J. Raptor Res. 32(3):261–264

PEREGRINE FALCONS (*FALCO PEREGRINUS*) NEST IN A QUARRY AND ON HIGHWAY CUTBANKS IN ALASKA

ROBERT J. RITCHIE
ABR, Inc. Environmental Research and Services, P.O. Box 80410, Fairbanks, AK 99708 U.S.A.

TERRY J. DOYLE
Tetlin National Wildlife Refuge, P.O. Box 779, Tok, AK 99780 U.S.A.

JOHN M. WRIGHT
Alaska Department of Fish and Game, 1300 Mile College Road, Fairbanks, AK 99701 U.S.A.

KEY WORDS: *Peregrine Falcon*; Falco peregrinus; *nesting*; *artificial nests*; *disturbance*; *Alaska.*

In Alaska, the Peregrine Falcon (*Falco peregrinus*) nests primarily on cliffs, although nesting on low relief dirt banks does occur (Cade 1960). As peregrine populations have recovered and increased in Alaska, sites that once may have been described as suboptimal for nesting have been occupied. Further, man-made structures and altered habitats might be expected to attract at least occasional use as densities of these falcons, as well as altered habitats, continue to increase. Examples of human developments in Alaska that might attract nesting peregrines include towers, quarries, and road cutbanks. Some of these artificial nesting habitats have been used elsewhere in the breeding range of the species (White et al. 1988, Cade et al. 1996), and have been used in Alaska by Gyrfalcons (*Falco rusticolus*; White and Roseneau 1970, Ritchie 1992). In this paper, we describe recent Peregrine Falcon nesting at two well-trafficked highway cutbanks along the Alaska Highway in east central Alaska and at a quarry site on the Seward Peninsula in northwestern Alaska.

HIGHWAY SITES

In 1995, we located a pair of Peregrine Falcons at a quarried road cut along the Alaska Highway in east-central Alaska. The nest (EN) was located on a broad, rocky ledge (approximately 1 m × 1 m), approximately 10 m from the base of the cut (Fig. 1). There was no rock overhang above the nest, but steep rock sides adjacent to the scrape sheltered the site partially from severe weather. Subsequent visits that year revealed the female incubating two eggs, both of which hatched and both young fledged. In 1996, an adult, presumably the female, was observed incubating two eggs but the nest eventually failed. In 1997, a pair of falcons again occupied this site, four eggs were incubated, and three young were present on 31 July.

The second nest (WN) was located along the highway on a cutbank approximately 300 km west of EN. Although the nest occurred on a well-shaded, natural ledge, approximately 50 m above the highway (Fig. 2), the lower third of the cliff had been quarried during widening of the road. This location was first identified as a possible nesting location by biologists during a general bird survey in the area; a pair was observed in May 1997 (M. Ambrose and C. McIntyre pers. comm.). Our observations that summer revealed that a pair nested on the bluff and that one young fledged in mid-August.

Peregrine Falcons are a common breeding bird along the Tanana River and some of its major tributaries adjacent to the Alaska Highway. More than 25 pairs occur on riparian cliffs along the main channel (Bente and Wright 1995). Off-river sites on bluffs bordering older portions of the floodplain or in upland areas (like EN) are present but more limited than are sites fronting the main river channel. Some of these off-river sites have been occupied, but after most cliff habitats along the river had been used (B. Ritchie, unpubl. data).

Although initial sightings of falcons at these two sites were not associated with rigorous Peregrine Falcon surveys in the area, we think that it is unlikely that peregrines occupied these sites during the previous decade. The EN site had been checked by one of the authors since 1988. The WN site is along a route frequented by biologists interested in peregrine use of cliffs in the area.

QUARRY SITE

The third site (QN) was located east of Nome, northwestern Alaska, in a rock quarry fronted by a well-maintained, two-lane gravel road. The quarry was cut in graduated 6–8 m steps to an elevation of approximately 110 m, on a 185 m tall headland on the coast of the Bering Sea. Peregrines were first reported there in 1988, when a pair of adults with one young was observed in late July (T. Booth and B. Nelson pers. comm.). From 1989–91, a pair of defensive peregrines was observed each year, but

Figure 1. A view of a quarried road cut used by Peregrine Falcons for nesting (EN) along the Alaska Highway.

no young were found during intensive searches. Two empty nest scrapes were found near the top of the quarry in niches in vertical step faces of the blasted rock in 1989. In 1996 and 1997 members of birding tours occasionally observed single peregrines at the site (P. Bente pers. comm.) and Common Ravens (*Corvus corax*) nested in the quarry.

