Aerial survey of wintering Pacific brant and other species at the Izembek NWR Complex and Sanak Islands, Alaska, January 2014.

Heather M. Wilson and Christian P. Dau, U.S. Fish and Wildlife Service, Migratory Bird Management, 1011 E. Tudor Road, Anchorage, AK, 99503

ABSTRACT: This report presents results of the 27-28 January 2014 aerial survey of Pacific brant and other species wintering at the Izembek NWR Complex and in the Sanak Islands. Our estimate of 48,140 brant within the lower Alaska Peninsula survey area serves as the Alaska component of the 2014 Pacific Flyway Midwinter index for brant and represents the highest average count in the history of the survey. This estimate represents a count of the Sanak Islands on 28 January (5,129), plus an average of replicate counts for the Izembek NWR Complex on 27 January (50,527) and 28 January (35,765). We also used average counts from the Izembek NWR Complex to estimate totals for emperor geese and Steller's eiders (Izembek + Sanak) at 8,343 (4,213/4,130), and 37,248 (34,911/2,337), respectively.

Key words: Winter survey, brant, Izembek NWR, Sanak Islands, Alaska.

February 2014

INTRODUCTION

Aerial surveys of wintering Pacific brant at the Izembek NWR Complex (hereafter Izembek), including refuge coastlines and adjacent marine estuaries, have been conducted annually since 1980 (Fig. 1). In 2010, the survey was expanded to include the Sanak Islands (hereafter Sanak; Fig. 2, Appendix 1). This survey serves as the Alaska component of the Pacific Flyway Midwinter index (PF-MWI) for brant, and documents winter distribution, abundance, population trend, and habitat use by brant and other species. Over-wintering brant at Izembek currently comprise the largest geographic component of the PF-MWI outside of Mexico.

Eelgrass beds from Moffet Bay to Bechevin Bay, along the north side of the Alaska Peninsula, and in Kinzarof Lagoon and Morzhovoi Bay, along the south side of the peninsula, are primary foraging areas for brant at Izembek. In addition, brant have historically wintered at Sanak, 80 km south of Izembek, although numbers have not been consistently documented (Jones 1952, 1955, McKnight 1971 and Dau and Chase 1995). Most brant at Sanak utilize eelgrass beds and other shallow intertidal habitats south of Sanak and Caton islands.

METHODS

The 2014 winter survey of Izembek and Sanak was flown from 27-28 January by Migratory Bird Management (MBM) personnel using an amphibious Cessna 206 aircraft (N9623R). Survey ground speed was approximately 160 km/hr (100 mph) and

altitude was 45m (150 feet) above sea level (ASL). Observations made from both sides of the aircraft were voice recorded into panel-mounted computers for later transcription using programs developed by Jack Hodges (USFWS-MBM, Juneau, AK).

Systematic flight paths provided coverage of all near shore and open water areas along shorelines and within estuaries (Fig. 3). Panel mounted computers provided moving map displays and paper topographic maps (scale 1:63,360) aided navigation. Observations of habitat and survey conditions including ice cover, wind speed and direction, temperature, sky condition, visibility, and tide stage were recorded.

The Izembek NWR Complex includes shorelines and estuaries from Moffet Bay to Bechevin Bay, along the north side of the Alaska Peninsula, and includes Kinzarof Lagoon and Morzhovoi Bay on the south side of the Alaska Peninsula (Figs. 1, 3). The Sanak Island group includes Sanak, Caton, and surrounding islets, approximately 80 km south of Cold Bay (Fig. 2, 3).

SURVEY CONDITIONS

Winter conditions in 2014 were mild relative to the previous year's survey. There was no lowland snow cover or marine or fresh-water ice cover at Izembek or Sanak in 2014, versus $\leq$1% marine ice in both Bering Sea and Pacific Ocean estuaries at Izembek in 2013. In 2013 fresh-water areas were frozen and lowland snow cover was 10-15%. Further, day time air temperatures were approximately 35^{o}F in 2013, versus 45+^{o}F in 2014. Tide levels were high in Bering Sea and Pacific Ocean estuaries at Izembek on 27 and 28 January and mid-level at Sanak on 28 January.

