

AERIAL SURVEY OF EMPEROR GEESE AND OTHER WATERBIRDS

IN

SOUTHWESTERN ALASKA,

FALL 2011

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# AERIAL SURVEY OF EMPEROR GEESE AND OTHER WATERBIRDS IN SOUTHWESTERN ALASKA, FALL 2011

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**Abstract:** This report presents results of the 33<sup>rd</sup> consecutive fall emperor goose population survey in southwestern Alaska. The 2011 fall emperor goose estimate is 62,561 birds. As in 2010, with the exception of bays near Cold Bay, weather conditions precluded surveying the south side of the Alaska Peninsula east of Cold Bay so the most recent 3-year average of 2,420 was included in our estimate for segments not flown. The aerial survey was flown on 27-28 and 30 September 2011 from Chagvan Bay to Bechevin Bay including all of the north side of the Alaska Peninsula and the south side Alaska Peninsula west of Cold Bay. All species of waterbirds and marine mammals were counted with emphasis on emperor geese, Pacific brant, Canada geese, and Steller's eiders. Total counts for Pacific brant, Canada geese, and Steller's eiders were 122,051, 26,872 and 36,581, respectively. One additional replicate survey of the Izembek National Wildlife Refuge (NWR) area was flown on 1 October to aid in estimating sizes of the Pacific brant and Canada goose populations. Averages counts for the Izembek area (n=2 surveys) were 126,028 Pacific brant and 23,165 Canada geese.

Key words: aerial survey, emperor geese, waterbirds, southwestern Alaska.

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## INTRODUCTION

Fall distribution, abundance, and population trends of emperor geese and other waterbirds at migratory staging areas throughout southwestern Alaska have been annually monitored since 1979. Data from this survey are used to expand photographic estimates of emperor goose production (i.e. percent juveniles) based on the proportional distribution of the population at various fall staging locations. A similar aerial survey for emperor geese is conducted during spring migration each year that serves as the principal population metric for management of emperor geese (Dau and Mallek 2012). Pacific brant observations (almost entirely within the Izembek area) are also recorded during the fall emperor goose survey and provide an estimate of the fall population of Pacific brant.

## METHODS

The survey was flown using a USFWS amphibious configured Quest Kodiak aircraft (N736) at an airspeed of approximately 175 km/hr (95 kts) and an altitude of 45m (150 feet) above sea level. Observations were made from both sides of the aircraft and voice recorded into two panel mounted computers. Computer programs developed by Jack Hodges (USFWS-MBM, Juneau) were used to collect and transcribe these data.

Coastline segments were usually flown 100 m offshore with deviations seaward to within 1.6 km (1 mile) of shorelines to confirm species identification and numbers. In estuaries, a systematic but meandering flight path was followed. The aircraft flight path was monitored on a computer moving map program to help ensure complete coverage of nearshore and estuarine habitats. Aircraft survey navigation was accomplished by using 8.5" x 11" paper maps at a scale of 1:250,000. Whenever possible, flights over estuaries were conducted with <20 kts of wind.

The maximum survey area included 143 shoreline/estuarine segments (Figures 1-2) which were previously described by Mallek and Dau (2000). In 2011, Segments 20 and 22 were flown on 27 September, Segments 34-59 on 28 September and Segments 60-68 and 80-85 on 30 September. One

additional survey of Izembek Lagoon and other estuaries adjacent to Izembek NWR was flown on 1 October and used to provide an average population estimate of Pacific brant. General observations of habitat and survey conditions including wind speed and direction, temperature, sky condition, visibility, and tide stage were recorded en route during all surveys.

## SURVEY CONDITIONS

27 September: Survey conditions at Chagvan Bay (Segment 20) and Nanvak Bay (Segment 22) were good with occasional glare and  $\geq 20$  miles visibility. Sky condition was 5,000 feet scattered with a northwest wind of 15 kts. Air temperature was approximately 45° F.

