

AERIAL SURVEY OF EMPEROR GEESE AND OTHER WATERBIRDS
IN
SOUTHWESTERN ALASKA,
FALL 2003

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Abstract: The fall aerial emperor goose survey was conducted in southwest Alaska for the 25th consecutive year in 2003. Emphasis was on emperor geese, Pacific brant, Canada geese and Steller's eiders with populations estimated at 77,290, 139,349, 25,678, and 67,539, respectively. The survey was flown from 27 September to 2 October 2003 from Kuskokwim Bay to Wide Bay, along the north and south sides of the Alaska Peninsula. An amphibious Cessna 206 (N234JB), with a left seat pilot/observer and right seat observer, was flown at 150 feet ASL and 110 knots along the coastline and over estuaries to determine species composition and numbers of birds. Additional replicate surveys of the Izembek NWR area were flown on 26 September, 8 and 9 October to estimate sizes of the Pacific brant and Canada goose (135,944 and 32,886, respectively) populations.

Key words: aerial survey, emperor geese, southwest Alaska, waterbirds, waterfowl

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INTRODUCTION

This annual survey is designed to provide data on the distribution and abundance of emperor geese and other waterbirds during fall migratory staging in southwestern Alaska. These data are used to expand photographic estimates of emperor goose productivity (i.e. percent juveniles) based on the proportional distribution of the population at various fall staging locations. The survey includes coastline and estuarine habitats from Kuskokwim Bay south and west along the north side of the Alaska Peninsula to Unimak Island, and the south side of the Alaska Peninsula east to Wide Bay.

METHODS

The survey was flown using a amphibious Cessna 206 (N234JB) at a ground speed of approximately 110 knots and an altitude of 150 feet ASL along coastline and estuarine survey segments from Jacksmith Bay to Bechevin Bay, along the north side of the Alaska Peninsula, and east to Wide Bay along the south side of the Alaska Peninsula. Observations were made from both sides of the aircraft (left-pilot/observer; right-observer). Observations were voice recorded into two laptop computers, one for each observer, using remote microphones. The computers received input from the aircraft Global Positioning System (GPS) which saved coordinates for each observation using a program designed by John Hodges (USFWS-Waterfowl Management-Juneau).

The coastal flight path was usually 100 meters offshore with deviations to confirm species identification and numbers, normally within 1 mile of exposed shorelines. In estuaries, a systematic but meandering flight path was followed to ensure complete coverage. Surveys were conducted, whenever possible, with ambient surface winds less than 20 knots and when primary staging areas were at or near high tide which concentrates emperor geese along shorelines.

The survey area includes 143 shoreline/estuarine segments (Figures 1-2) described by Mallek and Dau (2000). Segments 14-29 were flown on 27 September, segments 35-59 on 28 September, segments 60-85 on 30 September, and segments 86-137 on 2 October. Segments 30-33 were not flown due to failing light conditions however, we don't believe this affected estimates of population size or distribution as few if any emperor geese have been seen in these segments in previous surveys. Additional surveys of Izembek Lagoon and other estuaries adjacent to the Izembek NWR were flown on 26 September (Larned and Anderson), 8 October (Mallek and Bollinger), and 9 October (2 surveys, Bollinger and Mallek; Bollinger and Dau) to estimate Pacific brant and Canada goose populations which seem to concentrate there as well as the number of local, molting/staging Steller's eiders. General observations of habitat and survey conditions including wind speed and direction, temperature, sky condition and visibility, as well as start and stop times and tide stage were recorded.

SURVEY CONDITIONS

27 September: Northeast winds of approximately 10 knots increased to east 25 knots then southeast 10 knots during the day. Sky conditions were 3,000 feet scattered with good visibility through segment 29. Segments 30-33 were not counted due to failing light conditions. Temperature was 45°F at the start of the survey.

28 September: Southeasterly winds gradually increased from 10 to 25 knots during the day. Sky conditions were 5,000 feet broken to overcast with good visibility. Temperatures ranged from 45 to 52°F. Light precipitation occurred from Port Moller to Cold Bay. Low to mid tides occurred from Egegik Bay to Seal Islands Lagoon. Tides were high from Port Heiden to Nelson Lagoon.

30 September: Winds were 5 knots from the southeast with overcast sky conditions during the day. Visibility was good and temperature was 54°F at the start of the survey. Tides were high in Izembek Lagoon, Kinzarof Lagoon, Morzhovoi Bay and Bechevin Bay.

