

TESHEKPUK LAKE AREA MOLTING GOOSE SURVEY – 2009

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Abstract: The 28th annual molting goose survey, conducted in the area north and east of Teshekpuk Lake on the Arctic Coastal Plain of Alaska, was conducted on 16-17 July 2009. Pacific brant, Canada geese, white-fronted geese, and snow geese were recorded throughout the survey area with counts of adults and (young) at 18,647 (37), 18,720 (144), 34,944 (4,249), and 6,400 (147), respectively. Totals of 282 tundra swans with 64 cygnets were also counted throughout the survey area.

Key Words: aerial survey, molting geese, Teshekpuk Lake, National Petroleum Reserve **December 2009**

INTRODUCTION

This report summarizes the results from the 2009 Teshekpuk Lake area molting goose survey. The survey, initiated in 1976 and repeated in 1977-78 and conducted annually since 1982, monitors the abundance and distribution of molting geese that use the area north and east of Teshekpuk Lake. The significance of this area to molting geese was first documented by Henry (Hank) Hansen in 1957 (King 1970). Past surveys of the area have documented large concentrations of molting Pacific brant (*Branta bernicla nigricans*), Canada geese (*Branta canadensis*), and white-fronted geese (*Anser albifrons frontalis*).

This survey documents abundance and distribution of molting geese during the survey period (mid July). This timeframe is believed to be the peak of the molting period for most geese, and observations during the survey (flightless geese) substantiate this assumption. The distribution of geese before and after the peak molting period may be different than the distribution during the survey. Furthermore, goose distribution during the survey period (mid July 1976-2009) has changed over time (Flint et al. 2007). Therefore, data collected during this survey should only be used to determine general trends (with limited temporal extent) of goose distribution during the peak molt, and should not be the sole source to determine goose distribution throughout the molt cycle in the area north and east of Teshekpuk Lake.

STUDY AREA AND METHODS

Study Area and Survey Design

The survey area included approximately 197 lakes and several bay, shoreline, and creek segments located north and east of Teshekpuk Lake (Figure 1). Each lake was identified by a unique number and observations of geese, swans, and loons were recorded for each lake. The 2009 survey was flown in a Cessna 206 amphibious equipped aircraft

(N234JB) at 45-60 meters (150-200 feet) above ground level and at airspeeds of 130-190 kilometers per hour (80-110 knots). Aircraft navigation was maintained by an aerial photographic-based paper map with lake identifiers (numbers) printed on the map and by a remote computer screen running a moving map program developed by John Hodges (USFWS-retired). The aircraft flight path was recorded by a laptop computer connected to the aircraft global positioning system (GPS).

Survey Procedures

Shorelines of large lakes were flown so that feeding or loafing geese on land would be recorded. Surfaces of large lakes were also flown in a systematic fashion providing 100% coverage of the lake. Smaller lakes were flown so that the flight path over the lake provided an unrestricted view of the entire lake and shoreline. Observations from both observers were recorded directly into one laptop computer by the pilot/observer via a remote microphone (as sound files) using a program developed by John Hodges. A second computer program, also developed by John Hodges, was used later to replay sound files and transcribe data to text files. The transcribed text files were then used for data analyses.

RESULTS

The 2009 survey was conducted over two days on 16-17 July. Totals of 78,711 adult geese and 4,577 goslings were recorded during the survey. Pacific brant accounted for 24% of the adult geese observed (18,647 adults and 37 goslings), while white-fronted geese accounted for 44% of the adult geese observed (34,944 adults and 4,249 goslings). Canada goose totals were 18,720 adults and 144 goslings and accounted for 24% of the adult geese observed. Snow geese (*Anser chen caerulescens*) accounted for 8% of the adult geese observed (6,400 adults and 147 goslings). Tundra swan (*Cygnus columbianus*) totals were 282 adults and 64 cygnets. Pacific loon (*Gavia pacifica*), red-throated loon (*Gavia stellata*), and yellow-billed loon (*Gavia adamsii*) totals were 206, 51, and 7, respectively.

Observation totals for geese, swans, and loons are provided in Table 1 for the 2009 survey. Figures 2-4 and 6-7 illustrate the number of adult geese counted on this survey from 1982-2009.

