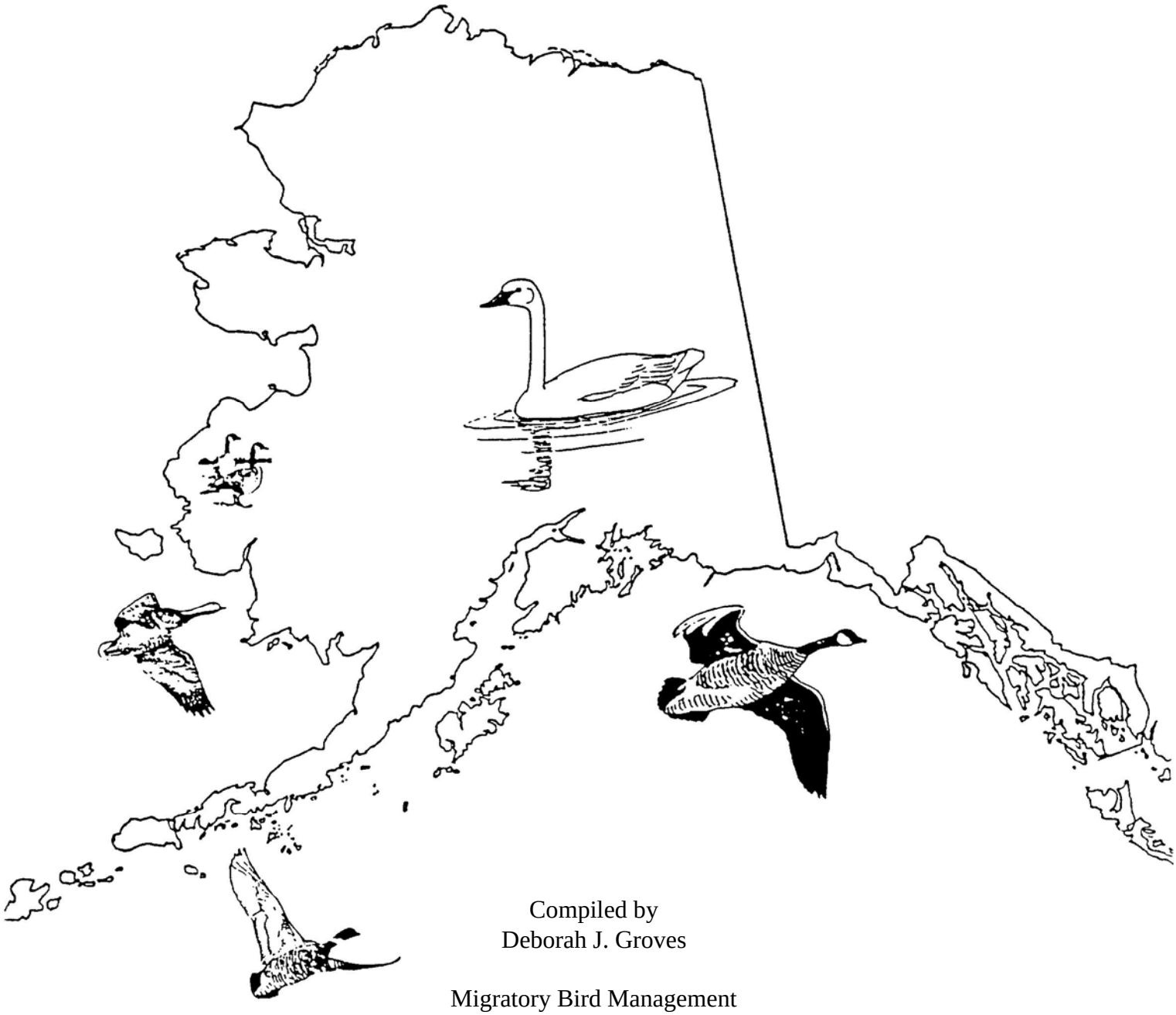
ALASKA PRODUCTIVITY SURVEYS OF GEESE, SWANS, AND BRANT 2009



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TITLE:

Waterfowl Productivity Surveys for Alaska – 2009

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)
- Izembek National Wildlife Refuge
- Koyukuk/Nowitna National Wildlife Refuge Complex
- Migratory Bird Management, Anchorage
- Migratory Bird Management, Fairbanks
- Migratory Bird Management, Juneau

U.S. Forest Service
- Cordova Ranger District

U.S. Army
- Fort Wainwright

Alaska Department of Fish and Game
- Division of Wildlife Conservation, Statewide Waterfowl Program

Comox Valley Naturalists Society – British Columbia
Graeme Fowler – British Columbia
Russ Canniff – Washington

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ABSTRACT:

Productivity surveys were conducted by several agencies and individuals during late summer, fall, and/or winter of 2009 and early 2010 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 Canada geese (*Branta canadensis minima*) in 2009.

The following productivity measures were estimated for 2009:

Species	Type of Year	Productivity Estimate	% Change From 2008	% Change From Mean
Pacific Brant	**Average**			
Fall % Juv.		26.8%	+77%	+19%
Fall Juv./Fam.		2.27	-10%	-14%
Winter % Juv.		---	---	---
Trumpeter Swan	**Below Average**			
Late Summer Brood Size		2.8	-7%	-13%
Late Summer % Juv.		22.0%	-1%	-13%
Late Summer % Prs. w/ Brd		32.1%	+14%	0%
Winter % Juv.		12.9%	+10%	-29%
Winter Juv./Fam.		2.29	-1%	-1%
Emperor Goose	**Average?**			
Fall % Juv.				
From ground counts		26.0%	0%	+10%
From aerial photos		15.7%	-37%	-18%
Fall Juv./Fam.		2.30	-16%	-17%
Cackling Canada Goose	**No Report**			
Dusky Canada Goose	**Above Average**			
Summer % Juv.				
Copper River Delta		36.9%	-22%	+86%
Middleton Island		---	---	---

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 2009), analysis of aerial photographs of emperor geese (Dau et al. 2006), and ocular sightings from the ground (e.g. Audubon Christmas Bird Counts).

RESULTS:

Pacific Brant:

Fall Productivity: Table 1.

Lucretia Fairchild of Izembek National Wildlife Refuge (NWR) reported that 26.8% juveniles were estimated from a sample of 59,440 brant during ground surveys conducted at Izembek NWR, Alaska in September and October (Dau 2009). She also reported an estimated mean of 2.27 juveniles per family group from a sample of 266 families. The proportion of juveniles was 77% above the 2008 estimate and 19% above the 46-year mean. The mean family group size was 10% below the 2008 estimate and 14% below the 43-year mean.

Winter Productivity: Table 2.

No winter productivity data were reported in 2009.

Summary: Pacific brant experienced average production in 2009.

Trumpeter Swan:

Late-Summer Productivity: Tables 3 and 4.

Late-summer productivity surveys were conducted in Alaska between 6 August and 1 September by Koyukuk/Nowitna NWR Complex, U.S. Army at Fort Wainwright, and USFWS Region 7 Migratory Bird Management. All surveys were flown using methods described by King (1973), with modifications that allowed capture of observation locations directly from a global positioning system unit. In 2009 36¼ 1:63,360-scale topographic maps were surveyed. Combining the results from all areas yielded a mean brood size of 2.8 (n=329 broods), 22.0% juveniles in the population (n=4,240 total swans), and 32.1% pairs with a brood (n=1,015 pairs) (Table 3). The mean brood size was 7% lower than in 2008 and was 13% below the 33-year mean (Table 4). The proportion of juveniles was 1% lower than in 2008 and 13% below the mean. The percentage of pairs with a brood was 14% higher than in 2008 and equal to the mean.

Winter Productivity: Table 5.

On Vancouver Island, British Columbia, Graeme Fowler reported the results of swan surveys conducted from November 2009 through February 2010 by the Comox Valley Naturalists Society. The mean percent juvenile was 20.2% (n = 538) in November, 17.3% (n = 1,807) in

December, 14.3% (n = 2,062) in January, and 15.5% (n = 1,843) in February. Note that only the February figure was included in Table 5.

In northwest Washington, Russ Canniff recorded age ratios for trumpeter swans in Skagit Valley and Port Susan in February 2010. He found that 11.9% were juveniles from a sample of 4,665 swans. He also collected data on family group size from November 2009 through February 2010 and found a mean of 2.29 juveniles per family group from a sample of 72 families.