28 September: From the Naknek River (Segment 34) south to Ugashik Bay (Segment 38) the sky condition was 5,000 feet scattered to broken with light and variable winds. The tide was mid and flooding. South to Seal Islands Lagoon (Segment 47) the tide was high and wind varied from west to west-northwest at 15-20 kts. Port Moller and Nelson Lagoon (Segment 50-57, 551-552) tides were mid and ebbing with southwest winds at 10 kts. Sky condition was 4,000 feet broken to overcast and visibility was good throughout the day with an air temperature of approximately 40° F.

30 September: Survey conditions in the Izembek NWR area (Segments 60-68, 80-85) were sky condition of 3,000 feet overcast with occasional light rain and a northwest wind increasing from 15 kts to 20 kts with gusts to 28 kts. Visibility was good and the air temperature was 44° F. Tides were high on the Bering Sea side of the Alaska Peninsula and low on the Pacific Ocean side of the Alaska Peninsula.

1 October: Survey conditions in the Izembek NWR area (Segments 60-65, 84-85) were sky condition of 4,000 feet to 5,000 feet overcast with light mist in Moffet Bay (Segment 60), otherwise visibility was good and the wind was north-northwest at 10-20 kts. The air temperature was 43° F. Tides were high on the Bering Sea side of the Alaska Peninsula and mid on the Pacific Ocean side of the Alaska Peninsula.

## RESULTS/DISCUSSION

The totals for all species observed during the survey are summarized in Table 1. Estimates of emperor goose population sizes (1979-2011) and corresponding 3-year averages are summarized in Table 2. Figure 3 depicts the 33-year population trend for fall staging emperor geese.

### Emperor Goose

The 2011 fall population of emperor geese was estimated at 62,561, which includes 60,141 birds observed during the survey plus 2,420 birds estimated for south side Alaska Peninsula segments not flown in 2011 (i.e. the most recent 3-year average). North Alaska Peninsula staging sites (Segments 34-65) contained 56,596 emperor geese, which accounted for 90.5% of the total population estimate. A very small proportion of the population ( $\leq 0.02\%$ ) was historically observed in segments along the north coast of Bristol Bay during previous year's surveys so these areas have not been included in the survey since 2005. The 2011 population estimate is 4.4% above the 59,924 observed in 2010 but the current 3-year population average of 67,377 is 7.2% below the previous 3-year average of 72,591 (Table 2). The

long-term fall population trend is highly variable and indicates no significant change (Figure 3). However, the 2011 population estimate is 16.2% below the 32-year average of 74,623 for this survey (1979-2010, MBM R7 files) (Table 2).

Numbers and proportions of emperor geese at primary staging sites along the Alaska Peninsula in 2011 were as follows: Egegik Bay 1,001 (1.6%, Segments 36-37); Ugashik Bay 616 (1.0%, Segment 38); Cinder River Estuary 16,975 (27.1%, Segments 39-43); Port Heiden 6,196 (9.9%, Segments 44-45); Seal Islands 16,087 (25.7%, Segment 46-47); Nelson Lagoon and adjacent estuaries 14,012 (22.4%, Segments 50-58, 551-552); Izembek Lagoon and adjacent estuaries 5,220 (8.3%, Segments 60-68 and 80-85); Cold Bay to Wide Bay estimate (3-year avg.) 2,420 (3.9%, Segments 86-137).

### Pacific Brant

A total of 122,051 Pacific brant was observed during the emperor goose survey of which >99% (121,821) were in Izembek Lagoon and adjacent estuaries. A replicate count of Izembek Lagoon and adjacent estuaries conducted on 1 October was 130,234. The average fall brant population size in the Izembek area was 126,028 based on these two surveys. The 2011 average count was 3.1% below the 2010 estimate of 130,091 (n= 3 surveys) and 5.7% below the 36-year average fall count of 133,632 (1975-2010, MBM R7 files).

