Alaska Department of Fish and Game
Division of Wildlife Conservation

Research Final Report
1 July 1993 - 30 June 1994

Documentation of Peregrine Falcon Nest Sites in Relation to State Land Use Proposals

by
Peter J. Bente
and
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ADF&G photo

Grant SE 2-8
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FINAL REPORT (RESEARCH)

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Project No.: SE-2-8 Project Title: Documentation of Peregrine Falcon Nest Sites in Relation to State Land Use Proposals

Study Title: Documentation of Active Peregrine Falcon Nest Sites

Period Covered: 1 July 1993-30 June 1994

SUMMARY

In 1993 we surveyed the Sagavanirktok River in northern Alaska and Tanana River in Interior Alaska to monitor the number and productivity of endangered and threatened peregrine falcons (*Falco peregrinus*). These rivers were established as representative study areas in the Peregrine Falcon Recovery Plan (U.S. Fish and Wildlife Service 1982). The study areas have a relatively long history of information on peregrine occupancy and nesting success.

On the Sagavanirktok River we observed 23 pairs and 4 lone adults. We observed 28 young and banded 26. An average of 2.55 young were in 11 successful nests. Even though the total number of occupied sites increased, the number of successful pairs and the number of young was approximately 25% lower than the number observed in 1992. Cool, rainy weather during incubation and the early nestling phase may have contributed to the lowered breeding success in 1993. One bird, raised as a nestling on the Colville River in 1991, moved to Sagwon Bluffs to breed successfully.

On the Tanana River we observed 26 pairs and 1 lone adult. We observed 62 young and banded 61. An average of 3.26 young were seen in 19 successful nests. Compared with 1992 the number of total occupied sites (n = 27) decreased by 1, and the number of total pairs (n = 26) increased by 1 pair. The increase in successful pairs (20%) combined with the high productivity per successful nest caused the large increase (59%) in the number of young produced. Favorable weather during the entire breeding season probably contributed to the increased production of young. Observations of color-banded birds (n = 17) show nestling and adult dispersal patterns. Most nestlings (n = 10) returned to their natal river to breed, moving an

average distance of 102 km from their birthplace. Nestlings and subadults (n = 4) banded on the Yukon River that relocated to the Tanana moved 230 to 660 km. Three birds banded as breeding adults on the Tanana in 1990-92 returned to the same breeding sites in all years since initial banding.

In 1994 the Alaska Department of Fish and Game plans to survey these index areas to continue monitoring the status of peregrine falcons.

Key Words: dispersal, *Falco peregrinus*, monitoring, nesting, peregrine falcon, productivity, Sagavanirktok River, Tanana River

CONTENTS

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 three subtaxa recognized in Alaska (White 1968) are listed as endangered or threatened. The American peregrine falcon (*F. p. anatum*) inhabits the boreal forests and is classified as endangered by the federal government. The arctic peregrine falcon (*F. p.*

tundrius) lives in northern tundra regions. It was reclassified from endangered to threatened by federal authorities in 1984. Both the American and arctic peregrine falcons were removed from the Alaska State Endangered Species List in 1993. Peale's peregrine falcon (*F. p. pealei*), the third subtaxon in Alaska, lives in coastal regions of the state from the Aleutians south through the Gulf of Alaska and southeastern Alaska. Unlike the first 2 populations 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 (FWS) 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. The recovery plan established 4 representative study areas (2 areas for each subtaxon) to monitor the status and recovery of the peregrine falcon in Alaska. The representative areas for the threatened arctic peregrine falcon are the Colville and Sagavanirktok Rivers. The representative areas for the endangered American peregrine falcon are the Tanana and upper Yukon Rivers. The FWS and the Bureau of Land Management (BLM) assumed responsibility for surveying all areas from 1979 to 1990. Since 1991 the Alaska Department of Fish and Game (ADF&G) has assumed the responsibility to monitor the populations on the Sagavanirktok and Tanana Rivers, with funding provided by FWS.

Roseneau *et al.* (1981) gives a comprehensive summary of numbers and occupancy of peregrine falcons on the Sagavanirktok and Tanana Rivers. Intermittent surveys from the late 1960s through the 1970s show the number of peregrines declined to 1 pair on the Sagavanirktok River in 1976 and just 2 lone adults and no pairs on the Tanana River in 1976. Annual monitoring of each study area began in 1979, and these surveys show a steady increase in numbers and productivity.

OBJECTIVES

The field study objectives for peregrine falcons in 1993 were the following:

1. Locate nesting territories
2. Determine productivity
3. Band nestlings
4. Collect prey remains
5. Append the atlas of nest cliff photographs

STUDY AREA AND METHODS

The study areas were along the Sagavanirktok River in northern Alaska and the Tanana River in Interior Alaska (Fig. 1). In 1993 we conducted 2 surveys in each study area. The first survey during the early nesting period determined the number of birds attempting to breed in the area. The second survey during the mid to late nesting period determined the number of pairs successful in rearing young. We visited nest sites during the second survey to band young and to collect samples (addled eggs, molted feathers, prey remains, etc.).

We check for nesting pairs on steep soil banks, gravel exposures, rock cliffs, and similar habitats during our survey. Whenever possible we check the area from the ground using a frontal view of the habitat. In many circumstances ground-based observations are not possible, especially during boat or raft surveys. In these situations we get the best vantage point for finding the birds or their nests.

When on the ground, we look for perched or flying birds or evidence of nest sites by carefully checking the bluff or cliff with binoculars or spotting scopes. We use a Field Model Questar spotting scope to view nest ledges from a distance without disturbing the birds. It is common to document occupancy by finding incubating birds with the Questar scope. Since peregrines respond vocally to intruders in their nesting areas, listening for defensive calls or courtship calls is an important survey technique in suitable conditions. Wind, rain, river noise, or other loud noises often obscure faint or distant calls of the birds. Climbing the area is sometimes necessary to help locate birds or their nest sites. If birds are present, our activities are performed quickly to minimize disturbance to nesting pairs. If birds are not located, we remain in the area as long as possible to hear or see birds in their normal activities. The FWS recommends 4 hours of observation to determine occupancy and nesting status; however, this is sometimes not achieved at potential nest locations because of the large area to be surveyed in a short time. When peregrine falcons are observed, the exact location is plotted on photographs or maps of the area.

During the second survey we climb to nest sites using standard rock climbing techniques. We count and band nestlings, collect prey remains, addled eggs, and other samples from the vicinity of the nest site. Nestlings are banded with FWS lock-on aluminum leg bands on the right leg and an auxiliary marker color band on the left leg. The color band is an anodized aluminum, riveted leg band that has an engraved alphanumeric code. Two colors are used following the protocol developed by the FWS: arctic peregrine falcons are banded with blue bands and American peregrine falcons are banded with black bands. The engraved code on the color band is large enough to be read with a powerful spotting scope. We use the Questar scope to read the color band codes on previously banded birds.

Each nesting area or area of potential nesting habitat is photographed with a 35 mm camera to prepare an atlas of nesting sites. The photographs are taken to show a distant view of the general landform, as well as a series of overlapping close-up views to show detail of the exact nest location. Most of the photography is completed in June and additional observations of peregrines are recorded on the photographs during the second survey. These photographs are stapled within polyethylene sleeves and observations written on the sleeve with a fine-tipped waterproof marker.

All nesting locations are recorded on 1:63,360- and 1:250,000-scale U.S. Geological Survey maps. Numbers, productivity, nesting status, activities, and nest-site characteristics are recorded on Raptor Observation Record Cards developed for the Alaska Raptor Database used by FWS. The maps, cards, banding data, and samples are filed with FWS Endangered Species Branch, Ecological Services, Fairbanks, Alaska.

Sagavanirktok River

The Sagavanirktok River is a glacial river that flows northward from the Brooks Range to the Arctic Ocean in the central North Slope of Alaska. The study area includes a 200 km section of the main river from the foothills near Slope Mountain in the southern portion of the drainage to the north end of Franklin Bluffs near the river delta at Prudhoe Bay. The river creates numerous soil and gravel cutbanks and a few large cliff exposures suitable to peregrine falcons for nesting.

The Sagavanirktok River was surveyed using 2 methods (raft survey and foot survey) during 2 survey periods. We surveyed the area in mid June to detect as many peregrine falcons as possible, and from late July to early August we revisited all confirmed locations to band nestlings, collect samples, and determine nesting success.

The first survey was conducted by 2 observers in an Avon Redshank raft between 14 June and 20 June. The area surveyed included the southern foothills beginning at the Slope Mountain Department of Transportation Maintenance Station and continued north to the Dalton Highway opposite the midsection of Franklin Bluffs. A foot survey continued 5 km north from this point to the northern terminus of the bluffs. The second survey was conducted by raft from 27 July to 4 August. The area covered included the section of river from the vicinity of Pump Station 3 to Franklin Bluffs. Several nest sites in the southern area and the northern portion of Franklin Bluffs were checked by foot survey. Staff from ADF&G (Bente and volunteers) conducted all surveys during both survey periods.

Tanana River

The Tanana River is a glacial river flowing westward through the Tanana Uplands of Interior Alaska. The study area includes the Tanana River from the Tetlin

Bridge, approximately 16 km east of Tok, to the confluence with the Salcha River, which is located approximately 30 km east of Fairbanks. Also, the section of river between Fairbanks and Nenana is surveyed to check several historical nesting locations used by peregrine falcons. The river creates numerous soil and gravel cutbanks and many large rock cliff exposures suitable for nesting.

The first survey on the Tanana River occurred from 24 May to 3 June to determine all locations where peregrine falcons were attempting to breed. This survey was interrupted at Delta Creek, and the areas downstream of this location were not checked on the first survey. A second survey occurred from 29 June to 12 July to determine nesting success and productivity and to band nestlings and collect samples. Both surveys were conducted by ADF&G staff (Bente and volunteers) using a 20-ft outboard jet-powered riverboat that allowed boating along the shallow channels common in this braided, glacial river.

RESULTS AND DISCUSSION

Survey Coverage

In northern Alaska we surveyed 159 km of the Sagavanirktok River. This was slightly more than the survey coverage in 1992. The additional area covered included a foot survey of the northern portion of Franklin Bluffs. The marginal habitat in the foothills south (upstream) of Slope Mountain Department of Transportation Maintenance Station was not surveyed. The southern area was last surveyed in 1991. In future years, if pairs are between Ribdon River and Pump Station 3, it is recommended the entire southern area be surveyed again to detect nesting pairs in this area of marginal habitat.

In Interior Alaska we surveyed 418 km of the Tanana River. This was less than the survey coverage in 1992. The lowered survey coverage occurred because the complete portion of the river between Fairbanks and Nenana was not surveyed; only 2 previously known nest sites were checked. The portion from Luke Slough to the Totatlanika River was not surveyed.

Nesting Territories

In the Sagavanirktok River study area, 27 locations were occupied by peregrine falcons (23 pairs and 4 lone adults, see Table 1). The average straight-line distance between pairs was approximately 6.9 km. Table 2 lists observations and locations during 1993.

Table 3 summarizes the recent history of occupancy and productivity on the Sagavanirktok River. In 1993 the number of sites with pairs remained the same as

1992, but the number of sites occupied by lone adults increased by 2 locations. The recent pattern of increasing number of pairs has stabilized in 1993.

Direct annual comparisons of occupied sites on the Sagavanirktok River through all survey years is inappropriate because there have been major differences in survey effort and coverage since 1991. Prior to 1991 only portions of Franklin and Sagwon Bluffs were surveyed. Since 1991 the entire drainage from the southern foothills to Franklin Bluffs has been surveyed. Yearly comparisons of the portion of river covered in early years (Sagwon and Franklin Bluffs) shows the number of pairs increased from 10 in 1988 to 14 in 1993 (Fig. 2). The number of lone adults changed from zero in 1988 to 3 in 1993. Since increased survey coverage caused an increase in total occupied sites from 1991 to 1993, this is our best estimate of the number of occupied sites occurring within the area that was regularly surveyed prior to 1991. The trend of increasing numbers of pairs and lone adults for the major bluffs reflects the increasing population of peregrine falcons along the remainder of the Sagavanirktok River.

In the Tanana River study area, 27 locations were occupied by peregrine falcons (26 pairs and 1 lone adult, see Table 1). The average straight-line distance between pairs was approximately 16 km. Table 4 lists our observations and locations during 1993.

Table 5 summarizes the recent history of occupancy on the Tanana River. In 1993 the number of sites with pairs increased by 1 pair, and the number of sites occupied by lone adults decreased by 2 locations. The recent pattern of increasing number of pairs has nearly stabilized in 1993.

Productivity, Banding, and Nesting Phenology

Sagavanirktok River: In the Sagavanirktok River study area, the number of successful pairs decreased from 15 in 1992 to 11 pairs in 1993. The decrease in productive pairs caused the lowest production of young since 1991.

The 11 successful pairs produced a minimum of 28 nestlings. Of the remaining 12 pairs, 11 failed to produce young to banding age, and 1 pair observed after fledging could not be confirmed as being either successful or failed. The number of young is a minimum value because we did not visit 1 nest to count the number of young (nestlings were observed with the Questar scope). Of the 28 nestlings observed, 26 were banded (Table 6). Since 1979, 156 nestlings have been banded in the study area. Productivity averaged 2.55 young per successful pair and 1.22 young per total pairs.

