AERIAL SPRING SURVEY OF EMPEROR GEESE (Chen canagica) IN SOUTHWESTERN ALASKA 3 - 6 MAY, 1989

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DEC 2 1 1989	Rodney J. King*	BA
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Key Words: Emperor goose, population, distribution, southwestern coastal Alaska, aerial survey, migratory birds.

December, 1989

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INTRODUCTION

1.

The ninth consecutive spring aerial survey for emperor geese began on 3 May and was concluded on 6 May, 1989. A Total of 45,800 emperor geese (Table 1) were counted along the southwest coast of Alaska from Hooper Bay to Unimak Island and the south side of the Alaska Peninsula to Portage Bay (Figure 1). This total is 14.8 percent less than the 1988 survey. The three year average of 50,355 is an increase of 2.4 percent over the 1988 three year average (Table 2).

METHODS

The 1989 spring survey was conducted by Rod King (Pilot/Observer, MBM-Fairbanks) and Chris Dau (Observer, Izembek NWR). This was the eigth consecutive year that the same observers have made up the survey team. A Cessna 185 (N1055F) on amphibious floats was used as the survey aircraft and was flown at 200-300 feet above ground level and at 110 mph. All coastal habitat including bays and estuaries frequented by emperor geese was surveyed from Hooper Bay to Portage Bay (Figure 1). Counting emperor geese is the highest priority of the survey, but other migratory birds are recorded as workload allows and are documented in Table 4.

RESULTS AND DISCUSSION

Spring conditions in the Bering Sea were monitored prior to the survey to estimate the progression of migration. Discussions with personnel of the Yukon Delta NWR indicated a very heavy snowpack on coastal nesting habitat. When reviewing ice maps provided by the National Weather Service it appeared that Bristol Bay was covered with young (present year) ice north of Nunivak Island prior to April 30. When the survey began on 3 May some scattered ice free conditions were obvious in the Bering Sea, but winter conditions were still prevelant on coastal habitat to sixty miles inland. Deep snow and ice completely covered the tundra and all fresh water lakes. At that time the only habitat available for migrating birds existed on the mud flats of the Yukon Delta NWR. The ice pack began approximately two miles off-shore necessitating that birds be concentrated within this narrow band of "open water"

habitat.

The Yukon Delta NWR segment of the survey totaled 5,074 emperor geese and was the second highest number of emperors recorded for this segment of the survey since the spring survey was initiated (Tables 1 and 2). Ice conditions north of the Hooper Bay area showed that no open water or vast areas of mud flats were available for goose use. Therefore, even though this was a higher number of geese than average for this northern segment there was virtually no emperor habitat available other than that surveyed, minimizing the possibility of emperor geese migrating further north prior to the survey.

Other major areas which can provide habitat for early spring migrating emperor geese are Chagvan and Nanvak Bays. Both of these bays were estimated to be 80 percent ice covered when surveyed on 4 May. These two areas combined held an estimated 1,051 emperors at that time (Table 3). This total is just slightly above the six year average of 928 emperors for the same area.

The 24.5 percent productivity of emperor geese from the previous fall was 11.4 percent below the three year average of 27.3 percent (Table 2). This coupled with one of the worst winters ever recorded in the Aleutian Islands may account for the low number of emperor geese in spring of 1989. Without data on overwinter mortality we can only hypothesize about the demize of emperor geese during a winter such as occurred in early 1989.

The total number of emperor geese during each survey since 1981 is illustrated in Figure 2. The significant downward trend is evident in Figure 3 where the three year averages are calculated starting with 1983 and the annual population changes are plotted as a curve.

Table 3 summarizes the spring distribution of emperor geese in all major habitats by total numbers and percent of the total in each area since 1984.

During the survey no unusual "other species" or unexpected numbers of bird species were observed. All migratory birds and other significant species are summarized in Table 4.

