

TESHEKPUK LAKE AREA MOLTING GOOSE SURVEY – 2007

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Abstract: The 26th annual molting goose survey, conducted in the area north and east of Teshekpuk Lake on the Arctic Coastal Plain of Alaska, was conducted on 15-17 July 2007. Pacific brant, Canada geese, white-fronted geese, and snow geese were recorded throughout the survey area with counts of adults and (young) at 27,109 (45), 13,428 (120), 45,747 (2,563), and 6,626 (222), respectively. Totals of 229 tundra swans with 78 cygnets were also counted throughout the survey area.

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

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INTRODUCTION

This report summarizes results from the 2007 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 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 time frame 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, 1976-2007) 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 2007 survey was flown in a Cessna 206 amphibious equipped aircraft at 45-60 meters (150-200 feet) above ground level and at airspeeds of 130-190 kilometers per hour (80-120 miles per hour). 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, Waterfowl Management-Juneau). 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 any 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. For smaller lakes, a 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 ASCII files. The transcribed ASCII files were then used for data analyses.

RESULTS

The 2007 survey was conducted over three days on 15-17 July. Totals of 92,910 adult geese and 2,950 goslings were recorded during the survey. Pacific brant accounted for 29% of total adult geese observed during the survey (27,109 adults and 45 goslings), while white-fronted geese accounted for 49% of total adult geese (45,747 adults and 2,563 goslings). Canada geese totals were 13,428 adults and 120 goslings. Canada geese accounted for 14% of the total adult geese observed during the survey. Snow geese (*Anser chen caerulescens*) accounted for 7% of the adult geese observed during the survey (6,626 adults and 222 goslings). Tundra swan (*Cygnus columbianus*) totals were 229 adults and 78 cygnets. Pacific loon (*Gavia pacifica*), red-throated loon (*Gavia stellata*), and yellow-billed loon (*Gavia adamsii*) totals were 187, 55, and 2, respectively.

Observation totals for geese, swans, and loons are provided in Table 1 for the 2007 survey. Figures 2-4 and 6-7 illustrate the numbers of adult geese counted on this survey from 1982-2007.

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 brant population for that year. The 2007 count for Pacific brant in this area (27,109) accounted for approximately 20% of the total Pacific brant population that was counted the previous winter (140,000, Mallek and Conant 2007). While the number of Pacific brant that use this area in a given year is an indicator of the importance of this area to brant, it doesn't indicate the proportion of the Pacific brant population that use this molting area in their life cycle.

Use of this molting area by failed and non-breeding after-second-year birds is determined by current-year success of breeding colonies throughout Alaska, Russia, and Canada. Similarly, use by second-year birds is determined by successful recruitment during the previous reproductive year. Therefore, the number, or proportion of the population, of brant that use this molting area in a given year, or averaged over multiple years, is a biased indicator (biased low) of use of this area by the Pacific brant 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.

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 Arctic Coastal Plain has grown slightly over the last two decades (Mallek et al. 2007), the molting population in the Teshekpuk Lake survey area has had substantially more growth (Figure 4). The 2007 count for adult white-fronted geese (45,747) was the highest ever reported since this survey was initiated. This may be due in part to poor nesting success on the ACP during 2007 as indicated by the drop in white-fronted goose goslings counted during the survey (Figure 5) as compared to recent years.

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). The 2007 count for snow geese (6,626) was the highest on record, which may be a result of poor reproductive success in adjacent snow goose colonies outside the survey area.

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. Data from this survey since 1998 confirms this importance. 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, further protection of this area from disturbance caused by oil development is certainly warranted.

ACKNOWLEDGMENTS

I thank Heather Wilson (MBM-Anchorage) for her help as observer during the survey. I acknowledge Rod King (USFWS) 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 permission from the author.

