

# **TESHEKPUK LAKE AREA MOLTING GOOSE SURVEY – 2006**

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**Abstract:** The 25<sup>th</sup> annual molting goose survey, conducted in the area north and east of Teshekpuk Lake on the Arctic Coastal Plain of Alaska, was conducted on 14-16 July 2006. Pacific brant, Canada geese, white-fronted geese, and snow geese were recorded throughout the survey area with counts of adults and (young) at 17,613 (286), 14,583 (76), 31,575 (5,485), and 3,967 (1,005), respectively. A total of 263 tundra swans with 92 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 2006 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*).

## 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 2006 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. The surface of large lakes was 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 2006 survey was conducted over three days on 14-16 July. A total of 67,738 adult geese and 6,852 goslings were recorded during the survey. Pacific brant accounted for 26% of total adult geese observed during the survey (17,613 adults and 286 goslings), while white-fronted geese accounted for 47% of total adult geese (31,575 adults and 5,485 goslings). Canada geese totals were 14,583 adults and 76 goslings. Canada geese accounted for 21% of the total adult geese observed during the survey. Snow geese (*Anser chen caerulescens*) accounted for 6% of the adult geese observed during the survey (3,967 adults and 1,005 goslings). A total of 263 adult Tundra Swans (*Cygnus columbianus*) were observed along with 92 cygnets. Pacific loon (*Gavia pacifica*), red-throated loon (*Gavia stellata*), and yellow-billed loon (*Gavia adamsii*) totals were 101, 39, and 3, respectively.

Observation totals for geese, swans, and loons are provided in Table 1 for the 2006 survey. Figures 2-4 and 6-7 illustrate the numbers of adult geese counted on this survey from 1982-2006.

## 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. Due to high use of this area by Pacific brant, any disturbance to molting brant north and east of Teshekpuk Lake could be significant and detrimental to this species.

### 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. 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). Furthermore, the number of white-fronted goose goslings has increased at even a greater rate (Figure 5). The reason(s) for this disproportionate growth rate are unknown.

## 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). Furthermore, previous to the 2006 survey, snow goose gosling counts have never exceeded 220 goslings, while the count for 2006 was 1,005 goslings.

## **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.

## **REFERENCES**

- Derksen, D.V., K.S. Bollinger, D. Esler, K.C. Jensen, E.J. Taylor, M.W. Miller, and M.W. Weller. 1992. Effects of aircraft on behavior and ecology of molting black brant near Teshekpuk Lake, Alaska. Final Report to U.S. BLM and U.S. MMS. 227pp.
- King J.G. 1970. The swans and geese of Alaska's arctic slope. *Wildfowl* 21:11-17.
- Mallek E.J., R. Platte, and R. Stehn. 2007. Aerial breeding pair surveys of the Arctic Coastal Plain of Alaska – 2006. Unpublished Report. U.S. Fish and Wildlife Service, Fairbanks, Alaska. 25pp.

