Productivity Surveys of Geese, Swans and Brant Wintering in North America 2005

Department of the Interior
U. S. Fish and Wildlife Service
Division of Migratory Bird Management
Arlington, Virginia

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Productivity Surveys of Geese, Swans and Brant

Wintering in North America - 2005

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Productivity Surveys of Geese, Swans and Brant
Wintering in North America - 2005

Waterfowl productivity analyses are conducted annually to monitor selected goose, swan, and brant populations. Methods used include satellite imagery of nesting habitat, inventory of staging concentrations, determination of percent juvenile and family size in fall and winter concentrations, as well as analysis of harvest data.

This report summarizes productivity data obtained during fall 2005 and winter 2006, and is grouped according to flyway and population. Data for 2006 will be forthcoming in April 2007.

Thanks to all biologists and volunteers for their dedication to collect the data reported in this document. Without your tireless efforts this data set and tradition of knowledge of waterfowl would not be possible. Thank you to the many supervisors both public and private to allow your employees to collect this information so we can better understand the outcome of the past year's production efforts of waterfowl.

A special thanks to the Flyway coordinators for their willingness to accept this additional burden in their already full schedules. To assemble each Flyway's data in one location for publication and for their efforts to strive for accuracies in the presentation of the data sets.

Any inaccuracies in the representation of the data in this report are my responsibility and I would appreciate notification of errors so we may make the necessary corrections. Comments and suggestions are always welcome in our effort to make the report more presentable!

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2005 PRODUCTIVITY REPORT SUMMARY

Flyway	Population	Per Cent Productivity	Type of year	Per Cent change from 2004
Atlantic				
	Greater snow geese	15.5%	Below Average	-26.5%
	Atlantic Brant	15.0%	Average	14.5%
	Tundra swan	9.6%	Below Average	-40.4%
Mississippi/Central				
	MC lesser snow geese (LA - pre season)	-		-
	MC lesser snow geese (LA - in season)	21.8%	Below Average	14.7%
	MC lesser snow geese (TX - pre season)	-		-
	MC lesser snow geese (TX - in season)	15.0%	Below Average	18.1%
	MC White-fronted geese[2]	38.3%	Average	20.8%
	WCF Lesser snow geese	28.1%	Above Average	88.6%
	WCF Ross's geese	11.8%	Below Average	12.4%
Pacific				
	Lesser snow geese (Mixed flocks)	36.0%	Above average	42.0%
	Lesser snow geese (Wrangel Island)	No Data		
	Ross's geese	23.1%	Above average	75.0%
	Greater white-fronted geese	32.3%	Average	7.7%
	Tule Greater white-fronted geese	24.7%	Below average	-19.8%
	Tundra swan	24.6%	Below Average	-4.6%
	RMP Trumpeter swan	20.8%	Below average	-12.2%
Alaska				
	Pacific Brant		Above Average	
	(Fall)	33.3%		83.0%
	(Winter)	15.6%		34.0%
	Trumpeter swan	20.8%	Above Average	22.0%
	Emperor geese		Above Average	
	(Fall ground)	28.6%		31.0%
	(Fall photo)	18.5%		67.0%
	Cackling Canada geese	No Data		-
	Dusky Canada geese	11.8%	Below Average	-58.0%

[1] MC = Mid-continent, WCF = Western Central Flyway, RMP = Rocky Mountain Population

[2] Starting in 2000, the Mississippi/Central Flyway report combines eastern and western segments of White-fronted geese into one population: MC Greater White-fronted geese.

TITLE Waterfowl Productivity Surveys for the Atlantic Flyway - 2005

SPECIES SURVEYED Greater Snow Goose (Chen caerulescens atlanticus)

Atlantic Brant (Branta bernicla bernicla)

Tundra Swan (Cygnus columbianus)

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Maryland Department of Natural Resources, Fish, Heritage, and Wildlife Service
New Jersey Department of Environmental Protection, Division of Fish, Game, and Wildlife
New York State Department of Environmental Conservation
North Carolina Wildlife Resources Commission
Pennsylvania Game Commission
U. S. Fish and Wildlife Service
- Alligator River National Wildlife Refuge
- Back Bay National Wildlife Refuge
- Bombay Hook National Wildlife Refuge
- Pea Island National Wildlife Refuge

COMPILED BY: Carl Ferguson, Division of Migratory Bird Management

ABSTRACT:

Atlantic Flyway productivity surveys for greater snow geese, Atlantic brant, and tundra swans were conducted during November and December of 2005 and January of 2006. The data indicates that productivity for greater snow geese decreased -26.5 %, increased for Atlantic brant 14.5 %, and decreased -40.4 % for tundra swans from 2004. These waterfowl species were surveyed in five States and on four National Wildlife Refuges within the Atlantic Flyway.

METHODS:

The procedures followed in conducting the surveys are contained in the draft Standard Operating Procedures for Productivity Surveys of Geese, Swans, and Brant, USFWS.

Greater Snow Geese (Table 1.)

Productivity Appraisals: A total of 11,969 snow geese were observed and aged in Delaware, New Jersey, Maryland, and North Carolina. The percent of immature birds observed was 15.5 %. This is a decrease from 2004, which was 21.1 percent. The number of young per family group observed decreased from 1.7 in 2004 to 1.2 in 2005.

Atlantic Brant (Table 2.)

Productivity Appraisals: During the fall of 2004, a total of 26,699 brant were aged in New Jersey and New York. The percent of juvenile birds observed in 2005 was 15.0 percent as compared to 13.1 percent in 2004; an increase of 14.5 %. The number of young per family group was 2.1 in 2005, an increase from 2.0 in 2004.

Tundra Swan (Table 3.)

Productivity Appraisals: A total of 6,961 swans were aged in Delaware, Pennsylvania, New Jersey, Maryland, and North Carolina, with almost half of the observations coming from North Carolina. The percent of immature swans observed was 9.6 per cent, a – 40.4 percent decrease from 2004. Juvenile swans observed per family group were 1.1, a decrease from 2004 when it was 2.4. Swans arrived during the normal time period this fall on the Atlantic Flyway.

DISCUSSION:

Snow Geese: Production decreased from 21.1 % of immature birds observed in 2004 to 15.5 % immature observed in 2005. Young observed per family group was 1.2, which was a decrease from last year (2004). The total number of birds observed, (11,969) was well below the 2004 total (33,748) and well below the mean of 18,900 birds observed.

Atlantic Brant: For 2005, production (15.0 %) as indicated by percent of immature birds increased slightly from 2004 (13.1 %). Young observed per family group was 2.1, a slight increase from 2004 (2.0).

Tundra Swan: This species showed a decrease from 2004 (-40.4 %). Young observed per family group was 1.1, a decrease from 2.4 in 2004.

A much lower than average number of tundra swans (6,961) and above average number of Atlantic brant (26,699) were observed and recorded for this productivity index in 2005. Productivity surveys should be continued in 2006. This production index should be watched closely for snow geese because of their population dynamics during the last decade, and also for Atlantic brant as there is no breeding ground survey for this species in the North. Snow goose observations dropped to well below the average of 18,900. Efforts should continue to maintain and expand the geographic coverage for these species. Productivity workshops will be conducted during early fall 2006.

Productivity 2005 - Percent Immature

Species	2005	% Change from 2004	Mean	% Change from Mean	Type of Year
Greater Snow Geese	15.5 %	-26.5 %	23.6 %	-34.2	Below Average
Atlantic Brant	15.0 %	14.5 %	18.5%	-18.8	Average
Tundra Swan	9.6 %	-40.4 %	13.5 %	-28.8	Below Average

LITERATURE CITED:

U.S. Fish and Wildlife Service, Standard Operating Procedures for Productivity Surveys of Geese, Swans and Brant (Draft) 52 pp

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Table 1. Historical Population and Productivity Data for the Atlantic Flyway - Greater Snow Geese

Year	Number Families	Families Adults	Families Immature	Other Adults	Other Immature	Total Adults	Total Immature	Total Birds	Percent Immature	Average Young Per Family
1978	307	614	597	13,165	3,057	13,779	3,654	17,433	21.0	1.9
1979	304	594	739	4,579	1,119	5,173	1,858	7,031	26.4	2.4
1980	412	784	1,104	7,205	3,479	7,989	4,583	12,572	36.5	2.7
1981	495	629	983	13,662	1,955	14,291	2,938	17,229	17.1	2.0
1982	423	842	1,095	8,890	1,046	9,732	2,141	11,873	18.0	2.6
1983	885	1,751	2,954	8,066	6,435	9,817	9,389	19,206	48.9	3.3
1984	273	538	734	7,544	2,317	8,082	3,051	11,133	27.4	2.7
1985	947	1,745	2,506	8,585	2,136	10,330	4,642	14,972	31.0	2.6
1986	72	142	150	12,665	152	12,807	302	13,109	2.3	2.1
1987	796	1,518	2,273	9,327	4,349	10,845	6,622	17,467	37.9	2.9
1988	455	900	1,165	8,926	3,299	9,826	4,464	14,290	31.2	2.6
1989	955	1,827	1,956	10,578	3,374	12,405	5,330	17,735	30.1	2.0
1990	835	1,524	1,956	18,709	2,691	20,233	4,647	24,880	18.7	2.3
1991	1,151	2,234	2,696	18,298	4,577	20,532	7,273	27,805	26.2	2.3
1992	301	549	281	10,684	248	11,233	529	11,762	4.5	0.9
1993	2,096	4,079	5,396	8,711	4,896	12,790	10,292	23,082	44.6	2.6
1994	669	1,313	927	15,791	1,721	17,104	2,648	19,752	13.4	1.4
1995	753	1,423	1,402	11,287	1,149	12,710	2,551	15,261	16.7	1.9
1996	991	1,826	1,964	14,655	5,283	16,481	7,247	23,728	30.5	2.0
1997	1,268	2,406	3,111	19,625	5,762	22,031	8,873	30,904	28.7	2.5
1998	610	1,307	1,406	30,528	10,080	31,835	11,486	43,321	26.5	2.3
1999	152	458	159	20,562	440	21,020	599	21,619	2.8	1.0
2000	1,443	2,778	2,245	13,597	6,402	16,375	8,647	25,022	34.6	1.6
2001	399	803	529	9,160	2,154	9,963	2,683	12,646	21.2	1.3
2002	460	890	245	18,984	325	19,874	570	20,444	2.8	0.5
2003	113	223	182	7,528	1,268	7,751	1,450	9,201	15.8	2.1
2004	484	968	839	28,691	3,250	29,659	4,089	33,748	21.1	1.7
2005	432	850	524	9,264	1,331	10,114	1,855	11,969	15.5	1.2
							% change from 2004		-26.5	
							% change from mean		-34.2	
MEAN*	660	1,268	1,433	13,188	3,011	14,456	4,443	18,900	23.6	2.1

* Mean = years 1978-2004

Table 2. Historical Population and Productivity Data for the Atlantic Flyway - Atlantic Brant

Year	Number Families	Families Adults	Families Immature	Other Adults	Other Immature	Total Adults	Total Immature	Total Birds	Percent Immature	Average Young Per Family
1978	144	284	308	10,362	361	10,646	669	11,315	5.9	2.1
1979	703	1,381	1,955	7,233	4,024	8,614	5,979	14,593	41.0	2.8
1980	622	1,232	1,637	15,247	6,733	16,479	8,370	24,849	33.7	2.6
1981	523	1,040	1,249	11,444	2,124	12,484	3,373	15,857	21.3	2.4
1982	429	1,002	1,009	14,863	3,853	15,865	4,862	20,727	23.5	2.4
1983	292	581	780	12,172	5,293	12,753	6,073	18,826	32.3	2.7
1984	335	655	789	11,310	2,456	11,965	3,245	15,210	21.3	2.4
1985	283	560	674	14,701	2,179	15,261	2,853	18,114	15.8	2.4
1986	105	210	263	19,690	506	19,900	769	20,669	3.7	2.5
1987	313	601	801	11,634	3,599	12,235	4,400	16,635	26.5	2.6
1988	274	542	667	12,068	3,856	12,610	4,523	17,133	17.0	2.4
1989	466	905	1,174	12,957	2,514	13,862	3,688	17,550	21.0	2.5
1990	387	732	838	15,777	1,176	16,509	2,014	18,523	10.9	2.2
1991	710	1,265	1,396	5,845	911	7,110	2,307	9,417	24.5	2.0
1992	124	242	212	19,510	230	19,752	442	20,194	2.2	1.7
1993	1,679	3,237	3,371	15,042	1,544	18,279	4,915	23,194	21.2	2.0
1994	619	1,203	1,210	18,029	968	19,232	2,178	21,410	10.2	2.0
1995	1,242	2,470	2,788	11,556	1,071	14,026	3,859	17,885	21.6	2.2
1996	830	1,637	1,826	19,523	2,011	21,160	3,837	24,997	15.3	2.2
1997	1,502	2,888	3,299	19,683	1,479	22,571	4,778	27,349	17.5	2.2
1998	1,006	1,990	2,621	15,545	2,942	17,535	5,563	23,098	24.1	2.6
1999	185	364	320	36,639	235	37,003	555	37,558	1.5	1.7
2000	1,305	2,542	2,769	15,098	3,155	17,640	5,924	23,564	25.1	2.1
2001	811	1,571	1,738	15,308	3,787	16,879	5,525	22,404	24.7	2.1
2002	637	1,214	1,157	55,047	3,045	56,261	4,202	60,463	6.9	1.8
2003	1,022	1,983	2,184	19,460	2,276	21,443	4,460	25,903	17.2	2.1
2004	848	1,672	1,663	22,337	1,950	24,009	3,613	27,622	13.1	2.0
2005	643	1,265	1,355	21,435	2,644	22,699	4,000	26,699	15.0	2.1
							% change from 2004		14.5	
							% change from mean		-18.8	
MEAN*	644	1,259	1,433	16,966	2,381	18,225	3,814	22,039	18.5	2.2

*MEAN = Years 1978-2004

Table 3. Historical Population and Productivity Data for the Atlantic Flyway - Tundra Swan

Year	Number Families	Families Adults	Families Immature	Other Adults	Other Immature	Total Adults	Total Immature	Total Birds	Percent Immature	Average Young Per Family
1978	6	10	8	433	176	443	184	627	29.3	1.3
1979	15	27	24	1,280	102	1,307	126	1,433	8.8	1.6
1980	19	36	35	1,807	182	1,843	217	2,060	10.5	1.8
1981	16	32	37	1,000	410	1,032	447	1,479	30.2	2.3
1982	144	281	282	4,656	357	4,937	639	5,576	11.5	2.0
1983	448	889	880	5,152	616	6,041	1,496	7,537	19.8	2.0
1984	240	467	516	6,682	1,248	7,149	1,764	8,913	19.8	2.2
1985	716	1,313	1433	7,397	1,251	8,710	2,684	11,394	23.6	2.0
1986	235	464	311	10,405	723	10,869	1,034	11,903	8.7	1.3
1987	109	203	179	7,199	629	7,402	808	8,210	9.8	1.6
1988	247	566	471	8,172	1,051	8,738	1,522	10,260	14.8	1.9
1989	461	883	791	10,856	1,306	11,739	2,097	13,836	15.2	1.7
1990	297	541	562	9,872	629	10,413	1,191	11,604	10.3	1.9
1991	139	261	219	3,002	237	3,263	456	3,719	12.3	1.6
1992	125	241	197	11,070	292	11,311	489	11,800	4.1	1.6
1993	434	858	418	10,462	1,582	11,320	2,000	13,320	15	1.0
1994	497	1,099	635	3,115	365	4,214	1,000	5,214	19.2	1.3
1995	234	475	268	8,458	519	8,933	787	9,720	8.1	1.1
1996	922	1,800	1,114	11,956	420	13,756	1,534	15,290	10	1.2
1997	846	1,707	697	8,974	174	10,681	871	11,552	7.5	0.8
1998	1,411	2,325	1,697	8,675	345	11,000	2,042	13,042	15.7	1.2
1999	700	1,244	1,097	10,993	326	12,237	1,423	13,660	10.4	1.6
2000	676	1,375	577	5,117	160	6,492	737	7,229	10.2	0.9
2001	947	1,904	1,147	10,169	166	12,073	1,313	13,386	9.8	1.2
2002	1,276	2,783	1,149	20,402	878	23,185	2,027	25,212	8	0.9
2003	694	1,276	929	31,927	887	33,203	1,816	35,019	5.2	1.3
2004	535	1,829	1,301	9,067	784	10,896	2,085	12,981	16.1	2.4
2005	477	941	538	5,350	132	6,291	670	6,961	9.6	1.1
							% change from 2004		-40.4	
							% change from mean		-28.8	
MEAN*	459	922	629	8,455	586	9,377	1,214	10,592	13.5	1.5

*MEAN = Years 1978-2

Title: **Lesser Snow Goose Productivity Surveys for the Central and Mississippi Flyways – 2005**

Submitted by: Fred Roetker, Flyway Biologist, Lafayette, LA

Abstract: Louisiana lesser snow geese (blue phase dominant) provided the following productivity data: in-season, 21.8% immature birds, young/family 1.31; In Texas (white phase dominant) the following results were indicated: in-season 15.0% immature birds.