CONCLUSIONS

The 1989 spring emperor goose survey total of 45,800 is a decrease

of 14.8 percent from spring of 1988 and indicates a considerable mortality of geese over-wintering in the Aleutian Islands. When reviewing the extreme low temperatures of January and February it is obvious that emperors in this environment were subjected to many days of poor survival conditions and could sustain a high amount of mortality to the population in a short period of time.

When reviewing Table 2 it appears that the only time there is an increase in emperor goose numbers in the spring is when the during the preceding fall there was more than 27 percent productivity, i.e., during the spring survey of 1987 and 1988. Granted two years is a small sample, but this correlation should be evaluated in future years. Obviously even a large recruitment in fall followed by a severe winter would jeoparidize the validity of the former comparison.

If emperor geese are subjected to extreme over winter conditions followed by delayed nesting and poor breeding area conditions we can expect the population to remain at this low level for years to come.

RECOMMENDATIONS

The emperor goose management level is based on the spring population survey. This spring survey appears to be the most important and reliable survey in attempting to estimate the emperor It is imperative that the survey team evaluate all population. weather survey, i.e., prior to the available information conditions, ice conditions, on ground observations (Research) and All of these condition are cursory aerial surveys (Refuges). important and necessary in judging the proper timing for initiation of the survey.

Continued information collected by the Division of Research on observations of marked emperor geese will further our knowledge of movements of birds during migration.

When necessary we should be prepared to expand emperor surveys to north of the Yukon Delta NWR and west of Unimak Island. This may be necessary when the survey team cannot arrive on the YK Delta prior to the migrational movement of emperor geese or when questions arise as to suggestions that emperors may be at other locations than in the survey area.

It appears that the only way to ensure the possibility of the

population to recover to past higher numbers is total abstinence of take of emperor geese for a number of years. Those faced with the opportunity for spring take of breeding emperor geese must be encouraged to understand that any unnecessary mortality from spring hunting at these low population levels is devistating to the population and prolongs the time before recovery to viable numbers occurs.

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APPENDICES

Although official memo documented the spring 1988 emperor survey there was no report. Attached to the tables of this report are Appendix A which summarizes all emperor goose observations by segment and Appendix B which documents all other species recorded during the spring 1988 survey.

ACKNOWLEDGEMENT

We wish to thank personnel of the Yukon Delta NWR, Alaska Peninsula NWR, Izembek NWR and Togiak NWR for the continued cooperation for this survey in providing bunkhouse space for lodging, vehicles, aircraft hanger parking, advice on migration status, and use of facility for radio communication. Margaret Severin (MBM-F) assembled and distributed this report.

Table 1. Emperor goose numbers observed by segment.	
<u>3 May, 1989</u> Wind 10 knots from southwest; overcast; 36 degrees F; surveyed from 1430 to 1825 hours.	
Hooper Bay-Nelson Island-Kuskokwin River-Bethel	5,074
<u>4 May, 1989</u> Overcast with winds southwest at 10 knots; 40 degrees F; survey time 1355 to 2000 hours.	
1. Bethel to Quinhagak	5
2. Ouinhagak to Jacksmith Bay	0
3. Jacksmith Bay to Carter Spit	364
4. Carter Spit to Goodnews Bay	124
5 Goodnews Bay to Chagvan Bay	0
6 Chagyan Bay to Nanvak Bay	662
7. Nanvak Bay to Cape Pierce	265
7A. Cape Pierce to Hagemeister Island	77
7B Hagemeister Island to Tongue Point	90
76. Tongue Point to Summit Island Point	56
7D. Summit Island Point to Kulukak Point	6
7E. Kulukak Point to Dillingham	107
7F. Dillingham to Kvichak	0
7G. Kvichak to Naknek	0
5 May, 1989 Overcast with winds southwest at 10 knots; 39 degrees F; high tide; survey time 1025 to 1855.	
8. Naknek to Egegik Bay	0
9. Egegik Bay to 6 km South of Goose Point	173
10. 6 km South of Goose Point to Smokey Point	0
11. Smokey Point to Cape Menshikof (Includes Ugashik Bay)	1,109
- 12. Cape Menshikof to Cinder River Lagoon	0
13. Cinder River Lagoon	4,512