Cool, rainy weather during incubation and the nestling phase probably contributed to the lowered production of young in 1993. Three clutches of eggs were abandoned

during the second survey. The eggs were collected but analysis of fertility has not been performed. If the eggs were fertile, it would suggest poor weather made foraging difficult and forced incubating birds to leave the nest in search of food. Two nests contained nestlings that appeared undernourished, indicating adults may have had difficulty foraging for prey during the poor weather. Ted Swem (FWS, pers. commun.) observed dead nestlings on the Colville River and attributed the losses to starvation and chilling caused by wet weather.

Table 7 shows the proportion of banded adults in the study area. Table 8 lists the banding status of each bird at every location. We observed 12 (24%) banded adult birds and 15 (30%) unbanded adults during this survey. The remaining birds (46%) were not seen well enough to determine leg banding status. Six of the banded adults had color bands but we were only able to read the color-band codes on 2 birds. The banding location of previously color-banded birds is summarized in Table 9. A 4-year-old adult male breeding at Sagwon Bluffs was raised on the Sagavanirktok River near Pump Station 2 in 1989. This bird moved approximately 13 km from natal to breeding area. A 2-year-old female breeding at Sagwon Bluffs was raised as a nestling on the lower portion of the Colville River in 1991. This bird moved approximately 140 km from natal to breeding area.

Based on the estimated age of young in 11 nests, the age of nestlings at banding shows an approximate 12-day span in hatch dates. The youngest nestlings were approximately 21 days old and the oldest nestlings were approximately 33 days old during the survey at the end of July. By using the observed age of nestlings to calculate the range in nesting phenology, initiation of egg laying occurred during 25 May-6 June, hatching occurred 1-13 July, and fledging occurred 10-23 August. Nesting phenology dates are based on 7 days for laying a complete clutch of 4 eggs, 34 days incubation beginning 4 days after laying the first egg, and 40 days from hatching to fledging. The initiation of nesting was similar to the dates observed in 1991 and 1992; however, there was more synchrony among successful pairs in 1993 (Bente and Wright 1992, 1993).

Tanana River: In the Tanana River study area, 19 pairs produced a minimum of 62 nestlings. The remaining 7 pairs failed to produce young to banding age. The number of young is a minimum value because we were unable to get an unobstructed view of 1 nest site, and there may have been more young present. Productivity averaged 3.26 young per successful nest and 2.38 young per total pairs.

Table 5 summarizes the recent history of productivity on the Tanana River. In 1993 the number of occupied sites decreased by 1 location. The number of total pairs increased by 1 pair from 1992 to 1993, and the number of successful pairs increased from 16 to 19. The increase in successful pairs and the high productivity of individual pairs caused the highest production of young (n = 62) ever recorded on the Tanana River. The previous record high of 38 young was attained in 1991 and

1992. Since survey coverage has been relatively consistent among years, the increase in pairs and productivity reflects the trend of an increasing population of peregrine falcons along the Tanana River.

Persistent warm, dry weather during incubation and the nestling phase contributed to the increased production of young in 1993. There were few addled eggs, and a record number of successful nests contained 4 young (n = 13, 68%) at the time of banding. Several nests contained healthy young with wide variations in age, indicating late-hatching chicks were not lost by poor weather or through competition for food.

Of the 62 nestlings observed, 61 were banded (Table 6). Since 1979, 170 nestlings have been banded in the study area.

Table 7 summarizes the proportion of banded adults observed in the study area. Table 10 lists the banding status of individual birds at each nesting location. We observed 26 (49%) banded adult birds and 24 (45%) unbanded adults during this survey. The remaining birds (6%) were not seen well enough to determine leg banding status. The banding location of previously color-banded birds is summarized in Table 9.

Twenty-five of the banded adults had color bands, and we were able to read the color-band codes on 17 birds: 3 were banded as nestlings in 1986, 1 was banded as an adult in 1988, 4 were banded as nestlings in 1989, 4 were banded as nestlings in 1990, 3 were banded as adults in 1990, 1 was banded as a nestling in 1991, and 1 was banded as an adult in 1991.

Ten birds (19%) were banded as nestlings on the Tanana River. The age structure of the birds returning to the Tanana River to breed is 3 birds 7 years old, 4 birds 4 years old, 3 birds 3 years old, and 1 bird 2 years old. There were no 1-year-old birds observed at nesting locations in 1993. A badly decomposed 1-year-old bird was recovered during September at the Tetlin National Wildlife Refuge at the eastern boundary of the study area, but it is not known if this bird attempted to breed in 1993. The mean distance from natal area to breeding area is 102 km (n = 10, range 30-217 km).

Four birds (8%) banded on the Yukon River were observed on the Tanana River. Two birds banded as nestlings on the upper Yukon River are now breeding successfully. One male raised near Circle in 1989 moved 230 km south to nest successfully near the Johnson River. This male replaced a male that was trapped and banded as a breeding adult at the nesting location in 1992. One female raised near the Nation River in 1991 moved 240 km southwest to nest successfully near Canyon Creek. Two birds banded as unpaired adults (apparently nonbreeding in the year of banding) on the lower Yukon River have also moved to the Tanana River.

A second-year male banded in 1989 near Nulato moved 445 km east to breed successfully near Nenana, and a male banded in 1990 near the Khotol River moved 660 km to breed unsuccessfully near Big Delta.

Three birds first banded as breeding birds on the Tanana River remained at the same locations and have been successful at rearing young. A second year female trapped and banded in 1992 near the Johnson River has a new mate (new male from Yukon River described above) and the pair was successful at rearing 1 young in 1993. Two other females banded in 1990 as breeding adults have remained at the same nest cliff and each reared 4 young in 1993.

The age of nestlings at banding shows an approximate 11-day span in hatch dates. The youngest nestlings were 20 days old and the oldest 31 days old during the survey in mid July. By using the observed age of nestlings to calculate the range in nesting phenology, initiation of egg laying occurred 8-19 May, hatching occurred 15-26 June, and fledging occurred 26 July-4 August. The phenology is similar to the dates observed in 1991 and 1992 (Bente and Wright 1992, 1993).

Samples Collected

We collected prey remains from nest sites on the Sagavanirktok River and the Tanana River. The samples will be analyzed at a later date.

Addled eggs were collected from nest sites when nestlings were being banded. Nine eggs were collected from 3 nest sites on the Sagavanirktok River. Nine eggs were collected from 6 nest sites on the Tanana River. Additional egg collections included 1 rough-legged hawk (*Buteo lagopus*) egg from the Sagavanirktok River and 2 bald eagle (*Haliaeetus leucocephalus*) eggs from the Tanana River. All eggs were given to FWS for contaminant analysis and results will be reported by FWS.

Other Raptors

Observations of 4 other raptor species and common ravens (*Corvus corax*) from the Sagavanirktok River are listed in Appendix A. Ravens were nesting at 3 locations, 2 pairs were successful at rearing young. Golden eagles (*Aquila chrysaetos*) were observed at 3 locations, but no birds were nesting. Gyrfalcons (*Falco rusticolus*) were observed nesting at 4 locations. Three pairs were successful at rearing 7 young (1.75 young per total pair). Nesting success was much better on the Sagavanirktok River compared to the Colville River (Swem, pers. commun.) and other North Slope rivers (Robert Ritchie, Alaska Biological Research, pers. commun.). Northern harriers (*Circus cyaneus*) were seen flying at 4 locations, but no effort was made to locate nests. Rough-legged hawks were attempting to nest at 22 locations. Eleven pairs were successful at rearing 16 young (1.45 young per successful pair), 7 pairs failed to produce young, and 4 nests were not revisited to determine nesting success. Overall,

the number of pairs increased markedly from the number observed in 1992 (Bente, unpubl. notes), but productivity was quite low. The unfavorable weather that affected peregrine falcons may have also reduced the number of young produced by rough-legged hawks.

Observations of 10 other raptor species and common ravens from the Tanana River are listed in Appendix B. American kestrels (*Falco sparverius*) were probably nesting at 5 locations because adults were carrying prey or defending against other raptors. No effort was made to locate nests or determine number of young produced. Bald eagles were observed at 43 locations. Fourteen pairs were successful at rearing 23 young (1.64 young per successful pair), 9 pairs failed to raise young, 11 empty nests were more than 2 km from failed or successful pairs (possibly indicating separate nest territories), and 9 locations were not revisited to determine nesting success. Common ravens were observed at 14 locations. Eight pairs were successful at rearing 20 young to near fledging age (4.0 young per successful pair). Great-horned owls (*Bubo virginianus*) were flushing from 2 locations along the river. No effort was made to locate nests. Golden eagles were not observed during the survey, but 4 nest structures were checked and unoccupied. Northern goshawks (*Accipiter gentilis*), a nesting pair, were heard calling at 1 location. No effort was made to locate the nest. Northern harriers were seen flying at 3 locations; their success at nesting is unknown. Ospreys (*Pandion haliaetus*) were nesting at 3 locations. During our second survey in mid July we were unable to count the number of young ospreys produced because adults were still brooding small young. Red-tailed hawks (*Buteo jamaicensis*) were flying at 7 locations. Three pairs were at nests brooding young. One nest reared 2 young that were nearly fledged when observed on 7 July. Sharp-shinned hawks (*Accipiter striatus*) were flying with prey at 2 locations, but no effort was made to locate their nests. A single Swainson's hawk (*Buteo swainsoni*) was observed flying high above the Tanana River in the vicinity of the Delta Agricultural Project.

CONCLUSIONS AND RECOMMENDATIONS

Peregrine falcons are widely distributed and locally common along the Sagavanirktok and Tanana River study areas. Although differences in survey coverage before 1991 on the Sagavanirktok River make yearly comparisons difficult, the general trend is an increasing population of peregrine falcons. The Tanana River has a more consistent history of survey coverage and shows a steady increase in numbers and productivity in recent years. On both rivers the number of pairs is increasing; however, the rate of increase is now slower than in previous years. The populations may be reaching maximum occupancy in the next few years. With such a long record of changes in the population, it is recommended that monitoring surveys be continued to track the last stages of recovery and population stability for peregrine falcons in Interior and northern Alaska.

Results from collections of prey remains are not available. These analyses are being conducted; the results will be reviewed in future reports.

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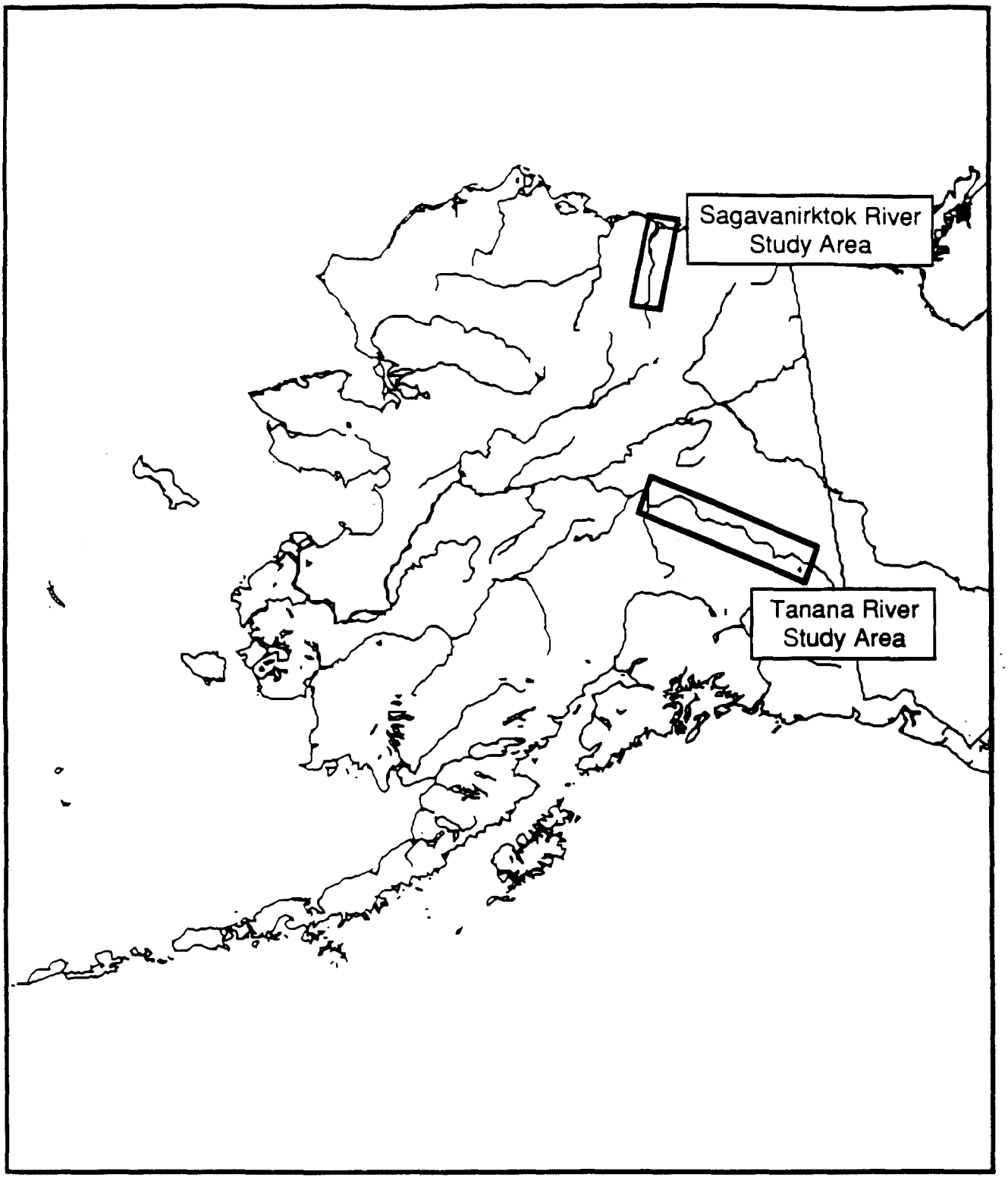


Fig. 1. Location of peregrine falcon study areas.

