to conservation concerns regarding the yellow-billed loon. This survey had the following objectives:

- To continue building communication among the local community and resource management agencies regarding loon conservation concerns;
- To provide accurate information on the species and number of loons and other birds harvested for subsistence uses;
- To improve understanding by resource management agencies of local systems for identification and naming of loons and therefore improve communication between local harvesters, biologists, and resource managers; and
- To obtain information on the composition and abundance of loons and other birds potentially available as subsistence resources in the St. Lawrence Island area.

On 23 May, 2012, Liliana Naves (ADF&G) and Tamara Zeller (USFWS) met with the Savoonga Tribal Council and community members to discuss 2011 survey results and options to release the harvest data. A written draft report was provided and the results were also presented at the meeting. Tribal Council and community members reviewed survey results, asked questions, and offered comments to (a) further improve survey methods in upcoming surveys, (b) clarify data presentation in the written report, and (c) clarify the local identification and naming of loons. We also discussed the need to expedite release of these data and the pros and cons of reporting harvest data at the village, island, and sub-regional level. The options discussed are explained below.

1. Timing for release of 2011 Savoonga bird harvest estimates

Option A. Expedite data release in relation to AMBCC 2-year regular process for data release: this will enable managers, agency staff, and villages to use the data in a timelier manner, especially the loon harvest data. Accurate loon harvest data are currently much needed in the ongoing processes of the yellow-billed loon listing evaluation and revision. It is important to ensure that the most recent and accurate information is available, which may help alleviate conservation concerns based on older, unreliable data. Under this option, 2011 data could be released in summer 2012.

Option B. Release the data under the regular AMBCC process, according to which adoption of 2011 harvest estimates is scheduled to occur in the spring of 2013.

2. Geographical level of harvest estimates

Option A. Report the data at the village level. AMBCC harvest data have been reported at the regional and subregional level because Native Partners, at least in the past, had concerns that village harvest data could be used to focus law enforcement efforts or to limit harvest. However, the main objective and goal for collecting harvest data is to document and protect subsistence uses and to ensure that resources will be available in the long-term. Village-level data make it easier to obtain effective data reviews from knowledgeable local residents. Also, village-level data are more useful for local communities than subregional or regional data.

Option B. Report the data at the St. Lawrence Island level (Gambell and Savoonga together).

Option C. Report data under the regular AMBCC survey sub-region, including Savoonga, Gambell, and Diomede (not surveyed in 2011).

The Tribal Council of the Native Village of Savoonga met again on 8 August, 2012 to discuss 2011 bird harvest data release options, this time without the participation of agency staff. At this meeting, the Tribal Council decided to:

1) Support reporting data at the village level for our community (Option 2.A). We agree that data reported at the village level can be more effective in alleviating yellow-billed loon conservation concerns caused by past unreliable harvest estimates at the regional level, which could not be properly reviewed at that level. Harvest estimates presented at the village level for all kinds of birds are more useful for our community because it is easier for us to understand and review results at the local level. Also, we will have the bird harvest data for our community readily available for use in other situations. We understand past concerns that bird harvest data at the village level data could be used to focus law enforcement efforts or to limit harvest. However, over the years, village-level data from other surveys have not been used for this purpose in our community. Data reported at the appropriate geographic scale are more effective for protecting and managing subsistence uses and harvests.

2) Support the immediate release of data from the 2011 Loon Dedicated Survey (Option 1.A) based on the fact that our community has already reviewed the survey results. We are looking forward to the publication of the final report in the short term including modifications to account for the comments and suggestions offered by our community.

It is our understanding that the Native Village of Gambell also has made a decision to support immediate release of their 2011 Loon Dedicated Survey at the village level and you will hear from them on this topic.

Recently, the Savoonga Tribal Council partnered again with ADF&G and USFWS to conduct a second year of the Loon Dedicated Survey in 2012. We hope that the detailed information provided by these efforts will help clarify and alleviate conservation concerns regarding loons and will help to protect our subsistence culture and harvests in the short and long term. Please contact me if you have comments or questions.

Sincerely,

Mitchell Kiyukiook
Native Village of Savoonga, President
P.O. Box 120, Savoonga AK 99769
907-984-2334 (phone), 907-984-6156 (fax)
tcsva@kawerak.org

Appendix D.–Letter from the Native Village of Savoonga in support of 2012 data release.

Savoonga, 21 February, 2013

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cc:

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pete_probasco@fws.gov

Dear Ms. Brown-Schwalenberg,

In 2012 the Native Village of Savoonga partnered again with the Division of Subsistence of the Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS) to conduct the 2012 Loon Dedicated Survey in response to conservation concerns regarding the yellow-billed loon. This survey had the following objectives:

- To continue building communication among the local community and resource management agencies regarding loon conservation concerns;
- To provide accurate information on the species and number of loons and other birds harvested for subsistence uses;
- To improve understanding by resource management agencies of local systems for identification and naming of loons and therefore improve communication between local harvesters, biologists, and resource managers; and
- To obtain information on the composition and abundance of loons and other birds potentially available as subsistence resources in the St. Lawrence Island area.

