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SPRING SURVEY OF EMPEROR GEESE
IN SOUTHWESTERN ALASKA,
25-28 April, 1983

By
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Key Words: Emperor Geese, Waterbirds
Southwestern Alaska, Bristol Bay,
Distribution, Abundance

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INTRODUCTION

The third annual spring emperor goose survey in southwestern Alaska was completed by two aerial survey crews from 25 to 28 April, 1983. A total of 79,155 emperor geese were observed. Favorable weather conditions allowed coverage of the coastline and estuarine areas from Kuskokwim Bay to Izembek Lagoon on 25 to 26 April. The area from Izembek Lagoon west to Unimak Island was surveyed on 28 April after a one day delay due to weather.

The survey results suggest an overall population decline of 21 percent (21,488 geese) from the 1982 spring population of 100,643.

METHODS

The 1983 survey was accomplished by pilot/observers and observers flying in Cessna 180 and 185 Service aircraft. Survey altitude was often dictated by weather conditions, however, from 250 to 300 feet AGL was maintained when possible to facilitate species identification. The coastline, bays, lagoons and estuaries along the survey route were surveyed and all birds and marine mammals observed were recorded. Emphasis was placed on emperor geese and other geese, hence, the numbers of other birds seen should be considered approximations and probably minimum figures. In larger bays and lagoons deviations in straight line flight routes were made to obtain a complete coverage. Start and stop times for each survey leg were recorded, as were general habitat conditions, tide level and distribution of any shore-fast or floating sea ice. Crews and aircraft used in 1983 survey are shown in Table 1. Air speed was maintained at approximately 110 mph on 1055 F (120-140 in N709). Sea ice forecast charts issued by the National Weather Service were consulted and these data were compared to actual field conditions observed to document the ice conditions encountered in 1983 (Appendix 1).

RESULTS AND DISCUSSION

The 1983 spring emperor goose survey was initiated simultaneously from Bethel and King Salmon, Alaska on 25 April. By mid April shore-fast ice was gone from most northerly segments of the survey area and key bays were becoming ice-free. Survey areas south of Cape Newenham were essentially free of ice during the survey period. Numbers of Emperor geese by survey segment are presented in Table 2 and a mapped distribution of observations is shown in figure 1.

Vern Berns (pilot/observer) and John Solberg (observer) surveyed most of the south side of the Alaska Peninsula on 25 April, completing remaining areas west to Cold Bay on 26 April. A total 2,072 emperor geese (2.6% of the total) were observed in these segments suggesting that spring migration was well advanced and most birds had probably moved to more northerly areas.

Rod King (pilot/observer) and Chris Dau (observer) completed survey segments from Bethel to Naknek on 25 April observing a total of 2,459 emperor geese (3.1% of the total). On 26 April the north side of the Alaska Peninsula from Naknek to Moffett Point was surveyed with most birds being in the Port Heiden and Seal Island lagoon areas. Total for the 26 April

Table 1. Personnel and aircraft used in the 1983 spring emperor goose survey

Date	Aircraft Type	Personnel	Area Covered
25 April	Cessna 185	R. King (pilot), Dau	Bethel to King Salmon
"	Cessna 180	Berns (pilot), Solberg	South side Alaska Peninsula, Wide Bay to Canoe Bay
26 April	"	"	South side Alaska Peninsula, Canoe Bay to Cold Bay
"	Cessna 185	R. King (pilot), Dau	North side Alaska Peninsula King Salmon to Izenbek Lagoon
28 April	"	"	North side Alaska Peninsula Izenbek Lagoon to Unimak Island, Southside Alaska Peninsula Bechevin Bay to Cold Bay