2 October: Initially calm winds increased to east 15 knots during the day. Clear skies gradually lowered to 1,000 feet overcast. Visibility was good and temperature averaged 55°F.

RESULTS/DISCUSSION

The totals for all species observed during the survey are summarized by segment in Table 1. Figure 3 depicts the 25-year trend for fall staging emperor geese. Previous estimates of emperor geese (1979-2003) and corresponding 3-year averages are summarized in Table 2.

Emperor Goose

We estimated the fall emperor goose population at 77,290 birds. The 2003 population estimate is 2% below the 2002 estimate of 78,692 and 7% above the 3 year average (2001-2003) of 71,990. Numbers and proportions of emperor geese at primary staging sites were as follows: Egegik Bay 1,242 (2%, segments 36-37); Ugashik Bay 270 (0.3%, segment 38); Cinder River Estuary 17,664 (23%, segments 40-42); Port Heiden 11,371 (15%, segments 44-46); Seal Islands 17,655 (23%, segment 47); Nelson Lagoon 15,679 (20%, segments 551-552, 56-57); Izembek Lagoon and

adjacent estuaries 4,820 (6%, segments 60-65, 67-68, 80, 85); Canoe Bay 797 (1%, segment 93); Chignik Lagoon (0.7%, segment 125); and Wide Bay (0.9%, segment 137).

Pacific Brant

A total of 139,349 Pacific brant were observed during the 27 September to 2 October emperor goose survey of which 99.6% (138,841, segments 60-68 and 78-85) were in Izembek Lagoon and adjacent estuaries. Replicate surveys of Izembek Lagoon and adjacent estuaries flown on 26 September, 8 and 9 October (2 surveys), were 144,184, 139,571, 127,669, and 129,455, respectively, providing an average of 135,944 for the five surveys. The 2003 average for the Izembek area (135,944) is 17% above the 2002 fall average of 115,839 (n=5 surveys) and 6% above the 29 year average of 127,750 (1975-03, C. Dau, USFWS, unpubl. data).

Canada Goose

We observed a total of 25,678 Canada geese during the 27 September to 2 October emperor goose survey. Mild weather probably delayed migration and many Canada geese probably lingered north of the survey area. Additionally, Canada goose concentration areas were flown at high tide when most birds are roosting or feeding in uplands outside the survey area. These factors are believed to have contributed to lower than normal numbers of birds observed. Izembek Lagoon and adjacent estuaries accounted for approximately 67% (17,221) of the Canada geese observed from 27 September to 2 October. Replicate surveys of Canada geese in Izembek Lagoon and adjacent estuaries on 26 September, 8 and 9 October (2 surveys) estimated the Canada goose population at 31,337, 36,365, 43,610, and 35,898, respectively. The population average for the five surveys of the Izembek Lagoon area was 32,886 Canada geese which is 28% below the 2002 average (45,394, n=5 surveys) and is 24% below the 29 year average of 43,376 (1975-03) for the Izembek area (C. Dau, USFWS, unpubl. data).

Steller's Eider

We observed a total of 67,539 Steller's eiders during the 27 to 2 October survey. Numbers and proportions of Steller's eiders at primary staging sites were as follows: Chagvan Bay 2,474 (4%, segment 20); Cinder River Estuary 1,400 (2%, segments 40-42); Port Heiden 855 (1%, segments 44-46); Seal Islands 6,500 (10%, segment 47); Nelson Lagoon 36,595 (54%, segments 551-552, 56-57); and Izembek Lagoon and adjacent estuaries 18,282 (27%, segments 60-65, 67-68, 80, 85). Replicate surveys for Izembek Lagoon and adjacent estuaries on 26 September, 8 and 9 October (2 surveys) were 6,124, 7,137, 10,250, and 7,280, respectively, providing an average of 9,815 for the five surveys. The average fall (September/October) population size for the Izembek Lagoon area is 21,976 (range 4,500-78,645) from 1975-03 (C. Dau, USFWS, unpubl. data).

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Figure 1. Map of emperor goose aerial survey segments 1-36 in southwest Alaska, 1992-2003.