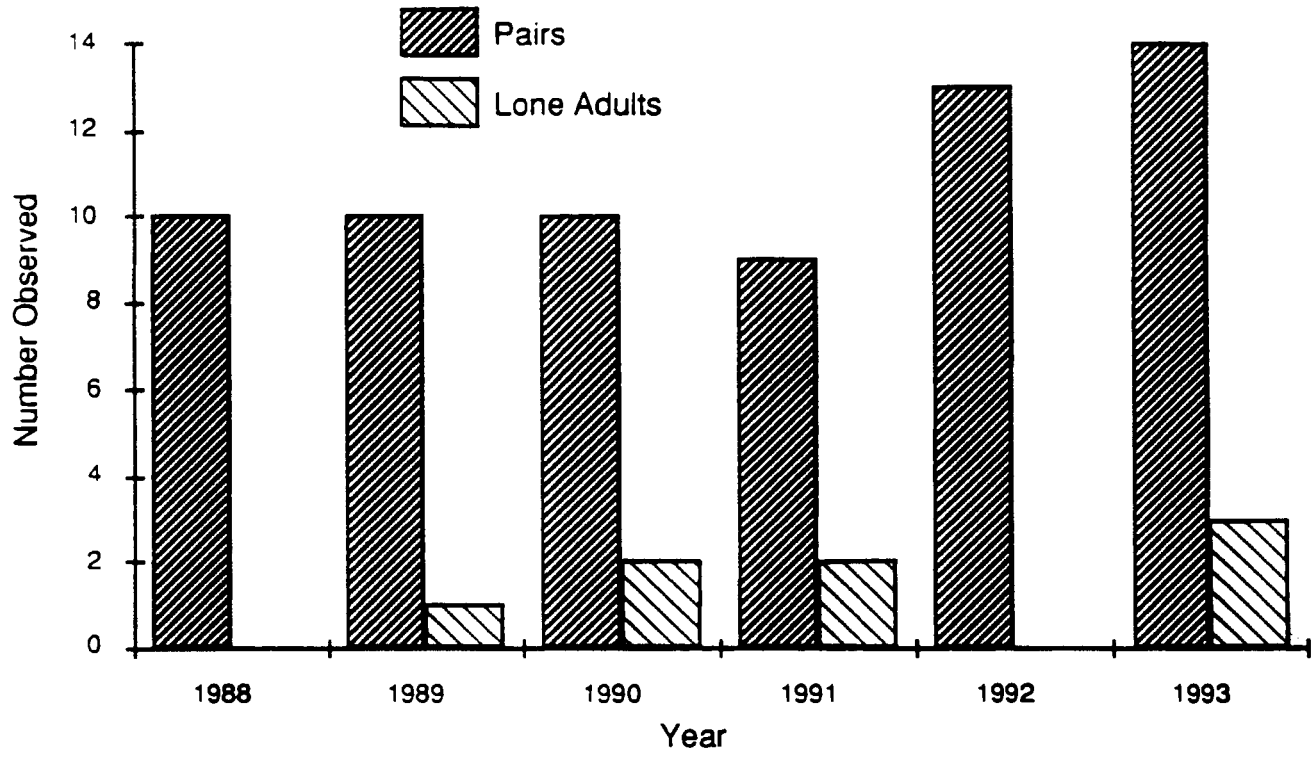


Fig. 2. Number of peregrine falcons observed in the regularly surveyed sections (Sagwon and Franklin Bluffs) of the Sagavanirktok River.

Table 1. Survey coverage, numbers, and productivity of peregrine falcons, Sagavanirktok and Tanana Rivers, Alaska, 1993.

	Sagavanirktok River	Tanana River
Kilometers surveyed	159	418
Number of surveys	2	2
Lone adults	4	1
Pairs - failed	11	7
Pairs - successful	11	19
Pairs - total	23[a]	26
Young - total	28	62
Young per total pair	1.22	2.38
Young per successful pair	2.55	3.26
Young banded	26	61
Percent young banded	93	98

[a] One pair observed after fledging with no information on success or failure.

Table 2. Observations of peregrine falcons on the Sagavanirktok River, 1993.

Terr[a]	Location[b]	Ad[c]	Yng[d]	Flg[e]	Status[f]	Observations
0	SAGA66.2	0			U	June 14 - gravel bank, vegetated rim, large boulder with orange color, no white-wash, no birds seen.
0	SAGA70.0	0			U	June 14 - loose gravel, vegetated rim, no white-wash, many slumped vegetation mats, no birds seen.
0	SAGA72.0	0			U	June 14 - float base of bluff, walk rim, no birds seen.
0	SAGA81.4	2			5	June 14 - pair, adult female incubating, ASY male no band L.
1760	SAGA95.2	0			1	June 14 - no birds at usual ledge, check with Questar, rim slumped near ledge.
1760	SAGA95.2	0			1	July 28 - no birds at cliff.
204	SAGA99.0	2			5	June 14 - pair, adult perched, adult incubating observed by AOU birder (Steve ?).
204	SAGA99.0	0			5	July 28 - no birds at cliff.
1768	SAGA101.8	2			4	June 15 - pair, nest exchange, new ledge, male unbanded, female no band L.
1768	SAGA101.8	2	4		6	July 28 - pair with 4 young banded, one young is a runt, no adults seen.
0	SAGA104.8	1			7	July 28 - single flush from gravel, perch at bluff, then gone, no mate seen.
1769	SAGA110.7	2			4	June 15 - pair, food transfer, new ledge, female unbanded, male can't tell legs.
1769	SAGA110.7	2	3		6	July 28 - pair with 3 young banded, both adults unbanded.
1772	SAGA116.0	0			1	June 15 - no birds seen by Questar scope from across channel.
1772	SAGA116.0	2	0		5	July 28 - pair without young, no defense, adults perch at cliff.
1772	SAGA116.0	2	0		5	July 29 - pair without young, fresh scrape, both adults unbanded.
1775	SAGA123.5	2			8	June 15 - pair, no defense, male unbanded, female no band R, possibly SY.
1775	SAGA123.5	2	0		8	July 29 - pair without young, empty scrape, no defense.
1780	SAGA136.9	2			4	June 16 - pair, adult female incubating, male unbanded.
1780	SAGA136.9	2	1		6	July 29 - pair with 1 young banded, adult female unbanded, rainy.
1785	SAGA144.2	2			4	June 16 - pair, male LX(VHBLU)R, female FWS R possibly xxxx-xx74x.
1785	SAGA144.2	2	4		6	July 29 - pair with 4 young banded, female FWS R.
1785	SAGA144.2	2	4		6	July 30 - pair with 4 young, male unbanded - not same bird as seen in June.
0	SAGA146.0	1			3	June 16 - adult female fly and perch at cliff, courtship displays, no mate seen.
0	SAGA146.0	1			3	July 30 - single adult female unbanded, walk rim, 3 fresh scrapes, no defense.
1789	SAGA146.8	2			4	June 16 - pair, male unbanded, female AUXMKR L, new ledge upstream from creek.
1789	SAGA146.8	2	1		6	July 30 - pair with 1 young banded, male unbanded, female 3H(HVBLU)L raised on Colville River in 1991.

Table 2. Continued.

Terr[a]	Location[b]	Ad[c]	Yng[d]	Flg[e]	Status[f]	Observations
1789	SAGA146.8	1			U	July 30 - single female interloper, chased by resident female.
0	SAGA150.2	2			4	June 16 - pair, adult incubating, adult on perch, distant view.
0	SAGA150.2	2	1		6	July 30 - pair with 1 young banded, no adults present.
0	SAGA155.0	2	U		7	August 15 - defensive pair observed on rim at N flank Sagwon by hunter, 2 miles S Pump 2.
209	SAGA157.9	2			4	June 16 - pair, no defense, male BLU L, female flutter-flight.
209	SAGA157.9	2	0		5	July 30 - pair without young, 4 eggs collected, female BLU L.
0	SAGA158.5	1			7	June 16 - adult male perch and fly, dive on adult and young CORA, mate or ledge not seen.
0	SAGA158.5	0			1	July 30 - no birds at cliff.
1795	SAGA159.5	1			7	June 17 - adult fly high above bluff, mate or ledge not seen.
1795	SAGA159.5	2	2		6	July 30 - pair with 2 young not banded, adult female unbanded, mate not seen.
0	SAGA182.5	0			1	August 01 - no birds, possible scrape on rim.
0	SAGA187.8	2			8	June 17 - pair, female flush from ledge at rim, female 'I3' OR L3(VVBLU)L, male unbanded.
0	SAGA187.5	1			8	August 01 - single adult male fly and soar at bluff, no mate seen.
0	SAGA191.9	0			1	June 17 - walk rim and find 1992 scrape with addled egg (whole), collected.
0	SAGA191.9	0			1	August 01 - no birds at bluff.
0	SAGA192.5	2			4	June 17 - pair, male unbanded, female FWS R, no nest on bluff, nest with 3 eggs on island.
0	SAGA192.5	2			5	June 17 - pair with 3 eggs, nest by shrub on gravel bar opposite bluff on E bank.
0	SAGA192.5	0			2	August 01 - no birds at bluff or gravel bar, eggs gone, high water debris.
1798	SAGA196.8	2			4	June 18 - pair, both adults unbanded.
1798	SAGA196.8	2	4		6	August 01 - pair with 4 young banded, 1 young jumped, adults unbanded.
211	SAGA198.2	2			7	June 18 - pair, male unbanded, female BLU L.
211	SAGA198.2	0			8	August 01 - no birds.
1803	SAGA199.7	1			7	June 18 - single male perched, unbanded, mate or ledge not seen.
1803	SAGA199.7	2	2		6	August 01 - pair with 2 young banded, 2 eggs collected, male not seen, female FWS R no AUXMKR.
213	SAGA203.0	2			4	June 18 - pair, male FWS R, female incubating.
213	SAGA203.0	2	4		6	August 02 - pair with 4 young banded, both adults unbanded.
0	SAGA204.5	2			4	June 18 - pair, adult incubating, adult perched, distant view.
0	SAGA204.5	2	3		6	August 02 - pair with 3 young banded, male not seen, female BLU L.

Table 2. Continued.

Terr[a]	Location[b]	Ad[c]	Yng[d]	Flg[e]	Status[f]	Observations
1806	SAGA205.7	2			4	June 19 - pair, female incubating in stick nest, flushed, unbanded, 3 eggs, male legs not seen.
1806	SAGA205.7	0	0		5	August 02 - no birds, 3 bleached eggs in stick nest, eggs collected.
214	SAGA208.3	2			4	June 19 - pair, male can't tell legs, female unbanded, flushed, 3 eggs.
214	SAGA208.3	1	0		5	August 03 - female fly high, weak defense, empty scrape, no evidence of hatching or young.
0	SAGA209.0	1			U	June 19 - female interloper, SY, passing from S, chased by resident pair.
0	SAGA209.0	2			U	June 19 - pair dive on passing subadult GOEA.
1813	SAGA217.5	2			7	June 19 - pair, food transfer at nest, no bird incubating, adult female dive on gulls.
1813	SAGA217.5	0			5	August 03 - no birds.
0	SAGA222.2	1			8	August 03 - single adult male on rim perch, fly N, no mate seen.

[a] Terr = Nest Territory Number assigned by U.S. Fish and Wildlife Service (FWS).
[b] Location = River code (four letters) followed by river milepost (in kilometers).
[c] Ad = Adults.
[d] Yng = Young.
[e] Flg = Fledglings.
[f] Status = Nesting territory status code standardized by FWS. 1 - unoccupied, 2 - occupancy unknown, 3 - occupied nonbreeding, 4 - occupied breeding, 5 - occupied unsuccessful breeding, 6 - occupied successful breeding, 7 - occupied breeding status unknown, 8 - occupied breeding status unknown but no young produced.

Table 3. Historical occupancy and productivity of peregrine falcons, Sagavanirktok River, Alaska, 1958-93[a].