As of 1991, more than 35 peregrine nest sites were known for the northwest coast of Alaska, on sea cliffs and dirt bluffs from the mouth of the Yukon River to Cape Prince of Wales (Bente and Wright 1992). The closest neighboring sites were approximately 60 km of our quarry site. Peregrines may have been at the quarry before 1988, but it is unlikely. Birding tours regularly drove by the site to reach premier birding spots and the quarry itself was checked occasionally by agency representatives.

ATYPICAL SITES

We think that at least two factors make these sites of special interest. First, all three sites were located in what can be described as moderate to high disturbance zones. Both sites in interior Alaska were along busy highways. Traffic records for EN identified over 600 vehicles/day during May–August (U.S. Customs, ALCAN Station, unpubl. data), the period during which peregrines would have courted, laid and incubated eggs, and raised young (Cade 1960). Traffic at WN undoubtedly was much greater due to regular commuter activity associated with nearby communities. In addition, heavy equipment (e.g., rock crusher) operated behind EN in the years it was successful.

The road beneath QN was used daily by numerous vehicles after mid-May (1988–91, 1996–97; J. Wright, unpubl. data). The quarry was in operation periodically during our visits. In July 1988, a rock crusher was operating at the base of the quarry within 200 m of the nest with young. From 1989–91, the quarry was not in operation when we stopped 2–4 times each summer to check for peregrines. In 1996 and 1997, blasting and crushing operations regularly occurred.

While it is true that a few other peregrine nests in Alaska have been found close to roads, the volume of and proximity to traffic are substantially less at these than levels and distances recorded at EN and WN. Numerous cases of peregrines using high-traffic areas (e.g., occupied buildings and traffic-laden bridges) have been described in urban areas (Cade et al. 1996, Bell et al. 1996). However, it is likely that many of these birds (especially in eastern North America) were captive-reared and released in urban areas (Cade and Bird 1990). These "urban" birds may have been more tolerant of human activity. To our knowledge, this phenomenon of using human altered habitats, within high disturbance areas, has not been reported for remote and wild populations in North America.

Confirmed records for Peregrine Falcons nesting on man-modified structures in Alaska are lacking. Peregrines were reported defending a large microwave tower at a Dewline Site on Barter Island in northern Alaska (D. Nigro pers. comm.), but proof of nesting was not established. In earlier years, Peregrine Falcons had successfully nested on a coastal dirt bluff within 2 km of the tower site (F. Mauer pers. comm.). Quarried sites undoubtedly provide suitable habitat for nesting and may be more attractive where natural cliffs are limited or occupied. As peregrine populations have recovered elsewhere from

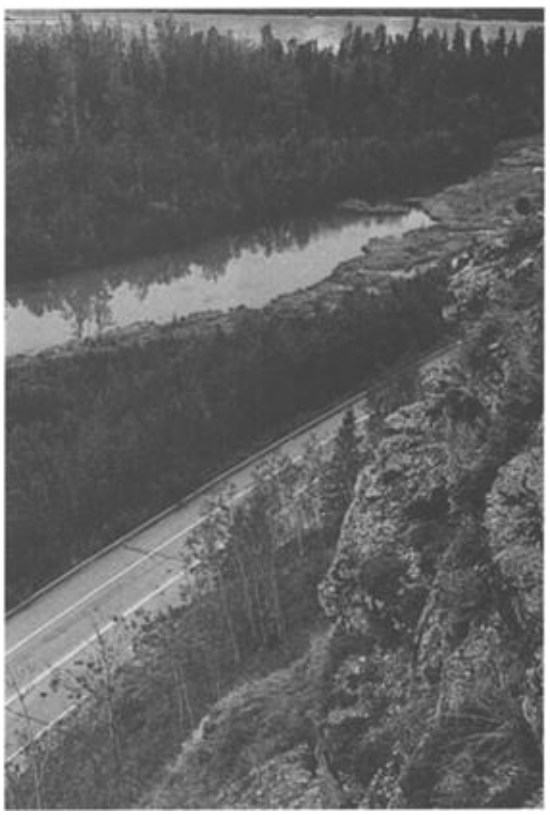

Figure 2. A view from the nest scrape on a quarried road cut used by Peregrine Falcons for nesting (WN) along the Alaska Highway.

the low numbers in the 1970s and prime habitats are reoccupied, quarries have been used (Australia: White et al. 1988, Olsen 1995; Britain: Ratcliffe 1988; U.S.: Cade et al. 1996). It is important to note, however, that while peregrines were successful in nesting at all of our sites during some years, they only definitely nested in one of six years at the QN site and failed during incubation in one of three years at EN. We cannot rule out disturbance as a factor in unsuccessful nesting.