### Canada Goose

We observed 26,872 Canada geese during the emperor goose survey with Izembek Lagoon and adjacent estuaries accounting for 83.1% (22,325) of the total birds observed. A replicate count of Izembek Lagoon and adjacent estuaries on 1 October provided an estimate of 24,005. The average Canada goose count estimated from these two surveys was 23,165. The 2011 average count was 5.8% below the 2010 estimate of 24,592 (n=3 surveys) and 44.2% below the 36-year average fall count of 41,490 (1975-2010, MBM R7 files).

### Steller's Eider

We observed a total of 36,581 Steller's eiders during the 2011 emperor goose survey, up 9.4% from the 2010 count of 33,434 and 40.4% below the 1979-2010 average of 61,424. The population trend of Steller's eiders indicates a 0.8%/year increase based on counts during the fall emperor goose survey (1979-2011, MBM R7 files).

Numbers and proportions of Steller's eiders at primary southwest Alaska estuarine staging sites were as follows: Chagvan Bay 959 (2.6%, Segment 20); Egegik Bay 400 (1.1%, Segments 36-37); Cinder River Estuary 275 (0.8%, Segments 40-42); Port Heiden 1500 (4.1%, Segments 44-45); Seal Islands 6,850 (18.7%, Segment 46-47); Nelson Lagoon and adjacent estuaries 23,785 (65.0%, Segments 50-58, 551-552); and Izembek Lagoon and adjacent estuaries 2,812 (7.7%, Segments 60-68 and 80-85).

A replicate Steller's eider count of Izembek Lagoon and adjacent estuaries on 1 October was 4,972. The average Steller's eider count for the Izembek area, based on the emperor goose survey estimate (2,812) and the single replicate (4,972), was 3,892. This estimate was 60.0% below the 2010 estimate of 9,742 (n= 4 surveys) and 81.5% below the 35-year average fall count of 21,087 (1975-2010, MBM R7 files).

*The findings and conclusions in this article are those of the author(s) and do not necessarily represent the views of the U.S. Fish and Wildlife Service.*

