

AERIAL SURVEY OF EMPEROR GEESE AND OTHER WATERBIRDS

IN

SOUTHWESTERN ALASKA,

FALL 2007

By

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

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Abstract: This report presents results of the 29th consecutive year of fall aerial emperor goose surveys in southwest Alaska. All bird and marine mammal species were counted with emphasis on emperor geese, Pacific brant, Canada geese, and Steller's eiders. Population estimates for emperor geese and Steller's eiders were 73,531 and 80,102, respectively. Two additional replicate surveys of the Izembek NWR area were flown on 2 and 3 October to estimate sizes of the Pacific brant and Canada goose populations. Averages counts for the Izembek area, based on three surveys, were 138,476 Pacific brant and 29,964 Canada geese. The survey was flown from 26 September to 3 October 2007 from the Naknek River to Bechevin Bay, along the north side of the Alaska Peninsula and along the south side west of Cold Bay. Weather precluded south side coverage east of Cold Bay. The USFWS Turbine-Beaver (N754) was used and a left seat pilot/observer and right seat observer made observations along coastlines and over estuaries from 45m (150 feet) ASL and at 200km/hr (110 kts).

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INTRODUCTION

This survey has annually monitored fall distribution, abundance, and population trends of emperor geese and other waterbirds at migratory staging areas throughout southwest Alaska 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. 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 the USFWS Turbine-Beaver (N754) at a ground speed of approximately 200 km/hr (110 kts) and an altitude of 45m (150 feet) ASL. The 2007 survey route covered the north side of the Alaska Peninsula coastline from the mouth of the Naknek River to Bechevin Bay and the south side of the peninsula east to Cold Bay. Weather precluded surveying of segments usually included east of Cold Bay. Observations were made from both sides of the aircraft and voice recorded into two panel-mounted computers using remote microphones. Computers received input from the aircraft Global Positioning System (GPS) saving coordinates for each observation. Computer programs developed by Jack Hodges (USFWS-MBM, Juneau) were used to collect and transcribe these data.

The coastal flight path was usually 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. Aircraft track was monitored on a computer moving map program to avoid duplication and ensure complete coverage. Whenever possible, flights were

conducted with <20 knots of wind and at or near high tide as this concentrated emperor geese near shorelines.

The greater survey area includes 143 shoreline/estuarine segments (Figures 1-2) which were previously described by Mallek and Dau (2000). In 2007, segments 34-35 were flown on 26 September; segments 36-47 were flown on 27 September; and segments 60-68, 80-85 were flown on 28 September. Adverse climatic condition precluded surveying segments east of Cold Bay. A replicate survey of the north side of the Alaska Peninsula, segments 40-57, was flown on 3 October. Two additional surveys of Izembek Lagoon and other estuaries adjacent to Izembek NWR were flown on 2 October (Mallek/Dau) and 3 October (Larned/Anderson). 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

26 September: Initially winds were southwest at 15 knots with light rain in squalls. Sky cover was overcast at 1,000 feet. Visibility was 20 miles out of squalls. Conditions deteriorated at Egegik Bay with winds westerly at 25 knots and persistent rain squalls so only segments 34-35 were flown. Tides were high and air temperature was 45°F.

27 September: Segments 36 (Egegik Bay) to 47 (Seal Islands Lagoon) were flown. Winds were initially calm, increasing to east southeast at 15 knots and tides were low to mid (flooding). Visibility was good and air temperature ranged from 38-42° F. Overcast ceilings of 1,500 feet persisted throughout the day. Conditions west of Seal Islands Lagoon were reported as >30 knots of wind so the survey was terminated after completion of segment 47.

28 September: Segments 48 to 59 were flown. Winds were initially southwest at 15-20 knots and increased to southwest 25 knots west of Port Moller. Sky conditions were overcast to broken at 1,000 feet and visibility of 10 miles briefly lowering to 200 feet overcast and <3 miles visibility from Cape Seniavin to Port Moller (Segment 49) and from David River to near Cape Lieskof (Segment 58) with light rain squalls. Tides were very high in the Nelson Lagoon complex.

29 September: Segments 60-68 and 80-85 were flown. Winds were west northwest at 20-25 knots with occasional light rain squalls. Ceilings were 2,000 feet overcast and air temperature was 42°. Tides were mid-level and high on the Pacific and Bering sides of the Alaska Peninsula, respectively.