Visibility was good at Izembek on 27 January with overcast skies, westerly winds of 10 mph and occasional light rain or mist. Visibility was fair at Izembek on 28 January with high, broken ceilings, variable winds of <10 mph and occasional sun glare. Visibility was good at Sanak on 28 January with broken ceilings, calm to <5 mph winds, and occasional light rain.

RESULTS

Pacific Brant

We observed totals of 50,257 and 35,765 brant at Izembek on 27 and 28 January, respectively (Tables 1a/b), resulting in an overall average of 43,011 at Izembek. In addition, we observed 5,129 brant at Sanak on 28 January (Table 2; Appendix 1). Thus, our combined total (Izembek average + Sanak) was 48,140, with Izembek representing 89.4% of the combined total. Marine ice was absent and did not restrict the distribution of wintering brant at Izembek or Sanak. Average winter counts at Izembek + Sanak indicate an increasing, long-term trend (1980-2014) of 8.6%/year (average 14,837 $\pm$ 4,196 [95% CI]; Fig. 4; MBM/Izembek NWR files).

Emperor Goose

We observed totals of 3,209 and 5,217 emperor geese at Izembek on 27 and 28 January, respectively (Tables 1a/b). In addition, we observed 4,130 emperor geese at Sanak on 28 January (Table 2; Appendix 2). Izembek winter counts (1980-2014) have been highly variable (range 542-5,139) primarily due to ice cover and habitat availability (average 2,789 ± 501 [95% CI], Trend -0.9%/year, MBM/Izembek NWR files).

Steller's Eider

We observed totals of 24,745 and 45,076 Steller's eiders at Izembek on 27 and 28 January, respectively (Tables 1a/b). In addition, we observed 2,337 Steller's eiders at Sanak on 28 January (Table 2; Appendix 1). At Izembek, the highest concentrations occurred within Izembek Lagoon (27 January, 93.7%; 28 January, 96.1%). The 2014 average Izembek count is nearly two-fold the average count from 1980-2013 and provides a current long-term average and trend of 18,667 ± 3,805 (95% CI) and -0.6%/year (MBM/Izembek NWR files).

DISCUSSION / RECOMMENDATIONS

The Izembek count of wintering brant has been used as part of the Pacific Flyway Midwinter Index (PF-MWI) since 1985-86. The Alaska survey was expanded in 2010 to include Sanak (USFWS 2011, Pacific Flyway Data Book). The current protocol of combining the average of replicate counts from Izembek with the count from Sanak, will be followed to provide the Alaska PF-MWI index. Annual counts for both locations will also continue to be reported separately.

Sea ice was absent within the survey area during the 2014 survey, resulting in a more uniform distribution of brant throughout the Izembek Complex, relative to high ice years. Ice conditions determine habitat accessibility and restrict brant distribution in high ice years to open-water areas (e.g., central Izembek Lagoon, Kinzaroff Lagoon, and Hook Bay; pers. obs.). Overall, winter weather conditions along the Alaska Peninsula continued to be mild in 2014; an important factor associated with increasing numbers of over-wintering brant at Izembek (Ward et al. 2009; Fig. 4).

Brant counts at Sanak over the last 5 years (2010-2014), have averaged 5,472 ± 3,417 (95% CI) representing 5.8-27.1% of the overall Alaska winter count. Larger proportions of wintering brant appear to be present at Sanak when ice conditions restrict habitat use at Izembek. For example, we found an average of 78% of brant at Izembek when ice cover was >50% (Izembek/Sanak surveys 2009-10 and 2011-12), versus 93% when ice was reduced or absent (2010-11, 2012-13 and 2013-14). However, we currently find no significant correlation between counts at Sanak and Izembek (r= -0.40, df = 3, p = 0.50). Additional studies will be required to elucidate use of Sanak and Izembek by wintering brant under different ice regimes.

