AERIAL SURVEY OF EMPEROR GEESE AND OTHER WATERBIRDS

IN

SOUTHWESTERN ALASKA,

FALL 2010

By

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Key Words: aerial survey, emperor geese, waterbirds, southwest Alaska.

April 2011

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Abstract: This report presents results of the 32nd consecutive, annual fall emperor goose population survey in southwest Alaska. The 2010 fall emperor goose estimate is 59,924 birds. With the exception of bays near Cold Bay, the south side of the Alaska Peninsula was not surveyed and a most recent 3-year average of 2,420 was added for the fall estimate. The aerial survey was flown between 30 September and 4 October 2010 from the Naknek River to Bechevin Bay including all the north side of the Alaska Peninsula. A USFWS Quest Kodiak (N700FW) was used and a left seat pilot/observer and right seat observer made observations along coastlines and over estuaries at an altitude of 45m (150 feet) ASL and airspeed of 200km/hr (110 kts). All species of waterbirds and marine mammals were counted with emphasis on emperor geese, Pacific brant, Canada geese, and Steller's eiders. Population estimates for Canada geese, and Steller's eiders within the surveyed area are 28,302 and 33,434, respectively. Two additional replicate surveys of the Izembek NWR area were flown on 5 October to estimate sizes of the Pacific brant and Canada goose populations. Averages counts for the Izembek area are 130,091 Pacific brant (n=3 surveys) and 24,592 Canada geese (n=3 surveys).

Key words: aerial survey, emperor geese, waterbirds, southwest Alaska. April 2011

INTRODUCTION

Fall distribution, abundance, and population trends of emperor geese and other waterbirds at migratory staging areas throughout southwest Alaska has been annually monitored since 1979. Data from this survey 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. Important data necessary for management of waterbird populations and their habitats are provided by this survey. The survey traditionally included 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. In 2010, Kuskokwim Bay, the north portion of Bristol Bay and the south side of the Alaska Peninsula east of Cold Bay were not surveyed.

METHODS

The survey was flown using a USFWS Quest Kodiak (N700FW) at a ground speed of approximately 200 km/hr (110 kts) and an altitude of 45m (150 feet) ASL. The 2010 survey route was from the Naknek River to Bechevin Bay, along the north side of the Alaska Peninsula and the south side of the peninsula west of Cold Bay. Observations were made from both sides of the aircraft and voice recorded into two laptop computers using remote microphones. Computer programs developed by Jack Hodges (USFWS-MBM, Juneau) were used to collect and transcribe these data.

Coast line segments were usually flown 100 meters offshore with deviations to confirm species identification and numbers seaward within 1.6 km (1 mile) of shorelines. In estuaries, a systematic but meandering flight path was followed. Whenever possible, flights over estuaries were conducted with <20 knots of wind.
The maximum survey area includes 143 shoreline/estuarine segments (Figures 1-2) which were

previously described by Mallek and Dau (2000). In 2010, segments 34-49 were flown on 30 September and segments 50-67; 80-85 on 4 October. Survey conditions were unfavorable from 1-3 October. Two additional surveys of Izembek Lagoon and other estuaries adjacent to Izembek NWR were flown on 5 October and used to estimate average brant, Canada goose and emperor goose populations for the area. 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

30 September: From the Naknek River (Segment 34) south to Port Moller (Segment 49), winds were initially south at 5 knots (Segments 34-42) becoming west at 10 knots (Segments 43-47) and then northwest at 15 knots (Segments 47-49). Sky cover was 1,500 to 4,000 feet broken to overcast to north of Seal Islands Lagoon, lowering to 800 overcast to the south. Visibility was good and tides were low to mid-level and air temperatures were approximately 40^{o}F.