Table 2. Summary of emperor goose sightings by area,
25-28 April 1983

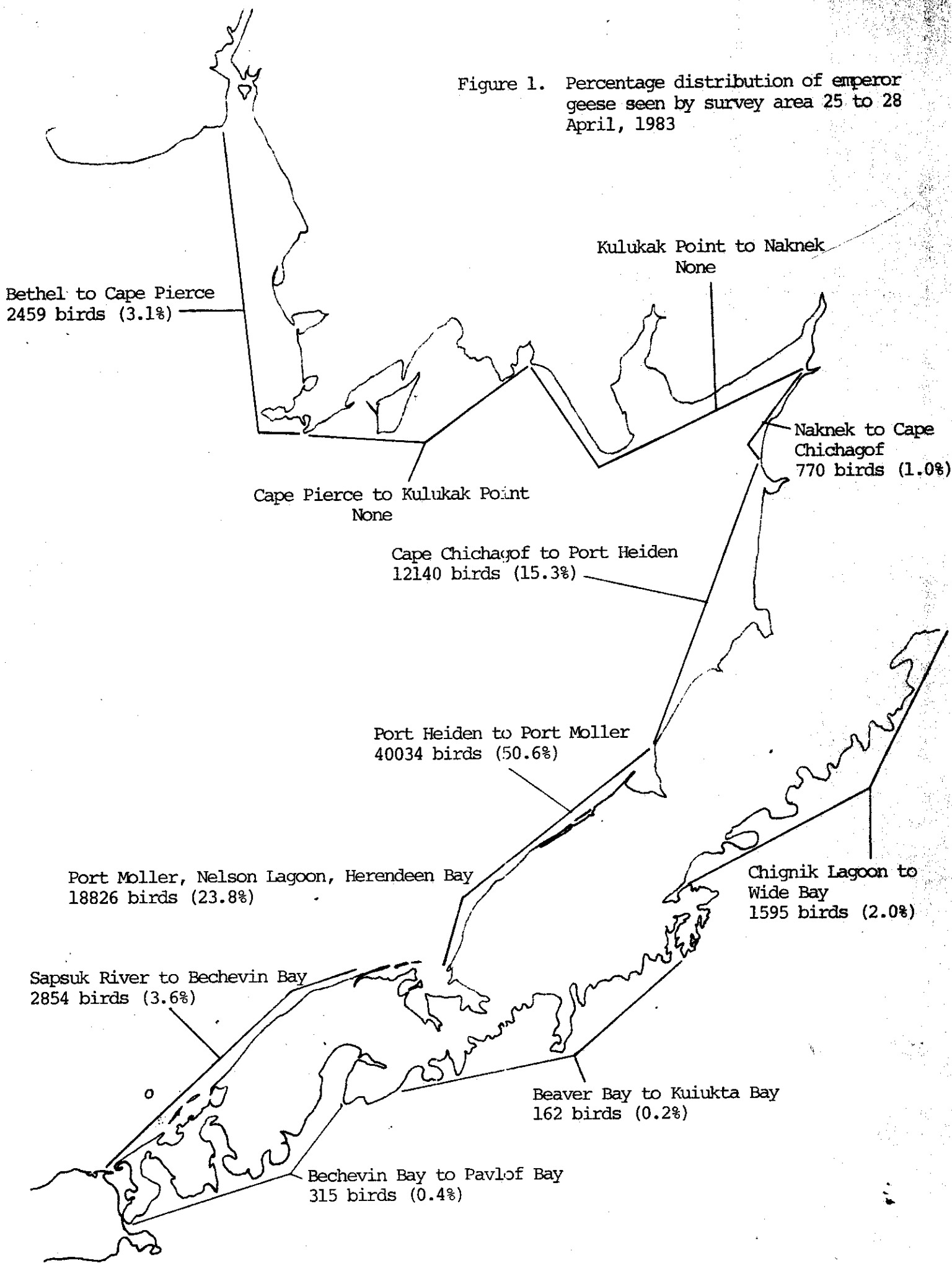
Date	Location	Number of emperor geese	Observers
25 April	Bethel to Kwigillingok (mouth of Kuskokwim R.)	0	R. King/Dau
"	Eek Island to Quinhagak	0	"
"	Quinhagak to Jacksmith Bay	0	"
"	Jacksmith Bay to Carter Bay	256	"
"	Carter Bay	60	"
"	Carter Bay to Platinum	27	"
"	Platinum to Security Cove (incl. Chagvan Bay)	1,806	"
"	Security Cove to Cape Pierce (incl. Nanvak Bay)	310	"
"	Cape Pierce to Asigyugpak Spit	0	"
"	Asigyugpak Spit to Tongue Point	0	"
"	Tongue Point to Kulukak Point	0	"
"	Kulukak Point to Dillingham	0	"
"	Dillingham to Nakeen	0	"
"	Nakeen to Cape Chichagof	0	"
"	Cape Chichagof to Goose Point (incl. Egegik Bay)	770	"
"	Goose Point to Cape Menshikof (incl. Ugashik Bay)	1,034	"
"	Cape Menshikof to Port Heiden (incl. Cinder River estuary and Hook Lagoon)	11,106	"
"	Port Heiden to Base of Strogonof Point (incl. Port Heiden)	25,992	"
"	Base of Strogonof Point to Ilnik (incl. Seal Islands Lagoon)	14,042	"
"	Ilnik to Port Moller (village)	0	"
"	Port Moller (village) to Point Divide	300	"
"	Herendeen Bay	0	"
"	Point Divide to Sapsuk River mouth (incl. Nelson Lagoon, Mud Bay and Kudobin, Deer and unnamed sand islands)	18,526	"
"	Sapsuk River mouth to Moffett Point	0	"
28 April	Moffett Point to Strawberry Point (incl. Moffett Bay)	1,734	"
"	Strawberry Point to Cape Krenitzin (incl. Izembek Lagoon and Applegate Cove)	1,120	"
"	Cape Krenitzin to Chunak Point (incl. Hook Bay, St. Catherines Cove and Hot Springs Bay)	0	"
"	Boiler Point to Big Lagoon (incl. Little, Middle, and Big Lagoons)	0	"
"	Big Lagoon to Delta Point (incl. Littlejohn, Old Mans and Mortensens Lagoons)	0	"
26 April	Cold Bay (village) to Lenard Harbor (incl. Kinzarof Lagoon)	0	Berns/Solberg
"	Lenard Harbor	0	"
"	Lenard Harbor to Indian Head	25	"
"	Indian Head to Volcano Bay	17	"
"	Volcano Bay	0	"
"	Arch Point to Jackson Lagoon	273	"
"	Jackson Lagoon to Canoe Bay	0	"
"	Canoe Bay	0	"

Table 2. (continued)

Date	Location	Number of emperor geese	Observers
25 April	Beaver Bay to Balboa Bay	85	Berns/Solberg
"	Dorenoi Bay to Mitrofanina	77	"
"	Mitrofanina to Chignik Lagoon	0	"
"	Chignik Lagoon to Base of Cape Kumlium	448	"
"	Base of Cape Kumlium to Cape Kilokak	322	"
"	Cape Kilokak to Hartman Island	825	"
"	Hartman Island to Coal Point (incl. Wide Bay)	0	"
		79,155	

Note: Fewer than 200 emperor geese were observed during incidental surveys of the Sanak and Shumagin Island groups on 26 April by Bruce Conant, Jack Hodges and Mike Nunn (N754.)

