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Documentation of Active Peregrine Falcon Nest Sites

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Research Final Report
15 June 1990–14 June 1991
Project SE-2-5**

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Study Title: Documentation of Active Peregrine Nest Sites

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SUMMARY

For the fourth consecutive year, portions of the western Alaska coast were surveyed for nesting peregrine falcons (*Falco peregrinus*). In the Norton Sound/southern Seward Peninsula area, 25 sites were occupied by pairs of peregrine falcons. A reconnaissance survey of eastern Kotzebue Sound found peregrine falcons at 4 sites. A similar initial survey of northern Bristol Bay did not locate any peregrine falcons, although a nesting pair was reported from a site not covered in the survey.

Young were observed at 20 sites in Norton Sound/southern Seward Peninsula and at 1 site in eastern Kotzebue Sound. An average of 2.5 young were counted in successful nests.

Twenty-nine young were banded with U.S. Fish and Wildlife Service bands. No band returns were reported during the past year.

Prey remains, and feather (to determine levels of trace metals) and blood samples (for genetic analysis) were collected. Results from analyses of these samples are not yet available.

Key Words: Bristol Bay, *Falco peregrinus*, Kotzebue Sound, nesting, Norton Sound, peregrine falcon, productivity, Seward Peninsula, Western Alaska.

CONTENTS

SUMMARY	i
BACKGROUND	1
OBJECTIVES	2
STUDY AREA AND METHODS	2
RESULTS AND DISCUSSION	3
Survey Coverage	4
Nesting Territories	4
Norton Sound/Southern Seward Peninsula	4
Bristol Bay	4
Kotzebue Sound	4
Productivity, Banding, and Nesting Phenology	6
Samples Collected	6
Other Raptors	7
CONCLUSIONS AND RECOMMENDATIONS	7
ACKNOWLEDGMENTS	7
LITERATURE CITED	7
FIGURE	8
TABLES	9

BACKGROUND

The peregrine falcon (*Falco peregrinus*) is a cosmopolitan species that attracted international concern in the 1960s when drastic declines were reported in breeding populations in Europe and North America (Hickey 1969). Two of the 3 subtaxa recognized in Alaska (White 1968) were included on endangered species lists. The American peregrine falcon (*F. p. anatum*) inhabits the boreal forests and is classified as endangered by both the Federal and State governments. The arctic peregrine falcon (*F. p. tundrius*) occurs in northern tundra regions. Although it is listed as endangered by the State of Alaska, it was reclassified from endangered to threatened by federal authorities in 1984. Peale's peregrine falcon (*F. p. pealei*), the third subtaxa in Alaska, is found in coastal regions of the state from the Aleutians south through the Gulf of Alaska and southeastern Alaska. Unlike the first two that are long-distance migrants wintering as far south as Argentina, Peale's falcons are year-round residents of Alaska or short-distance migrants along the west coast of North America and are not classified as threatened or endangered.

As part of a national program to restore peregrine falcon populations, the U.S. Fish and Wildlife Service (USFWS) established the Alaska Peregrine Falcon Recovery Team to develop a recovery plan for American and arctic peregrine falcons (U.S. Fish and Wildlife Service 1982). The plan recognized the importance of monitoring

population trends, identifying nesting habitats and prey species, and protecting nesting areas from incompatible human activities.

An interagency committee determined that current information was needed on the status of nesting peregrine falcons on the western coast of Alaska (Hughes 1986). Initial surveys of portions of that area found a surprisingly large number of peregrine falcons (Wright 1987). In addition to providing basic distribution and abundance information on an endangered species, this study was conducted to determine the exposure of nesting peregrine falcons in coastal western Alaska to toxic trace metals, and to gather information on the genetic relationship of this population which inhabits an area on the boundary separating the ranges of 2 endangered subtaxa.

OBJECTIVES

The objectives of the 1990 field study were to locate nesting territories occupied by peregrine falcons along the coast of western Alaska, determine productivity, band nestlings, collect prey remains, collect feather samples from nestlings for toxic trace metal analysis, and collect blood samples from nestlings for genetic analysis.