5 May, 1989 (Table 1. Continued)

14.	Cinder River Lagoon to Port Heiden	125
15.	Port Heiden to 24 km South of Strogonof Point	12,000
16.	South of Strogonof Point to Seal Island	650
17.	Seal Islands to Ilnik Lake	5,331
18.	Ilnik Lake to Port Moller	0
19.	Port Moller to Herendeen	75
20.	Herendeen to Cape Rozhnof (Including Mud Bay)	1,019
21.	Cape Rozhnof to Lagoon Point (Including Kudobin Islands)	11,022
22.	Lagoon Point to Kinzarof Lagoon	3
23.	Kinzarof Lagoon	26
<u>6 Ma</u>	and mid-high tide; survey time 1100 to 2035 h	degrees F. ours.
24.	Moffet Lagoon	1,020
25.	Izembek Lagoon	235
26.	Applegate Cove to Big Lagoon	41
27.	Big Lagoon/Hook Bay	15
28.	Morzhovoi Bay	0
29.	Bechevin Bay	105
30.	Swanson Lagoon	-
31.	Urilia Bay	-
32.	South side Unimak Island (Cape Luke to Cape Aksit)	-
33.	Otter Cove	-
34.	. Ikatan Bay to Kenmore Head	(Rain/Fog)
35	. Kenmore Head to Thin Point	(Rain/Fog)
36	. Thin Point to Cold Bay	(Rain/Fog)

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6 May, 1989 (Table 1. Continued)

37.	Cold Bay to King Cove	10 - C	0
38.	King Cove to Pavlof Bay		60
39.	Pavlof Bay		85
40A.	Canoe Bay to Seal Cape		0
40B.	Seal Cape to Balboa Bay		0
41.	Balboa Bay to Dorenoi Bay		0
42.	Dorenoi Bay to American Bay		0
43.	American Bay to Ramsey Bay		0
44.	Ramsey Bay to Ivanof Bay		0
45.	Ivanof Bay to Chignik Lagoon		947
46.	Chignik Lagoon to Chignik Bay		0
47.	Chignik Bay to Kujulik Bay		45
48.	Kujulik Bay to Aniakchak Bay		6
49.	Aniakchak Bay		0
50.	Amber Bay to Cape Kunmik		220
51.	Cape Kunmik to Cape Providence		0
52.	Cape Providence to Agripina Bay		0
53.	Argipina Bay to Wide Bay		0
54.	Wide Bay to Portage Bay		146
55.	Portage Bay to Puale Bay		(Rain/Fog)
		TOTAL EMPERORS	45,800

YEAR	Population (%change /prev.yr)	Three year Ave.(x1000)	Percent(1) Juvenile	Three Yr. Ave. (%Juv.)	Family(2) Group Size(#juv.)
1981	91,267		26.0		3.2
1982	100,643 (+10.3)		7.8		2.7
1983	79,155 (-21.4)	90.4	29.1	20.9	3.2
1984	71,217 (-10.0)	83.7	22.4	19.8	2.8
1985	58,833 (-17.3)	69.7	17.5	23.0	2.8
1986	42,231 (-28.2)	57.4	29.9	23.3	3.1
1987	51,655 (+22.3)	50.9	27.6	25.0	3.3
1988	53,784 (+4.1)	49.2	24.5	27.3	3.1
1989	45,800 (-14.8)	50.4			

Table 2. Spring population size and productivity trends in emperor geese.

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(1) - Percent juvenile data from surveys by Migratory Bird Management -Anchorage, Izembek NWR, and Alaska Peninsula NWR.

(2) - Family group size from Izembek NWR data.

