

The pair bonding behavior in phalaropes seems variable and open to several interpretations. This suggests the need for further study, especially with color-marked individuals.

Polyandry in phalaropes.—Although the phalaropes represent the classic example of reversed sexual dimorphism in size and coloration and were long suspected of having polyandrous mating relationships, these have been demonstrated only recently in the Red-necked Phalarope (Raner, *Fauna och Flora* 67:135–138, 1972; Hildén and Vuolanto 1972) and Red Phalarope (Schamel and Tracy 1977) but not at all in Wilson's Phalarope, even though this species shows the greatest sexual dimorphism in the group. Höhn (1967), Johns (1969), Howe (1975a), and I (this study) found that female Wilson's Phalaropes outnumbered males early in the season during pair-formation and egg-laying, giving little opportunity for polyandry to occur. Only Kagarise (1979) found males available for second matings of females, but these were males from failed nests in a population that suffered extraordinarily high rates of predation on the eggs.

The desertion of mates may be advantageous when the deserters have opportunities to obtain additional mates (Pienkowski and Greenwood, *Biol. J. Linnean Soc.* 12:85–94, 1979), but in phalaropes such opportunities seem limited, males being in excess only occasionally in the Red-necked Phalarope (Hildén and Vuolanto 1972) and Red Phalarope (Schamel and Tracy 1977) and seemingly only rarely in Wilson's Phalarope. Because polyandrous species often have high losses of eggs compared with other shorebirds, it may be tempting to suggest that males are often available as potential mates for deserting females. However, the mates of deserting females also suffer high losses, and, thus, a female does not necessarily increase her reproduction by changing mates for her second clutch. Indeed, one can at least hypothesize that in a species with high egg loss, females could increase their probability of successful reproduction by remaining with their mates, not only laying replacement clutches but even providing protection or other assistance in reducing the probability of egg loss. Whether females stay with their mates or desert them would depend upon the probability of having two or more males tending successful clutches. It can be shown (Murray, unpubl.) that this probability is greater when the sex ratio favors males than when first clutches suffer a high loss of eggs. Thus, high egg loss seems an inadequate explanation for desertion of nests by females.

Female Wilson's Phalaropes seem able either to stay with their mates or to desert them. What they do undoubtedly depends upon particular conditions, which are at present unknown. What is known about phalaropes is that males only rarely exceed females in number and that polyandry is infrequent in the populations that have so far been studied. One can only wonder what selective forces have led to the striking reversed sexual dimorphism of these species.

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Nest-site selection by Eastern Kingbirds in a burned forest.—Unlike many species of North American tyrannids, Eastern Kingbirds (*Tyrannus tyrannus*) use a variety of habitats for breeding (Bent, U.S. Natl. Mus. Bull. 179, 1942). In seral and riparian communities, nests are generally concealed in the foliage of woody vegetation, but in habitats where

TABLE 1
USE OF NESTING SITES BY EASTERN KINGBIRDS IN A BURNED FOREST

	1977	1978	1979	1980	Total
Number of nests	3	4	3	4	14
Nest-site					
Burned branches	2	1	0	2	5
Trunk depressions	1	3	3	2	9

arboreal sites are lacking, kingbirds may select atypical nesting sites that offer little or no concealment (Roberts, *The Birds of Minnesota*, Univ. Minn. Press, Minneapolis, Minnesota, 1932; Baust et al., *Bull. Entomol. Soc. Am.* 27:23–25, 1981).

Following fire, species richness and densities of some birds may decrease, but Niemi (Loon 50:73–84, 1978) found that kingbirds remained common despite a decrease in habitat complexity. Because a crown fire will reduce the number of potential nesting sites, these birds must be opportunistic in selecting nest-sites in order to reproduce successfully in burned habitats.

From 1977–1980, data were collected on nest-sites of Eastern Kingbirds in a burned jackpine (*Pinus banksiana*)-northern pin oak (*Quercus ellipsoidalis*) forest in northern Clare County, Michigan. Observations were limited to a 20-ha plot burned by wildfire in mid-April 1977. Neither ground nor crown vegetation survived the fire, but subterranean rhizomes of perennial forbs and some shrubs eventually regenerated, forming a mosaic ground cover over much of the area.

The post-fire landscape consisted largely of standing burned jackpines interspersed with pin oak “shrubs,” produced by secondary growth at the bases of charred trees. Regeneration by jackpine was minimal, probably due to severe drought conditions during 1977. The unburned forest surrounding the study site consisted principally of a closed canopy of jackpines and pin oaks. Although kingbirds did not occur in the unburned forest, they have nested repeatedly on the burn where the number of breeding birds has remained relatively unchanged (Table 1). Presumably, the species was absent from the area prior to the fire.