	Occupancy			Productivity		
Year	Lone Adults	Total Pairs	Successful Pairs[b]	Number of Young[b]	Young Per Total Pair	Young Per Successful Pair
1958	0	5	U	U	--	--
1963	0	4	U	U	--	--
1964	0	1	U	U	--	--
1970	0	3	2	5	1.67	2.50
1972	1	4	2	5	1.25	2.50
1973	0	2	U	U	--	--
1974	1	4	2	3	0.75	1.50
1975	0	3	1	1	0.33	1.00
1976	0	1	1	1	1.00	1.00
1977	0	3	1	2	0.67	2.00
1978	0	1	U	U	--	--
1979	0	4	3	6	1.50	2.00
1980	1	3	1	2	0.67	2.00
1981	0	4	3	8	2.00	2.67
1982	0	4	2	4	0.67	2.00
1983	0	5	5	13	2.60	2.60
1984	1	6	6	15	2.50	2.50
1985	0	8	6	20	2.50	3.33
1986	0	7	6	16	2.29	2.67
1987	2	7	6	24	3.43	4.00
1988	0	10	6	29	2.90	2.90
1989	1	10	10	29	2.90	2.90
1990	2	10	7	19	1.90	2.71
1991	6	14	11	22	1.57	2.00
1992	2	23	15	37	1.60	2.47
1993	4	23	11	28	1.22	2.55

[a] Data for 1958-78 from a review by Roseneau *et al.* 1981. Data for 1979-90 from U.S. Fish and Wildlife Service, Endangered Species, Fairbanks unpublished summaries. Data for 1991 from Bente and Wright 1992. Data for 1992 from Bente and Wright 1993.

[b] U = Unknown

Table 4. Observations of peregrine falcons on the Tanana River, 1993.

Terr[a]	Location[b]	Ad[c]	Yng[d]	Flg[e]	Status[f]	Observations
227	TANA103.0	2			4	May 25 - pair, adult incubating, trap ASY male put on 2206-14416, 47(VVBLK)L.
227	TANA103.0	2	4		4	July 06 - pair with 4 young banded, male 47(VVBLK)L new, female unbanded.
228	TANA135.0	2			4	May 26 - pair, male ET(VVBLK)L gives weak defense.
228	TANA135.0	2	4		4	July 07 - pair with 4 young banded, both adults BLK L.
1206	TANA181.0	1			7	May 27 - adult male BT(VVBLK)L at cliff, no defense, no mate seen.
1206	TANA181.0	0			2	July 07 - no birds, all ledges empty.
1206	TANA183.0	0			2	July 07 - no birds, all ledges empty.
230	TANA205.0	1			4	May 27 - adult perched at cliff, mate not seen.
230	TANA205.0	2	4		4	July 07 - pair with 4 young banded, both adults unbanded.
0	TANA211.0	2			4	May 28 - pair, flush unbanded ATY female, 4 eggs.
0	TANA211.0	2	4		4	July 08 - pair with 4 young banded, male FWS R, female unbanded.
231	TANA221.5	2			4	May 28 - pair, female 3C4(VVVBLK)L, male can't tell legs.
231	TANA221.5	2	4		4	July 08 - pair with 4 young banded, male unbanded, female 3C4(VVVBLK)L.
0	TANA232.5	2			4	May 28 - pair, both adults unbanded, new nesting location.
0	TANA232.5	2	1		4	July 08 - pair with 1 young banded, 2 eggs collected, both adults unbanded.
1271	TANA243.0	2			4	May 29 - pair, trap ATY female put on 1807-30371, Z-4(V-VBLK)L.
1271	TANA243.0	2	0		5	July 09 - pair with no young, male 3C2(VVVBLK)L, female Z-4(V-VBLK)L new.
0	TANA244.5	1			7	May 05 - single bird at cliff.
0	TANA247.5	1			4	May 29 - adult incubating, mate not seen.
0	TANA247.5	2	0		5	July 09 - pair with no young, collect egg, male KN(VVBLK)L.
174	TANA258.5	2			4	May 29 - pair, male with BLK on L, female unbanded.
174	TANA258.5	2	3		4	July 09 - pair with 3 young banded, 1 egg collected, male BLK L, female unbanded.
0	TANA269.5	2			4	May 30 - pair, adult incubating, male unbanded, new ledge.
0	TANA269.5	0			5	July 09 - no birds present.
175	TANA273.0	2			4	May 30 - pair, adult incubating, male D?(V?BLK)L, female X5(VVBLK)L, male banded in 1992 has been replaced.
175	TANA273.0	2	1		4	July 10 - pair with 1 young banded, male D8(VVBLK)L, female X5(VVBLK)L.
176	TANA280.5	2			4	May 30 - pair, female with BLK on L, male can't tell legs.
176	TANA280.5	2	4		4	June 30 - pair with 4 young (3 banded), male unbanded, female M2(VVBLK)L.
176	TANA280.5	2	4		6	July 10 - pair with 4 young (4th young banded), male unbanded, female M2(VVBLK)L.
177	TANA288.5	1			7	May 05 - single bird at cliff.

Table 4. Continued.

Terr[a]	Location[b]	Ad[c]	Yng[d]	Flg[e]	Status[f]	Observations
177	TANA288.5	2			4	May 30 - pair, male unbanded, female incubating, new ledge.
177	TANA288.5	2	4		4	June 30 - pair with 4 young banded, male unbanded, female M4(VVBLK)L.
178	TANA299.0	2			4	May 30 - pair, dive on pigeon, adult female return to ledge to incubate.
178	TANA299.0	2	3		4	July 01 - pair with 3 young banded, both adults unbanded.
58	TANA336.5	2			4	May 31 - pair, female incubating, male 3C5(VVVBLK)L.
58	TANA336.5	2	4		4	July 01 - pair with 4 young banded, male 3C5(VVVBLK)L, female unbanded.
59	TANA376.0	2			4	June 02 - pair, male unbanded, female BLK L, new ledge.
59	TANA376.0	2	4		4	July 02 - pair with 4 young banded, male CT(VVBLK)L, female unbanded.
0	TANA380.0	2			5	July 03 - pair with no young, male unbanded, SY female 23(VVBLK)L, not a good look at band.
386	TANA386.0	2			4	June 02 - pair, both adults BLK L, new ledge.
386	TANA386.0	2	2		4	July 03 - pair with 2 young (not banded), both adults BLK L, 3 digit codes?
61	TANA414.5	1			4	June 03 - adult male on perch, mate not seen, medical emergency - end survey.
61	TANA414.5	2	4		4	July 03 - pair with 4 young banded, male unbanded, female looks TY BLK L.
0	TANA427.0	2	2		4	July 03 - pair with 2 young banded, 1 egg collected, male unbanded, female WB(VVBLK)L.
0	TANA431.0	2	3		4	July 04 - pair with 4 young banded, both adults unbanded.
62	TANA436.5	2	0		5	July 04 - pair with no young, both adults BLK L.
63	TANA443.0	2	4		4	July 04 - pair with 4 young banded, male M3(VVBLK)L, female L9(VVBLK)L.
2244	TANA459.5	2			4	June 29 - pair, male unbanded, female BLK L, flushed, 3 eggs.
2244	TANA459.5	2	0		5	July 04 - pair, male incubating, female fly high.
1516	TANA550.0	2	0		4	May ?? - Swem visited cliff with Russian visitor and saw nondefensive pair.
1516	TANA550.0	1	0		5	July 09 - Wright and Whitten checked site and saw single adult bird, no young.
1516	TANA550.0	0	0		5	July 15 - Wright and Whitten check site and see no birds.
103	TANA610.0	2	4		4	July 12 - pair with 4 young banded, male 00(VVBLK)L, female unbanded.

[a] Terr = Nest Territory Number assigned by U.S. Fish and Wildlife Service (FWS).
[b] Location = River code (four letters) followed by river milepost (in kilometers).
[c] Ad = Adults.
[d] Yng = Young.
[e] Flg = Fledglings.
[f] Status = Nesting territory status code standardized by FWS. 1 - unoccupied, 2 - occupancy unknown, 3 - occupied nonbreeding, 4 - occupied breeding, 5 - occupied unsuccessful breeding, 6 - occupied successful breeding, 7 - occupied breeding status unknown, 8 - occupied breeding status unknown but no young produced.

Table 5. Historical occupancy and productivity of peregrine falcons, Tanana River, Alaska, 1968-93[a].

	Occupancy			Productivity		
Year	Lone Adults	Total Pairs	Successful Pairs	Number of Young	Young Per Total Pair	Young Per Successful Pair
1968	0	12	11	23	1.92	2.09
1970	0	6	6	16	2.67	2.67
1971	0	4	3	9	2.25	3.00
1972	0	4	3	7	1.75	2.33
1973	0	4	4	8	2.00	2.00
1974	0	2	1	1	0.50	1.00
1975	1	2	0	0	0	--
1976	2	0	0	--	--	--
1977	0	3	1	1	0.33	1.00
1978	0	4	3	6	1.50	2.00
1979	3	3	2	4	1.33	2.00
1980	0	4	2	5	1.25	2.50
1981	0	5	5	12	2.40	2.40
1982	0	5	3	8	1.60	2.67
1983	0	5	4	11	2.20	2.75
1984	1	4	2	4	1.00	2.00
1985	0	4	3	5	1.25	1.67
1986	2	5	4	12	2.40	3.00
1987	0	8	5	10	1.25	2.00
1988	1	12	9	16	1.33	1.78
1989	0	15	11	29	1.93	2.64
1990	3	15	19	29	1.93	3.22
1991	0	20	16	38	1.90	2.38
1992	3	25	16	38	1.56	2.44
1993	1	26	19	62	2.38	3.26

[a] Data for 1968-78 from a review by Roseneau *et al.* 1981. Data for 1979-90 from U. S. Fish and Wildlife Service, Endangered Species, Fairbanks, Alaska unpublished summaries. Data for 1991 from Bente and Wright 1992. Data for 1992 from Bente and Wright 1993.

Table 6. Peregrine falcons banded by Alaska Department of Fish and Game, 1993[a].

Band Number[b]	Auxiliary Marker Code[c]	AOU #[d]	Age[e]	Sex[f]	Region[g]	Lat-Long[h]	Location[i]	Date	Bander
1807-30163	A-7(V-VBLK)L	356.0	L	U	AK-503	633-1435	TANA221.5 Round Lake	07-08-93	P. J. Bente
1807-30164	B-7(V-VBLK)L	356.0	L	U	AK-503	633-1435	TANA221.5 Round Lake	07-08-93	P. J. Bente
1807-30165	C-7(V-VBLK)L	356.0	L	U	AK-503	633-1435	TANA221.5 Round Lake	07-08-93	P. J. Bente
1807-30166	D-7(V-VBLK)L	356.0	L	U	AK-503	634-1435	TANA232.5 N of Chief Crk	07-08-93	P. J. Bente
1807-30167	E-7(V-VBLK)L	356.0	L	U	AK-503	634-1442	TANA258.5 Head Johnson	07-09-93	P. J. Bente
1807-30168	G-7(V-VBLK)L	356.0	L	U	AK-503	634-1444	TANA280.5 George Lake	07-10-93	P. J. Bente
1807-30169	H-7(V-VBLK)L	356.0	L	U	AK-503	643-1485	TANA610.0 Totatlanika	07-12-93	P. J. Bente
1807-30170	K-7(V-VBLK)L	356.0	L	U	AK-503	643-1485	TANA610.0 Totatlanika	07-12-93	P. J. Bente
1807-30171	L-7(V-VBLK)L	356.0	L	U	AK-503	643-1485	TANA610.0 Totatlanika	07-12-93	P. J. Bente
1807-30172	11(HHBLU)L	356.0	L	U	AK-503	690-1484	SAGA101.8 Icecut North	07-28-93	P. J. Bente
1807-30173	12(HHBLU)L	356.0	L	U	AK-503	690-1484	SAGA101.8 Icecut North	07-28-93	P. J. Bente
1807-30174	13(HHBLU)L	356.0	L	U	AK-503	690-1484	SAGA101.8 Icecut North	07-28-93	P. J. Bente
1807-30175	ZU(VVBLU)L	356.0	L	U	AK-503	690-1484	SAGA110.7 Lupine	07-28-93	P. J. Bente
1807-30176	V7(HVBLU)L	356.0	L	U	AK-503	691-1484	SAGA136.9 Pipe anchors	07-29-93	P. J. Bente
1807-30177	14(HHBLU)L	356.0	L	U	AK-503	692-1484	SAGA144.2 S Sagwon	07-29-93	P. J. Bente
1807-30178	16(HHBLU)L	356.0	L	U	AK-503	692-1484	SAGA144.2 S Sagwon	07-29-93	P. J. Bente
1807-30179	21(HHBLU)L	356.0	L	U	AK-503	692-1483	SAGA150.2 Gard	07-30-93	P. J. Bente
1807-30180	22(HHBLU)L	356.0	L	U	AK-503	694-1483	SAGA196.8 S Bruce	08-01-93	P. J. Bente
1807-30181	23(HHBLU)L	356.0	L	U	AK-503	694-1483	SAGA196.8 S Bruce	08-01-93	P. J. Bente
1807-30182	24(HHBLU)L	356.0	L	U	AK-503	694-1483	SAGA199.7 N Bruce Crk	08-01-93	P. J. Bente
1807-30183	31(HHBLU)L	356.0	L	U	AK-503	694-1484	SAGA203.0 Mid Franklin	08-02-93	P. J. Bente
1807-30184	32(HHBLU)L	356.0	L	U	AK-503	694-1484	SAGA203.0 Mid Franklin	08-02-93	P. J. Bente
1807-30185	33(HHBLU)L	356.0	L	U	AK-503	694-1484	SAGA203.0 Mid Franklin	08-02-93	P. J. Bente
1807-30186	34(HHBLU)L	356.0	L	U	AK-503	694-1484	SAGA204.5 S Greta	08-02-93	P. J. Bente
1807-30187	41(HHBLU)L	356.0	L	U	AK-503	694-1484	SAGA204.5 S Greta	08-02-93	P. J. Bente
1807-30371	Z-4(V-VBLK)L	356.0	ASY	F	AK-503	634-1440	TANA243.0 Billy Creek +2	05-29-93	P. J. Bente
1807-30372	A-5(V-VBLK)L	356.0	L	U	AK-503	634-1444	TANA280.5 George Lake	06-30-93	P. J. Bente

Table 6. Continued.