AREA	1984	1985	1986	1987	1988	1989
vuton Delta NGR	(0) 0	0) 0	125 (0.3)	296 (0.6)	140 (0.3)	5074 (11.1)
Jarksmith/Carter	23 (tr)	681 (1.2)	199 (0.5)	344 (0.7)	150 (0.3)	369 (0.8)
Chadvan Bay	49 (0.1)	82 (0.1)	787 (1.8)	480 (0.9)	200 (0.4)	786 (1.7)
Nanvak Bay	20 (tr)	723 (1.2)	1395 (3.3)	365 (0.7)	409 (0.8)	265 (0.6)
North Bristol Bay	(0) 0	666 (1.1)	17 (tr)	0 (0)	75 (0.1)	336 (0.7)
Egegik Bay	280 (0.4)	520 (0.9)	182 (0.4)	659 (1.3)	507 (0.9)	173 (0.4)
Udashik Bay	2140 (3.0)	789 (1.3)	813 (1.9)	1298 (2.5)	605 (1.1)	1109 (2.4)
Cinder Lagoon	10672 (15.0)	5571 (9.5)	4645 (11.0)	2807 (5.4)	7506 (13.9)	4512 (9.8)
Port Heiden	16363 (23.0)	20447 (34.8)	12694 (30.0)	24997 (48.4)	20800 (38.7)	12125 (26.5)
Seal Islands	11123 (15.6)	6927 (11.8)	5251 (12.4)	5539 (10.7)	6115 (11.4)	5981 (13.1)
Nelson/Moller	20376 (28.6)	17099 (29.1)	14135 (33.5)	8340 (16.2)	12220 (22.7)	12116 (26.5)
Izembek NWR	5657 (8.0)	2636 (4.5)	983 (2.3)	2936 (5.7)	2376 (4.4)	1340 (2.9)
False Pass/ Unimak	265 (0.4)	189 (0.3)	75 (0.2)	45 (0.1)	10 (0.1)	105 (0.2)
Bering Sea Total	66968 (94.0)	56330 (95.8)	41301 (97.8)	48106 (93.1)	51173 (95.2)	44291 (96.7)
South Side AK. Penn.	4249 (6.0)	2503 (4.2)	930 (2.2)	3549 (6.9)	2611 (4.8)	1509 (3.3)
TOTAL	71217	56833	42231	51655	53784	45800

Table 3. Spring distribution of emperor geese in southwestern Alaska with percent of total for each segment in parentheses.

