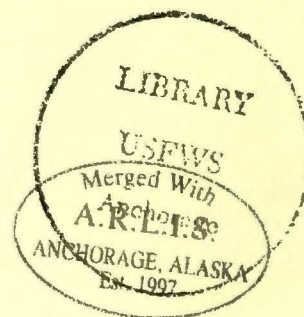


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A Final Report of the
Peregrine Falcon Surveillance Program
Between Circle, Alaska and the Alaska-Yukon Border, 1978.



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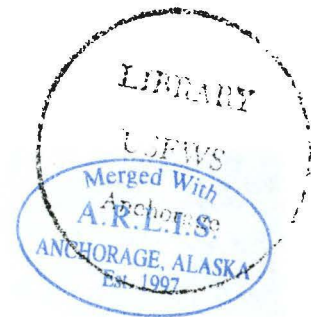
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INTRODUCTION

In 1977, a surveillance program on Peregrine Falcons (Falco peregrinus anatum) was initiated on the upper Yukon River (Ambrose and Curatolo, 1977). The program was continued in 1978 and this paper reports on the results of that year's activities.

The objectives of the program are:

- (1) To monitor and minimize human disturbances on the Peregrine Falcon population nesting along the upper Yukon River;
- (2) to obtain population and behavioral data pertinent to the management of Peregrine Falcons;
- (3) and to locate and identify public use within the study area.

STUDY AREA

The study area, approximately 166 miles (267 km), included that portion of the upper Yukon River between the Alaska-Yukon border and Circle, Alaska and the adjacent cliffs, bluffs, islands and lowlands (Appendix D).

METHODS

Field work included the following dates: 21 May - 1 June, 28 June - 29 July, 8 August - 11 August, and 22 August - 25 August. Transportation was provided by two motorized canoes. Boats were launched at either Circle or Eagle, Alaska. One biologist monitored activities between Circle and the Charlie River and the other between the Charlie River and the Alaska-Yukon border. A total of 34 camps were used.

Observations were made with binoculars and variable power spotting scopes. No attempts were made to climb to eyries until late August when all young had fledged, except in one case to return a chick to the wild. Camps were located at a distance of at least 1/2 mile from active eyries to minimize disturbance. Location of all active eyries, raptors, and fishnets were plotted on 1:63,360 USGS topographical maps.

RESULTS and DISCUSSION

Human Activity

There appeared to be a slight increase in river traffic during May, 1978 (11 boats, 20 people) as compared with May, 1977 (6 boats, 10 people) (Ambrose and Curatolo, 1977). During comparable dates in July, traffic decreased in 1978 as compared with 1977 (30 boats, 64 people vs. 48 boats, 93 people). There appeared to be fewer organized floats in 1978, such as the army maneuvers, and geology class observed in 1977.

Although the total numbers decreased, there appeared to be an increase in residential use of the river. This can best be exemplified by the number of fishnets observed (Table 1). Sixteen nets were observed in 1977 (Ambrose and Curatolo, 1977) as compared to 38 in 1978 for the same stretch of river. Most fishnets in the study area were owned by local residents. Nine of the 19 occupied cliffs had a fishnet within one mile (1.6 km). Four nets were directly below an active scrape. Gillnetting could provide a source of harassment since many prime netting locations are in eddies formed beneath rock cliffs. The increase in fishing provides for a greater chance for a net to be placed close to a pair of birds which may not tolerate daily visits of the fisherman.

There were a total of 102 aircraft sightings (91 fixed-wing, 11 helicopter) in the study area. Low flying aircraft may present a potential for harassment. Eighteen of the 91 fixed-wing aircraft were observed flying below 500 feet. Six sightings were of the same aircraft, a Cessna 206 (N29109), which was based at the gold mine on Coal Creek. Of the six, three produced some reaction from nesting Peregrines (Appendix B). Aircraft in the area which have a tendency to be flown low and along the same route as in the above case may be a continual source of disturbance throughout the breeding season.

Table 1. Observations of fishnets between Circle, Alaska and the Alaska - Yukon Border.