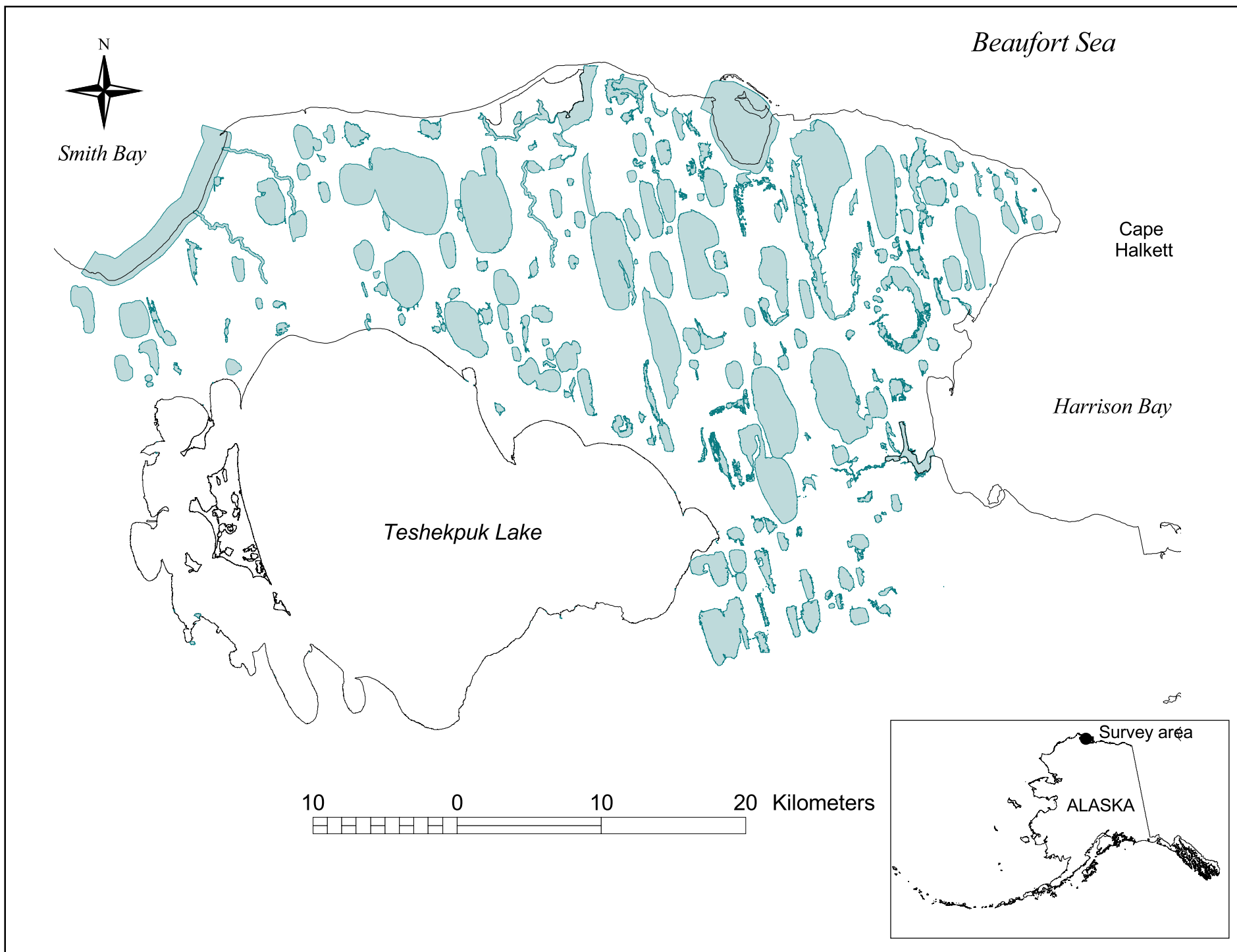


Fig. 1. Lakes, bay shorelines, and creeks surveyed by airplane for molting geese on a portion of the Arctic Coastal Plain of Alaska.

Table 1. Observations of geese, swans, loons, and snowy owls by lake from Teshekpuk Lake area molting goose survey 2007.