4 October: Port Moller/Nelson Lagoon estuary (Segment 50-56, 55-552) to Bechevin Bay (Segments 67-68) and to Kinzarof Lagoon (Segment 85). Winds were southwesterly at 5 knots increasing to 20 knots in the Port Moller/Nelson Lagoon area and areas to the south. Tides were mid-level at Port Moller/Nelson Lagoon and low at Izembek Lagoon. Tides were high in south side estuaries from Bechevin Bay to Kinzarof Lagoon. Visibility was good with scattered light rain in Izembek Lagoon. Ceilings lowered from 7,000 to 500 feet overcast throughout the day with air temperatures increasing from 39-46^{o} F throughout the day

5 October: Izembek NWR area (Segments 60-68; 80-85) was surveyed twice. Calm to light winds were present in the morning and southwesterly winds of 15 knots occurred in the afternoon. Visibility was good with high ($\leq$8,000 feet) ceilings. Tides were high on the Bering side of the Alaska Peninsula and low on the Pacific side in the morning and the reverse in the afternoon. Temperature was approximately 40^{o}F throughout the day.

RESULTS/DISCUSSION

The totals for all species observed during the survey are summarized in Table 1. Estimates of emperor goose population sizes (1979-2010) and corresponding 3-year averages are summarized in Table 2. Figure 3 depicts the 32-year population trend for fall staging emperor geese.

Emperor Goose

The 2010 fall population of emperor geese was estimated at 59,924. The south side of the Alaska Peninsula east of Cold Bay was not surveyed in 2010 so we used the most recent 3-year average of emperor geese seen in those areas (2,420 birds) to better estimate total population. Northern Alaska Peninsula estuarine staging sites (Segments 34-65) contained 54,278 emperor geese (90.6% of the population estimate and 94.4% of 57,504 emperor geese observed). A very small proportion of the population was historically observed in segments along the north coast of Bristol Bay ($\leq$0.02%) during previous year's surveys so these areas have not been included in the survey since 2005. The 2010 population estimate is 24.8% below the 79,647 observed in 2009 and the current 3-year

population average of 72,591 is 5.9% below the previous 3-year average of 77,127 (Table 2). Fall emperor goose population data indicate a rather flat growth rate of 0.2%/year (Figure 3).

Numbers and proportions of emperor geese at primary staging sites along the Alaska Peninsula in 2010 were as follows: Egegik Bay 2,058 (3.4%, Segments 36-37); Ugashik Bay 224 (0.4%, Segment 38); Cinder River Estuary 12,844 (21.4%, Segments 39-43); Port Heiden 3,848 (6.4%, Segments 44-45); Seal Islands 20,834 (34.8%, Segment 46-47); Nelson Lagoon and adjacent estuaries 14,256 (23.8%, Segments 50-58, 551-552); Izembek Lagoon and adjacent estuaries 3,196 (5.3%, Segments 60-68 and 80-85); Cold Bay to Wide Bay (3-year avg.) 2,420 (4.0%, Segments 86-137). The first observation of emperor geese at Unalaska was on 11 September (single family group) and the first flocks appeared on 7 October (S. Golodoff, pers comm.). These data suggest the majority of the population had not departed the survey area prior to completion of the count on 4 October.

Pacific Brant

A total of 139,243 Pacific brant was observed during the emperor goose survey of which >99% (139,236) were in Izembek Lagoon and adjacent estuaries. Replicate counts of Izembek Lagoon and adjacent estuaries on 5 October were 127,901 and 123,135, respectively. The average fall population size brant in the Izembek area was 130,091 based on these three surveys. The 2010 average count was 10.0% below the 2009 estimate of 144,594 (n= 2 surveys) and 2.7% below the 35-year average fall count of 133,662 (1975-2009, Izembek NWR files).