DISCUSSION

Pacific Brant

The importance of this survey area to molting Pacific brant (Figure 2) is well documented in previous reports of this survey. The 2001 count for Pacific brant in this area (36,817) was the highest ever recorded and constituted approximately 30% of the total Pacific flyway population for that year. The 2009 count for brant in this area (18,647) accounted for approximately 12% of the total Pacific flyway population that was counted in the

winter of 2007-2008 (~156,600, Mallek and Wortham, 2008), and was similar to the previous ten-year (1999-2008) mean of 19,124.

Data from this survey are useful to determine the number of brant that use this area in any given year during peak molt, as well as to determine the proportion of the Pacific flyway population that molt in this area in a specific year. While these numbers are useful indicators of the importance of this area to brant, they can not be used to estimate the proportion of the Pacific flyway population that uses this area in their life cycle. Some brant may use this area only once in their life time (e.g., as a second-year bird), other brant may molt here occasionally (e.g., after nest failure), and some brant may use this area many times (e.g., as an adult non-breeder). Therefore, the number or proportion of the population of brant that use this area in a specific year or averaged over multiple years is probably a biased indicator (biased low) of the use of this area by the Pacific flyway population.

Canada Geese

Use of the survey area by molting Canada geese is highly variable (Figure 3) and appears to be weakly correlated to use by Pacific brant. The 2009 Canada geese count was 18,720 which is well above to the previous ten-year (1999-2008) mean of 12,235.

White-fronted Geese

The nesting grounds of white-fronted geese that use this area is believed to be the Arctic Coastal Plain of Alaska (ACP). Although the estimated population of white-fronted geese during the nesting season on the ACP has grown slightly over the last two decades (Larned et al. 2008), the molting population in the Teshekpuk Lake survey area has had substantially more growth (Figure 4). The 2009 count for adult white-fronted geese was 34,944 birds, while the gosling count was 4,249. The high gosling count suggests good white-fronted goose production throughout the ACP in 2009, and suggests that use of this molting area by white-fronted geese is continuing a positive trajectory.

Snow Geese

Use of the survey area by snow geese is relatively low when compared to other species of geese, although in recent years snow goose numbers have increased significantly (Figure 6).

CONCLUSION

The importance of the Teshekpuk Lake survey area to molting geese has been well documented and is a major reason this area gained temporary protection from oil development in 1998 and was reaffirmed in 2008 with a 10-year deferral to oil and gas leasing (U.S. BLM 2008). Since molting geese are highly susceptible to disturbance (Derksen et al. 1992), and in some years molting habitat provided by this small area is

extremely important to the global population of Pacific brant, continued protection of this area from disturbance caused by oil development is certainly warranted.

ACKNOWLEDGMENTS

I thank Karen Bollinger (MBM-Fairbanks) for her help as an observer during the survey. I acknowledge Rod King (USFWS-retired) for collecting the majority of the data (1982-1999) presented in the figures of this report.

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Data and conclusions presented in this report are preliminary and are not for publication or citation in published manuscripts without the permission from the author.