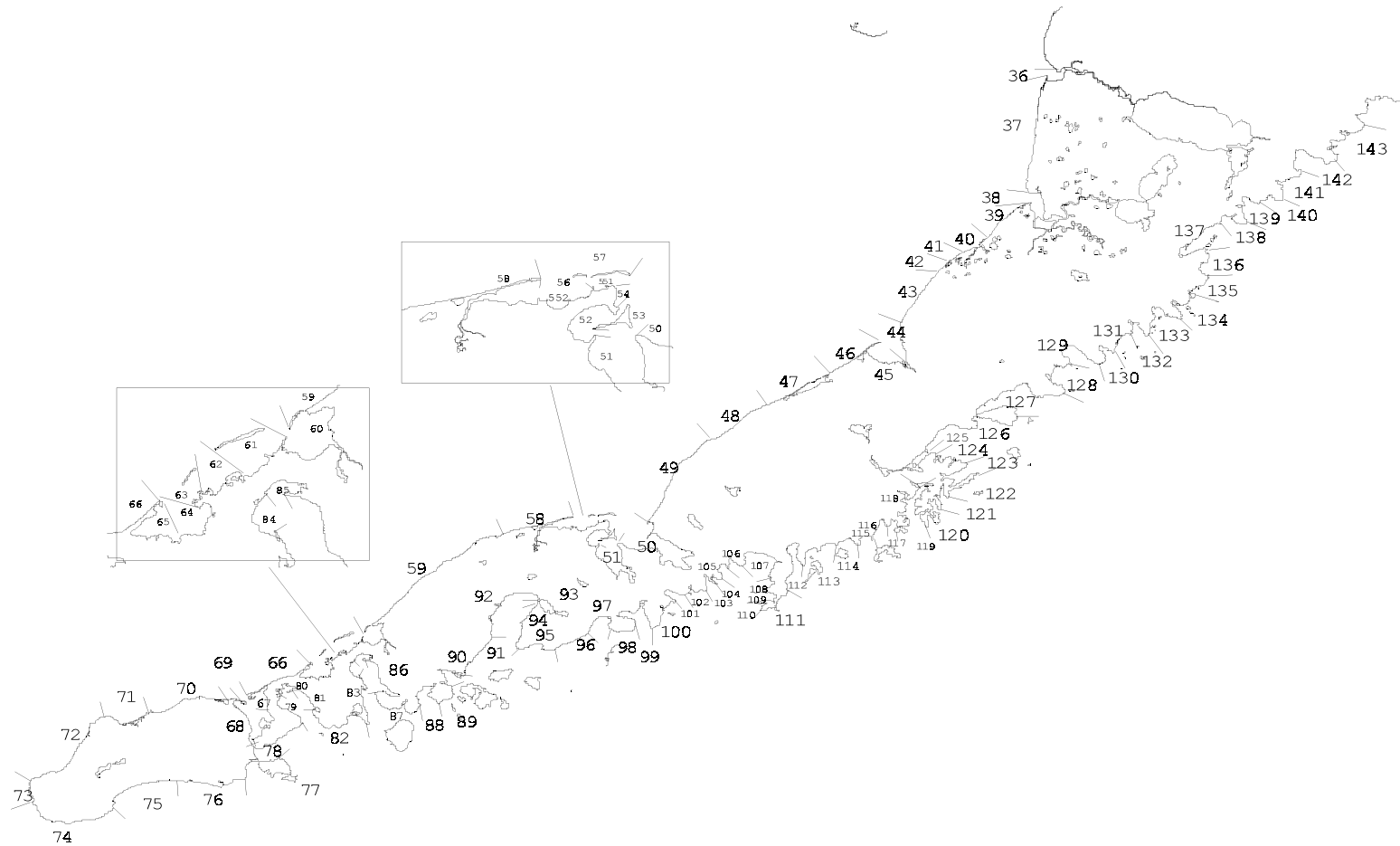


Figure 2. Map of emperor goose aerial survey segments 36-143 in southwest Alaska, 1992-2003.