The three sites described herein are close analogs of natural cliff habitats in their respective regions. With the exception of the levels of human disturbance, each provided basic requirements for successful nesting: good ledges and protection from ground predators. Additionally, each appeared to be proximal to enough habitats used by common prey species for successful hunting. Prey remains gathered at WN and EN were typical of prey for peregrines in interior Alaska (Cade 1960). For example, shorebirds (53%), ducks and gulls (18%) and passerines (29%) comprised the prey items found at the EN site ($N = 17$). Similar species have been gathered at Tanana River nests (B. Ritchie, unpubl. data).

As populations of the Peregrine Falcon continue to recover in Alaska, they appear to be increasing in areas which once were thought to contain suboptimal nesting sites (e.g., off-river areas, subalpine cliffs). As reported here, some pairs have been able to use "suboptimal" (i.e., disturbed areas) cliffs modified by humans. It will be interesting to monitor the continued recovery of peregrines in Alaska as man-modified habitats increase in distribution, abundance, and diversity. We suspect that a growing number of birds will tolerate human activity and attempt to use these areas for nesting.

RESUMEN.—*Falco peregrinus* anidó exitosamente en tres habitats alterados de Alaska. Dos de los sitios fueron en canteras a lo largo de congestionadas autopistas en el interior de Alaska. El tercer sitio ocupado fue una de las caras de una cantera activa en el noreste de Alaska. Estas son las primeras observaciones registradas de halcones peregrinos anidando en este tipo de habitats en lugares remotos como Alaska. Aun más, todos los sitios estaban cercanos a carreteras con bastante tráfico. De continuar en aumento el número de peregrinos y de sitios alterados en Alaska, sospechamos que mas halcones peregrinos utilizarán estos habitats y estructuras.

[Traducción de César Márquez]

ACKNOWLEDGMENTS

The authors would like to thank Clayton White, Ted Swem and Dan Varland for reviewing a draft of this paper and making insightful comments for its improvements. We would also like to thank a number of people who provided their observations of Peregrine Falcons at sites described in our paper: Michelle Ambrose; Peter Bente and Bob Nelson, Alaska Department of Fish and Game; Carol McIntyre, National Park Service; Tony Booth, Fran Mauer, and Henry Timm, U.S. Fish and Wildlife Service; and Debbie Nigro, ABR, Inc.

LITERATURE CITED

BELL, D.A., D.P. GREGOIRE AND B.J. WALTON. 1996. Bridge use by Peregrine Falcons in the San Francisco Bay Area. Pages 15–24 *in* D.M. Bird, D.E. Varland and J.J. Negro [EDS.], Raptors in human landscapes. Academic Press, London, U.K.

BENTE, P.J. AND J.M. WRIGHT. 1992. Documentation of active Peregrine Falcon nest sites. Alaska Dept. Fish and Game, Fed. Aid in Wildl. Restor., Final Rep., Proj. SE 2-6, Juneau, AK U.S.A.

——— AND ———. 1995. Documentation of Peregrine Falcon nest sites in relation to state land use proposals. Alaska Dept. Fish and Game, Fed. Aid in Wildl. Restor., Final Rep. Proj. SE 2-8, Part II, Juneau, AK U.S.A.

CADE, T.J. 1960. The ecology of peregrines and Gyrfalcons in Alaska. *Univ. Calif. Publ. Zool.* 63:151–290.

——— AND D.M. BIRD. 1990. Peregrine Falcons, *Falco peregrinus*, nesting in an urban environment: a review. *Can. Field-Nat.* 104:209–218.