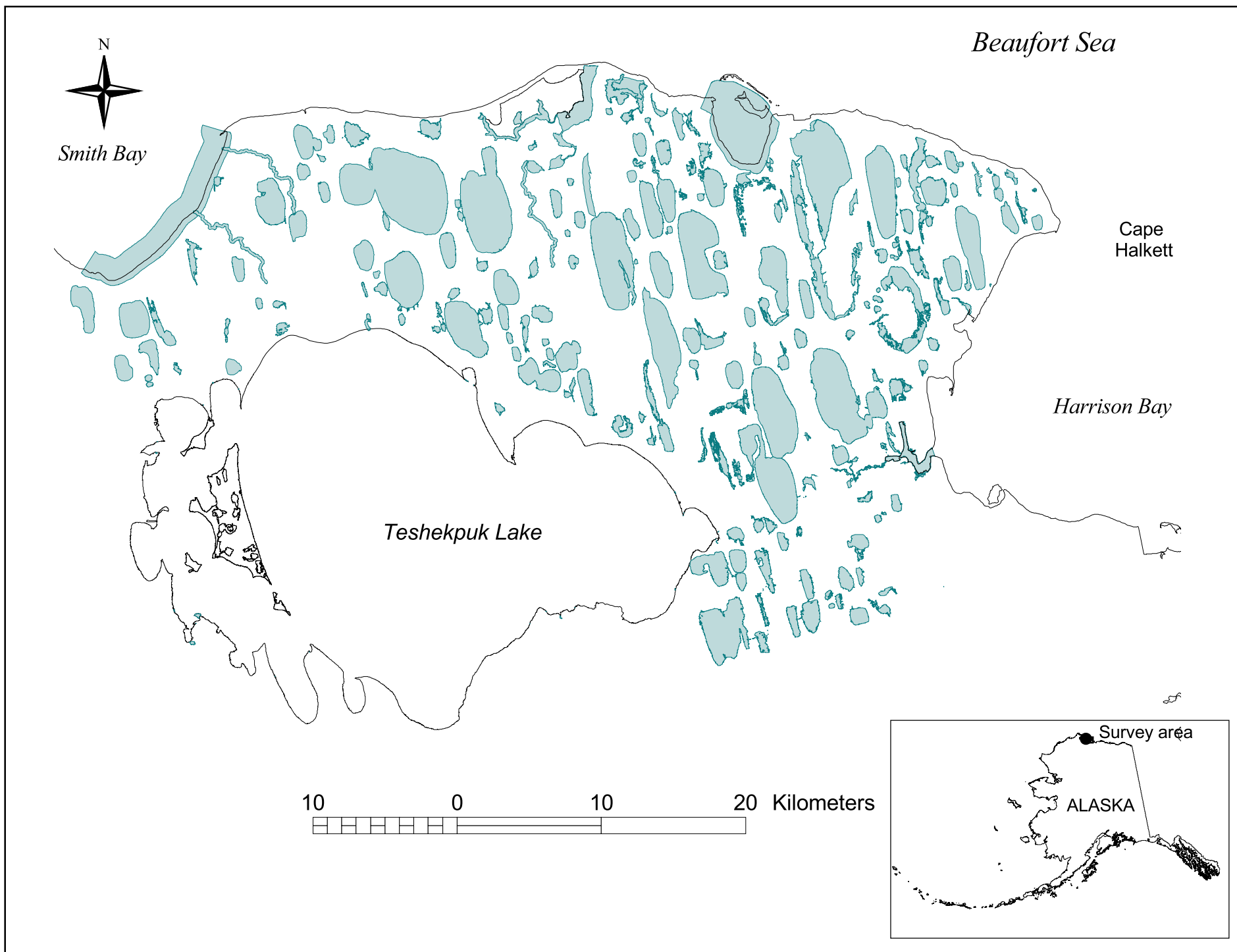


Fig. 1. Lakes, bay shorelines, and creeks surveyed by airplane for molting geese on a portion of the Arctic Coastal Plain of Alaska.

Table 1. Observations of geese, swans, loons, and snowy owls by lake from Teshekpuk Lake area molting goose survey 2009.

Lake Number	BLBR	BLBRB	CAGO	CAGOB	GWFG	GWFGB	PALO	RTLO	SNGO	SNGOB	SNOW	SWAN	SWANC	YBLO	Grand Total
1					686	38	2					2			728
2					318	30	2	1				7			358
3					650				3			2			655
4			2		31	40						3		4	80
5					10	20									30
6							2					1			3
7							2					2			4
8					88	20	7	2				2			119
9					42	7	2							1	52
10															0
11							1					2			3
12					72	131	2								205
13					40							2			42
14					16	20	2								38
15			40		44	20	2	1				2			109
16															0
17					9	12						2			23
18			288	10	142			2	276						718
19	5		80		350				60						495
20															0
21	95		312		1082	116	2		727	8	1				2343
22					7	3	1		2	3					16
23					112	8	4								124
24	8				355	4	1		2						370
25					199		1		6	2		3			211
26					37	2	4								43
27							6								6
28			43		493	8									544
29	5		118		920										1043
30					34	10		2							46
31	4		30		18	36									88
32					10	20									30
33			10		105	22	1								138
34												2			2
35							1	2				2			5
36			78		606	51		2							737
37							5					2			7
38	6	1	110		69	38						2	2		228
39			27		88										115
40	8	12	27		946	19	2								1014
41					7	15						1			23
42					14	28									42
43					150							2	3		155
44			153		664	107			165			2			1091
45					64	31									95
46	20		65						202						287
47			27		19				37	5		3			91
48	22		270		989	45	1		249		1	10			1587
49															0
50															0
51					28	15			4		1				48
52	1442		2038	4	145	273			8	12	2	6			3930