Lake Number	BLBR	BLBRB	CAGO	CAGOB	GWFG	GWFGB	PALO	RTLO	SNGO	SNGOB	SNOW	SWAN	SWANC	YBLO	Grand Total
1					22	41						3	1		67
2					327			1			1	2			331
3	8				624	6						3	1		642
4					94	6	5					3			108
5												2			2
6					2	4									6
7					8	3									11
8					70	14	1	1			1	6			93
9					298		1								299
10												2			2
11							1								1
12															0
13							3					2	3		8
14					110		4					4			118
15			81		38		1				1				121
16											1				1
17	2				2	6	1				1				12
18	4	5	180		913	2		1	109	14					1228
19					195							2			197
20															0
21	115		354		1806	41		1	451		1	4			2773
22												2	1		3
23	10				179							2			191
24	5		8		612										625
25			95		487	12			29		2	3	3		631
26							3				1				4
27												1			1
28					343	15									358
29			14		917	2	2	4				1			940
30					21										21
31			27		549	33		5							614
32					7		2								9
33															0
34							3					3			6
35							3								3
36	50		57		883	74	3	4							1071
37					3	5	7					2	1		18
38			65		76	51									192
39			27		85							7			119
40			8		234	99	1					2			344
41					5	7	2					2			16
42					32	93	1	2							128
43					525							3	3		531
44			50		943	80	2	2	1						1078
45					11	6	2	2							21
46	85		40		135			1	452		2				715
47			90		68				35						193
48	60		420	3	2346	17	3	5	51						2905
49															0
50											1				1
51					22	35	1		27	5					90
52	792		2898		6	12					1	7	2		3718

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-throated 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 2007.

Lake Number	BLBR	BLBRB	CAGO	CAGOB	GWFG	GWFGB	PALO	RTLO	SNGO	SNGOB	SNOW	SWAN	SWANC	YBLO	Grand Total
53	4629		792		74	124	1	1				6			5627
54					1308	14						5			1327
55	4		309		142	140						1			596
56					130										130
57			35		440										475
58					3		1					1			5
59															0
60															0
61	210		524		1700						1				2435
62	675	2	58		2234	43	2		7			2	3		3026
63					500										500
64							3					6	2		11
65					290										290
66			35		430		2		5			2	2		476
67					305						1				306
68			12		277		1								290
69			2		8	14						2			26
70	2	5	9		76	61	2					1	2		158
71					10	8	2					1			21
72			195		260	15									470
73					11		2								13
74					948	54	9		60	31					1102
75					72	66	9		2	4		2			155
76					870				1			4			875
77					14	6	6	1				5	3		35
78			12	34	24	50	8					11	1		140
79												3			3
80												2			2
81					205		2					4	5		216
82												2	2		4
83							3	1				8	8		20
84					26	12	1								39
85					118	6						1			125
86							5					2			7
87			311		582	72	3		4			2			974
88							2								2
89					2		4					6	3		15
90					997		2					2	2		1003
91					36										36
92							1								1
93	2				1150		3					1			1156
94															0
95			175	3	62	14	1		27	21					303
96			60		25										85
97					30	20						2			52
98			12		325										337
99	375		450		1158							4	3		1990
100			65		696	8									769
101			2	3	57	29	2								93
102			8		22				3						33
103					10		2	15				2			29
104	1183		135		1635	18		5	58	8				1	3043

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-throated loon, SNGO = snow goose, SNGOB = snow goose gosling, SNOW = snowy owl, SWAN = tundra swan, SWANC = Tundra swan cygnet, YBLO = yellow-billed loon.