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

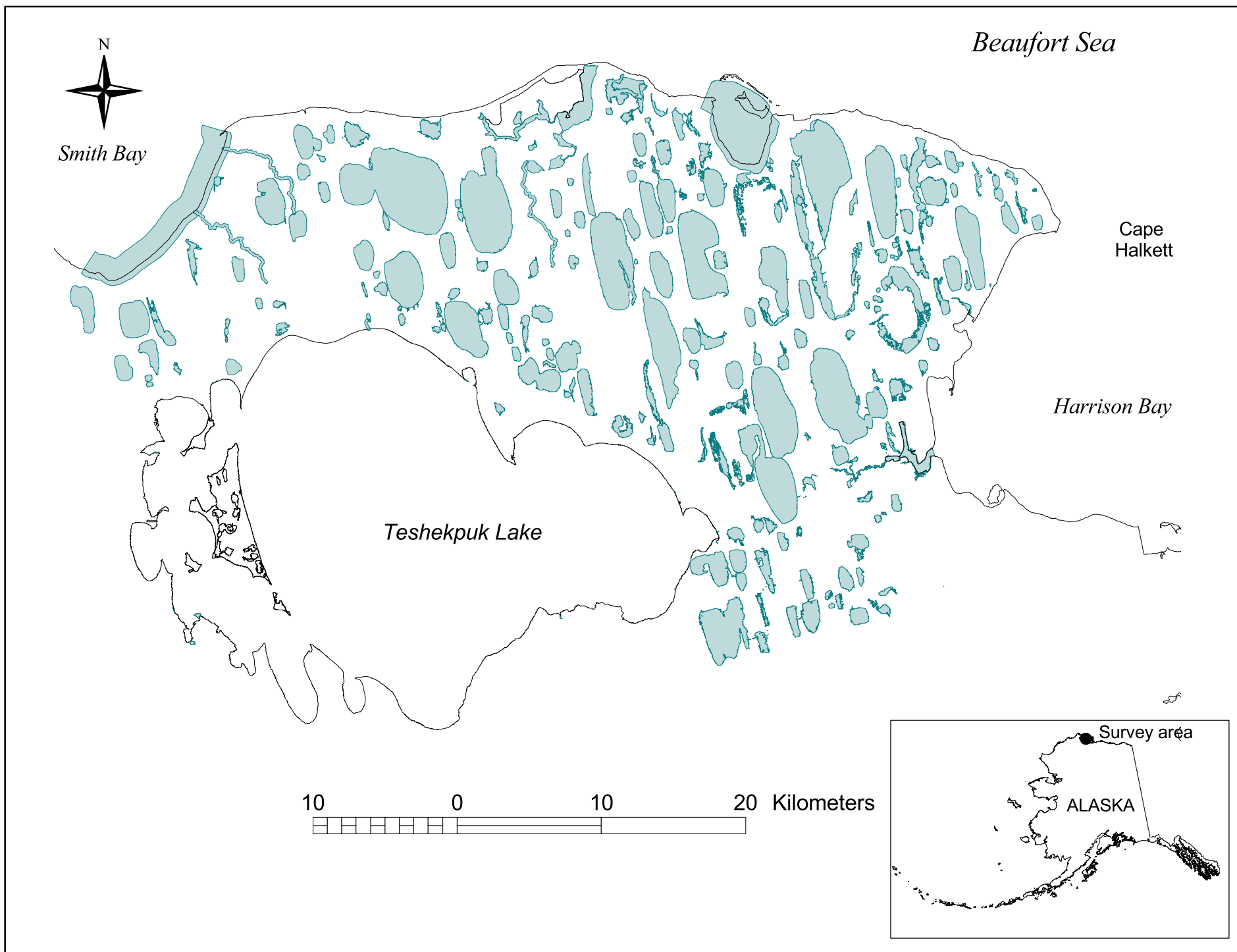


Fig. 1. Lakes, bay shorelines, and creeks surveyed by airplane for molting geese on a portion of the Arctic Coastal Plain of Alaska.

Table 1. Observations of geese, swans, and loons by lake from Teshekpuk Lake area molting goose survey 2006.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Pacific Brant			2	3											2			8			36				12
Pacific Brant Goslings															2			12							
Canada Geese															66			220	18		95		1		32
Canada Goose Goslings																									
White-fronted Geese	146	103	458	193	5			5	352			2		2	42			832	22	1	736	2	345	372	71
White-fronted Goose Goslings	2	4	7	4	13			4	4					2				14	5		138		13	4	38
Pacific Loon		1		1			2	2			2		2					2			1	1			1
Red-throated Loon		2																			9				
Snow Geese																		24			168				11
Snow Goose Goslings																					4				
Tundra Swan			2	3		2	1	2	2		4		2				2				4				5
Tundra Swan Cygnets				2		2	3						2								2				
Yellow-billed Loon				1					1												1				
Total	148	110	469	207	18	4	6	13	359	0	6	2	6	4	112	0	2	1112	45	1	1194	3	359	376	170

Species	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Pacific Brant		2	4	5			6				94		4				4		9	2			72		
Pacific Brant Goslings			8				4				10		6				6			1					
Canada Geese			6	73		22					115		94	22			50		79		101	30	270		
Canada Goose Goslings																									
White-fronted Geese	3		157	675	4	172			18		711		78				12		290	4			1331		
White-fronted Goose Goslings	5		49		5	18			25		31		10				19		22	5			60		
Pacific Loon	1	1					1		3	3	1	5			4							1			
Red-throated Loon						1													1				9		
Snow Geese																	4				172	8	25		
Snow Goose Goslings																	10								
Tundra Swan		2	4		2		2			2		2								1			1	2	
Tundra Swan Cygnets			4																					2	
Yellow-billed Loon																									
Total	9	5	232	753	11	213	13	0	46	5	962	7	104	110	4	0	105	0	401	13	273	39	1768	4	0

Table 1 (continued). Observations of geese, swans, and loons by lake from Teshekpuk Lake area molting goose survey 2006.