STUDY AREA AND METHODS

In June and July 1990, potential peregrine falcon nesting habitat was surveyed in 3 areas along the coast of western Alaska (Fig.1). The Norton Sound/southern Seward Peninsula coast was searched from Stuart Island, at the southern edge of Norton Sound, to Cape Prince of Wales, at the western tip of Seward Peninsula. In addition to the outer coast of the mainland, the survey included Stuart, St. Michael, and Whale Islands; Norton Bay, except for the low coast around the head of the bay near Koyuk; Golovin Bay; Sledge Island; Port Clarence, except for the low spit leading to Pt. Spencer; Grantley Harbor, and Tuksuk Channel. Portions of this area were first surveyed in 1987 by the Alaska Department of Fish and Game (ADF&G) (Wright 1987), and the majority of this coast, from just south of Unalakleet to Wales, has been surveyed each year since 1988 (Wright 1988, 1990).

Two additional areas (Bristol Bay and Kotzebue Sound) were surveyed for the first time in 1990 during single visits by helicopter. On 21 May the northern portion of the Bristol Bay coast was surveyed, along the mainland from Tvativak Bay, on the south edge of Kulakak Bay, to the west around Cape Newenham, to Castle Rock on the western corner of Security Cove (certain sea cliffs in the Togiak National Wildlife Refuge were avoided because of colonial nesting seabirds). The shorelines of Hagemeister, High, Crooked, and Summit Islands were also covered. On 9 and 10 July the eastern part of Kotzebue Sound was surveyed, from Kotzebue south along the west coast of the Baldwin Peninsula to the Choris Peninsula, Chamisso Island,

and the shore of the northern Seward Peninsula from just west of Kiwalik Lagoon to Cape Deceit near Deering.

The first flights, in late May or early June, were to determine the presence or absence of peregrine falcons at probable nesting sites. Using a Bell 206 or Hughes 500 helicopter, a pilot and 2 or 3 observers flew along the coast. Particular attention was paid to known nesting sites, but whenever a cliff or bluff was encountered we slowed down to scrutinize potential nesting habitat closely. Repeated passes and, occasionally, landing and observing with binoculars and spotting scopes were required to cover some high cliffs adequately. Where large concentrations of cliff-nesting seabirds were present, we landed the helicopter inland and approached the cliffs on foot to minimize disturbance to the seabirds. Observations of falcons and other birds were recorded on this first survey, but no concerted attempt was made to pinpoint nest sites.

July surveys were timed to gather information on productivity. As in the first survey, a pilot and 2-3 observers in a helicopter flew along the coast searching potential nesting habitat. However, on this survey we landed when peregrine falcons were observed, so the exact location of nests could be determined (because of time and fuel constraints, we were unable to stop at all locations where peregrine falcons were observed in the Kotzebue Sound area). When a nest was found or suspected, we climbed to the site to count and, when possible, band nestlings. Young were banded with USFWS lock-on aluminum leg bands and an additional color band (rivet-on, blue anodized aluminum with alpha-numeric code). If the secondary wing feathers of nestlings were sufficiently developed, 1-1.5 cm of a feather tip was taken for trace metal analysis. A 0.1-0.2 ml blood sample was drawn from selected nestlings for genetic analysis. Prey remains were collected in the vicinity of the nests.

Observations were recorded on 1:63,360- and 1:250,000-scale U.S. Geological Survey maps. Activity, productivity, and nest site characteristics were recorded on Raptor Observation Record Cards. The maps, cards, banding data, and feather and blood samples were deposited with the USFWS Endangered Species Branch, Northern Alaska Ecological Services office in Fairbanks.

RESULTS AND DISCUSSION

Survey Coverage

Approximately 850 miles (1,370 km) of coastline were surveyed; 550 miles (885 km) in the Norton Sound/southern Seward Peninsula area, 213 miles (343 km) in northern Bristol Bay, and approximately 90 miles (140 km) in eastern Kotzebue Sound.

Because of poor weather and mechanical problems with the helicopter, the July Norton Sound/southern Seward Peninsula survey was conducted in 2 periods, 10-12 July and 28-31 July.

Nesting Territories

Norton Sound/Southern Seward Peninsula

In the Norton Sound/southern Seward Peninsula study area, 27 sites were occupied by pairs of peregrine falcons. Single birds occupied 10 additional locations (Table 1). The average straight-line distance between occupied territories was 20 miles (33 km).

On our first survey of a limited portion of this area in 1987 (conducted during a single visit in early to mid-July, primarily using a skiff), peregrine falcons were seen at 6, or possibly 7, sites. For comparison, in 1988 when the area was first surveyed from a helicopter (with 2 visits, one in June and a second in July), peregrine falcons were found at 12 sites in the same area. During visits by helicopter in 1989 and 1990, 17 and 20 sites, respectively, were observed occupied.

