

AERIAL SURVEY OF EMPEROR GEESE AND OTHER WATERBIRDS
IN
SOUTHWESTERN ALASKA,
FALL 2001

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Abstract: A fall aerial emperor goose survey was conducted on the Alaska Peninsula for the 23rd consecutive year in 2001. The survey was flown during 26-28 September and 1 October 2001. An amphibious Cessna 206 (N736), 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. Emphases were on emperor geese, Pacific brant, Canada geese and Steller's eiders with estimated populations of 59,987, 113,721, 44,468, and 88,391, respectively.

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) at various fall staging locations based on the proportional distribution of the population. The survey includes coastline and estuarine habitats from the Yukon-Kuskokwim Delta 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. In 2001 the survey began in southern Kuskokwim Bay and included the north and south sides of the Alaska Peninsula.

METHODS

The survey was flown using a amphibious Cessna 206 (N736) 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 False Pass 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-Migratory Bird 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 with ambient surface winds less than 20 knots and when possible, primary staging areas

were flown at or near high tide.

The survey area includes 143 shoreline/estuarine segments (Figures 1-2) described by Mallek and Dau (2000). Segments 14-32 were flown on 26 September, segments 33-59 on 27 September, segments 60-85 on 28 September and segments 86-137 on 1 October. An additional survey of Izembek Lagoon and adjacent estuaries was flown on 5 October (Chris Dau, USFWS-MBM-Anchorage and David Ward, USGS/BRD-ASC-Anchorage) to estimate Pacific brant and Canada goose populations which concentrate there. 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 by segment.

SURVEY CONDITIONS

26 September: Calm to light winds (<5 kts SE) with ceilings lowering gradually from 2500 to 700 feet overcast and corresponding visibility reducing from 30 to approximately 5 statute miles. Light rain occurred from Togiak to Naknek. Temperature held at around 45°F.

27 September: Initial calm winds gradually increased to 10 kts WSW during the day. Sky condition was \geq 2500 feet scattered with good visibility and 43°F. Mid-ebbing tides occurred in Egegik and Ugashik bays with low tides in Cinder River Lagoon, Port Heiden, and Seal Islands Lagoon. Tide was mid to low at Nelson Lagoon.

28 September: Winds were 5 kts NW during the day. Skies were clear with good visibility and 39°F. Mid to low tides occurred in Izembek Lagoon and Kinzarof Lagoon with high water in Bechevin and Morzhovoi bays.

1 October: Winds were 12-15 kts WSW during the day. Skies were clear with occasional glare restricting visibility. Visibility was good at Ivanof Bay, Chignik Lagoon, and Wide Bay where emperor geese were concentrated. Temperature was 43°F.

RESULTS/DISCUSSION

The totals for all species observed during the survey are summarized by segment in Table 1. Previous estimates of emperor geese (1979-2000) and corresponding 3-year averages are summarized in Appendix 1.

Emperor Goose

We estimate the fall emperor goose population at 59,987 birds. The 2001 population estimate is 3% below the 2000 estimate of 61,626 and 1% below the 3 year average (1999-2001) of 60,613. Average numbers and proportions of emperor geese at primary staging sites were as follows: Egegik Bay 1,644 (3%, segments 36-37); Ugashik Bay 594 (1%, segment 38); Cinder River Estuary 8,303 (14%, segments 40-42); Port Heiden 4,066 (7%, segments 44-46); Seal Islands 15,014 (25%, segment 47); Nelson Lagoon 13,215 (22%, segments 551-552 and 56) and Izembek Lagoon 1,852 (3%, segments 60-65).

Pacific Brant

Izembek Lagoon and adjacent estuaries accounted for >99% (113,086, segments 60-68 and 78-85) of the brant observed during the 2001 fall emperor goose survey (113,721). The replicate count of Izembek Lagoon and adjacent estuaries, obtained on 5 October, totaled 112,021 and provided an average of 112,554 for the two surveys of that area. The 2001 estimate for the Izembek area (112,554) is 28% below the 2000 fall average for the Izembek area (156,008, n=5) and 12% below the 26 year average (1975-00) for the Izembek area (128,478).