AKNOWLEDGMENTS

We appreciate support of the staffs of the Alaska Peninsula/Becharof and Izembek NWR's for providing lodging and vehicle use. We appreciate assistance from Bob Platte (MBM-R7) for preparation of map presentations for Figures 1-3.

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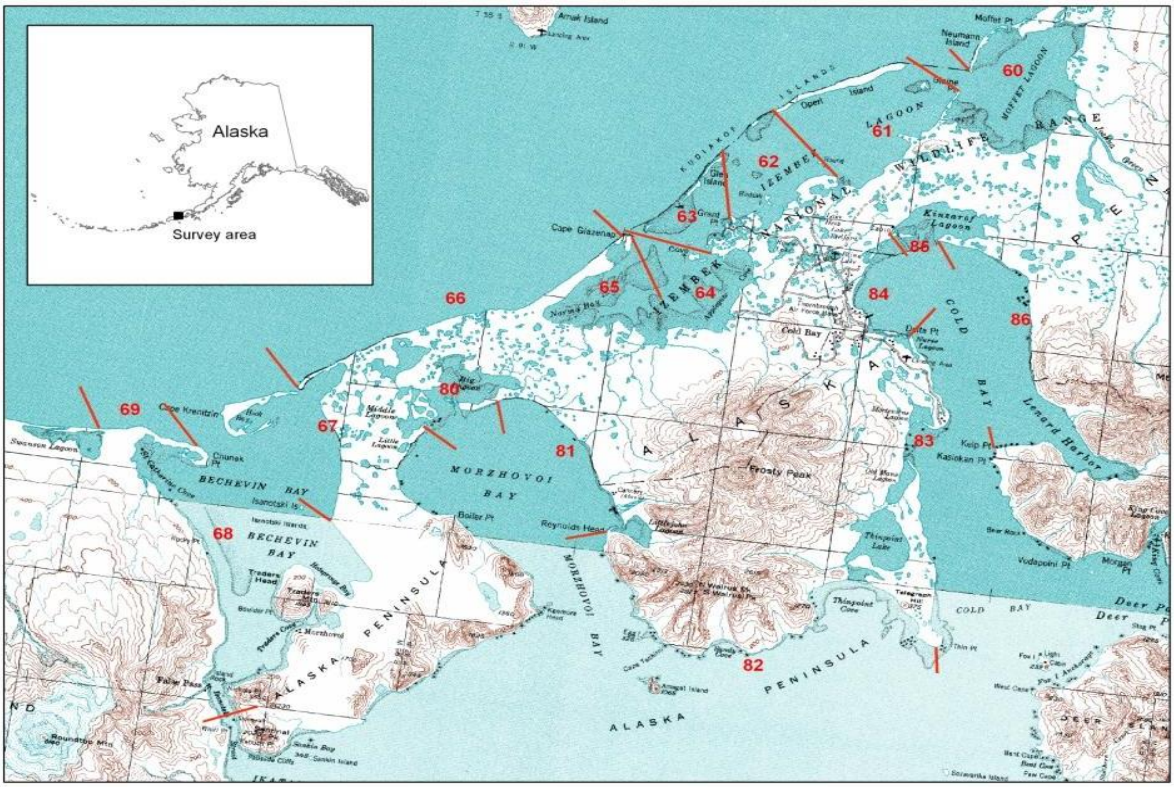

