

DRAFT - EMPEROR GOOSE MANAGEMENT PLAN

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I. PURPOSE AND GOAL:

The purpose of this management plan is to provide guidelines for the cooperative management of the emperor goose (Anser canagicus) which breeds in Alaska and the USSR and winters primarily in southwestern Alaska.

II. OBJECTIVES

A. The population objective of this plan is to maintain the population level at or above the level determined by coordinated surveys in 1981.

When population size is determined over a several year period, a more definitive objective will be set.

B. The population distribution objective of this plan is to maintain the existing geographic distribution of geese (Table 1 and Figure 1).

C. The habitat objective of this plan is to maintain in sufficient quantity and quality, the habitat necessary to support the determined population objective level. The habitats necessary to accomplish this objective are shown in Figure 2 and described in Table 1.

III. STATUS:

A. Population Characteristics

An estimated 80 to 90 percent of the total breeding population of emperor geese nest on the Yukon-Kuskokwim Delta (YKD). Elsewhere in Alaska the species is a scattered nester from Carter Spit (Kuskokwim Bay) on the south to Kivalina (Kotzebue Sound) in the north. In the USSR, emperor geese are uncommon nesters along the periphery of the Chukotski Peninsula from Anguema and Ukouge Lagoons in the north to Mallen Lagoon on the south (Figure 1, Table 1).

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On the YKD the arrival of emperor geese in the spring is usually later than other goose species and concurrent with the availability of nest sites (Figure 3). Most nesting occurs from Cape Romanzof to Cape Avinof and within 20 kilometers of the coastline.

Average numbers of emperor geese observed on spring aerial breeding pair transects over the YKD are portrayed in Figure 4. Although unsurveyed from the air, the delta of the Yukon River supports a low number of nesting birds.

Nesting densities, success and production rates from selected study areas on the YKD are presented in Table 2.

A well documented molt migration of subadults and probably failed breeding adults occurs in mid June from the YKD and possibly Soviet nesting areas, to St. Lawrence Island. Molting emperor geese occur in the USSR along the northern and eastern shores of the Chukotski Peninsula (Figure 2). During the third week of June a molt migration to Kolyuchin Bay and Ukouge Lagoon occurs.

Flight routes are in a northwesterly direction along the north coast of the Chukotski Peninsula. The total summering population of emperor geese in the USSR is estimated to be 12,000 to 15,000 (A.A. Kistchinski, personal communication).

The fall departure of breeding adult emperor geese and young from western Alaska begins in late August, with most arriving on the Alaska Peninsula by late September and early October. The timing of the arrival of fall migrants at wintering areas in the Aleutian Islands is less well known. Fall arrival at Adak Island in the Central Aleutians has ranged from 9 September to 7 October. The only arrival

- date for the western Aleutians is 24 November at Shemya Island. Most of the emperor goose population has departed the Aleutian Islands and is occupying key staging areas of the Alaska Peninsula by late April where they may remain for up to three weeks. Survey data for the Alaska Peninsula area is presented in Table 3 with key areas shown in Figure 6.

- Migratory routes, staging and wintering areas utilized by emperor geese are described in Table 1 and shown in Figure 2.

#### B. Human Utilization

The most comprehensive survey of subsistence use of waterfowl on the YKD was made in 1964. In that year an estimated 8,200 emperor geese were taken (6,500 in the spring and 1,700 in the fall). An additional 40,000 eggs of all waterfowl were taken of which an unknown percentage were emperor geese. Although the human population on the YKD increased 77 percent from 1964 to 1977, the relationship between human population increase and harvest is unclear. Transportation modes and hunting equipment gear have improved since 1964 and the timing of major harvest has shifted from traditional summer drives of molting geese to intensive hunting for a short period during early spring. In early spring, the largest waterfowl concentrations occur on the YKD due to the progression of the snow melt and its limitation of available habitat.

According to the State of Alaska and U.S. Fish & Wildlife Service mail questionnaire surveys, the sport harvest of emperor geese has averaged about 2,500 annually during the past 5 years (Table 4). The harvest has been gradually increasing in recent years. Most harvest

occurs along the north side of the Alaska Peninsula, principally at Pilot Point, Cinder River Delta, Port Heiden and Izembek Lagoon. An estimated 200 birds may be taken each year on Adak Island in the central Aleutian Islands. Unreported fall and winter harvest on the YKD, along the Alaska Peninsula and at remote locations throughout the Aleutian Islands is, in aggregate, probably greater than the reported harvest.

Up to 1978, about 800 emperor geese were banded and through March 1981 only 25 had been reported by hunters (table 5). Limited banding of molting emperor geese in the USSR has resulted in two recoveries, both in Alaska.

#### C. Management

The following are procedures used in the management of emperor geese:

##### Population Assessments

1. Study plots on the Yukon-Kuskokwim Delta and incidental observations on other breeding areas.
2. Family group and production counts in September and October at Izembek Lagoon.