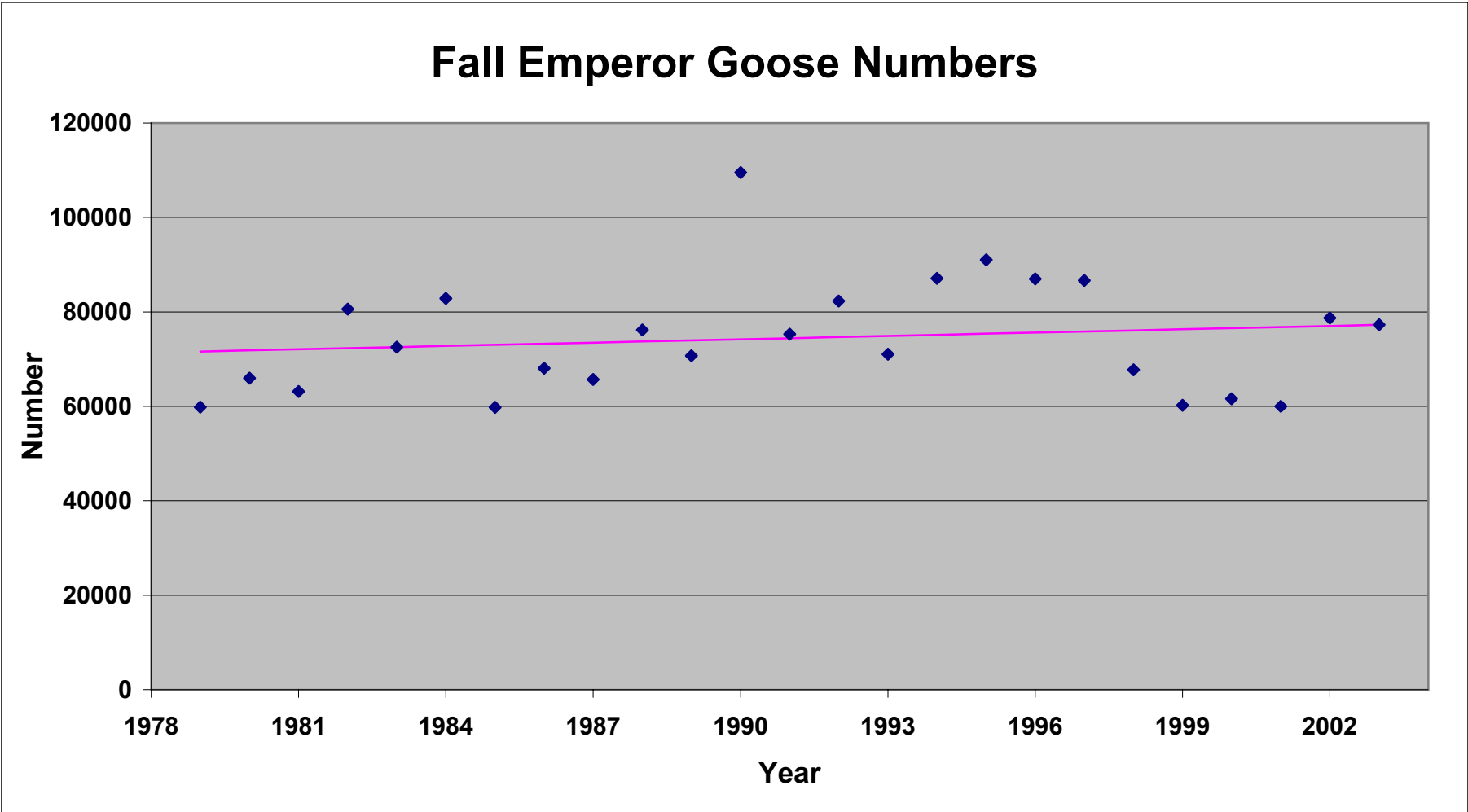


Figure 3. Twenty-five year trend of staging emperor geese in southwest Alaska. Mean = 74,435, P = 0.497.

Table 1. Waterbird and mammal observations by segment from southwest Alaska, 27 September - 2 October 2003.

SPECIES	14	15	16	17	18	19	20	21	22	23	24	25	26	27	29	34
American Green-winged Teal																
American Wigeon							130									3
Bald Eagle														1		1
Beluga Whale																
Black Scoter		270	4	3			470	111			65	10			310	
Brown Bear																
Canada Goose				50	102		2315		3205							
Common Eider				11			8	12	1		13					
Common Loon																
Common Murre																
Common Raven											1					
Cormorant spp.				2		4				1	5				2	
Coyote																
Emperor Goose					12		11									
Greater Scaup	220	45	755		48		2163		80		1633					2
Gray Whale																
Harbor Seal						350	350									
Harlequin Duck											15	11				
Jaeger spp.																
King Eider			1													
Large Gull	33	244	108	46	56	30	184	40	128	71	54	512	171	89	491	94
Long-tailed Duck																
Mallard	160		25		5		465									43
Northern Harrier					1											
Northern Pintail	635	83	425	20	470		3678		520							92
Pacific Brant					3		500									
Pacific Loon																
Red-breasted Merganser			40		65		152		125		5	78			31	
Red-necked Grebe											16					
Red-throated Loon			1	1						1	2				1	
Sea Otter																
Shorebird	20		128													6
Small Gull	121	213	87	6	1	1					1				1540	
Lesser Snow Goose																
Steller's Eider			45		178	50	2474		250		37		50			
Steller's Sealion																
Surf Scoter																
Tundra Swan	4															15
Tundra Swan cygnet																
Walrus																
White-winged Scoter			25			53	290	6		7	16	2			202	

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 27 September - 2 October 2003.