Figure 1. Pacific brant survey area by segment in the Izembek NWR Complex

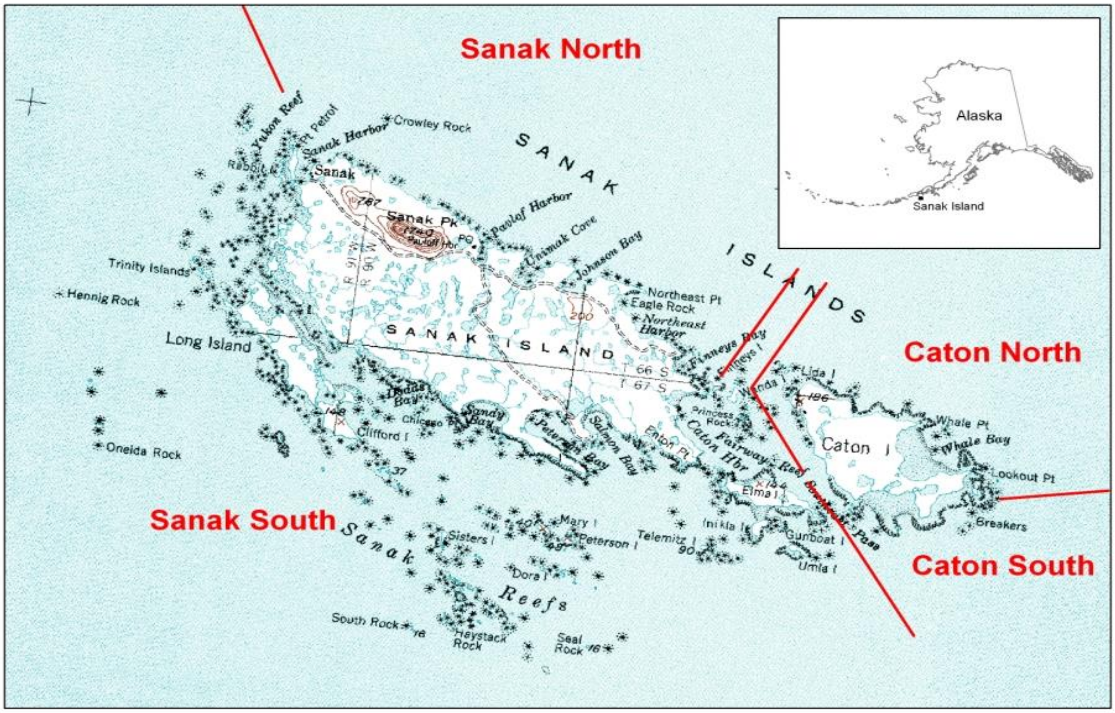

Figure 2. Pacific brant survey by segment in the Sanak Islands.

