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ACTIVITIES OF A MIGRANT MERLIN DURING AN ISLAND STOPOVER

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Activities of a radio-tagged Merlin (*Falco columbarius*), which was trapped and identified as an adult female by George Allez and Daniel D. Berger, were observed from 10–16 April 1977 on Loggerhead Key, a 20 ha island in the Dry Tortugas (Fig. 1). The island is located in the Gulf of Mexico, 126 km west of Key West, Florida. Habitats consisted of 1) surrounding gulf waters, 2) open coral beach, 3) dense stands of Australian pine (*Casuarina equisetifolia*), 4) a community dominated by *Opuntia* spp. and century plant (*Agave americana*), 5) a grass association dominated by *Uniola* spp., and 6) areas adjacent to the lighthouse and buildings, planted in coconut palms (*Cocos nucifera*). Many birds of prey pause at Loggerhead Key during spring migration according to Ward (1975), who states, "a research team consisting of me, Mr. William S. Clark, Mr. William S. Seegar, and Mr. Edward B. Trescott, visited Loggerhead Key in shifts from 9 through 17 April 1974. Birds of prey observed during this period included 5 Peregrine Falcons, 63 Merlins, 48 kestrels, 4 Sharp-shinned Hawks, 3 Broad-winged Hawks, and 12 Ospreys."

An adult female Merlin trapped on 9 April 1977 at 1600 H (EST), had a U.S. Fish and Wildlife Service band applied and a 3.3-gram radio transmitter attached using the tail feather attachment method described by Cochran (1975). The Merlin was released on 10 April at 0715 H (EST) with one of us (AR) thereafter radio-tracking the bird on foot continuously during the daylight hours through 16 April to allow for visual observation during 80% of that time (75.6 hr). The Merlin migrated north at 0733 H on 17 April. The bird stayed on or near the island during the 7 d except for 73 min on 15 April when it flew east 4 km to Garden and Bush keys at 0937 H (EST).

Tracking was done cautiously to avoid disturbing the Merlin; however, 9 of 277 observed flights (Fig. 2a) may have been caused by the tracker (6 flights) or by other people with dogs (3 flights). In these nine cases the bird was on the ground or within 5 m of the ground with a cuckoo prey when flushed. Although the tracker often came equally close to the bird when it was perched in a tree, the Merlin did not flush in those instances.

Over 7 d of observation, the Merlin's time in flight averaged 5.7% (range 1.9%–10.8%) of daylight (the 808 min between morning and evening civil twilight). This is similar to 6% reported for migrating Peregrines (*Falco peregrinus*) (Cochran 1975) and 6.5 to 7.1% for winter Goshawks (*Accipiter gentilis*) (Widen 1984). The reduced flight of the Merlin on 10 April (Fig. 2a) may have been related to its having been held overnight. Upon release the Merlin flew to an Australian pine and remained until 1230 H. On 13 and 14 April, when Yellow-billed Cuckoos (*Coccyzus americanus*) were captured early, flight time and number of flights were markedly less than on days when lighter prey were captured (Fig. 2).

Four of 20 (20%) observed capture attempts were successful. Eight other prey obervations (of the 12 documented, Fig. 2b) were the result of unobserved capture attempts (behind vegetation or buildings, or out over the water). The 20% success rate is within the range of hunting success reported elsewhere: 25% (Toland 1986), 12.8% (Page and Whitacre 1975), 5% (Rudebeck 1951), 22.5% (Buchanan et al. 1988).

Feeding (eating, standing with prey, or bill wiping) time averaged 7.0% of daylight (range 0–21.6%). The least feeding was observed the first two days after release (0% and 0.7%). Feeding was shorter (4.0% of daylight) on days when lighter prey were captured and longer (14.6% of daylight) on days when heavier prey (Yellow-billed Cuckoos) were captured. The extra feeding time on large prey was largely a result of the time spent holding the prey between bouts of feeding. Cuckoos were held on or near the ground until partially consumed or until the Merlin was flushed. Light and medium-sized prey were always carried to an elevated perch where they were immediately consumed. One of the cuckoos was cached in a tree and consumed during two visits. Caching has been noted previously for Merlins (Sperber and Sperber 1962; Oliphant and Thompson 1976).