BLBR = Pacific brant, BLBRB = Pacific brant gosling, CAGO = Canada goose, CAGOB = Canada goose gosling, GWFG = greater white-fronted goose, GWFGB = greater white-fronted goose gosling, PALO = Pacific loon, RTLO = red-thoated loon, SNGO = snow goose, SNGOB = snow goose gosling, SNOW = snowy owl, SWAN = tundra swan, SWANC = tundra swan cygnet, YBLO = yellow-billed loon.

Table 1 (continued). Observations of geese, swans, loons, and snowy owls by lake from Teshekpuk Lake area molting goose survey 2009.

Lake Number	BLBR	BLBRB	CAGO	CAGOB	GWFG	GWFGB	PALO	RTLO	SNGO	SNGOB	SNOW	SWAN	SWANC	YBLO	Grand Total
53	1912		640		37	72						2			2663
54			90	10	580	381			30						1091
55	405		700		95	105	1					3	3		1312
56					124	7						2			133
57			46		200		1					2			249
58					60	10	2		12	8		2			94
59															0
60	4	4	351												359
61	252	5	47		857		2								1163
62	307		245		1392	118	4		31			4	3		2104
63					430				28						458
64							2	2				4			8
65			2		30				90						122
66					542	60									602
67					53							2			55
68			4		300		3					2	2		311
69												2	3		5
70					42	5	1					1			49
71												2			2
72	37		90		166	5	1	1				2			302
73							1								1
74	8		80		433	52	2		75						650
75					7	22	6					2			37
76					70		1								71
77			8		599	6	9					6	3		631
78	10	11			206	122	7					16	4		376
79					60		1					6			67
80					5	3						1			9
81												5	3		8
82			10		18	45		2				5	3		83
83					121	43	1	8	6		1	6	2		188
84					420		4					22			446
85					60										60
86					237	8	3					2			250
87			394		347	134	4		65	37		4	4		989
88							2								2
89					114	25			4			3			146
90					625				1						626
91					17	3	4								24
92							2								2
93					350										350
94							3					4			7
95			114	11	309	290			11	6	1	1			743
96			40		41				10						91
97					27	50	1					2	4		84
98					277										277
99	404		764		916	23			1			1	4		2113
100			150		325	4			80						559
101			4		402	2	2	1	2			4	3		420
102			20		136	49									205
103							12					2			14
104	800		317	50	1430		3	3	101			1			2705