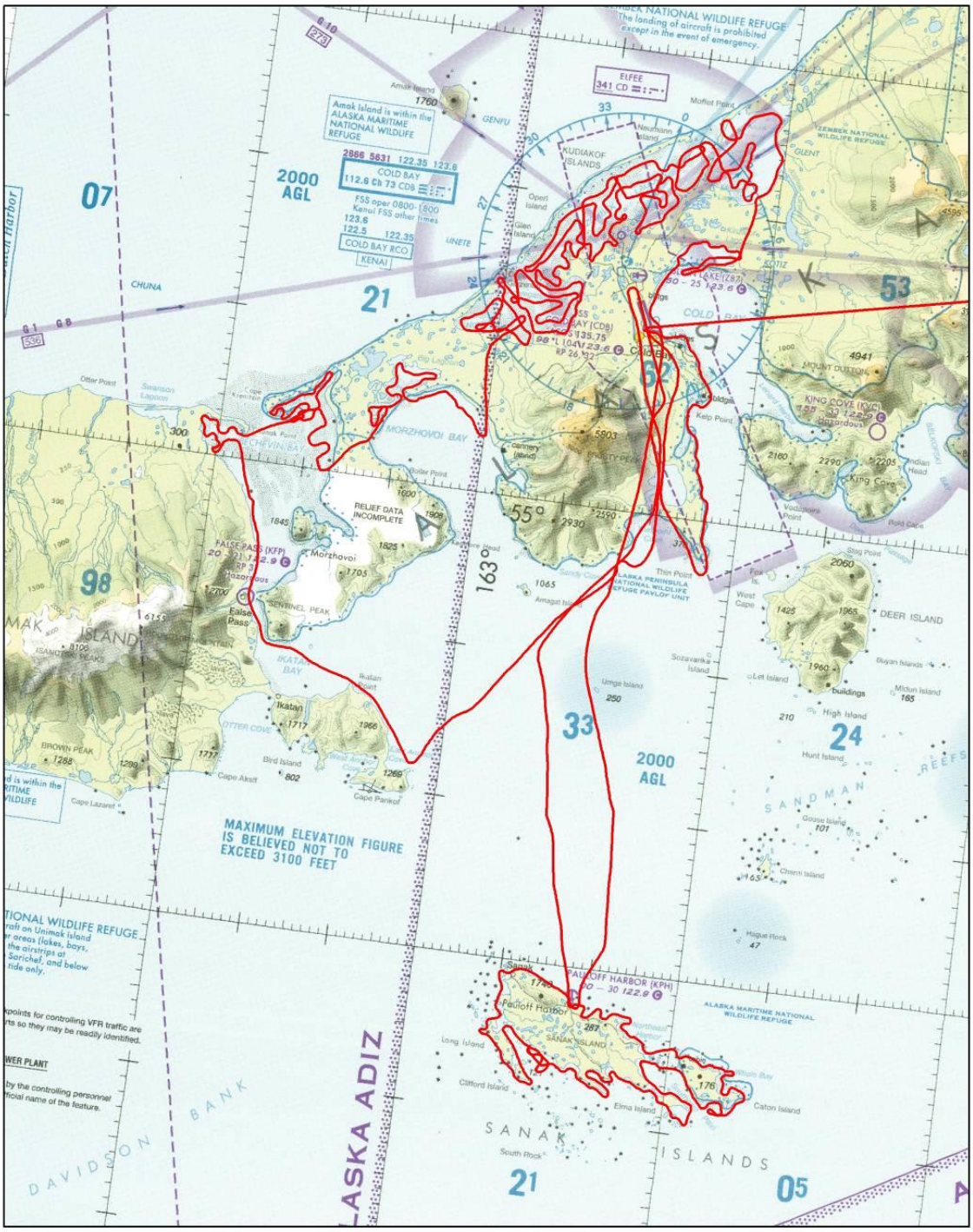

Figure 3. Aircraft track for January 28, 2014, showing survey path for the Izembek Complex and Sanak Islands.