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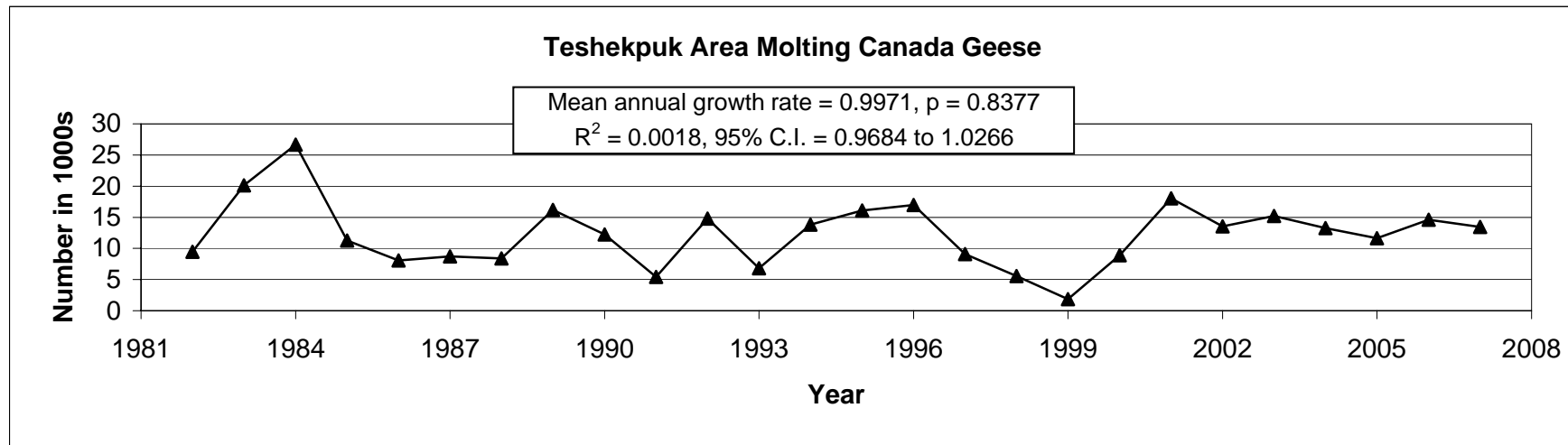
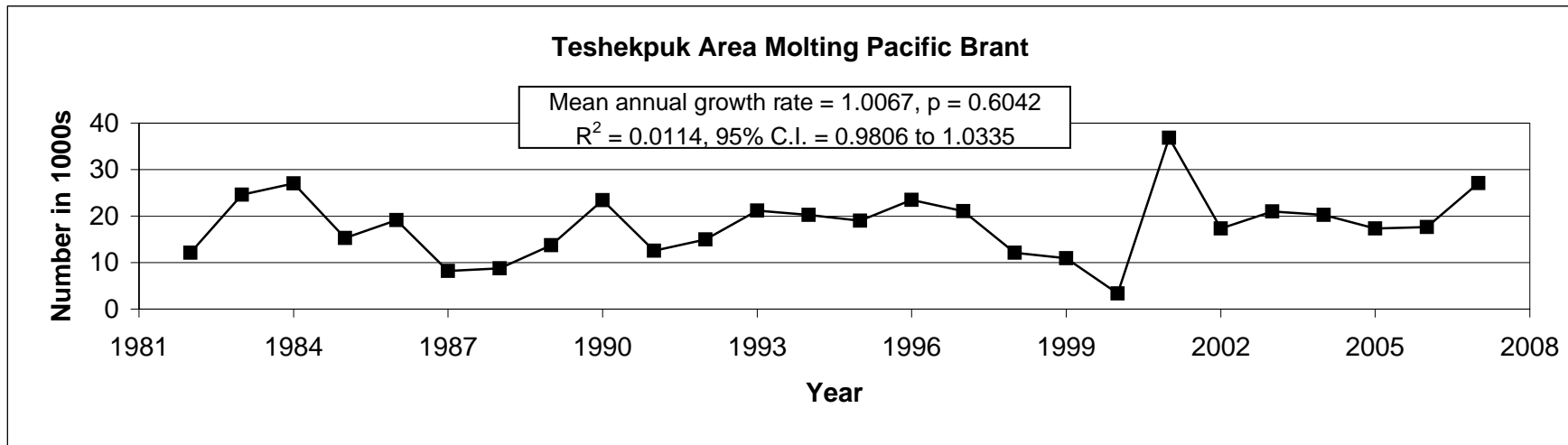
Lake Number	BLBR	BLBRB	CAGO	CAGOB	GWFG	GWFGB	PALO	RTLO	SNGO	SNGOB	SNOW	SWAN	SWANC	YBLO	Grand Total
105	150				1050										1200
106	2162		574	10	431				14		1				3192
107	1110		445		422										1977
108	8		35		290							2			335
109															0
110	12				60	24			20	15		3			134
111															0
112	18				85										103
113					157				1			1			159
114					330										330
115															0
116	2		125		12						5				144
117	80														80
118	638	2			27	14			15	4	3				703
119															0
120															0
121	160		10												170
122	65		30		2										97
123	176				2		3								181
124															0
125	655		202		240		3								1100
126							1					2	3		6
127															0
128															0
129	160		127		170										457
130					26		1								27
131			162		530		2								694
132	187		42		3										232
133															0
134					10	12									22
135	55		17		18	37									127
136	5														5
137	8														8
138															0
139															0
140	35		80		137	3									255
141	160		19		3										182
142	80		119		62							4			265
143	15		47		111	10									183
144			30		700							4			734
145	1778		465	2	647	3		6				2			2903
146							2								2
147			56	10	272	3						2			343
148												2			2
149	4292		282		839	125			260			5	2		5805
150	70				115	15			442						642
151	2	1										2			5
152					7	4									11
153															0
154					65		4					4			73
155					200		3					2			205
156			15		458	26									499