Methods: The procedures used in conducting these appraisals were developed by Lynch (1969) and are outlined in the Standard Operating Procedures for Productivity Surveys of Geese, Swans, and Brant (Draft) 1977. Louisiana in-season data was collected from November, 2004 through March, 2005. The Texas in-season data was collected during December on Anahuac National Wildlife Refuge in Chambers County.

Results: Lesser snow geese wintering in Louisiana are primarily blue phase, ranging from 90-95% blue at Delta NWR located at the mouth of the Mississippi River to 65-80% blue in southwestern Louisiana, or west of the Atchafalaya River. The mid-continent lesser snow geese which winter in other regions of the Central and Mississippi Flyways, except New Mexico, 90-95% white, indicate the white phase to be dominant, 55-65%. The 14,502 in-season records from seventeen flocks showed 21.8% to be immature geese with an average young/family of 1.31 goslings. The 2005 records from Texas during the goose season indicated 15.0% to be immature birds.

Discussion: The trend for significant numbers of snow geese to arrive late in southwestern Louisiana continued in 2005. Similar to 2004, birds appeared to be three to four weeks late. Only limited numbers of snow geese were present when the hunting season opened in Louisiana and Texas. As a result, no pre-season productivity data was collected in either state.

Literature Cited:

Lynch, J. J. 1969. Appraisals of annual productivity and mortality among geese, swans, and other birds. Annual Report, Part II and Appendix A. U. S. Fish and Wildlife Service. 26pp.

U. S. Fish and Wildlife Service, 1977. Standard Operating Procedures for Productivity Surveys of Geese, Swans, and Brant (Draft) 52 pp.

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Cooperators:

U. S. Fish & Wildlife Service
David Boudreaux, Crowley, LA
Matt Whitbeck, Anahuac NWR

Table 1. Historical Lesser Snow Goose age ratios (% Imm.) and average young per family (Y/F) for Louisiana and Texas. n = number of geese sampled. n* = number of families sampled

	Pre-Season LA				In-Season LA				Pre-season TX				In-season TX			
Year	n	% Imm.	n*	Y/F	n	% Imm.	n*	Y/F	n	% Imm.	n*	Y/F	n	% Imm.	n*	Y/F
1984		31.4		1.76		22.3		1.44		--		--		26.5		1.76
1985		33.4		1.96		28.9		1.84		--		--		24.5		1.62
1986		20.0		1.92		12.6		1.55		--		--		8.4		1.45
1987		34.9		2.25		24.0		1.81		--		--		12.2		1.73
1988		35.6		2.00		28.5		1.61		--		--		25.2		--
1989		34.5		1.91		29.4		1.67		--		--		27.4		--
1990		29.0		1.61		23.0		1.52		--		--		20.1		2.10
1991		30.3		1.73		29.1		1.50		31.4		2.60		17.7		1.64
1992		8.6		1.43		8.1		1.36		10.8		1.30		2.3		--
1993		29.4		1.83		32.9		1.52		--		--		22.8		1.43
1994		29.5		1.76		29.6		1.51		27.7		1.78		28.3		1.80
1995		37.1		1.82		30.5		1.49		--		--		--		--
1996		30.6		1.70		27.5		1.47		--		--		34.5		1.65
1997		27.3		1.53		31.4		1.28		28.7		1.95		--		--
1998		25.6		1.54		29.4		1.43		--		--		40.2		2.05
1999		26.3		1.61		24.2		1.40		23.5		1.69		25.2		1.80
2000		32.5		1.61		23.9		1.42		--		--		28.5		1.67
2001		29.2		1.63		30.2		1.29		--		--		26.9		1.61
2002		--		--		22.5		1.33		--		--		19.6		1.75
2003		--		--	12526	25.0	648	1.37		--		--	2472	17.2	39	1.54
2004		--		--	11768	19.0	562	1.25		--		--	2989	12.7	26	1.42
2005		--		--	14502	21.8	714	1.31		--		--	2004	15.0	--	--
Mean = years 1984 - 2004						25.3								22.1		

Title: **Mid-Continent White-fronted Geese Productivity Report - 2005**

Submitted by: Fred Roetker, Flyway Biologist, Lafayette, LA

Abstract: Productivity appraisals of Mid-Continent White-fronted Geese were conducted in Texas and Louisiana. The percentage of immature birds was 38.3. The average number of young per family was 1.68.

Methods: The procedures used in conducting these appraisals were developed by Lynch (1969). The Texas data was collected during the period October 26-28, 2005. Ten state and federal cooperators put forth an excellent effort to obtain representative data near Eagle Lake, Nada, and East Bernard, Texas. In Louisiana, the sampling occurred during October, November, and December, 2005; and January and February, 2006 in southwestern Louisiana near Gueydan and Lake Arthur.

Results: The sample of 23,360 birds indicated 38.3% were immature. The average young per family was 1.68, based on 786 families observed. The 2004 data reflected 31.7% immature (14,726 records) and 1.68 goslings per family.

Discussion: Similar to the trend evident the last five years, significant numbers of whitefronts were three to four weeks behind their normal arrival dates. Hurricane Rita may have caused a redistribution of geese in southwestern Louisiana. Birds seemed to be more prevalent further north in the rice-marsh interface. Marshes and agricultural fields along and especially south of the Gulf Intercoastal Waterway were influenced by saltwater from the storm surge.

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Lynch, J. J. 1969. Appraisals of annual productivity and mortality among geese, swans, and other birds. Annual Report, Part II and Appendix A. U. S. Fish and Wildlife Service. 26pp.

U. S. Fish and Wildlife Service, 1977. Standard Operating Procedures for Productivity Surveys of Geese, Swans, and Brant (Draft) 52 pp.

Acknowledgments:
David Boudreaux, Crowley, Louisiana deserves special recognition for his five month effort to sample birds in southwest, Louisiana. David mentored under John Lynch and has tirelessly continued annual productivity surveys since.

Cooperators:

U.S. Fish & Wildlife Service

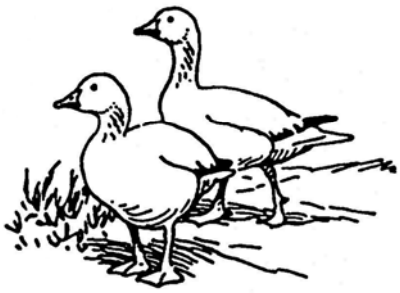
David Boudreaux, Patrick Walther, Al Jones, Matt Whitbeck, Mike Nance, Rebecca Smith, Lee Gaston, Wes Hoyer, Jena Moon, Beth Rigby, and Craig Hoffpauir.

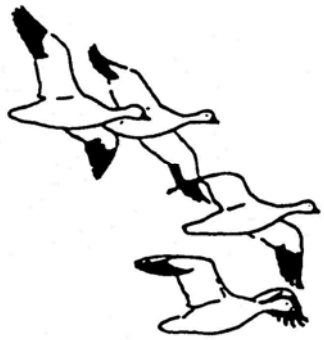
Table 1. Historical Mid-Continent White-fronted Goose age ratios (% Imm.) and average young per family (Y/F). Data for 1979 and after are weighted by flock size.

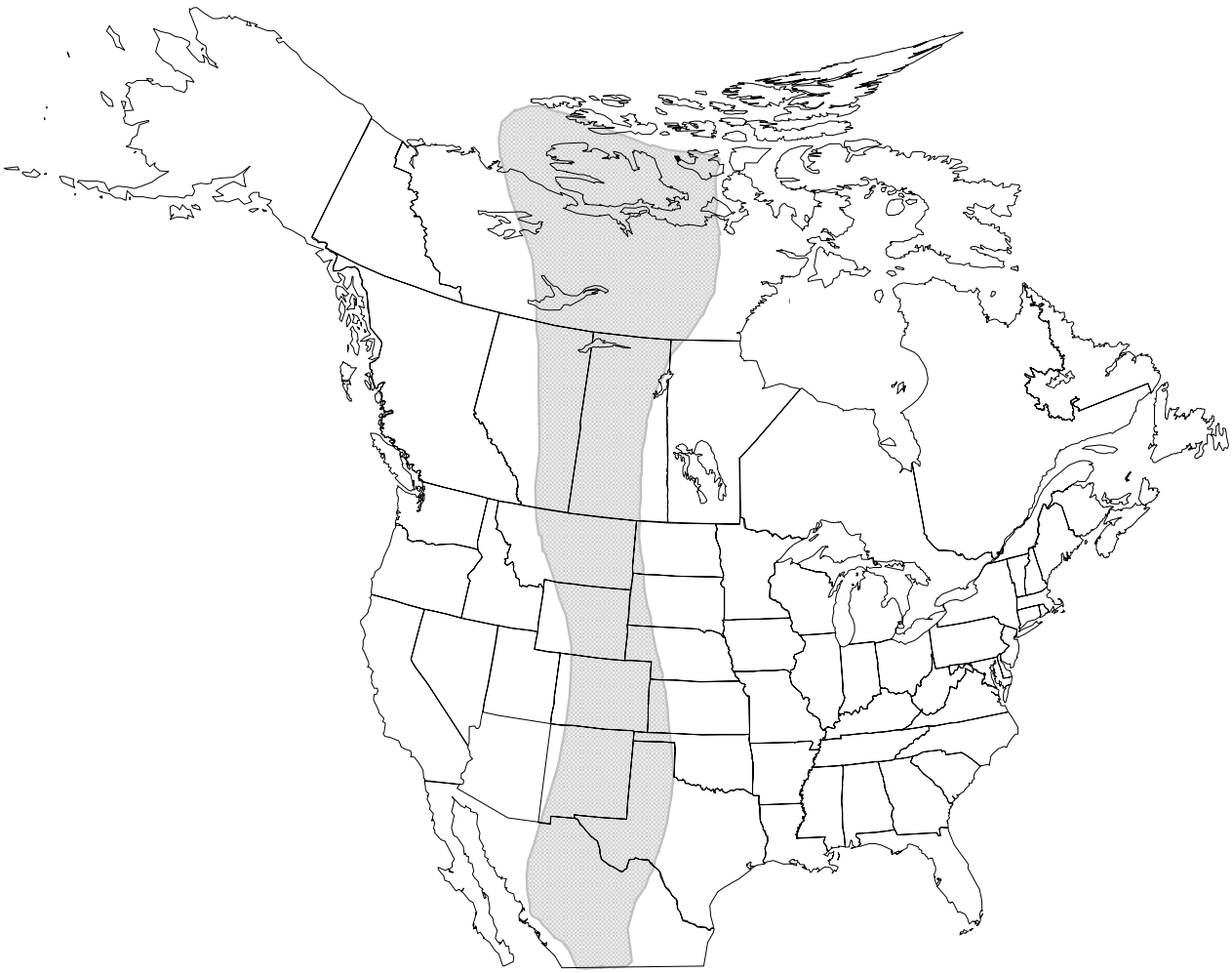
Year	n	% Imm	n*	Yg / Fam
1956		33.8		1.18
1957		46.3		1.80
1958		42.8		2.30
1959		51.6		2.58
1960		50.4		2.83
1961		19.7		2.04
1962		36.4		2.08
1963		49.7		2.82
1964		28.9		2.37
1965		36.8		2.75
1966		43.8		2.92
1967		36.2		2.57
1968		34.4		2.80
1969		41.2		2.87
1970		44.5		2.72
1971		34.4		2.36
1972		28.4		2.29
1973		42.8		2.70
1974		32.6		2.37
1975		41.9		2.29
1976		21.2		2.18
1977		38.1		2.35
1978		8.9		1.49
1979		33.0		3.18
1980		34.0		2.26
1981		36.6		2.04
1982		29.9		1.80
1983		38.0		2.15
1984		44.7		1.79
1985		30.9		1.62
1986		29.5		1.61
1987		24.6		1.39
1988		28.5		1.52
1989		32.2		1.87
1990		29.2		1.69
1991		29.4		1.76
1992		21.2		1.61
1993		29.2		1.45
1994		33.0		1.70
1995		40.2		1.82
1996		40.7		1.52
1997		30.8		1.46
1998		34.7		1.88
1999		37.2		1.83
2000		36.9		1.96
2001		32.1		1.73
2002		34.1		1.94
2003	17658	40.0	1289	1.91
2004	14726	31.7	715	1.68
2005	23360	38.3	786	1.68
Mean = years 1956 - 2004		34.8		2.08

n = number birds sampled *n = number families sampled

2005 - 2006
Western Central Flyway Light Goose Productivity Report







WESTERN CENTRAL FLYWAY LIGHT GOOSE PRODUCTIVITY REPORT – WINTER 2005 - 2006

Philip Thorpe, Division of Migratory Bird Management, Lakewood, CO

ABSTRACT: Productivity appraisals of the Western Central Flyway Light Goose Population (WCFP) were conducted in 3 U.S. States and 1 Mexican State between 1 December 2005 and 9 January 2006. These surveys yielded a combined population estimate of 173,708 light geese. We estimate the WCFP was composed of 63.4% adult snow/blue geese and 36.6% adult Ross's geese. The blue morph comprised 3.1% of the adult snow goose population. The average percentage of immatures in our samples was 28.1% for snow/blue geese and 11.8% for Ross's geese. The average number of immatures per snow goose family was 2.3. Productivity of snow geese was 88.6% higher than 2004 and was 40.5% higher than the 1984 - 2004 average. The productivity of Ross's geese was 12.4% higher than 2004, but 30.6% lower than the 1984 - 2004 average. Average nesting phenology and seasonable weather conditions in the central and western Arctic during the nesting period likely contributed to the improved production for snow geese, but does not explain the below average production observed for Ross's geese.

Surveys concerning flock characteristics of light geese have been conducted on migration and wintering grounds in the Central Flyway since 1978. The procedures for these appraisals are from Lynch and Singleton (1964) and Lynch (1969). The method of flock sampling was described by Drewien (1988). Flock size, species composition, color morph, adult:immature ratio, and family size are collected at major migration and wintering areas in Colorado, New Mexico, Texas, and Chihuahua, Mexico. Habitat conditions and specific information on surveys in the Middle Rio Grande Valley, NM and in Chihuahua are reported in Appendix A.

RESULTS

Below average precipitation was reported for southeastern Colorado, New Mexico, and western Texas during the period from November, 2005 – January, 2006. According to the National Drought Mitigation Center (2006), all 3 survey states experienced deteriorating water conditions from November through January. Texas was most effected by the drought with a moderate drought that became severe in the panhandle by the end of January. Negative effects on agriculture and hydrology were widespread through out the Texas. During the mid-winter waterfowl survey in the Texas Panhandle (2-6 January) only 5% of the 223 randomly selected playas surveyed had basins containing water compared to 54% during the 2005 mid-winter survey. Moderate drought conditions expanded into southeastern Colorado and New Mexico in January. These areas were considered abnormally dry in November and December. Across the U.S. portion of the WCFP wintering range, mean temperatures were above normal during December (1-2 ^{o} C) and January (3-5° C).

The 2005 - 2006 productivity appraisals for the WCFP involved Colorado, Texas, New Mexico, and Chihuahua, Mexico and included 17 concentration areas (Fig. 1). Light goose flocks were surveyed during the following dates: Texas, 1 December; New Mexico, 2-8 December (Bitter Lake, Las Vegas, and Maxwell NWRs), 20-22 December (Rio Grande Valley, Appendix A); Colorado, 12-13 December; and Chihuahua, 29 December-9 January (Appendix A).

A 20.7% sample (*n* = 35,959) of the total light goose population estimate was classified by species, age, and color morph (white or blue)(Table 1). Adult snow/blue and Ross's geese comprised 63.4% and 36.6% of the sample, respectively (Table 1, Fig. 2). The proportion of adult Ross's geese (36.6%) was similar to 2004 (36.8%), but 79.4% higher than the 1984 - 2004 average (20.4%) in the WCFP (Table 2). The total 2005 WCFP estimate was 23.8% and 10.5% lower than the 2004 estimate and the 1984 - 2004 average, respectively (Table 2, Fig. 3).

Lesser Snow Geese

Immature snow/blue geese accounted for 28.1% (*n* = 6,869) of 24,438 snow/blue geese sampled (Table 1). Of 17,569 adult snow/blue geese sampled, 3.1% (*n* = 537) were blue morph (Table 1). Average family size was 2.3 immatures/family (*n* = 982 families), which was 21.1% and 15.0% higher than the 2004 estimate and the 1984 - 2004 average, respectively (Table 2).

We observed 14 snow goose neck-collars during the survey, 1 in New Mexico and 13 in Colorado (Table 3).