##### Trends in Population Size and Distribution

1. Breeding waterfowl survey in Alaska.
2. Study plots on the Yukon-Kuskokwim Delta and incidental observations on other breeding areas.
3. Irregular surveys along the Alaska Peninsula and coastline of Bristol Bay.
4. Irregular banding on the Yukon-Kuskokwim Delta.
5. Regulations pertaining to harvest and method of take.
6. Harvest survey (mail questionnaire) by Alaska Department of Fish & Game until 1976, (terminated thereafter); USFWS annual harvest survey.

7. 1964 subsistence harvest estimate, YKD and 1979 and 1980 pilot studies by FWS of subsistence harvest.

#### Habitat Management

1. Special protection for habitat is afforded by land classification as National Wildlife Refuge, State management area and critical habitat. Areas important to Emperor geese are listed in Table 2 and portrayed in Figure 2.
2. Various Federal and State laws provide habitat protection through use permits and coastal zone planning.
3. Federal and State managing agencies have interpretative programs, make news releases, distribute brochures and employ other means to enhance the appreciation of waterfowl by the public.
4. Continual communication and coordination exists between managing agencies and organized groups interested in birds.

#### IV. PROBLEMS:

##### A. Data Limitations

1. Data on total population and population trends are inadequate and no comprehensive inventory technique has been implemented to acquire this information.
2. Data on the distribution and abundance of breeding birds in Alaska and the USSR are inadequate.
3. The magnitude and age composition of the harvest during spring and summer in Alaska are unknown.
4. Data on the sport harvest in Alaska are inadequate for areas other than the Alaska Peninsula.
5. Data on the distribution and abundance of molting and fall and spring staging geese are inadequate.

6. Data are inadequate to determine the relationships between specific breeding areas in Alaska and the USSR and staging or wintering areas.

7. Banding and inventory data are inadequate to determine age class or population mortality rates.

B. Population Status

1. Possible, but as yet unverified, population decline based on infrequent counts and personal observations on staging and wintering areas. Breeding ground studies indicate stable or slightly increasing population.

C. Other Problems

1. The association of emperor geese with the maritime habitat makes this species highly sensitive to potential adverse impacts of petroleum exploration and development activities.

2. Potential for reindeer husbandry, low level aircraft flights and other disturbances on the YKD nesting grounds and Alaska Peninsula areas poses probable adverse effects to the population.

V. Management Procedures:

A. Habitat

1. Develop and maintain cooperative agreements with landowners on the YKD to minimize adverse impacts. Lead Agency USFWS, Priority 1 Timing 1980 ongoing

2. Prohibit reindeer husbandry on the Yukon Delta National Wildlife Refuge unless it is clearly demonstrated through comprehensive studies and an environmental assessment or impact statement that herds and herding will not significantly impact waterfowl resources of the YKD.

Lead Agency USFWS Priority 1 Timing as necessary

3. Institute protective measures and retain existing ones to preserve coastal areas utilized as staging, molting and wintering areas by emperor

geese (Figure 1 and Table 1). Lead Agency ADF&G, USFWS Priority 1  
Timing as necessary

B. Regulations

4. Establish regulations which will allow for the maintenance of the population objective determined after coordinated surveys in 1981.

Lead Agency USFWS, ADF&G Priority 1 Timing 1981 and ongoing

5. Develop a procedure to promulgate regulations for subsistence hunting when such hunting is legalized.

Lead Agency USFWS, ADF&G, subcommittee or other direct involvement of the Pacific Flyway Technical Committee and Council Priority 1 Timing as necessary

C. Data Needs

6. Develop a system or inventory to estimate the magnitude, species composition timing and location of subsistence waterfowl harvest in Alaska at least once every three (3) years (preferably annually) with the emphasis on the YKD. Lead Agency USFWS, Participating Agency ADF&G Priority 1 Timing 1980

7. Develop survey techniques to determine the distribution and abundance of staging, molting, and wintering emperor geese in Alaska, with special emphasis on the YKD and the Alaska Peninsula. Lead Agency USFWS, Participating Agency ADF&G Priority 2 Timing 1981

8. Continue monitoring sport harvest in Alaska. Lead Agency USFWS, ADF&G Priority 1 to 2 Timing ongoing

9. Increase sampling intensity on the YKD to better assess the distribution, nesting density, and production of emperor geese. Lead Agency USFWS, Priority 2, Timing ongoing

10. Increase effort to determine age composition on a minimum of 2,500 birds (or a statistically significant sample) on the Izembek NWR and adjacent areas. Lead Agency USFWS Priority 2 Timing on going

11. Initiate banding/neck collaring program to determine relationships between nesting, molting, staging and wintering areas. Lead Agency USFWS, Academy of Sciences USSR, Priority 3, Timing to be determined

D. Plan Review and Management Administration

12. A memorandum of Understanding or similar agreement between the USFWS and ADF&G should be prepared to achieve maximum cooperation and interagency coordination. The duties of the participating agencies will be to: 1) annually review this plan and recommend changes, 2) recommend action to meet objectives of procedures that are deficient. 3) develop and submit research proposals. 4) review sport and subsistence hunting regulations and make recommendations to the technical committee. 5) review unsolicited research proposals and 6) perform other duties as appropriate.