On 21 February 2013, Liliana Naves (ADF&G) met with the Savoonga Tribal Council and community members to discuss 2012 survey results and options to release the harvest data. A written draft report was provided and the results were presented at the meeting. Tribal Council and community members reviewed survey results, asked questions, and offered comments. We also discussed the need to expedite release of these data and the pros and cons of reporting harvest data at the village, island, and sub-regional level. The options discussed are explained below.

1. Timing for release of 2012 Savoonga bird harvest estimates

Option A. Expedite data release in relation to the AMBCC 2-year regular process for data release: this will enable managers, agency staff, and villages to use the data in a timelier manner, especially the loon harvest data. Accurate loon harvest data are currently much needed in the ongoing processes of the yellow-billed loon listing evaluation and revision. It is important to ensure that the most recent and accurate information is available, which may help alleviate conservation concerns based on older, unreliable data. Under this option, 2012 data could be released in winter 2013.

Option B. Release the data under the regular AMBCC process, according to which adoption of 2012 harvest estimates is scheduled to occur in the spring of 2014.

2. Geographical level of harvest estimates

Option A. Report the data at the village level. AMBCC harvest data have been reported at the regional and subregional level because Native Partners, at least in the past, had concerns that village harvest data could be mis-used to focus law enforcement efforts. However, the main objective and goal for collecting harvest data is to document and protect subsistence uses and to ensure that resources will be available in the long-term. Village-level data make it easier to obtain effective data reviews from knowledgeable local residents. Also, village-level data are more useful for local communities than subregional or regional data.

Option B. Report the data at the St. Lawrence Island level (Gambell and Savoonga together).

Option C. Report data under the regular AMBCC survey sub-region, including Savoonga, Gambell, and Diomede (not surveyed in 2012).

The Tribal Council of the Native Village of Savoonga decided to:

1) Support reporting data at the village level for our community (Option 2.A). We agree that data reported at the village level can be more effective in alleviating yellow-billed loon conservation concerns caused by past unreliable harvest estimates at the regional level, which could not be properly reviewed at that level. Harvest estimates presented at the village level for all kinds of birds are more useful for our community because it is easier for us to understand and review results at the local level. Also, we will have the bird harvest data for our community readily available for use in other situations. We understand past concerns that bird harvest data at the village level data could be used to focus law enforcement efforts. However, over the years, village-level data from other surveys have not been used for this purpose in our community. Data reported at the appropriate geographic scale are more effective for protecting and managing subsistence uses and harvests.

2) Support the immediate release of data from the 2012 Loon Dedicated Survey (Option 1.A) based on the fact that we have already reviewed the survey results. We are looking forward to the publication of the final report in the short term including modifications to account for the comments and suggestions offered by our community.

3) Support re-consideration of 2007 harvest estimates. On the 21 Feb, 2013 meeting we also discussed results of previous AMBCC harvest surveys. 2007 Harvest estimates are excessively high, incorrect, and do not represent bird harvests in our village.

4) Support 2011 and 2012 as the most representative harvest estimates for our village. These surveys included a very high proportion of households and data was collected in collaboration among local surveyors, biologists, and anthropologists.