2 October: An Izembek NWR replicate survey of segments 60-68, 80 and 85 was flown. Winds were west at 20 knots with occasional west northwest at 25 knots and gusts to 30 knots in squalls. Ceilings were broken at 5,000 feet and visibility was unrestricted except during 2-3 light rain squalls when visibility was reduced to 3-5 miles. Overall visibility was good. Tides were low on the Pacific and near high on the Bering sides of the Alaska Peninsula. Air temperature was 42°F.

3 October: A replicate survey of the north side Alaska Peninsula, segments 40-57, was flown. Winds were less than 5 knots from the west southwest with scattered ceilings and good visibility. Tides were low along the Bering Sea side of the Alaska Peninsula. Air temperature was 36°F.

RESULTS/DISCUSSION

The totals for all species observed during the survey are summarized in Table 1. Estimates of emperor goose population sizes (1979-2007) and corresponding 3-year averages are summarized in Table 2. Figure 3 depicts the 29-year population trend for fall staging emperor geese.

Emperor Goose

Most emperor geese were at northern Alaska Peninsula estuarine staging sites during the survey and we estimated the 2007 fall population size within that area at 73,531. Weather conditions precluded surveying segments along the south side of the Alaska Peninsula east of Cold Bay so we used the most recent 3-year average of emperor geese seen in those areas to amend the total. A very small proportion of the population 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 2007 population estimate is 9.3% below the 81,078 emperor geese observed in 2006 and the current 3-year average of 75,940 is 8.1% below the previous 3-year average of 82,611 (Table 2). North side Alaska Peninsula segments 57-40 were replicated on 3 October and the peak counts for primary estuaries were used in our population estimate. The fall emperor goose population trend indicates a 0.4%/year increase (Figure 3).

Numbers and proportions of emperor geese at primary staging sites along the Alaska Peninsula in 2007 were as follows: Egegik Bay 1,716 (2.4%, segments 36-37); Ugashik Bay 908 (1.3%, segment 38); Cinder River Estuary 15,256 (21.7%, segments 40-42); Port Heiden 11,238 (15.9%, segments 44-45); Seal Islands 16,515 (23.4%, segments 46-47); Nelson Lagoon and adjacent estuaries 20,678 (29.3%, segments 50-57, 551-552); and Izembek Lagoon and adjacent estuaries 3,934 (5.6%, segments 60-65, 67-68, 79-81, 83-85).

Pacific Brant

A total of 154,603 Pacific brant was observed during the 26 September to 3 October emperor goose survey of which >99% (154,219) were in Izembek Lagoon and adjacent estuaries. A replicate count of Izembek Lagoon and adjacent estuaries (2 October) and another of Izembek and Kinzarof Lagoons provided counts of 122,079 and 130,354, respectively. The average brant count estimated from these three surveys (includes the emperor goose survey) was 138,476. The 2007 average count was 14.6% above the 2006 estimate of 120,875 (n=4 surveys) and 3.5% above the 32-year average peak fall count of 133,735 (1975-2007, Izembek NWR files).

Canada Goose

We observed 29,468 Canada geese during the 26 September to 3 October emperor goose survey. Izembek Lagoon and adjacent estuaries accounted for 97.5% (28,729) of the total birds observed. The low total count of Canada geese may be attributed to mild weather conditions and resulting delayed migration and good crowberry (*Empetrum nigrum*) production which would result in many birds feeding or roosting in adjacent uplands outside the survey area, especially during high tides. A replicate count of Izembek Lagoon and adjacent estuaries (2 October) and another of Izembek and

Kinzarof Lagoons provided counts of 27,543 and 33,620, respectively. The average Canada goose count estimated from these three surveys (includes the emperor goose survey) was 31,289. The 2007 peak count was 11.3% above the 2006 estimate of 27,741 (n=4 surveys) and 25.9% below the 32-year average peak fall count of 42,249 (1975-2007, Izembek NWR files).

Steller's Eider

We observed a total of 80,102 Steller's eiders during the 26 September to 3 October emperor goose survey, 14.6% above the 2006 count of 69,870 and 25.8% above the 1979-2007 average of 63,661. Population trend calculated from this survey indicates a 2.4% annual increase. Local population trends indicate a 4.3% annual increase at Nelson Lagoon versus a 3.2% annual decrease at Izembek Lagoon.