TABLE I Known Habitat Use Areas of Emperor Geese

Map No.	Area	Type of Use	Population Est.	Habitat, Status and Threats
USSR				
1.	Chukotsky shorelands (Amguema Lagoon to Mallen Lagoon)	Nesting, molting	11,000 - 15,000	Unknown
2.	Ukouge Lagoon	Molting	2,000	Unknown
3.	Kolyuchinskaya Bay	Nesting, molting	3,000 - 3,500 (molting)	Unknown
4.	Wankaren Lagoon	Nesting	Unknown	Unknown
5.	Kresta Bay	Nesting	Unknown	Unknown
6.	Kamachatka Peninsula shoreland and Commander Islands	Wintering	200 (Commander Islands)	Unknown
ALASKA				
7.	Yukon-Kuskokwim Delta	Nesting, Molting	80 - 90% of total nesting population	Yukon Delta National Wildlife Refuge, Native Corporation Lands. Potential on and offshore oil development. Potential reindeer herding.
8.	Kotzebue Sound shorelands	Nesting	Unknown	Bering Land Bridge National Park, Nati Corporation Lands. Potential on and o shore oil development. Reindeer herd
9.	Nunivak Island and Southwestern Alaska shorelands	Spring/fall staging	80% of total population	Yukon Delta and Togiak NWR's, Native Corporation Lands. Potential on and off shore oil development. Reindeer herding. Commercial fishing activities.
10.	St. Lawrence Island	Nesting, molting	Nesting - few molting - 10,000 to 20,000	St. Lawrence Island Reserve (Villages of Gambel & Savoonga) Reindeer herdin Potential on and off shore oil development.
11.	Kodiak Island, Aleutian Islands & Alaska Peninsular (including the southwest peninsula and Izembek Lagoon, Port Moller, Ilnik area Port Heiden, Hook Lagoon, Cinder River, Ugashik Bay & Egegik Bay)	Spring/fall staging, wintering	Est. 95% of total population	Aleutian Island, Izembek, Alaska Mari time, Alaska Peninsula & Becharof NWR's. Native Corporation and other private lands. Potential on/off shore oil development. Commercial fishing activities. Aircraft traffic

TABLE 2. NESTING AND PRODUCTION DATA ON THE EMPEROR GOOSE

	ONUMIUK STUDY AREA (1													12 year	KOKECHIK BAY STUDY AREA (1			
	1969	70	71	72	73	74	75	76	77	78	79	80	Average (3	1971	72	73	Average (3	
Nesting Density (nests/sq. mi.)	(2													6.1 ± 3.1	70.2	46.8	54.6	57.2± 11.9
Average Clutch Size (early incubation)	4.9	4.6	4.2	4.6	3.9	4.9	3.8	5.2	4.3	5.7	5.1	5.3	4.7 ± 0.6	4.3	5.1	5.4	4.9 ± 0.6	
Hatching Success (% of all eggs laid)	81	45	95	77	74	87	56	60	62	81	62	71	71 ± 14	80	66	78	75.0 ± 8.0	
Nesting Success (% nests hatching ≥ 1 egg) (N)	90 (4)	68 (3)	100 (5)	95 (3)	91 (3)	100 (11)	80 (3)	80 (8)	100 (3)	100 (8)	83 (8)	69 (2)	88 ± 12	82	91	88	87.0 ± 5.0	
Class I Brood Size (N)	3.7 (13)	3.9 (15)	3.7 (21)	4.3 (24)	4.0 (13)	3.8 (12)	3.9 (14)	4.8 (16)	3.7 (46)	3.1 (23)	3.8 (4)	3.9 (47)	3.9 ± 0.4	3.1 (42)	3.9 (430)	4.2 (195)	3.7 ± 0.6	
Class III/F Brood Size (N)	3.5 (56)	3.8 (16)	3.1 (29)	3.0 (38)	5.0 (1)	3.5 (20)	3.3 (3)	4.8 (5)	4.5 (24)	2.8 (13)	3.2 (36)	3.2 (43)	3.6 ± 0.7	3.3 (344)	3.1 (232)	3.3 (137)	3.2 ± 0.1	
Family Group Size Izenbek NWR (N)	3.3 (161)	2.9 (383)	2.7 (484)	3.1 (210)	-	2.6 (50)	2.9 (51)	2.6 (136)	2.8 (108)	3.0 (62)	3.3 (53)	2.3 (40)	2.9 ± 0.3					
% Family Group in Pop. Izenbek NWR	41.8 (7129)	33.7 (14,655)	30.2 (11,722)	32.5 (6930)	-	15.7 (2025)	35.2 (1149)	14.4 (2247)	40.2 (1697)	26.2 (1890)	11.8 (954)	24.8 (2363)	28.1 ± 10.0					