Preening averaged 3.0% of the daylight period (range 0.14–8.8%), including time spent manipulating the band (0.4% of daylight) and radio transmitter (0.6% of daylight) During the first 5¼ hr after release, while perching in the same tree, 10.1% of her time was spent grooming (4.1% preening, 4.1% manipulating the band and 1.9% preening the transmitter). We include the bird's response to the presence of the band and transmitter as preening time because the bird appeared to be attempting to preen away these objects and because all band and transmitter manipulation occurred while preening. The amount of time spent in manipulating the band and transmitter suggest the behavioral effect of these study techniques is probably small. The decreased initial flight and feeding were probably due to handling and being held overnight.

Seven prey species identified (Fig. 2b) were among those

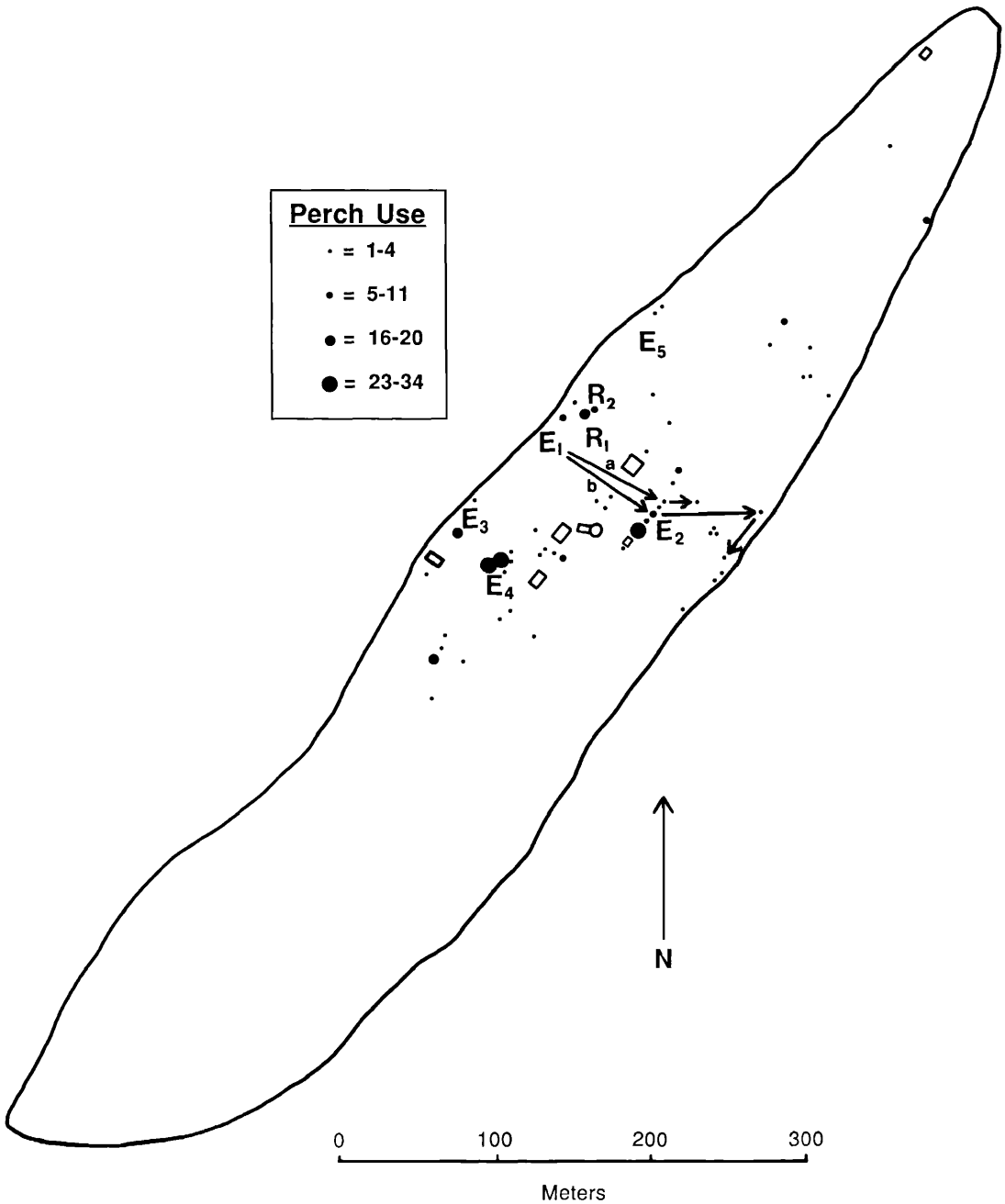

Figure 1. Perching (dots), feeding (E), and roosting (R) sites of a female Merlin on Loggerhead Key during an April migratory stopover. Open rectangles and circle (light house) are buildings. Size of perch symbols indicates frequency of use. Roosting site R1 was used 10–13 April and R2 14–16 April. Feeding site E1 was used on 11, 13 and 14 April; E2 on 12 and 14 April; E3 on 12, 13, 15 and 16 April; E4 on 15 April; E5 on 16 April. Arrows indicate the consecutive feeding sites used while feeding on a large prey item on 13 April (a) and 14 April (b).