Band Number[b]	Auxiliary Marker Code[c]	AOU #[d]	Age[e]	Sex[f]	Region[g]	Lat-Long[h]	Location[i]	Date	Bander
1807-30373	B-5(V-VBLK)L	356.0	L	U	AK-503	634-1444	TANA280.5 George Lake	06-30-93	P. J. Bente
1807-30374	C-5(V-VBLK)L	356.0	L	U	AK-503	634-1444	TANA280.5 George Lake	06-30-93	P. J. Bente
1807-30375	D-5(V-VBLK)L	356.0	L	U	AK-503	634-1444	TANA288.5 Gerstle	06-30-93	P. J. Bente
1807-30376	E-5(V-VBLK)L	356.0	L	U	AK-503	634-1444	TANA288.5 Gerstle	06-30-93	P. J. Bente
1807-30377	G-5(V-VBLK)L	356.0	L	U	AK-503	634-1444	TANA288.5 Gerstle	06-30-93	P. J. Bente
1807-30378	H-5(V-VBLK)L	356.0	L	U	AK-503	634-1444	TANA288.5 Gerstle	06-30-93	P. J. Bente
1807-30379	K-5(V-VBLK)L	356.0	L	U	AK-503	635-1444	TANA299.0 Sawmill	07-01-93	P. J. Bente
1807-30380	L-5(V-VBLK)L	356.0	L	U	AK-503	635-1444	TANA299.0 Sawmill	07-01-93	P. J. Bente
1807-30381	M-5(V-VBLK)L	356.0	L	U	AK-503	641-1454	TANA376.0 Indian	07-02-93	P. J. Bente
1807-30382	P-5(V-VBLK)L	356.0	L	U	AK-503	641-1454	TANA376.0 Indian	07-02-93	P. J. Bente
1807-30383	R-5(V-VBLK)L	356.0	L	U	AK-503	641-1454	TANA376.0 Indian	07-01-93	P. J. Bente
1807-30384	S-5(V-VBLK)L	356.0	L	U	AK-503	641-1461	TANA414.5 Delta Creek	07-03-93	P. J. Bente
1807-30385	U-5(V-VBLK)L	356.0	L	U	AK-503	641-1461	TANA414.5 Delta Creek	07-03-93	P. J. Bente
1807-30386	V-5(V-VBLK)L	356.0	L	U	AK-503	641-1463	TANA427.0 Canyon Creek	07-03-93	P. J. Bente
1807-30387	W-5(V-VBLK)L	356.0	L	U	AK-503	641-1463	TANA427.0 Canyon Creek	07-03-93	P. J. Bente
1807-30388	X-5(V-VBLK)L	356.0	L	U	AK-503	641-1463	TANA431.0 Canyon Creek	07-03-93	P. J. Bente
1807-30389	Z-5(V-VBLK)L	356.0	L	U	AK-503	641-1463	TANA431.0 Canyon Creek	07-03-93	P. J. Bente
1807-30390	A-6(V-VBLK)L	356.0	L	U	AK-503	641-1463	TANA431.0 Canyon Creek	07-03-93	P. J. Bente
1807-30391	C-6(V-VBLK)L	356.0	L	U	AK-503	641-1464	TANA443.0 VABM Hill	07-04-93	P. J. Bente
1807-30392	D-6(V-VBLK)L	356.0	L	U	AK-503	641-1464	TANA443.0 VABM Hill	07-04-93	P. J. Bente
1807-30393	E-6(V-VBLK)L	356.0	L	U	AK-503	641-1464	TANA443.0 VABM Hill	07-04-93	P. J. Bente
1807-30394	G-6(V-VBLK)L	356.0	L	U	AK-503	641-1464	TANA443.0 VABM Hill	07-04-93	P. J. Bente
1807-30395	K-6(V-VBLK)L	356.0	L	U	AK-503	632-1424	TANA103.0 Tok River	07-06-93	P. J. Bente
1807-30396	L-6(V-VBLK)L	356.0	L	U	AK-503	632-1430	TANA135.0 Samo	07-07-93	P. J. Bente
1807-30397	P-6(V-VBLK)L	356.0	L	U	AK-503	632-1434	TANA205.0 Robertson	07-07-93	P. J. Bente
1807-30398	R-6(V-VBLK)L	356.0	L	U	AK-503	632-1434	TANA205.0 Robertson	07-07-93	P. J. Bente

Table 6. Continued.

Band Number[b]	Auxiliary Marker Code[c]	AOU #[d]	Age[e]	Sex[f]	Region[g]	Lat-Long[h]	Location[i]	Date	Bander
1807-30399	U-6(V-VBLK)L	356.0	L	U	AK-503	633-1434	TANA211.0 Below Robert	07-08-93	P. J. Bente
1807-30400	V-6(V-VBLK)L	356.0	L	U	AK-503	634-1434	TANA211.0 Below Robert	07-08-93	P. J. Bente
2206-14416	47(VVBLK)L	356.0	ATY	M	AK-503	632-1430	TANA103.0 Tok River	05-26-93	P. J. Bente
2206-14417	48(VVBLK)L	356.0	L	U	AK-503	635-1444	TANA299.0 Sawmill	07-01-93	P. J. Bente
2206-14418	49(VVBLK)L	356.0	L	U	AK-503	640-1450	TANA336.5 Volkmar	07-01-93	P. J. Bente
2206-14419	50(VVBLK)L	356.0	L	U	AK-503	640-1450	TANA336.5 Volkmar	07-01-93	P. J. Bente
2206-14420	6-P(V-VBLK)L	356.0	L	U	AK-503	640-1450	TANA336.5 Volkmar	07-01-93	P. J. Bente
2206-14421	6-R(V-VBLK)L	356.0	L	U	AK-503	640-1450	TANA336.5 Volkmar	07-01-93	P. J. Bente
2206-14422	N-5(V-VBLK)L	356.0	L	U	AK-503	641-1454	TANA376.0 Indian	07-02-93	P. J. Bente
2206-14423	6-S(V-VBLK)L	356.0	L	U	AK-503	641-1461	TANA414.5 Delta Creek	07-03-93	P. J. Bente
2206-14424	6-T(V-VBLK)L	356.0	L	U	AK-503	641-1461	TANA414.5 Delta Creek	07-03-93	P. J. Bente
2206-14425	6-U(V-VBLK)L	356.0	L	U	AK-503	632-1424	TANA103.0 Tok River	07-06-93	P. J. Bente
2206-14426	6-V(V-VBLK)L	356.0	L	U	AK-503	632-1424	TANA103.0 Tok River	07-06-93	P. J. Bente
2206-14427	6-W(V-VBLK)L	356.0	L	U	AK-503	632-1424	TANA103.0 Tok River	07-06-93	P. J. Bente
2206-14428	6-X(V-VBLK)L	356.0	L	U	AK-503	632-1430	TANA135.0 Samo	07-07-93	P. J. Bente
2206-14429	6-Y(V-VBLK)L	356.0	L	U	AK-503	632-1430	TANA135.0 Samo	07-07-93	P. J. Bente
2206-14430	6-Z(V-VBLK)L	356.0	L	U	AK-503	632-1430	TANA135.0 Samo	07-07-93	P. J. Bente
2206-14431	7-A(V-VBLK)L	356.0	L	U	AK-503	632-1434	TANA205.0 Robertson	07-07-93	P. J. Bente
2206-14432	7-B(V-VBLK)L	356.0	L	U	AK-503	632-1434	TANA205.0 Robertson	07-07-93	P. J. Bente
2206-14433	7-C(V-VBLK)L	356.0	L	U	AK-503	633-1434	TANA211.0 Below Robert	07-08-93	P. J. Bente
2206-14434	7-D(V-VBLK)L	356.0	L	U	AK-503	633-1434	TANA211.0 Below Robert	07-08-93	P. J. Bente
2206-14435	7-E(V-VBLK)L	356.0	L	U	AK-503	633-1435	TANA221.5 Round Lake	07-08-93	P. J. Bente
2206-14436	7-G(V-VBLK)L	356.0	L	U	AK-503	634-1442	TANA258.5 Head Johnson	07-09-93	P. J. Bente
2206-14437	7-H(V-VBLK)L	356.0	L	U	AK-503	634-1442	TANA258.5 Head Johnson	07-09-93	P. J. Bente
2206-14438	7-K(V-VBLK)L	356.0	L	U	AK-503	634-1443	TANA273.0 Johnson River	07-10-93	P. J. Bente
2206-14439	7-M(V-VBLK)L	356.0	L	U	AK-503	644-1485	TANA610.0 Totatlanika	07-12-93	P. J. Bente

Table 6. Continued.

Band Number[b]	Auxiliary Marker Code[c]	AOU #[d]	Age[e]	Sex[f]	Region[g]	Lat-Long[h]	Location[i]	Date	Bander
2206-14440	K0(VVBLU)L	356.0	L	U	AK-503	690-1484	SAGA101.8 Icecut North	07-28-93	P. J. Bente
2206-14441	K1(VVBLU)L	356.0	L	U	AK-503	690-1484	SAGA110.7 Lupine River	07-28-93	P. J. Bente
2206-14442	K2(VVBLU)L	356.0	L	U	AK-503	690-1484	SAGA110.7 Lupine River	07-28-93	P. J. Bente
2206-14443	H2(VVBLU)L	356.0	L	U	AK-503	692-1484	SAGA144.2 S Sagwon	07-29-93	P. J. Bente
2206-14444	H3(VVBLU)L	356.0	L	U	AK-503	692-1484	SAGA144.2 S Sagwon	07-29-93	P. J. Bente
2206-14445	H4(VVBLU)L	356.0	L	U	AK-503	692-1484	SAGA146.8 Sagwon Crk	07-30-93	P. J. Bente
2206-14446	H5(VVBLU)L	356.0	L	U	AK-503	694-1483	SAGA196.8 S Bruce	08-01-93	P. J. Bente
2206-14447	H7(VVBLU)L	356.0	L	U	AK-503	694-1483	SAGA196.8 S Bruce	08-01-93	P. J. Bente
2206-14448	K3(VVBLU)L	356.0	L	U	AK-503	694-1483	SAGA199.7 N Bruce Crk	08-01-93	P. J. Bente
2206-14449	K4(VVBLU)L	356.0	L	U	AK-503	694-1484	SAGA204.5 S Greta	08-02-93	P. J. Bente

[a] Information provided to U.S. Fish and Wildlife Service for submission to Bird Banding Laboratory.
[b] Lock-on aluminum leg band.
[c] Auxiliary marker color leg band with engraved code [Format: code(orientation-color)leg].
[d] American Ornithologists Union number.
[e] Age codes: ASY = after second year, L = local (nestling), SY = second year.
[f] Sex codes: F = female, M = male, U = unknown.
[g] Banding region using code designated by Bird Banding Laboratory.
[h] 10-minute band block code showing latitude and longitude.
[i] River code (four letters) followed by river milepost (in kilometers) and brief description [SAGA = Sagavanirktok River, TANA = Tanana River].

Table 7. Number and percentage of resightings of previously banded peregrine falcons, Sagavanirktok and Tanana Rivers, Alaska, 1993.

Banding status	Sagavanirktok River	Tanana River
Unknown banding	23 (46%)	3 (6%)
Unbanded	15 (30%)	24 (45%)
FWS[a]-R, No AUXMKR[b]	4 (8%)	0 (0%)
FWS-L, No AUXMKR	0 (0%)	1 (2%)
Unk FWS, No AUXMKR	2 (4%)	0 (0%)
AUXMKR-R, unknown code	0 (0%)	0 (0%)
AUXMKR-L, unknown code	4 (8%)	9 (17%)
AUXMKR-known code	2 (4%)	16 (30%)
Total AUXMKR	6 (12%)	25 (47%)
Total Individuals	50	53

[a] FWS = U.S. Fish and Wildlife Service leg band on either right (R), left (L), or no (No) leg.
[b] AUXMKR = Auxiliary marker color leg band on either right (R), left (L), or no (No) leg.

Table 8. Nest site summary of previously banded peregrine falcons, Sagavanirktok River, Alaska, 1993.

Location[a]	UNK[b]	UNBAND	FWS[c]-R	FWS-L	FWS-U	AUXMKR[d]-R	AUXMKR-L	AUXMKR CODE[e]
SAGA81.4	M[f] F[g]							
SAGA99.0	M F							
SAGA101.8		M			F			
SAGA104.8	F							
SAGA110.7	M	F						
SAGA116.0	M F							
SAGA123.5		M			F			
SAGA136.9	M	F						
SAGA144.2			F					M - LX(VHBLU)L
SAGA146.0		F						
SAGA146.8		M						F - 3H(HVBLU)L
SAGA150.2	M F							
SAGA155.0	M F							
SAGA157.9	M						F	
SAGA158.5	M							
SAGA159.5	M	F						
SAGA187.8		M					F	
SAGA192.5		M					F	
SAGA196.8		M F						
SAGA198.2		M					F	
SAGA199.7		M	F					
SAGA203.0		F	M					
SAGA204.5	M		F					
SAGA205.7	M F							
SAGA208.3	M	F						
SAGA217.5	M F							
SAGA222.2	M							
TOTAL	M=15 F=8	M=8 F=7	M=1 F=3	M=0 F=0	M=0 F=2	M=0 F=0	M=0 F=4	M=1 F=1

[a] Location = River code (four letters) followed by river milepost (in kilometers).
[b] UNK = Unknown banding status (neither leg was observed).
[c] FWS = U. S. Fish and Wildlife Service leg band on either right (R) or left (L) leg. Unknown (U) banding occurs when one leg has no band and the other leg was not seen. In this case the bird does not have an AUXMKR but it may or may not have a FWS band on the unseen leg.
[d] AUXMKR = Auxiliary marker color leg band used on either right (R) or left (L) leg.
[e] AUXMKR CODE = Auxiliary marker color leg band with engraved code [Format: CODE(Orientation-Color)Leg].
[f] M = Male.
[g] F = Female.