Canada Goose

We observed 28,302 Canada geese during the emperor goose survey with Izembek Lagoon and adjacent estuaries accounting for 94.0% (26,614) of the total birds observed. Replicate counts of Izembek Lagoon and adjacent estuaries on 5 October) provided counts of 20,986 and 26,177. The average Canada goose count estimated from these three surveys (including the Izembek area of the emperor goose survey) was 24,592. The 2010 average count was 46.5% below the 2009 estimate of 45,975 (n=3 surveys) and 42.2% below the 35-year average fall count of 42,526 (1975-2009, Izembek NWR files).

Steller's Eider

We observed a total of 33,434 Steller's eiders during the 2010 emperor goose survey, down 41.7% from the 2009 count of 57,320 and 48.3% below the 1979-2009 average of 64,725. The population trend of Steller's eiders indicates a 1.6%/year increase based on counts during the fall emperor goose survey (1979-2010).

Numbers and proportions of Steller's eiders at primary southwest Alaska estuarine staging sites were as follows: Egegik Bay 0 (0%, Segments 36-37); Cinder River Estuary 10 (0.0003%, Segments 40-42); Port Heiden 350 (1.1%, Segments 44-46); Seal Islands 8,006 (24.0%, Segment 46-47); Nelson Lagoon and adjacent estuaries 20,968 (62.7%, Segments 50-58, 551-552); and Izembek Lagoon and adjacent estuaries 4,100 (12.3%, Segments 60-68 and 80-85).

Replicate counts of Izembek Lagoon and adjacent estuaries on 28 September (Larned/Wilson-MBM) and 5 October (Mallek/Dau) provided counts of 10,366, 15,070 and 9,430, respectively. The average Steller's eider count in the Izembek area, estimated from these three surveys and the Izembek area of the emperor goose survey, was 9,742. This estimate is 20.9% above the 2009 estimate of 8,056 (n= 3 surveys) and 55.8% below the 34-year average fall count of 22,046 (1975-2009, Izembek NWR files).

AKNOWLEDGMENTS

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Figure 1. Map of emperor goose aerial survey segments 1-36 in southwest Alaska, 1992-2010.