High numbers of fall staging (i.e. molting) Steller's eiders is indicative of low nesting effort or success. This was the second consecutive year of successful nesting effort by the ACP-Alaska population at Barrow. Hence, the increase in the fall staging population was not expected unless our survey is indicative of low reproductive effort by the bulk of the nesting population in Russia.

Numbers and proportions of Steller's eiders at primary Alaska Peninsula staging sites were as follows: Egegik Bay 50 (0.1%, segment 36); Port Heiden 10,103 (12.6%, segments 44-45); Seal Islands 18,400 (23.0%, segments 46-47); Nelson Lagoon and adjacent estuaries 39,288 (49.0%, segments 50-57, 551-552); and Izembek Lagoon and adjacent estuaries 12,261 (15.3%, segments (60-65, 67-68, 79-81, 83-85).

A replicate count of Izembek Lagoon and adjacent estuaries (2 October) and another of Izembek and Kinzarof Lagoons provided counts of 3,857 and 7,046, respectively. The average Steller's eider count in the Izembek area, estimated from these three surveys (including the emperor goose survey), was 7,721. This estimate is 33.6% below the 2006 estimate of 11,623 (n=4 surveys) and 65.4% below the 32-year average peak fall count of 22,332 (1975-2007, Izembek NWR files).

ACKNOWLEDGMENTS

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Figure 1. Map of emperor goose aerial survey segments 1-36 in southwest Alaska, 1992-2007.