Canada Goose

We observed a total of 44,468 Canada geese during the 26-28 September and 1 October survey. Izembek Lagoon and adjacent estuaries accounted for approximately 86% (38,196) of the Canada goose total. The replicate count of Canada geese for Izembek Lagoon and adjacent estuaries on 5 October totaled 39,282. The average count for the two surveys of the Izembek Lagoon area is 38,739 Canada geese which is 1% below 2000 average (39,132, n=5) and is 9% below the 26 year average (42,338, 1975-00) for that area.

Steller's Eider

We observed a total of 88,391 Steller's eiders during the 26-28 September, 1 October survey. Totals for Izembek Lagoon and adjacent estuaries were 24,749 on 28 September (during the emperor goose survey) and 24,351 during the 5 October replicate survey providing an average of 24,550 for the area. The average fall population size for the Izembek Lagoon area is 23,412 (range 4,500-78,645, n=88) from 1975-00 (Dau, USFWS, unpubl. data).

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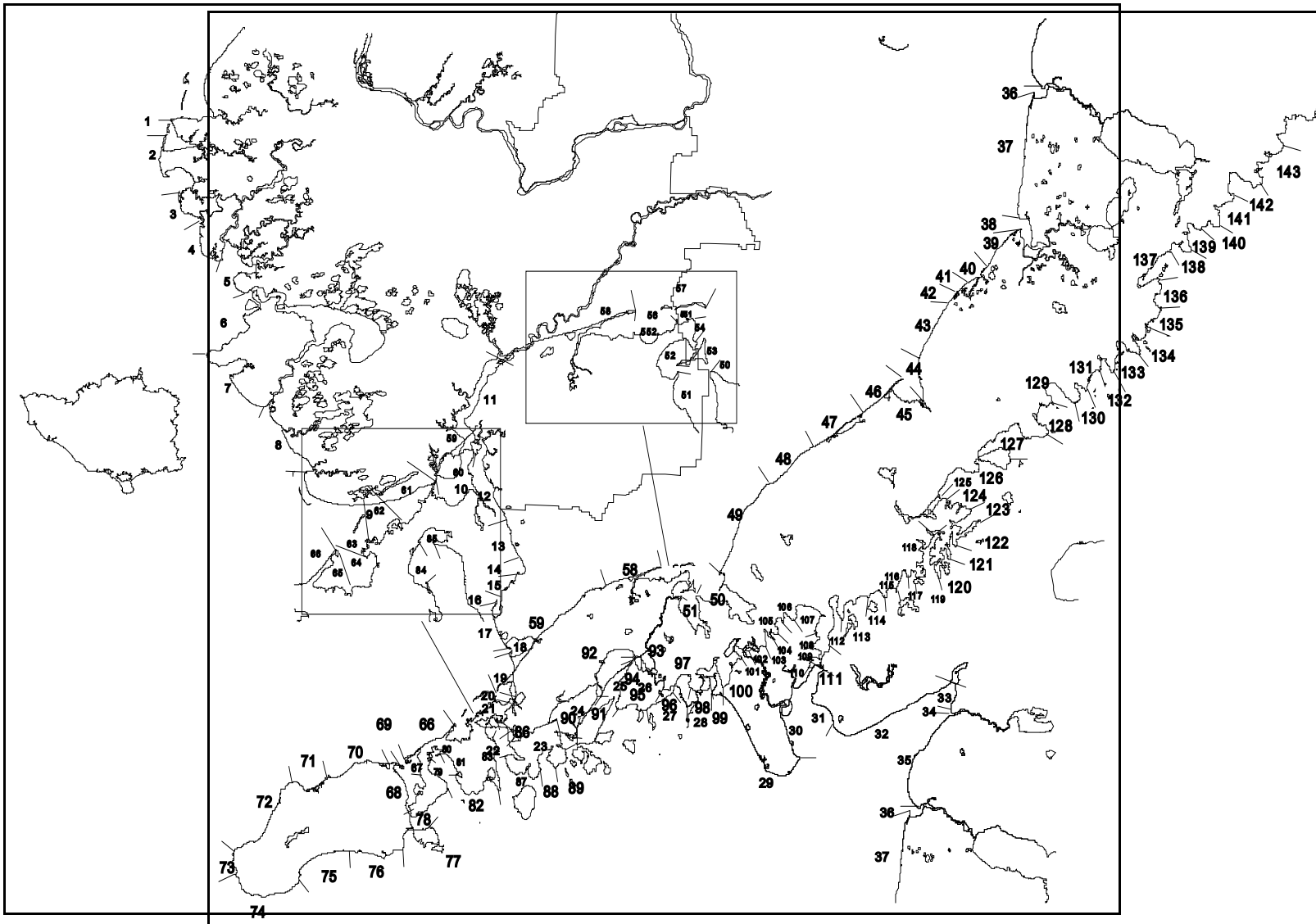


Table 1. Waterbird and mammal observations by segment from southwest Alaska, 26-28 September and 1 October 2001.