Table 9. Location and movements of previously banded peregrine falcons observed on the Sagavanirktok River and Tanana River, Alaska, 1993.

				Banding Information					Recovery/Resighting Information					
Band No.[a]	Auxmkr[b]	Dist km[c]	Dir[d]	Date	Location[e]	Lat-Long[f]	Age[g]	Sex[h]	Date	Location	Lat-Long	Age (yr)	Sex	No. Yng[i]
987-32971	LX(VHBLU)R	13	SW	07/23/89	SAGA159.5	692-1483	L	U	06/16/93	SAGA144.2	692-1484	4	M	4
1807-29859	3H(HVBLU)L[j]	140	SE	08/01/91	COLV597.0	700-1513	L	F	07/30/93	SAGA146.8	692-1484	2	F	1
1807-02307	ET(VVBLK)L	70	SE	07/02/89	TANA242.0	634-1440	L	U	05/26/93	TANA135.0	632-1430	4	M	4[k]
1807-30006	C2(VVBLK)L	125	SE	06/27/90	TANA336.5	640-1450	L	U	07/07/93	TANA135.0	632-1430	3	F	4[k]
1807-02301	BT(VVBLK)L	90	SE	07/05/89	TANA273.0	634-1443	L	U	05/27/93	TANA181.0	632-1433	4	M	0
987-71368	3C4(VVVBLK)L	217	SE	07/10/86	TANA438.5	641-1464	L	U	05/28/93	TANA221.5	633-1435	7	F	4
987-71366	3C2(VVVBLK)L	130	SE	07/10/86	TANA436.0	641-1464	L	U	07/09/93	TANA243.0	634-1440	7	M	0
1807-02313	KN(VVBLK)L	30	SE	07/01/89	TANA299.0	635-1444	L	U	07/09/93	TANA247.5	634-1441	4	M	0
1807-30028	D8(VVBLK)L	230	S	07/02/90	YUKO229.0[l]	653-1435	L	U	05/30/93	TANA273.0	634-1443	3	M	1[k]
1807-30365	X5(VVBLK)L	0	--	07/18/92	TANA273.0	634-1443	SY	F	05/30/93	TANA273.0	634-1443	2	F	1[k]
1807-30071	M2(VVBLK)L	0	--	09/09/90	TANA280.5	634-1444	ASY	F	06/30/93	TANA280.5	634-1444	>4	F	4
1807-30072	M4(VVBLK)L	0	--	09/09/90	TANA288.5	634-1444	ASY	F	06/30/93	TANA288.5	634-1444	>4	F	4
987-71369	3C5(VVVBLK)L	100	ESE	07/10/86	TANA438.5	641-1464	L	U	05/31/93	TANA336.5	640-1450	7	M	4
1807-02303	CT(VVBLK)L	65	NW	07/05/89	TANA273.0	634-1443	L	U	07/02/93	TANA376.0	641-1454	4	F	4
816-98705	23(VVBLK)L	660	E	07/13/90	YUKO1432.0[m]	640-1584	ASY	M	07/03/93	TANA380.0	641-1454	>4	M	0
1807-30509	WB(VVBLK)L	240	SW	07/07/91	YUKO95.0[n]	651-1414	L	U	07/03/93	TANA427.0	641-1463	2	F	2
2206-14301	M3(VVBLK)L	130	NW	09/09/90	TANA299.0	635-1444	HY	M	07/04/93	TANA443.0	641-1464	3	M	4[k]

Table 9. Continued.

				Banding Information					Recovery/Resighting Information					
Band No.[a]	Auxmkr[b]	Dist km[c]	Dir[d]	Date	Location[e]	Lat-Long[f]	Age[g]	Sex[h]	Date	Location	Lat-Long	Age (yr)	Sex	No. Yng[i]
1807-30070	L9(VVBLK)L	130	NW	09/09/90	TANA281.5	634-1444	HY	F	07/04/93	TANA443.0	641-1464	3	F	4[k]
816-72841	00(VVBLK)R	445	E	06/13/89	YUKO1231.0[o]	644-1575	SY	M	07/12/93	TANA610.0	644-1485	4	M	4
1807-30369	Z5(VVBLK)L	190	SE	07/19/92	TANA376.0[p]	641-1454	L	F	09/17/93	Tetlin NWR	625-1413	1	F	U
1807-02319	KH(VVBLK)L	35	NW	07/05/89	TANA414.5	641-1461	L	U	07/05/93	SALCHA	643-1464	4	M	0[k]
1807-30059	K8(VVBLK)L	275	WSW	07/07/90	YUKO56.0[q]	645-1412	L	U	07/05/93	SALCHA	643-1464	3	F	0[k]

[a] U.S. Fish and Wildlife Service lock-on aluminum leg band.
[b] Auxiliary marker color leg band with engraved code [Format: CODE(Orientation-Color)Leg].
[c] Distance moved, kilometers.
[d] Direction moved in compass directions.
[e] River code (four letters) followed by river milepost location (in kilometers) [COLV-Colville River, SAGA-Sagavanirktok River, SALC-Salcha River, TANA-Tanana River, YUKO-Yukon River].
[f] 10-minute band block code showing latitude and longitude [634-1442 = 63° 40' N, 144° 20' W].
[g] Age codes: ASY-after second year, HY-hatch year, L-local (nestling).
[h] Sex codes: F-female, M-male, U-unknown
[i] Number of young produced by breeding pairs, U - unknown breeding status.
[j] Nestling raised near Ocean Point on Colville River moved to Sagavanirktok River to breed successfully.
[k] One member of a pair where both birds are color banded.
[l] Nestling raised near Circle on Yukon River moved to Tanana River to breed successfully.
[m] Nonbreeding male banded near Khotol and Yukon River moved to Tanana River to breed unsuccessfully (no young produced).
[n] Nestling raised near Nation and Yukon Rivers moved to Tanana River to breed successfully.
[o] Nonbreeding male banded near Gemeodedon Island on Yukon River moved to Tanana River to breed successfully.
[p] Badly decomposed female left at Tetlin NWR bunkhouse during migration season, unknown breeding status or breeding location. Nestling raised near Indian Creek on Tanana River in 1992.
[q] Nestling raised near Millers Camp on Yukon River moved to Salcha River to breed unsuccessfully (no young produced).

Table 10. Nest site summary of previously banded peregrine falcons, Tanana River, Alaska, 1993.

Location[a]	UNK[b]	UNBAND	FWS[c]-R	FWS-L	FWS-U	AUXMKR[d]-R	AUXMKR-L	AUXMKR CODE[e]
TANA103.0		M[f] F[g]						
TANA135.0								M - ET(VVBLK)L F - C2(VVBLK)L
TANA181.0								M - BT(VVBLK)L
TANA205.0		M F						
TANA211.0		F		M				
TANA221.5		M						F - 3C4(VVVBLK)L
TANA232.5		M F						
TANA243.0		F						F - 3C2(VVVBLK)L
TANA247.5							F	M - KN(VVBLK)L
TANA258.5		F					M	
TANA269.5	F	M						
TANA273.0								M - D8(VVBLK)L F - X5(VVBLK)L
TANA280.5		M						F - M2(VVBLK)L
TANA288.5		M						F - M4(VVBLK)L
TANA299.0		M F						
TANA336.5		F						M - 3C5(VVVBLK)L
TANA376.0		F					M	
TANA380.0		M						F - 23(VVBLK)L
TANA386.0							M F	
TANA414.5		M					F	
TANA427.0		M						F - WB(VVBLK)L
TANA431.0		M F						
TANA436.5							M F	
TANA443.0								M - M3(VVBLK)L F - L9(VVBLK)L
TANA459.5		M					F	
TANA550.0	M F							
TANA610.0		F						M - 00(VVBLK)R
SALCHA								M - KH(VVBLK)L F - K8(VVBLK)L
TOTAL	M=1 F=2	M=13 F=11	M=0 F=0	M=1 F=0	M=0 F=0	M=0 F=0	M=4 F=5	M=8 F=10

[a] Location = River code (four letters) followed by river milepost (in kilometers).
[b] UNK = Unknown banding status (neither leg was observed).
[c] FWS = U.S. Fish and Wildlife Service leg band on either right (R) or left (L) leg. Unknown (U) banding occurs when one leg has no band and the other leg was not seen. In this case the bird does not have an AUXMKR but it may or may not have a FWS band on the unseen leg.
[d] AUXMKR = Auxiliary marker color leg band used on either right (R) or left (L) leg.
[e] AUXMKR CODE = Auxiliary marker color leg band with engraved code [Format: CODE(Orientation-Color)Leg].
[f] M = Male.
[g] F = Female.

Appendix A. Observations of other raptors on the Sagavanirktok River, 1993.

Terr[a]	Location[b]	Species[c]	Ad[d]	Yng[e]	Flg[f]	Status[g]	Observations
0	SAGA110.0	CORA	0			1	June 15 - new nest, occupied by GYRF, faces downstream.
0	SAGA158.0	CORA	2	3		6	June 16 - pair with 3 young, near fledged.
0	SAGA158.5	CORA	2	3		6	June 16 - pair with 3 young, new nest, PEFA dives on young in nest and adults return with food.
0	SAGA158.5	CORA	0			1	July 30 - no birds at cliff.
0	SAGA199.5	CORA	2	U		7	June 18 - pair, nest at head of 'canyon', adult brooding but no young seen.
0	SAGA199.5	CORA	0			1	August 01 - no birds at cliff, nest not found.
0	SAGA182.0	GOEA	1			U	August 01 - adult fly and soar above bluff, E bank.
0	SAGA199.7	GOEA	1			U	June 18 - adult pass overhead to N.
0	SAGA208.0	GOEA				U	June 19 - subadult grounded by diving RLHA.
0	SAGA99.0	GYRF	2	2		4	June 14 - pair with 2 young, downies.
0	SAGA99.0	GYRF	0			U	July 28 - no birds at cliff.
0	SAGA110.0	GYRF	2	3		4	June 15 - pair with 3 young, recent hatchlings, adult female defensive.
0	SAGA110.0	GYRF	2	2		6	July 28 - pair with 2 young just fledged, adult female defensive.
0	SAGA118.0	GYRF	1			U	July 28 - adult perched on road sign at Happy Valley.
0	SAGA153.0	GYRF	1			4	June 16 - adult at overhang on high rim, very far, no young seen.
0	SAGA153.0	GYRF	0			U	July 30 - no birds seen at overhang area.
0	SAGA159.0	GYRF	1			4	June 17 - adult incubating in pothole.
0	SAGA159.0	GYRF	2	3	3	6	July 30 - pair with 3 fledged young, adult harassed by parasitic jaeger.
0	SAGA65.0	NOHA	2			2	June 13 - pair fly over shrub meadow adjacent to river, harassed by yellow wagtail.
0	SAGA70.0	NOHA	1			U	June 14 - adult male fly near river.
0	SAGA107.0	NOHA	1			U	July 28 - adult female flying S.
0	SAGA132.5	NOHA	1			U	June 15 - adult male fly near TAPS ROW on W side of river.
0	SAGA82.0	RLHA	0			1	June 14 - old stick nest on gravel slope at river.
0	SAGA95.0	RLHA	1			U	June 14 - adult fly above bluff area.
0	SAGA95.8	RLHA	1			U	June 14 - new stick nest, empty, adult male fly above cliff.
0	SAGA97.2	RLHA	1			U	June 14 - adult perched on ground at hilltop E of river.

Appendix A. Continued.