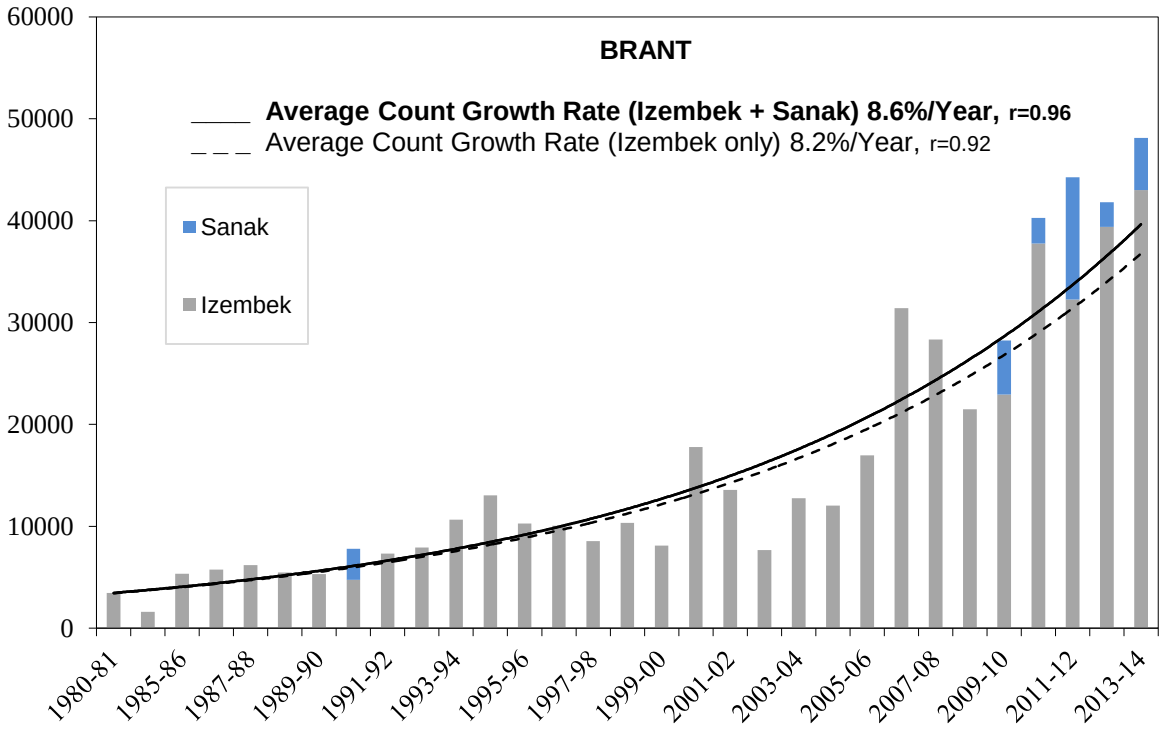

Figure 4. Trends in the Alaska component of the Pacific Flyway Midwinter index for brant (1981-2014). Annual totals represent averages of within-year replicates at Izembek (grey bars), plus counts at the Sanak Islands, Alaska (blue bars).

Table 1a. Waterbird and mammal observations by segment, Izembek NWR Complex, 27 January 2014.

	SEGMENT NUMBER											
SPECIES	60	61	62	63	64	65	67	68	80	81	85	**TOTAL**
Bald Eagle				1				3		2		**6**
Brant	3398	9627	5873	3685	1465	25904	216	59			30	**50257**
Black Scoter	38	384	60	715	147	134	171	40	5	122	61	**1877**
Emperor Goose	825			50	758	840				135	601	**3209**
Greater Scaup						400						**400**
Harlequin Duck					15		10				45	**70**
Harbor Seal					300					2		**302**
Large gull ssp.	270	1	2	1			7	1	8	31	23	**344**
Long-tailed Duck	159	185	95	15	183	41			5	7	10	**700**
Mew Gull	30	13										**43**
Northern Pintail	30										5	**35**
Pacific Loon											1	**1**
P. Cormorant							1					**1**
R-b. Merganser	18	28	1	7	68		27	77	8		74	**308**
Sea Otter	26	10	181	61	230	55	40	7			4	**614**
Sm. Shorebird ssp.									300		50	**350**
Steller's Eider	5728	3885	2391	2620	5094	3469	50	461			1056	**24754**
Tundra Swan		5				5						**10**
W-w. Scoter					1				5	3		**9**

Table 1b. Waterbird and mammal observations by segment, Izembek NWR Complex, 28 January 2014.

	SEGMENT NUMBER													
SPECIES	60	61	62	63	64	65	67	68	80	81	83	84	85	**TOTAL**
Bald Eagle					2	1			2					**5**
Bald Eagle (juv)									2					**2**
Brant	1540	12013	4630	2505	3753	11070	20	12	180	18		14	10	**35765**
Black Scoter	15	81	528		231	313	95	94	256	91	518	148	80	**2450**
Bufflehead													20	**20**
Common Eider		1	10				15	3		8		80	10	**127**
C. Goldeneye			10				30							**40**
Common Loon									1				2	**3**
D-c. Cormorant											8			**8**
Emperor Goose	1757				98	2084			323		361	65	529	**5217**
Greater Scaup						1850								**1850**
Harlequin Duck								6	35		95	30	56	**222**
Harbor Seal					40									**40**
King Eider							45	15						**60**
Large gull ssp.	603	206	206	3	4	4	61	22	28	5	16	6	22	**1186**
Long-tailed Duck	1147	612	160	178	1204	822	154	274	73	21	295	17	19	**4976**
Mallard	6		30		30			85			10			**161**
Mew Gull								5						**5**
Northern Pintail	150												20	**170**
Pacific Loon									1					**1**
P. Cormorant											6	1		**7**
R-b Merganser	2	110	11	30	113	82	153	64	120		18	9	174	**886**
Sea Otter	3	8	144	20	189	22	110	492	1	17	10	12	11	**1039**
Sm. Shorebird ssp.				600							170			**770**
Steller's Eider	7016	11727	6423	2250	5920	9996	128	557	310	30	65	20	634	**45076**
Tundra Swan	10									10		3		**23**
W-w. Scoter										30	19	7		**56**