(1) Both study areas are located within major nesting areas of the Y-K Delta

(2) Study area not fully searched and some adjacent areas included

(3) ± 1 SD

TAB 3. SPRING AND FALL SURVEYS OF EMPEROR GEESE ALONG THE ALASKA PENINSULA

Survey Date	Egegik Bay	Ugashik Bay	Cinder River	Hook Lagoon	AREA				Unimak Island	Total
					Port Heiden	Ilnik	Port Moller	Southwest Peninsula & Izembek Lagoon		
SPRING										
Mid May 1969	265	60	5000	NS	4800	3110	3611	NS	NS	16846
March 1970	South side of Alaska Peninsula including Sanak and Deer Islands									5469
Late March 1977	--	202	--	--	745	--	25778	21021	NS	47746
Late April 1981	1765	834	6329	--	25647	13941	23598	3824	--(1	75938 (2
FALL										
Late Oct. 1968	150	250	25000	NS	20000	19000	1925	NS	NS	66325
Early Oct. 1969	1080	NS	75000	NS	45250	16500	NS	NS	NS	137830
Mid Dec. 1969	NS	NS	750	NS	75	1000	4650	NS	NS	6475
Late Aug. 1970	NS	25	850	400	875	825	NS	NS	NS	2975
Late Sept. 1970	NS	50	17180	3100	26650	10180	19400	NS	NS	76560
Early Oct. 1970	NS	NS	10050	NS	8580	4700	15350	NS	NS	38680
Mid Sept. 1971	NS	200	2050	NS	2200	5000	2600	NS	NS	12050
Early Oct. 1971	2031	60	4894	NS	17525	19740	25400	NS	1315	71055
Mid Oct. 1975	--	--	--	--	--	--	--	10395	11	64477
Mid Oct. 1976	--	--	--	--	--	--	--	--	--	45653
Early Oct. 1979	60	84	3255	--	28603	6719	13067	7326	--	59114
Early Oct. 1980	588	322	5284	--	9695	4064	35481	7649	--	63083

NS = Not Surveyed

(1 East end only included in survey.

(2 Including areas from the Kuskokwim River south to Bristol Bay and South Alaska Peninsula.

TABLE 4. EMPEROR GOOSE HARVEST DATA

YEAR	ALASKA				IZEMBEK NWR		
	Estimated		% of Goose		Harvested/ Observed (3	Est. Total (5	% of Goo Harvest
	No. Harvested		Harvest				
	ADF&G	USFWS	ADF&G	USEWS			
	(1	(2					
1970	NS	1400	NS	9.1	340		51.3
1971	NS	800	NS	4.3	488 (4		52.7
1972	1840	307	17.0	3.4	265		51.4
1973	2375	41	12.9	3.3	NS		NS
1974	2065	765	15.5	7.3	NS		NS
1975	2890	359	15.5	3.1	NS		NS
1976	2590	3863	18.0	27.6	288	1233	40.4
1977	NS	2199	NS	12.6	161	252	48.9
1978	NS	3000	NS	21.4	109	330	36.7
1979	NS	2100	NS	13.6	113	1052	23.8
1980	NS	NA	NA	NS	52	339	23.2

(1 A.D.F.&G. Survey (mail)

(2 Data from Administrative Reports, Migratory Bird Populations Station, Laurel MD

(3 Intensive bag checks during charter hunt weekends (usually 2 per season). An estimated 85% of total take recorded. An estimated 10% of the remainder of the harvest is observed.

(4 1971 <sup>data and latter years</sup> ^ include reported cripples.

(5 Estimated total = Charter weekend obs. harvest / .85 plus other harvest / .10 plus reported crippling loss.