———, M. MARTELL, P. REDIG, G. SEPTON AND H. TORDOFF. 1996. Peregrine Falcons in urban North America. Pages 3–13 *in* D.M. Bird, D.E. Varland and J.J. Negro [EDS.], Raptors in human landscapes. Academic Press, London, U.K.

OLSEN, P. 1995. Australian birds of prey: the biology and ecology of raptors. John Hopkins Univ. Press, Baltimore, MD U.S.A.

RATCLIFFE, D.A. 1988. The peregrine population of Great Britain and Ireland, 1965–1985. Pages 147–157 *in* T.J. Cade, J.H. Enderson, C.G. Thelander and C.M. White [EDS.], Peregrine Falcon populations: their management and recovery. The Peregrine Fund, Inc., Boise, ID U.S.A.

RITCHIE, R.J. 1992. Effects of oil development on providing nesting opportunities for Gyrfalcons and Rough-legged Hawks in northern Alaska. *Condor* 93:180–184

WHITE, C.M. AND D.G. ROSENEAU. 1970. Observations on food, nesting, and winter populations of large North American falcons. *Condor* 72:13–115.

———, W.B. EMISON AND W.M. BREN. 1988. Atypical nesting habitat of the Peregrine Falcon in Victoria, Australia. *J. Raptor Res.* 22:37–43.

Received 29 December 1997; accepted 17 May 1998

J. Raptor Res. 32(3):264–266

LICE (PHTHIRAPTERA: AMBLYCERA, ISCHNOCERA) OF RAPTORS IN HUNGARIAN ZOOS AND REHABILITATION CENTERS

SZABOLCS SOLT
H-9083 Écs, Petöfi u. 60., Hungary

KEY WORDS: *Phthiraptera; louse infestations; rehabilitation centers; injured raptors; Hungary.*

Here, I describe louse (Phthiraptera: Amblycera, Ischnocera) infestations of raptors kept in zoos and rehabilitation centers in Hungary and conclude that injuries increase the frequency and extent of such infestations. Fifty-five individuals of 18 species of raptors from the families Accipitridae, Falconidae, Tytonidae, and Strigidae were examined in 1995–96 at the Zoological Parks of Győr and Veszprém (14 and 12 birds, respectively), the raptor rehabilitation center of Fertõ-Hanság National Park at Kõszeg (11 birds), and the rehabilitation center of Hortobágy National Park at Góréstanya (18 birds). There was no regular use of insecticides to control louse infestations at any of these sites. Many of the raptors were badly injured by electrocution from high voltage transmission lines or by illegal shooting. Injuries often resulted in extensive damage to wings and legs.

Lice were collected using forceps during 10-min visual examinations while the birds were immobilized by assistants. Twenty birds (36%) were found to carry lice resulting in a total of 373 lice (86 males, 196 females, and 91 nymphs, Table 1) collected. Eight species of lice were found, two of which were typical parasites of galliform hosts and presumably originated from dead chickens supplied as food.

Avian grooming partially serves to control the spread of ectoparasites (Marshall 1981). Grooming, such as foot scratching, eliminates lice on the head and bill preening removes lice from other body parts (Clayton 1991, Rózsa 1993). Since I assumed that birds with major limb injuries were presumed to preen less frequently, I compared the numbers of lice on 11 injured and 28 healthy raptors. Because of the aggregated distribution of lice on different individuals (Rékási et al. 1997), I used a one-tailed Mann-Whitney U-test as a nonparametric statistic. Statistical analyses were carried out by InStat 2.01.

Avian lice can be viewed as representatives of a single ecological guild of ectoparasites. Thus, their abundance can be expressed as total louse numbers (belonging to any species) living on the same individual bird (Rózsa 1997). When comparisons were made between raptors with damaged limbs versus intact limbs, there was a significant difference in total louse abundance ($U = 48.5$, $P < 0.001$, Fig. 1). Lice also show considerable site-specificity on their hosts (e.g., Perez et al. 1996); therefore different louse taxa should show different responses to decreased grooming abilities of injured raptors. Species of the genus *Craspedorrhynchus*, for instance, are typically distributed on the head and nape of raptors and birds scratch using their feet to remove them (Gallego et al 1987). Limb-damaged birds naturally show much less foot scratching, either because they lack the use of one leg which prohibits them from reaching their heads with the other one, or because they have broken wings which distorts normal foot scratching movements at least on one side of the body. In fact, the abundance of *Craspe-*