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Date 5/3-6/89 Pilot	Rod King	Observ	ver Chris	<u>. Dau We</u>	ather			
	Hooper				Sub-Tot.	35-54	•	. 7
SEGMENT (#)	Bay to	1-7	8-22	23-34	No. side	So. side	Total	
	Eek Is.				Ak, Penn	Ak, Penn		·
C. Loon				6	6	1	7	
Pac Loon	1	14	3		18		18	
	13	42	2	2	59	31	90	
P N Graha		2	2		4	1	5	
R.N. Grebe		26	14	16	55	116	171	
			20	LU	56		56	
S.H. Crane	19	/ / /			6.76	5	/.91	<u> </u>
Tundra Swan		411	02	261	4/0	[701	
Canada Goose	22	4.08			1 /91			
Cackling Goose					1 110	<u> </u>		
White-Fr. Goose		427	21	_	448		448	
		1						
<u>Brant</u>	226	28.055	72	<u>_58,804</u>	87,157	4,189	91,346	
						}		
Emperor Goose	(see Tabl	e 1.)				<u> </u>		· · · · · · · · · · · · · · · · · · ·
Snow Goose		10			10	<u> </u>	<u> 10</u> -	
Uid.Dark Goose					<u> </u>	 		
Mallard		17	15	3	35	3	38	
Gadwall			137	5	142	<u> </u>	142	
G.W. Teal		5	82		87		87	
Am. Wigeon		6		2	8	<u> </u>	88	
Pintail	35	2,403	745	18	3,201	55	3,256	
Shoveler	2	30	31		63	5_	68	
Dabblers			40		40		40	
Scaup spp.		1,019	195	262	1.476	13_	1,489	
C. Eider	364	1.821	1,784	<u> </u>	3,969		3,969	
King Eider	355	51			406	55	461	· · · · · · · · · · · · · · · · · · ·
Stel. Eider	13,702	1,384	9,743	13,640	38,469	260	38,729	
Scoter spp.				20	20	<u> </u>	20	
Black Scoter	16	2,470	7,550	528	10,564	2.042	12,606	
W-W Scoter	8	36	185		229	315_	544	
Oldsquaw	1.410	591	6	L	2,007	10	2,017	
C. Goldeneye	2		41	L L	96	40	136	
Harleguin	13	142	22.7	554	936	792	1,728	
R.B. Merganser	4	795		275	1.074	351	1.425	<u> </u>
Medium sh.bird	10	637	51		698	30	728	ļ
Small sh.bird		3,972	145	910	5.027	5	5,032	
Jaeger spp.	1	4	33				8	
Large Gull	2,153	11,945	8,055	4,447	26,600	3,291	29,891	
Mew Gull	256	1.111	309		1,676	445	2,121	<u> </u>
Kittiwake spp.	65	3,387	1.189	650	5.291	1,272	6,563	ļ
Tern spp.	10	33	182	15	240		240	
Murre		8,274	<u> </u>		8,275		8,275	
Bald Eagle		5	63	24	92	58_	150	ļ
Raven		10	57		67	3	70	
Gray Whale			26	1	27		27	
Seal SDD.			331	47	378	1 7	385	<u> </u>
Sea Lion		22	· · · · · · · · · · · · · · · · · · ·	16	38		69	
Sea Otter			57	4 30	487	547	1,034	
Walrus		4	4		8		8	<u> </u>
Grizzly Bear				6	6	3	99	
Snowy Owl			2		2		2	
Caribou		10	18	6	34		34	<u> </u>
Bufflehead		2			2		2	<u> </u>
C. Merganser		14	5	6	25	2	27	
Sabine Gull	1	3	1		5		5	
Spectacled Eider	4				4		4	1
	1	1	ł	1	1		1	

Table 4. Total of all species observed during the 1989 Spring survey.







APPENDIX A

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Table 1. Emperor goose numbers observed by segment.	
<u>2 May, 1988</u> Wind 10 kts. Northeast; clear; 40 degrees F; time 1210 to 1605 hours	
Hooper Bay-Nelson Island-Kuskokwin River-Bethel	140
<u>3 May,1988</u> Overcast with winds East at 10 knots, 40 degrees F; survey time 1215 to 1745 hours.	
1. Bethel to Quinhagak	55
2. Quinhagak to Jacksmith Bay	4
3. Jacksmith Bay to Carter Spit	91
4. Carter Spit to Goodnews Bay	52
5. Goodnews Bay to Chagvan Bay	0
6. Chagvan Bay to Nanvak Bay	148
7. Nanvak Bay to Cape Pierce	409
7A. Cape Pierce to Hagemeister Island	0
7B. Hagemeister Island to Tongue Point	0
7C. Tongue Point to Summit Island Point	0
7D. Summit Island Point to Kulukak Point	0
7E. Kulukak Point to Dillingham	75
7F. Dillingham to Kvichak	0
7G. Kvichak to Naknek	0
<u>4 May, 1988</u> Overcast with winds southeast at 10 knots; 40 degrees F; survey time 1210 to 1950 hours.	
8. Naknek to Egegik Bay	0
9. Egegik Bay to 6km South of Goose Point	507
10. 6 km South of Goose Point to Smokey Point	0
11. Smokey Point to Cape Menshikof (Includes Ugashik Bay)	605
12. Cape Menshikof to Cinder River Lagoon	0

APPENDIX A (Continued)