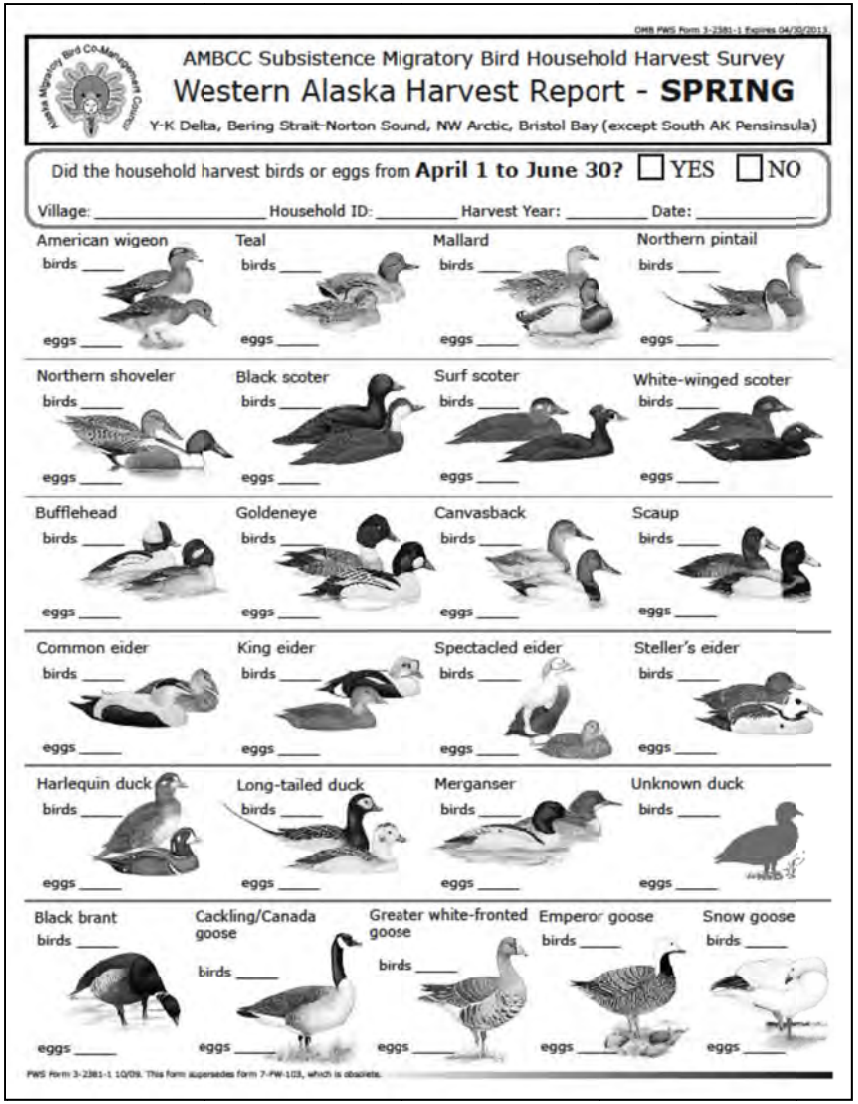
4) Support reporting data at the village level for our community in all surveys done by the AMBCC including previous years. We would like a report with previous years of the AMBCC survey to be produced for our village.

We hope that the detailed information provided by these efforts will help clarify and alleviate conservation concerns regarding loons and will help to protect our subsistence culture and harvests in the short and long term. Please contact me if you have comments or questions.

Sincerely,

Mitchell Kiyuklook
Native Village of Savoonga, President
P.O. Box 120, Savoonga AK 99769
907-984-6414 (phone), 907-984-6150 (fax)
tc.sva@kawerak.org

Appendix E.–Harvest report form, Western Alaska (spring sheet, both sides, original size 8.5 x 11 in).



OMB FWS Form 3-2381-1 Expires 04/30/2013

AMBCC Subsistence Migratory Bird Household Harvest Survey

Western Alaska Harvest Report - **SPRING**

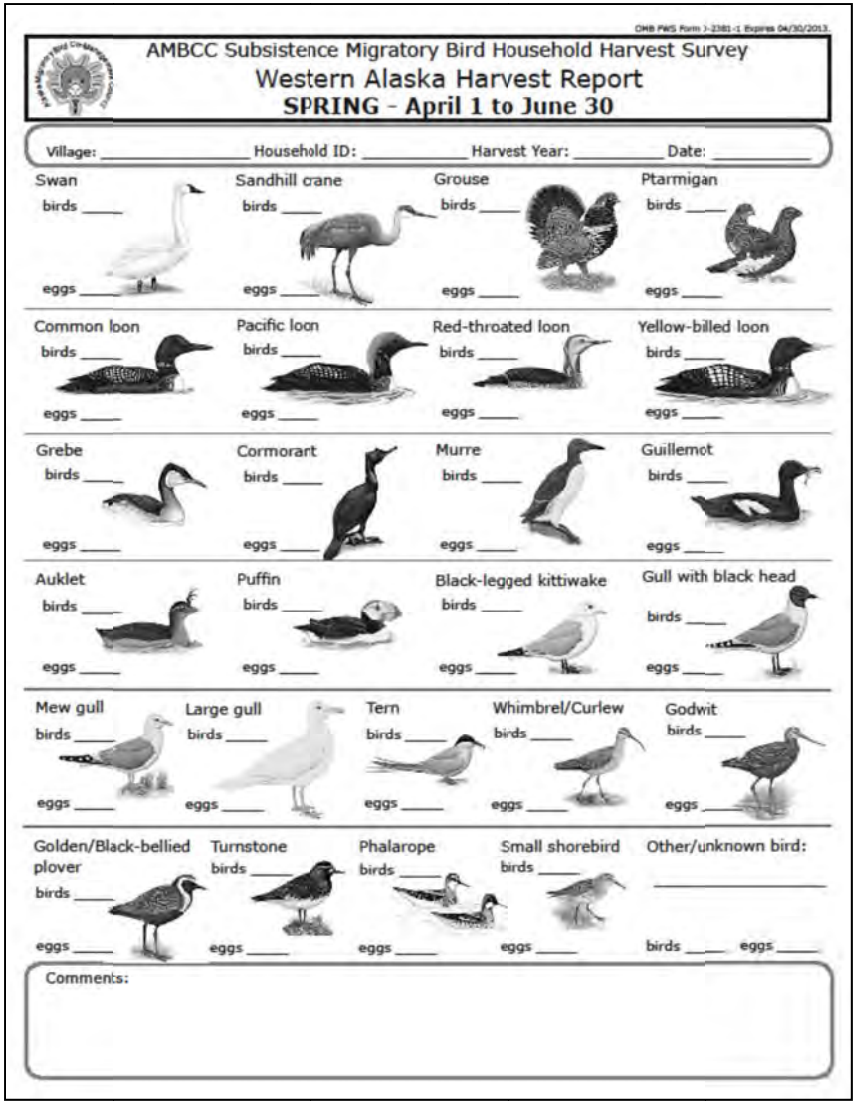
Y-K Delta, Bering Strait-Norton Sound, NW Arctic, Bristol Bay (except South AK Peninsula)