Terr[a]	Location[b]	Species[c]	Ad[d]	Yng[e]	Flg[f]	Status[g]	Observations
0	SAGA97.8	RLHA	0			1	June 14 - old stick nest, low, empty.
0	SAGA99.0	RLHA	1			U	June 14 - adult on perch, no nest seen.
0	SAGA99.0	RLHA	1			U	July 28 - single adult perched on meadow E of cliff.
0	SAGA100.8	RLHA	1			U	July 28 - adult dark morph circle high above river.
0	SAGA101.8	RLHA	1			U	June 15 - adult with narrow tail band cross high to S.
0	SAGA110.4	RLHA	2			4	June 15 - pair, adult in nest, high wall near red rim.
0	SAGA110.4	RLHA	2	U		6	July 28 - pair with fledged young, young not seen.
0	SAGA110.8	RLHA	2			4	June 15 - pair, low overwater, tail of bluff.
0	SAGA110.8	RLHA	1			U	July 28 - adult perched on pipeline VSM, across river from bluff.
0	SAGA110.8	RLHA	2	1	1	6	July 28 - pair with 1 young fledged, pair defensive.
0	SAGA115.0	RLHA	1			U	June 15 - adult fly S along hill W of river.
0	SAGA116.0	RLHA	0			1	June 15 - remnant stick nest on boulder, no adults.
0	SAGA126.5	RLHA	2			4	June 15 - pair, female in nest, dark morphs.
0	SAGA134.0	RLHA	2			4	June 16 - pair, nest in stack of cement pipe anchors, W edge of river.
0	SAGA143.7	RLHA	2			4	June 15 - pair, nest on sliding grass mat at half bluff height.
0	SAGA143.7	RLHA	2	1	1	6	July 30 - pair with 1 young near fledged.
0	SAGA145.5	RLHA	2			4	June 16 - pair, female FWS R.
0	SAGA145.5	RLHA	2	2	2	6	July 30 - pair with 2 young near fledged.
0	SAGA146.3	RLHA	2			4	June 16 - pair, nest on spire.
0	SAGA146.3	RLHA	2	3		6	July 30 - pair with 3 young near fledged.
0	SAGA148.4	RLHA	2			4	June 16 - pair, new nest, also empty nest nearby.
0	SAGA148.4	RLHA	2	2		6	July 30 - pair with 2 young, 3/4 to fledging.
0	SAGA151.5	RLHA	2			4	June 16 - pair, new nest.
0	SAGA151.5	RLHA	2	1	1	6	July 30 - pair with 1 young near fledged.
0	SAGA157.9	RLHA	2			4	June 16 - pair, adult in nest.
0	SAGA157.9	RLHA	2	U		7	July 30 - pair with young, rainy, did not count young.
0	SAGA159.0	RLHA	2			4	June 17 - pair, new nest on column.
0	SAGA159.0	RLHA	2	2	2	6	July 30 - pair with 2 young in nest, near fledged.
0	SAGA195.0	RLHA	2			4	June 18 - pair, new nest on N side creek canyon.

Appendix A. Continued.

Terr[a]	Location[b]	Species[c]	Ad[d]	Yng[e]	Flg[f]	Status[g]	Observations
0	SAGA197.0	RLHA	0			1	June 18 - old nest on spire.
0	SAGA197.8	RLHA	2			7	June 18 - pair fly and land on rim, no nest seen.
0	SAGA199.0	RLHA	2			7	June 18 - pair adults perched, flying, calling, no nest seen, could be up canyon.
0	SAGA199.0	RLHA	2			7	August 01 - pair calling, walk rim, no nest seen.
0	SAGA199.3	RLHA	2			7	June 18 - pair perch on rocks, no nest seen.
0	SAGA199.5	RLHA	2			7	June 18 - pair fly above canyon, no nest seen.
0	SAGA200.0	RLHA	2			7	June 18 - pair present, adult on spire, could be nest.
0	SAGA202.5	RLHA	2			4	June 18 - pair, adult in nest.
0	SAGA202.5	RLHA	2	4	4	6	August 02 - pair with 4 young near fledged.
0	SAGA203.5	RLHA	2			4	June 18 - pair, adult in nest.
0	SAGA203.5	RLHA	2	U		7	August 02 - pair calling, nest not seen.
0	SAGA208.0	RLHA	1			7	June 19 - adult dive on subadult GOEA, no nest seen.
0	SAGA217.5	RLHA	1			U	June 19 - adult circle up from E bank bluff, fly south, mate or nest not seen.
0	SAGA218.5	RLHA	2			U	June 19 - pair, fly over bluff, no nest seen.
0	SAGA219.0	RLHA	1			3	June 19 - single adult at nest, climb to nest, fresh lining, no eggs.
0	SAGA219.0	RLHA	0			3	June 19 - empty nest, fresh material, 1992 nest bowl with shell frags.
0	SAGA220.0	RLHA	0			5	June 19 - nest with 1 addled egg, no adults present, egg collected.

[a] Terr = Nest Territory Number assigned by U.S. Fish and Wildlife Service (FWS).

[b] Location = River code (four letters) followed by river milepost (in kilometers).

[c] Species = Four letter code standardized by FWS. CORA - common raven, GOEA - golden eagle, GYRF - gyrfalcon, NOHA - northern harrier, RLHA - rough-legged hawk.

[d] Ads = Adults.

[e] Yng = Young.

[f] Flg = Fledglings.

[g] Status = Nesting territory status code standardized by FWS. 1 - unoccupied, 2 - occupancy unknown, 3 - occupied nonbreeding, 4 - occupied breeding, 5 - occupied unsuccessful breeding, 6 - occupied successful breeding, 7 - occupied breeding status unknown, 8 - occupied breeding status unknown but no young produced.

Appendix B. Observations of other raptors on the Tanana River, 1993.

Terr[a]	Location[b]	Species[c]	Ad[d]	Yng[e]	Flg[f]	Status[g]	Observations
0	TANA129.0	AMKE	1			7	July 07 - adult fly and perch near river.
0	TANA172.0	AMKE	1			7	July 07 - adult male fly across river, perch in cottonwood (CW).
0	TANA183.8	AMKE	2			7	July 07 - adult male cross river to N with prey, food transfer to female in windfall area.
0	TANA185.0	AMKE	1			7	May 27 - adult cross river to N to windfall area above Cathedral, no nest seen.
0	TANA244.0	AMKE	1			7	July 09 - adult female foraging at base of cliff, no mate seen, no nest seen.
0	TANA259.0	AMKE	1			7	May 30 - adult dive on CORA at S bank.
0	TANA285.0	AMKE	1			U	May 30 - single bird flying.
0	TANA298.0	AMKE	1			7	May 31 - adult male fly across channel.
0	TANA331.0	AMKE	1			7	May 31 - adult male fly across channel.
0	TANA416.0	AMKE	1			7	July 03 - adult male dive on adult BAEA near BAEA nest.
0	TANA435.0	AMKE	1			7	July 07 - adult fly along bar near S bank.
0	TANA86.5	BAEA	1			U	May 25 - 1 adult perched on ground at S bank.
0	TANA86.5	BAEA				U	May 26 - 2 subadults perched on ground at S bank.
0	TANA88.0	BAEA				U	May 25 - 2 subadults fly low over water.
0	TANA101.0	BAEA	2			7	May 26 - pair adults in trees, no nest seen.
0	TANA114.0	BAEA	1			U	July 06 - adult perched in spruce (SP).
0	TANA116.2	BAEA	1			4	May 05 - adult in spruce (SP) nest.
0	TANA116.2	BAEA	2			4	May 26 - pair, adult in spruce (SP) nest, climb tree, 2 eggs, collect 1 egg, adult defends.
0	TANA116.8	BAEA	2	0		5	July 06 - pair with no young, collect unhatched egg.
0	TANA138.0	BAEA	0			1	May 05 - empty nest.
0	TANA138.0	BAEA	1			7	May 26 - empty cottonwood (CW) nest, 2nd empty nest, adult perched between nests.
0	TANA138.0	BAEA	0			1	July 07 - empty nest, cottonwood (CW).
0	TANA146.0	BAEA	0			U	July 07 - broken top spruce (SP), no nest.
0	TANA163.0	BAEA	0			1	May 27 - empty nest.
0	TANA163.0	BAEA	0			1	July 07 - empty nest, no adults.

Appendix B. Continued.

Terr[a]	Location[b]	Species[c]	Ad[d]	Yng[e]	Flg[f]	Status[g]	Observations
0	TANA171.0	BAEA	3			U	May 27 - dead moose on gravel bar, 3 adults, 2 subadults gathered in area.
0	TANA192.0	BAEA	2			7	May 27 - pair adults, active flight high over river, no nest seen.
0	TANA210.5	BAEA	U			U	May 05 - nest not found.
0	TANA211.0	BAEA	0			U	May 28 - nest gone.
0	TANA211.0	BAEA	0			U	July 08 - nest gone.
0	TANA219.0	BAEA	2			4	May 05 - adult in spruce (SP) nest, adult perched nearby.
0	TANA219.0	BAEA	2	1		4	May 28 - adult on spruce (SP) nest, climb tree, hear chick, adult defends close.
0	TANA219.0	BAEA	2	2		4	July 08 - pair with 2 young, 4+ weeks old, no adults present.
0	TANA226.5	BAEA	0			1	May 05 - empty nest.
0	TANA231.4	BAEA	U			U	May 05 - nest not found, leaning cottonwood (CW) in 1992.
0	TANA238.0	BAEA	0			1	May 05 - empty nest - new location, 1 mile above Billy Crk.
0	TANA238.0	BAEA	0			1	May 29 - empty nest, broken top spruce (SP).
0	TANA240.0	BAEA	2			7	May 29 - pair adults soaring together, high above river.
0	TANA244.3	BAEA	U			U	May 05 - date on map by Swem, no observation, is this a bird/nest location?
0	TANA251.0	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA251.0	BAEA	1			4	May 29 - adult in cottonwood (CW) nest, panting in hot sun.
0	TANA251.0	BAEA	2	2		4	July 09 - pair with 2 young, 4+ weeks old.
0	TANA254.0	BAEA	1			4	May 05 - adult in spruce (SP) nest.
0	TANA254.0	BAEA	2	0		5	May 29 - pair adults near spruce (SP) nest, climb tree, dead chick 80g in nest, failed pair.
0	TANA259.0	BAEA	2			U	May 30 - 2 adult flying in the distance above slough/meadow.
0	TANA275.0	BAEA	2			7	July 10 - pair perched and flying at S bank, harassed by gulls, no nest seen.
0	TANA311.0	BAEA	1			4	May 05 - adult on cottonwood (CW) nest.
0	TANA311.0	BAEA	U			U	May 31 - nest not checked, channel clogged.
0	TANA311.0	BAEA	U			U	July 01 - nest not checked, channel clogged.
0	TANA318.0	BAEA				U	July 01 - subadult harassed by mew gull.

Appendix B. Continued.

Terr[a]	Location[b]	Species[c]	Ad[d]	Yng[e]	Flg[f]	Status[g]	Observations
0	TANA320.0	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA320.0	BAEA	2			4	May 30 - pair, adult on nest.
0	TANA320.0	BAEA	1			4	July 01 - adult brooding, young not seen.
0	TANA324.5	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA324.5	BAEA	U			U	May 31 - nest not found.
0	TANA324.5	BAEA	1			7	July 01 - adult perched near empty nest.
0	TANA327.0	BAEA	0			1	May 31 - empty old nest.
0	TANA327.0	BAEA	1			7	July 01 - adult near empty old nest.
0	TANA330.5	BAEA	1			4	May 05 - adult in spruce (SP) nest.
0	TANA330.5	BAEA	0			1	July 01 - empty spruce (SP) nest at tail end of grove on island.
0	TANA332.0	BAEA				U	May 31 - subadult flush from sandbar.
0	TANA333.0	BAEA	2	2		4	July 01 - pair with 2 young, 3-4 weeks old.
0	TANA335.0	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA335.0	BAEA	2			4	May 31 - pair, adult stand in nest, brooding.
0	TANA335.0	BAEA	2	2		4	July 01 - pair with 2 young 3+ weeks old.
0	TANA342.0	BAEA	1			7	July 02 - 2 1/2 yr old perched in spruce (SP).
0	TANA343.0	BAEA	U			U	May 05 - nest not found.
0	TANA343.0	BAEA	1			7	June 01 - adult in grove of tall spruce (SP), N portion of bend in river.
0	TANA343.0	BAEA	1			7	July 01 - adult perched in spruce (SP).
0	TANA343.4	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA345.0	BAEA	0			1	July 02 - empty nest, cottonwood (CW).
0	TANA347.5	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA347.5	BAEA	2	1		4	July 02 - pair with 1 young 5+ weeks old, adult brooding.
0	TANA352.5	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA352.5	BAEA	U			U	June 01 - nest not checked (boat problems).
0	TANA352.5	BAEA	0			1	July 19 - empty nest, no adults.
0	TANA358.0	BAEA	0			1	May 05 - empty nest.
0	TANA358.0	BAEA	U			U	July 02 - nest not found.
0	TANA365.5	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.

Appendix B. Continued.