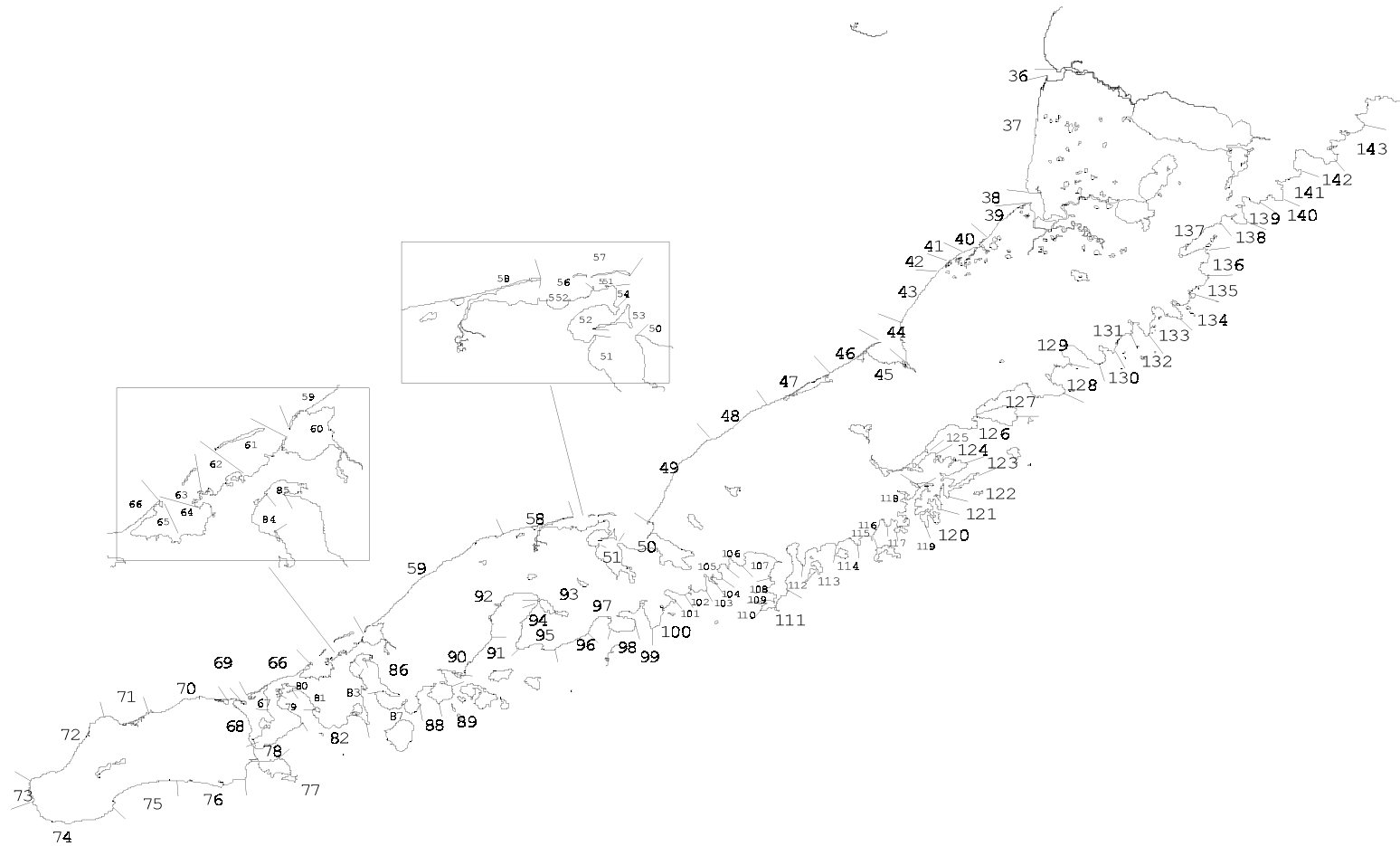


Figure 2. Map of emperor goose aerial survey segments 36-143 in southwest Alaska, 1992-2007.

Table 1. Waterbird and mammal observations by segment, southwest Alaska, 26 Sept. - 3 Oct. 2007.

SPECIES	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Amer. Green-winged Teal		75	950		25									75	
Amer. Wigeon					50				5						
Bald Eagle (adult)											1				
Bald Eagle (juvenile)														1	
Pacific Brant			6	3									1	50	
Black-legged Kittiwake				5						300					5
Black Scoter		574	370	2305	159	1525				20	4	3575	3238		340
Bonaparte's Gull							3								
Canada Goose		159			55		50		25		180			55	
Common Eider															
Common Loon	2	1													
Common Raven		1												2	
Cormorant				12	1										
Emperor Goose		143	1716		908	45	12221		3035		2617	8621	25	16490	19
Gadwall					15		2								
Brown Bear									1	4					
Greater Scaup		142	150		1				150			100			
Gray Whale															
Harlequin Duck					4										
Harbor Seal					200							1575		260	
King Eider				15											
Large Gull	24	978	176	32	536	9	1190	20	100	580	220	2320	105	850	25
Large Shorebird															
Mallard			1183	20	605		410		282					580	
Mew Gull	1	1	540	7	420							410		150	
Medium Shorebird				5											
Northern Fulmar															
Northern Pintail		2051	2812	150	7556		1200		110		45	10053		3595	
Pacific Loon															
Pelagic Cormorant															17
Pomarine Jaeger															
Red-breasted Merganser				5							2				
Rough-legged Hawk															
Red-necked Grebe				1											
Red-throated Loon	5	1		2											
Sabine's Gull															
Sea Otter						1					3	237		4	2
Small Gull	12	650	889	133	280	15	10				200	110		5	3
Small Shorebird		8085	200		2880		370		550	100	240	5500		500	
Steller's Eider			50								100	10003		18400	
Surf Scoter															
Tundra Swan	19										2			2	
Walrus										1					
White-fronted Goose															
Willow Ptarmigan															
White-winged Scoter				349	26	60					50		200		2

Table 1 (continued). Waterbird and mammal observations by segment, southwest Alaska, 26 Sept. - 3 Oct. 2007.

SPECIES	49	50	51	52	53	54	551	552	56	57	58	59	60	61	62
Amer. Green-winged Teal				25			2350								
Amer. Wigeon							600	250					10		
Bald Eagle (adult)			1												
Bald Eagle (juvenile)															
Pacific Brant			1			12	140		8			163	19931	37221	12493
Black-legged Kittiwake	11										1	556	12	100	6
Black Scoter	99	12	939	1508	13	213	75			5616		141			
Bonaparte's Gull													500		
Canada Goose			20	75			120						13345	1020	
Common Eider									600						
Common Loon															
Common Raven						4									
Cormorant	1					2			2						
Emperor Goose	13	2000	601	2235			2162	6154	3739	3787			964	232	103
Gadwall															
Brown Bear	1														
Greater Scaup					120								405		
Gray Whale															
Harlequin Duck															
Harbor Seal															550
King Eider															
Large Gull	574	2343	566	1395	3	4	1075	4112	5205	875	11	341	1597	4058	2010
Large Shorebird				20											
Mallard				10			570						60		
Mew Gull		3				125		8		6	2		800		
Medium Shorebird															
Northern Fulmar															
Northern Pintail		110	125	1125			5138	3960					5600	350	2
Pacific Loon	2											1			
Pelagic Cormorant	12											5		1	1
Pomarine Jaeger		5											3		1
Red-breasted Merganser			12		2										
Rough-legged Hawk				1											
Red-necked Grebe														2	
Red-throated Loon										2					
Sabine's Gull															
Sea Otter	1	51	191	4	9	7			654	9	143	113	76	186	
Small Gull	182	4								22	35	730		20	
Small Shorebird	50			25500			3650	1800				60			1710
Steller's Eider					1400	2670	5600	29615		3			1650	8516	100
Surf Scoter			10												
Tundra Swan				3									5		
Walrus	42														
White-fronted Goose															
Willow Ptarmigan				17			10								
White-winged Scoter	3		24		8	25				102		2			