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 ____

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



OMB FWS Form 3-2381-1 Expires 04/30/2013

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 ____
Common loon birds ____ eggs ____
Pacific loon birds ____ eggs ____
Red-throated loon birds ____ eggs ____
Yellow-billed loon birds ____ eggs ____
Grebe birds ____ eggs ____
Cormorant birds ____ eggs ____
Murre birds ____ eggs ____
Guillemot birds ____ eggs ____
Auklet birds ____ eggs ____
Puffin birds ____ eggs ____
Black-legged kittiwake birds ____ eggs ____
Gull with black head birds ____ eggs ____
Mew gull birds ____ eggs ____
Large gull birds ____ eggs ____
Tern birds ____ eggs ____
Whimbrel/Curlew birds ____ eggs ____
Godwit birds ____ eggs ____
Golden/Black-bellied plover birds ____ eggs ____
Turnstone birds ____ eggs ____
Phalarope birds ____ eggs ____
Small shorebird birds ____ eggs ____
Other/unknown bird: _____ birds ____ eggs ____

Comments:

Appendix F.–Bird identification guide, Western Alaska (both sides, original size 8.5 x 11 in).

Appendix G.–Species that may be harvested or mentioned in harvest surveys, Saint Lawrence Island.

English, *Latin*	Saint Lawrence Island Yupik
Eurasian wigeon *Anas penelope*	
American wigeon *A. americana*	
Green-winged teal *A. crecca*	
Mallard *A. platyrhynchos*	
Northern pintail *A. acuta*	Ngiikaq[2], nqiikaaq[1, 2], quulvekesiiq[2]
Northern shoveler *A. clypeata*	Pekutaghraak[1, 2]
Black scoter *Melanitta nigra*	Metghasaak[1], whistlers[3], butterballs[3]
Surf scoter *M. perspicillata*	
White-winged scoter *M. fusca*	
Bufflehead *Bucephala albeola*	
Common goldeneye *B. clangula*	
Canvasback *Aythya valisineria*	
Greater scaup *A. marila*	
Common eider *Somateria mollissima*	Metghaq[1, 2], metghaqpik[2], gatepak[2], tagrapak[2], uskulla[2]
King eider *S. spectabilis*	Qengalek[1, 2]
Spectacled eider *S. fischeri*	Iyegaatelek[2], livghaan[1, 2]
Steller's eider *Polysticta stelleri*	Aglekeseqaq[1, 2]
Harlequin duck *Histrionicus histrionicus*	Qagingik[1, 2]
Long-tailed duck *Clangula hyemalis*	Aahaangwliq[2], kangghwaak (female) [1, 2], uyangsaq[2], ugeyiighaq(male)[2]
Red-breasted merganser *Mergus serrator*	Aqfasuk[1, 2], iikaaq[2]
Brant *Branta bernicla*	Teghqillkak[1, 2], qefteq[1]
Taverner's Canada goose *B.hutcnhinsii taverneri*	Qefteq[1, 2], teghqilkagpak[7]
Greater white-fronted goose *Anser albifrons*	Wilwitu[7]
Emperor goose *Chen canagica*	Leghlleq[1, 2]
Snow goose *C. caerulescens*	Kaanguq[2], kaangu[1], white goose[3]
Tundra swan *Cygnus columbianus*	Quuk[1, 2]
Sandhill crane *Grus canadensis*	Satelgaq[1, 2]
Rock ptarmigan *Lagopus muta*	Aqergiiq[1, 2]
Northern fulmar *Fulmarus glacialis*	Aghqulluk[1]
Short-tailed shearwater *Puffinus tenuirostris*	Kaputaghaq[1]
Fork-tailed storm petrel *Oceanodroma furcata*	
Pelagic cormorant *Phalacrocorax pelagicus*	Ngelqaq[1, 2]
Arctic tern *Sterna paradisea*	Tekeyiighaq[1, 2]
Black-legged kittiwake *Rissa tridactyla*	Qaqsungiq[1, 2]
Sabine's gull *Xema sabini*	Nasallenguq[1, 2]
Ross's gull *Rhodostethia rosea*	Kulusim qawaaga[1] (iceberg, polar ice bird)
Mew gull *Larus canus*	Naghuya[2], ungazim naghuyangi[7] (different gull species)