Species	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
Pacific Brant	8	373	436								55	337					19	2					
Pacific Brant Goslings		8	6									2					10						
Canada Geese		2447	1481	1	35		21	5		425	76	280					73	20					55
Canada Goose Goslings								6															
White-fronted Geese	25	105	393	370	166		235				905	1615	350		132	447	170	315		138		142	5
White-fronted Goose Goslings	70	181	489	424	165		58					26			2	20	21	18		14		54	4
Pacific Loon							1					2								1	2	2	
Red-throated Loon										1		1											
Snow Geese		4													4								
Snow Goose Goslings																							
Tundra Swan	4		6		1					2				4		2	2				2		
Tundra Swan Cygnets														1									
Yellow-billed Loon																							
Total	107	3118	2811	795	367	0	315	11	0	428	1036	2263	350	5	138	469	295	355	0	153	4	253	9

Species	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
Pacific Brant	39				34		2	2	7	1	2			99								49	
Pacific Brant Goslings	35				11				4		2			10									
Canada Geese	20													134								295	56
Canada Goose Goslings														10									
White-fronted Geese	716	10	22	340	107		283	18	15	200	172		375	436			802	75		955		154	41
White-fronted Goose Goslings	182	5	18	13	90		22	23	19	74	13			633			4					129	23
Pacific Loon	1	9	5	9						1		1		1		1	2		2	1			
Red-throated Loon			1																				
Snow Geese	18	2		1										54								6	
Snow Goose Goslings	19	6		2										122								12	
Tundra Swan	5		6	5	20	4	5	4	2	13	1	4		4			7	4			2	2	
Tundra Swan Cygnets				3	9	5		4		11		3					4	3			2	4	
Yellow-billed Loon																							
Total	1035	32	52	373	271	9	312	51	47	300	190	8	375	1503	0	1	819	82	2	956	4	651	120

Table 1 (continued). Observations of geese, swans, and loons by lake from Teshekpuk Lake area molting goose survey 2006.

Species	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
Pacific Brant			104	12	2			1040	8	1378	960			3			79			36	24	1206
Pacific Brant Goslings																	5			3		
Canada Geese		9	449	65				199	8	749	350	43		140			147			165	471	807
Canada Goose Goslings			3	55																		
White-fronted Geese	4	350	1937	400	47		8	707	720	285	400	250				31	18			1		
White-fronted Goose Goslings	4		2		71		27		4							10	20			3		
Pacific Loon					1	3		1												1		
Red-throated Loon								3							2							
Snow Geese				86				4						1								35
Snow Goose Goslings				1				12														42
Tundra Swan	2		1		1	1	3	4		2				2	2			1		2	3	2
Tundra Swan Cygnets							2	5														2
Yellow-billed Loon																						
Total	10	359	2496	619	122	4	40	1975	740	2414	1710	293	2	146	4	41	269	1	0	211	498	2094

Species	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Pacific Brant			650	37	351		820							505	85	6	2			25	825	50
Pacific Brant Goslings					10									15			4					
Canada Geese			475	276	214		280							31								65
Canada Goose Goslings																						
White-fronted Geese		2				1	138				143		3	12	38							100
White-fronted Goose Goslings		8					25				2			25								
Pacific Loon														1								1
Red-throated Loon																						
Snow Geese																						
Snow Goose Goslings																						
Tundra Swan								5				2										
Tundra Swan Cygnets								2														
Yellow-billed Loon																						
Total	0	10	1125	313	575	1	1263	7	0	0	145	2	3	589	123	6	6	0	0	25	825	216