Ross's Geese

Immature Ross's geese represented 11.8% (*n* = 1,357) of the 11,521 Ross's geese sampled (Table 1). This was 12.4% higher than the 2004 estimate, but remained 30.6% lower than the 1984 - 2004 average (Table 2).

We observed 11 Ross's goose neck-collars during the survey this year including 6 in Colorado and 5 in eastern New Mexico (Table 3).

DISCUSSION

The WCFP breeds primarily in the central and western Canadian Arctic and have large nesting colonies near the Queen Maud Gulf and on Banks Island. Based on a normal spring phenology and seasonable weather conditions during the 2005 nesting period, biologists predicted average to above average production from light geese in the western and central Arctic colonies (U.S. Fish and Wildlife Service 2005). Our immature snow goose estimates were average to above average for all areas surveyed, but our immature Ross's goose estimates were below average and are below the long-term average for the survey (Table 2). It is unclear why there was a discrepancy between the 2 species. Differences in migration because of a milder winter throughout the flyway may have allowed family groups to remain farther north in the flyway during our surveys, but why this would only be reflected in Ross's geese is uncertain. Ross's goose flock

characteristics can have biases because they are smaller and can easily be missed in high crop stubble or large flocks of snow geese. Below-average estimates for immature Ross's geese from numerous flocks and by several observers throughout the survey area seem to indicate that the low number of immature birds reflect reality and not a survey bias.

This survey serves as the only standardized check on species composition for the WCFP. It has become especially important to monitor these species given the population explosion of light geese during the last decade and the implementation of harvest strategies in 1999 to control their populations.

I want to thank the agencies and field stations listed as contributors for their support of this survey. Thanks to Erv Boeker for volunteering his time to help collect data. Kammie Kruse and Tim Moser collected data in Texas and New Mexico and I appreciate their help. Thanks to landowners in Texas and Colorado for allowing access to their land. I thank Rod King for comments that helped improve this report.

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Table 1. Distribution and flock characteristics of the Western Central Flyway Light Goose Population, winter 2005-06.

		Flock composition by area, state/country, and flyway											
			Species composition		Snow/blue goose age ratios and flock composition				Ross's goose age ratios			Snow/blue family size	
Location	Population estimate[1]	*n*	% snow/blue[2]	% Ross's[2]	Adult snow/ blue	Immature snow/ blue	% Imm. snow/blue	% Blue[2]	Ad.	Imm.	% Imm.	No. of families	Avg. imm./ family
COLORADO													
Lamar Area	21,000	3,703	70.1	29.9	1,782 / 117	802/ 30	30.5	6.2	811	161	16.6	95	2.3
Rocky Ford Area	4,500	2,404	78.8	21.2	1,378 / 52	498 / 14	26.4	3.6	385	77	16.7	37	2.4
Colorado total	25,500	6,107	73.6	26.4	3,160 / 169	1,300/ 44	28.8	5.1	1,196	238	16.6	132	2.3
TEXAS													
Cactus Lake	27,500	2,222	77.0	23.0	1,163 / 123	447/ 14	26.4	9.6	384	91	19.2	-	-
Lake Rita Blanca	12,000	1,074	42.1	57.9	340 / 33	80/ 1	17.8	8.9	514	106	17.1	-	-
Texas total	39,500	3,296	64.9	35.1	1,503 / 156	527/ 15	24.6	9.4	898	197	18.0	-	-
NEW MEXICO													
Bitter Lake NWR	6,300	1,469	49.1	50.9	579 / 19	191/ 3	24.5	3.2	621	56	8.3	71	1.9
Rio Grande Valley	44,553	11,745	64.9	35.1	6,019 / 117	2,113/ 29	25.9	1.9	3,316	151	4.4	269	2.4
Maxwell NWR[3]	65	0											
Las Vegas NWR[3]	3,640	0											
New Mexico total	54,558	13,214	63.1	36.9	6,598 / 136	2,304 / 32	25.8	2.0	3,937	207	5.0	340	2.3
MEXICO													
Mexico total[4]	54,150	13,342	58.6	41.4	5,771 / 76	2,613/ 34	31.2	1.3	4,133	715	14.7	510	2.3
Western Central Flyway total	173,708	35,959	63.4	36.6	17,032/537	6,744/ 125	28.1	3.1	10,164	1,357	11.8	982	2.3

[1] Estimate was from partial ground surveys and is independent of the official winter waterfowl survey.

[2] Generated using adult component only.

[3] Data from refuge surveys, flocks were not appraised.

[4] See Appendix A for flock characteristics by individual survey area.

Table 2. Population estimates and productivity data for the Western Central Flyway Light Goose Population, winters 1960-2005.

		Average flock composition				% Immature		Snow/blue family size	
Year	Population estimate[1]	No. geese sampled	% Snow/blue[2]	% Ross's[2]	% Blue[2]	Snow/blue	Ross's	Avg. imm./ family	No. families sampled
1960	5,826 [3]								
1961	12,349 [3]				2.5				
1962	7,997 [3]				3.0				
1963	44,402 [3]				2.3	17.0			
1964	23,321 [3]				1.8	12.0			
1965	38,167 [3]								
1966	231 [3]				2.3				
1967	123 [3]				1.3	50.0			
1968	5 [3]				1.1				
1969	0 [3]				0.8				
1970	34,806 [3]				0.6				
1971	35 [3]				1.0	47.0			
1972	0 [3]				1.7	40.0			
1973	1,719 [3]				1.0	13.0			
1974	16,341 [3]				2.5	52.0			
1975	42,330				0.5	21.7			
1976	66,326				0.5	61.1			
1977	72,617				2.5	42.0			
1978	85,390 [3]	5,787			1.0	39.3			
1979	94,283 [3]	6,776	86.7	13.3	2.2	20.6	21.6		
1980	98,996 [3]	8,833	85.6	14.4	3.5	35.2	30.7		
1981	75,073	5,705	84.4	15.6	2.6	25.1	22.1		
1982	141,702	2,512				12.7			
1983	36,493	8,988	71.1	28.9	1.8	39.9	19.2		
1984	63,043 [3]	15,453	93.6	6.4	1.8	24.9	22.1		
1985	176,713	25,217	91.9	8.1	1.4	30.1	22.9		
1986	121,395	23,721	85.3	14.7	0.9	3.7	12.2	2.0	378
1987	120,655	29,548	86.5	13.5	1.1	19.4	8.1	2.1	2,185
1988	134,352 [3]	27,241	86.2	13.8	1.1	27.3	16.3	2.3	1,603
1989	172,813	31,689	89.1	10.9	1.7	21.0	27.2	2.1	1,214
1990	166,900	28,321	84.2	15.8	1.3	21.5	12.3	1.9	1,297
1991	91,739 [3]	22,918	84.8	15.2	1.8	11.7	11.4	1.8	812
1992	139,162	21,629	80.1	19.9	1.0	15.6	8.0	1.9	850
1993	196,700	35,538	76.4	23.7	1.7	34.2	20.3	2.4	1,414
1994	161,290	26,531	74.4	25.6	1.3	18.9	13.8	2.0	916
1995	193,915	33,648	75.5	24.5	2.4	22.3	18.2	2.1	1,302
1996	183,290	37,005	82.0	18.0	1.7	29.0	20.9	2.4	2,019
1997	218,658	41,183	70.2	29.8	2.4	15.8	14.0	1.8	1,364
1998	240,410	43,771	75.4	24.6	1.9	31.8	24.9	2.1	2,202
1999	309,861	44,072	78.9	21.1	3.1	27.3	27.4	2.2	2,161
2000	221,736	40,270	75.9	24.1	2.3	12.6	12.8	1.8	1,066
2001	211,640	37,783	76.0	24.0	1.9	9.8	18.7	1.8	816
2002	236,775	47,868	69.0	31.0	1.8	7.8	14.9	1.6	841
2003	192,132	33,537	73.2	26.8	2.0	20.6	21.1	1.9	1,140
2004	228,065	32,089	63.2	36.8	3.7	14.9	10.5	1.9	991
2005	173,708	35,959	63.4	36.6	3.1	28.1	11.8	2.3	982
Average, 1975-83[4]	72,424	6,434	82.0	18.1	2.2	28.8	23.4	-	-
Average, 1984-04[5]	194,006	32,335	79.6	20.4	1.8	20.0	17.0	2.0	1,293
% change from 2004	-23.8	12.1	0.3	-0.5	-16.2	88.6	12.4	21.1	-0.9
% change, '84-'04 avg.	-10.5	11.2	-20.4	79.4	72.2	40.5	-30.6	15.0	-24.1

[1] Population estimates preceeding 1978 are from the Mid-winter Waterfowl Survey, estimates following 1978 are from ground and aerial estimates made during productivity surveys. Coverage in Chihuahua, Mexico initiated in 1984.

[2] Generated using adult component only.

[3] Incomplete survey coverage.

[4] Average for surveys prior to the initiation of the Mexico survey in 1984. Population estimate average only includes years of complete survey coverage. Flock characteristic averages include 1978 - 1983 (years with a sample).

[5] Average reflects the addition of the Mexico productivity survey that began in 1984. Population estimate average only includes years of complete survey coverage. Flock characteristic averages include all years from 1984 to 2004.

Table 3. Location and number of neck-collared lesser snow and Ross's geese observed during productivity surveys in Colorado, Texas, and New Mexico, December 2005[1].

	Snow					Ross's		
Location	Red[2]	Black[3]	Yellow[4]	Green[5]	Blue[6]	Blue[4]	Yellow[2]	Total
COLORADO								
Lamar Area		5	2	1			3	11
Rocky Ford Area	1	1	1	2		3		8
NEW MEXICO								
Bitter Lake NWR		1				4	1	6
TEXAS								
Rita Blanca Res.								0
Cactus								0
TOTAL	1	7	3	3	0	7	4	25

[1] See Appendix A for location and number of collars seen in the Rio Grande Valley, NM and Chihuahua, Mexico.

[2] Baffin Island, W. Hudson Bay, La Perouse Bay, Wrangel Is.

[3] Western Arctic

[4] Central Arctic E.

[5] Akimiski Is., Cape Henrietta Maria, Southampton Is.,

[6] Alaska

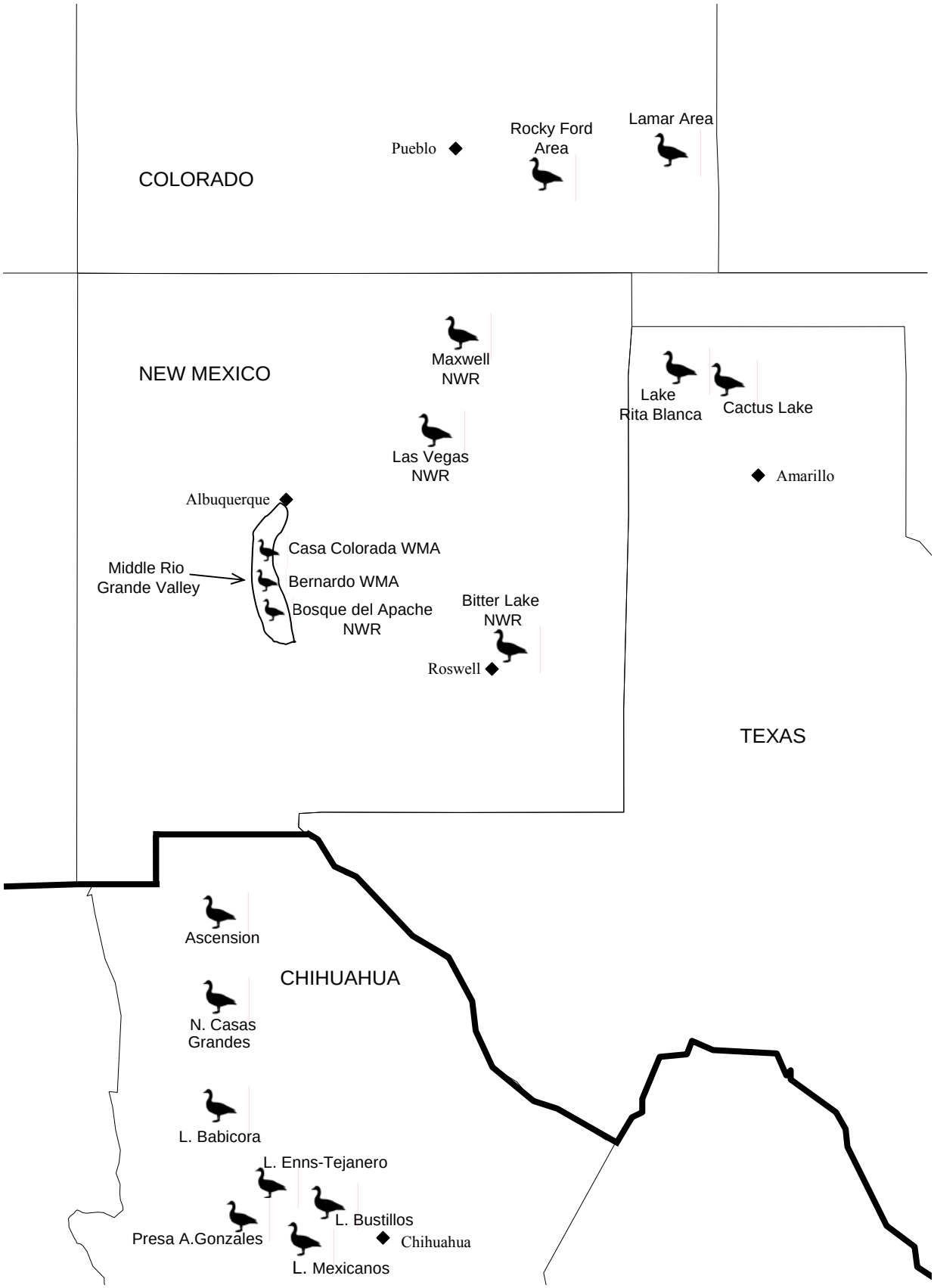

Fig. 1. Locations surveyed in the Western Central Flyway to assess species composition and productivity of lesser snow and Ross's geese, fall and winter, 2005-2006.

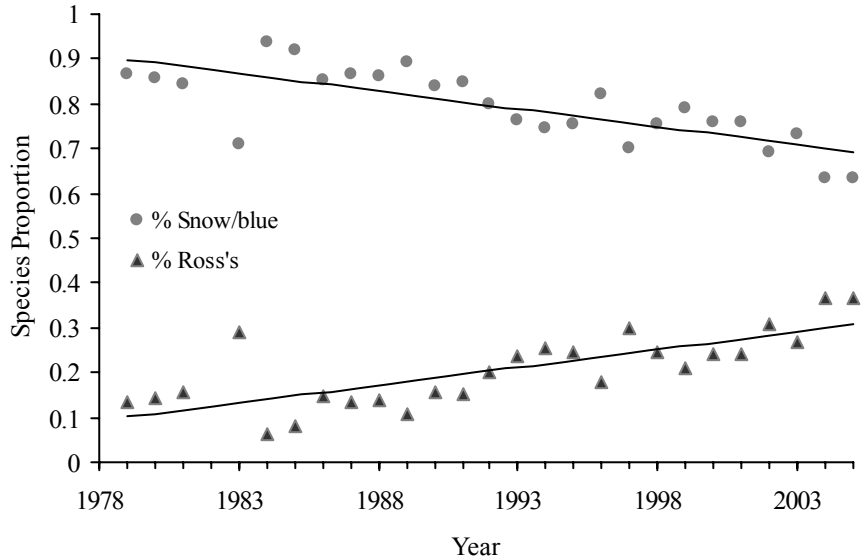

Fig. 2. Proportion of adult snow and Ross's geese in the Western Central Flyway Population, Winters 1979 – 2005. Data for 1982 were unavailable.

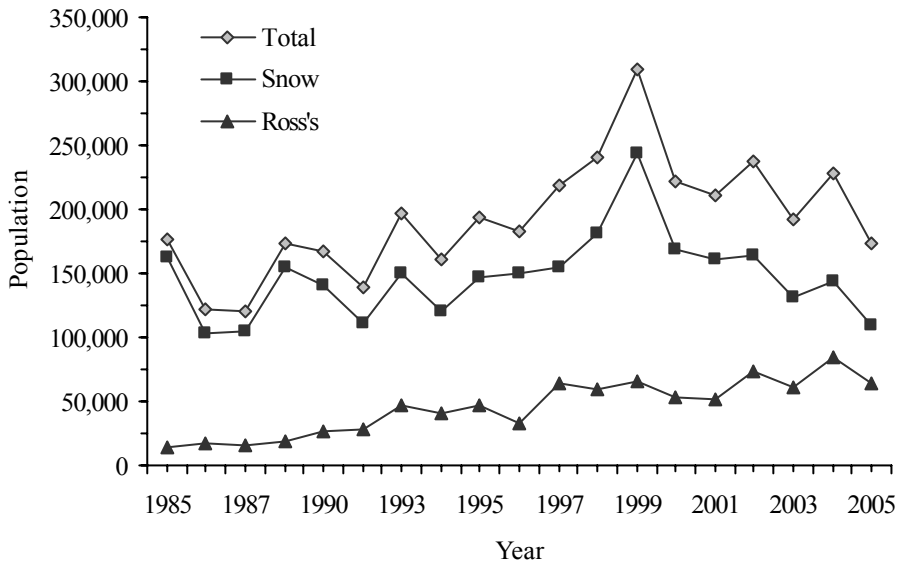

Fig. 3. Population estimates of Western Central Flyway light geese during winters 1985 – 2005. Incomplete survey years, 1988 and 1991, were excluded. Population estimates for each species were calculated using species compositions weighted for the Flyway based on each year (see Table 2).