Figure 1. Percentage distribution of emperor geese seen by survey area 25 to 28 April, 1983



survey along the north side of the Alaska Peninsula was 71,770 emperor geese (90.7% of the total observed). Izembek Lagoon and coastline and estuarine areas west to Unimak Island were surveyed on 28 April after a one day delay due to weather with a total of 2,854 emperor geese observed (3.6% of the total).

Subjectively, it appears the one day delay in completion of the survey had little effect on the numbers of birds observed. Vern Berns and John Solberg viewed most of Izembek Lagoon and Moffett Lagoon on 26 April and reported numbers of emperor geese similar to what King and Dau observed during an intensive effort on 28 April. Likewise, on 26 April no emperor geese were observed in Morzhovoi or Bechevin bays by Bruce Conant (Waterfowl Investigations, Juneau), Jack Hodges (Raptor Management Studies, Juneau) and Mike Nunn (Izembek NWR). On 28 April survey segments in these areas were completed by King and Dau and again no emperor geese were present suggesting that the majority of the population was in the survey area and that little movement if any had occurred during the delay. On 29 April both survey aircraft departed Cold Bay. Incidental counts made during these flights are summarized in Appendix 2.

Climatic conditions in April of 1983 were in all respects milder than those encountered in April and May of 1982. Ice conditions in mid April of 1983 were comparable to those encountered in the first week of May 1982. Late, heavy ice conditions in 1982 retarded spring migration as evidenced by the greater numbers of emperor geese observed south of the Alaska Peninsula and from Izembek Lagoon west to Unimak Island. Few emperor geese were observed in these areas in 1983 when ice conditions farther north were very light.

CONCLUSION

The importance of sea ice charts and field appraisals by Service pilots in coastal areas of southwestern Alaska were utilized to determine the appropriate survey period. Climatic conditions were mild and ice coverage light in April in the Bristol Bay area and it is believed these factors resulted in a successful survey of the majority of the emperor goose population.

Observer biases are inherent in surveys such as this. To the extent possible these biases have been reduced by maintaining a consistency in one or both members of the survey crew covering the primary staging areas along the north side of the Alaska Peninsula.

A population decline of from 100,643 to 79,155 emperor geese (down 21%) based on a comparison of the spring aerial surveys of 1982 and 1983 is alarming and points out the need for a quantitative analysis of mortality factors affecting emperor geese. Also of value would be a more complete appraisal of migratory behavior in late April and early May to support our subjective opinions that essentially the entire population is included in the survey.

Investigations relating to migration that would help qualify spring population survey data are:

-Timing and duration of use of primary estuaries by emperor geese in southwestern Alaska. Repetitive surveys completed in 1981, 1982 and 1983 have been very valuable in beginning to monitor

these factors however additional surveys are needed.

-Extent and location of trans-Bristol Bay migrations of emperor geese. Coastal observations and subjective opinions suggest that such movements may occur in spring from as far west as Nelson Lagoon. Emperor geese following such routes could be missed by aerial coastline surveys.

Investigations relating to mortality that would help qualify spring population survey data are:

-Effects of a climatically late versus early spring on the physiology of emperor geese as related to reproductive output and spring and summer mortality. Recruitment in 1982 (7.8%) was the lowest observed since surveys began in 1966 and is believed to be the result of unfavorable climatic conditions on the Yukon-Kuskokwim Delta.

-Effects of climatically late versus early springs on the vulnerability of emperor geese to spring harvest at staging locations and on nesting areas.

The spring population inventory of emperor geese should be continued annually due to:

- 1.) The uncertain status of the emperor goose population, at a level considerably below the goal identified in the draft Pacific Flyway Emperor Goose Management Plan.
- 2.) The importance of documenting temporal and spatial distribution patterns in years of varying climatic conditions.
- 3.) The need for quantifying the importance of key estuarine staging areas in light of potential development of energy related resources in the area.

SPECIES ACCOUNTS BY SURVEY SEGMENTS

Start: 25 April 1983

<u>Bethel to Kwigillingok</u>	1055 hrs.
Tundra Swan	4
Canada Goose	5
Common Goldeneye	5
Common Raven	3

<u>Eek Island to Quinhagak</u>	1124 hrs.
Tundra Swan	15
Canada Goose	158
White-fronted Goose	15
Mallard	524
Pintail	580
Common Goldeneye	10
Red-breasted Merganser	4
Unk. Puddle Duck	161
Glaucous-winged Gull	24
Mew Gull	2
Small Sandpiper	35

<u>Quinhagak to Jacksmith Bay</u>	1148 hrs.
Canada Goose	25
White-fronted Goose	55
Pintail	25
A. Wigeon	2
Common Goldeneye	15
Glaucous-winged Gull	19