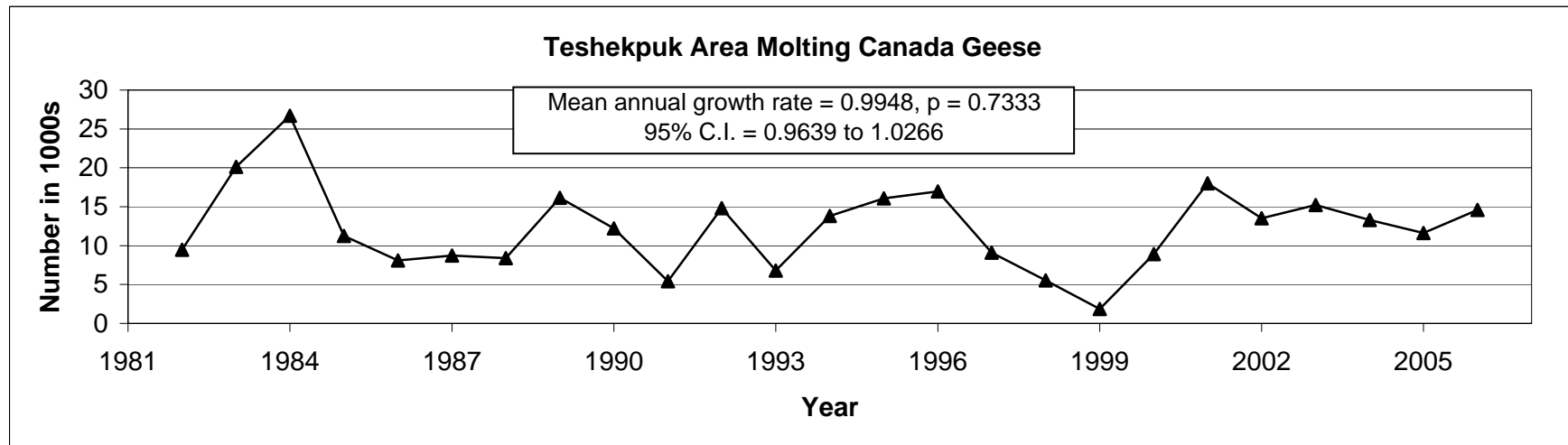
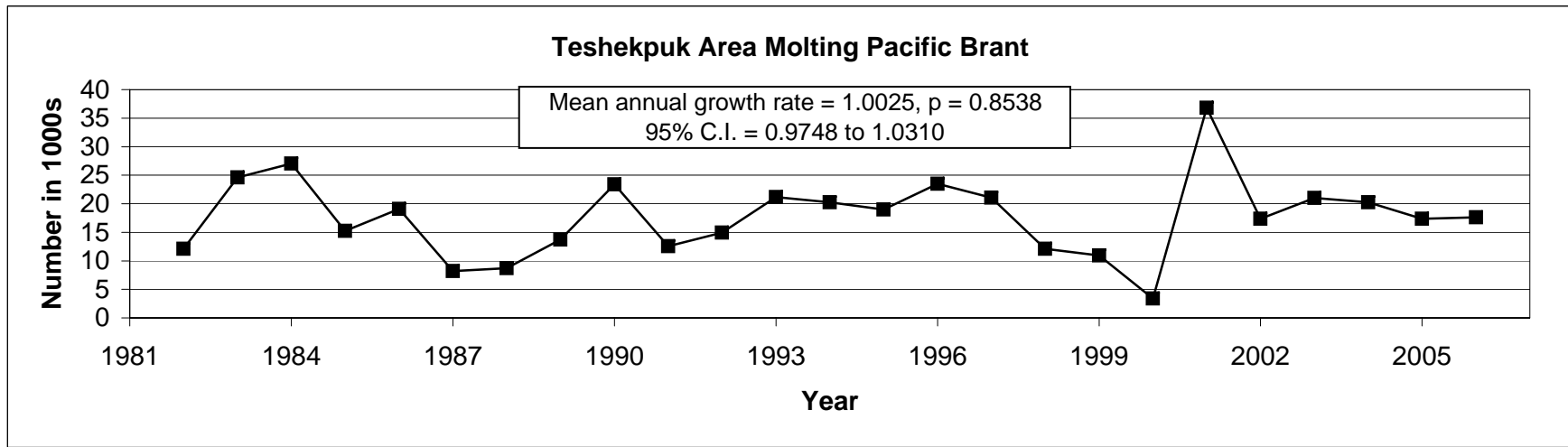
Table 1 (continued). Observations of geese, swans, and loons by lake from Teshekpuk Lake area molting goose survey 2006.