Date Observed	Location Mi (km) From Alaska-Yukon Border	River- bank	Nets Within One Mile (1.6 km) of an Occupied Cliff
5 July	0.5 (0.8)	N	
2 July	1.1 (1.8)	S	
7 July	2.2 (3.5)	S	0.0 (0.0)
2 July	3.2 (5.2)	S	
2 July	3.4 (5.4)	S	
2 July	4.0 (6.4)	S	
6 July	8.1 (13.0)	N	
1 July	10.4 (16.7)	N	
1 July	10.4 (16.7)	N	
1 July	10.4 (16.7)	N	
14 July	11.6 (18.7)	S	
1 July	12.4 (20.0)	S	
14 July	12.5 (20.1)	S	
1 July	14.0 (22.5)	S	
14 July	18.5 (29.8)	N	
14 July	20.0 (32.2)	N	
14 July	21.3 (34.3)	N	
14 July	23.8 (38.3)	S	0.2 (0.3)
14 July	23.9 (38.5)	S	0.1 (0.2)
6 July	28.0 (45.1)	N	
14 July	34.0 (54.8)	N	
14 July	35.0 (56.4)	S	
6 July	44.2 (71.2)	S	
7 July	48.7 (78.4)	N	0.7 (1.1)
30 June	56.8 (91.5)	S	0.2 (0.3)
30 June	57.0 (91.8)	S	0.0 (0.0)
25 July	71.2 (114.7)	S	
25 July	72.3 (116.4)	S	
10 July	73.5 (118.4)	N	0.6 (1.0)
30 June	74.5 (120.0)	S	0.4 (0.6)
30 June	74.7 (120.3)	S	0.6 (1.0)
23 July	87.5 (140.9)	S	0.0 (0.0)
23 July	88.5 (142.5)	S	1.0 (1.6)
10 July	89.4 (144.0)	S	
15 July	113.3 (182.4)	S	0.0 (0.0)
6 July	125.7 (202.4)	N	1.0 (1.6)
6 July	125.9 (202.7)	N	

Population Status

There were 19 cliffs occupied by Peregrines in 1978: 16 pairs and 3 lone adults (Table 2). Fourteen pairs fledged 28 young for an average of 1.75 young per starting pair. Young were never seen at the two sites that failed to fledge young. Because of the late start of field work (28 June), we do not know if these pairs attempted to nest, nor do we know how many other young hatched but failed to fledge. In 1977, 4 young of 25 observed died of natural causes,

The total number of adults seen in 1978 was higher than ever recorded for this portion of the river. The number of young fledged per starting pair is equal to the highest ever recorded (1.75). Between Eagle and Circle, the previous high was 15 pairs with 26 young in 1966 (Cade, 1968). The decline was gradual to the lowest point in 1973, of 10 pairs with 16 young (Ritchie, 1976). A gradual rise now has the population at 15 pairs, 26 young and 3 lone adults for 1978 (Table 3).

Major (intensive) biological studies occurred 1966, 1967, 1968 and 1970, mainly to document the presence of persistent pesticides (Cade and Fyfe, 1970). Population surveys were done in 1971, 1973, 1975, 1977 and 1978. In 1972, the United States banned nearly all applications of DDT, and in 1974, Aldrin and Dieldrin. Now, six

years later, we have observed an increase in the Peregrine population and production. In Europe, several countries in the early 1960s restricted the use of DDT and other organochlorines, and during the late 1960s, higher numbers of Peregrines and improved breeding success was observed in Britain (Newton, 1976). The increase in the population is encouraging, but to document a real recovery will take several years of observation. Of three major areas in Alaska with documented use by Peregrines, the Tanana River, the Colville River and the Upper Yukon River, only the Upper Yukon is now at or near the population level first recorded. The Upper Yukon was also the only area to never lose the majority of its breeding population. Both the Tanana and the Colville populations fell to about 25% of the first recorded population, and now each has shown a marked improvement from the lowest years of the early 1970s (Ritchie, Pers. Comm.) (Todd, Pers. Comm.).

Table 2. A summary of Peregrine Observations, 1978.

LOCATION ¹	ADULTS OBSERV.	YOUNG OBSERV.	YOUNG FLEDGED	APPROX. DATE FLEDGED	EYRIE ² LOCATION	ACCESSI- BILITY ³	COMMENTS
2.2	2	2	2	26 July	---	WR	Border
24	2				---	R	Calico
48	2	4	4	22 July	Yes	R	Montauk
52.5	1				---		Trout Creek
57	2	2	2	27 July	Yes	WR	Nation
60.2	2	4	4	6 Aug.	---	R	Nation Cabin
74.1	2	2	2	27 July	NO	R	Glenn Creek
78.7	1				---		Kathul Mtn.
87.5	2	1	1	10 Aug	---	W	Weshrinarin
93.5	2				---		Beiderman
113.3	2	1	1	28 July	Yes	R	McGregors
117.6	2				---		Woodchopper
124.7	2	1	1	?	Yes		Eureka
128.9	1				---		Thanksgiving
131.8	2	3	3	28 July	Yes	WR	Takoma
143.2	2	1	1	11 Aug.	Yes	R	Connell
147.3	2	3	3	28 July	---	R	16 Mile
152.6	2	4	4	30 July	---	WR	13 Mile
158.7	2				---	W	6 Mile
TOTAL	35	28	28				

¹miles from the Alaska - Yukon border

²Change from previous year

³W = walk, WR = walk with aid of rope, R = rope

Table 3. A comparison of Peregrine productivity between Circle, Alaska and the Alaska - Yukon Border.