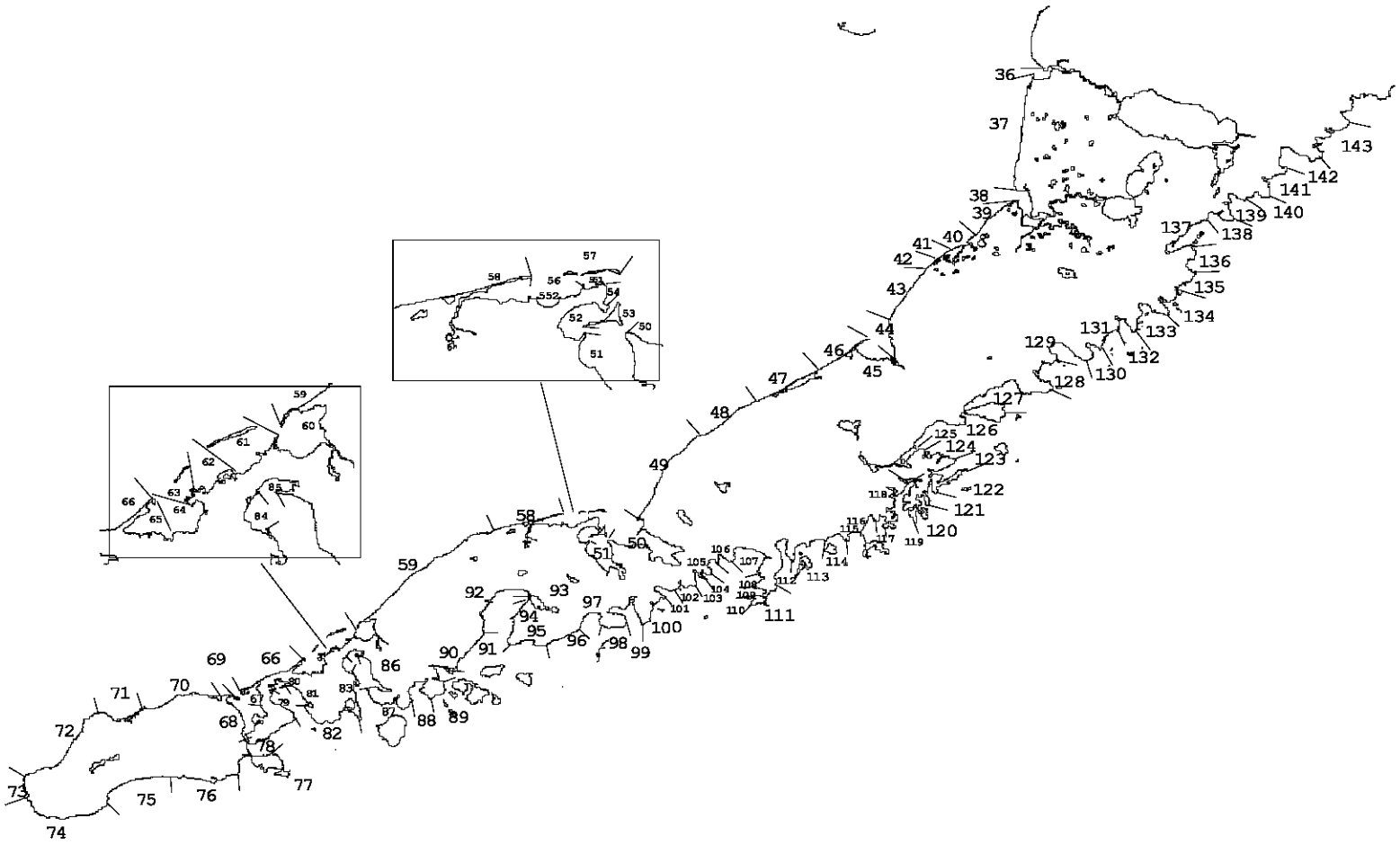


Figure 2. Map of emperor goose aerial survey segments 36-143 in southwest Alaska, 1992-2010.

Table 1. Waterbird and mammal observations by segment, southwest Alaska 30 September, 4 October 2010.

SPECIES	34	35	36	37	38	39	40	41	42	43	44	45	46
American Green-winged Teal			100										
Alcid spp													
American Wigeon	100		15										
Bald Eagle adult	1				1							1	
Bald Eagle juvenile	1		1							1			
Beluga Whale					5								
Pacific Brant													
Black-legged Kittiwake													
Black Scoter		2173	6400	1564	160	1283				28		1000	2408
Brown Bear							1						
Canada Goose				8	743	101					95		15
Common Eider													
Common Loon													1
Common Raven					2								
Emperor Goose		244	1993	65	224	105	9127		3582	30	1234	2614	2804
Gadwall		30											
Greater Scaup		300			278						207		
Harlequin Duck				105									
Harbor Seal		600	300		650								
King Eider										10			
Large gull	380	1198	252	16	290	21	1170	7	420	327	900	2530	186
Mallard	212	12	1060		3053				20		3	400	
Mew Gull		38	211		402		2		200	1		3300	23
Medium shorebird							170						
Northern Pintail	290	355	2505	3	3925		3530					11800	
Northern Shoveler													
Pacific Loon													
Pelagic Cormorant									1				
Red-breasted Merganser	160	50											
Rough-legged Hawk	1												
Red-necked Grebe				6						7			1
Red-throated Loon		1	2	5		2							
Sea Otter						1					1		
Small gull	100	460	20		302		250			300	25	2200	
Small shorebird		1605	2500		1600		6500		500			6500	
Steller's Eider							10					350	
Surf Scoter		197											
Tundra Swan	450												
Greater White-fronted Goose	50												
White-winged Scoter										77	51		441

Table 1(cont). Waterbird and mammal observations by segment, southwest Alaska 30 September, 4 October 2010.