SNOW AND ROSS'S GEESE SURVEYS IN THE MIDDLE RIO GRANDE VALLEY, NEW MEXICO, AND IN CHIHUAHUA, MEXICO, WINTER 2005-06

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ABSTRACT: Flocks of lesser snow geese and Ross's geese (light geese) were surveyed in the Middle Rio Grande Valley, New Mexico and at 7 areas in Chihuahua, Mexico during winter 2005-06. In New Mexico, geese peaked at 44,553 on 8 December, -2.3% below the 21-year mean. In Chihuahua, 54,150 geese were recorded at 7 areas during 29 December-8 January and numbers were -29.8% below the mean. An estimated ≈92,500 light geese were at survey sites in the Rio Grande Valley, New Mexico and at 7 areas in Chihuahua in early January 2006. Samples of geese (New Mexico-11,745, Chihuahua-13,342) were classified by species, color morph and age. Species composition of adults in New Mexico was 64.9% snow geese and 35.1% Ross's geese; 1.91% of adult snow geese were blue morph. In Chihuahua, 58.6% of adults were snow geese and 41.4% were Ross's geese; 1.30% of adult snow geese were blue morph. The percentages of immature snow geese were 25.9% in New Mexico and 31.2% in Chihuahua, and were +30.6% and +57.6% above the 21-year means, respectively. The mean number of immatures per family was 2.40 in New Mexico and 2.28 in Chihuahua. Ross's geese averaged 4.4% and 14.8% immatures in New Mexico and Chihuahua; recruitment was –69.2% and –14.1% below average, respectively. Three blue morph Ross's geese were recorded during surveys.

Snow and Ross's geese wintering in New Mexico and the Northern Highlands of Mexico, including the state of Chihuahua, belong to the Western Central Flyway Light Goose Population (Central Flyway Council 1982). Most originate from nesting colonies in the western and central Canadian Arctic with smaller numbers from Alaska and west Hudson Bay colonies. Rare neckbanded individuals from Wrangel Island, Russia and eastern Arctic colonies on Baffin and Southampton Islands, LaPerouse Bay and Cape Henrietta Maria also have been recorded. The senior author has monitored wintering light geese flocks for various population parameters in the Middle Rio Grande Valley, New Mexico annually since 1978 and at 5-7 locations in Chihuahua, Mexico since 1984.

Locations surveyed in the Middle Rio Grande Valley in 2005 included the Edeal Dairy at Los Lunas, the Bosque del Apache NWR (Bosque Refuge) and the State Waterfowl Management Area at Bernardo. These winter sites were described by Taylor and Kirby (1990). In Chihuahua, 7 wetland units were surveyed. Laguna Encinillas has not been surveyed since 1996 and starting in 1997 we substituted a new unit, Lagunas Tejanero and Tascate (Drewien and Shea 1998). These 2 smaller wetlands and the nearby small Laguna Enns, located in 1998, are in the Cuauhtemoc Valley in west-central Chihuahua and northwest of Laguna Bustillos in the Mennonite farm country. Various areas surveyed in Chihuahua were described by Saunders and Saunders (1981), Drewien and Brown (1985, 1987, 1993), Turner et al. (1994), Drewien et al. (1996, 2003), and Drewien and Shea (1998).

Information collected from flocks at each location included estimates of total numbers, species composition, color morph (white:blue), adult:immature composition, and family size for snow geese; neckband sightings were also recorded. Proportions of snow:Ross's geese and % blue morphs were calculated from samples of adults only. Flock survey methods have been described elsewhere (e.g., Drewien and Brown 1985, 1993, Drewien et al. 2003) and include recording spot samples of 50-150 geese at intervals along a continuous "W" pattern to insure sampling along edges and within interior of flocks. This is important for

sampling Ross's geese as they often concentrate in the interior of mixed light geese flocks. We surveyed geese in the Middle Rio Grande Valley on 20-22 December 2005 and in Chihuahua from 29 December 2005-9 January 2006.

Surveys were funded by the U.S. Fish and Wildlife Service, Division of Migratory Bird Management. We thank Philip Thorpe for providing funds for the survey. Colin Lee and Bernard Lujan, Bosque Refuge, and Tim Mitchusson, New Mexico Department of Game and Fish, kindly provided goose count data and other information for the Middle Rio Grande Valley.

RESULTS AND DISCUSSION

Habitat and Survey Conditions

Wetland habitat conditions were adequate in the Middle Rio Grande Valley, although corn production at the Bosque Refuge and the New Mexico Game and Fish had Wildlife Management Areas was well below average (C. Lee and T. Mitchusson, pers. comm.). Corn production records since 1991 at the Bosque Refuge revealed that yields were at a 15-year low. Corn crops were depleted by late January/early February and some sandhill cranes were reported migrating northward. Supplemental stored corn was scattered in fields at the Bosque Refuge at the rate of 7,000-10,000 lbs/week to offset limited food supplies for waterfowl and cranes. During the winter, about 20 light geese also were reported lost due to avian cholera at the Bosque Refuge (C. Lee, pers. comm.).

In Chihuahua, wetland water levels were improved due to above average precipitation in late summer and fall. A number of smaller depressional wetlands were full (e.g., L. Arazata and L. Honda-Cuauhtemoc Valley) although some of the larger natural wetlands did not fill completely and were surrounded by extensive mud flats (e.g., L. Mexicanos, L. Bustillos). Conditions at the tri-wetland complex of Tejanero-Tascate-Enns varied. Lagunas Tascate and Enns had moderate water levels, whereas Laguna Tejanero was very low and only about 15% of the basin was flooded. Water levels were high at A. Gonzales Reservoir. Laguna Babicora, often the most important light goose winter area in the Interior Highlands, had low water levels with only some 25% of the wetland basins in the south half of the valley containing shallow water and they were surrounded by extensive mud flats. Light geese were not found at L. Babicora, although we found 1,900 at L. Golondrinas in the Madera Valley west of L. Babicora. The larger goose concentrations we found were at Laguna de Bustillos and at N. Casas Grandes.

Only 400 light geese were found at A. Gonzales Reservoir, the lowest numbers observed in many years. Several locals reported geese were more abundant before our arrival. One resident indicated that increases in boating and fishing activities probably contributed to the decline in goose numbers. We were unable to obtain flock composition data from the 400 geese at the reservoir as they soon departed after their arrival and we were unable to relocate them.

Northern pintail was the most abundant duck species observed during the survey with largest concentrations noted at L. Mexicanos (12,000), L. Enns (11,000) and L. Tejanero (9,000). Over 2,000 white-fronted geese were noted each at L. Bustillos, L. Mexicanos and L. Tascate. No Canada geese were observed during the survey.

Small grain stubble fields, mainly oats and sorghum, and harvested corn fields were present at most survey locations in Chihuahua, and provided food for geese. Irrigated fields of alfalfa, winter wheat, milo and corn were utilized extensively by light geese at N. Casas Grandes. Agricultural lands surrounding Lagunas Tejaneros, Enns, and Bustillos in the Cuauhtemoc Valley included thousands of irrigated acres of harvested corn and oats but most fields were being plowed by early January.

Lesser Snow Goose and Ross's Goose Populations

New Mexico: A peak winter population of 44,553 light geese was recorded in the Middle Rio Grande Valley on 8 December (Tables 1 and 2). The peak population estimate was –2.3% below the 21-year mean (45,599). A population of 36,202 was present in the Rio Grande Valley during our December survey and 38,381 were in the Valley at the time of our survey in Chihuahua (Table 2).

A total of 11,745 light geese was classified by species and age (Table 2). Classification of 9,452 adults yielded 64.9% snow geese and 35.1% Ross's geese (Table 2). The proportion of Ross's geese in 2005 is +80.8% above the 19-year mean (x=19.4%). Of 6,136 adult snow geese classified, 1.91% (n=117) were blue morph (Table 2). During 21 winters, the percent blue morph averaged 1.7%, (sd=0.19) and has remained relatively constant (range, 1.5-2.1%). Two adult blue morph Ross's geese were observed at Bosque NWR (1) and Bernardo (1).

Chihuahua: A total of 54,150 light geese was recorded at 7 survey units or -30.7% below the 21-year mean (78,194) (Tables 1 and 2). Because species composition differed greatly at L. Bustillos, we separated survey results into north and south units(Table 2).

We classified 13,342 light geese by species and age. Classification of 9,980 adults revealed that 58.6% were snow geese and 41.4% were Ross's geese (Table 2). The percentage of estimated Ross's geese in light goose flocks varied by location from 1.2% at Laguna Bustillos (north) to 69.0% at N. Casas Grandes (Table 2). An estimated 17,450 Ross's geese (weighted by flock size) were at 6 survey units. One adult blue morph Ross's goose was recorded at Laguna de los Mexicanos.

Classification of 5,847 adult snow geese showed that 1.30% (n=76) were blue morph (Table 2). The percentage of blue morph in Chihuahua averaged 0.60% (sd=0.11) between 1984-96 and had remained relatively constant over 13 years (range, 0.43-0.82) but increased to 1.13 during 1997-1998 winters and 1.33% during winters 1999-2000. Presence of the blue morph in 2005 varied by location with lows of 0.86% at Laguna Bustillos and 0.88% at Laguna de los Mexicanos to a high of 2.06% at N. Casas Grandes (Table 2).

Recruitment Estimates

Snow Geese: Samples totaling 6,136 snow geese (includes blue morph) in New Mexico contained 25.9% immatures (Table 2) and was +30.6% above the 21-year mean (19.8%). The percent immatures for the small sample of blue morphs (n=146) was 19.9%. The mean number of immatures/family was 2.40 (Table 3). In Chihuahua, samples totaling 8,494 snow geese (includes blue morph) contained 31.2% immatures (Table 2) or +57.6% above the 21-year mean (19.8%). The percent immatures in a small sample of blue morphs (n=110) was 30.9%. The mean number of immatures/family was 2.28 (Table 3).

Ross's Geese: The percent immatures in a sample of 3,467 Ross's geese in New Mexico was 4.4% (Table 2), or –69.2% below the 19-year (1986-04) mean (14.3%). In Chihuahua, immatures averaged 14.7% in Ross's geese sampled at 6 units and varied by location from 10.2% at Laguna de los Mexicanos to 29.0% at Ascension (Table 2). The 14.7% immatures was -14.1% below the 19-year mean (17.2%). Most immatures were not associated in family units during winter and data on family size were not collected (Drewien and Brown 1987).

Observations of Neckbanded Lesser Snow Geese and Ross's Geese

We observed 119 neckbanded geese (66-snow, 53-Ross's) including 54 in New Mexico and 65 in Chihuahua (Table 4). Neckbanded snow geese were mainly from western (black) and central (yellow) Canadian Arctic colonies, except for 2 from (1-red, 1-green) eastern Arctic colonies on Baffin Island (1-Bernardo, NM), and Southampton Island (1-Laguna Golondrinas, Chih) (K. Meeres, CWS, pers. comm.). Four other green collared snow geese were all banded in 2005 in the Queen Maud Gulf in the central Arctic (Table 4). Neckbanded Ross's geese were from the central Canadian Arctic (blue) and west Hudson Bay (yellow).

We located a mounted Ross's goose with a blue collar (Y7H; # 1707-81393) on display in a saddle and leather shop in N. Casas Grandes, Chihuahua. The goose was shot in November 2004 at nearby Laguna Fierro by the store owner, Jose Luis Sujo B. This bird was banded as a juvenile male in August 2003 in the Queen Maud Gulf in the central Canadian Arctic.

Three neckbanded geese (snow-2, Ross's-1) all observed on 1 January at L. Tascate in the Cuauhtemoc Valley were resighted some 70 miles northwest on 7 January with 1,900 light geese at Laguna Golondrinas in the Madera Valley. Geese at Laguna Golondrinas probably were part of the flock at Laguna Tascate and therefore may have been counted twice in our survey results. These observations also suggest that some geese may have started the northward migration in early January.

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Table 1. Counts of lesser snow geese and Ross's geese in the Middle Rio Grande Valley, New Mexico, and at 5-7 sites in Chihuahua, Mexico, winters 1984-2005.

Year	Rio Grande Valley, NM1/	Chihuahua Mexico	Areas surveyed in Mexico	Comments
1984	41,375	25,800	6	Partial counts-Ascension & Babicora; NS 2/ A. Gonzales Reservoir
1985	62,399	90,900	7	
1986	36,902	56,129	7	
1987	39,400	56,175	7	
1988	42,367	73,900	5	NS-Bustillos, Mexicanos
1989	47,800	96,718	7	
1990	55,275	74,550	7	
1991	38,920	30,205	6	Partial count-Ascension, NS-Babicora
1992	31,000	88,562	7	
1993	46,200	105,700	6	NS-Encinillas
1994	47,950	81,140	6	Severe drought; NS-Encinillas, Partial count-Ascension
1995	45,082	57,715	7	Extreme drought-Babicora & Mexicanos dry
1996	49,200	87,100	7	Water levels low
1997	39,960	105,700	7	Water levels below normal, NS- Encinillas 3/
1998	50,650	91,050	7	Extreme drought-Ascension, Babicora, Mexicanos dry
1999	56,400	86,600-102,050	7	Partial count-Mexicanos
2000	55,600	78,905	7	Water levels very low, several wetlands dry
2001	59,050	85,930	7	Extreme drought, several wetlands dry
2002	38,000	133,975	7	Drought, water levels very low, Babicora dry
2003	34,900	60,225	7	Extreme drought-Ascension, Babicora, Mexicanos dry
2004	39,150	75,100	7	Water levels low but improved water levels in Dec due to heavy precipitation
2005	44,553	54,150	7	Water levels variable but all areas had water

1/ Peak counts; data provided by J. Taylor, C. Lee and B. Lujan, Bosque del Apache NWR (pers. comm.);
1986 count includes only the Bosque del Apache NWR

2/ NS = No Survey

3/ Lagunas de Tejanero-Tascate-Enns substituted for L. Encinillas starting 1997-99.

Table 2. Population estimates and numbers of lesser snow geese and Ross's geese sampled in the Middle Rio Grande Valley, New Mexico, and Chihuahua, Mexico, winter 2005-06.

Location	Population estimate	Snow/blue geese				Ross's geese				Total geese
		Adult	Immature 1/	(%)	Total	Adult	Immature	(%)	Total	
NEW MEXICO										
Rio Grande Valley	44,553 2/ (38,381) 3/	6,019/117	2113/29	(25.9)	8,278	3,316	151	(4.4)	3,467	11,745
CHIHUAHUA										
Ascension	4,700	311/ 6	136/ 3	(30.5)	456	385	157	(29.0)	542	998
N. Casas Grandes	11,650	1,048/22	373/ 6	(26.2)	1,449	2,377	358	(13.1)	2,735	4,184
L. Babicora-Madera Valley	1,900	570/ 8	282/ 6	(33.3)	866	29	6	(17.1)	35	901
L. Tascate	9,200	1,444/19	646/ 6	(30.8)	2,115	66	22	(25.0)	88	2,203
L. Bustillos-north	9,500	973/ 6	486/ 1	(33.2)	1,466	12	3	(20.0)	15	1,481
L. Bustillos-south	7,000	639/ 8	304/ 7	(32.5)	958	481	80	(14.3)	561	1,519
L. Mexicanos	9,800	786/ 7	386/ 5	(33.0)	1,184	783	89	(10.2)	872	2,056
A. Gonzales Res.	400									
Chih. Total/($\overline{X}$%)	54,150	5,771/76	2,613/34	(31.2)	8,494	4,133	715	(14.7)	4,848	13,342

1/ % immatures include blue morph.
2/ Peak count in Valley, 8 Dec 2005, (C. Lee, pers. comm.).
3/ Estimated number of light geese in Rio Grande Valley, New Mexico in early Jan 2006 during Mexico survey.

Table 3. Family sizes of lesser snow geese in the Middle Rio Grande Valley, New Mexico, and in Chihuahua, Mexico, winter 2005-06.