Year	1973 ¹	1975 ²	1977 ³	1978
Total Number of Pairs	10	11	12	16
Number of Pairs with Young	6	9	9	13
Lone Adults	0	0	3	3
Total Number of Young Observed	16*	16*	25	28*
Total Number of Young Fledged	16*	16*	21	28*
Young Fledged per Total Pair	1.60	1.45	1.75	1.75

*Late surveys precluded observations of early mortality.

¹Ritchie, 1976 (does not include border eyrie, mile 2.2).

²Ambrose, unpublished notes (does not include border eyrie, mile 2.2)

³Ambrose and Curatolo, 1977.

Behavior

Appendix B summarizes the observations of Peregrines reacting to various stimuli. The reaction of Peregrines to avian predators were similar to those described by Cade (1960). Golden eagles appeared to elicit the greatest response, followed by ravens, other hawks and herring gulls.

Motorized boats generally were ignored or at most, watched as they passed by an occupied cliff. Aircraft produced the greatest response next to humans. Low flying planes and helicopters usually produced a reaction. On three occasions birds made rapid head jerking motions, a behavior not otherwise observed during the study. It appears possible that low passes at critical times or on a continual basis could prove to be detrimental. More data is needed on this subject.

Humans probably produced the greatest responses when they are close to an eyrie. This may be partially due to the longer time spent at a site as compared to an aircraft. The variability in individual Peregrine behavior is best exemplified by their reactions to humans. At one site (mile 147.3) both adults would circle above and scream at a person standing 1500 feet from the eyrie, while at another eyrie (mile 143.2) at least one adult did not respond to people standing 300 feet away. Individual differences in

Food Habits

The major prey species of Peregrine Falcons along the Yukon River have been identified by others (Table 4). Of these, gray jays, spotted sandpipers and common snipe have been observed to constitute nearly 30 percent of the prey items (Cade, 1960).

During this study prey items were collected from five active eyries and numerous plucking perches. On several occasions it was possible to identify the prey during the observation of a kill. Due to time constraints, the volume of the prey material, and the relative difficulty in identification the results from this section will be presented at a later date.

Table 4. Prey of Peregrines found along the Yukon River.*

KEY

Major Habitats

R=rivers, creeks
 L=lakes, ponds
 A=alpine
 W=woodland associations
 C=cliffs, banks
 B=brush
 M=meadows (dry tundra and grasslands)
 m=muskeg
 v=varied

Status

c=common
 r=regular
 b=breeding
 PR=permanent resident

Species	Major Habitat	Status
Red-necked Grebe	L	r-c,b
Horned Grebe	L	r-c,b
Black Brant		
Mallard	L,R	r-c,b
Pintail	L	r-c,b
Green-winged Teal	L,R	r-c,b
Blue-winged Teal	L	
American Widgeon	R,L	r-c,b
Shoveler	L	r-c,b
Canvasback	L	r,b
Lesser Scaup	L,R	r-c,b
Common Goldeneye	L,R	r-c,b
Bufflehead	L,R	r-c,b
Oldsquaw	L	r
Harlequin Duck	R	r,b
White-winged Scoter	L,R	r,b
Surf Scoter	L,R	r-c,b
Red-breasted Merganser	L,R	r,b
Sharp-shinned Hawk	W	r,b
Kestrel	W,B	r-c,b

Table 4 (Continued).

Species	Major Habitat	Status
Spruce Grouse	W	PR
Ruffed Grouse	B,W	PR
Common Snipe	L,m	r-c,b
Upland Plover	B,m	r,b
Spotted Sandpiper	R,G	r-c,b
Solitary Sandpiper	R,G	r-c,b
Lesser Yellowlegs	L,m	r-c,b
Least Sandpiper	B,m	r
Semipalmated Sandpiper	M	r-c
Northern Phalarope	L	r,b
Mew Gull	L,R	r-c,b
Bonaparte's Gull	L,R	r-c,b
Arctic Tern	R,L	r-c,b
Hawk Owl	W	PR
Belted Kingfisher	R	r-c,b
Yellow-shafted Flicker		
Say's Phoebe	C	r-c,b
Trail's Flycatcher		
Olive-sided Flycatcher	W	r,b
Violet-green Swallow	R,C	r-c,b
Tree Swallow	W	r-c,b
Bank Swallow	R,C	r-c,b
Cliff Swallow	C,R	r-c,b
Gray Jay	W,v	PR
Black-capped Chickadee	W	PR
Boreal Chickadee	W	PR
Robin	W	r-c,b
Varied Thrush	W	r-c,b
Hermit Thrush	W	r-c,b
Swainson's Thrush	W	r-c,b
Graycheeked Thrush	W	r-c,b
Townsend's Solitaire	A,W	r,b
Water Pipit	A	r-c,b

Table 4 (Continued).