<u>Jacksmith Bay to Carter Bay</u>	1157 hrs.
Tundra Swan	6
Canada Goose	35
Emperor Goose	256
Pintail	151
Black Scoter	21
Glaucous-winged Gull	45
Mew Gull	25
Small Shorebirds	3

<u>Carter Bay</u>	1208 hrs.
Tundra Swan	2
Canada Goose	10
Emperor Goose	60
Common Goldeneye	100
Steller's Eider	75
Black Scoter	200
Unk. Seaduck	65
Glaucous-winged Gull	824
Small Shorebird	25
Common Raven	3

<u>Carter Spit to Platinum</u>	1216 hrs.
(incl. Goodnews Bay)	
Tundra Swan	6
White-fronted Goose	5
Emperor Goose	27
Pintail	2063
G. Scaup	47
Common Goldeneye	20
Red-breasted Merganser	30
Oldsquaw	12
Steller's Eider	250
Black Scoter	17
Unk. Seaduck	150
Glaucous-winged Gull	649
H. Puffin	10
Cormorant	51
Small Shorebirds	10

<u>Platinum to Security Cove</u>	1242 hrs.
(incl. Chagvan Bay)	
Canada Goose	3,991
Black Brant	1,877
Emperor Goose	1,806
Oldsquaw	6
Steller's Eider	15,312
Black Scoter	52
Unk. Seaduck	10
Glaucous-winged Gull	431
Cormorant	11
Murre	100
Small Shorebird	50
Aircraft	2
Small Boats/Camps	2

<u>Security Cove to Cape Pierce</u>	1307 hrs.
(incl. Nanvak Bay)	
Canada Goose	90
Emperor Goose	310
Pintail	25
Steller's Eider	88
Unk. Seaduck	40
Glaucous-winged Gull	116
Cormorant	3
Gyrfalcon	1
Harbor Seal	40
Small Boats	2

Cape Pierce to Asigyugpak Spit 1315 hrs.

Oldsquaw	12
Black Scoter	100
Steller's Eider	11
Common Eider	160
Glaucous-winged Gull	125
Murre	8
Small Shorebird	5

Aircraft	1
Small Boats	2

Asigyugpak Spit to Tongue Point 1352 hrs.

Canada Goose	202
White-fronted Goose	3
Pintail	70
Red-breasted Merganser	17
Steller's Eider	30
Black Scoter	30
Unk. Seaduck	179
Glaucous-winged Gull	44
Mew Gull	6
Cormorant	176
Bald Eagle	1 Ad.
Common Raven	2
Walrus	6 (dead \leq one year).

Tongue Point to Kulukak Point 1352-1407, 1455-1530 hrs.

Tundra Swan	9
Canada Goose	1
White-fronted Goose	2
Mallard	2
Pintail	490
Common Goldeneye	50
Red-breasted Merganser	4
Oldsquaw	16
Black Scoter	33
Harlequin	2
Glaucous-winged Gull	1,278
Mew Gull	250
Cormorant	125
L. Sandhill Crane	2

Walrus 3 (dead \leq one year).

Small Boats/Camps 2

Kulukak Point to Dillingham 1530-1623 hrs.

Canada Goose	2
White-fronted Goose	7
Pintail	50
Black Scoter	15
Glaucous-winged Gull	4,006
Mew Gull	2

Red-throated Loon	1
L. Sandhill Crane	2
Bald Eagle	3 Juv.
Common Raven	1
Walrus	2 (dead \leq one year).
Whale	3 (dead \geq one year).
Small Boats	2
<u>Dillingham to Ekuk</u>	1707 hrs.
Tundra Swan	12
Canada Goose	367
White-fronted Goose	12
Pintail	250
Glaucous-winged Gull	77
Red-throated Loon	1
L. Sandhill Crane	2
<u>Ekuk to Nakeen</u>	1720 hrs.
Tundra Swan	9
White-fronted Goose	276
Mallard	5
Pintail	121
Common Goldeneye	8
Unk. Puddle Duck	30
Glaucous-winged Gull	486
Mew Gull	3
Bald Eagle	1 Ad.
W. Ptarmigan	6
Gray Whale	1 (live)
<u>Nakeen to Naknek</u>	1755 hrs.
Tundra Swan	14
Canada Goose	95
White-fronted Goose	241
Unk. Dark Geese	7
Snow Goose	1
Pintail	74
<u>26 April 1983</u>	
<u>Naknek to Cape Chichagof</u>	1000 hrs.
Tundra Swan	11
Canada Goose	7
Mallard	10
Pintail	308
A. Wigeon	2
Common Goldeneye	10
Unk. Puddle Duck	50
Unk. Seaduck	50
Glaucous-winged Gull	505
Mew Gull	185
Whale	1 (dead \geq one year).