Location	Immatures/family 1	2	3	4	5	6	Total families	Mean immatures per family
NEW MEXICO								
Rio Grande Valley	47	118	66	28	8	2	269	2.40
CHIHUAHUA								
Ascension	3	7	7	1			18	2.33
N. Casas Grandes	15	27	21	5	4	1	73	2.44
L. Golondrinas	11	24	12	5			52	2.21
L. Tascate	34	66	28	13	3		144	2.20
L. Enns								
L. Bustillos	38	61	24	12	7		142	2.22
L. Mexicanos	13	35	22	9	2		81	2.41
A. Gonzales Res.								
Total Families – Mexico	114	220	114	45	16	1	510	2.28

Table 4. Locations and numbers of neckbanded lesser snow geese and Ross's geese observed in the Middle Rio Grande Valley, New Mexico and Chihuahua, Mexico, winter 2005-06.

	Snow geese					Ross's geese		
Location	Yellow	Black	Red	Green	Blue	Yellow	White	Total
NEW MEXICO								
Bosque NWR	18	6		1	8	8		41
Bernardo	4	6	1		2			13
Subtotal	22	12	1	1	10	8		54
CHIHUAHUA								
Ascension	3				1			4
N. Casas Grandes	2	2		1	15	9	2	31
L. Golondrinas		2		1	1			4
L. Tascate	6	5		2	1	1		15
L. Bustillos	1	4						5
L. Mexicanos	1				2	3		6
Subtotal	13	13		4	20	13	2	65
TOTAL	35	25	1	5	30	21	2	119

TITLE:

Pacific Flyway Goose and Swan Productivity Surveys - 2005

SPECIES SURVEYED:

Lesser Snow Goose (Chen caerulescens)
Ross's Goose (Chen rossii)
Greater White-fronted Goose (Anser albifrons albifrons)
Tule Greater White-fronted Goose (Anser albifrons gambelli)
Tundra Swan (Cygnus columbianus)

COOPERATORS:

Canadian Wildlife Service(CWS)
U.S. Fish and Wildlife Service(USFWS)
- Division of Migratory Bird Management(DMBM)
- Klamath Basin NWR
- Red Rock Lakes NWR
- Sacramento NWR
- Delevan NWR
- Colusa NWR
- Sutter NWR
- Butte Sink (CA/Pvt./FWS)

Oregon Department of Fish & Wildlife(ODFW)
Utah State Division of Wildlife Resources
Wrangel Island Preserve

REPORTED BY:

Elizabeth Huggins, Flyway Biologist, USFWS/Division of Migratory Bird Management

ABSTRACT:

Productivity surveys for most species and populations were conducted in 2005 and appear in the tables of this report along with a short narrative in the Results section. Productivity survey results from the portion of the Ross's goose population that winters in the northern highlands of Mexico, appear in the Western Central Flyway Report.

METHODS:

Procedures followed in conducting these appraisals are found in Lynch and Singleton (1964) and (1969). Additional techniques include analyzing aerial photographs and ocular sightings from aircraft. For this report the terms juvenile, immature, and young all refer to birds hatched in 2005.

RESULTS:

Lesser Snow Goose:

Western Arctic: No report

Mixed flocks: Table 1.

J. Isola, M. Carpenter and M. Wolder collected data at Sacramento and Colusa NWR for 7 days from November 16, 2005 to December 12, 2005 with a result of 35% juvenile lesser snow geese (n= 6537 adults and 3527 juveniles).

Marty St. Louis collected data in the Summer Lake wildlife area for 2 days on October 26 and 29, 2005 with a result of 42.4% juvenile lesser snow geese (n= 822 adults and 606 juveniles).

The combined production for Sacramento and Summer Lake lesser snow goose flocks was 36%. This is and increase of 42.3% from last year (25.3%)

Wrangel Island: Table 2 and 3.

V. Baranyuk collected data on Wrangel Island in 2005 . Age ratio data was not reported. The total spring population (117.5 thousand) was similar to last years count, the breeding population was 68.7% higher and the percentage of successful nests was 9.7% higher than last year.

Sean Boyd, CWS, reports on data collected for the Fraser/ Skagit deltas winter 2004-05. Total lesser snow geese observed was 80,040 with 39.0% young. Last year's count was 68,141 total lesser snow geese with 15.3% young. This is a 155% increase in production from last year and a 198% increase in production from the 1948 to 2005 long term mean.

Ross' Goose: Table 4.

Productivity appraisals for Central Flyway wintering Ross's geese in the northern highlands of Mexico continue to be conducted by Dr. Rod Drewien and are reported in the Western Central Flyway White Goose Productivity Survey Report.

J. Isola and M. Carpenter collected data at Sacramento and Colusa NWR for 3 days from November 16 to December 12, 2005. A sample of 1866 total birds revealed 23.1% juvenile Ross's geese (N=1435 adults and 431 juveniles). This was a 75.0% increase from last year (13.2%).

Greater White-fronted Goose: Table 5.

J. Isola and M. Wolder collected data at Colusa and Sacramento NWR for 3 days from September 23 to October 12, 2005 with a result of 31.7% juvenile Pacific greater white-fronted geese(n=1936 adults and 899 juveniles).

E. Huggins collected data at the Klamath Basin NWR complex for 3 days from September 28 to October 6, 2005 (pre-hunting season) with a result of 33.4% juvenile greater white-fronted geese (N=981 adults and 491 juveniles).

The combined production from Colusa, Sacramento and the Klamath Basin was 32.3%. This is a 7.7% increase from last year (30.0%).

Tule Greater White-fronted Goose: Table 6.

M. Wolder , J. Isola and Sacramento NWR staff collected data at Sacramento, Delevan and Colusa NWR for 8 days from September 14 to November 30, 2005 with a result of 26.1% juvenile Tule greater white-fronted geese(n= 1056 adult and 372 juvenile geese).

Marty St. Louis collected data in the Summer Lake wildlife area for 4 observation periods in September 2005 with a result of 17.3% juvenile Tule greater white-fronted geese(n=498 adults and 104 juvenile geese).

Combined production for the Sacramento complex and Summer Lake wildlife area is 23.4%. This is a decrease of -19.9% from last year (29.2).

Tundra Swan: Table 7 & 8.

Tom Aldrich reports on data collected in Utah with a result of 36.1% juvenile Tundra Swans (n= 6038 adults and 3412 juveniles) with 2.07 young/family.

Marty St. Louis collected data in the Summer Lake Wildlife Area for 11 days from October 22, 2005 to January 25, 2006 with a result of 16.4% juvenile Tundra Swans(1.83 young/family).

Surveys conducted by Rod King on tundra swans in the Sacramento Valley during December 9 -11, 2005, revealed a productivity rate of 15.6 % juveniles +/- 0.18 % S.E. at p = .05 (n = 10,422 total birds consisting of 8,798 adults and 1,624 juveniles). Productivity rate was lower than the 19.5 % juveniles counted in 2004. Total swan sample size (n =10,422) was 24.1% less than 2004 (n = 13,733). A sample of 963 broods consisted of 1,624 juveniles, for an average family size of 1.7 +/- 0.81 and was significantly different than the 2.17 mean family size for 2004. Total family sample size in 2005 (963) was 21.9% less than the sample in 2004 (1,233). One neckband was observed on an adult bird in 2005: black with white codes “Z90”

Combined production for the Utah, Summer Lake and Sacramento areas was 24.6%. This is a decrease of -4.7% from last year.

Trumpeter Swan (Rocky Mountain Population): Table 9.

Data are provided from the annual fall survey and report, Trumpeter Swan Survey of the Rocky Mountain Population (RMP), Fall 2004. This report was formerly the Tristate Trumpeter Swan Survey Report (1967-1991) and is written and distributed by personnel from Red Rock Lakes NWR. The following is an excerpt from the 1993 report:

> The current survey includes traditional Trumpeter Swan habitat in Montana (Centennial Valley, Madison River, upper Yellowstone River and surrounding area), Idaho (and area north of the south Fork of the Snake River and east of Camas NWR) Wyoming (Yellowstone National Park, Grand Teton National Park, National Elk Refuge, the South Fork of the Snake River and surrounding areas), the East Rocky Mountain Front in Montana, Gray's Lake NWR and lower Snake River in Idaho, Ruby Lake NWR in Nevada, Malheur NWR and Summer Lake WA in Oregon, and the Salt and Green Rivers in Wyoming.

The primary purposes of the survey are to document the size of the resident trumpeter swan flocks and to enumerate the annual production of cygnets to fledgling age. The survey also provides some information on territorial occupancy and the distributions of failed breeders and non-breeders from year to year.

This years report was compiled by Jim Dubovsky Assistant Migratory Bird Coordinator. Observers from the Fall 2005 RMP survey counted 510 total swans in the U.S. Breeding segment of this population, a count 22.3% higher than last year and the highest count since 1992. Numbers of white birds (404) and cygnets (106) were higher than those from 2004 (318 and 99, respectively) with 20.8% juvenile birds. This is a decrease of -12.2% from last year.

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Table 1. Historical productivity records for Lesser snow geese in the Pacific Flyway 1961 to present.

Year	Population* Indices	Western Arctic				Miscellaneous Flocks			Mixed Flocks: Summer Lk., OR			Mixed Flocks: Klamath Basin, OR & CA			Mixed Flocks: Sacramento Valley, CA				Mixed Flocks Productivity
	(thousands)	Ad.	Juv.	%Juv**	Yg/Fam	Ad.	Juv.	%Juv.	Ad.	Juv.	%Juv.	Ad.	Juv.	%Juv.	Ad.	Juv.	%Juv.	Yg/Fam	% Juv.
1961	541														6428	1665	20.6	1.8	20.6
1962	483					4008	1673	29.5										2.1	29.5
1963	454					3050	1336	30.5										2.1	30.5
1964	483														10882	3262	23.1	1.8	23.1
1965	294											3276	165	4.8	5646	276	4.7	2.0	4.7
1966	441					4785	4594	49.0										2.6	49.0
1967	747					17929	3494	16.3										1.7	16.3
1968	506					9904	3042	23.5										1.9	23.5
1969	413					5595	2192	28.2										2.1	28.2
1970	462					3394	2001	37.1										2.2	37.1
1971	513					4565	1170	20.4										1.7	20.4
1972	436					6030	895	12.9										1.7	12.9
1973	324																	2.2	39.1
1974				1.0														1.0	1.0
1975																		2.2	46.9
1976				75.1														2.0	44.8
1977																		1.8	35.1
1978																		1.9	35.7
1979	528			3.1														1.7	24.6
1980	204			3.3		2400	1238	34.0							1037	426	29.1	2.0	32.6
1981	760			11.3				29.9				1580	420	21.0	2595	1202	31.6		
1982	354	8640	7360	46.0								3221	227	6.6	2666	232	8.0		7.2
1983	548			26.8				23.0						31.0			36.0		
1984	466			32.0	2.6			25.6									31.0		
1985	550			40.0	2.3									24.1			44.0		
1986	522			2.6				5.0											5.0
1987	525			37.0													22.0		22.0
1988	441			42.0													35.0		35.0
1989	464			19.3,28	2.1												24.0		24.0
1990	709														1382	620	31.0		31.0
1991	690														2372	610	7.8		7.8
1992	639																18.0		18.0
1993	569					889	1011	53.2	653	595	47.7				3865	1917	33.2		39.5
1994	478								1354	312	18.7				3360	538	13.8		15.3
1995	501														544	227	29.4		29.4
1996	366								3567	1130	24.0								24.0
1997	416																		
1998	354								4168	1185	22.1				197	41	20.8		21.9
1999	579								9775	2669	21.4								21.4
2000	657								858	444	34.1								34.1
2001	448								3077	828	21.2				6259	638	10.2	1.9	13.6
2002	597								2957	1766	37.4				7697	1082	12.3		21.1
2003	588								1269	255	16.7	10356	2754	21.0	4921	1491	23.3		21.4
2004	750								1429	442	23.6				6848	2368	25.7		25.3
2005									822	606	42.4				6537	3527	35.0		36.0
Mean	508	8640	7360	27	2	5686	2059	28	2911	963	27	4608	892	18	4169	1037	23	2	25
% change from mean									-72	-37	59				57	240	51		44
% change from 2004									-42	37	80				-5	49	36		42

See individual Annual Winter Productivity Report narrative which credits participants with their respective data set for each area.
For Wrangel Island Lesser snow goose age ratio data see Table 2.
*Population indices include Western Arctic Snow/Ross' geese combined & Wrangle Island Snow geese compiled from surveys conducted in December.
**Percent Juv. columns with more than one estimate of productivity included sample sizes that are not available.

Table 2. Wrangel Island Population and Productivity Information (V. Baranyuk)

YEAR	TOTAL SPRING POP. (x1000)	ADULTS SPRING (x1000)	%JUV SPRING	BREED POP (x1000)	COLONY SIZE (HA)	NESTS (x1000)	%SUCC. NESTS	CLUTCH SIZE	BROOD SIZE LV COLONY	BROOD SIZE LV ISLAND
1966								3.6		
1967								4.9		
1969				114.0	1962	58.2		3.7		
1970	150.0	120.0	20.0	120.0	2600	60.0	96.0	3.7	3.5	2.5
1971	132.0	120.0	9.1	24.0	825	12.0	55.0	4.7	3.4	2.3
1972	107.0	106.0	0.6	36.0	950	18.0	45.0	4.2	3.5	2.3
1973	86.0	85.9	0.0	12.0	200	6.0	67.0	6.0	3.9	
1974	70.0	69.5	0.7	32.0	800	15.0	0.0	4.7		
1975	56.0	56.0	0.0	56.0		28.0	74.4	3.8	3.4	2.4
1976	58.0	46.0	20.7	46.0	1840	23.0	79.0	3.7	3.2	2.8
1977	68.2	57.2	16.1	10.0	400	5.0	76.8	5.0	3.7	
1978	65.4	64.9	0.8	42.0	2200	21.0	80.0	4.2	3.7	2.4
1979	84.5	62.1	26.5	60.0	1860	30.0	90.0	3.8	3.6	
1980	90.7	80.3	11.5	20.0	315	10.0	70.0	5.4	3.3	
1981	89.0	86.2	3.2	78.0	2118	39.0	95.0	4.0	3.7	3.1
1982	100.0	81.0	18.5	28.0	688	14.0	65.0	4.1	3.2	2.8
1983	95.0	92.8	2.4	3.4	125	1.7	5.9	4.8		
1984	85.0	85.0	0.0	42.0	1500	21.0	83.3	3.7	3.2	2.1
1985	85.0	80.0	5.4	50.0	1457	25.0	87.7	3.7	3.2	2.4
1986	90.0	70.0	20.4	58.0	2100	29.0	90.0	3.9	3.6	3.2
1987	100.0	85.0	15.0	47.0	1900	23.5	80.0	3.7	3.4	2.8
1988	80.0	80.0	17.7	13.0	675	6.5	51.0	5.2	3.4	2.7
1989	70.0	70.0	1.4	60.0	1025	30.0	60.0	3.8	3.3	
1990	60.0	60.0	0.0	53.0	940	26.5	49.2	3.8	3.2	2.2
1991	60.0	56.0	6.6	41.6	888	20.8	82.0	4.1	3.4	2.7
1992	70.0	56.0	20.0	46.2	742	23.1	70.1	4.0	3.5	3.5
1993	65.0	64.5	0.8	52.2	910	26.1	85.1	3.9	3.2	
1994	70.0	52.5	25.0	30.0	1000	15.0	13.0	2.8	2.1	
1995	65.0	64.0	0.8	8.8	430	4.4	50.0	4.7	2.8	
1996	75.0	75.0	0.0	75.4	740	37.7	75.4		3.7	2.4
1997	85.0	70.0	15.0	55.2	628	22.6	71.2	4.0	3.5	
1998	90.0	80.0	10.0	31.8	750	15.9	66.0	4.6	3.5	
1999	90.0	85.0	5.6	20.8	278	10.4	75.0	4.7	3.3	
2000	95.0	87.4	8.0	49.6	738	24.8	87.8	3.5	3.2	2.8
2001	105.0	92.4	12.0	48.0	900	24.0	87.0	3.6	3.2	2.3
2002	110.0			60.6		30.3	81.5	4.0	3.5	
2003				55.0		27.5	77.5			
2004	117.5	105.0	4.9	56.8		28.4	75.0	3.6		
2005	117.5			95.8	900	47.9	82.3	4.2	3.7	

Table 3. Midwinter counts and harvest data for **Lesser Snow Geese** wintering in British Columbia, 1948-2005.