Bristol Bay

No peregrine falcons were seen during the survey in Bristol Bay, although a pair was reported regularly in recent years at a site within the Togiak National Wildlife Refuge avoided in this survey because of colonial nesting seabirds (Togiak National Wildlife Refuge staff, 1990, pers. commun.). One gyrfalcon (*Falco rusticolus*) was seen during the survey within a few miles of the reported peregrine falcon site, and nesting bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles were common along the coast.

Kotzebue Sound

Peregrine falcons were seen at 4 sites. One nest was found, and a defensive pair was seen at a second location. Single birds were observed at the other 2 sites.

As in Bristol Bay, Kotzebue Sound was only visited once; therefore, results are not comparable with areas where surveys are conducted in both June and July. Birds may have been missed on these single-visit surveys, especially in Kotzebue Sound where we were unable to survey thoroughly because fuel was low at the survey's end near Deering.

Productivity, Banding, and Nesting Phenology

Young were observed at 21 sites in July. Twenty of these were in Norton Sound/southern Seward Peninsula, and the other in Kotzebue Sound.

A minimum of 53 young were seen, 50 in Norton Sound/southern Seward Peninsula and 3 in Kotzebue Sound. In the Norton Sound/southern Seward Peninsula area, we were unable to count the number of young in brood, and at 3 sites we saw 2 young but were unable to get an unobstructed view to ensure that all young were counted. Productivity averaged 2.7 young per nest for the 17 successful nests where all young were counted. Including the 3 nests where some young may have been hidden from view (and where at least 2 were seen in each nest), productivity averaged 2.6 per successful nest. Calculated on the basis of young per total pairs observed ($n = 27$), productivity in Norton Sound/southern Seward Peninsula averaged 2.0 young. The single nest observed in Kotzebue Sound held 3 young.

Data from this year are compared with productivity information from 1987, 1988, and 1989 in Table 2. Caution should be used in drawing conclusions from these productivity data because nests were not found at some sites (and therefore young, if present, were not counted), and the dates of July surveys and the phenology of peregrine falcon breeding were not consistent (so nests may have been visited up to 2 weeks later in some years, increasing the likelihood that fewer young would survive to be counted and that adults might abandon sites; or conversely, increasing the conspicuousness of the young in the nest). These and other factors cloud inter-year comparisons.

Twenty-nine nestlings from 11 nests were banded. In the past 4 years a total of 91 nestling peregrine falcons have been banded in the study area. No band returns have come to our attention in the past year. In late April 1988, a peregrine falcon banded as a nestling in Norton Sound in July 1987 was trapped and released at Padre Island, Texas during spring migration.

Nestlings observed at 4 nests on 10-11 July were estimated to be from 10 to 15 days old, and 2 of 3 young at another nest started flying on 29 July. Calculated dates for initiation of laying, hatching, and fledging were 13-25 May, 19 June-1 July, and 29 July-10 August, respectively [calculations based on (1) 7 days for laying a complete clutch of 4 eggs; (2) 34 days for incubation beginning 4 days after laying first egg; and (3) 40 days from hatching to fledging].

Samples Collected

Prey remains were collected from nesting territories but have not been analyzed. Feather samples were collected from 13 nestlings from 5 nest sites for a study of toxic trace metals. Blood was drawn from 10 young from 10 separate nests for use

in studying the taxonomic relationships of peregrine falcons in western Alaska. Results from the trace metal and genetic studies are not yet available.

Other Raptors

In the course of this peregrine falcon survey, the presence of other birds of prey was noted. The following species were seen: gyrfalcon (10 sites in Norton Sound/southern Seward Peninsula, 1 site in Bristol Bay, none in Kotzebue); merlin (*Falco columbarius*) (2, 0, and 0; by area in same order as above); rough-legged hawk (*Buteo lagopus*) (5, 2, and 7); golden eagle (5, 3, and 0); bald eagle (0, 11, and 0); and common raven (*Corvus corax*) (22, 3, and 2).

CONCLUSIONS AND RECOMMENDATIONS

Peregrine falcons are widely distributed and fairly abundant throughout the Norton Sound and southern Seward Peninsula coastal area. Additional nesting pairs were found in the extreme southern corner of Norton Sound as survey coverage was expanded to cover that portion of the coast for the first time. Initial reconnaissance surveys were also conducted in eastern Kotzebue Sound, where peregrine falcons appear to be fairly common, and northern Bristol Bay, where no peregrine falcons were observed but reports indicate 1 site was occupied.