<u>4 Ma</u>	y, 1988 (Continued)		
13.	Cinder River Lagoon	7,506	
14.	Cinder River Lagoon to Port Heiden	500	
15.	Port Heiden to 24km South of Strogonof Point	20,300	
16.	South of Strogonof Point to Seal Island	10	
17.	Seal Islands to Ilnik Lake	6,105	
18.	Ilnik Lake to Port Moller	0	
19.	Port Moller to Herendeen	0	
20.	Herendeen to Cape Rozhnof (Including Mud Bay)	398	
21.	Cape Roxhnof to Lagoon Point (Including Kudobin Islands)	11,822	
22.	Lagoon Point to Kinzarof Laggon	0	
<u>6 Ma</u>	y, 1988 Wind northwest at 5 knots; overcast; 40 degrees F; survey time 0920 to 1830 hours.		
23.	Kinzarof Lagoon	15	
24.	Moffet Lagoon	2,143	
25.	Izembek Lagoon	118	
26.	Applegate Cove to Big Lagoon	100	
27.	Big Lagoon/Hook Bay	0	
28.	Morzhovoi Bay	70	
29.	Bechevin Bay	0	
30.	Swanson Lagoon	(not surveyed	1)
31.	Urilia Bay	(not surveyed	i)
32.	South side Unimak Island (Cape Luke to Cape Aksit)	(not surveyed	1)
33.	Otter Cove	(not surveyed	(£
34.	Ikatan Bay to Kenmore Head	0	
35.	Kenmore Head to Thin Point	0	

APPENDIX A (Continued)

6 May	7, 1988 (Continued)		
36.	Thin Point to Cold Bay	н. 1	0
37.	Cold Bay to King Cove		0
38.	King Cove to Pavlof Bay		5
39.	Pavlof Bay		125
40A.	Canoe Bay to Seal Cape		0
40B.	Seal Cape to Balboa Bay		(not surveyed)
41.	Balboa Bay to Dorenoi Bay		15
42.	Dorenoi Bay to American Bay		0
43.	American Bay to Ramsey Bay		0
44.	Ramsey Bay to Ivanof Bay		8
45.	Ivanof Bay to Chignik Lagoon		877
46.	Chignik Lagoon to Chignik Bay		0
47.	Chignik Bay to Kujulik Bay		117
48.	Kujulik Bay to Aniakchak Bay		0
49.	Aniakchak Bay		0
50.	Amber Bay to Cape Kunmik		302
51.	Cape Kunmik to Cape Providence		9
52.	Cape Providence to Agripina Bay		35
53.	Argipina Bay to Wide Bay		130
54.	Wide Bay to Portage Bay		988
55.	Portage Bay to Puale Bay		0
		TOTAL EMPERORS	53,784