Species	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163
Pacific Brant	32	295		22	868				664	105												55	
Pacific Brant Goslings				10					6													6	
Canada Geese	18	139	17		349				497	12		14										226	
Canada Goose Goslings																							
White-fronted Geese	4	87	109	263	622	527	292		1165	339		89		32	104	303	13		32	22	338		2
White-fronted Goose Goslings		9	8	27	15	4			561			124			4	40	12		21	27	76		
Pacific Loon				1					1	2					1								1
Red-throated Loon					1																		
Snow Geese									59	265		18											
Snow Goose Goslings									88			44											
Tundra Swan					2		4		2	2	2				4	2	3		2	8	1		2
Tundra Swan Cygnets										4	3				1	1				3			
Yellow-billed Loon																							
Total	54	530	134	323	1857	531	296	0	3043	729	5	289	0	32	114	346	28	0	55	60	641	61	5

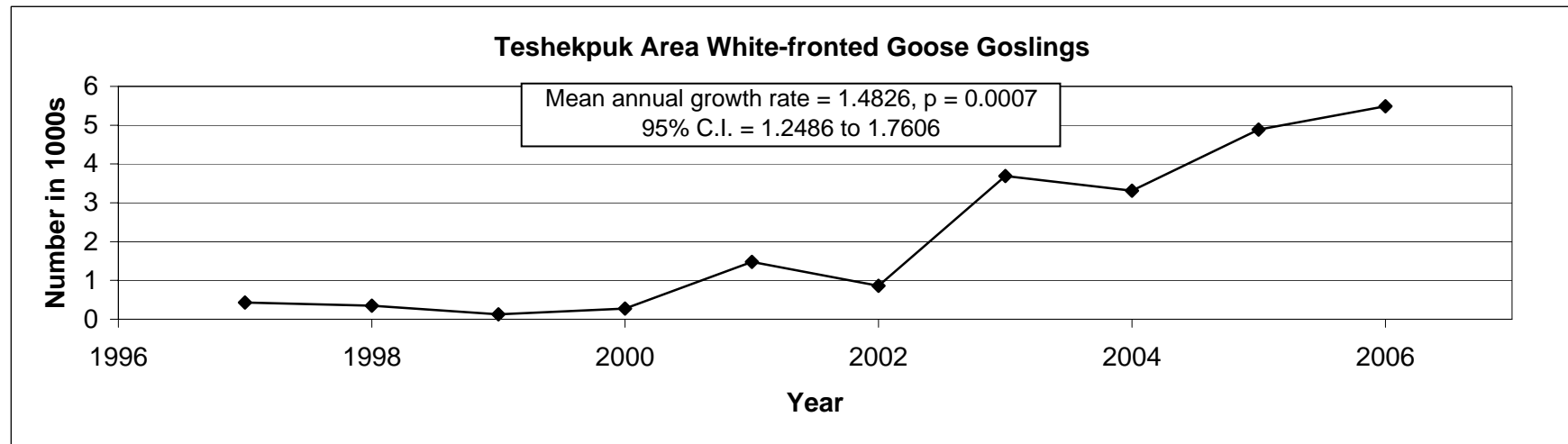
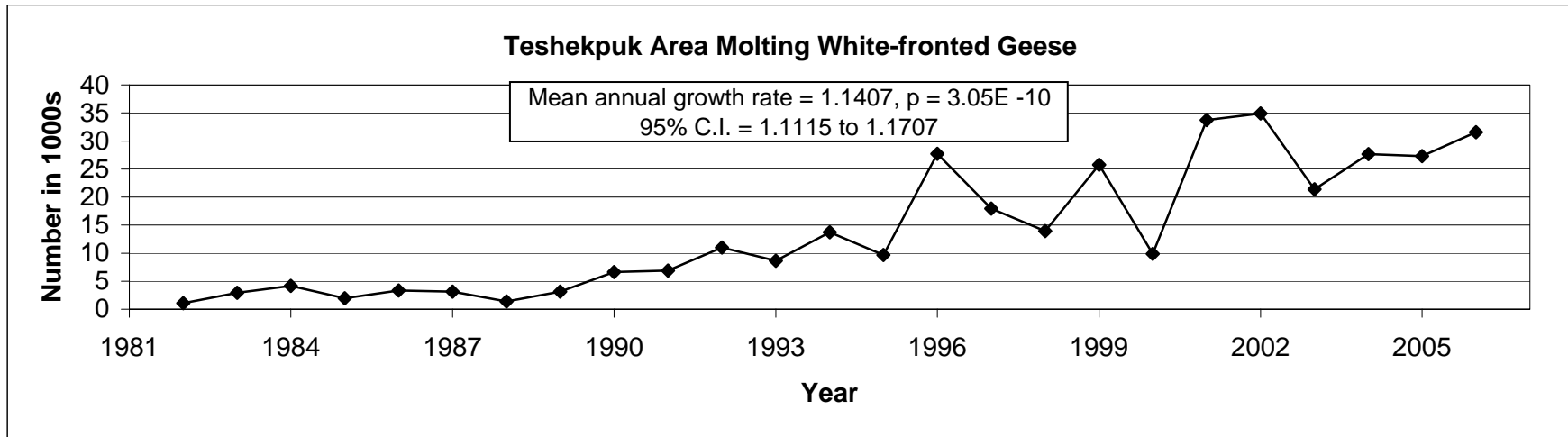
Species	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186
Pacific Brant				6			270	585	28	114		474	141			10		85	525			75	1425
Pacific Brant Goslings									12														
Canada Geese						35	27	33	69	309		345	45	17				45				36	
Canada Goose Goslings														2									
White-fronted Geese		70	44	137	16	485	215		154			195	351	26			52	35			44		
White-fronted Goose Goslings			48	70	40				23			6		37			25				63		
Pacific Loon	2				2						1			1									
Red-throated Loon																							
Snow Geese									3	5													
Snow Goose Goslings																							
Tundra Swan	2	5	2	7	2							5		2							1		
Tundra Swan Cygnets														1									
Yellow-billed Loon																							
Total	4	75	94	220	60	520	512	618	289	428	1	1025	537	86	0	10	77	165	525	0	144	75	1425