Prey remains and samples for trace metal and genetic analyses were collected, but results are not available at this writing. Concern over mercury in nearshore waters and sediments suggests that monitoring of mercury levels in feathers of nestling peregrine falcons be continued. This is a simple and inexpensive method of measuring trace minerals in a species foraging at the top of the marine food chain.

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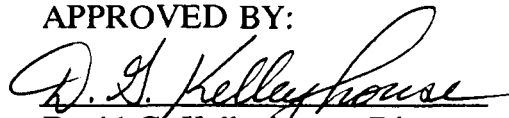
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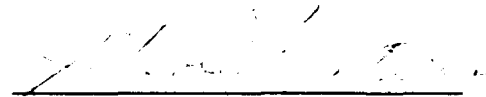
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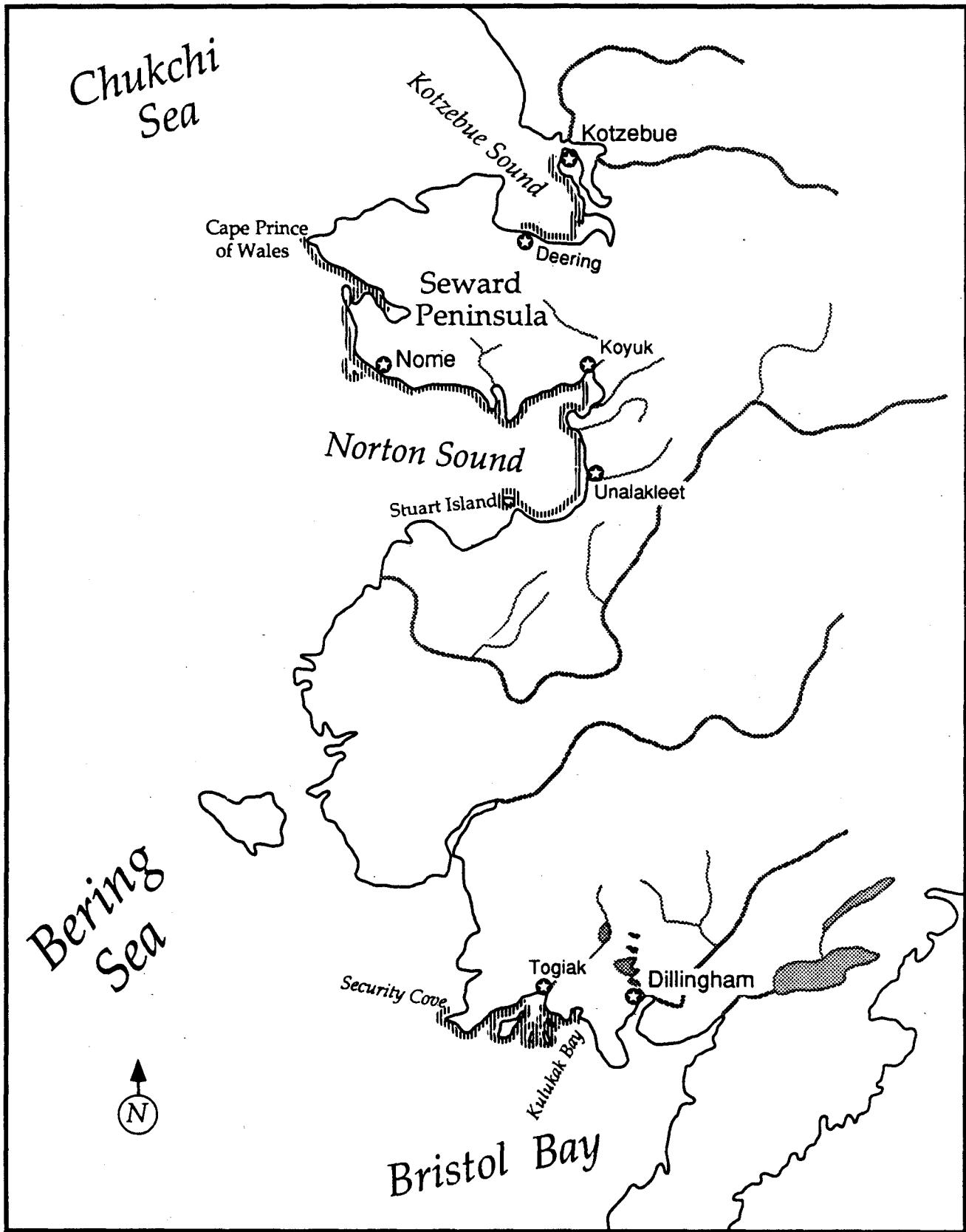


Figure 1. Areas surveyed in coastal western Alaska [hatch lines (————) represents survey routes].