TABLE 5. BAND RECOVERY LOCATIONS FOR YUKON-KUSKOWKIM DELTA BANDED  
EMPEROR GEESE (1)

Recovery Location	Total Birds Recovered	%
ALASKA		
Yukon-Kuskokwim Delta	6	24
Kuskokwim Bay	1	4
Alaska Peninsula	12	48
Aleutian Islands	2	8
St. Lawrence Island	1	4
USSR		
Chukotski Peninsula	1	4
British Columbia	1	4
Washington	1	4
Total	25	100

(1 Reported to Bird Banding Laboratory prior to 12 March 1981

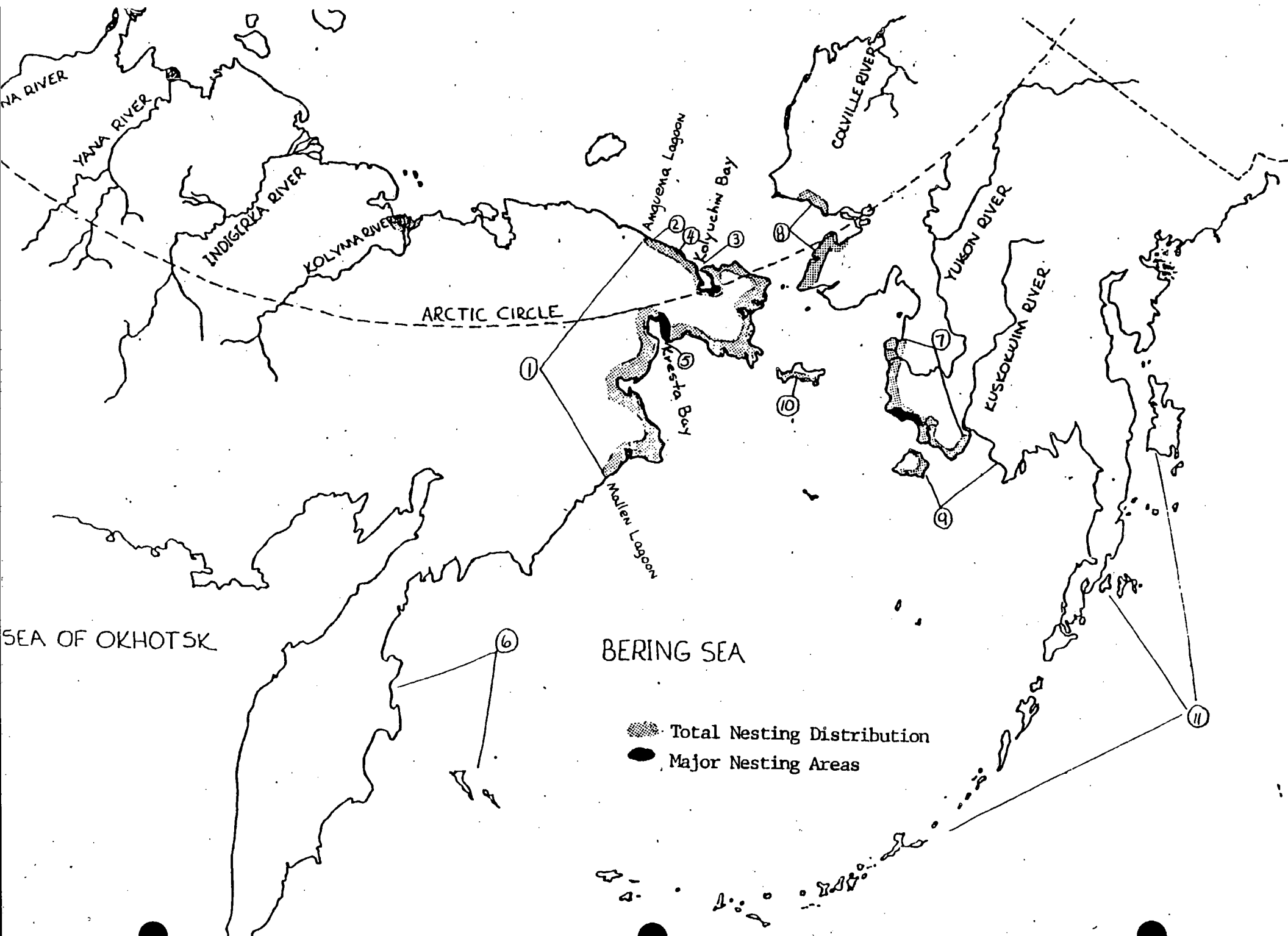