Table 1 (continued). Observations of geese, swans, and loons by lake from Teshekpuk Lake area molting goose survey 2006.

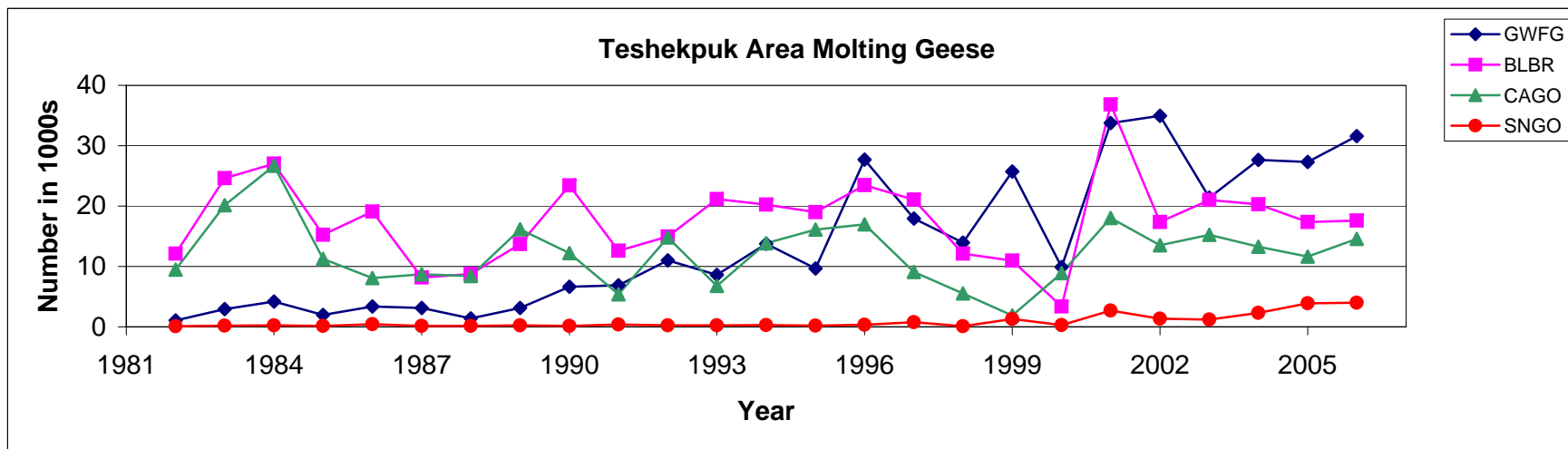
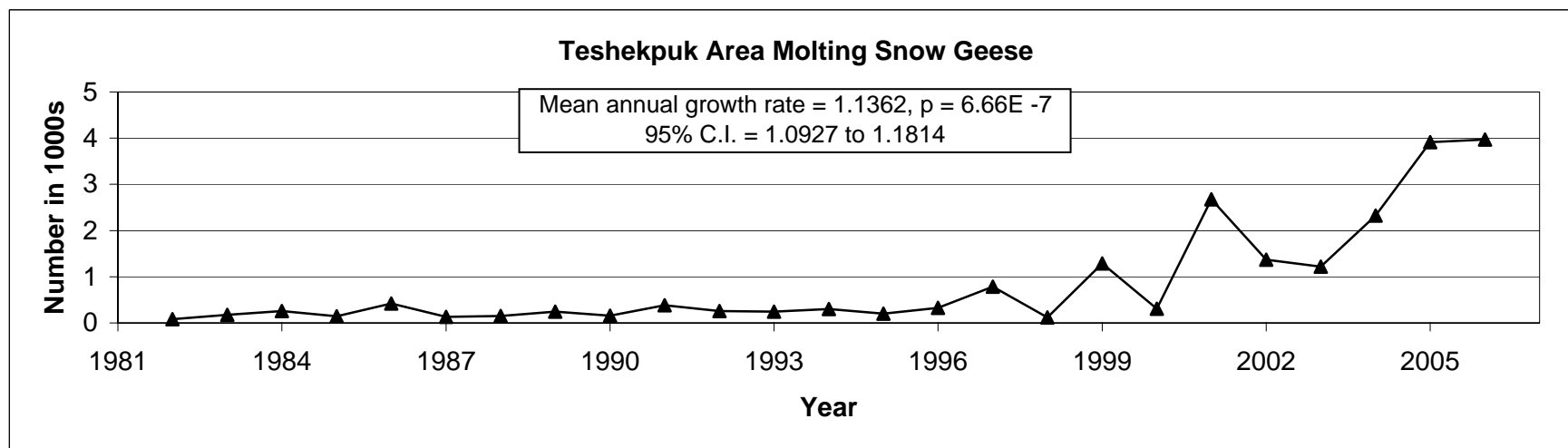
Species	187	188	189	190	191	192	193	194	195	196	198	199	200	201	202	206	207	208	209	Grand Total
Pacific Brant	31					6	975		120		367		55		145	100	97			17613
Pacific Brant Goslings													25			40	13			286
Canada Geese							130				82		405			72				14583
Canada Goose Goslings																				76
White-fronted Geese		4		70		16	325		19		15	102	272	51		454	46	1025	36	31575
White-fronted Goose Goslings		5		64		26						102	98	14		182	122	16	120	5485
Pacific Loon								1				4								101
Red-throated Loon										6	2									39
Snow Geese												59	2717			172	42			3967
Snow Goose Goslings												103				480	60			1005
Tundra Swan							2	1						1		1		5		263
Tundra Swan Cygnets								2												92
Yellow-billed Loon																				3
<b>Total</b>	<b>31</b>	<b>9</b>	<b>0</b>	<b>134</b>	<b>0</b>	<b>48</b>	<b>1432</b>	<b>4</b>	<b>139</b>	<b>0</b>	<b>470</b>	<b>372</b>	<b>3572</b>	<b>66</b>	<b>145</b>	<b>1501</b>	<b>380</b>	<b>1046</b>	<b>156</b>	<b>75088</b>



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, 1982-2006 (goslings not included). Pacific brant: mean 1982-2006 = 17,658; mean 1997-2006 = 17,791; high count = 36,817 in 2001. Canada geese: mean 1982-2006 = 12,267; mean 1997-2006 = 11,166; high count = 26,811 in 1984.



Figures 4 and 5. Numbers of adult and subadult molting white-fronted geese (1982-2006, goslings not included) and white-fronted goose goslings (1997-2006) on lakes and wetlands north and east of Teshekpuk Lake. Adult and subadult white-fronted geese: mean 1982-2006 = 13,977; mean 1997-2006 = 24,406; high count = 34,929 in 2002.



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, 1982-2006 (goslings not included). Snow geese: mean 1982-2006 = 858; mean 1997-2006 = 1,797; high count = 3,967 in 2006.