Table 1. Peregrine falcon observations^a along the coast of western Alaska, 1987-90.

Site	1987		1988		1989		1990	
	July	June	July	June	July	June	July	
<u>Norton Sound/southern Seward Peninsula</u>								
1						Pair	4 yng	
2						Pair	4 yng	
3						Pair	3 yng	
4		1 ad	Pair,3 yng	None		1 ad	Pair,3 yng	
5		None	None	None	1 ad,4 yng	1 ad	1 ad	
6		2 ad	1 ad	Pair	1 ad	None	None	
7		None	None	None	Pair	1 ad	None	
8		None	None	None	Pair,2 yng	1 ad	None	
9		Pair	2-3 ad					
10	None	Pair	None	1 ad	1 ad	1 ad	1 ad,3 yng	
11	Pair,4 yng	Pair	Pair,2 yng	Pair	1 ad,2 yng	1 ad	Pair,3 yng	
12	None	None	None	None	None	1 ad	Pair	
13	None	None	None	1 ad	Pair	None	1 ad	
14	None	None	None	None	None	1 ad	None	
15	None	None	None	None	None	Pair	Pair	
16	None	None	None	None	None	1 ad	1 ad	
17	Pair	Pair	Pair,3 yng	1 ad	1 ad,2 yng	None	None	
18	None	None	None	None	1 ad	1 ad	Pair,1 yng	
19	Pair,4 yng	1 ad	Pair,2 yng	None	Pair,2 yng	None	Pair,1 yng	
20		None		None		1 ad		
21	None	1 ad	Pair,3 yng	1 ad	1 ad,2 yng	Pair	Pair,2 yng	
22		None				1 ad,incub	None	
23		None				1 ad	1 ad	
24		None				Pair	1 ad,2(+?)yng	
25		1 ad	Pair,4 yng	None	None	1 ad	1 ad	
26		Pair	Pair	1 ad	Pair	1 ad	None	
27		None	None	None	Pair	1 ad	None	
28	Pair ^b	1 ad	Pair	Pair	1 ad,2 yng	1 ad	1 ad, 2 yng	
29	None	None		1 ad	None	None	Pair,3 yng	
30	None	None	None	None	None	1 ad	None	
31	None	1 ad	Pair,3 yng	Pair	Pair,2 yng	None	None	
32	None	None	None	None	Pair,2 yng	Pair	1 ad,2 yng	
33	None	None		None		Pair,def	Pair,3 yng	
34	1 ad	None	None	Pair	Pair	Pair,incub	1 ad	
35	Pair,4 yng	1 ad	Pair,1 yng	1 ad	Pair,2 yng		1 ad,2(+?)yng	
36	None	None	None	Pair	None	1 ad	1 ad	
37	None	Pair	Pair,2 eggs	None	1 imm	None	None	
38			Pair,1 yng	Pair	Pair	Pair	Pair	
39	Pair,1 yng	1 ad	Pair,1 yng	Pair	1 ad,0 yng	None		
40	Pair,3 yng	Pair	Pair,4 yng	Pair	Pair,4 yng	Pair	4 yng	
41	None	1 ad	Pair,3 yng	Pair	1 ad,4 yng	Pair	2 yng	
42		None	1 imm	None				
43		1 ad	Pair,4 yng	None	Pair,3 yng	Pair	1 ad,4 yng	
44		None	None	1 ad	None	Pair	Pair,2(+?)yng	
45		1 ad	Pair	Pair	Pair,2 yng	Pair,incub	1 ad,?#yng	
46		None	1 ad	None	None			
<u>Kotzebue Sound</u>								
47	None						None	
48							Pair	
49							1 ad	
50							Pair, 3 yng	
51							1 ad	
52	None							