Data from all winter survey areas combined resulted in an estimate of 12.9% juveniles from a sample of 6,508 swans. This was 10% above the 2008 estimate and 29% below the 32-year mean. The mean family group size was 2.29 from a sample of 72 families. This was 1% below the 2008 estimate and 1% below the 27-year mean.

Summary: Trumpeter swans experienced below-average production in 2009.

Emperor Goose: Tables 6 and 7.

Lucretia Fairchild reported that 26.0% juveniles were estimated from a sample of 2,857 emperor geese during ground surveys conducted at Izembek NWR, Alaska in September and October (Table 6) (Fairchild 2009). She also reported an estimated mean of 2.30 juveniles per family group from a sample of 148 families. The proportion of juveniles was equal to the 2008 estimate and 10% above the 42-year mean. The mean family group size was 16% lower than in 2008 and 17% below the 42-year mean.

Bob Stehn of USFWS, Migratory Bird Management Anchorage reported the results of aerial photo work on the Alaska Peninsula conducted in late September. He 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 15.7% juveniles for the 2009 fall population, 37% lower than in 2008 and 18% below the 24-year mean (Table 7).

Summary: Differences in results from the surveys reported preclude an unequivocal determination of productivity in 2009. Perhaps emperor geese experienced average or slightly below-average production in 2009.

Cackling Canada Goose: No Report.

Dusky Canada Goose: Table 8.

Dan Rosenberg 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 15 July (Petrula 2009). Of a total count of 7,017 geese, 36.9% were identified as juveniles. The proportion of juveniles was 22% below the 2008 estimate and 86% above the 38-year mean.

Summary: Dusky Canada geese experienced above-average production in 2009.

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    Graeme Fowler – Comox, British Columbia
    Russ Canniff – Snohomish, Washington

Table 1. Historical fall productivity records for Pacific brant at Izembek Lagoon, AK, 1963-2009.[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
2006	26684	6798	20.3	222	583	2.63
2007	22450	8819	28.2	208	526	2.53
2008	39169	6971	15.1	214	542	2.53
2009	43517	15923	26.8	266	604	2.27
Mean[b]			22.5			2.64
% Change from:						
2008			77%			-10%
Mean			19%			-14%

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

[b] Mean excludes 2009.

Table 2. Historical winter productivity records for brant in the Pacific Flyway, 1983-2009.

Year[a]	Birch/Oak Bays, WA[b]			Padilla/Samish Bays, WA[b]			Willapa Bay, WA[c]			Olympic Peninsula, WA[d]			Oregon Coast[e]			Combined Productivity
	Ad.	Juv.	% Juv.	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
2006	422	33	7.3													7.3
2007[f]																
2008[f]																
2009[f]																
Mean			7.3			14.9			11.2			7.7			10.1	12.2
% Change from:																
2008			N/A			N/A			N/A			N/A			N/A	N/A
Mean			N/A			N/A			N/A			N/A			N/A	N/A

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

[b] Data supplied by Russ Canniff and Washington Department of Wildlife. A high proportion of birds at Padilla/Samish bays were 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] No data were reported.

Table 3. Results of late-summer 2009 productivity surveys for trumpeter swans in Alaska.[a]

Area	Number of 1:63,360 Maps Surveyed	Dates Surveyed	Adults and Subadults				Cygnets	Total Swans	Broods	Mean Brood Size	% Juv.	% Pairs w/ Brood
			In Pairs	As Singles	In Flocks	Subtotal						
Koyukuk/Nowitna/ Kaiyuh Flats	6	8/6-8/25	456	35	243	734	205	939	76	2.7	21.8	33.3
Minto Flats	7	8/26-9/1	976	59	642	1677	487	2164	170	2.9	22.5	34.6
Ft. Wainwright	4.25	8/11-8/13	84	10	7	101	30	131	10	3.0	22.9	23.8
Copper River Delta	11	8/24-8/26	444	34	220	698	164	862	58	2.8	19.0	25.2
Southeast Alaska	8	8/28	70	3	23	96	48	144	15	3.2	33.3	42.9
Total	36.25		2030	141	1135	3306	934	4240	329	2.8	22.0	32.1

[a] Data supplied by Koyukuk/Nowitna NWR Complex, U.S. Army - Ft. Wainwright, USFS Cordova Ranger District, and USFWS Region 7 Migratory Bird Management.