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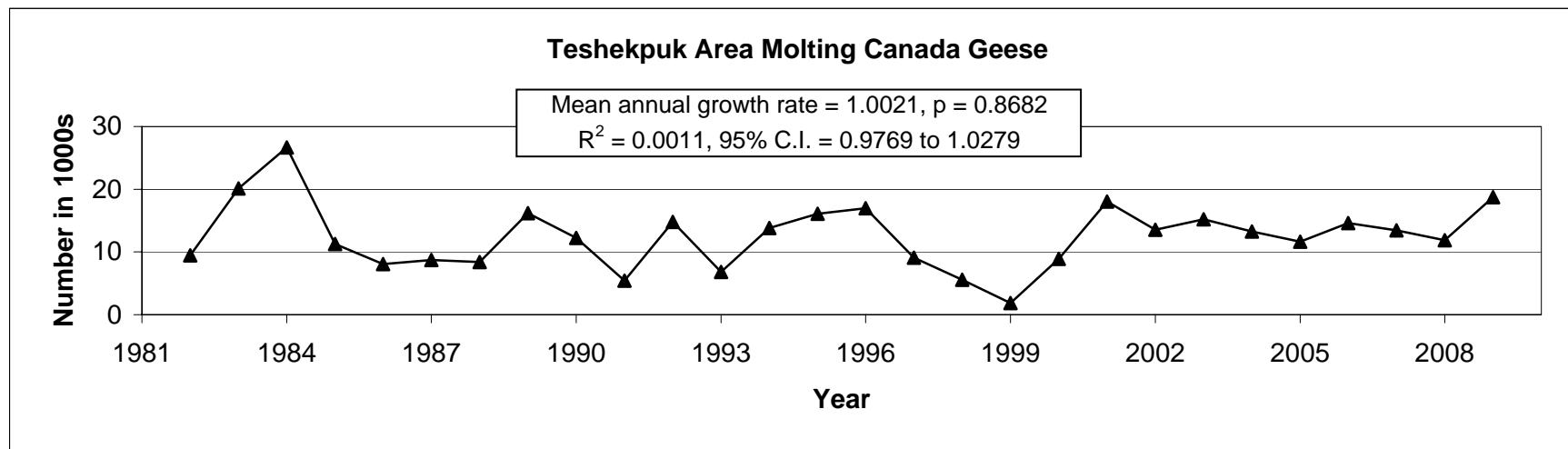
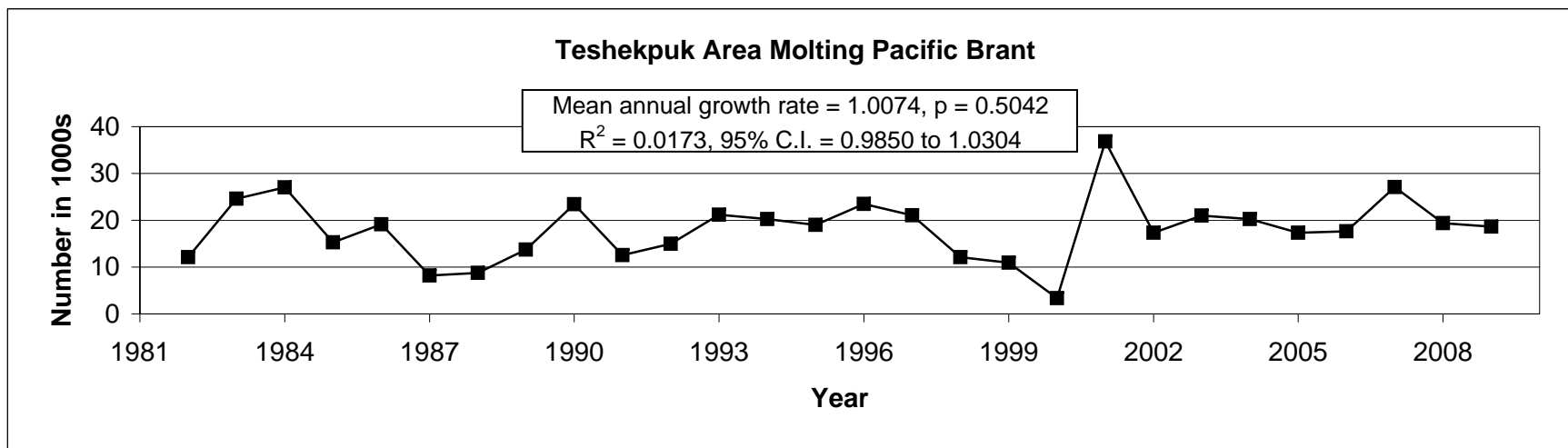
Lake Number	BLBR	BLBRB	CAGO	CAGOB	GWFG	GWFGB	PALO	RTLO	SNGO	SNGOB	SNOW	SWAN	SWANC	YBLO	Grand Total
105	365				530				1			2	2		900
106	745		1646		533				25			7			2956
107	726		257		580	6									1569
108			60		35										95
109							1								1
110	12		1370		446	2			1						1831
111															0
112			200		325				6			2			533
113	105		213		20										338
114							4					2	3		9
115			1231						2	3		2			1238
116	94		240		42	61						3			440
117															0
118	144		210		9	13	14		18	13	1	2			424
119	245										1				246
120	5														5
121					8										8
122			35					8							43
123	50		75												125
124															0
125	139		274		25							5			443
126			115		300										415
127															0
128															0
129	40				30										70
130					45	10									55
131											1				1
132	70		79		34	60									243
133	175														175
134												2			2
135			26												26
136					14	20									34
137	370		10		6	12									398
138															0
139	222														222
140	30		75		200							1			306
141			20												20
142	150		130		20										300
143	35		56		82	31									204
144			65	5	194	10	2		2			2			280
145	510		358		437	20		1	195		1	5			1527
146			30	10	138	5	2		2		1				188
147			15		178				32						225
148							1								1
149	1772		492	40	1028	135			1286	30	3				4786
150	200		20		54				270	4		2			550
151					2	4									6
152			10		85	154			4	2	1				256
153															0
154					230				1			1			232
155					228	10	3					2			243
156					408	35	2								445