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Appendix G.–Page 2 of 3.

English, *Latin*	**Saint Lawrence Island Yupik**
Large gull Glaucous gull *L. hyperboreus* (1) Herring gull *L. argentatus* (2) Glaucous-winged gull *L. glaucescens* (3)	 (1) Naghuyapik[1, 2] (2) Ugraaq[5, 6]
Auklet Crested auklet *Aethia cristatella* (1) Least auklet *A. pusilla* (2) Parakeet auklet *A. psittacula* (3) Rhinoceros auklet *Cerorhinca monocerata* (4)	Amaaghaq (auklet chick) (1): Sukilpaq[1, 2] (2): Akmaliighaq[1, 2] (3): Suklugraq[1, 2]
Murre Common murre *Uria aalge* (1) Thick-billed murre *U. lomvia* (2)	Alpa[1, 2] (1): Kuwaaq[1, 2] (2): Aqevgaghnak[1, 2], alpapiget[1], alpapik[7], quwaaghet[7]
Guillemot Pigeon guillemot *Cepphus columba* (1) Black guillemot *C. grylle* (2)	Samseghhaghaq[1, 2] (adult)[5], sipelaaghhaq[2] (young)[5]
Dovekie *Alle alle*	Quqiiq[1,6]
Ancient murrelet *Synthliboramphus antiquus*	
Kittlitz's murrelet *Brachyramphus brevirostris*	
Puffin Tufted puffin *Fratercula. cirrhata* (1) Horned puffin *F. corniculata* (2)	 (1): Pagrugaq[1, 2] (2): Quprughaq[2]
Parasitic jaeger *Stercorarius parasiticus*	
Pomarine jaeger *S. pomarinus*	
Whimbrel/curlew Whimbrel *Numenius phaeopus* (1) Bristle-thighed curlew *N. tahitiensis* (2)	Sugtuvak[1, 2, 5] (any shorebird with long beak and larger than sandpipers[5]).
Godwit Bar-tailed godwit *Limosa lapponica* (1) Black-tailed godwit *L. limosa* (2)	Sugtuvak[5]
Golden/black-bellied plover Pacific golden plover *Pluvialis squatarola* (1) Black-bellied plover *P. fulva* (2) American golden plover *P. dominica* (3)	Turiighpak[5] (large shorebird)
Turnstone Ruddy turnstone *Arenaria interpres* (1) Black turnstone *A. melanocephala* (2)	 (1): Sagelmak[1, 2]
Phalarope Red phalarope *Phalaropus fulicaria* (1) Red-necked phalarope *P. lobatus* (2)	Qulighyak[2], sughmeghaq[1, 2]

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English, *Latin*	Saint Lawrence Island Yupik
Small shorebird[a] Dunlin *Calidris alpina* (1) Pectoral sandpiper *C. melanotos* (2) Rock sandpiper *C. ptilocnemis* (3) Western sandpiper *C. mauri* (4) Sharp-tailed sandpiper *C. acuminata* (5) Semipalmated plover *Charadrius semipalmatus* (6) Gray-tailed tatler *Tringa breviceps* (7) Long-billed dowitcher *Limnodromus scolopaceus* (8)	Turiighaq[5] (1, 2): Teraateriiq[1, 2] (3): Qalmesam teraateriiq[5] (4): Iglagllengiiq[1, 2] (7): Qalmesam qawaaga[1, 2]
Loon *Gavia* sp.	Yuwayu[2, 4]: any loon species, breeding plumages. May also be used for any plumage (loon in general). Yuwayaaghaq[4]: juvenile or nonbreeding adult of any loon species.
Red-throated loon *G. stellata*	Eghqaaq[1, 2]: breeding plumage
Pacific loon *G. pacifica*	Melqupak[1, 2]: breeding plumage
Arctic loon *G. arctica*	Melqupak[1, 2]: breeding plumage
Common loon *G. immer*	Nangqwalek[4]: breeding plumage Nangqwalgaaghaq[4]: juvenile or nonbreeding adult
Yellow-billed loon *G. adamsii*	Nangqwalek[4]: breeding plumage Nangqwalgaaghaq[4]: juvenile or nonbreeding adult
Grebe Red-necked grebe *Podiceps griseana* (1) Horned grebe *P. auritus* (2)	Aqfasuget[1], aqfasuq[5]. Note: it seems sometimes aqfasuk is used for grebe and merganser.
Rough-legged hawk *Buteo lagopus*	
Peregrine falcon *Falco peregrinus*	
Gyrfalcon *F. rusticolus*	
Short-eared owl *Asio flammeus*	
Snowy owl *Bubo scandiaca*	Anipa[1, 2]
Common raven *Corvus corax*	