SPECIES	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Am. Green-winged Teal														
American Wigeon							42							
Bald Eagle Adult											1			
Bald Eagle Juvenile														
Brown Bear														
Brown Bear Cub														
Beluga Whale														
Pacific Brant							328		125		150			
Black-legged Kittiwake		10		2										
Black Oystercatcher														
Black Scoter	26	294	48			50		13	3	29	387	334		62
Canada Goose			125				62		4160				120	
Caribou				2										
Common Eider			2		13		316	25	208			110	4	30
Common Loon														
Common Murre														
Common Raven									2					
Cormorant												1	9	5
Double-crested Cormorant					1									
Emperor Goose									5					
Gadwall														
Goldeneye sp.							2							
Greater Scaup		1	53		35	4	8465	17	555		100	440		
White-fronted Goose		40		100										
Harlequin Duck											46		8	4
Harbor Seal			1								5			
Herring Gull														
King Eider		6	120			5	10				2			45
Large Shorebird														
Mallard	145						160							30
Mew Gull	309	168	3	1		10					11	30	77	
Medium Shorebird														
Moose														
Northern Harrier														
Northern Pintail	1532	624	2138				5370		440		315		92	
Long-tailed Duck	1										119			
Parasitic Jaeger														
Pacific Loon			3											
Pelagic Cormorant								3		5	4	10	6	26
Pigeon Guillemot														
Red-breasted Merganser	7		2				40				56			
Red-necked Grebe											43		2	8
Red-throated Loon								3						
Sea Otter														
Small Shorebird	240	200	855									225	25	
Steller's Eider		69	69		90		3987		250		533	15	125	25
Steller's Sealion														
Short-tailed Shearwater														
Surf Scoter					15									
Tundra Swan														
Tundra Swan Juvenile														
Walrus										1				
White-winged Scoter	20		26			72	130	7		80	19	37		15
Yellow-billed Loon														
Sabine's Gull														
Large Gull	405	97	206	408	27	196	193	32	319	4	214	767	292	168

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 26-28 September and 1 October 2001.

SPECIES	28	29	32	33	34	35	36	37	38	39	40	41	42	43
Am. Green-winged Teal						250			450					
American Wigeon					10		8							
Bald Eagle Adult	1		1		1				2			1		
Bald Eagle Juvenile														
Brown Bear						1								3
Brown Bear Cub														
Beluga Whale			35											
Pacific Brant														
Black-legged Kittiwake		22		37			5							
Black Oystercatcher														
Black Scoter	359	2400	16			1832	55	2641	1445	120	2		2	3
Canada Goose			1	25			250	180	609					
Caribou								6						
Common Eider		2					10							
Common Loon														
Common Murre														
Common Raven														
Cormorant	1													
Double-crested Cormorant														
Emperor Goose						228	1614	30	594		5338		2965	
Gadwall														
Goldeneye sp.														
Greater Scaup	123	4	250			471	275							
White-fronted Goose		2												
Harlequin Duck	91													
Harbor Seal							75		200		450			
Herring Gull				1										
King Eider		3				2								
Large Shorebird									250					
Mallard				10	128	35	502		1306		200		125	
Mew Gull	1090	105	1135		2	10	450						20	
Medium Shorebird							500		1		5			
Moose														
Northern Harrier			1											
Northern Pintail	250	200	394	70	20	3207	6865	21	5080		2150		360	
Long-tailed Duck							150		200					
Parasitic Jaeger														
Pacific Loon														
Pelagic Cormorant		1												
Pigeon Guillemot														
Red-breasted Merganser														
Red-necked Grebe		1												
Red-throated Loon														
Sea Otter														
Small Shorebird	210	20	2505			4365	2880		5150		4050		3150	
Steller's Eider	27													
Steller's Sealion														
Short-tailed Shearwater														
Surf Scoter	1													
Tundra Swan					101				2					
Tundra Swan Juvenile					4									
Walrus														
White-winged Scoter	134	292	109			536	60	556	10	30	40			2

Yellow-billed Loon	1													
Sabine's Gull														
Large Gull	1285	367	1553	442	24	2824	1840	721	810	15	5025	1	67	174

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 26-28 September and 1 October 2001.