Table 4. Historical late-summer productivity records for trumpeter swans in Alaska, 1968-2009. [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
2006	43	1962	188	1051	3201	1246	4447	396	3.1	28.0	39.4
2007	31	910	81	510	1501	350	1851	124	2.8	18.9	25.9
2008	28	1082	57	448	1587	455	2042	154	3.0	22.3	28.1
2009	36.25	2030	141	1135	3306	934	4240	329	2.8	22.0	32.1
Mean[b]									3.2	25.3	32.0
% Change from:											
2008									-7%	-1%	14%
Mean									-13%	-13%	0%

[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 2009.

Table 5. Historical winter productivity records for trumpeter swans in the Pacific Flyway, 1977-2009.

	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
2006						1632	297	15.4	2958	567	16.1	117	2.24	15.8
2007						2001	273	12.0	2927	376	11.4	45	2.24	11.6
2008						1457	218	13.0	3873	486	11.1	57	2.32	11.7
2009						1558	285	15.5	4110	555	11.9	72	2.29	12.9
Mean[e]			22.1		2.36			17.1			18.1		2.31	18.1
% Change from:														
2008			N/A		N/A			19%			7%		-1%	10%
Mean			N/A		N/A			-10%			-34%		-1%	-29%

[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 2009.

Table 6. Historical fall productivity records (from ground counts) for emperor geese at Izembek Lagoon and Cold Bay, AK, 1966-2009.[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
2006	3360	2062	38.0	476	1074	2.26
2007	5124	1146	18.3	179	387	2.16
2008	3739	1323	26.1	250	687	2.75
2009	2114	743	26.0	148	340	2.30
Mean[c]			23.7			2.77
% Change from:						
2008			0%			-16%
Mean			10%			-17%

[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 2009.

Table 7. Historical fall productivity records (from aerial photos) for emperor geese on the Alaska Peninsula, 1985-2009.[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
2006	469	9773	35.2
2007	347	12134	17.4
2008	506	10207	24.9
2009	607	12404	15.7
Mean[c]			19.2
% Change from:			
2008			-37%
Mean			-18%

[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 2009.

Table 8. Historical productivity data for dusky Canada geese on the Copper River Delta and Middleton Island, AK, 1971-2009.[a]

	Copper River Delta[b]		Middleton Island[c]		
Year	Geese Sampled	% Juv.	Adults	Estimated Juveniles	% Juv.
1971	5717	16.2			
1972	8193	10.6			
1973	5873	36.0			
1974	8199	51.4			
1975	8990	17.9			
1976	7092	24.2			
1977	----	44.3			
1978	----	24.8			
1979	12700	16.0			
1980	7500	23.7			
1981	8740	17.9			
1982	8473	23.7			
1983	7740	15.0			
1984	11913	18.3			
1985	13780	3.7			
1986	13309	10.7			
1987	12448	9.8			
1988	6917	22.5			
1989	6114	8.6			
1990	5530	23.5			
1991	7098	21.5			
1992	7633	23.1			
1993	4542	5.0			
1994	6977	5.7			
1995	5818	3.9			
1996	6329	21.7	1497	673	31.0
1997	6253	10.5	1168	884	43.1
1998	4919	11.7			
1999	4156	14.7			
2000	4397	24.1	1309	1220	48.2
2001	3165	25.4			
2002	3708	30.5	1416	806	36.3
2003	5929	7.2			
2004	5678	27.8	1499	876	36.9
2005	5364	11.8			
2006	6261	23.1	1453	974	40.1
2007	4741	20.9			
2008	7238	47.2	1317	795	37.6
2009	7017	36.9			
Mean[d]		19.9			39.3
% Change from:					
2008		-22%			N/A
Mean		86%			N/A

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

[b] Aerial survey conducted in mid- to late-July.

[c] Ground survey conducted in mid- to late-June.

[d] Mean excludes 2009.