Species	Major Habitat	Status
Bohemeinian Waxwing	W	r-c,b
Orange-crowned Warbler	W	r-c,b
Yellow Warbler	R,B	r-c,b
Northern Waterthrush	R,W	r-c,b
Rusty Blackbird	L,m	r-c,b
Pine Grossbeak	W	PR
Common Redpoll	W	PR
White-winged Crossbill	W	PR
Savannah Sparrow	B	r-c,b
Slate-colored Junco	W,B	r-c,b
Tree Sparrow	B	r-c,b
White-crowned Sparrow	V	r-c,b
Fox Sparrow	W	r-c,b

*From (Ritchie, 1976), (Cade; 1968).

SUMMARY

1. River traffic appeared to decrease slightly in 1978 as compared to 1977.
2. Residential use of the river appeared to increase; 38 fish-nets were observed in 1978 as compared to 16 in 1977.
3. Nineteen cliffs between Circle and the Alaska-Yukon border were occupied by Peregrine Falcons. This included 16 pairs and 3 lone individuals.
4. Twenty-eight young fledged for an average of 1.75 young per total pair observed.
5. The majority of young fledged the last week of July; one bird fledged on 10 August.
6. Six of the seven known nest locations changed from 1977.
7. Peregrines reacted to the presence of golden eagles, ravens, other hawks, and herring gulls in a decreasing degree of response.
8. Motorized boats and high flying planes produced little reactions.
9. Humans and low flying aircraft produced the greatest response.
10. There was an apparent difference between individuals in their tolerance to intrusions and their ability to catch prey.
11. Of a total of 46 hunting attempts observed, 15 or 33 percent, were successful.

RECOMMENDATIONS

1. More study on Peregrine reactions to potential disturbances.
2. Critical Habitat designations should be pursued.
3. A vocalization study should be initiated to catalog the various vocalizations and possibly be used to determine individuals.
4. A study on prey species to determine their pesticide load and comparison to Colville population.
5. Determine a management plan for returning confiscated birds to the wild.
6. Prepare a guide for law enforcement observation of active eyries to minimize disturbance.

APPENDIX A

OBSERVATIONS OF RIVER TRAFFIC BETWEEN CIRCLE, ALASKA AND
THE ALASKA-YUKON BORDER

R = Riverboat
 C = Canoe
 MC = Motorized Canoe
 K = Kayak
 Ra = Raft
 MRa = Motorized Raft

Dates in () denote known time periods
 spent in the study area.

Res = Resident along the river
 Rec = Recreationist

Table A-1. Observations of river traffic between Circle, Alaska and the Charlie River.

Date Observed	Type of Boat	Number of People Observed	Comments
21 May	MC	2	
22 May	2 MC	2	Res
23 May	MC	1	Res
24 May	MC	2	Res
26 May	3 MRa	6	Commercial Tour (25-28 May)
28 May	R	2	
30 May	R	3	Bear Hunters (26-30 May)
1 June	C	2	Rec
TOWN			
3 July	R	2	
	2 K	2	Rec
4 July	MC	1	
	R	4	
	2 K	3	Rec
	R	2	
	R	1	
	R	1	
	K	2	Rec
5 July	R	4	Res
	R	1	Res
7 July	R	4	Rec
	K	1	Rec
	R	3	Rec
8 July	C	1	Rec
	K	4	Rec
9 July	C, MRa	3	Rec
10 July	C	1	Res
	R	2	Rec (8-20 July)
	Ra	1	Rec
	R	2	Rec
	MC	2	Rec

Table A-1(Continued).

Date Observed	Type of Boat	Number of People Observed	Comments
12 July	R	4	Rec
	R	2	Rec
14 July	R	2	Rec
15 July	R	3	Res
16 July	R	3	Res
17 July	R	1	Res
	R	1	Res
	C	1	Rec
	R	1	Res
18 July	R	4	Rec (13-26 July)
	C	1	Rec
	R	1	
	R	1	
19 July	R	3	Res
	R	1	Res
	R	1	
	R	1	Res
20 July	R	1	
	R	1	Res
21 July	R	1	Miner (21-25 July)
	C	2	Rec
22 July	C	1	Rec
23 July	Ra	3	Rec
	R	2	Res
24 July	Ra	3	Rec
	R	4	Res
27 July	R	3	Res
	C	1	Rec
28 July	C,K	4	Rec
	R	1	Res
	K	2	Rec
	C	2	Rec
TOWN			
8 August	K	1	Rec
	R	1	Res
9 August	R	2	
	R	4	
	C	1	Rec (8-10 August)
	2 K	2	Rec
	C	2	Rec

Table A-2. Observations of river traffic between the Charlie River and the Alaska-Yukon Border,

Date Observed	Type of Boat	Number of People Observed	Comments
27 June	R	2	
	R	5	Res
28 June	C	1	Rec
	3C	7	Rec
	R	2	Res
	R	4	
30 June	C	1	Rec
	R	3	Rec
1 July	2K	2	Rec
	MRa	4	
	R	3	
	R	1	Res
	3K	5	Rec
	K	2	Rec
	R	1	Res
2 July	R	3	
	R	2	Res
	MC	2	Res
	R	1	Res
	2R	5	Res
	K	1	Rec
	R	2	Res
3 July	R	4	
	R	4	
	MC	2	Res
	R	1	Res
	R	4	Rec
	R	4	Rec
	MC	2	Res
4 July	R	1	Res
	C	1	Res
	R	1	
	R	4	
	R	3	Res
	R	4	

Table A-2(Continued).