Terr[a]	Location[b]	Species[c]	Ad[d]	Yng[e]	Flg[f]	Status[g]	Observations
0	TANA365.5	BAEA	2	1		4	July 02 - pair with 1 young, 5 weeks old, cottonwood (CW), N bank side of heavy spruce (SP) island.
0	TANA369.0	BAEA	0			7	July 02 - empty nest, cottonwood (CW), pair adults fly above ridge.
0	TANA369.5	BAEA	0			1	May 05 - empty nest.
0	TANA370.0	BAEA	2	1		4	July 02 - pair with 1 young, 5 weeks old, nest in aspen on hilltop above 'Bluff Cabin.'
0	TANA377.0	BAEA				U	June 02 - subadult fly high, headed downstream.
0	TANA388.0	BAEA				U	June 02 - subadult perched in cottonwood (CW).
0	TANA390.0	BAEA	1			7	June 02 - adult perched in spruce (SP) on N bank.
0	TANA391.8	BAEA	0			1	July 03 - empty nest, small cottonwood (CW), edge of slough.
0	TANA392.0	BAEA	0			1	June 02 - empty nest, cottonwood (CW).
0	TANA392.0	BAEA	0			1	July 03 - empty nest, cottonwood (CW).
0	TANA394.0	BAEA	1			7	July 03 - adult perched in cottonwood (CW).
0	TANA396.0	BAEA	2	2		4	July 03 - pair with 2 young, 4+ weeks old, small island near N bank.
0	TANA400.5	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA400.5	BAEA	0			1	July 03 - empty nest, cottonwood (CW).
0	TANA403.0	BAEA	0			1	May 05 - empty nest.
0	TANA403.0	BAEA	2	U		7	July 03 - pair adults, one with prey, fly S low across river, no nest seen.
0	TANA406.0	BAEA	1			7	May 24 - adult with grayish tail carry stick nest near road, soar.
0	TANA408.0	BAEA	2	2		4	July 03 - pair with 2 young, 6+ weeks old, cottonwood (CW).
0	TANA414.5	BAEA	0			1	May 05 - empty nest, slumped.
0	TANA416.5	BAEA	1			4	May 05 - adult in cottonwood (CW) nest, previously at head of slough.
0	TANA416.5	BAEA	2	1		4	July 04 - pair with 1 young, 3+ weeks old.
0	TANA433.0	BAEA	0			1	July 04 - empty nest, cottonwood (CW).
0	TANA434.0	BAEA	0			1	July 04 - empty nest, cottonwood (CW), N bank.
0	TANA435.5	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA435.5	BAEA	2	2		4	July 04 - pair with 2 young, 7 weeks old, no adults present.
0	TANA447.5	BAEA	1			4	May 05 - adult in spruce (SP) nest.
0	TANA447.5	BAEA	2	2		4	July 04 - pair with 2 young 5+ week, spruce (SP) nest.
0	TANA452.5	BAEA	0			1	May 05 - empty nest.

Appendix B. Continued.

Terr[a]	Location[b]	Species[c]	Ad[d]	Yng[e]	Flg[f]	Status[g]	Observations
0	TANA462.0	BAEA	0			U	May 05 - nest gone.
0	TANA463.0	BAEA	2	2		4	July 04 - pair with 2 young, 6-7 weeks old, adults unbanded.
0	TANA471.2	BAEA	1			4	May 05 - adult in cottonwood (CW) nest, mouth of Salcha River.
0	TANA471.2	BAEA	1			7	July 05 - adult perch and fly, walk woods, nest not found.
0	TANA492.0	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA500.0	BAEA	0			1	May 05 - empty nest.
0	TANA506.5	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA511.0	BAEA	0			1	May 05 - empty nest.
0	TANA511.5	BAEA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA517.0	BAEA	U			U	May 05 - nest not found.
0	TANA524.5	BAEA	1			4	May 05 - adult in spruce (SP) nest, artificial nest.
0	TANA612.0	BAEA	0			1	July 12 - empty nest at creek, 2nd nest looks empty but poor view.
0	TANA614.5	BAEA	1			7	July 12 - adult perched at bluff, harassed by gull.
0	TANA88.0	CORA	1			U	May 26 - adult perched with BAEA.
0	TANA102.0	CORA	0			1	May 26 - two nest scars on small rock.
0	TANA103.0	CORA	2			7	May 26 - pair nesting on cliff.
0	TANA119.5	CORA	1			7	May 26 - adult stand in nest, no white-wash, no young.
0	TANA129.5	CORA	0			1	May 26 - old nest midden, some white-wash.
0	TANA183.0	CORA	2	3		4	May 27 - pair with 3 young at 2/3 fledge.
0	TANA183.0	CORA	2	U		7	July 07 - pair with fledged young, young gone, not seen.
0	TANA211.0	CORA	2	2		4	May 27 - pair with 2 young at 2/3 fledge.
0	TANA221.5	CORA	2	5		6	May 28 - pair with 5 young near fledged.
0	TANA232.5	CORA	2	0		5	May 28 - pair with no young, new nest.
0	TANA236.0	CORA	0			1	May 28 - empty nest, new, tail of bluff.
0	TANA243.0	CORA	2	3		4	May 29 - pair with 3 young, nest in steep chimney.
0	TANA249.0	CORA	2	2		4	May 29 - pair with 2 young, new nest, high rock.
0	TANA259.0	CORA	2	3		6	May 30 - pair with 3 young, near fledged.
0	TANA289.9	CORA	0			1	May 30 - empty nest.
0	TANA327.0	CORA	1			7	July 01 - adult with prey in bill fly W.
0	TANA336.0	CORA	2	4		4	May 31 - pair with 4 young, new nest.

Appendix B. Continued.

Terr[a]	Location[b]	Species[c]	Ad[d]	Yng[e]	Flg[f]	Status[g]	Observations
0	TANA413.0	CORA	2	3		4	June 03 - pair with 3 young, new nest location.
0	TANA438.5	CORA	1			7	June 29 - adult call from base of cliff.
0	TANA477.5	CORA	1			4	May 05 - adult in cottonwood (CW) nest.
0	TANA108.0	GHOW	1			U	July 06 - adult flush from perch at river bank.
0	TANA614.5	GHOW	1			U	July 12 - adult flush with prey, along slough.
0	TANA188.0	GOEA	0			1	May 27 - empty nest.
0	TANA188.0	GOEA	0			1	July 07 - empty nest.
0	TANA204.0	GOEA	0			1	May 27 - empty nest, high rock wall.
0	TANA204.0	GOEA	0			1	July 07 - empty nest.
0	TANA205.0	GOEA	0			1	May 27 - empty nest, creek valley.
0	TANA235.0	GOEA	0			1	July 08 - empty nest.
0	TANA92.0	GOSH	1			7	July 06 - adult calling from thick stand of trees on island.
0	TANA163.0	NOHA	1			7	May 27 - adult female flushed from meadow.
0	TANA221.5	NOHA	1			U	May 28 - adult male fly over shrub meadow.
0	TANA326.0	NOHA	1			U	May 31 - adult male fly over river.
0	TANA225.5	OSPR	1			4	May 28 - adult at new spruce (SP) nest, narrow slough.
0	TANA227.5	OSPR	0			U	May 28 - nest gone.
0	TANA264.5	OSPR	0			1	May 05 - empty nest.
0	TANA264.5	OSPR	2			4	May 30 - pair, adult in nest, adults unbanded.
0	TANA264.5	OSPR	2			4	July 09 - pair, adult in nest, incubating, flushed, adults unbanded.
0	TANA278.0	OSPR	2			4	May 30 - pair, adult in nest, spruce (SP).
0	TANA278.0	OSPR	1			4	June 30 - adult low in nest, incubating.
0	TANA278.0	OSPR	1			4	July 08 - adult on nest, flushed, no band L.
0	TANA278.0	OSPR	2			4	July 10 - pair with small young, adult brooding, mate perched nearby.
0	TANA167.0	RTHA	2	2		4	July 07 - pair with 2 young, nest in spruce (SP), female is Harlan's Hawk type, male not seen.
0	TANA177.0	RTHA	1			2	May 27 - adult fly high, very pale reddish tail.
0	TANA192.0	RTHA	1			2	May 27 - adult fly high and soar.

Appendix B. Continued.

Terr[a]	Location[b]	Species[c]	Ad[d]	Yng[e]	Flg[f]	Status[g]	Observations
0	TANA242.5	RTHA	2	U		4	July 09 - pair with young, spruce (SP) witches broom at right edge of aspen 'draw'.
0	TANA332.0	RTHA	1			7	May 30 - adult on snag perch.
0	TANA335.5	RTHA	1			7	July 01 - adult perched at bluff, fly across river.
0	TANA347.0	RTHA	1			7	July 02 - adult Harlan's Hawk type perch in cottonwood (CW), scolding, 2nd adult on perch, no nest found.
0	TANA259.0	SSHA	1			7	May 30 - adult female cross river to S, perch in large cottonwood (CW), then gone.
0	TANA305.0	SSHA	1			7	May 31 - adult female carry prey into trees at Sawmill Landing - millsite.
0	TANA345.0	SWHA	1			2	June 01 - adult circling up on thermal above river, this area adjacent to Delta Ag Fields.

[a] Terr = Nest Territory Number assigned by U.S. Fish and Wildlife Service (FWS).

[b] Location = River code (four letters) followed by river milepost (in kilometers).

[c] Species = Four letter code standardized by FWS. AMKE - American kestrel, BAEA - bald eagle, CORA - common raven, GHOW - great-horned owl, GOEA - golden eagle, GOSH - northern goshawk, NOHA - northern harrier, OSPR - osprey, RTHA - red-tailed hawk, SSHA - sharp-shinned hawk, SWHA - Swainson's hawk.

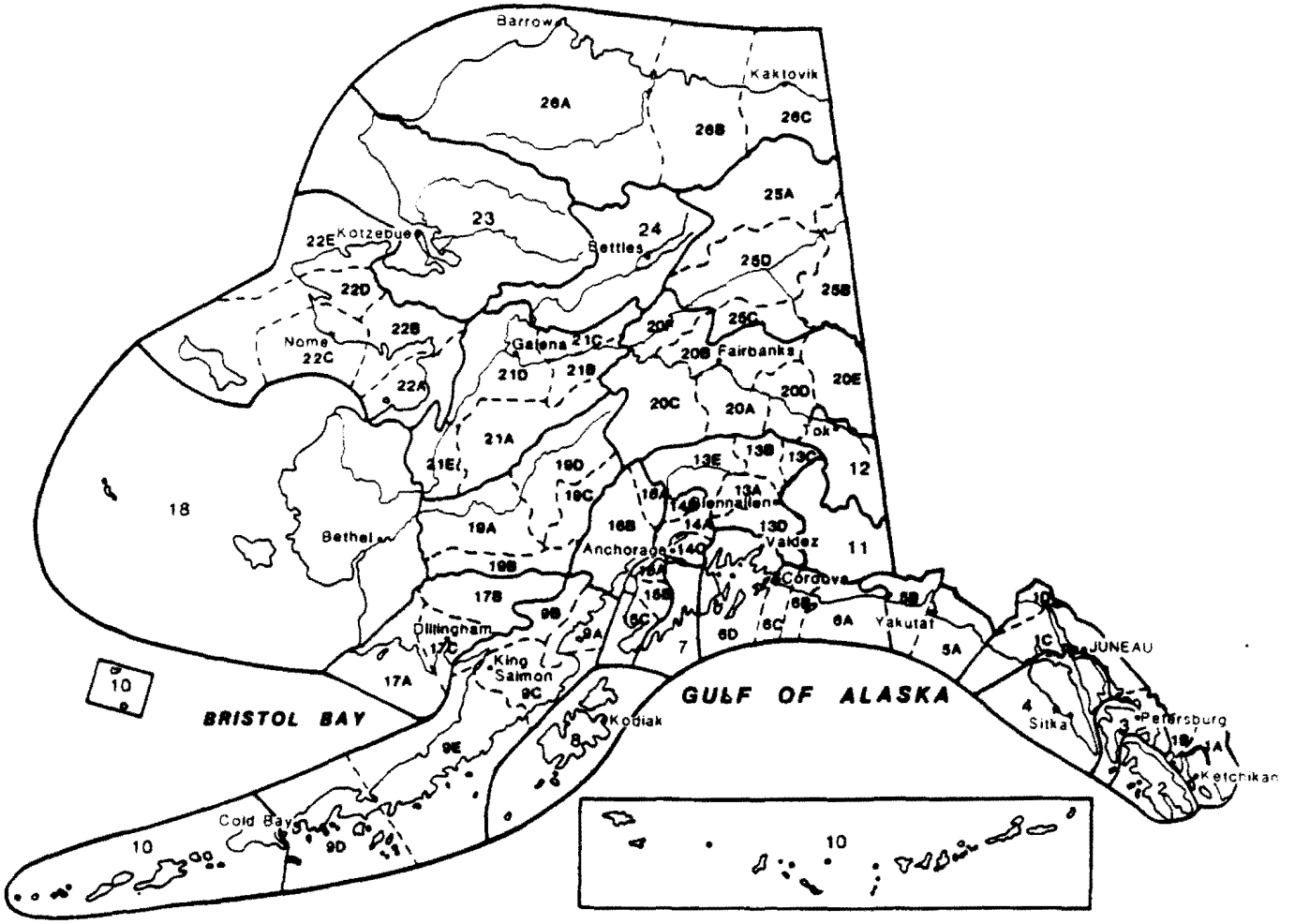
[d] Ads = Adults.

[e] Yng = Young.

[f] Flg = Fledglings.

[g] Status = Nesting territory status code standardized by FWS. 1 - unoccupied, 2 - occupancy unknown, 3 - occupied nonbreeding, 4 - occupied breeding, 5 - occupied unsuccessful breeding, 6 - occupied successful breeding, 7 - occupied breeding status unknown, 8 - occupied breeding status unknown but no young produced.

Alaska's Game Management Units



Federal Aid in Wildlife Restoration

The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sales of handguns, sporting rifles, shotguns, ammunition, and archery equipment. The Federal Aid program then allots the funds back to states through a formula based on each state's geographic area and the number of paid hunting licenseholders in the state. Alaska receives 5% of the revenues collected each year, the maximum allowed. The Alaska Department of Fish and Game uses the funds to help restore, conserve, manage, and enhance wild birds and mammals for the public benefit. These funds are also used to educate hunters to develop the skills, knowledge, and attitudes necessary to be reponsible hunters. Seventy-five percent of the funds for this project are from Federal Aid.