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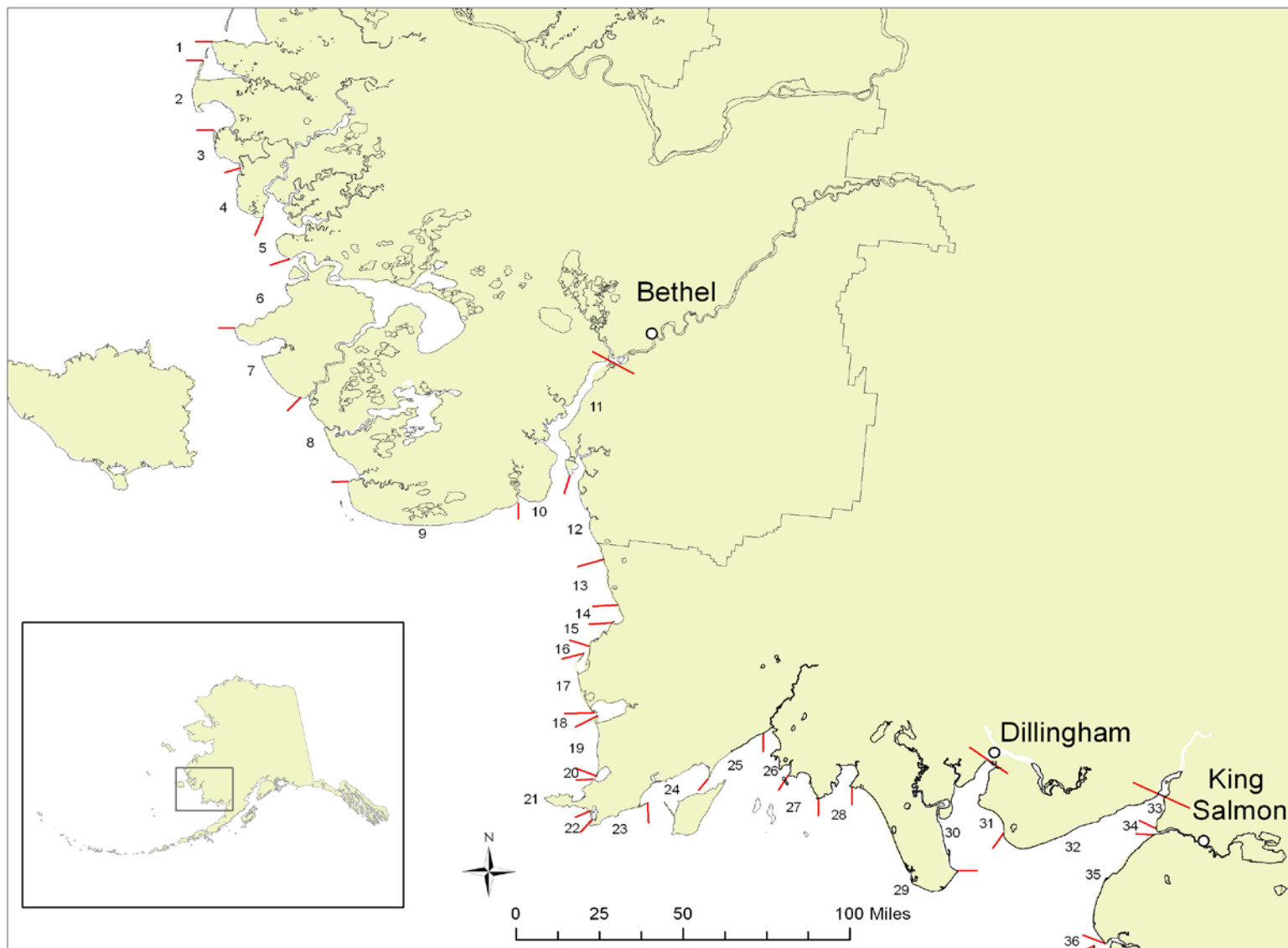


Figure 1. Map of emperor goose aerial survey segments 1-35 in southwest Alaska, 1992-2011