Table 1 (continued). Waterbird and mammal observations by segment, southwest Alaska, 26 Sept. - 3 Oct. 2007.

SPECIES	63	64	65	66	67	68	80	81	82	83	84	85	Grand Total
Amer. Green-winged Teal													3500
Amer. Wigeon													915
Bald Eagle (adult)	1	1				1			3			1	9
Bald Eagle (juvenile)								2	2				5
Pacific Brant	16147	29142	27265		1725	2395	4620					3280	154603
Black-legged Kittiwake	1	1		23	84			270	2	42			1419
Black Scoter		15		30	1	12	20	106		47	25		20982
Bonaparte's Gull													503
Canada Goose	370	1325	6025		45	2550	1650					2399	29468
Common Eider													600
Common Loon										3			6
Common Raven				2									9
Cormorant										2			20
Emperor Goose	485	80				664	187	314	21	592	125	167	73531 ¹
Gadwall													17
Brown Bear													6
Greater Scaup													1068
Gray Whale										1			1
Harlequin Duck		20	5	65				20	18	60		28	220
Harbor Seal					1								2586
King Eider													15
Large Gull	1413	2065	4875	359	42	145	907	706	187	429	167	658	43287
Large Shorebird													20
Mallard		150				2							3872
Mew Gull								113		5			2591
Medium Shorebird													5
Northern Fulmar					15								15
Northern Pintail		100	2500				245					40	46867
Pacific Loon					12			3		3			21
Pelagic Cormorant	2		2	13	2		1	48					104
Pomarine Jaeger													9
Red-breasted Merganser							1303			362	70	145	1901
Rough-legged Hawk													1
Red-necked Grebe				6	3					5			17
Red-throated Loon				10				2					22
Sabine's Gull								2					2
Sea Otter	7	97	54		89				16			6	1960
Small Gull	400	450	150	95	80	7		125	274	123	20		5024
Small Shorebird	50			10				5		500	20	300	52080
Steller's Eider	20	1500	475										80102
Surf Scoter													10
Tundra Swan		2					2						35
Walrus													43
White-fronted Goose						1							1
Willow Ptarmigan													27
White-winged Scoter				2			10	5		36	4		908

¹ Total observed (70465) + previous 3-yr average for segments 86-137 (3066) = 73531.

Table 2. Emperor goose fall survey data, southwest Alaska, 1979-2007.

YEAR	TOTAL	3YR. AVG.	DATES	OBSERVERS	SURVEY AREA
1979	59,808	NA	10/1-4	B. Conant/R.E. Gill, Jr.	North Alaska Peninsula only
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 ¹
1997	86,669	88,232	10/3-5	R.J. King/C.P. Dau	North Alaska Peninsula only ¹
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	E.J. Mallek/C.P. Dau	North Alaska Peninsula only ¹
2000	61,626	63,199	10/1-5	E.J. Mallek/C.P. Dau	Kuskokwim Bay south
2001	59,987	60,613	9/26-10/1	E.J. Mallek/C.P. Dau	Kuskokwim Bay south
2002	78,692	66,768	9/29-10/2	E.J. Mallek/C.P. Dau	Kuskokwim Bay south
2003	77,290	71,990	9/27-10/2	E.J. Mallek/C.P. Dau	Kuskokwim Bay south
2004	93,544	83,175	9/30-10/3	E.J. Mallek/C.P. Dau	Kuskokwim Bay south
2005	73,212	81,349	10/4-8	E.J. Mallek/C.P. Dau	Alaska Peninsula only
2006	81,078	82,611	9/26-28	E.J. Mallek/C.P. Dau	Alaska Peninsula only
2007	73,531	75,940	9/26-10/3	E.J. Mallek/C.P. Dau	North Alaska Peninsula only ¹

¹ Previous south side of the Alaska Peninsula used in estimate.