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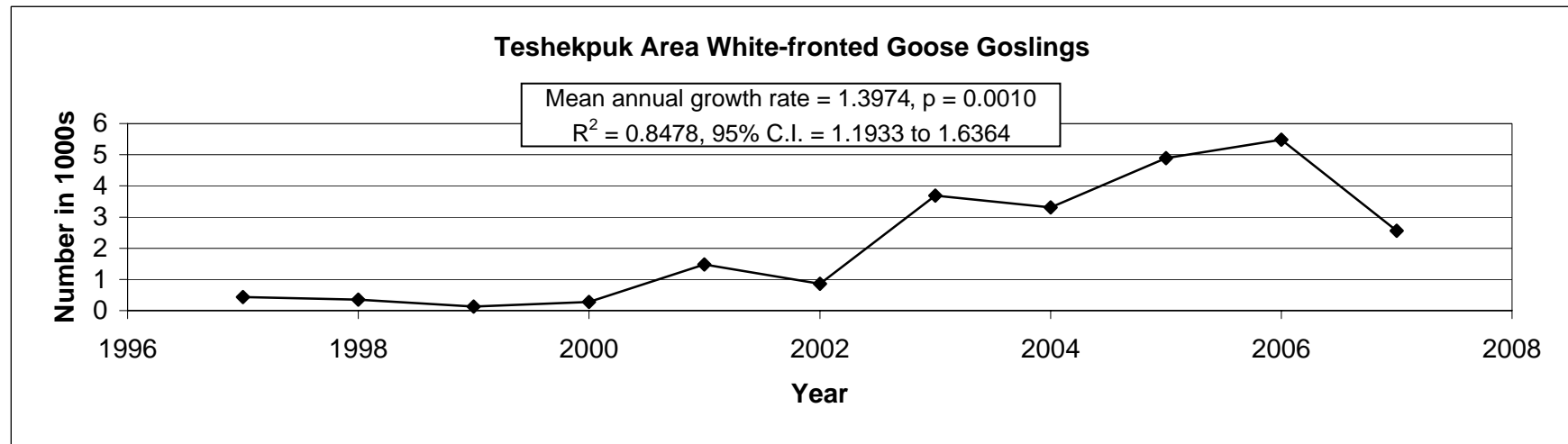
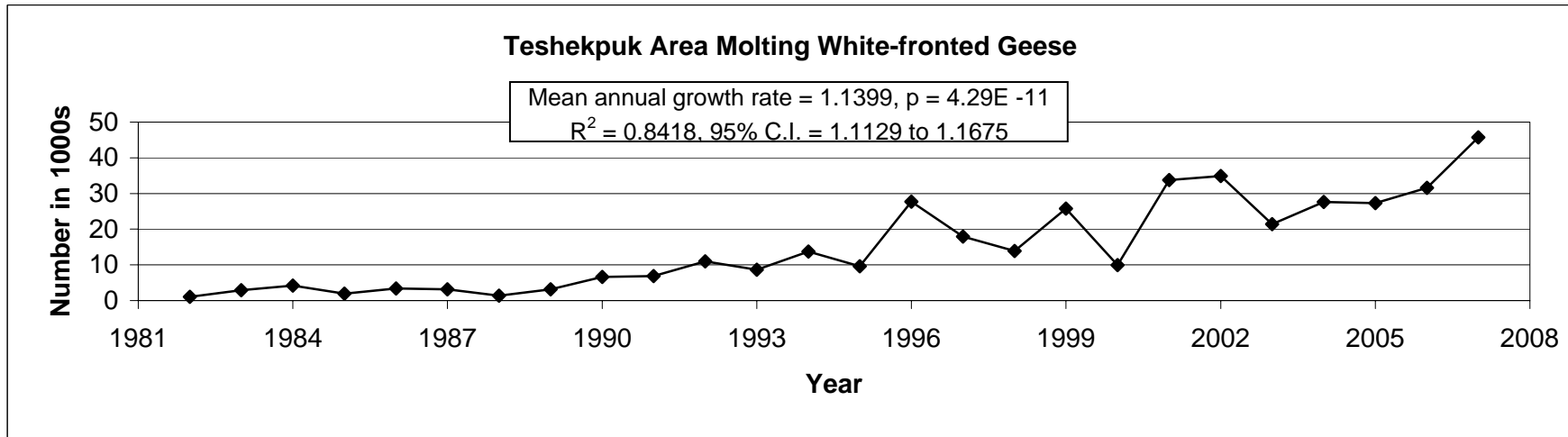
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Lake Number	BLBR	BLBRB	CAGO	CAGOB	GWFG	GWFGB	PALO	RTLO	SNGO	SNGOB	SNOW	SWAN	SWANC	YBLO	Grand Total
157											1	2	3		6
158															0
159					250										250
160												4	4		8
161	27	15	360	4	871		1								1278
162	24				503	65						1			593
163							2								2
164					4	10		1				2			17
165					38	15									53
166	2	4			7		1								14
167	5	8			25	54	1					3	7		103
168					325	8						1			334
169			30		525										555
170	260		167	3	500		1								931
171	838		27		5										870
172	392		15		627		1		5			2			1042
173			138												138
174			164									2			166
175	863		131		305	8						4	2		1313
176	117		235	10	971	2			6						1341
177					36	52						2			90
178												2			2
179	210														210
180	30		15		420							2			467
181															0
182	105														105
183															0
184	208		78		128										414
185															0
186	925		35				1								961
187	30				2										32
188															0
189															0
190	10				36	83									129
191															0
192	3				58	50									111
193	1175				50							2			1228
194			2	5			6					2	4		19
195	706				210										916
196															0
197															0
198	637		290												927
199					39	45	5	11			3			1	104
200	247	3	1034	33	178	20	1		4302						5818
201					170		1								171
204					249	160			80						489
205					60	30									90
206			110		682	111			147	110		3			1163
207					64	90									154
208	1		100		652	20	3		12	10	2	2	2		804
209					16	24									40
Grand Total	27109	45	13428	120	45747	2563	187	55	6626	222	30	229	78	2	96442