		API	PENDIX B	77 -	b			
Date 5/2-6/88 Pilot	<u>R.King</u>	<u>Observe</u>	C. Day	weat	ner f l		1	}
	Coastal				Sub-Total	35-56		1
SEGMENT (#)	YK Delta	17	8-22	23-34	No. side	So. side	TOTAL	
	NWR			15	<u>NK Penn</u>	<u>ak. Penn.</u> 2	21	
C. Loon				10	10	<u>_</u>	21	·····
Pac. Loon	8				9		22	
R.T. Loon	<u> </u>	<u>+ +</u>	0		22		22	
R.N. Grebe	L			63	63		63	
Cormorant		472	245	84	802	133	935	
5.H. Crane	7	29 [13		49		49	
Tundra Swan	32	143	86	4	265		265	
Canada Goose	176	208	35	10	429		429	
Cackling Goose	10	20			30		30	
White-Fr. Goose	167	432	43		642		642	
		1						
Prant	18	15.087	136	56.035	71.276	2,188	73.464	
Stant						·····		
Emporer Coore	140	834	47.753	2 446	51,173	2.611	53.784	
Luderor Goose	++			-,	<u>81</u>		81	
LIOW GOOSE	╆┉┈╍╍╸╸┍╴┼	01			1 10		40	
Jid.Dark Goose	<u>+15_</u>	25			40		40	
Mailard	╀─────┤	<u> </u>	/	6	28		20	
Gadwall	╀─────╁	2	124		126		120	
G.W. Teal	+	42			42		42	
Jnid. sea duck	<u> </u>		250		250	87	337	· · ·
<u>Pintail</u>	215	1,253	788	115_	2,371	36	2,407	
Shoveler		134	8		142		142	
Dabblers			50		50		50	
Scaup spp.	6	690	1,028	53	1,777	10	<u>1.787</u>	
C. Eider	5,434	52	33		5,519	5	5.524	
King Eider	19		1,044		1,063		1,063	
Stel. Eider	29.225	1,419	11,403	7,684	49,731	255	49,986	
Scoter spp.								
Black Scoter	63	642	26,008	859	27.572	858	28,430	
W-W Scoter		9	500		509	116	625	
Oldsmaw	2 261	100	15	90	2 466	10	2.476	
		45	5		50	2	52	
<u>Gordeneye</u> spp.	+	12	19	908	940	507	1 447	
	4	354	119	77	554	264	818	
<u>K.B. Merganser</u>	4	255	155	·····	410	1	410	
Medium Sn. Dird	4.00	500	1 758	200	3 047	1	3 047	
Small Sn.blrd	400	<u>_</u>	2,730	230				
Jaeger SDD.	<u> </u>	1 6 7 9	<u> </u>	2 090	12 972	2 021	16 703	
Large Gull	005	1 020	1 0.500	1 3.009	2 177	2,921	2 191	
Mew Guli	<u> </u>	1 2 277	<u> </u>		$\frac{4.1/1}{0.12}$	4		· · · · · · · · · · · · · · · · · · ·
AITTIWAKE SPD.		<u> 4,8/⊥</u>	0,202		<u> </u>	1	<u> </u>	
<u>rern spp.</u>			0	+		<u> </u>		
Alcids		20		2	24	+	24	
Bald Eagle		<u> </u>	<u> </u>	8	64	<u>5/</u>	121	
Raven		44	21	+	25	$\frac{1}{1}$	26	
Gray Whale			1414		14	+ 1	15	ļ
Seal spp.			50	191	241	<u> </u>	241	<u> </u>
Sea Lion			-l	5	5_	53	58	
Sea Otter	_		187	681	868	275	1.143	
<u>Valrus</u>			375(7HL)	<u>375(7HI</u>	.) <u> </u>	375(7 Headle
Grizzly Bear			7(5)	7(5) 13	20(<u>5juvenil</u>
Fox			2		2		2	
Caribou			19	5	24		24	
Moose						3	3	
S.L. Hawk	2	1			2	1	3	1
Surf Scotor	20		31		51	121	172	1
	102				192	27	210	1
C F1-	$-\frac{103}{1}$		1	1	2	1	<u> </u>	1
Prefei al a		1	16		20	<u>_</u>	20	<u> </u>
		4	1 10		20			1

Distribution List for Emperor Goose Population Surveys

Bob Leedy, Chief, Migratory Bird Management Dick Pospahala, Migratory Bird Coordinator, R-7 Paul Schmidt, DARD, Refuges and Wildlife, R-7 Bill Butler, Migratory Bird Management-Anchorage Bruce Conant, Migratory Bird Management-Juneau Dirk Derksen, Alaska Fish & Wildlife Research Center, Chief, Migratory Birds-Anchorage Margaret Petersen, AFWRC, Migratory Birds Susan Cantor, AFWRC, Migratory Birds Jowel Schmutz, AFWRC, Migratory Birds Lynn Denlinger, Migratory Bird Management, Anchorage Jim Bartonek, Pacific Flayway Representative, Portland John Martin, Alaska Maritime NWR Ron Hood, Alaska Peninsula NWR Mike Boylan, Aleutian Islands NWR Robin West, Izembek NWR Jay Bellinger, Kodiak NWR Dave Fisher, Togiak NWR Ron Perry, Yukon Delta NWR Jim Sedinger, U of A, Fairbanks Ray Bane, Superintendent, NPS, King Salmon Sam Patten, ADFG, Bethel

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