SPECIES	44	45	46	47	48	49	50	51	52	53	54	551	552	56
Am. Green-winged Teal														
American Wigeon														
Bald Eagle Adult						1		1	1	1	1			
Bald Eagle Juvenile					2									
Brown Bear				1		2	1							1
Brown Bear Cub														
Beluga Whale														
Pacific Brant	3													8
Black-legged Kittiwake					20	1		153						
Black Oystercatcher														
Black Scoter	237	8633	2554		1149	1146	17	698	211	3910	4200			710
Canada Goose	730												10	
Caribou													7	
Common Eider		5											250	
Common Loon														
Common Murre														
Common Raven														
Cormorant							12			7				150
Double-crested Cormorant														2
Emperor Goose	447	3619		15014			935	1923	225		28	3568	5177	4470
Gadwall		2												
Goldeneye sp.														
Greater Scaup	100	10						855					10	
White-fronted Goose														
Harlequin Duck														
Harbor Seal	1120	1				10	350							1
Herring Gull														
King Eider	2	10	1											100
Large Shorebird														
Mallard	40												200	205
Mew Gull						200								50
Medium Shorebird														
Moose														
Northern Harrier														
Northern Pintail	10	6685		1065			300		700		600	1250	2727	
Long-tailed Duck														
Parasitic Jaeger					2									
Pacific Loon														
Pelagic Cormorant					6	4								
Pigeon Guillemot														
Red-breasted Merganser														
Red-necked Grebe														
Red-throated Loon														
Sea Otter		3					62	12	3	9	1			

Small Shorebird	225	7900		6500					270			3000	1550	50
Steller's Eider	150	10795		10050			370	1650	1509	1450	1245	6427	5400	18945
Steller's Sealion														
Short-tailed Shearwater														
Surf Scoter	10	13							1	200				
Tundra Swan				1										
Tundra Swan Juvenile														
Walrus						750								
White-winged Scoter	2	550					8	8		227	107	50	40	
Yellow-billed Loon														
Sabine's Gull														
Large Gull	440	2015	19	672	188	502	319	1522	725	3	1	260	3560	5255

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 26-28 September and 1 October 2001.

SPECIES	57	58	59	60	61	62	63	64	65	66	67	68	78	79
Am. Green-winged Teal														
American Wigeon											25	400		
Bald Eagle Adult												4	5	
Bald Eagle Juvenile												2		
Brown Bear			1									2		
Brown Bear Cub			2											
Beluga Whale												3		
Pacific Brant			1	7875	32371	17390	13582	15822	15600		3281	2625		
Black-legged Kittiwake		17	26								20	1211	533	259
Black Oystercatcher														
Black Scoter	42	26	4							28		20	10	
Canada Goose				11793	8802	3051	100	5790	4675		225	1725		
Caribou														
Common Eider				2									3	
Common Loon														
Common Murre														
Common Raven														
Cormorant												55	3	4
Double-crested Cormorant														
Emperor Goose	4821	45	12	1558	125	65	104				15	1044		
Gadwall														
Goldeneye sp.														
Greater Scaup														
White-fronted Goose														
Harlequin Duck										125		15	38	28
Harbor Seal				250		240	190		8			1		
Herring Gull														
King Eider										85				
Large Shorebird														
Mallard					36			325	14					
Mew Gull		9												
Medium Shorebird														
Moose														
Northern Harrier														
Northern Pintail				1550	1884	220	800	865	387			1895		

Long-tailed Duck														
Parasitic Jaeger														
Pacific Loon														
Pelagic Cormorant		1								104	65	121	91	
Pigeon Guillemot														
Red-breasted Merganser														100
Red-necked Grebe			1							1				
Red-throated Loon														
Sea Otter			46	368	41	5	114	8	16	1	333	24		
Small Shorebird		450	285	3170	4350	150	10							75
Steller's Eider				5363	14945	400	800			3165	16			20
Steller's Sealion														4
Short-tailed Shearwater												170		
Surf Scoter														
Tundra Swan											8			
Tundra Swan Juvenile														
Walrus														
White-winged Scoter													15	
Yellow-billed Loon														
Sabine's Gull		2												
Large Gull	7	49	708	853	1055	739	2556	11	857	653	372	1986	461	72

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 26-28 September and 1 October 2001.