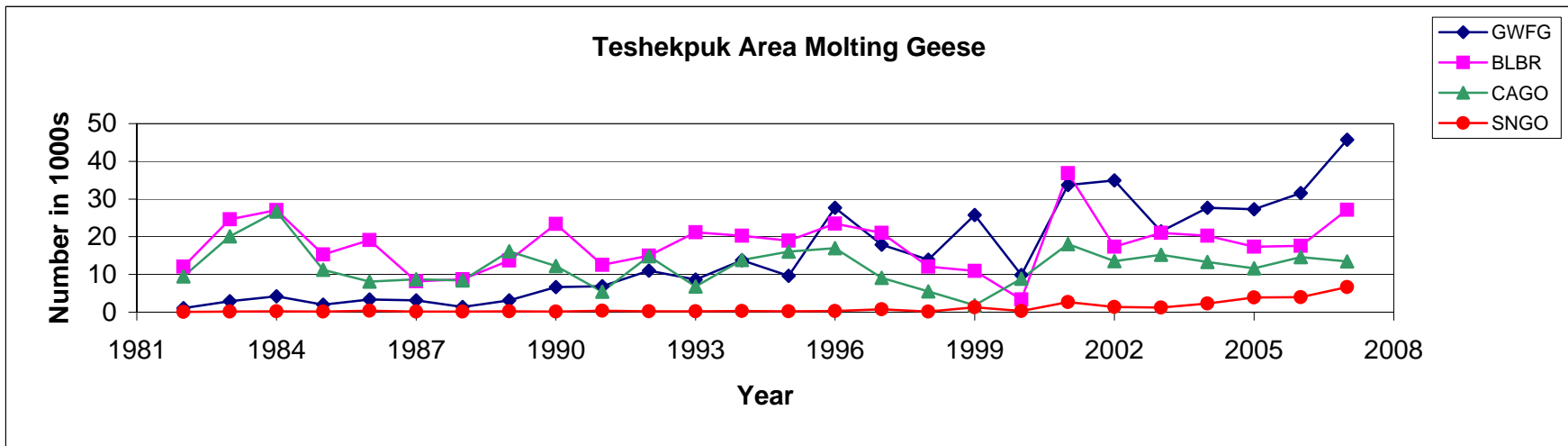
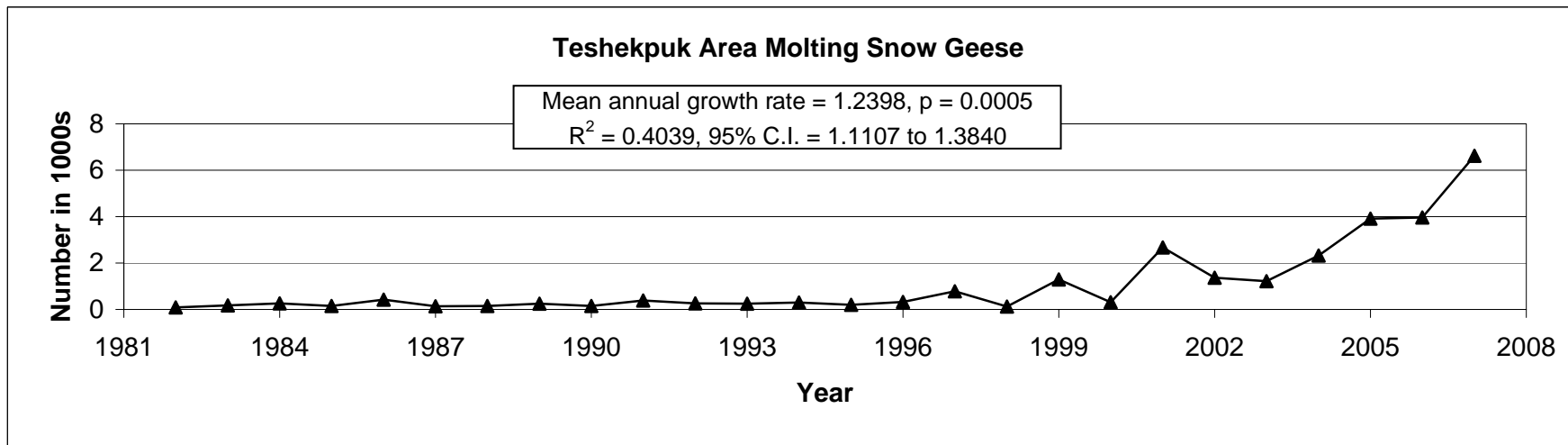
BLBR = Pacific brant, BLBRB = Pacific brant gosling, CAGO = Canada goose, CAGOB = Canada goose gosling, GWFG = greater white-fronted goose, GWFGB = greater white-fronted goose gosling, PALO = Pacific loon, RTLO = red-throated loon, SNGO = snow goose, SNGOB = snow goose gosling, SNOW = snowy owl, SWAN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



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, 1982-2007 (goslings not included). Pacific brant: mean 1982-2007 = 18,022; mean 1998-2007 = 18,396; high count = 36,817 in 2001. Canada geese: mean 1982-2007 = 12,312; mean 1998-2007 = 11,600; high count = 26,681 in 1984.



Figures 4 and 5. Numbers of adult and subadult molting white-fronted geese (1982-2007, goslings not included) and white-fronted goose goslings (1997-2007) on lakes and wetlands north and east of Teshekpuk Lake. Adult and subadult white-fronted geese: mean 1982-2007 = 15,199; mean 1998-2007 = 27,188; 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, 1982-2007 (goslings not included). Snow geese: mean 1982-2007 = 1,080; mean 1998-2007 = 2,381; high count = 6,626 in 2007.