<u>Cape Chichagof to Goose Point</u>	1014 hrs.
(incl. Egegik Bay)	
White-fronted Goose	5
Emperor Goose	770
Pintail	90
G. Scaup	15
Common Goldeneye	5
King Eider	10
Glaucous-winged Gull	1,064
Mew Gull	312
Small Sandpipers	5
L. Sandhill Crane	2
Gyrfalcon	1
<u>Goose Point to Cape Menshikof</u>	1050 hrs.
(incl. Ugashik Bay)	
Tundra Swan	65
Canada Goose	6
Emperor Goose	1,034
Gadwall	3
G. Scaup	152
Oldsquaw	3
Steller's Eider	750
Common Eider	110
Black Scoter	3,460
White-winged Scoter	10
Glaucous-winged Gull	287
Small Shorebirds	5
L. Sandhill Crane	2
Red-throated Loon	1
Bald Eagle	4 Ad. (one on nest)
Common Raven	5
Gray Whale	5 (live)
<u>Cape Menshikof to Cinder River</u>	1136 hrs.
(incl. Cinder River Estuary)	
Tundra Swan	4
Emperor Goose	11,106
Oldsquaw	80
Steller's Eider	2,500
Common Eider	120
King Eider	250
Black Scoter	327
<u>Cinder River to Port Heiden</u>	1155 hrs.
(incl. Hook Lagoon)	
Tundra Swan	2
Pintail	135
G. Scaup	50
Oldsquaw	85
Steller's Eider	150
Black Scoter	25
Glaucous-winged Gull	37
Dunlin/Rock Sandpiper	500
Bald Eagle	1 Ad.

Common Raven	1
Gray Whale	1 (live)

Port Heiden to Strogonof Point 1215-1237 hrs.
(incl. Port Heiden Estuary)

Emperor Goose	25,992
Red-breasted Merganser	25
Oldsquaw	3,300
Steller's Eider	19,220
Common Eider	100
Black Scoter	13,515
Glaucous-winged Gull	435
Common Raven	2
Harbor Seal	50

Strogonof Point to Ilnik 1340 hrs.
(incl. Seal Island Lagoon)

Black Brant	1
Emperor Goose	14,042
Mallard	2
Pintail	10
Gadwall	2
G. Scaup	30
Bufflehead	24
Red-breasted Merganser	2
Oldsquaw	22
King Eider	500
Black Scoter	185
Glaucous-winged Gull	320
Bald Eagle	1 Ad.
Common Raven	3
Harobr Seal	875

Walrus 3 (dead \Rightarrow one year).

Ilnik to Port Moller (village) 1410 hrs.

Tundra Swan	15
Mallard	10
Pintail	10
G. Scaup	20
Steller's Eider	9,557
King Eider	10
Black Scoter	1,130
White-winged Scoter	4
Harlequin	236
Glaucous-winged Gull	5,651
Mew Gull	37
Black-legged Kittiwake	5,100
Common Loon	2
Cormorant	300
Black Turnstone	200
Small Sandpipers	70
Gyrfalcon	1
Bald Eagle	1 Ad., 2 Juv.

Walrus 3500 (live), 4 (dead \Rightarrow one year).
Whale 1 (dead one year).

Port Moller (village) to Point Divide 1445-1500 hrs.

Emperor Goose	300
Pintail	390
G. Scaup	2
Red-breasted Merganser	7
Oldsquaw	7
Steller's Eider	2,500
Black Scoter	12,492
White-winged Scoter	17
Glaucous-winged Gull	178
Mew Gull	262
Small Shorebirds	150
Bald Eagle	2 Ad., 3 Juv.
Harbor Seal	130
Walrus	195 (live)

Herendeen Bay 1510-1525 hrs.

Black Scoter	4,300
White-winged Scoter	10
Glaucous-winged Gull	575
Bald Eagle	2 Ad., 2 Juv.
Walrus	48

Point Divide to Sapsuk River Mouth (incl. Nelson Lagoon, Mud Bay, and Kudobin, Deer and unnamed sand islands) 1500-1510, 1525-1600 hrs.

Black Brant	1
Emperor Goose	18,526
Pintail	260
G. Scaup	600
Steller's Eider	34,075
Common Eider	422
King Eider	15
Black Scoter	2,840
Harlequin	70
Glaucous-winged Gull	9,435
Mew Gull	522
Bald Eagle	2 Ad., 2 Juv.
Harbor Seal	150
Walrus	3,252 (live)

Sapsuk River mouth to Moffett Point

Tundra Swan	2
Glaucous-winged Gull	2,377
Small Shorebirds	340
Bald Eagle	6 Ad.
Common Raven	2

28 April 1983

Moffett Point to Strawberry Point (incl. Moffett Bay) 1,435 hrs.
Black Brant 4,528
Emperor Goose 1,734
Pintail 2
G. Scaup 35
Steller's Eider 14,877
Black Scoter 360
Glaucous-winged Gull 3,193
Black-legged Kittiwake 400
Rock Sandpipers 500
Small Shorebirds 600
Bald Eagle 2 Ad., 2 Juv.

Harbor Seal 15

Strawberry Point to Cape Krenitzin (incl. Izembek Lagoon and Applegate Cove) 1505 hrs.
Black Brant 87,745
Emperor Goose 1,120
Steller's Eider 8,500
Black Scoter 5
Glaucous-winged Gull 4,489
Black-legged Kittiwake 500
Bald Eagle 2 Juv.

Harbor Seal 110
Sea Otter 3

Cape Krenitzin to Rocky Point (incl. Hook Bay, St. Catherine's Cove and Hot Springs Bay)
Black Brant 7
Steller's Eiders 10
Black Scoters 50
Harlequin 100
Glaucous-winged Gulls 3,593
Mew Gull 210
Cormorant 225
Bald Eagle 2 Ad., 1 Juv.