Sources [1] (Romanenko et al. 1997); [2] (Alaska Native Language Center 2008); [3] (Paige et al. 1996); [4] this study; [5] study informants; [6] (Ehrlich et al. 1993); [7] (Tahbone and Trigg 2011).

Note Cells with a gray background indicate Saint Lawrence Island Yupik names used for more than one species.

Note Parenthesis ( ) indicate species likely to occur in the region.

a. Small shorebird species listed to not include species that occur only occasionally and in very small numbers (categories "rare" or less common than rare in Lehman (2012).* Autumn birdlife at Gambell and Saint Lawrence Island, Alaska (1992–2012). Unpublished Report.)

* Lehman, P. E. 2012. Autumn birdlife at Gambell and Saint Lawrence Island, Alaska (1992–2012). Unpublished Report. Cited in this report as Lehman 2012.

Appendix H.–Formulas to calculate village estimated harvest and confidence interval.

$$\hat{X}_k = \sum_{j=1}^{k}\left[\left(\sum_{i=1}^{n_j} x_{ji}\right)\times\frac{N_j}{n_j}\right]$$

$$CIP(\hat{X}_k) = \frac{t_{1/\alpha}\times\sqrt{\mathrm{var}(\hat{X}_k)}}{\left(\hat{X}_k \div N_k\right)}$$

$$\mathrm{var}(\hat{X}_k) = \frac{1}{N_k^2}\left[\sum_{j=1}^{k} N_j \times (N_j - n_j)\times\frac{s_j^2}{n_j}\right]$$

$$s_j^2 = \frac{\sum_{i=1}^{n_j}\left(x_i - \bar{x}_{ji}\right)^2}{n_j}$$

$$\bar{x}_{ji} = \frac{\frac{N_j}{n_j}\left(\sum_{i=1}^{n_j} x_{ji}\right)}{N_j}$$

$\hat{X}_k$ = estimated village harvest.

CIP = 95% confidence interval percentile.

$\mathrm{var}\left(\hat{X}_k\right)$ = variance of estimated village harvest.

s_j^2 = harvest level strata variance.

$\bar{x}_{ji}$ = sample average for stratum *j* (average household harvest for stratum *j*).

i = households.

j = harvest level strata (harvester, nonharvester).

k = village.

x_{ij} = harvest reported by individual households.

N_j = total number of households in stratum *j*.

n_j = number of households surveyed in stratum *j*.

N_k = total number of households in village *k*.

$t_{1/\alpha}$ = Student's *t* distribution value with tail area probability α (1.96).

Appendix I.–Gambell bird harvest estimates 1993–2012.

Species	1993	1996	2002	2004	2005	2006	2007	2009	2010	2011	2012
Teal	0	0	2	0	0	0	0	16	9	2	3
Mallard	0	13	0	0	0	33	0	0	11	6	3
Northern pintail	12	49	86	512	164	23	34	88	22	62	58
Black scoter	2	0	4	0	0	3	0	0	3	0	0
Surf scoter	0	0	0	0	0	0	0	16	2	2	0
Common eider	262	1,071	1,055	1,156	1,057	510	955	1,441	16	360	260
King eider	59	377	271	264	644	76	347	793	57	101	55
Spectacled eider	0	0	176	0	0	69	76	64	0	45	20
Steller's eider	42	0	0	0	0	0	0	32	0	4	0
Harlequin duck	47	8	0	0	0	2	0	24	9	4	2
Long-tailed duck	60	1,075	366	4	20	0	24	572	0	50	0
Merganser	0	0	0	0	5	2	0	0	2	2	0
Black brant	7	97	270	227	278	115	155	526	22	45	27
Canada goose	1	6	22	65	102	46	5	57	5	40	6
Greater white-fronted goose	0	0	6	4	12	21	51	32	2	7	7
Emperor goose	1	110	1,068	1,174	707	86	249	967	0	60	128
Snow goose	118	243	638	926	1,143	306	343	1,608	6	18	21
Swan	5	15	62	35	22	3	2	120	0	12	6
Sandhill crane	0	21	237	249	77	12	54	98	0	5	1
Cormorant	500	1,432	767	1,000	623	746	435	1,696	200	690	458
Black-legged kittiwake	0	36	0	0	0	0	0	51	0	0	17
Large gull	203	472	487	562	25	0	115	223	23	314	128
Auklet	2,836	5,862	4,284	5,966	3,618	2,116	2,266	5,776	200	2,137	2,537

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Appendix I.–Page 2 of 2.