FIGURE 1. Known Habitat Use Areas of Emperor Geese

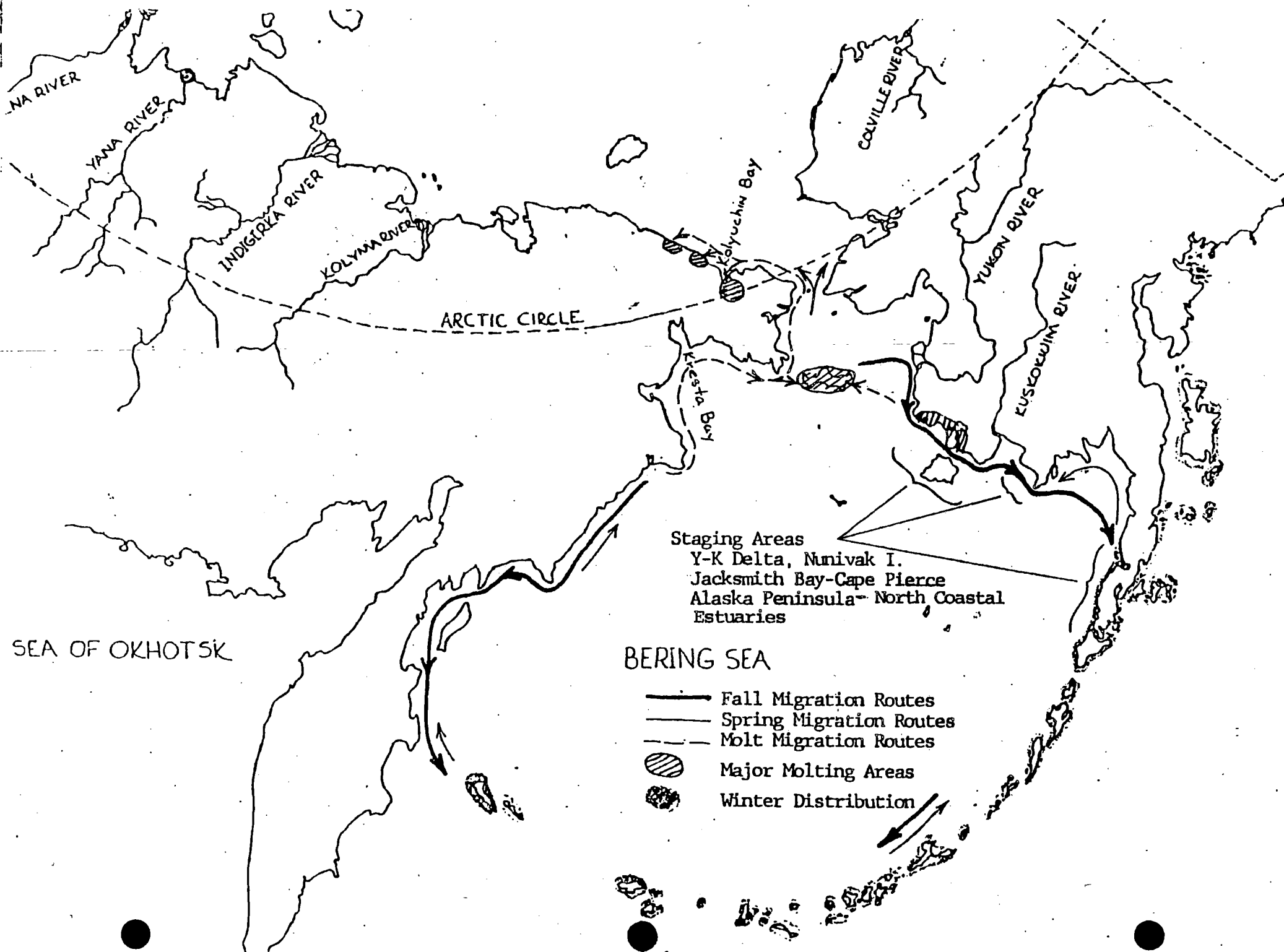


FIGURE 2. Migration Routes and Staging Areas of Emperor Geese

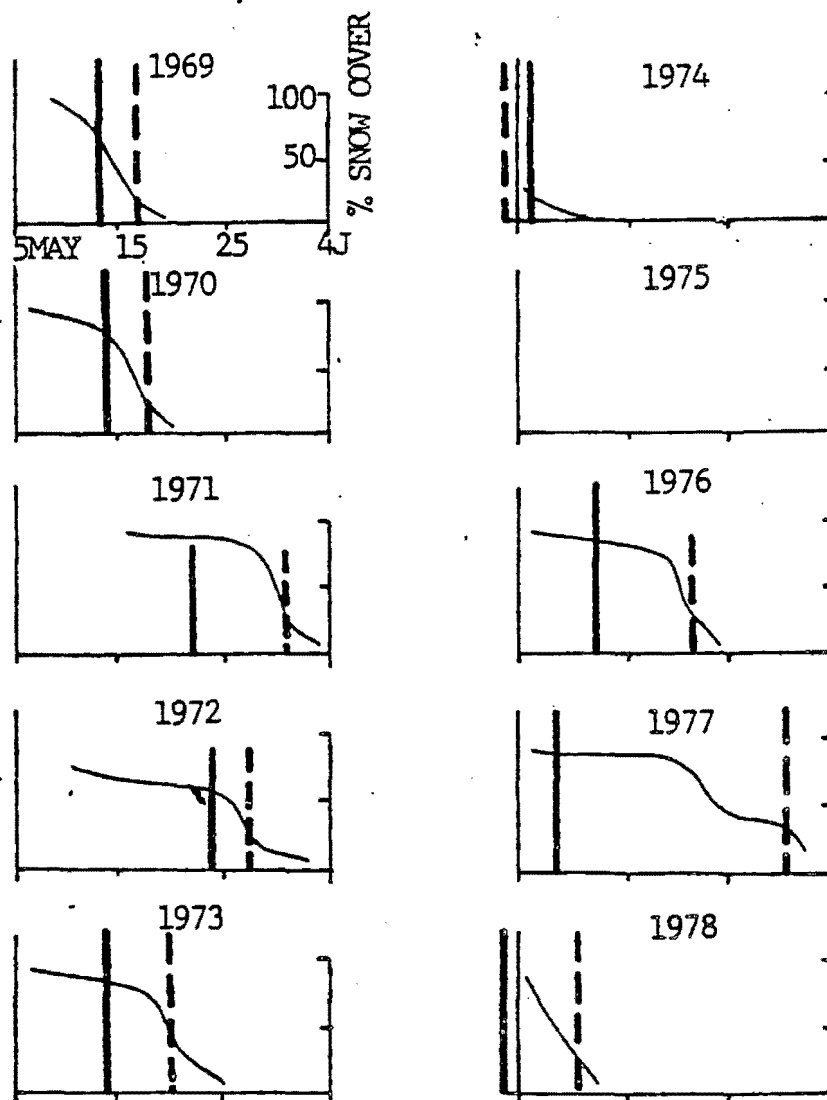
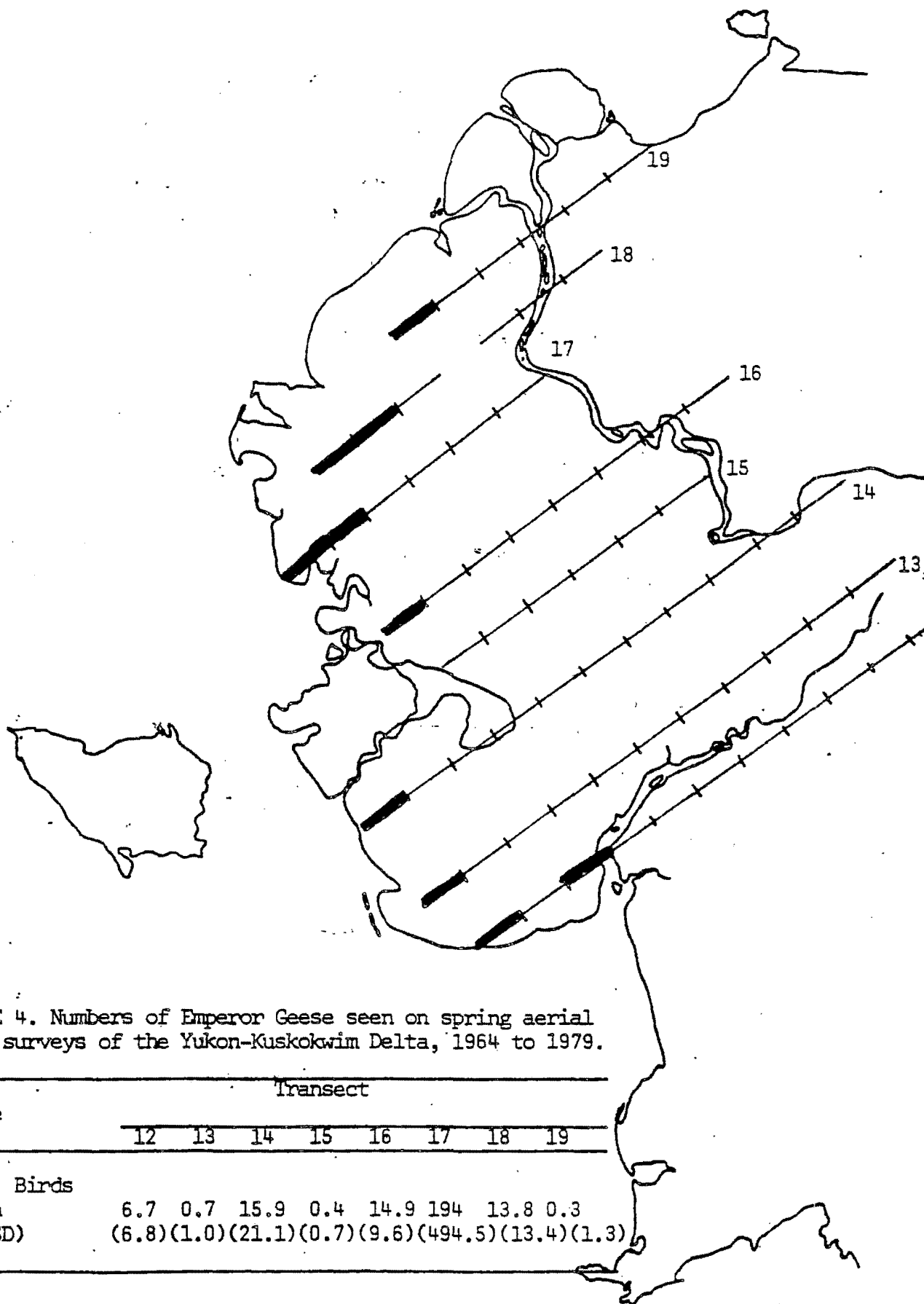