Date Observed	Type of Boat	Number of People Observed	Comments
5 July	C	1	
	R	1	Res
	R	3	Res
	R	2	Res
	R	2	
	R	3	
6 July	R	1	Res
	C	1	
	R	3	
7 July	MC	1	Res
	C	1	Res
	MC	4	Rec
8 July	MC	2	Res
	R	2	
9 July	MC, MRa	3	Rec
	R	2	
	C	2	Res
	MRa	1	Rec
10 July	R	1	
	R	2	Rec
	MC	2	
	R	2	rec
	MC, C	2	Res
11 July	R	3	Res
	R	3	Res
12 July	Ra	1	Res
	R	4	
	R	4	Rec
	R	2	Rec
14 July	R	4	Rec
	R	2	Res
	R	3	
	R	4	
15 July	R	5	Res
	C	1	Rec
	R	3	Res
	MC	1	Res
16 July	C	1	Rec
	R	2	
	R	1	Res

Table A-2(Continued).

Date Observed	Type of Boat	Number of People Observed	Comments
17 July	C	2	Rec
	R	5	Res
	Ra	1	Rec
18 July	MC	1	Res
	R	5	Res
	R	4	
	MC	3	Res
	R	6	
	R	2	
	K	1	Rec
	C	3	Res
	R	2	Rec
19 July	C	2	Rec
20 July	C	2	Rec
21 July	C,K	3	Rec
	MRa	1	Rec
	R	1	
22 July	Ra	3	
23 July	R	1	
	C	3	Res
	MRa	3	Rec
	2MC	5	Res
	R	3	Res
24 July	MC	3	Res
	MC	2	Res
	2MC	5	Rec
25 July	C,K	4	Rec
	C	2	Rec
	K	2	Rec
	R	2	Res
	R	1	Res
	MC	2	Res
	MC	1	Res
	R	5	Res
	MC	1	Res
27 July	R	2	
	R	3	
	R	3	
29, July	R	2	
	R	2	
	R	3	

APPENDIX B

BEHAVIORAL REACTIONS BETWEEN PEREGRINE FALCONS AND VARIOUS
POTENTIAL DISTURBING FACTORS

Table B-1. Reaction of Peregrine Falcons to aircraft.

Stimulus	Date	Location ¹	Distance	Comments
Twin-engine aircraft	16June77	48	3500 ft Above	One Adult - no visible reaction
Hughes 500 Helicopter	29June77	57	150 ft below & 600 ft out	Female - jerked head around quickly from side to side
Bell 206 Helicopter	2July77	74.1	2000 ft out	One adult - moved head slowly following path of helicopter
Float plane	8July78	113.3	4000 ft above 2500 ft out	One adult - bird turned around, faced plane and moved head, following the path of the plane
Cessna 206	19July78	147.3	1000 ft above 1500 ft out	One adult - bird screamed as aircraft passed
Cessna 206	19July78	152.6	400 ft Above	Three chicks - one jumped up and ran out of sight in rear of scrape, no visible reaction from other two.
Cessna 206	9Aug78	143.2	100 ft above 300 ft out	Two chicks - both watched plane go by
Single-engine aircraft	10Aug78	143.2	1500 ft above	Two chicks - no visible reaction.
Helicopter	21June77	156.7	2500 ft	One adult female - no response from bird, which was sitting on a gravel bar
Helicopter	13June77	24	400 ft above 1500 ft out	One adult - flew from bluff in front of helicopter and out of sight

¹ Miles from the Alaska-Yukon Border

Table B-1(Continued).

Stimulus	Date	Location ¹	Distance	Comments
Hughes 500 Helicopter	14June77	57	500 ft above 5000 ft out	One adult - no visible response
Hughes 500 Helicopter	16June77	48	1000 ft above 3000 ft out	One adult - Peregrine had been watching ravens, when helicopter approached, it moved its head back and forth quickly and when the helicopter was nearest, it began to stoop at the ravens
Hughes 500 Helicopter	29June77	57	1200 ft out	One adult - as helicopter flew by the bird jerked its head rapidly back and forth
Jet Ranger Helicopter	30June77	57	1200 ft out	One adult - bird screamed

Table B-2. Reaction of Peregrine Falcons to humans.