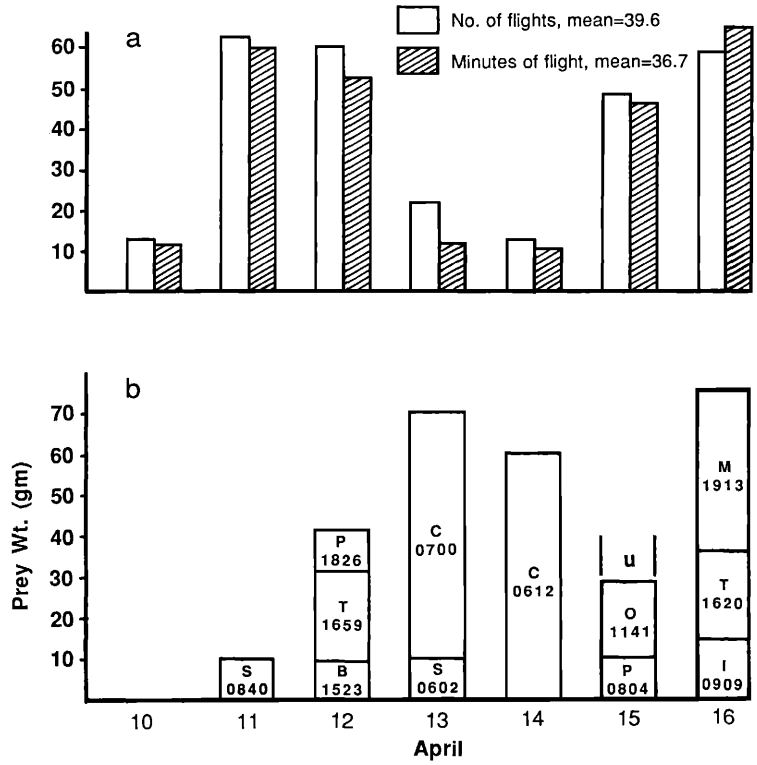

Figure 2. Daily breakdown of Merlin a. flight activity and b. prey weight, species and time taken. S = small bird (approx. 10 grams), B = Black-throated blue warbler (*Dendroica caerulescens*), T = Tree swallow (*Iridoprocne bicolor*), P = Palm warbler (*D. palmarum*), C = Yellow-billed cuckoo (*Coccyzus americanus*), O = Ovenbird (*Seiurus aurocapillus*), I = Indigo bunting (*Passerina cyanea*), M = medium-sized bird (approx. 40 grams), U = unknown prey taken in Garden or Bush Key area, if any. Weights are from Clench and Leberman (1978).

reported to be common Merlin prey (Bent 1938; Breckenridge and Errington 1938; Craighead and Craighead 1940; Oliphant and McTaggart 1977; Hodson 1978; Page and Whitacre 1975; Becker 1985). Most of these prey were among the commonest prey observed in the areas in which the Merlin was observed to hunt (A. Raim, pers. obs.).

Most activities took place in the central semi-open part of the island (Fig. 1) where there were numerous scattered live and dead Australian pines, coconut palms and *Agava* stalks. Less than 15% of daylight was spent in the open scrub vegetation in the south and the denser Australian pine in the north and northwest parts of the island. The Merlin perched in many different locations during the day; some perch sites were used repeatedly. As indicated by monitored radio signals, the Merlin also perched and made several flights while in the vicinity of Garden and Bush Keys.

Two trees were used as night roosts. Roosting from 10 through 13 April was in a coconut palm (Fig. 1: R1) and from 14 through 16 April, in an Australian pine (Fig. 1: R2). On the two mornings when the Merlin was found perched exactly where she had roosted the night before, she left 12 and 18 min before sunrise. On the other four days she had already left the roost by the time observation began (range 12 min before sunrise to 8 min after sunrise). The time that she went to roost averaged 20.5 min (range 11–27 min) after sunset on 4 evenings and were between 20 and 30 min after sunset on three occasions when the exact minute she arrived at the roost tree could not be determined.