FIGURE 3. Relationships Between Emperor Goose Arrival Dates (—), Snow Cover (---), and Nest Site Availability Dates (· · ·) on the Onumtuk Study Area, Yukon-Kuskokwim Delta.





Transect segments where Emperor Geese have been seen.

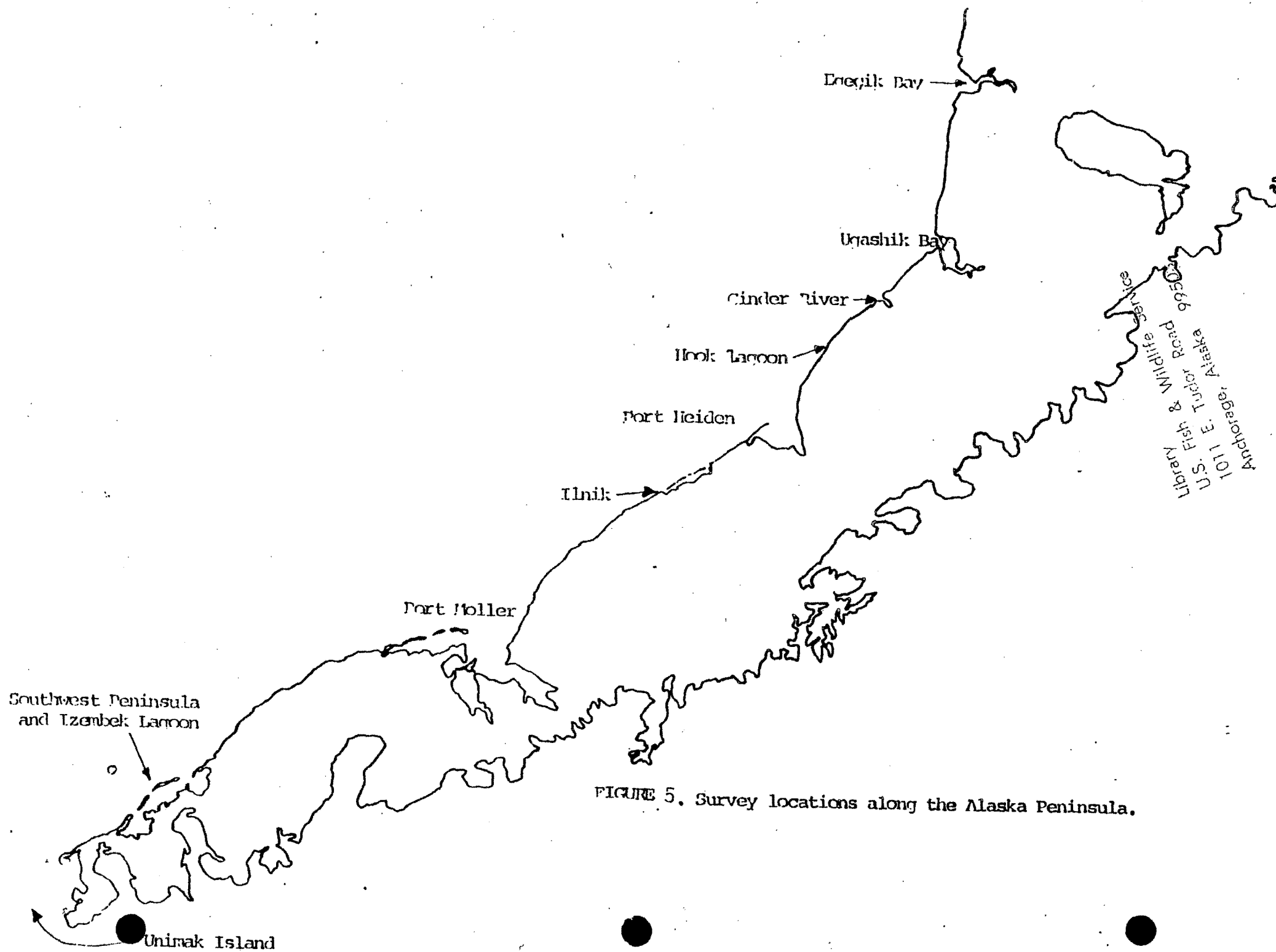


FIGURE 5. Survey locations along the Alaska Peninsula.