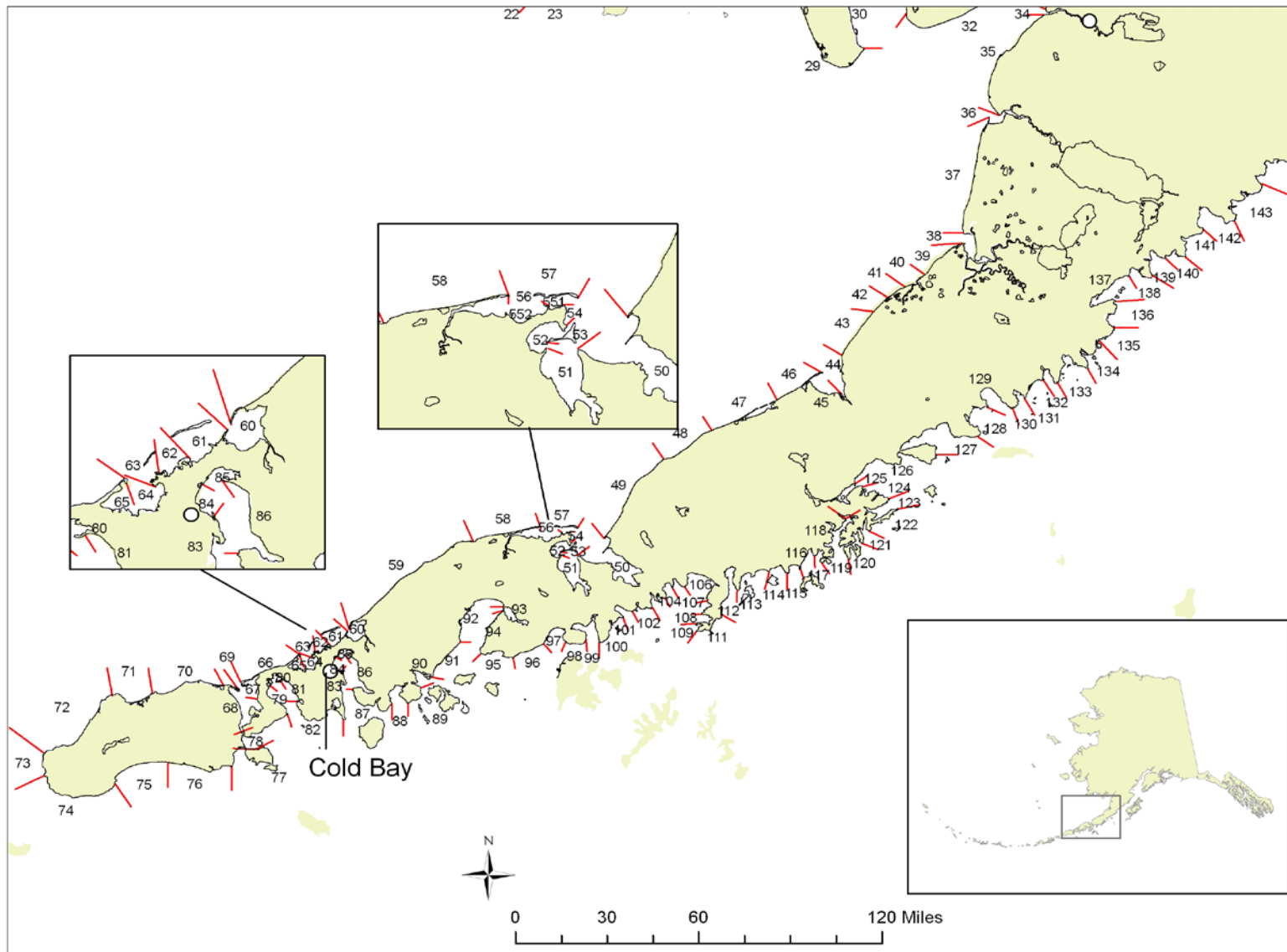


Figure 2. Map of emperor goose aerial survey segments 35-143 in southwest Alaska, 1992-2011.