Species	1993	1996	2002	2004	2005	2006	2007	2009	2010	2011	2012
Murre	1,537	5,029	3,263	4,610	2,676	3,377	2,300	5,790	80	1,635	908
Guillemot	12	0	0	0	5	0	0	496	25	12	0
Puffin	4	36	12	2	20	20	0	3	0	0	0
Golden/Black-bellied plover	0	0	36	0	99	0	0	112	0	0	0
Phalarope	0	0	0	0	0	0	0	0	68	0	0
Common loon	34	93	60	18	56	41	179	90	3	9	0
Pacific loon	24	68	205	410	2	110	71	89	0	10	0
Red-throated loon	0	0	4	2	5	0	5	99	8	0	0
Nonbreeding loon	–	2	–	–	–	–	–	–	–	–	8
Yellow-billed loon	17	40	198	138	44	15	7	139	0	8	0
Other birds	1	19	2	0	0	2	5	24	14	43	3
Total birds	**5,784**	**16,174**	**13,581**	**17,324**	**11,404**	**7,733**	**7,678**	**21,042**	**786**	**5,683**	**4,658**

Sources 1993: Paige et al. (1996); 1996: Georgette and Iknokinok (1997); 2002: Kawerak, Inc. (2004); 2004, 2005, 2007, 2009, 2010: this study; 2006: Ahmasuk and Trigg (2008); 2011–2012: Naves and Zeller (2013).

Note This table includes species reported as harvested in at least 1 year. The category "other birds" includes species reported only sporadically and that contributed a small amount to the annual harvests.

Note "–" indicates species not detailed in harvest survey.

Appendix J.–Gambell egg harvest estimates 1993–2012.

Species	1993	1996	2002	2004	2005	2006	2007	2009	2010	2011	2012
Mallard	0	0	0	0	0	0	0	3	0	0	0
Northern pintail	0	0	0	0	0	40	0	0	0	0	0
Goldeneye	0	0	0	0	0	0	0	0	0	36	0
Common eider	10	174	24	17	238	196	71	790	0	225	31
King eider	6	0	24	0	0	20	0	334	0	0	0
Steller's eider	0	0	0	0	0	0	0	32	0	0	0
Long-tailed duck	0	0	0	9	0	0	0	318	0	0	0
Merganser	0	0	0	0	0	123	0	0	0	0	0
Black brant	0	0	0	0	0	7	0	40	0	24	0
Canada goose	0	0	0	0	0	0	0	0	0	83	0
Greater white-fronted goose	0	0	0	0	0	0	0	0	0	53	0
Emperor goose	0	0	0	0	0	0	0	0	0	24	0
Swan	0	0	0	4	20	0	0	19	0	0	0
Sandhill crane	0	0	0	0	15	0	0	25	0	5	0
Cormorant	0	34	0	0	0	0	0	0	0	0	0
Mew gull	0	0	0	0	0	0	0	175	0	0	0
Large gull	0	0	0	0	35	224	0	318	0	57	0
Auklet	0	0	0	0	0	0	0	159	0	0	0
Murre	7,027	3,730	1,914	4,954	1,280	6,829	3,588	10,541	388	2,174	5,165
Common loon	0	0	0	0	0	0	0	48	0	0	0
Pacific loon	0	0	0	0	0	0	0	48	0	0	0
Red-throated loon	0	0	0	0	0	0	0	41	0	0	0
Yellow-billed loon	0	0	0	0	0	0	0	44	0	0	0
Total eggs	**7,043**	**3,938**	**1,962**	**4,984**	**1,588**	**7,438**	**3,659**	**12,935**	**388**	**2,681**	**5,195**

Sources 1993: Paige et al. (1996); 1996: Georgette and Iknokinok (1997); 2002: Kawerak, Inc. (2004); 2004, 2005, 2007, 2009, 2010: this study; 2006: Ahmasuk and Trigg (2008); 2011–2012: Naves and Zeller (2013).

Note This table includes species reported as harvested in at least 1 year.

Appendix K.–Savoonga bird harvest estimates 1993–2012.