Table 2. Waterbird and mammal observations by segment, Sanak Islands, 28 January 2014.

SPECIES	Caton North	Caton South	Sanak North	Sanak South	TOTAL
Am. Wigeon		15			**15**
Bald Eagle			5	8	**13**
Brant	1788	1722		1619	**5129**
B. Oystercatcher	30	54	45	81	**210**
Black Scoter	10	354	13	1596	**1973**
Common Loon			1	2	**3**
Cattle[1]				96	**96**
Common Raven		10		1	**11**
D-c Cormorant				3	**3**
Emperor Goose	820	1191	267	1852	**4130**
Greater Scaup				230	**230**
Harlequin Duck	10	251	11	597	**869**
Harbor Seal		20			**20**
Horse[1]				30	**30**
Large gull ssp.	13	6	2	129	**150**
L-t Duck	3			2	**5**
Mallard		6			**6**
N. Pintail	110	50			**160**
P. Cormorant		22	9	63	**94**
R-b Merganser	2	2		63	**67**
Sea Otter				7	**7**
Small shorebird spp.		600	50	230	**880**
Steller's Eider	1120	715	80	422	**2337**
W-w Scoter				27	**27**

[1] Cattle and horses counted only by the right front observer.

Appendix 1. Summary of aerial survey data of the Sanak islands, Alaska[1].

Species	2010			2011 [3]			2012			2013			2014		
	Sanak	Caton	**Total**	Sanak	Caton	**Total**	Sanak	Caton	**Total**	Sanak	Caton	**Total**	Sanak	Caton	**Total**
Am. Wigeon	10	0	**10**				0	0	**0**	0	0	**0**	0	15	**15**
Bald Eagle	36	4	**40**				20	2	**22**	17	2	**19**	13	0	**13**
Bald Eagle (juv)	8	4	**12**				21	0	**21**	3	0	**3**	0	0	**0**
Brant	3871	1432	**5303**	1237	1280	**2517**	6103	5893	**11996**	543	1870	**2413**	1619	3510	**5129**
B-l Kittiwake	0	0	**0**				0	0	**0**	0	0	**0**	0	0	**0**
Black Oystercatcher	729	159	**888**				260	93	**353**	94	10	**104**	126	84	**210**
Black Scoter	1914	676	**2590**				396	17	**413**	1592	183	**1775**	1609	364	**1973**
Bufflehead	80	61	**141**				2	22	**24**	155	3	**158**	0	0	**0**
Canada Goose[2]	0	0	**0**				0	0	**0**	0	0	**0**	0	0	**0**
Cattle [5]	914	0	**914**				642	0	**642**	538	0	**538**	96	0	**96**
Common Eider	0	0	**0**				0	0	**0**	0	0	**0**	0	0	**0**
Common Loon	12	2	**14**				1	0	**1**	0	0	**0**	3	0	**3**
Common Merganser	3	0	**3**				15	0	**15**	0	0	**0**	0	0	**0**
Common Murre	0	0	**0**				0	0	**0**	0	0	**0**	0	0	**0**
Common Raven	0	40	**40**				13	1	**14**	8	0	**8**	1	10	**11**
D-c. Cormorant	0	0	**0**				0	0	**0**	0	0	**0**	3	0	**3**
Eider ssp.	0	0	**0**				0	0	**0**	0	0	**0**	0	0	**0**
Emperor Goose	5737	1638	**7375**	1910	718	**2628**	6250	2598	**8848**	1573	1869	**3442**	2119	2011	**4130**
Gadwall	0	0	**0**				0	0	**0**	0	0	**0**	0	0	**0**
Goldeneye ssp.	11	45	**56**				1	0	**1**	0	0	**0**	0	0	**0**
Greater Scaup	301	65	**366**				3	215	**218**	80	0	**80**	230	0	**230**
Harlequin Duck	2778	1528	**4306**				2084	625	**2709**	1183	734	**1917**	608	261	**869**
Harbor Seal	197	76	**273**				200	0	**200**	90	0	**90**	0	20	**20**
Horned Puffin	0	0	**0**				0	0	**0**	0	0	**0**	0	0	**0**
Horse [5]	53	0	**53**				13	0	**13**	17	0	**17**	30	0	**30**
King Eider	0	0	**0**				10	0	**10**	0	0	**0**	0	0	**0**
Large gull ssp.	203	28	**231**				210	188	**398**	650	547	**1197**	131	19	**150**
Long-tailed Duck	63	3	**66**				13	0	**13**	31	6	**37**	2	3	**5**
Mallard	633	33	**666**				57	310	**367**	44	0	**44**	0	6	**6**