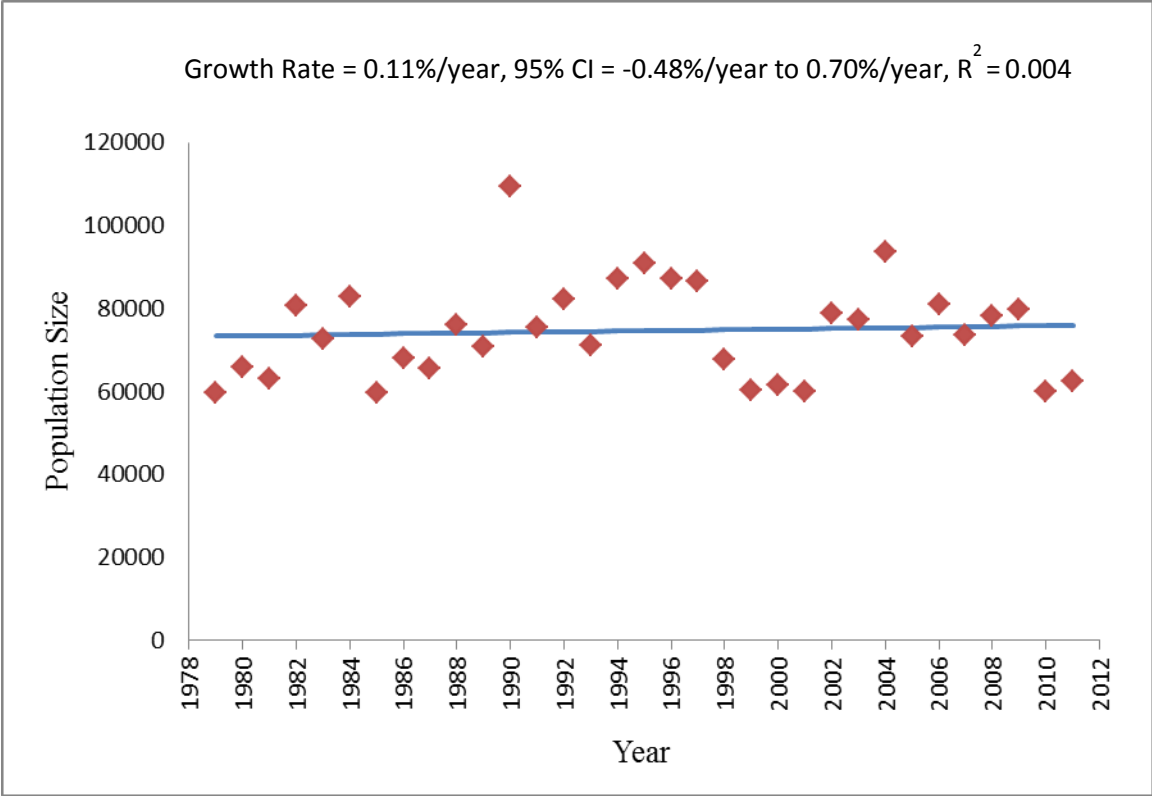


Figure 3. Fall emperor goose population estimates and trend, southwest Alaska. The estimated trend is not statistically significant.

Table 1. Waterbird and mammal observations by segment, southwest Alaska 27-28 and 30 September 2011.

SPECIES	20	22	34	35	36	37	38	39	40	41	42	43	44	45
American Green-winged Teal					600						700			
American Wigeon	175		2		450		5							200
Arctic Tern								1						
Bald Eagle adult														
Bald Eagle juvenile				1					1			1		
Pacific Brant	45	5							40				35	
Black-legged Kittiwake	375	950		100								4		
Black Scoter				29	300	1088		1031				51		
Brown Bear				1								1		1
Canada Goose	713	2850			70	60	335		6		90		150	115
Common Eider	3													
Common Raven		7	4	2			1				1			
Emperor Goose	15	6			888	113	616	2	13293		3644	36	2145	4051
Gadwall					50									
Greater Scaup	258		1	2137	345	10			10				20	
Harlequin Duck						3								
Harbor Seal	250													
King Eider														
Large gull	77	266	1560	413	1760	4	1805	38	960	7	272	560	245	4540
Long-tailed Duck														
Mallard	120		130	230	1703	50	250		660		50			100
Mew Gull		150		130	100		400					2		
Medium shorebird							700							
Northern Pintail	1210	350	190	1023	7888		1030		2470		540		205	14760
Northern Shoveler														10
Pacific Loon														
Pelagic Cormorant	4													
Red-breasted Merganser														1
Red-necked Grebe	100													
Red-throated Loon														
Sea Otter								1			1	1		1
Small gull			86	299	700	8	384		95			112		50
Small shorebird				400	1420		1580		5100		202		80	13120
Steller's Eider	959				400				75		200			1500
Surf Scoter														
Tundra Swan			350			4							10	
Walrus														
White-winged Scoter				106	600	20	250	3	1			26	2	

Blanks indicate zeros (0).

Table 1 (continued). Waterbird and mammal observations by segment, southwest Alaska 27-28 and 30 September 2011.