SPECIES	35	36	37	38	39	40	41	42	43	44	45	46
American Green-winged Teal											200	
American Wigeon		10										
Bald Eagle			1							2		
Beluga Whale				1								
Black Scoter	1101	3	1346	115	1270	1			409		75	2629
Brown Bear												
Canada Goose		325		450						1710	10	
Common Eider											45	
Common Loon												
Common Murre												
Common Raven			1									
Cormorant spp.			1	4					1			
Coyote												
Emperor Goose		1242		270		14914		2750		1221	8765	1385
Greater Scaup	490	475		40							150	
Gray Whale			1									
Harbor Seal	85	15									150	
Harlequin Duck												
Jaeger spp.											1	
King Eider									10			210
Large Gull	442	1466	128	1445	160	2442		129	154	815	2520	238
Long-tailed Duck			270									
Mallard		86		1625		70				205	50	
Northern Harrier												
Northern Pintail		2219		3625		965		100		150	3175	
Pacific Brant												
Pacific Loon												
Red-breasted Merganser	47	3	5	100		23			6	38	30	10
Red-necked Grebe										1		
Red-throated Loon			1									
Sea Otter	2											
Shorebird	10	1353		2130		1550				1945	11460	
Small Gull	261	25	10	25	22				20	3	446	
Lesser Snow Goose												
Steller's Eider						1400					855	
Steller's Sealion												
Surf Scoter	29	125	194									
Tundra Swan										2		
Tundra Swan cygnet										5		
Walrus												
White-winged Scoter	10		682	3	27	40			16	6		

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 27 September - 2 October 2003.

SPECIES	47	48	49	50	51	52	53	54	551	552	56	57	58
American Green-winged Teal									200	670			
American Wigeon										220			
Bald Eagle				1					2		2		
Beluga Whale													
Black Scoter		1615	483	95	1752	15	550	570	2203		1070	400	1485
Brown Bear													
Canada Goose								20		70			
Common Eider										50	307	700	
Common Loon													
Common Murre													
Common Raven													
Cormorant spp.			2								30		1
Coyote													
Emperor Goose	17655	10		1164	79	1468		20		7254	2795	5630	1960
Greater Scaup									350				
Gray Whale													
Harbor Seal			14										
Harlequin Duck			8										
Jaeger spp.													
King Eider		800											
Large Gull	3696	225	166	854	220	974	10	150	171	5823	6656	670	790
Long-tailed Duck													
Mallard					3				60	35			
Northern Harrier													
Northern Pintail	675					350			805	1565			
Pacific Brant								5					
Pacific Loon			2										
Red-breasted Merganser									3	10			
Red-necked Grebe													
Red-throated Loon													
Sea Otter				24	95	1	21		2		5		1
Shorebird	700			75		35045			250	5235	3913		
Small Gull	75	167	329	87				125		376			51
Lesser Snow Goose	2												
Steller's Eider	6500					33		790	2074	14216	19605	700	
Steller's Sealion													
Surf Scoter			2										
Tundra Swan										2			
Tundra Swan cygnet													
Walrus		450											
White-winged Scoter		10	110	10	12	1		15	250				20

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 27 September - 2 October 2003.