Stimulus	Date	Location	Distance	Reaction
2 Kayaks 3 People	4July78	143.2	2000 ft.	People floated by speaking very loud, adult flew from cliff, screaming.
2 People 1 Canoe 1 Dog	19July78	147.3	1500 ft.	Two adults - both adult birds flew from cliff, circled and screamed until party left.
Same	Same	147.3	2000 ft.	Same - Birds flew back to cliff, one bird intermittently screamed when a person or dog would walk around.
Same	26July78	147.3	2000 ft.	One adult - screamed from perch on cliff.
Same	27July78	147.3	Same	One adult - screamed from perch on cliff.
4 People	10Aug78	143.2	300 ft.	One adult female - caught a small bird and brought it to the eyrie, no visible response to the people.
2 People checking fishnet	23July77		----	One adult female - bird with prey flew over people en route to the bluff, it screamed when overhead.

Table B-3. Reaction of Peregrine Falcons to motorized boats.

Stimulus	Date	Location	Distance	Reaction
Riverboat	16June77	48	2500 ft.	One adult - no visible reaction
Riverboat	24June77	143.2	2500 ft.	One adult - bird watched boat go by
Riverboat	15July78	113.3	500 ft. below	One adult - man checking fishnet, no visible reaction
Canoe	17July78	131.8	2500 ft.	One adult - watched canoe motor around an island
Canoe 4 dogs on shore	10July78	48	500 ft	Pair - both birds circled over dogs as they ran along shore under eyrie, following the canoe.
Canoe	12July78	48	1500 ft.	One adult female - bird flew toward the canoe, circled overhead at about 200 ft., then returned to eyrie and dropped off a prey item which it had been carrying

Table B-4. Reaction of Peregrine Falcons to birds and mammals.

Stimulus	Date	Location	Distance	Reaction
Herring Gull	29June77	57	600 ft below	One adult - no visible reaction
Cow & calf Moose	30June77	57	600 ft below	One adult - no visible reaction
16 Herring Gulls	8July78	113.3	300 ft below	One adult - no visible reaction
4 Ravens	16July78	113.3	600 ft	One adult - attacked Ravens, made four stoops, returned to cliff
Herring Gull	18July78	131.8	1000 ft	One adult - screamed, flew above gull and left
Herring Gull	20July78	158.7	2000 ft.	One adult - flew off cliff, stooped at gull and returned
Harlan's Hawk	28June78	158.7	1000 ft	One adult female - flew after hawk, both going out of view
Harlan's Hawk	30June78	87.5	2500 ft	One adult - made a stoop at hawk
Adult Female Peregrine	6July78	48	----	Pair - adult male brought prey to adult female. It was followed by a second female. The male made several stoops at female, which left the area. Both male and second female vocalized. Resident female made no visible response

Table B-4 (Continued).

Stimulus	Date	Location	Distance	Reaction
Marsh Hawk	8July78	48	100 ft	One adult female - hawk flew by eyrie and under female, no visible reaction
Golden Eagle	15July78	57	500 ft	Pair - eagle flew over eyrie and was pursued by both adults for about 1/2 mile, at which time they returned to the cliff
Harlan's Hawk	20July78	158.7	1200 ft	One adult - Peregrine flew out to hawk, made one stoop (hawk presented it talons) and returned to cliff
Female Marsh Hawk	29June77	57	---	One adult female - chased hawk for about 1500 ft.
Female Marsh Hawk	20July77	48	500 ft above	Pair - no visible reaction
Immature Bald Eagle	4July77	117.6	2500 ft	Pair - both birds pursued eagle, caught up to it and began stooping at the bird as it flew till they were out of sight
Raven	27June78	158.7	---	One adult - made three stoops at raven
Immature Raven	15June77	48	---	One adult - stooped twice at raven
Immature Ravens	16Jully77	48	---	One adult - made 15 passes, hit raven once, raven did not fly - made 8 passes at another perched on a rock, rolled it over - another raven tried walking up the slope, Peregrine

Table B-4 (Continued).

Stimulus	Date	Location	Distance	Reaction
3 Ravens	27June77	48	1200 ft	made 7 passes Pair - Ravens were flying toward eyrie Peregrines began stooping, ravens landed, one in tree, two on a rock, ravens on the rock were knocked down the slope by repeated passes. One raven tried to fly away, one Peregrine caught the bird and they fell about 5 ft. to the ground. It immediately flew off, chased by the pair.
Raven	1July77	74.1	500 ft below	One adult - made 5 passes at raven
Raven	3July77	117.6	400 ft	Pair - both adults stooped at raven which landed
Raven	20July77	48	---	One adult - made a stoop at raven
2 Ravens	24July77	48	---	One adult male - made 6 stoops

APPENDIX C

RAPTOR OBSERVATIONS (EXCEPT PEREGRINE FALCONS) BETWEEN CIRCLE,
ALASKA AND THE ALASKA - YUKON BORDER

Raptors (except Peregrine Falcons) observed in the study area, 1978.