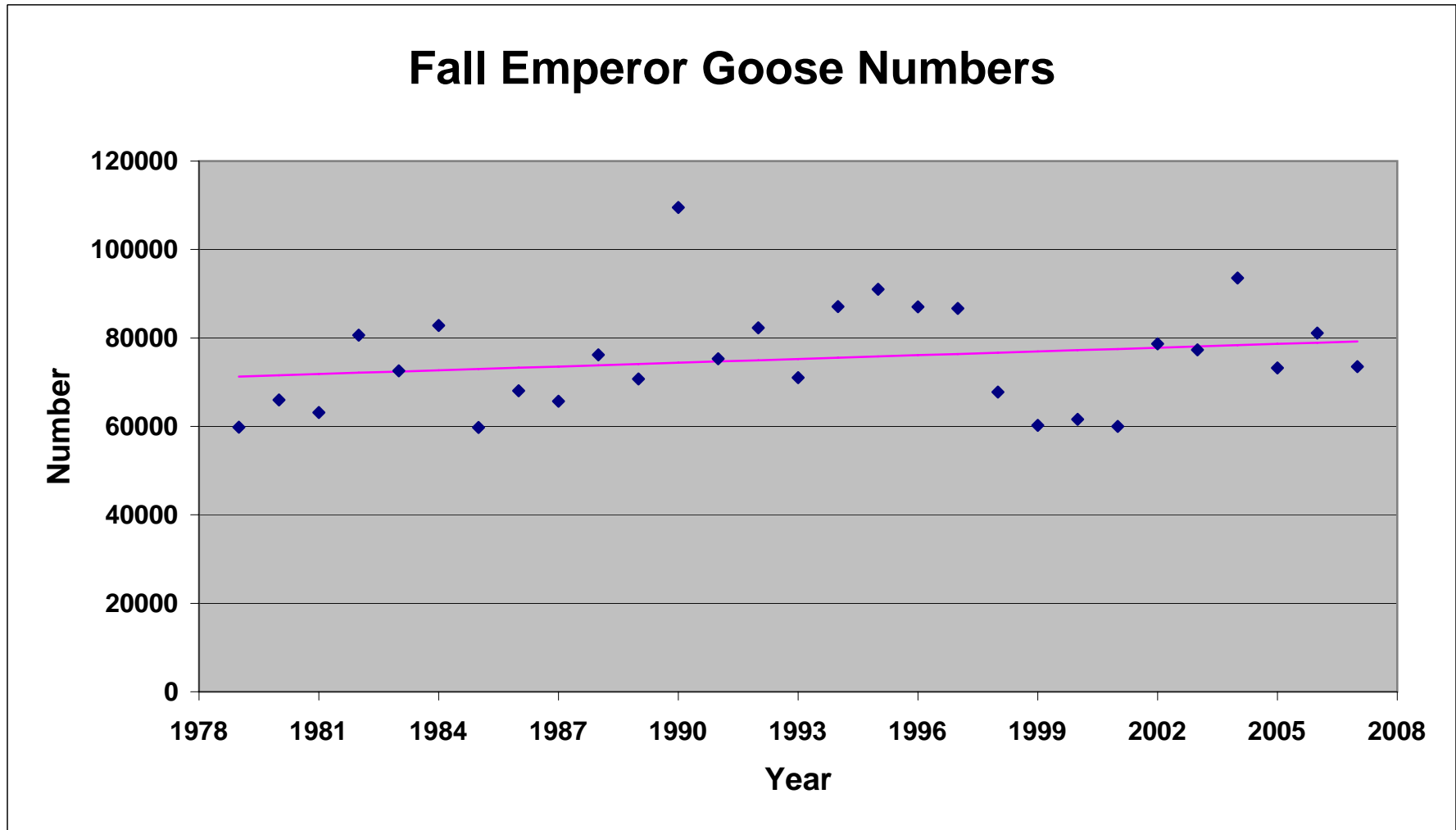


Figure 3. Twenty-nine year trend of fall staging emperor geese in southwest Alaska: mean = 75,249, slope = 284, $p = 0.29$, R square = 0.04, mean annual growth rate = 0.38%.