Appendix 1 (con'd). Summary of aerial survey data of the Sanak islands, Alaska[1].

Species	2010			2011 [3]			2012			2013			2014		
	Sanak	Caton	**Total**	Sanak	Caton	**Total**	Sanak	Caton	**Total**	Sanak	Caton	**Total**	Sanak	Caton	**Total**
Mew Gull	0	0	**0**				0	0	**0**	35	0	**35**	0	0	**0**
Northern Pintail	45	170	**215**				2110	475	**2585**	0	0	**0**	0	160	**160**
Northern Shoveler	0	60	**60**				0	0	**0**	0	0	**0**	0	0	**0**
Pacific Loon	1	0	**1**				0	0	**0**	0	0	**0**	0	0	**0**
Pelagic Cormorant	783	397	**1180**				363	49	**412**	74	69	**143**	72	22	**94**
Puddle duck ssp.	0	0	**0**				0	0	**0**	0	0	**0**	0	0	**0**
Puffin ssp.	0	0	**0**				0	0	**0**	0	0	**0**	0	0	**0**
R-b Merganser	558	187	**745**				35	8	**43**	246	65	**311**	63	4	**67**
Red-necked Grebe	2	0	**2**				0	0	**0**	0	0	**0**	0	0	**0**
Scoter spp.	0	0	**0**				0	0	**0**	0	0	**0**	0	0	**0**
Sea Otter	2	1	**3**				0	0	**0**	3	0	**3**	7	0	**7**
Shorebird (ROSP)	1530	510	**2040**				940	9005	**9945**	121	1685	**1806**	280	600	**880**
Steller's Eider	2054	3173	**5227**	345	742	**1087**	4063	2394	**6457**	115	123	**238**	502	1835	**2337**
Tufted Puffin	0	0	**0**				0	0	**0**	0	6	**6**	0	0	**0**
Tundra Swan	29	0	**29**				20	0	**20**	0	0	**0**	0	0	**0**
Steller's Sealion	0	48	**48**				0	0	**0**	0	0	**0**	0	0	**0**
Whimbrel	10	0	**10**				0	0	**0**	7	0	**7**	0	0	**0**
W. Ptarmigan	0	0	**0**				0	0	**0**	2	0	**2**	0	0	**0**
White-winged Scoter	164	4	**168**				10	0	**10**	30	0	**30**	27	0	**27**

[1] 22 March 1970 (McKnight 1971); 15 February 1991 (Dau and Chase 1995);

[2] Possibly brant misidentified as Canada geese.

[3] Other species data missing.

[4] In 2014, cattle and horses counted only by observer.