Sea Otter 96

Boiler Point to Big Lagoon (incl. Little, Middle and Big Lagoon) 1637 hrs.
Pintail 90
Oldsquaw 27
Common Eider 155
Unk. Seaduck 15
Glaucous-winged Gull 1,930
Bald Eagle 2 Ad.

Sea Otter 23

<u>Big Lagoon to Delta Point</u>	1645-1728 hrs.
(incl. Littlejohn, Old Man's and Mortensen's Lagoons)	
Tundra Swan	1
Pintail	30
Black Scoter	25
Harlequin	19
Glaucous-winged Gull	314
Bald Eagle	1 Ad., 1 Juv.
<u>26 April 1983</u>	
<u>Cold Bay (village) to Lenard Harbor</u>	1100 hrs.
(incl. Kinzarof Lagoon)	
Tundra Swan	1
Eider spp.	150
Merganser spp.	4
Gull spp.	40
<u>Lenard Harbor</u>	1105 hrs.
Merganser spp.	9
Gull spp.	2
<u>Lenard Harbor (Kelp Point)</u>	1110 hrs.
<u>to Indian Head</u>	
Emperor Goose	25
Gull spp.	49
Bald Eagle	2 Ad. (nest)
Whale	1
Sea Otter	20
<u>Indian Head to Volcano Bay</u>	1120 hrs.
Emperor Goose	17
Common Eider	5
Steller's Eider	10
Eider spp.	7
Scoter spp.	20
Gull spp.	10
<u>Volcano Bay</u>	1130 hrs.
Black Brant	3,600
Eider spp.	58
Gull spp.	60
Bald Eagle	1
<u>Arch Point to Jackson Lagoon</u>	1140 hrs.
Canada Goose	45
Emperor Goose	273
Mallard	3
Unk. Puddle Ducks	3
Common Goldeneye	5
Eider spp.	20
Gull spp.	94
Small Shorebirds	150
Bald Eagle	3 Ad. (one nest), 1 Juv.
Caribou	56

<u>Canoe Bay</u>	1200-1210 hrs.
Eider spp.	55
Merganser spp.	98
Gull spp.	313
Bald Eagle	2
<u>25 April 1983</u>	
<u>Jackson Lagoon to Canoe Bay</u> (incl. Pavlof Bay)	1700-1715 hrs.
Tundra Swan	4
Black Brant	60
Eider spp.	230
Gull spp.	49
Caribou	400
<u>Beaver Bay to Balboa Bay</u>	1630 hrs.
Tundra Swan	2
Canada Goose	24
Black Brant	47
Emperor Goose	85
Common Goldeneye	10
Steller's Eider	150
Eider spp.	183
Scoter spp.	56
Cormorant spp.	25
Gull spp.	390
Bald Eagle	4 Ad. (one nest), 1 Juv.
Seal	25
Sea Otter	22
Brown Bear	2
<u>Dorenoi Bay to Mitrofanina</u>	1520 hrs.
Tundra Swan	13
Canada Goose	16
Emperor Goose	77
Mallard	21
Pintail	65
Unk. Puddle Ducks	31
Common Goldeneye	13
Eider spp.	39
Scoter spp.	147
Merganser spp.	9
Unk. Seaducks	20
Cormorant spp.	21
Gull spp.	550
Bald Eagle	12 Ad. (3 nests), 2 Juv.
Common Raven	1
Sea Otter	1
Caribou	1

<u>Mitrofanina to Kuiukta Bay</u>	1455 hrs.
Canada Goose	23
Green-winged Teal	12
Steller's Eider	142
Scoter spp.	25
Cormorant spp.	11
Gull spp.	151
Bald Eagle	4 Ad. (one nest), 1 Juv.
<u>Kuiukta Bay to Chignik Lagoon</u>	1310-1315, 1415-1455 hrs.
Canada Goose	11
Eider spp.	90
Scoter spp.	49
Cormorant spp.	2
Gull spp.	35
Bald eagle	4 Ad. (2 nests)
Seal	4
Whale	8
<u>Chignik Lagoon to Base of Cape Kumliun</u>	1230 hrs.
Tundra Swan	1
Canada Goose	27
Black Brant	2,011
Emperor Goose	448
Mallard	30
Pintail	10
Common Goldeneye	25
Steller's Eider	275
Eider spp.	424
Scoter spp.	59
Merganser spp.	23
Gull spp.	1,427
Small Shorebirds	200
Bald Eagle	8 Ad. (3 nests), 2 Juv.
Seal	20
Sea Otter	843
Whale	6
Caribou	4
<u>Base of Cape Kumliun to Cape Kilokak</u>	1111 hrs.
Tundra Swan	3
Black Brant	95
Emperor Goose	322
Pintail	75
Unk. Puddle Ducks	20
Eider spp.	131
Scoter spp.	75
Gull spp.	482
Bald Eagle	16 Ad. (2 nests), 2 Juv.
Seal	35
Whale	2
Moose	3

<u>Cape Kilokak to Hartman Island</u>	1053 hrs.
Canada Goose	120
Black Brant	205
Emperor Goose	825
Gull spp.	261
Bald Eagle	1 Ad. (nest), 2 Juv.