SPECIES	47	48	49	50	51	52	53	54	551	552	56	57
American Green-winged Teal												
Alcid spp												
American Wigeon									75			
Bald Eagle adult		2										
Bald Eagle juvenile					1							
Beluga Whale												
Pacific Brant					1	1			5			
Black-legged Kittiwake		1490	5040									
Black Scoter			779		10	500		2460			500	
Brown Bear		2				3						
Canada Goose						35			691			
Common Eider	100										350	
Common Loon							1	1				
Common Raven												
Emperor Goose	18030			1707	1154	1374	22	311	4572	3433	1636	27
Gadwall												
Greater Scaup					25				150			
Harlequin Duck												
Harbor Seal										375	300	850
King Eider												
Large gull	2110	68	44	1605	28	312		2032	450	750	3108	195
Mallard	360								810	350		
Mew Gull	1000			1311		20		50			250	
Medium shorebird												
Northern Pintail	3100			1260		1700			3520	2250		
Northern Shoveler									10			
Pacific Loon												
Pelagic Cormorant			4								10	
Red-breasted Merganser				10								
Rough-legged Hawk												
Red-necked Grebe				2								
Red-throated Loon												
Sea Otter				10	83	5	29			3	6	3
Small gull		10	375	80	70	3		10		155	40	
Small shorebird	3740					500	15	15	12670	8500		
Steller's Eider	8006			1900				1140	3750	4803	9375	
Surf Scoter												
Tundra Swan									2			
Greater White-fronted Goose												
White-winged Scoter			100		3							

Table 1(cont). Waterbird and mammal observations by segment, southwest Alaska 30 September, 4 October 2010.

SPECIES	58	59	60	61	62	63	64	65	66	67	68
American Green-winged Teal											
Alcid spp											
American Wigeon				50							
Bald Eagle adult											
Bald Eagle juvenile			1								
Beluga Whale											
Pacific Brant			7315	42220	20860	5935	21407	25355		1925	778
Black-legged Kittiwake											
Black Scoter	5350	546	2	40					1291		
Brown Bear			1								
Canada Goose			10490	2904	2870		4865	5000			485
Common Eider											
Common Loon		1									
Common Raven											
Emperor Goose	20		193	2		19			20	55	749
Gadwall											
Greater Scaup			70								
Harlequin Duck		1							327	3	
Harbor Seal		220			395		250	50			
King Eider											
Large gull	52	550	2640	979	3370	1410	1889	292	1139	77	710
Mallard			40			1	133				100
Mew Gull		152					300		12	5	
Medium shorebird											
Northern Pintail			180	500	800	450	150	1480			20
Northern Shoveler											
Pacific Loon		1									
Pelagic Cormorant		4	2			1	2	25	140	1	
Red-breasted Merganser											
Rough-legged Hawk											
Red-necked Grebe		127							4	3	
Red-throated Loon											
Sea Otter	1	4	33	53	1	70	4		4	25	1
Small gull		570					100				
Small shorebird			650	300	400	300		500	40		
Steller's Eider			2625	950			300	225			
Surf Scoter									2		
Tundra Swan											
Greater White-fronted Goose											
White-winged Scoter	50	823							905		

Table 1(cont). Waterbird and mammal observations by segment, southwest Alaska 30 September, 4 October 2010.