SPECIES	46	47	48	49	50	51	52	53	54	551	552	56	57	58	59
Am. Green-winged Teal															
American Wigeon										300					
Arctic Tern															
Bald Eagle adult							1				1				
Bald Eagle juvenile															
Pacific Brant							45			20					40
Black-legged Kittiwake	5	300	531	1884										31	50
Black Scoter	4033		900	1090		30	125		20			3000			251
Brown Bear		1		3											2
Canada Goose	18	15								125					
Common Eider													490		
Common Raven			1												
Emperor Goose	568	15519	13		2640	1242	2073	21	547	4607	2650	70	157	5	
Gadwall															
Greater Scaup															
Harlequin Duck															
Harbor Seal											180	390	155		125
King Eider				100				150							
Large gull	20	1312	249	380	858	410	935	3135	772	651	1491	1544	2	6	32
Long-tailed Duck															
Mallard		30			20					1060	850				
Mew Gull							350			625	425	2000			
Medium shorebird											300				
Northern Pintail	400	2955			5		150			7135	880				
Northern Shoveler															
Pacific Loon															3
Pelagic Cormorant				1				5							1
Red-breasted Merganser			15			4									
Red-necked Grebe															2
Red-throated Loon					1										3
Sea Otter					24	4	5	32			2	56	5	1	5
Small gull	195	925		550	10	40		155	20			640		90	479
Small shorebird	1	10680		5			23536			9400	1260	2040			
Steller's Eider		6850						750	2800	5400	5485	9050	300		
Surf Scoter						20									
Tundra Swan		2													
Walrus	1		755												
White-winged Scoter			4										1		57

Blanks indicate zeros (0).

Table 1 (continued). Waterbird and mammal observations by segment, southwest Alaska 27-28 and 30 September 2011.

SPECIES	60	61	62	63	64	65	66	67	68
American Green-winged Teal									
American Wigeon									
Arctic Tern									
Bald Eagle adult									
Bald Eagle juvenile								1	
Pacific Brant	12055	27768	9907	10845	26588	26000		48	1265
Black-legged Kittiwake	2	125	50				5		10
Black Scoter							393		
Brown Bear	3								
Canada Goose	11457	350	623	150	300	4550			995
Common Eider									
Common Raven									
Emperor Goose	833	205	433	225			5	81	1192
Gadwall									
Greater Scaup									
Harlequin Duck							40		
Harbor Seal									
King Eider									
Large gull	2235	822	1000	1400	900	350	473	4	43
Long-tailed Duck							30		
Mallard									125
Mew Gull									
Medium shorebird									
Northern Pintail	1600		200						
Northern Shoveler									
Pacific Loon								1	
Pelagic Cormorant				1	4		6		1
Red-breasted Merganser				2					
Red-necked Grebe							3		
Red-throated Loon									
Sea Otter	10	14	1	2	10	4	7	3	7
Small gull	300	300					25		
Small shorebird		140	200	700	400		20	1000	
Steller's Eider	2102	210				500			
Surf Scoter									
Tundra Swan									
Walrus									
White-winged Scoter							195		

Blanks indicate zeros (0).

Table 1 (continued). Waterbird and mammal observations by segment, southwest Alaska 27-28 and 30 September 2011.

SPECIES	80	81	82	83	84	85	Total
American Green-winged Teal							1300
American Wigeon							1132
Arctic Tern							1
Bald Eagle adult		2		1		1	6
Bald Eagle juvenile							4
Pacific Brant	5315			25		2005	122051
Black-legged Kittiwake							4422
Black Scoter					10	4	12355
Brown Bear							12
Canada Goose	3420					480	26872
Common Eider							493
Common Raven							16
Emperor Goose	154	323	19	1428	157	165	60141
Gadwall							50
Greater Scaup							2781
Harlequin Duck		8		34	20	10	115
Harbor Seal						25	1125
King Eider							250
Large gull	158	32	22	1106	13	409	33271
Long-tailed Duck							30
Mallard							5378
Mew Gull							4182
Medium shorebird							1000
Northern Pintail	350			150		225	43716
Northern Shoveler							10
Pacific Loon							4
Pelagic Cormorant		65		1			89
Red-breasted Merganser	107			16	10	10	165
Red-necked Grebe							105
Red-throated Loon							4
Sea Otter			2	1			199
Small gull		17					5480
Small shorebird					100	500	71884
Steller's Eider							36581
Surf Scoter							20
Tundra Swan	1						367
Walrus							756
White-winged Scoter					25		1290

Blanks indicate zeros (0).