SPECIES	59	60	61	62	63	64	65	66	67	68	79	80	81
American Green-winged Teal													
American Wigeon			275										
Bald Eagle							2	1	1	1	1		1
Beluga Whale													
Black Scoter	622							968	65			150	70
Brown Bear													
Canada Goose	200	13072	2465	15	210	269	790			145			
Common Eider													
Common Loon													
Common Murre													
Common Raven													
Cormorant spp.					59	3		2	21				266
Coyote													
Emperor Goose		929	1112	394					313	644		496	364
Greater Scaup									60				
Gray Whale													
Harbor Seal	245	4				500		1					1
Harlequin Duck	3		4		5			55				17	48
Jaeger spp.													
King Eider								275					
Large Gull	441	868	1574	1574	331	823	810	226	75	173	33	314	1142
Long-tailed Duck													
Mallard		375									5	67	
Northern Harrier													
Northern Pintail		12197	450			405	275		3				
Pacific Brant		6052	42308	8344	34155	21416	22673		539	574		2314	
Pacific Loon	2												
Red-breasted Merganser												1195	58
Red-necked Grebe								7					25
Red-throated Loon	2								2				
Sea Otter	6	117	97	101	8	183	24	23	161	41	2	1	
Shorebird		17060	820							125			20
Small Gull	78	476	150						147				28
Lesser Snow Goose													
Steller's Eider		5615	6900	2656	315	435	2298					50	
Steller's Sealion								2					
Surf Scoter													
Tundra Swan	2										7	3	
Tundra Swan cygnet													
Walrus													
White-winged Scoter	59							603					238

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 27 September - 2 October 2003.

SPECIES	82	83	84	85	86	88	90	91	92	93	94	95	96	97
American Green-winged Teal														
American Wigeon														
Bald Eagle	7				1	1	1	3	2	4	2		2	3
Beluga Whale														
Black Scoter	31	594	15	9	41	31	207		657	66	87			5
Brown Bear						1	3		1					
Canada Goose			145	110										
Common Eider														
Common Loon	3	9					6	1	22	2	7		1	
Common Murre														
Common Raven			2	6	1		3			2				
Cormorant spp.	27	24			2	2	2	34	206	2	99		4	10
Coyote								1						
Emperor Goose	22	792	29	932	5		37		378	797				
Greater Scaup														
Gray Whale														
Harbor Seal				132			60		30	106			1	8
Harlequin Duck	156	54	21	44	161	3	84	1	101	89	206		61	89
Jaeger spp.														
King Eider														
Large Gull	2132	883	212	524	685	2825	2354	348	449	1921	2330	1001	3210	270
Long-tailed Duck									8					2
Mallard			5	50						22				
Northern Harrier														
Northern Pintail				70						330				
Pacific Brant				466										
Pacific Loon					9				20		6			
Red-breasted Merganser		1960		380	246	60	3		280	1134	35			
Red-necked Grebe		1			38		6	47	343	3	71	7		37
Red-throated Loon								1						
Sea Otter	4	1		14	82	1			83	43	2		10	
Shorebird	62	10		175						100				
Small Gull	1051	55			19	71	58	111	471	152	397	300	10	485
Lesser Snow Goose														
Steller's Eider				13										
Steller's Sealion														
Surf Scoter						10			67		47	50		10
Tundra Swan								3						
Tundra Swan cygnet														
Walrus														
White-winged Scoter	42	5	1	10	64				2550	98	1249	2	30	55

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 27 September - 2 October 2003.

SPECIES	99	101	102	107	112	113	114	115	116	117	118	125	126	127	128	129
American Green-winged Teal												30				
American Wigeon												800				
Bald Eagle	2			3	3							1	11	6	5	4
Beluga Whale																
Black Scoter	25			58	15								10	45	12	45
Brown Bear		2														
Canada Goose																
Common Eider																
Common Loon	9		2	6									3	1		2
Common Murre											3					
Common Raven									1					1	3	1
Cormorant spp.	3	2	13	14	4	1		3	16		25	2	23	23	7	29
Coyote																
Emperor Goose					25							557		78	60	58
Greater Scaup												650				
Gray Whale																
Harbor Seal	30			37								30	3		7	3
Harlequin Duck	31		11		25	13						35	35	32	8	87
Jaeger spp.																
King Eider																
Large Gull	379	55	158	385	824	204	111	396	619	47	33	965	1150	320	408	181
Long-tailed Duck													56			
Mallard	35				507							150				
Northern Harrier																
Northern Pintail					125							800				
Pacific Brant																
Pacific Loon				5										1		
Red-breasted Merganser	55			95										30		
Red-necked Grebe	1	25		34	5				7	3				4	1	
Red-throated Loon																
Sea Otter							1					4	33	34	16	17
Shorebird																
Small Gull	176	239	3	171	39	42	140	122	207	37	100	91	1082	705	895	1
Lesser Snow Goose																
Steller's Eider																
Steller's Sealion		1														
Surf Scoter				27									15	90		
Tundra Swan					7							4				
Tundra Swan cygnet																
Walrus																
White-winged Scoter	10		10	2									2	11		3

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 27 September - 2 October 2003.