Species	Location		Date Observed
	MI(KM) From the Alaska-Yukon Border		
Golden Eagle (<u>Aquila chrysaetos</u>)	20	(32)	14 July
	58	(93)	30 June
	82	(132)	10 July
	124	(200)	21 July - pair and one young
Harlan's Hawk (<u>Buteo harlani</u>)	20	(32)	22 May
	30	(48)	25 July - pair
	60	(96)	24 Aug. - 2 individuals
	89	(143)	30 June
	131	(211)	29 July - pair
	144	(230)	8 Aug
	146	(235)	28 July - pair
	152	(243)	8 Aug. - 2 individuals
	156	(251)	28 June, 8 Aug.
	158	(254)	27 June - pair
Sharp-Shinned Hawk (<u>Accipiter Striatus</u>)	48	(77)	25 July
	96	(155)	19 July
	125	(201)	22 July
	130	(209)	19 July
	143	(230)	21 July
	149	(240)	25 July
	161	(258)	8 Aug.
	165	(266)	20 July
Kestrel (<u>Falco sparverius</u>)	25	(40)	25 July - pair
	36	(58)	25 July - pair
	43	(69)	6 July
	61	(98)	10 July
	84	(135)	10 July
	124	(200)	21 July - pair
	147	(237)	28 July
	155	(250)	28 June

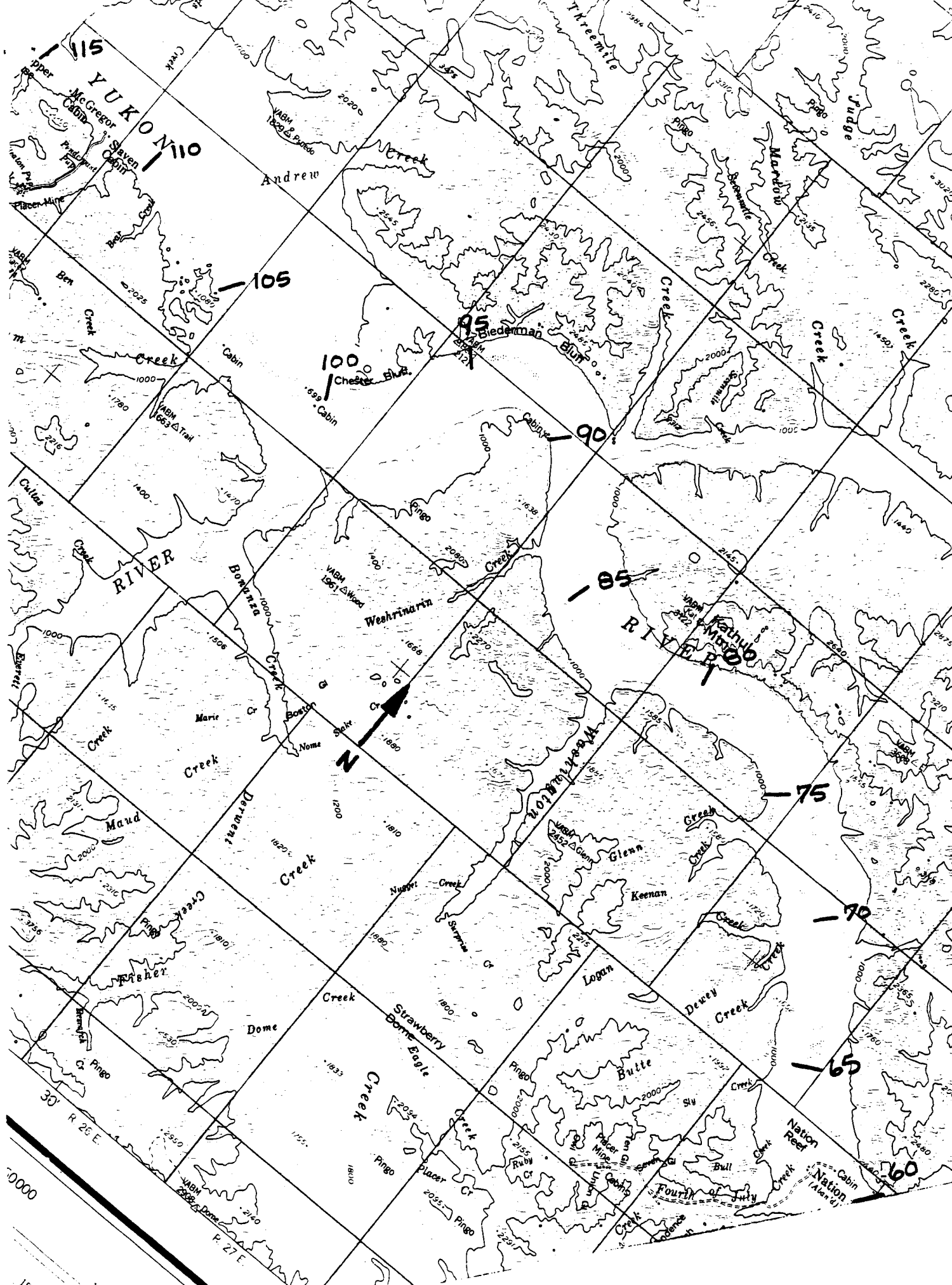
Raptors (except Peregrine Falcons) Observed in the Study Area, 1978
(Continued).