	British Columbia			Fraser-Skagit Estuaries		Fraser River Delta	
Fall Year	Estimated Harvest[1]	Hunter Effort[2]	Hunter Success[3]	Total Population[4]	Percent Juvenile[4]	Local Harvest[5]	% Juvenile[5]
1948	-	-	-	*29400*	34.9	-	-
1949	-	-	-	*18200*	10	-	-
1950	-	-	-	*16100*	5.5	-	-
1951	-	-	-	*25700*	34.6	-	-
1952	-	-	-	*17200*	25	-	-
1953	-	-	-	*22700*	14.6	-	-
1954	-	-	-	*19100*	18.8	-	-
1955	-	-	-	*15100*	22.7	-	-
1956	-	-	-	*20400*	-	-	-
1957	-	-	-	*27000*	33	-	-
1958	-	-	-	*14200*	2	-	-
1959	-	-	-	-	36	-	-
1960	-	-	-	*22200*	3.4	-	-
1961	-	-	-	-	25	-	-
1962	-	-	-	*23600*	0	-	-
1963	-	-	-	-	-	-	-
1964	-	-	-	*26100*	30.3	-	-
1965	-	-	-	-	0	-	-
1966	-	-	-	*20900*	35.4	-	-
1967	-	-	-	-	2.6	-	-
1968	-	-	-	-	0	-	-
1969	-	-	-	*31700*	25	-	-
1970	-	-	-	*36000*	25	-	-
1971	-	-	-	-	1	-	-
1972	-	-	-	*19000*	1	-	-
1973	-	-	-	*12500*	0	-	-
1974	-	-	-	*12400*	0	-	-
1975	2972	53.61	0.18	*16000*	37.8	-	-
1976	1102	137.10	0.06	*24900*	36.3	-	-
1977	576	284.58	0.03	*16100*	3.4	-	-
1978	401	399.02	0.02	*26900*	40	-	-
1979	1917	75.00	0.11	*39700*	36.4	-	-
1980	1725	86.06	0.10	*40500*	11	-	-
1981	3378	45.49	0.19	*43100*	49.5	-	-
1982	2666	57.07	0.15	*40900*	17	-	-
1983	0	-	-	*31600*	-	-	-
1984	2700	46.21	0.19	*40200*	16.3	-	-
1985	3972	27.14	0.32	*40500*	32	-	-
1986	0	-	-	*39600*	29	-	-
1987	2329	39.81	0.21	*55400*	30	-	-
1988	1556	53.74	0.17	*43700*	6	-	-
1989	926	74.33	0.10	*33800*	0	-	-
1990	137	506.25	0.02	*32100*	10	748	31.0
1991	2619	24.15	0.32	*39200*	28	1642	49.6
1992	467	133.15	0.06	*33300*	2	1246	24.6
1993	2094	27.62	0.30	*47000*	40	2232	66.6
1994	2174	18.21	0.46	*41900*	6	1838	20.4
1995	1589	28.12	0.25	*39600*	5	750	26.2
1996	2863	16.0	0.47	*45200*	23	1869	56.9
1997	0	-	-	*44,084*	14	1536	52.9
1998	1797	29.4	0.27	*45,944*	13.9	1351	49.7
1999	1990	23.9	0.33	*50,533*	15.6	1380	57.8
2000	2559	17.5	0.43	*56,270*	20.3	1893	56.3
2001	2354	16.3	0.46	*57,143*	21.1	1458	54.0
2002	2536	15.6	0.51	*73,138*	26.7	2230	59.7
2003	1897	16.9	0.47	*66,798*	12.8	2387	47.5
2004	1188	21.5	0.32	*68,141*	15.3	978	39.5
2005				***80,040***	**39.0**	3991	70.2
(1975-04) LTA	1,768.8	79.3	0.24	34,285 (48-04)	19.7 (48-04)	1,569	46.2
% Change 2005 *vs.* LTA.	- 32.8%	- 72.9%	33.3%	133%	98%	154.4%	51.9%
2005 vs. 04	- 37.4%	27.2%	- 31.9%	17%	155%	308.1%	77.7%

Table Notes: 1) Canadian Wildlife Service National Harvest Survey; 2) Hunter Effort = Hunter Days (from Table 7) / Estimated Harvest; 3) Hunter Success = Est. Harvest / Active Hunters (from Table 7); 4) Compiled by S. Boyd, CWS (Washington State Wildlife Service prior to 1987, CWS Aerial Surveys from 1987-1996, S. Boyd, unpubl. data); 5) CWS Harvest Questionnaire, includes estimated 20% cripple loss; 6) Preliminary Results for fall of 2000 season only.

Table 4. Historical productivity records for Pacific wintering Ross' geese, 1965 to present.

Year	Miscellaneous Areas				Saskatchewan				Sacramento Valley, CA			
	Ad	Juv	%Juv.	Yg/Fam	Ad.	Juv.	%Juv.	Yg/Fam	Ad.	Juv.	%Juv.	Yg/Fam
1965			27.1									
1966			53.2	2.9								
1967			25.4	2.6								
1968			32.4	2.6								
1969												
1970												
1971												
1972			0.4									
1973			45.1	2.7								
1974			13.7	1.8								
1975			41.5	2.7								
1976												
1977			38.5	2.3								
1978			4.1	1.6								
1979												
1980			24.0									
1981												
1982												
1983			23.0									
1984			35.6									
1985			20.0									
1986												
1987												
1988												
1989												
1990												
1991												
1992												
1993												
1994							26.0					
1995					4941	2040	29.2					
1996					459	446	46.9					
1997					4976	1539	23.6	0.33				
1998									197	76	27.8	
1999												
2000												
2001									1023	179	14.9	
2002									6371	1202	15.9	
2003									4274	844	16.5	2.65
2004									1991	304	13.2	
2005									1435	431	23.1	

Data on Ross' geese of the Western Central Flyway are included in the "Western Central Flyway Light Goose Productivity Surveys", section of this North American Productivity Report.

See individual Annual Winter Productivity Report narratives which credit participants with their respective data set for each area.

Table 5. Historical productivity records for Greater white-fronted geese in the Pacific Flyway 1961 to present.

Year	Population Indices* (thousands)	Misc. Areas Ad.	Misc. Areas Juv.	Misc. Areas %Juv.	Misc. Areas Yg/Fam	Klamath Basin, OR & CA Ad.	Klamath Basin, OR & CA Juv.	Klamath Basin, OR & CA %Juv.**	Klamath Basin, OR & CA Yg/Fam	Sacramento Valley, CA Ad.	Sacramento Valley, CA Juv.	Sacramento Valley, CA %Juv.	Sacramento Valley, CA Yg/Fam	Combined Productivity % Juv.
1961	193.3	2407	1383	36.5	2.27									
1962	127.7	3587	2289	38.9	2.52									
1963	171.8	5653	2401	29.8	2.27									
1964	99.9	8270	3834	31.7	2.29									
1965	69.3					11461	7303	38.9	2.6					
1966	67.0	2847	2045	41.8	2.5									
1967	185.6	3716	1682	31.2	2.49									
1968	70.9	2663	1826	40.7	2.39									
1969	114.2	3071	1821	37.2	2.35									
1970	206.7	2734	1073	28.2	2.21									
1971	106.3	2171	1314	37.7	2.37									
1972		2028	1483	42.2	2.07									
1973				38.6	2.47									
1974				28.6	1.81									
1975				41.2	1.9									
1976				49.9	2.48									
1977				39	2.01									
1978				37.7	2.02									
1979	73.1			38.4	1.82			22	2.32					
1980	93.5					7380	2620	26.2	2.18					
1981	116.5					29480	10520	26.3	1.9					
1982	91.7					3770	460	10.9	2	1465	383	20.7	1.9	13.9
1983	112.9			19.7	2.9			29				29		
1984	100.2							20.5	3.24			28		
1985	93.8			15.5				13.5,15.1	1.92			33		
1986	107.1							26.7,35	1.8			28-32	2.3	
1987	130.6											37		
1988	161.5											33-35		
1989	218.8	3300	1700	34.0								25		
1990	240.8									98	60	38.6		
1991	236.5									1079	531	33		
1992	230.9									7290	2835	28		
1993	295.1					3239	1137	26		2947	1146	28		27.0
1994	324.8					1127	264	19	1.38	1350	588	30.3		25.6
1995	277.5					587	263	31		1706	927	35.2		34.2
1996	344.1					1153	260	18.4	3.54	1967	411	17.3		17.7
1997	319.0					757	371	32.9	2.13	2085	384	15.6		21.0
1998	413.1					410	78	16.0	1					16.0
1999	393.9					1569	323	17.1						17.1
2000	353.6					383	67	14.9		360	81	18.4		16.6
2001	433.4					1478	287	16.3		2981	834	21.9		20.1
2002	358.5					1090	315	22.4		3418	511	13		15.5
2003	422.2									1575	206	11.6		11.6
2004	374.9					536	164	23.4		1096	536	32.8		30.0
2005						981	491	33.4		1936	899	31.7		32.3
Mean	208.9	3537.3	1904.3	35.2	2.3	4087.6	1557.7	23.4	2.1	2090.2	688.8	26.4	2.1	20.5
% change from mean						-76	-68.48	42.74146		-7.377	30.52	20.05		57.8
% change from 2004						83.022	199.39	42.73504		76.642	67.72	-3.35		7.7

*Population indices from Pacific Flyway Data Book (Trost, et al). Indices after 1998 are based on number of total indicated birds from breeding ground survey and calculated according to guidelines established in the Flyway management plan.

**For %Juv. columns with more than one estimate of productivity, sample sizes were not available.

See individual Annual Winter Productivity Report narratives which credit participants with their respective data set for each area.

Table 6. Historical productivity records for Tule greater white-fronted geese, 1964 to present.

Year	Miscellaneous Areas			Summer L.ake, OR			Klamath Basin, OR & CA			Sacramento Valley, CA				Combined Productivity
	Ad.	Juv.	%Juv.	Ad.	Juv.	%Juv.	Ad.	Juv.	%Juv.	Ad.	Juv.	%Juv.	Yg/Fam	% Juv.
1964										99	26	21.7	2	21.7
1965														
1966														
1967														
1968														
1969														
1970														
1971														
1972														
1973														
1974														
1975														
1976														
1977														
1978			35.4											
1979			28.9											
1980	1324	213	13.9							1653	847	33.8		26.3
1981	847	437	34							1449	851	37.0	1.85	35.9
1982	833	167	16.7										2.01	16.7
1983														
1984														
1985														
1986												18.0		18.0
1987												37.0		37.0
1988												28.0		28.0
1989												27.0		27.0
1990										863	234	21.4		21.4
1991										680	222	24.6		24.6
1992										546	128	19.0		19.0
1993										295	77	20.7		20.7
1994				183	101	35.6				182	94	34.0		34.8
1995										70	30	30.0		30.0
1996				293	181	38.2				529	136	20.5		27.8
1997				278	76	21.4				117	12	9.3		18.2
1998				528	109	17.1	427	98	18.6	69	11	13.7		17.6
1999				591	139	19				873	556	39.0		32.2
2000				807	233	22.4	1038	292	22.0	619	152	19.7		21.6
2001				294	105	26.3				384	78	16.9		21.3
2002	441	126	22.2	491	134	21.4	22	10	31.3	664	139	17.3		20.2
2003				629	154	19.7				450	123	21.5		20.4
2004				468	144	23.5				606	300	33.1		29.2
2005				498	104	17.3				1056	372	26.1		23.4
Mean	861.25	235.75	25.18	456.2	137.6	24.46	495.67	133.33	23.9667	563.78	223.1	24.7	1.9533	24.7
% change from mean				9.1626	-24.42	-29.27				87.308	66.73			5.7
%change from 2004				6.4103	-27.78	-26.38				74.257	24	-21.1		-19.8

Mean does not include current year.

See individual Annual Winter Productivity Report narratives which credit participants with their respective data set for each area.

Table 7. Historical productivity records for Tundra swans in the Pacific Flyway, 1961 - present.

Year	Population* Indices (thousands)	Miscellaneous Areas				Utah				Summer Lk., OR				Sacramento Valley, CA				Combined Productivity
		Ad.	Juv.	%Juv.	Yg/Fam	Ad.	Juv.	%Juv.	Yg/Fam	Ad.	Juv.	%Juv.	Yg/Fam	Ad.	Juv.	%Juv.	Yg/Fam	% Juv
1961	40.8			8.0	2.3													
1962	32.4			10.6	2.3													
1963	46.4			14.4	2.1	1595	745	31.8	2.2									
1964	40.5			13.9	1.9	1937	888	31.4	1.9									
1965	42.6			14.7	2.2	1165	903	43.7	2.6									
1966	34.8			8.5	2.2	5578	3466	38.3	2.3									
1967	48.9			25.0	2.5	5943	5697	48.9	2.9									
1968	35.6			21.3	2.6	12463	9288	42.7	2.8									
1969	74.9			34.3	2.7	20801	17445	45.6	3.2									
1970	31.0			19.5	2.4	29478	8088	21.5	2.4									
1971	98.9			20.6	2.3	6497	2587	28.5	2.3									
1972	82.8			15.3	2.1	5982	2160	26.5	2.2									
1973	33.9			34.9	2.6	5036	3654	42.0	2.3									
1974	69.8			18.0	2.3	10764	3066	22.2	2.3									
1975	54.9			19.6	2.5	2879	702	19.6	2.5									
1976	51.4			39.7	2.6	1947	811	29.4	2.6									
1977	47.3			23.8	2.4	3878	1214	23.8	2.4									
1978	45.6			8.2	2.3	5040	1685	25.1	2.3									
1979	53.5					9130	4654	33.8	2.6									
1980	65.2					9242	4710	33.8	2.3									
1981	83.6					14128	6552	31.7	2.1									
1982	91.3	250	87	25.8	2.5	4715	1905	28.8	2.2									
1983	67.3	252	119	32.1	2.5	14004	8602	38.1	2.9							20.0		
1984	61.9	237	41	14.7	2.3	1428	798	35.8	2.5							18.0		
1985	48.8	238	74	23.7	2.6	824	449	35.3	2.3							13.0		
1986	66.2	245	28	10.3	2.0	1144	977	46.1	2.4							25.0		
1987	52.8	223	68	23.4	2.3	538	399	42.6	2.6							27.0		
1988	59.2	624	131	17.4	2.2	1834	1318	41.8	2.4							22.0		
1989	78.7	8628	1438	14.3	2.2	1551	1048	40.3	2.4							11.0		
1990	40.1	5440	1236	22.2	2.8	4250	2610	38.0	2.6							19.1		
1991	47.6	821	283	25.6	2.7	2750	1770	39.2	2.6					616	89	12.7		33.8
1992	63.7	797	268	25.2	2.7	3250	1396	28.4	2.3					1386	304	18.0		26.6
1993	62.2	1410	414	22.7	2.6	2169	1079	33.2	2.5					13182	4393	25.0	2.4	26.0
1994	79.4	2116	470	18.2		3958	1979	33.3	2.4	6037	947	13.6		15254	3813	20.0	2.4	20.9
1995	52.9					7221	3955	35.4	2.3	2666	713	21.1	2.0	4358	1644	27.4		30.7
1996	98.1	492	42	7.9		8493	3559	29.5	1.9	1390	355	20.3	1.7	3695	1036	21.9	2.2	26.2
1997	122.5	570	119	17.3		110336	24968	18.5	2.4	4498	780	14.8	2.0					18.3
1998	70.0	1167	164	12.3		88631	14132	13.8	2.2	8333	737	8.1	1.9					13.3
1999	119.8	1221	103	7.8		68594	11814	14.7	2.2	8717	1305	13.0	2.2					14.4
2000	89.6					48098	3695	7.1	1.9	4704	585	11.1	1.8	2525	200	7.3	1.6	7.5
2001	87.3					26996	2174	7.5	2.0	6952	747	9.7	1.6	7431	706	8.7	1.4	8.1
2002	58.7					45069	9942	18.1	2.1	6371	1198	15.8	1.9	4736	997	17.4	1.8	17.8
2003	102.7					18517	6018	24.5	2.6	5485	1182	17.7	2.0	8681	2177	20.1	2.2	22.3
2004	83.0					13148	6109	31.7	2.9	3093	698	18.4	1.9	11061	2672	19.5	2.17	25.8
2005	92.1					6038	3412	36.1	2.1	1529	300	16.4	1.8	8798	1624	15.6	1.7	24.6
Mean	64.1	1455	299.1	19.2	2.4	15023.8	4500.3	31.0	2.4	5295.1	840.6	14.9	1.9	6629.5	1639	18.6	2.0	20.8
%change from mean						-59.8	-24.2	16.5	-13.3	-71.1	-64.3	10.2	-5.6	32.7	-0.9	-16.0	-16.3	18.1
% change from 2004						-54.1	-44.1	13.9	-27.9	-50.6	-57.0	-10.9	-7.2	-20.5	-39.2	-20.0	-21.7	-4.6

Mean does not include current year.

*Population indices are from Pacific Flyway Data Book (Trost, et al) and are conducted in January.

See individual annual Winter Productivity Report narratives which credits participants with their respective data set for each area.