SPECIES	130	131	132	133	134	135	136	137	Grand Total
American Green-winged Teal									1100
American Wigeon									1438
Bald Eagle	1	1		1	1	11	1	10	104
Beluga Whale									1
Black Scoter		20		40	3	10	40	170	22541
Brown Bear							1	4	12
Canada Goose									25678
Common Eider									1147
Common Loon	1	1				3			79
Common Murre									3
Common Raven		7						1	30
Cormorant spp.	7	10	5	38	158	8	35	264	1515
Coyote									1
Emperor Goose							6	657	77290
Greater Scaup									7161
Gray Whale									1
Harbor Seal	3	1		10				1	2177
Harlequin Duck			1	4			26	22	1594
Jaeger spp.									1
King Eider									1296
Large Gull	14	606	635	1016	343	141	188	1176	70606
Long-tailed Duck									336
Mallard								100	4148
Northern Harrier									1
Northern Pintail								28	34235
Pacific Brant									139349
Pacific Loon	2								47
Red-breasted Merganser								275	6577
Red-necked Grebe			18						700
Red-throated Loon									12
Sea Otter	4	2		4			3	10	1283
Shorebird									82192
Small Gull	220	334	567	520	233	27	57	90	14214
Lesser Snow Goose									2
Steller's Eider									67539
Steller's Sealion									3
Surf Scoter				2				256	924
Tundra Swan									49
Tundra Swan cygnet									5
Walrus									450
White-winged Scoter		35	109					125	7126

Table 2. Emperor goose fall survey data, southwest Alaska, 1979-2003.

YEAR	TOTAL	3YR. AVERAGE DATES	SURVEY DATES	OBSERVERS	SURVEY AREA
1979	59,808	NA	10/1-4	B. Conant/R.E. Gill, Jr.	South Alaska Peninsula missing
1980	65,971	NA	10/4-8	R.J. King/R.E. Gill, Jr.	North Alaska Peninsula only
1981	63,156	62,978	10/3-8	R.J. King/R.E. Gill, Jr./D.V. Derksen	All
1982	80,608	69,912	10/6-10	R.J. King/K.S. Bollinger	All
1983	72,551	72,105	10/10-16	R.J. King/D.V. Derksen	All
1984	82,842	78,667	10/3-8	R.J. King/D.V. Derksen	All
1985	59,790	71,728	10/10-14	R.J. King/W.D. Eldridge	All
1986	68,051	70,228	10/5-11	R.J. King/W.D. Eldridge	All
1987	65,663	64,501	10/2-5	R.J. King/W.D. Eldridge	All
1988	76,165	69,960	10/7-12	R.J. King/W.D. Eldridge	All
1989	70,729	70,852	10/7-12	R.J. King/L. Denlinger	All
1990	109,531	85,475	10/17-19	R.J. King/A.W. Brackney	All
1991	75,295	85,185	10/3-8	R.J. King/A.W. Brackney	All
1992	82,295	89,040	10/10-17	R.J. King/A.W. Brackney	All
1993	71,051	76,214	10/23-26	R.J. King/D.A. Dewhurst	Alaska Peninsula only
1994	87,086	80,144	10/8-14	R.J. King/K. Laing	All
1995	91,009	83,049	10/14-20	R.J. King/K.S. Bollinger	All
1996	87,018	88,371	9/28-29	R.J. King/W.D. Eldridge	North Alaska Peninsula only [#]
1997	86,669	88,232	10/3-5	R.J. King/C.P. Dau	North Alaska Peninsula only [#]
1998	67,744	80,477	10/7-9	R.J. King/E.J. Mallek	Alaska Peninsula only
1999	60,226	71,546	10/1-5	C.P. Dau/E.J. Mallek	North Alaska Peninsula only [#]
2000	61,626	63,199	10/1-5	C.P. Dau/E.J. Mallek	Kuskokwim Bay south
2001	59,987	60,613	9/26-10/1	C.P. Dau/E.J. Mallek	Kuskokwim Bay south
2002	78,692	66,768	9/29-10/2	C.P. Dau/E.J. Mallek	Kuskokwim Bay south
2003	77,290	71,990	9/27-10/2	E.J. Mallek/C.P. Dau	Kuskokwim Bay south

[#] Previous south side of the Alaska Peninsula used in estimate.