Nearly 65% of the nests were constructed in charred trunks containing cupped depressions that were formed by embers that burned into heartwood. The remaining nests were placed among burned branches of jackpines. Three nests that occurred in cupped depressions were reused during consecutive years, suggesting that birds return to previous nest-sites. Fairfield (Long Pt. Bird Obs. Ann. Rept. 13, 1972) found that color-marked kingbirds returned to the same nest-sites. One nest that was used consecutively failed during 1978 when it was deserted after a prolonged period of rain (Hamas, Jack-pine Warbler 57:26–27, 1979). The nest-site was not used again until 1980. Hildén (*Ann. Zool. Fenn.* 2:53–75, 1965) indicated that site tenacity may be reinforced by learning in several species of birds, but at sites where nesting has been unsuccessful during a previous year, birds are less likely to return.

Although data on clutch-size and hatching success were incomplete for kingbirds using the burn, young fledged from all nests. The lack of concealment by foliage, an important determinant of nesting success in kingbirds (Murphy, *Condor*, in press), did not contribute to predation. Thus, reproductive success in local or isolated habitats may favor continued use of atypical nest-sites and ultimately lead to behavioral variation in species that are habitat generalists.

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Herring Gull males eat their own eggs.—Although Herring Gull (*Larus argentatus*) adults are known to eat their own chick offspring (Parsons, Ph.D. thesis, Univ. Durham, Durham, England, 1971) we know of no documented observations of them eating their own eggs. On two occasions we observed male Herring Gulls break open and eat eggs in the clutches they were incubating: on 12 May 1978 at a colony on Fighting Island, Detroit River (near Lasalle, Essex Co., Ontario, Canada) and on 22 May 1979 at the Lighthouse colony near Port Colborne, Ontario, Niagara Co., Canada. The sex of the birds in question was determined by observations of copulation together with size differences (male larger) within the pair. Both members of the pair at the Lighthouse colony were individually color-banded. Both pairs laid three-egg clutches. The clutch at Fighting Island was completed on 26 April 1978 and was one of the earliest of all clutches ($N = 40$) in the colony. The clutch at the Lighthouse was completed on 6 May 1979, during the “peak” of clutch initiation ($N = 75$) at the colony. Thus, in both instances the behavior was observed 16 days after clutch completion.

Details of the two observations follow. At Fighting Island, an elevated blind was located about 15 m from the nest of interest. The male was incubating at the beginning of the observation period (08:20) and although the female was present intermittently throughout the day, the male was not relieved by her during observations of the nest (completed 18:30). At 16:50 the male, apparently unalarmed, stood over the clutch. With active pecking movements the bird then broke open one of the eggs and consumed the contents. He resumed incubation of the remaining eggs at 16:55. The female was present during the egg-eating episode. Both eggs hatched from the clutch and one chick eventually fledged.

At the Lighthouse colony, an elevated blind was located about 10 m from the nest of interest. The male had incubated the clutch for at least 2 h (14:00–16:00) when he stood over the clutch, broke open all three eggs within 30 sec and then partially ate the contents. His mate, present during the event, had attended the male at the nest-site during the previous hour. She had been trapped that morning (22 May 1979) and radio-transmitter equipment attached to her back. The pair remained at the nest-site throughout the breeding season although no further eggs were laid. Both clutches had been checked daily from clutch initiation. All eggs in the Fighting Island clutch were intact 24 h before the incident occurred, while at the Lighthouse all eggs were intact on the morning of the incident.

In evolutionary terms, egg-eating behavior is clearly maladaptive as considerable time and energy have already been invested with relatively little subsequent investment needed to bring the eggs to term. Eaten eggs may be inviable through infertility or embryo mortality; however, detection of the appropriate egg by an adult seems unlikely. Although the age of the birds in each pair was unknown, all were in adult plumage when the incidents occurred and the early laying dates suggest older, experienced birds (Chabrzyk and Coulson, *J. Anim. Ecol.* 45:187–203, 1976). Thus, we rule out the possibility that the anomalous egg-eating behavior was a result of youth or inexperience of the males. An obvious proximate explanation is that our activity in both colonies was sufficiently disturbing to cause the aberrant behavior by these two individuals. Certainly in the case of the trapping activity at the Lighthouse colony, this would be reasonable. However, over 40 adult Herring Gulls have been trapped at this colony between 1978–1980 and there is no evidence that either this procedure or the