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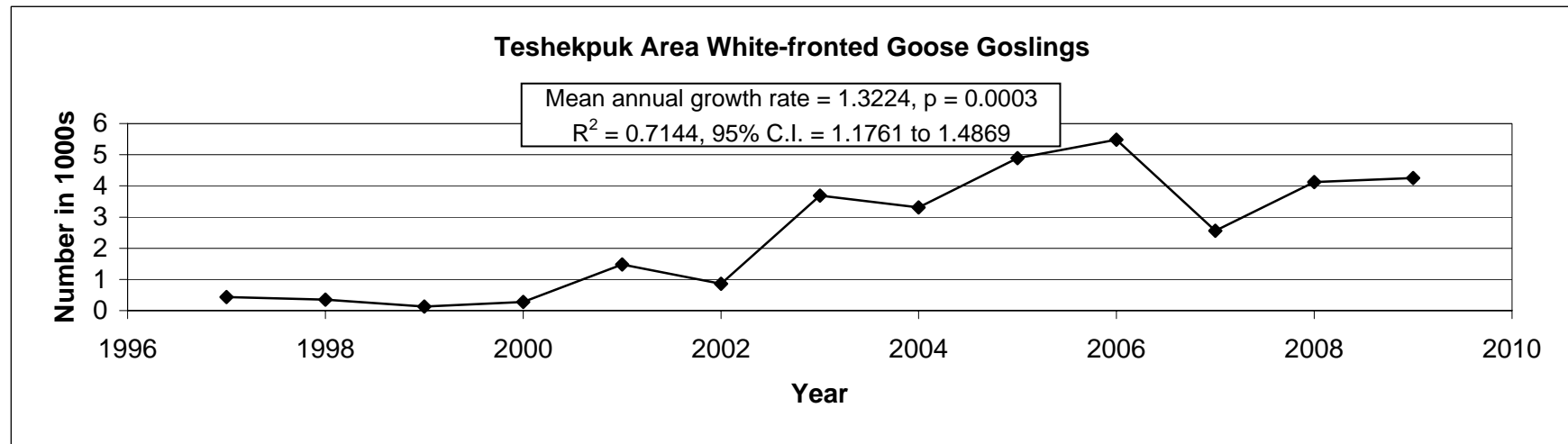
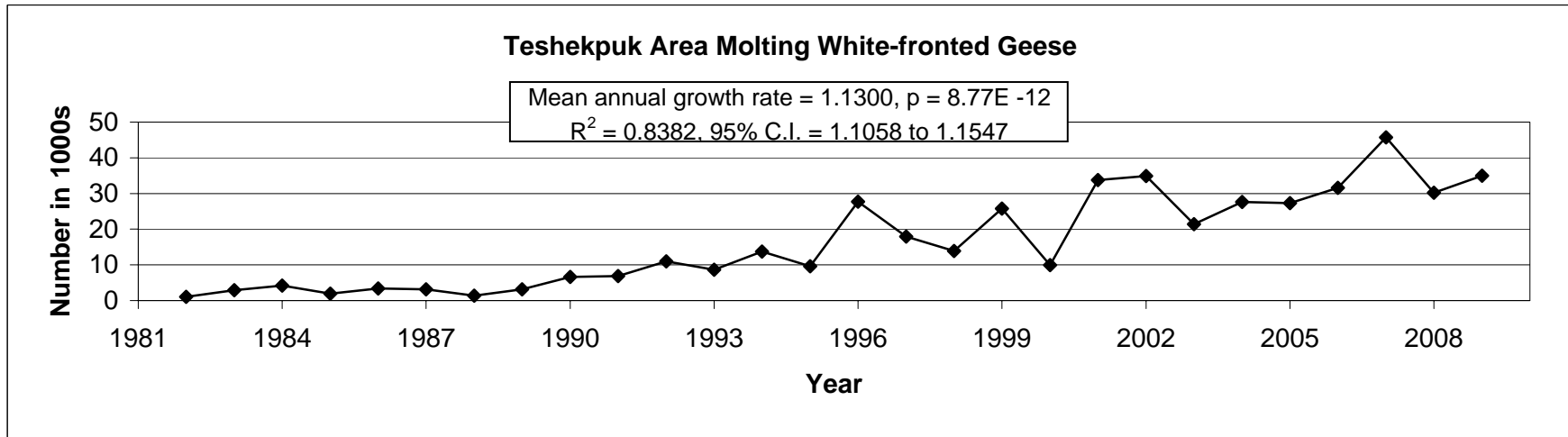
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Lake Number	BLBR	BLBRB	CAGO	CAGOB	GWFG	GWFGB	PALO	RTLO	SNGO	SNGOB	SNOW	SWAN	SWANC	YBLO	Grand Total
157					6		4					3			13
158															0
159							2					2	2		6
160					60	125						6	4		195
161			465		1140	110			18			2			1735
162	5	4	111		275	30			12						437
163							2					3			5
164							3					2	2		7
165					68	3	4		2	6		5			88
166					60	30	3					2			95
167					278	125						8			411
168					6		4					2			12
169			80		320						1	2			403
170	460		297		240		2								999
171	170		140		2	6									318
172	360		71		266	5	2		6			1			711
173			102		2										104
174	25		50		160		2					1			238
175	218		244		240	10						4			716
176	357		218	4	231	6									816
177			30		200		2					4	4		240
178												2			2
179	55				2										57
180	10		20		350										380
181															0
182	369														369
183															0
184	250		103		150	30	2								535
185															0
186	60		290												350
187			35		20			1							56
188															0
189															0
190															0
191															0
192					16							1			17
193	650		58									1			709
194	3						2					2			7
195	698				250										948
196							1								1
197															0
198	80		275		20			2							377
199	9				65	60		9	25					2	170
200	2910		485		439	60			2127						6021
201					243	13			7	3					266
205			175		60										235
206			125		395	60			5	5					590
207					32	80			5						117
208			200		963	75	4	1	60			4	1	7	1308
Grand Total	18647	37	18720	144	34944	4249	206	51	6400	147	17	282	64	7	83915
	BLBR	BLBRB	CAGO	CAGOB	GWFG	GWFGB	PALO	RTLO	SNGO	SNGOB	SNOW	SWAN	SWANC	YBLO	Grand Total