Table 8. Age ratios and family group size of tundra swan flocks in northern Utah.										
	Grouped Birds			Family Associations			Combined Totals			
YEAR	ADULTS	JUV	% JUV	NO. FAM	JUV	JUV/FAM	ADULTS	JUV	% JUV	
1963	1397	527	27.4	99	218	2.2	1595	745	31.8	
1964	1193	171	12.5	372	717	1.93	1937	888	31.4	
1965	883	541	38.0	141	362	2.57	1165	903	43.7	
1966	4326	2002	31.6	626	1464	2.33	5578	3466	38.3	
1967	4753	3975	45.5	595	1722	2.89	5943	5697	48.9	
1968	10597	6679	38.7	933	2609	2.80	12463	9288	42.7	
1969	19527	15414	44.1	637	2031	3.19	20801	17445	45.6	
1970	28478	6907	19.5	500	1181	2.36	29478	8088	21.5	
1971	5465	1422	20.6	516	1165	2.26	6497	2587	28.5	
1972	5102	1193	19.0	440	967	2.20	5982	2160	26.5	
1973	3696	2105	36.3	670	1549	2.31	5036	3654	42.0	
1974	9610	1733	15.3	577	1333	2.31	10764	3066	22.2	
1975	2443	163	6.3	218	539	2.47	2879	702	19.6	
1976	1457	171	10.5	245	640	2.61	1947	811	29.4	
1977	2960	123	4.0	459	1091	2.38	3878	1214	23.8	
1978	3848	342	8.2	596	1343	2.25	5040	1685	25.1	
1979	7210	2198	23.4	960	2456	2.56	9130	4654	33.8	
1980	7868	3116	28.4	687	1594	2.32	9242	4710	33.8	
1981	11636	3917	25.2	1246	2635	2.11	14128	6552	31.7	
1982	4173	1305	23.8	271	600	2.21	4715	1905	28.8	
1983	12456	6373	33.8	774	2229	2.88	14004	8602	38.1	
1984	1298	639	33.0	65	159	2.45	1428	798	35.8	
1985	670	276	29.2	77	173	2.25	824	449	35.3	
1986	754	513	40.5	195	464	2.38	1144	977	46.1	
1987	402	224	35.8	68	175	2.57	538	399	42.6	
1988	1364	762	35.8	235	556	2.37	1834	1318	41.8	
1989	1263	696	35.5	144	352	2.44	1551	1048	40.3	
1990	3548	1708	32.5	351	902	2.57	4250	2610	38.0	
1991	2286	1176	34.0	232	594	2.56	2750	1770	39.2	
1992	3102	920	22.9	209	476	2.28	3520	1396	28.4	
1993	1809	630	25.8	180	449	2.49	2169	1079	33.2	
1993 Aeria	2380	598	20.1	143	381	2.66	2666	979	26.9	
1994	3434	1346	28.2	262	633	2.42	3958	1979	33.3	
1995	5655	2178	27.8	783	1777	2.27	7221	3955	35.4	
1996	7317	2434	25.0	588	1125	1.91	8493	3559	29.5	
1997	108626	22934	17.4	855	2034	2.38	110336	24968	18.5	
1998	87629	13033	12.9	501	1099	2.19	88631	14132	13.8	
1999	67388	10481	13.5	603	1333	2.21	68594	11814	14.7	
2000	47752	3371	6.6	173	324	1.87	48098	3695	7.1	
2001	26836	2012	7.0	80	162	2.03	26996	2174	7.5	
2002	43301	8115	15.8	884	1827	2.07	45069	9942	18.1	
2003	18103	5485	23.3	207	533	2.57	18517	6018	24.5	
2004	13072	6000	31.5	38	109	2.87	13148	6109	31.7	
2005	5198	2544	32.9	420	868	2.07	6038	3412	36.1	
2005 Aeria	11115	1493	11.8	530	988	1.86	11115	1493	11.8	
2007										
2008										

Table 8. Historical records for the Rocky Mountain Population of Trumpeter Swans, 1967 to Present.*

Year	Area	White birds	Cygnets	Total	% Juv.	Ave. Brood Size
1967	Tristate Survey	580	58	638	9.1	
1968	Tristate Survey	489	174	663	26.2	
1969						
1970						
1971	Tristate Survey	477	95	572	16.6	
1972						
1973						
1974	Tristate Survey	492	89	581	15.3	
1975						
1976						
1977	Tristate Survey	454	90	544	16.5	
1978						
1979						
1980	Tristate Survey	533	49	582	8.4	
1981						
1982						
1983	Tristate Survey	471	76	547	13.9	
1984	Tristate Survey	496	67	563	11.9	
1985	Tristate Survey	431	144	575	25.0	3.1
1986	Tristate Survey	365	87	452	19.2	2.7
1987	Tristate Survey	417	194	611	31.8	3.5
1988	Tristate Survey	513	146	659	22.2	2.9
1989	Tristate Survey	535	63	598	10.5	2.5
1990	Tristate Survey	468	158	626	25.2	3.0
1991	Tristate Survey	446	109	555	19.6	3.3
1992	RMP Survey**	465	98	563	17.4	3.5
1993	RMP Survey	303	51	354	14.4	2.2
1994	RMP Survey	302	152	454	33.5	2.2
1995	RMP Survey	365	62	427	14.5	
1996	RMP Survey	380	78	458	17.0	2.6
1997	RMP Survey	358	69	427	16.2	1.0
1998	RMP Survey	364	105	469	22.4	2.0
1999	RMP Survey	347	70	417	16.8	2.3
2000	RMP Survey	372	109	481	22.7	2.3
2001	RMP Survey	416	71	487	14.6	1.2
2002	RMP Survey	311	60	371	16.2	
2003	RMP Survey	321	96	417	23.0	
2004	RMP Survey	318	99	417	23.7	
2005	RMP Survey	404	106	510	20.8	

*As reported by Red Rock Lakes National Wildlife Refuge.
** Name changed to Trumpeter Swan Survey of the Rocky Mountain Population (RMP)/U.S. Flocks Fall 1992.
Note: It is the opinion of the author of table (see narrative) that a better method to assess annual productivity is to estimate the number of young produced per breeding pair because a proportion of white birds each year are subadults or adults that did not nest. However, this data is not collected as a part of the Fall survey.

TITLE:

Waterfowl Productivity Surveys for Alaska – 2005

SPECIES SURVEYED:

Pacific Brant (*Branta bernicla nigricans*)
Trumpeter Swan (*Cygnus buccinator*)
Emperor Goose (*Chen canagica*)
Dusky Canada Goose (*Branta canadensis occidentalis*)

CONTRIBUTORS:

U.S. Fish and Wildlife Service (USFWS)
- Arctic National Wildlife Refuge
- Innoko National Wildlife Refuge
- Izembek National Wildlife Refuge
- Kanuti National Wildlife Refuge
- Kenai National Wildlife Refuge
- Koyukuk/Nowitna National Wildlife Refuge Complex
- Migratory Bird Management, Anchorage
- Migratory Bird Management, Fairbanks
- Migratory Bird Management, Juneau
- Migratory Bird Management, Laurel, MD
- Migratory Bird Management, Mare Island, CA
- Migratory Bird Management, Soldotna
- Tetlin National Wildlife Refuge
- Yukon Flats National Wildlife Refuge

National Park Service
- Denali National Park and Preserve
- Gates of the Arctic National Park and Preserve
- Wrangell-St. Elias National Park and Preserve
- Yukon-Charley National Park and Preserve

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- Yakutat Ranger District

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Canadian Wildlife Service
University of Alaska Fairbanks
Yakutat Tlingit Tribe
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ABSTRACT:

Productivity surveys were conducted by several agencies and individuals during late summer, fall, and/or winter of 2005 and early 2006 to estimate juvenile-to-adult age ratios for Pacific brant (*Branta bernicla nigricans*), the Pacific Coast population of trumpeter swans (*Cygnus buccinator*), emperor geese (*Chen canagica*), and dusky Canada geese (*Branta canadensis occidentalis*). The results of these surveys appear in the tables of this report, along with short narratives in the Results section. No productivity data were reported for Cackling cackling geese (*Branta hutchinsii minima*) in 2005.

The following productivity measures were estimated for 2005:

Species	Type of Year	Productivity Estimate	% Change From 2004	% Change From Mean
Pacific Brant	**Above Average**			
Fall % Juv.		33.3%	+83%	+49%
Fall Juv./Fam.		2.89	+16%	+10%
Winter % Juv.		15.6%	+34%	+27%
Trumpeter Swan	**Above Average**			
Late Summer Brood Size		3.1	+3%	-3%
Late Summer % Juv.		27.2%	+30%	+7%
Late Summer % Prs. w/ Brd		33.9%	+10%	+6%
Winter % Juv.		20.8%	+22%	+12%
Winter Juv./Fam.		2.35	-6%	+2%
Emperor Goose	**Above Average**			
Fall % Juv.				
From ground counts		28.6%	+31%	+23%
From aerial photos		18.5%	+67%	+1%
Fall Juv./Fam.		2.79	+15%	+0%
Cackling Cackling Goose	**No Report**			
Dusky Canada Goose	**Below Average**			
Late Summer % Juv.		11.8%	-58%	-38%

METHODS:

Fall and winter productivity appraisals generally followed procedures developed by Lynch (1969) and outlined in the Standard Operating Procedures for Productivity Surveys of Geese, Swans and Brant (Draft) 1977. Additional survey methods included late-summer aerial surveys of trumpeter swans (King 1973) and dusky Canada geese (Petrula 2005), analysis of aerial photographs of emperor geese (Anderson et al. 2006), and ocular sightings from the ground (e.g. Audubon Christmas Bird Counts).

RESULTS:

Pacific Brant:

Fall Productivity: Table 1.

Kristine Sowl of Izembek National Wildlife Refuge (NWR) reported that 33.3% juveniles were estimated from a sample of 25,361 brant during ground surveys conducted at Izembek Lagoon, Alaska in September and October. She also estimated a mean of 2.89 juveniles per family group from a sample of 89 families. The proportion of juveniles was 83% higher than 2004 and 49% above the 42-year mean. The mean family group size was 16% higher than 2004 and 10% above the 39-year mean.

Winter Productivity: Table 2.

Russ Canniff collected data from Padilla and Samish Bays, WA on 20 January 2006. He estimated 18.5% juveniles from a sample of 119 brant. He also reported a mean of 2.08 juveniles per family group from a sample of 12 families. He noted that nearly all (97%) of the brant he observed were the gray-bellied variety from the western high arctic population.

Dave Pitkin of Oregon Coast NWR Complex reported that 67 brant were aged in Netarts Bay, Oregon in 2006. From that sample, 7, or 10.4%, were juveniles.

Combining data from both winter survey areas resulted in an estimate of 15.6% juveniles from a sample of 186 brant. This was 34% higher than 2004 and 27% above the 21-year mean.

In summary, Pacific brant experienced above-average production in 2005.

Trumpeter Swan:

Late-Summer Productivity: Tables 3 and 4.

A complete aerial census of trumpeter swans in Alaska was conducted 20 July – 8 September by USFWS and other cooperating agencies. Results indicated a mean brood size of 3.1 (n=2,084 broods), 27.2% juveniles in the population (n=23,692 total swans), and 33.9% pairs with brood (n=5,970 pairs) (Table 3). The mean brood size was 3% higher than 2004 but was 3% below the 29-year mean (Table 4). The proportion of juveniles was 30% higher than 2004 and 7% above the mean. The percentage of pairs with a brood was 10% higher than 2004 and 6% above the mean.

Winter Productivity: Table 5.

In Alaska, Nate Catterson of USFS, Yakutat Ranger District, reported that 15.2% juveniles were observed from a total of 646 swans during an aerial population survey of the Yakutat Forelands on 2 March 2006.

On Vancouver Island, British Columbia, Graeme Fowler reported the results of swan surveys conducted from November 2005 through February 2006 by the Comox Valley Naturalists Society. The mean % juvenile was 20.0% (n = 419) in November, 21.0% (n = 1,814) in December, 20.5% (n = 2,323) in January, and 21.0% (n = 2,305) in February. Note that only the February figure was included in Table 5.

This year CWS conducted a winter swan survey of southwestern British Columbia, including all of Vancouver Island and the Fraser Valley between Hope and the Fraser River delta. The survey was conducted on 19 January in the Fraser Valley and 8-10 February on Vancouver Island. Sean Boyd reported that of 7570 total swans recorded, 25.1% were identified as juveniles. Note that to maintain consistency in the report table these results are not included in Table 5.

In northwest Washington, Russ Canniff recorded age ratios for trumpeter swans in Skagit Valley and Port Susan in February 2006. He found that 21.6% were juveniles from a sample of 3,519 swans. He also collected data on family group size from November 2005 through February 2006 and found a mean of 2.35 juveniles per family group from a sample of 28 families.

Data from all winter survey areas combined (excluding the CWS survey) resulted in an estimate of 20.8% juveniles from a sample of 6,470 swans. This was 22% higher than 2004 and 12% above the 28-year mean. The mean family group size was 2.35 from a sample of 28 families. This was 6% lower than 2004 but 2% above the 23-year mean.

In summary, trumpeter swans experienced above-average production in 2005.

Emperor Goose: Tables 6 and 7.

Kristine Sowl reported that 28.6% juveniles were estimated from a sample of 3,983 emperor geese during ground surveys conducted at Izembek Lagoon, Alaska in September and October (Table 6). She also estimated a mean of 2.79 juveniles per family group from a sample of 131 families. The proportion of juveniles was 31% higher than 2004 and 23% above the 38-year mean. The mean family group size was 15% higher than 2004 and equal to the mean.

Paul Anderson and Bob Stehn of USFWS, Migratory Bird Management Anchorage reported the results of aerial photo work on the Alaska Peninsula conducted in late September. They estimated the proportions of juveniles in seven major lagoons from aerial photos and then weighted the proportions by the population counts of those lagoons from an independent aerial population survey. The result was a weighted-mean estimate of 18.5% juveniles for the 2005 fall population, 67% higher than 2004 and 1% above the 20-year mean (Table 7).

In summary, emperor geese experienced above-average production in 2005.

Cackling Cackling Goose: No Report.

Dusky Canada Goose: Table 8.

Tom Rothe of the Alaska Department of Fish and Game reported the results of an aerial production survey that was flown over the west Copper River Delta on 17 July. Of a total count of 5,364 geese, 11.8% were identified as juveniles. The proportion of juveniles was 58% lower than 2004 and 38% below the 34-year mean.

In summary, dusky Canada geese experienced below-average production in 2005.

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James Wynbrandt – New York, New York

Table 1. Historical fall productivity records for Pacific brant at Izembek Lagoon, AK, 1963-2005. [a]

	Grouped Birds			Family Associations		
Year	Adults	Juveniles	% Juv.	Families	Juveniles	Juv./Family
1963	3968	1243	23.9			
1964	13324	4577	25.6			
1965	21210	5050	19.2			
1966	9927	7134	41.8	195	557	2.86
1967	15219	3081	16.8	359	926	2.58
1968	15110	3117	17.1	145	377	2.60
1969	12829	3577	21.8	293	780	2.66
1970	12104	6256	34.1	148	476	3.22
1971	4820	1953	28.8	295	716	2.43
1972	6599	3698	35.9	153	416	2.72
1973	12025	4999	29.4	327	938	2.87
1974	13118	632	4.6	105	239	2.28
1975	9396	5452	36.7	189	543	2.87
1976	7962	4340	35.3	237	674	2.84
1977	8856	4092	31.6	240	603	2.51
1978	10696	1842	14.7	110	326	2.96
1979	13674	2349	14.7	146	361	2.47
1980	9618	3341	25.8	177	489	2.76
1981	4109	936	18.6	154	431	2.80
1982	11509	1213	9.5	89	237	2.66
1983	6149	1947	24.0	173	515	2.98
1984	9451	1499	13.7	192	564	2.94
1985	12032	1915	13.7	624	1538	2.46
1986	15621	2823	15.3	137	352	2.57
1987	17411	7882	31.2	948	2587	2.73
1988	16138	3847	19.2	263	633	2.41
1989	13654	4281	23.9	303	914	3.02
1990	24215	5750	19.2	349	894	2.56
1991	31432	12127	27.8	415	1066	2.57
1992	55795	11044	16.5	404	1127	2.79
1993	103254	31942	23.6	979	2727	2.79
1994	21371	2808	11.6	353	735	2.08
1995	26964	15240	36.1	78	218	2.79
1996	15148	4201	21.7	50	152	3.04
1997	15216	3105	16.9	40	106	2.65
1998	8214	2836	25.7	220	488	2.22
1999	12500	3450	21.6	111	254	2.29
2000	6669	2982	30.9	91	202	2.22
2001	14829	1198	7.5	68	167	2.46
2002	18441	4751	20.5	92	222	2.41
2003	27517	4371	13.7	197	446	2.26
2004	19715	4384	18.2	129	322	2.50
2005	16906	8455	33.3	89	257	2.89
Mean[b]			22.3			2.64
% Change from:						
2004			83%			16%
Mean			49%			10%

[a] Data supplied by Izembek National Wildlife Refuge and USGS Alaska Science Center.