SPECIES	80	81	82	83	84	85	86	88	90	91	92	93	97	99
Am. Green-winged Teal	350					400								
American Wigeon														
Bald Eagle Adult			3	2							2	6	1	
Bald Eagle Juvenile								3	1		1	2		
Brown Bear									4					
Brown Bear Cub														
Beluga Whale														
Pacific Brant	3375					1165					20			
Black-legged Kittiwake		235	639	134					50	23		325	75	100
Black Oystercatcher														
Black Scoter		2		85	117	99		25	5		105	30		
Canada Goose	875					1160								
Caribou														
Common Eider														
Common Loon														
Common Murre														
Common Raven			2				2	3						
Cormorant		3	47				4			20				
Double-crested Cormorant														
Emperor Goose	77	862		1042	155	495	21		85		331	526	35	
Gadwall														
Goldeneye sp.														
Greater Scaup														
White-fronted Goose				1										
Harlequin Duck		46	15	144	110	170	10		37	2	17	8		32
Harbor Seal	16			1		50	6					27		1

Herring Gull														
King Eider														
Large Shorebird														
Mallard	200			160		200						80		
Mew Gull				5				450	100	105	181			583
Medium Shorebird														
Moose													1	
Northern Harrier														
Northern Pintail	170					725							445	
Long-tailed Duck											2			
Parasitic Jaeger														
Pacific Loon														
Pelagic Cormorant		50	1	1						1	101			
Pigeon Guillemot											5			
Red-breasted Merganser		302		435			74	180			30	280		175
Red-necked Grebe							8	1		47				14
Red-throated Loon														
Sea Otter			2				8				46	21		
Small Shorebird				195		1885						10		
Steller's Eider				40					1		200	10		
Steller's Sealion			2											
Short-tailed Shearwater														
Surf Scoter										90				
Tundra Swan				25										
Tundra Swan Juvenile														
Walrus														
White-winged Scoter				24			8	65		3	100	10		7
Yellow-billed Loon			2											
Sabine's Gull														
Large Gull	1081	360	1012	869	256	381	89	813	1076	542	664	286	159	519

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 26-28 September and 1 October 2001.

SPECIES	101	102	103	104	105	106	107	112	113	114	115	116	117	118
Am. Green-winged Teal														
American Wigeon														
Bald Eagle Adult		1					2						1	
Bald Eagle Juvenile					1		3	1						
Brown Bear														
Brown Bear Cub														
Beluga Whale														
Pacific Brant														
Black-legged Kittiwake	545	148	8	26	344	831	442	325	425	170	335	505	357	
Black Oystercatcher														
Black Scoter				30	205	8	250	15	5					
Canada Goose														
Caribou														
Common Eider														
Common Loon		2					2							
Common Murre				4			5							
Common Raven		2												

Cormorant								8					1			
Double-crested Cormorant																
Emperor Goose																
Gadwall																
Goldeneye sp.																
Greater Scaup																
White-fronted Goose																
Harlequin Duck	8				18		6									
Harbor Seal								100								
Herring Gull																
King Eider																
Large Shorebird																
Mallard																
Mew Gull	147							265	15	75						
Medium Shorebird																
Moose													1			
Northern Harrier																
Northern Pintail																
Long-tailed Duck																
Parasitic Jaeger																
Pacific Loon																
Pelagic Cormorant		16					40									
Pigeon Guillemot																
Red-breasted Merganser					2			195								
Red-necked Grebe																
Red-throated Loon																
Sea Otter	10															
Small Shorebird								10								
Steller's Eider																
Steller's Sealion																
Short-tailed Shearwater																
Surf Scoter					100								10			
Tundra Swan							2							2		
Tundra Swan Juvenile							2									
Walrus																
White-winged Scoter						75			5							
Yellow-billed Loon																
Sabine's Gull																
Large Gull	349	111			255	1136	187	786	270	201			135	32	19	155

Table 1 (continued). Waterbird and mammal observations by segment from southwest Alaska, 26-28 September and 1 October 2001.