Species	1993	1996	2002	2004	2005	2006	2007	2009	2010	2011	2012
Northern pintail	0	0	0	0	0	0	0	0	0	0	7
Black scoter	0	0	0	0	0	88	0	0	0	7	0
Surf scoter	0	0	0	0	0	6	0	0	0	8	0
White-winged scoter	0	0	25	0	0	0	0	40	0	9	25
Common eider	32	159	627	377	1,435	937	3,581	704	501	183	157
King eider	8	0	510	118	370	603	2,818	82	52	38	26
Spectacled eider	9	0	289	5	67	290	788	64	45	15	25
Steller's eider	0	0	5	0	12	23	0	0	19	13	17
Harlequin duck	4	0	24	240	1,195	229	1,990	9	44	5	4
Long-tailed duck	0	126	24	5	0	9	625	0	169	5	0
Merganser	0	0	0	124	0	12	124	15	0	0	0
Black brant	8	0	562	181	0	398	836	62	4	53	49
Canada goose	0	6	28	0	148	27	8	0	0	34	0
Emperor goose	12	0	544	227	421	352	934	177	76	44	62
Snow goose	15	48	961	156	402	749	956	374	32	181	7
Swan	0	6	30	73	128	4	611	107	0	5	0
Sandhill crane	0	0	37	20	0	4	23	9	0	6	9
Short-tailed shearwater	–	–	–	–	–	–	–	–	–	17	48
Cormorant	494	853	3,289	2,053	2,279	2,807	10,423	3,970	2,172	899	452
Black-legged kittiwake	0	13	773	664	2,344	723	2,347	43	3	9	8
Large gull	98	270	77	83	880	301	1,161	258	181	171	99
Auklet	470	536	1,637	616	1,164	2,502	14,491	2,373	1,052	567	233
Murre	1,824	3,490	6,275	5,646	1,850	7,836	33,530	6,547	3,363	2,541	1,676
Guillemot	0	0	903	410	0	413	0	520	3,005	22	13
Puffin	0	0	0	18	0	0	0	0	0	0	0
Small shorebird	0	0	0	0	0	0	0	0	0	16	0
Common loon	66	197	843	319	801	719	2,312	125	46	72	6
Pacific loon	27	13	7	16	0	1	5	5	0	32	47
Red-throated loon	0	0	0	20	0	432	361	128	0	11	8
Nonbreeding loon	–	13	–	–	–	–	–	–	–	–	107
Yellow-billed loon	17	0	0	132	0	310	1,070	11	0	9	3
Other birds	12	0	29	0	0	0	0	0	42	10	8
Total birds	**3,096**	**5,730**	**17,499**	**11,503**	**13,496**	**19,774**	**78,994**	**15,623**	**10,806**	**4,980**	**3,095**

Sources 1993: Paige et al. (1996); 1996: Georgette and Iknokinok (1997); 2002: Kawerak, Inc. (2004); 2004, 2005, 2007, 2009, 2010: this study; 2006: Ahmasuk and Trigg (2008); 2011–2012: Naves and Zeller (2013).

Note This table includes species reported as harvested in at least 1 year. The category "other birds" includes species reported being harvested only sporadically and that contributed a small amount to the annual harvests.

Note "–" indicates harvests are not detailed in the harvest survey.

Appendix L.–Savoonga egg harvest estimates 1993–2012.

Species	1993	1996	2002	2004	2005	2006	2007	2009	2010	2011	2012
Common eider	0	0	0	0	0	0	0	0	3	52	1
King eider	0	0	125	0	0	0	51	23	0	0	0
Spectacled eider	0	0	17	0	0	0	0	0	0	0	0
Emperor goose	0	0	0	0	0	0	28	0	0	0	0
Swan	0	0	0	0	0	0	0	0	0	0	10
Cormorant	0	0	0	0	0	1,434	0	0	0	0	0
Black-legged kittiwake	0	0	0	52	0	0	0	0	0	0	0
Mew gull	0	0	73	0	0	0	0	0	0	0	34
Large gull	0	0	0	156	0	0	0	0	0	54	32
Auklet	0	0	0	116	0	0	0	41	0	0	12
Murre	6,517	10,286	35,836	64,754	65,077	57,994	118,281	91,337	41,140	15,750	20,746
Golden/Black-bellied plover	0	0	0	10	0	0	0	0	0	0	0
Yellow-billed loon	0	0	0	8	0	0	0	0	0	0	0
Total eggs	**6,517**	**10,286**	**36,051**	**65,096**	**65,077**	**59,428**	**118,360**	**91,401**	**41,143**	**15,856**	**20,835**

Sources 1993: Paige et al. (1996); 1996: Georgette and Iknokinok (1997); 2002: Kawerak, Inc. (2004); 2004, 2005, 2007, 2009, 2010: this study; 2006: Ahmasuk and Trigg (2008); 2011–2012: Naves and Zeller (2013).

Note This table includes species reported as harvested in at least 1 year.

A NOTE ON THE AMBCC LOGO

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

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

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