On thirteen occasions the Merlin was observed near other raptors. In five instances the radio-tagged Merlin chased other Merlins; in three instances it took off and flew with passing Merlins for short distances before returning to its perch. Three other times it ate or perched

in a tree occupied by another Merlin, with no interaction observed even when it flew and then returned to a perch 3 m from a male Merlin. The Merlin also stooped on a Northern Harrier (*Circus cyaneus*) and on another unidentified raptor.

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LITERATURE CITED

BECKER, D. M. 1985. Food habits of Richardson's Merlins in southeastern Montana. *Wilson Bull.* 97:226–230.

BENT, A. C. 1938. Life histories of North American Birds of prey. Part 2. *U.S. Nat. Mus. Bull.* 167.

BRECKENRIDGE, W. J. AND P. L. ERRINGTON. 1938. Food habits of small falcons in north-central states. *Auk* 55: 668–670.

BUCHANAN, J. B., C. T. SCHICK, L. A. BRENNAN AND S. C. HERMAN. 1988. Merlin predation on wintering Dunlins: hunting success and Dunlin escape tactics. *Wilson Bull.*, 100:108–118.

CLENCH, M. H. AND R. C. LEBERMAN. 1978. Weights of 151 species of Pennsylvania birds analyzed by month, age and sex. *Bull. Carnegie Mus. Nat. Hist.* 5.

COCHRAN, W. W. 1975. Following a migrating peregrine from Wisconsin to Mexico. *Hawk Chalk* 14(2): 28–37.

CRAIGHEAD, J. J. AND F. C. CRAIGHEAD. 1940. Nesting Pigeon Hawks. *Wilson Bull.* 52:241–248.

HODSON, K. 1978. Prey utilized by Merlins nesting in shortgrass prairie of southern Alberta. *Can. Field-Nat.* 92:76–77.

OLIPHANT, L. W. AND S. MCTAGGART. 1977. Prey utilized by urban Merlins. *Can. Field-Nat.* 91:190–192.

——— AND W.J.P. THOMPSON. 1976. Food caching behavior in Richardson's Merlin. *Can. Field-Nat.* 90: 364–365.

PAGE, G. AND D. F. WHITACRE. 1975. Raptor predation on wintering shorebirds. *Condor* 77:73–83.

RUDEBECK, G. 1951. The choice of prey and modes of hunting of predatory birds with special reference to their selective effect. *Oilos* 3:200–231.

SPERBER, I. AND C. SPERBER. 1962. Notes on the food consumption (activity, storage) of Merlins (*Falco columbarius*). *Zool. Bidr. Upps.* 35:263–268.

TOLAND, B. 1986. Hunting success of some Missouri raptors. *Wilson Bull.* 98:116–125.

WARD, F. P. 1975. International color-banding studies of Peregrine Falcons: 1975 Status Report. U.S. Army Biomedical Laboratory, Aberdeen Proving Ground, MD.

WIDEN, P. 1984. Activity patterns and time budget in the goshawk *Accipiter gentilis* in a boreal forest area in Sweden. *Ornis Fenn.* 61:109–112.

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BALD EAGLE DIES FROM ENTANGLEMENT IN FISH NET

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Discarded fishing line is a reported source of mortality to birds (Bartel, *N. Am. Bird Band.* 9:8, 1984) including raptors (Knight, Skriletz and Ryan, *Raptor Res.* 14:40, 1980; L. Young, Snake River Birds of Prey Research Project, pers. comm.). Fish nets also kill non-target wildlife including fish, marine mammals, reptiles and seabirds (Stone, NOAA Tech. Memo. NOAA-TM-NMFS-SWR-012, 1986). There is apparently no reference in the literature to raptor deaths from net entanglement.

On 20 April 1988, while collecting information on Bald Eagle (*Haliaeetus leucocephalus*) nest parameters near Lummi Bay in northwestern Washington, I came upon the badly decomposed carcass of a juvenile (approx. 9 wk old) eagle. The bird was evidently 1 of 2 observed in the nest in 1987. A closer investigation revealed that the eaglet was hanging by a 3 m × 0.5 m piece of 12 cm mesh monofilament fish net. The bird's head had passed through 2 of the gillnet meshes which were taut around the neck.