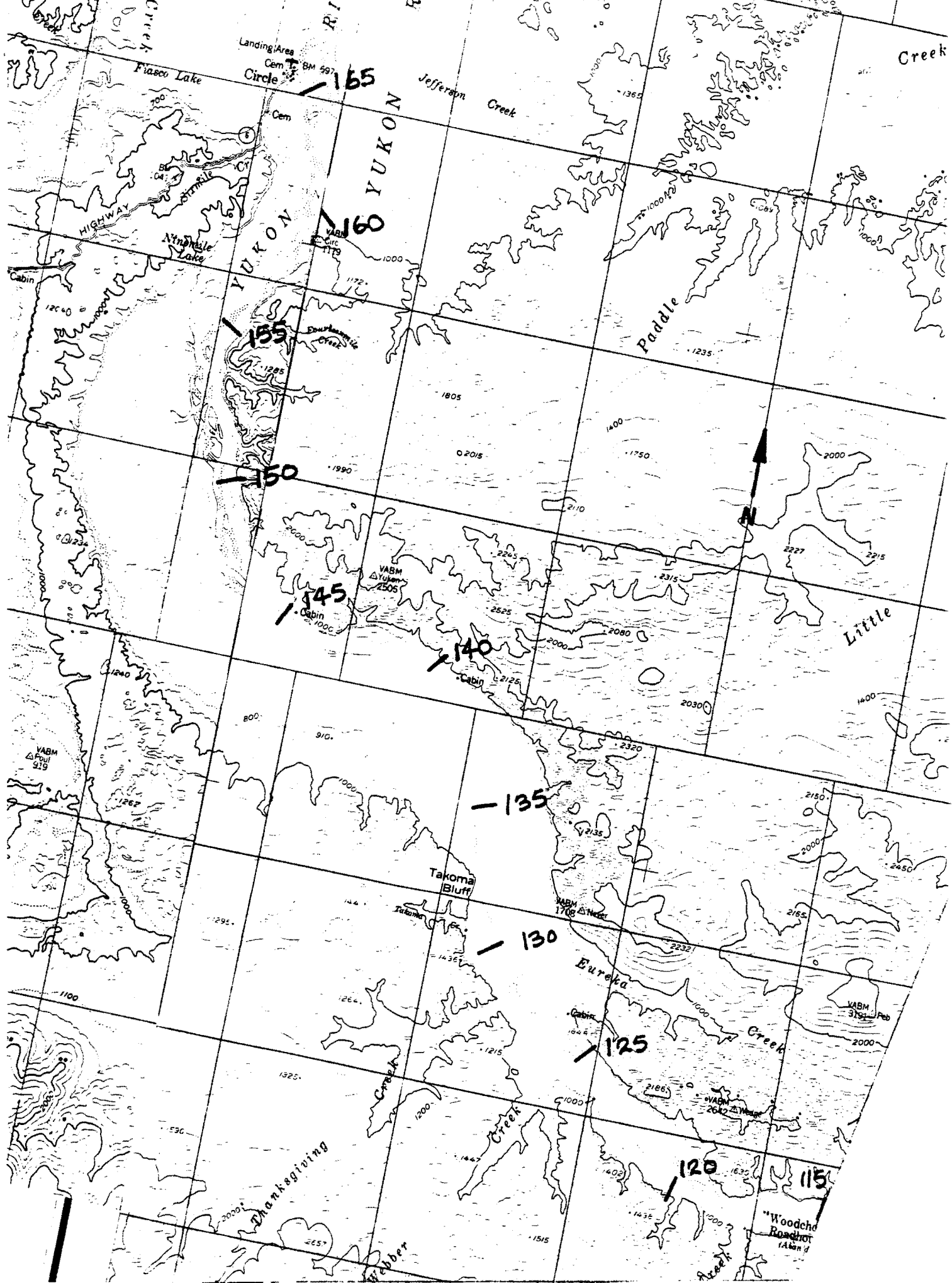
Species	Location		Date Observed
	MI(KM) From the Alaska-Yukon Border		
Marsh Hawk (<u>Circus cyaneus</u>)	43	(69)	25 July - F
	48	(77)	8 July - F
	51	(82)	13 July - F
	86	(138)	27 July - F
	94	(151)	14 July - M
	124	(200)	28 July - F
	139	(224)	20 July - 2M
	146	(235)	28 July - F

APPENDIX D

STUDY AREA







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