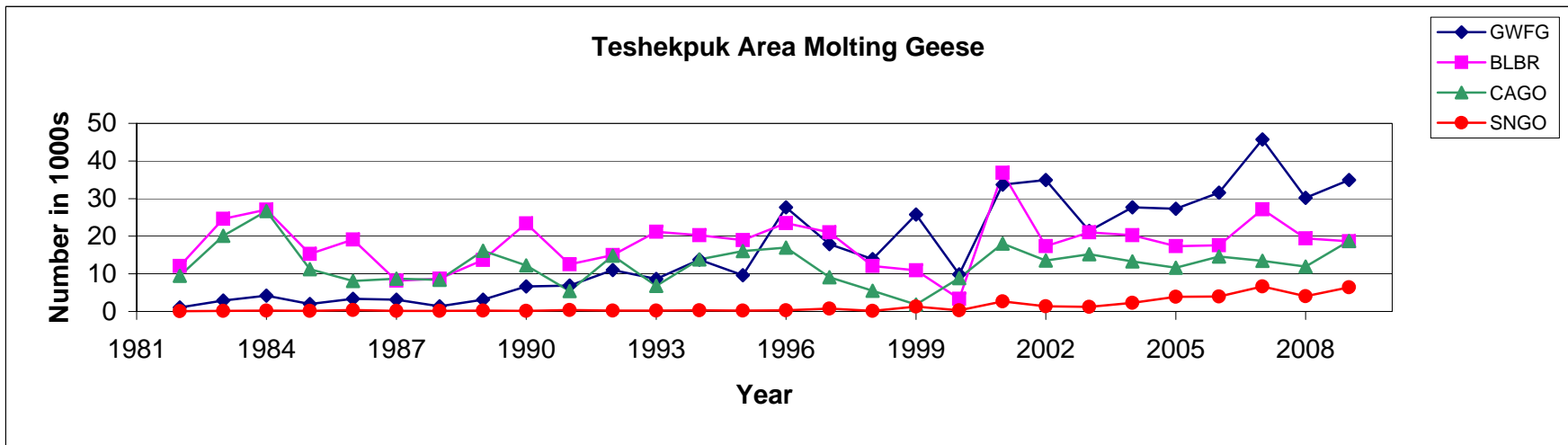
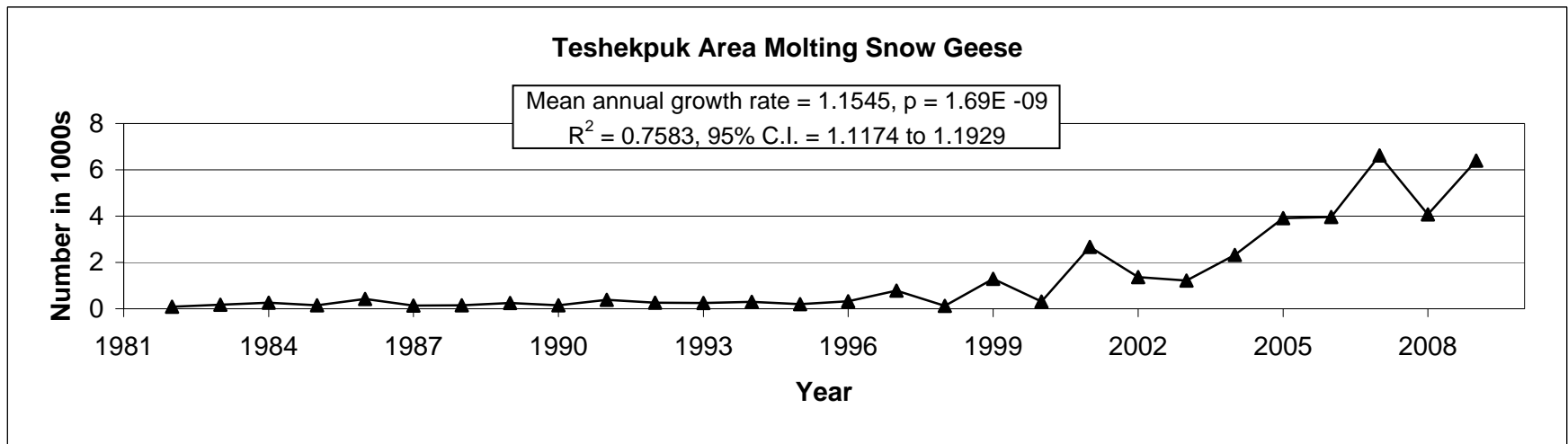
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Figures 2 and 3. Numbers of adult and subadult Pacific brant and Canada geese molting on lakes and wetlands north and east of Teshekpuk Lake, 1982-2009 (goslings not included). Pacific brant: mean 1982-2009 = 18,093; mean 2000-2009 = 19,893; high count = 36,817 in 2001. Canada geese: mean 1982-2009 = 12,525; mean 2000-2009 = 13,921; high count = 26,811 in 1984.



Figures 4 and 5. Numbers of adult and subadult molting white-fronted geese 1982-2009 (goslings not included) and white-fronted goose goslings (1997-2009) on lakes and wetlands north and east of Teshekpuk Lake. Adult and subadult white-fronted geese: mean 1982-2009 = 16,439; mean 2000-2009 = 29,734; high count = 45,747 in 2007.



Figures 6 and 7. Numbers of adult and subadult snow geese and all geese molting on lakes and wetlands north and east of Teshekpuk Lake, 1982-2009 (goslings not included). Snow geese: mean 1982-2009 = 1,377; mean 2000-2009 = 3,287; high count = 6,626 in 2007.