SPECIES	80	81	82	83	84	85	Grand Total
American Green-winged Teal							100
Alcid spp			1				1
American Wigeon							240
Bald Eagle adult		3	3	3			14
Bald Eagle juvenile	1						6
Beluga Whale							5
Pacific Brant	8115	5				5321	139243
Black-legged Kittiwake			45		5		6580
Black Scoter		5		20			26519
Brown Bear							5
Canada Goose							28302
Common Eider							450
Common Loon	2		2	5	1		14
Common Raven	2			3			7
Emperor Goose	318	890	44	661	68	177	57504
Gadwall							30
Greater Scaup							1030
Harlequin Duck		40	32	113	51	3	675
Harbor Seal							3990
King Eider							10
Large gull	512	389	132	730	171	55	33496
Mallard							6554
Mew Gull							7277
Medium shorebird							170
Northern Pintail				50		200	38068
Northern Shoveler							10
Pacific Loon				3			4
Pelagic Cormorant		32	17	7			246
Red-breasted Merganser	210	50		90	1		571
Rough-legged Hawk							1
Red-necked Grebe				7	1		158
Red-throated Loon							10
Sea Otter			18	1		1	357
Small gull		8	500	7	3	75	5663
Small shorebird	20			233			47088
Steller's Eider							33434
Surf Scoter							199
Tundra Swan				2			454
Greater White-fronted Goose							50
White-winged Scoter		1		2	30		2483

Table 2. Emperor goose fall survey data, southwest Alaska, 1979-2010.

YEAR	TOTAL	3YR. AVG.	DATES	OBSERVERS	SURVEY AREA
1979	59,808	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[1]
1997	86669	88232	10/3-10/5	R.J. King/C.P. Dau	North Alaska Peninsula only[1]
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[1]
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[1]
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[1]

[1] Average count of south side of the Alaska Peninsula used in estimate.

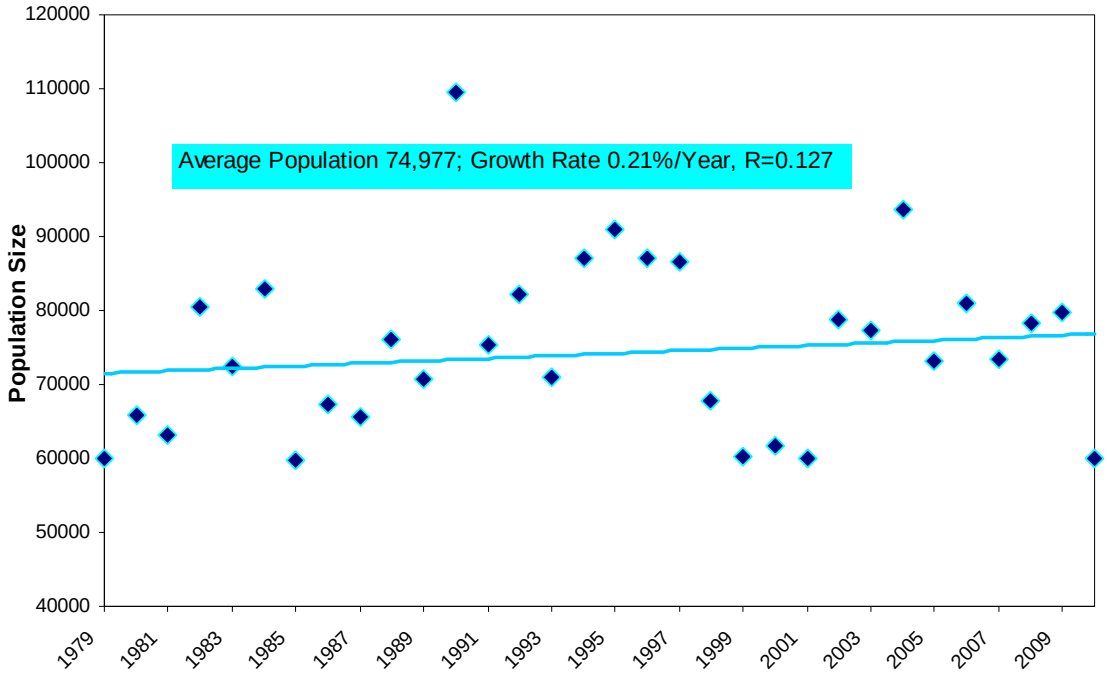


Figure 3. Fall emperor goose population estimate and trend, southwest Alaska.