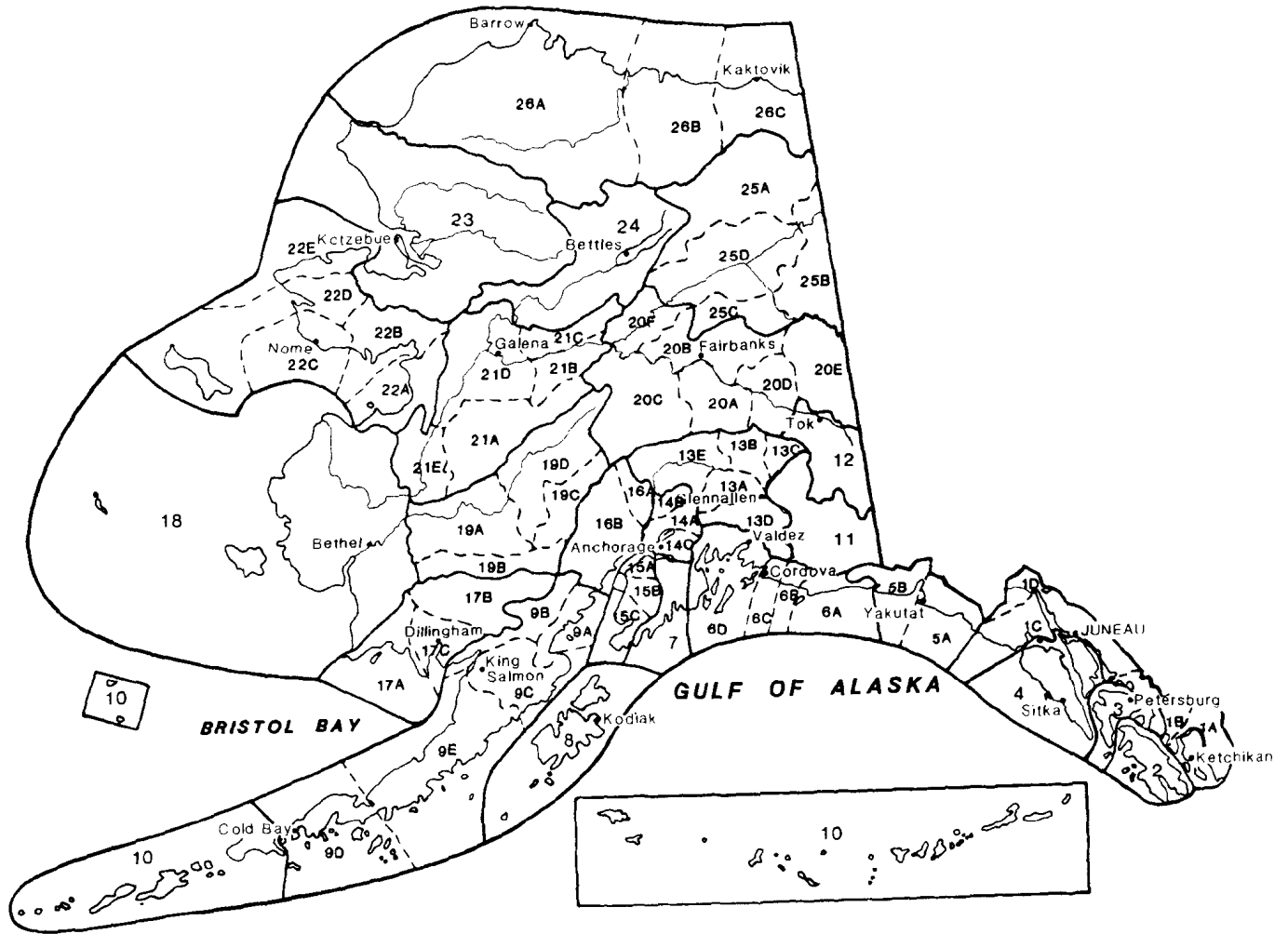
^a Blank = not visited, yng = young, ad = adult, incub = incubating, imm = immature.

^b Probable sighting.

Table 2. Territory occupancy and productivity of peregrine falcons along the coast of western Alaska, 1987-90.

Year	Occupancy		Nestling productivity				
	No. of pairs	No. of singles	No. of pairs with young	% pairs with young	No. of young	Young/pair	Young/successful pair
1987	6	0	4	67	12	2.0	3.0
1988	19	1 or 2	13	68	34	1.8	2.6
1989	23	2	14	61	35	1.5	2.5
1990	27	10	21	78	53	2.0	2.5

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