<u>Hartman Island to Coal Point</u>	1050-1053 hrs.
(incl. Wide Bay)	
Gull spp.	121
Bald Eagle	2 Ad.

APPENDIX 1. Environmental conditions recorded during 1983 emperor
goose survey, 25-28 April.

25 April: Bethel to Naknek

Snow conditions were light from Bethel to Quinhagak with 10 percent or less ground cover. No snow was present in low areas south of Quinhagak. Onshore, open water was present as overflow from sloughs and rivers and from snow and ice melt in meadow areas. Open holes in the Kuskokwim River existed from the Johnson River south to Kuskokwim Bay (45% of the total river area) with solid ice persisting north of the Johnson River. In Kuskokwim Bay broken pans of ice were present from the Kuskokwim River mouth to approximately 20 miles north of Quinhagak. Shore-fast ice in this area varied in widths of from 1/2 to one mile. From 5 miles north of Quinhagak to 5 miles south of Quinhagak the shore-fast ice became broken and spotty in distribution. No shore-fast ice on exposed coastlines occurred south of this point.

The southern 1/3 of Carter Bay was ice covered. Goodnews Bay had very little broken shore ice along its north side with the remainder of the bay open. Chagvan Bay and Nanvak Bay were 25 and 50 percent ice covered, respectively. Ice in these three bay systems appeared to be largely melting in place. Fresh-water ponds south of Quinhagak were either ice free or covered by melt water.

Survey conditions were excellent throughout this segment.

26 April: Naknek to Moffett Point

No snow or fresh-water pond ice was encountered in this area. Exposed coastlines and estuaries were ice free as well.

Flying conditions (ie. wind and visibility) were good throughout this segment of the survey. However, tides were very low in the Port Moller and Nelson Lagoon areas which resulted in difficulties in spotting birds and more flight time.

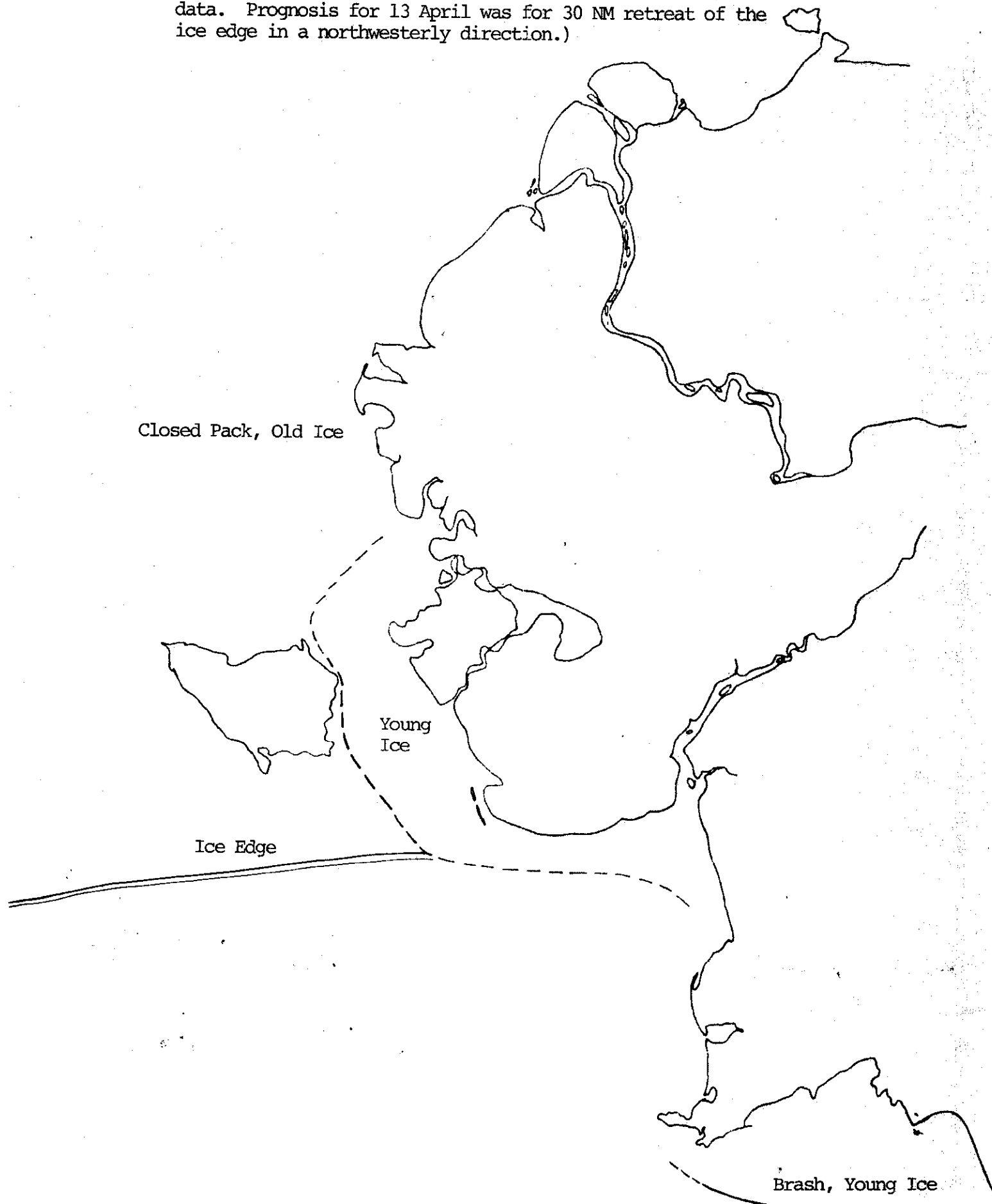
25-26 April: Wide Bay to Cold Bay

No snow or ice was encountered in this survey segment and flying conditions and visibility were judged to be good.