[b] Mean excludes 2005.

Table 2. Historical winter productivity records for brant in the Pacific Flyway, 1983-2005.

	Padilla/Samish Bays, WA[b]			Willapa Bay, WA[c]			Olympic Peninsula, WA[d]			Oregon Coast[e]			Combined Productivity
Year[a]	Ad.	Juv.	% Juv.	Ad.	Juv.	% Juv.	Ad.	Juv.	% Juv.	Ad.	Juv.	% Juv.	% Juv.
1983				982	166	14.5							14.5
1984				2605	251	8.8							8.8
1985													
1986	3731	292	7.3	1925	186	8.8	217	11	4.8				7.7
1987	3110	1242	28.5	997	196	16.4	1540	306	16.6				23.6
1988	2003	297	12.9	1167	184	13.6	1544	311	16.8				14.4
1989	4928	622	11.2	982	88	8.2	2231	232	9.4				10.4
1990	3047	837	21.5				2013	88	4.2				15.5
1991	2464	336	12.0	1189	126	9.6	913	123	11.9				11.4
1992	6294	669	9.6	944	88	8.5	839	46	5.2				9.0
1993	3032	1074	26.2				1299	265	16.9				23.6
1994	3771	197	5.0	937	97	9.4	1034	26	2.5				5.3
1995	1083	185	14.6				634	15	2.3				10.4
1996	1964	530	21.3	70	12	14.6	793	20	2.5				16.6
1997	1660	189	10.2				779	50	6.0				8.9
1998	2573	466	15.3	125	19	13.2							15.2
1999	1199	349	22.5				386	29	7.0				19.3
2000	877	337	27.8	1818	183	9.1	430	32	6.9				15.0
2001	1089	11	1.0				361	24	6.2				2.4
2002							368	28	7.1				7.1
2003	752	48	6.0				551	25	4.3	476	51	9.7	6.5
2004	647	85	11.6										11.6
2005	97	22	18.5							60	7	10.4	15.6
Mean[f]			14.7			11.2			7.9			9.7	12.2
% Change from:													
2004			59%			N/A			N/A			N/A	34%
Mean			26%			N/A			N/A			7%	27%

[a] Surveys conducted some time between November of the stated year and February of the next year.

[b] Data supplied by Russ Canniff and Washington Department of Wildlife. A high proportion of these birds are the "gray-bellied" variety.

[c] Data supplied by Willapa National Wildlife Refuge and Washington Department of Wildlife.

[d] Data supplied by Washington Maritime National Wildlife Refuge Complex.

[e] Data supplied by Oregon Coast National Wildlife Refuge Complex.

[f] Mean excludes 2005.

Table 3. Results of late-summer 2005 complete census of trumpeter swans in Alaska.[a]

Area	Number of 1:63,360 Maps Surveyed	Date(s) Surveyed	Adults and Subadults: In Pairs	Adults and Subadults: As Singles	Adults and Subadults: In Flocks	Adults and Subadults: Subtotal	Cygnets	Total Swans	Broods	Mean Brood Size	% Juv.	% Pairs w/ Brood
Gulf Coast	44	8/1-9/1	800	85	474	1359	459	1818	141	3.3	25.2	34.5
Copper Canyon	8	8/6	56	3	33	92	24	116	7	3.4	20.7	21.4
Gulkana	81	8/2-8/25	2440	252	510	3202	1228	4430	393	3.1	27.7	31.1
Kenai	23	8/16-8/22	282	20	91	393	172	565	52	3.3	30.4	36.2
Cook Inlet	97	8/3-8/27	1470	196	310	1976	694	2670	216	3.2	26.0	28.4
Lower Tanana	128	8/2-8/31	3054	305	1040	4399	1786	6185	607	2.9	28.9	38.7
Kuskokwim	89	8/8-9/8	1016	69	338	1423	535	1958	186	2.9	27.3	35.4
Koyukuk	81	8/2-9/4	950	104	467	1521	460	1981	163	2.8	23.2	33.1
Yukon Flats	142	8/5-9/8	632	40	374	1046	324	1370	103	3.1	23.6	32.0
S.E. Mainland	21	7/20-7/29	76	10	56	142	70	212	22	3.2	33.0	50.0
Upper Tanana	66	8/11-8/31	1164	73	455	1692	695	2387	194	3.6	29.1	33.0
Total	780		11940	1157	4148	17245	6447	23692	2084	3.1	27.2	33.9

[a] Data supplied by USFWS Migratory Bird Management in Juneau, Anchorage, Soldotna, Fairbanks, and Region 9, Arctic NWR, Kanuti NWR, Koyukuk/Nowitna NWR, Tetlin NWR, Yukon Flats NWR, Denali N.P., Gates of the Arctic N.P., Wrangell-St. Elias N.P., Yukon-Charley N.P., USFS Cordova Ranger District, and USFS Yakutat Ranger District.

Table 4. Historical late-summer productivity records for trumpeter swans in Alaska, 1968-2005.[a]

Year	Number of 1:63,360 Maps Surveyed	Adults and Subadults: In Pairs	Adults and Subadults: As Singles	Adults and Subadults: In Flocks	Adults and Subadults: Subtotal	Cygnets	Total Swans	Broods	Mean Brood Size	% Juv.	% Pairs w/ Brood
1968	181	1320	108	496	1924	923	2847	257	3.6	32.4	35.4
1975	285	2102	151	740	2993	1177	4170	378	3.1	28.2	35.4
1978	13	284	36	130	450	116	566	37	3.1	20.5	26.1
1979	13	264	26	229	519	164	683	46	3.6	24.0	32.6
1980	297	3324	169	1766	5259	2437	7696	683	3.6	31.7	40.3
1981	19	632	23	673	1328	547	1875	136	4.0	29.2	41.5
1982	36	1164	97	443	1704	421	2125	138	3.1	19.8	23.4
1983	46	1260	69	488	1817	903	2720	230	3.9	33.2	35.7
1984	43	1358	125	780	2263	755	3018	230	3.3	25.0	33.1
1985	425	5120	449	2204	7773	1686	9459	588	2.9	17.8	22.6
1986	113	2560	184	678	3422	1349	4771	438	3.1	28.3	33.3
1987	73	1640	108	760	2508	1030	3538	294	3.5	29.1	35.7
1988	54	1610	103	1203	2916	1087	4003	322	3.4	27.2	39.1
1989	63	1150	105	295	1550	488	2038	158	3.1	23.9	26.8
1990	625	7056	647	2039	9742	3595	13337	1124	3.2	27.0	31.2
1991	61	1968	123	936	3027	923	3950	322	2.9	23.4	32.1
1992	80	1592	119	819	2530	825	3355	270	3.1	24.6	32.9
1993	76	1766	127	663	2556	1080	3636	341	3.2	29.7	37.0
1994	69	1982	128	1094	3204	1196	4400	374	3.2	27.2	37.2
1995	674	7946	859	3184	11989	3834	15823	1218	3.1	24.2	30.1
1996	50	1624	116	1042	2782	814	3596	256	3.2	22.6	30.5
1997	46	1212	72	566	1850	584	2434	189	3.1	24.0	30.5
1998	51	1702	104	740	2546	976	3522	281	3.5	27.7	32.4
1999	27	508	36	212	756	228	984	71	3.2	23.2	26.0
2000	733	9986	899	3049	13934	3223	17157	1149	2.8	18.8	22.4
2001	22	1164	66	491	1721	531	2252	168	3.2	23.6	28.0
2002	35	1118	111	521	1750	488	2238	165	3.0	21.8	28.3
2003	55	2066	206	844	3116	1212	4328	407	3.0	28.0	37.5
2004	39	1086	118	792	1996	529	2525	177	3.0	21.0	30.8
2005	780	11940	1157	4148	17245	6447	23692	2084	3.1	27.2	33.9
Mean[b]									3.2	25.4	32.0
% Change from:											
2004									3%	30%	10%
Mean									-3%	7%	6%

[a] Complete statewide censuses were conducted in 1968, 1975, 1980, 1985, 1990, 1995, 2000, and 2005 (shaded in gray). In other years, surveys were conducted by various agencies to meet local objectives.

[b] Mean excludes 2005.

Table 5. Historical winter productivity records for trumpeter swans in the Pacific Flyway, 1977-2005.

	Alaska[b]					SE Vancouver Island, BC[c]			Skagit Valley/Port Susan, WA[d]					Combined Productivity
Year[a]	Ad.	Juv.	% Juv.	No. Fam.	Juv./Fam.	Ad.	Juv.	% Juv.	Ad.	Juv.	% Juv.	No. Fam.	Juv./Fam.	% Juv.
1977									214	70	24.6			24.6
1978						384	134	25.9	218	76	25.9			25.9
1979	431	129	23.0	15	2.60	459	158	25.6	273	82	23.1			24.1
1980	167	65	28.0	27	2.41	499	211	29.7	310	127	29.1	45	2.82	29.2
1981									316	92	22.5	41	2.24	22.5
1982	110	35	24.1	14	2.50				339	56	14.2	24	2.33	16.9
1983	115	29	20.1	4	1.50	533	113	17.5	330	94	22.2	39	2.41	19.4
1984	109	79	42.0	5	2.40	1101	216	16.4	359	62	14.7	29	2.14	18.5
1985	95	14	12.8	1	2.00	1336	98	6.8	340	44	11.5	22	2.00	8.1
1986	146	40	21.5	7	1.29	1228	280	18.6	356	113	24.1	49	2.31	20.0
1987	146	52	26.3	20	2.60	1081	334	23.6	347	133	27.7	49	2.71	24.8
1988	164	52	24.1			1353	304	18.3	473	111	19.0	48	2.31	19.0
1989	239	55	18.7			1209	194	13.8	568	128	18.4			15.8
1990	266	57	17.6	14	2.21	1553	295	16.0	678	111	14.1			15.6
1991	696	267	27.7	21	2.67	1049	165	13.6	810	155	16.1	64	2.42	18.7
1992	578	169	22.6	19	2.53	1639	149	8.3	905	94	9.4	45	2.09	11.7
1993	667	322	32.6	30	2.70	1801	530	22.7	762	233	23.4	167	2.40	25.1
1994	562	190	25.3	15	3.27	1543	536	25.8	927	242	20.7	112	2.41	24.2
1995	294	61	17.2			1427	398	21.8	1187	239	16.8	83	2.46	19.4
1996						1307	195	13.0	1774	312	15.0	93	2.31	14.1
1997						1540	272	15.0	1569	249	13.7	102	2.23	14.4
1998	272	35	11.4			1427	286	16.7	2180	381	14.9	76	2.34	15.3
1999	338	59	14.9			1380	198	12.5	2384	336	12.4	67	2.03	12.6
2000	585	118	16.8			1612	275	14.6	2256	355	13.6	84	2.04	14.4
2001	191	79	29.3			1763	204	10.4	1936	366	15.9	53	2.19	14.3
2002	76	17	18.3			1659	263	13.7	2256	521	18.8	149	2.31	16.7
2003	580	151	20.7			1479	339	18.6	4158	912	18.0	210	2.19	18.4
2004	508	84	14.2			1886	377	16.7	3301	706	17.6	106	2.50	17.0
2005	548	98	15.2			1820	485	21.0	2758	761	21.6	28	2.35	20.8
Mean[e]			22.1		2.36			17.4			18.5		2.31	18.6
% Change from:														
2004			7%		N/A			26%			23%		-6%	22%
Mean			-31%		N/A			21%			17%		2%	12%

[a] Surveys conducted between November of the given year and February of the next year.

[b] Data supplied by AK Dept. of Fish and Game, USFS Cordova and Yakutat, AK, USFWS Region 7 Migratory Bird Management, Peter Walsh, and Paul Meyers.

[c] Data supplied by British Columbia Ministry of Environment, Land, and Parks, Comox Valley Naturalists Society, and Graeme Fowler.

[d] Data supplied by Russ Canniff.

[e] Mean excludes 2005.

Table 6. Historical fall productivity records (from ground counts) for emperor geese at Izembek Lagoon, AK, 1966-2005.[a]

	Grouped Birds			Family Associations[b]		
Year	Adults	Juveniles	% Juv.	Families	Juveniles	Juv./Family
1966	699	265	27.5	132	331	2.51
1967	1457	585	28.6	66	215	3.26
1968	1195	585	32.9	40	112	2.80
1969	4149	2980	41.8	161	530	3.29
1970	9722	4933	33.7	383	1115	2.91
1971	8142	3458	29.8	484	1318	2.72
1972	4680	2270	32.7	210	641	3.05
1973						
1974	2025	377	15.7	50	130	2.60
1975	744	405	35.2	51	149	2.92
1976	1923	324	14.4	207	567	2.74
1977	996	683	40.7	108	302	2.80
1978	1395	495	26.2	62	188	3.03
1979	841	113	11.8	117	329	2.81
1980	1446	454	23.9	40	93	2.33
1981	1527	747	32.8	235	750	3.19
1982	1653	140	7.8	32	85	2.66
1983	1326	543	29.1	192	612	3.19
1984	2753	795	22.4	80	230	2.88
1985	2245	503	18.3	125	354	2.83
1986	3283	1381	29.6	266	794	2.98
1987	1706	808	32.1	305	993	3.26
1988	3884	1242	24.2	200	616	3.08
1989	3811	1136	23.0	145	455	3.14
1990	4002	1068	21.1	97	309	3.19
1991	8599	2882	25.1	147	480	3.27
1992	9291	1347	12.7	151	451	2.99
1993	13976	2176	13.5	161	441	2.74
1994	4658	792	14.5	301	702	2.33
1995	6434	1618	20.1	99	319	3.22
1996	3128	631	16.8	125	330	2.64
1997	1345	144	9.7	43	114	2.65
1998	1595	432	21.3	97	239	2.46
1999	2395	527	18.0	82	200	2.44
2000	1870	410	18.0	93	192	2.06
2001	1232	228	15.6	42	103	2.45
2002	4789	1842	27.8	260	696	2.68
2003	5744	785	12.0	218	439	2.01
2004	4600	1288	21.9	235	568	2.42
2005	2844	1139	28.6	131	365	2.79
Mean[c]			23.2			2.80
% Change from:						
2004			31%			15%
Mean			23%			0%

[a] Data supplied by Izembek National Wildlife Refuge, USGS Alaska Science Center, and USFWS Region 7 Migratory Bird Management.

[b] 1979, 1981, and 1987 data include Izembek Lagoon and Alaska Peninsula; 1984-1995 data include Izembek Lagoon and Nelson Lagoon.

[c] Mean excludes 2005.

Table 7. Historical fall productivity records (from aerial photos) for emperor geese on the Alaska Peninsula, 1985-2005.[a]

Year	No. Photos	No. Birds Aged in Photos	% Juvenile[b]
1985	155	3193	16.5
1986	311	6380	25.4
1987	703	10177	22.8
1988	483	11180	24.4
1989	390	12718	21.9
1990	474	13541	24.1
1991	412	14569	23.2
1992	403	14832	15.5
1993	255	5735	24.2
1994	479	16881	22.8
1995	361	11664	25.5
1996	182	10793	17.8
1997	205	11138	11.1
1998	336	16544	11.8
1999	392	13489	17.8
2000	263	7748	11.2
2001	365	11186	11.5
2002	402	6458	17.8
2003	421	8686	9.3
2004	370	6237	11.1
2005	500	6563	18.5
Mean[c]			18.3
% Change from:			
2004			67%
Mean			1%

[a] Data supplied by USFWS Migratory Bird Management, Anchorage and Fairbanks, AK.

[b] Mean of % juvenile in each of 7 lagoons from photo samples, weighted by the population counts of those lagoons from an independent aerial survey.

[c] Mean excludes 2005.

Table 8. Historical productivity data for dusky Canada geese on the Copper River Delta, AK, from July aerial surveys, 1971-2005.[a]

Year	% Juvenile	No. Geese Sampled
1971	16.2	5717
1972	10.6	8193
1973	36.0	5873
1974	51.4	8199
1975	17.9	8990
1976	24.2	7092
1977	44.3	----
1978	24.8	----
1979	16.0	12700
1980	23.7	7500
1981	17.9	8740
1982	23.7	8473
1983	15.0	7740
1984	18.3	11913
1985	3.7	13780
1986	10.7	13309
1987	9.8	12448
1988	22.5	6917
1989	8.6	6114
1990	23.5	5530
1991	21.5	7098
1992	23.1	7633
1993	5.0	4542
1994	5.7	6977
1995	3.9	5818
1996	21.7	6329
1997	10.5	6253
1998	11.7	4919
1999	14.7	4156
2000	24.1	4397
2001	25.4	3165
2002	30.5	3708
2003	7.2	5929
2004	27.8	5678
2005	11.8	5364
Mean[b]	19.2	
% Change from:		
2004	-58%	
Mean	-38%	

[a] Data supplied by Alaska Department of Fish and Game.

[b] Mean excludes 2005.