Table 2. Fall emperor goose fall survey data, southwest Alaska, 1979-2011.

YEAR	TOTAL	3YR. AVG.	DATES	OBSERVERS	SURVEY AREA
1979	59808	NA	10/1-10/4	B.Conant/R.E.Gill, Jr.	North Alaska Peninsula only
1980	65971	NA	10/4-10/8	R.J. King/R.E. Gill, Jr.	North Alaska Peninsula only
1981	63156	62978	10/3-10/8	R.J. King/R.E. Gill, Jr./D.V. Derksen	Kuskokwim Bay south
1982	80608	69912	10/6-10/10	R.J. King/K.S. Bollinger	Kuskokwim Bay south
1983	72551	72105	10/10-10/16	R.J. King/D.V. Derksen	Kuskokwim Bay south
1984	82842	78667	10/3-10/8	"	Kuskokwim Bay south
1985	59790	71728	10/10-10/14	R.J.King/W.D. Eldridge	Kuskokwim Bay south
1986	68051	70228	10/5-10/11	"	Kuskokwim Bay south
1987	65663	64501	10/2-10/5	"	Kuskokwim Bay south
1988	76165	69960	10/7-10/12	"	Kuskokwim Bay south
1989	70729	70852	10/7-10/12	R.J. King/L. Denlinger	Kuskokwim Bay south
1990	109531	85475	10/17-10/19	R.J. King/A.W. Brackney	Kuskokwim Bay south
1991	75295	85185	10/3-10/8	"	Kuskokwim Bay south
1992	82295	89040	10/10-10/17	"	Kuskokwim Bay south
1993	71051	76214	10/23-10/26	R.J. King/D.A. Dewhurst	Alaska Peninsula only
1994	87086	80144	10/8-10/14	R.J. King/K. Laing	Kuskokwim Bay south
1995	91009	83049	10/14-10/20	R.J. King/K.S. Bollinger	Kuskokwim Bay south
1996	87018	88371	9/28-9/29	R.J. King/W.D. Eldridge	North Alaska Peninsula only <sup>1</sup>
1997	86669	88232	10/3-10/5	R.J. King/C.P. Dau	North Alaska Peninsula only <sup>1</sup>
1998	67744	80477	10/7-10/9	R.J. King/E.J. Mallek	Alaska Peninsula only
1999	60226	71546	10/1-10/5	E.J. Mallek/C.P. Dau	North Alaska Peninsula only <sup>1</sup>
2000	61626	63199	9/26-28,10/2	"	Kuskokwim Bay south
2001	59987	60613	9/26-28,10/1	"	Kuskokwim Bay south
2002	78692	66768	9/29-10/2	"	Kuskokwim Bay south
2003	77290	71990	9/27-10/2	"	Kuskokwim Bay south
2004	93544	83175	9/30-10/3	"	Kuskokwim Bay south
2005	73212	81349	10/4-10/8	"	Alaska Peninsula only
2006	81078	82611	9/26-9/28	"	Alaska Peninsula only
2007	73531	75940	9/26-10/3	"	North Alaska Peninsula only <sup>1</sup>
2008	78201	77604	9/26-9/28	"	Kuskokwim Bay south
2009	79647	77127	9/29-10/5	"	Kuskokwim Bay south
2010	59924	72591	9/30, 10/4	"	North Alaska Peninsula only <sup>1</sup>
2011	62561	67377	9/27-28,10/2	"	North Alaska Peninsula only <sup>1</sup>

<sup>1</sup> Average count of south side of the Alaska Peninsula used in estimate.