SPECIES	124	125	126	127	128	129	130	131	132	133	134	135	136	137
Am. Green-winged Teal														
American Wigeon														
Bald Eagle Adult			3	3	3	1	1	1		1	1	1		2
Bald Eagle Juvenile		1		1					1					
Brown Bear														8
Brown Bear Cub														
Beluga Whale														
Pacific Brant														

Black-legged Kittiwake	5		735	271	277	245	166	338	511	465	329	510	198	175
Black Oystercatcher														2
Black Scoter		175	25	10						35		20		203
Canada Goose														
Caribou					20									
Common Eider														
Common Loon			3										1	
Common Murre			10	2							6			
Common Raven					1									
Cormorant	18		3	1	14		4			4				16
Double-crested Cormorant														
Emperor Goose		862			270	133	80					11	765	268
Gadwall														
Goldeneye sp.														
Greater Scaup		5185												
White-fronted Goose														
Harlequin Duck			7		24	55								
Harbor Seal		2				1								
Herring Gull				3										
King Eider														20
Large Shorebird														
Mallard														
Mew Gull		100												
Medium Shorebird														
Moose														
Northern Harrier														
Northern Pintail														150
Long-tailed Duck														
Parasitic Jaeger														
Pacific Loon					1									
Pelagic Cormorant			5		113	7	2			1	43	13	12	4
Pigeon Guillemot														
Red-breasted Merganser			35	1	2	60								878
Red-necked Grebe			2											
Red-throated Loon														
Sea Otter		3	1		1	1	1							
Small Shorebird		50				25								
Steller's Eider		250												
Steller's Sealion														
Short-tailed Shearwater														
Surf Scoter			50		10					40				50
Tundra Swan													2	
Tundra Swan Juvenile														
Walrus														
White-winged Scoter														16
Yellow-billed Loon														
Sabine's Gull														
Large Gull	5	1699	550	172	644	70	282	507	114	755	146	201	352	875

Table 1 (continued). Waterbird and mammal observation totals from southwest Alaska, 26-28 September and 1 October 2001.

SPECIES	Grand Total
Am. Green-winged Teal	1450
American Wigeon	485
Bald Eagle Adult	56
Bald Eagle Juvenile	19
Brown Bear	24
Brown Bear Cub	2
Beluga Whale	38
Pacific Brant	113721
Black-legged Kittiwake	12583
Black Oystercatcher	2
Black Scoter	35165
Canada Goose	44468
Caribou	35
Common Eider	980
Common Loon	8
Common Murre	27
Common Raven	12
Cormorant	390
Double-crested Cormorant	3
Emperor Goose	59987
Gadwall	2
Goldeneye sp.	2
Greater Scaup	16953
White-fronted Goose	143
Harlequin Duck	1064
Harbor Seal	3106
Herring Gull	4
King Eider	411
Large Shorebird	250
Mallard	4101
Mew Gull	5706
Medium Shorebird	506
Moose	2
Northern Harrier	1
Northern Pintail	51556
Long-tailed Duck	472
Parasitic Jaeger	2
Pacific Loon	4
Pelagic Cormorant	857
Pigeon Guillemot	5
Red-breasted Merganser	2854
Red-necked Grebe	128
Red-throated Loon	3
Sea Otter	1140
Small Shorebird	54035
Steller's Eider	88391
Steller's Sealion	6
Short-tailed Shearwater	170
Surf Scoter	590
Tundra Swan	143
Tundra Swan Juvenile	6
Walrus	751
White-winged Scoter	3495
Yellow-billed Loon	3
Sabine's Gull	2
Large Gull	62451

Appendix 1. Emperor goose fall survey data, southwest Alaska, 1979-2001.

YEAR	TOTAL	3YR. MEAN	DATES	OBSERVERS	REMARKS
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	All
2001	59,987	60,613	9/26-10/1	C.P. Dau/E.J. Mallek	All

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