28 April: Izembek Lagoon to Unimak Island

No snow or ice was encountered in this survey segment and flying conditions and visibility were judged to be good.

Ice conditions 11 April, 1983, Southwestern Alaska.
(Note: Information from National Weather Service satellite data. Prognosis for 13 April was for 30 NM retreat of the ice edge in a northwesterly direction.)



APPENDIX 2. Observations made during 29 April return flights, Cold Bay to King Salmon.

N709 Vern Berns/John Solberg

Moffett Point to Sapsuk River mouth 0940 hrs.

Tundra Swan	11
Mallard	2
Unk. Puddle Duck	25
Scoter spp.	10
Gull spp.	204
Small Shorebird	50
Bald Eagle	1 Ad. (nest)
Seal	20
Caribou	2

Sapsuk River mouth to Point Divide 1005 hrs.

(incl. Nelson Lagoon, Mud Bay and Kudobin, Deer and unnamed sand islands)

Emperor Goose	13,770
Pintail	213
Unk. Puddle Duck	30
Steller's Eider	6,650
Common Eider	200
Eider spp.	12,158
Scoter spp.	953
Gull spp.	1,316

Herendeen Bay 1040 hrs.

Tundra Swan	4
Emperor Goose	288
Pintail	55
Unk. Puddle Ducks	30
Steller's Eider	580
Eider spp.	1,790
Scoter spp.	192
Unk. Seaducks	5
Gull spp.	123
Bald Eagle	9 Ad., 2 Juv.
Common Raven	4
Seal	1
Walrus	32

Point Divide to Port Moller (village) 1110 hrs.

Steller's Eider	200
Eider spp.	850
White-winged Scoter	9
Scoter spp.	19
Gull spp.	385
Bald Eagle	7 Ad. (4 nests)
Sea Otter	8
Walrus	3
Moose	1

<u>Port Moller (village) to Ilnik 1205 hrs.</u>	
Tundra Swan	34
Mallard	17
Common Goldeneye	3
Steller's Eider	1,125
Scoter spp.	15
Gull spp.	93
Unk. Shorebird	50
Bald Eagle	7 Ad. (one nest)
Common Raven	1
Whale	2
Walrus	600
Caribou	10
Red Fox	1

Ilnik to Base of Strogonof Point 1235 hrs.
(incl. Seal Island Lagoon)

Tundra Swan	16
Emperor Goose	4,931
Mallard	11
Unk. Puddle Ducks	55
Common Goldeneye	9
Steller's Eider	1,800
Common Eider	15
Eider spp.	2,850
Scoter spp.	327
Merganser spp.	5
Gull spp.	266
Small Shorebird	75

Base of Strogonof Point to Port Heiden 1255 hrs.
(incl. Port Heiden)

Emperor Goose	16,483
Steller's Eider	1,400
Common Eider	40
Scoter spp.	397
Gull spp.	70
Small Shorebirds	50
Common Raven	5

Port Heiden to Cinder River 1335 hrs.
(incl. Hook Lagoon)

Tundra Swan	2
Common Goldeneye	2
Scoter spp.	16
Gull spp.	61
Small Shorebirds	12

Cinder River to Cape Menshikof 1405 hrs.
(incl. Cinder River estuary)

Tundra Swan	16
Emperor Goose	4,620
Mallard	3
Unk. Puddle Ducks	80
Scoter spp.	12

Merganser spp.	7
Gull spp.	426
Small Shorebirds	200
Common Raven	1
Caribou	11
Brown Bear	4
<u>Cape Menshikof to Goose Point</u> (incl. Ugashik Bay)	1415-1425 hrs.
Tundra Swan	8
Mallard	20
Pintail	26
Common Goldeneye	2
Scoter spp.	78
Merganser spp.	6
Gull spp.	93
<u>N1055F Rod King</u>	
<u>King Cove to Arch Point</u>	1000 hrs.
Tundra Swan	4
Black Brant	950
Steller's Eider	10
King Eider	2
Scoter spp.	35
Harlequin	85
Gull spp.	30
<u>Arch Point to Canoe Bay</u> (incl. Pavlof Bay)	
Black Brant	65
Emperor Goose	194
Steller's Eider	5
Common Goldeneye	10
Small Shorebirds	15
Gull spp.	240
Bald Eagle	3 Ad.
<u>Canoe Bay</u>	
Cormorant	60
Small Shorebird	25
Gull spp.	135
Seal	60
<u>Beaver Bay to Balboa Bay</u>	1043 hrs.
Emperor Goose	10
Steller's Eider	20
Scoter spp.	15
Gull spp.	90
Bald Eagle	2 Ad.
<u>Dorenoi Bay to Mitrofanina</u>	1100 hrs.
Tundra Swan	11
Mallard	1
Pintail	6
Wigeon spp.	6
Steller's Eider	20