

Relation of territorial conflicts to pair bond.—In some species (e.g., Hairy Woodpecker [*Picoides villosus*]) (Kilham, Wilson Bull. 81:169–183, 1969), the pitch of emotion aroused against a rival can be diverted to courtship during lulls in territorial conflict. This antecedent situation was seldom evident for *S. carolinensis*. On a number of occasions there was an increase in intimate, antiphonal notes between members of pairs following conflicts. I also once saw courtship feeding after a conflict. Generally, however, there were no indications that agonistic behavior stimulated courtship. Severe conflict appeared to have the opposite effect. In some instances, a male attacked his mate during lulls in fighting with a rival, behavior also noted by Löhrl (1959) in *S. europaea*. This would seem to be a case of redirected attack in the sense used by Bastock et al. (1953).

Size and nature of territories.—By following limits of wanderings as well as noting location of conflicts, I estimated that 1 pair of nuthatches had a territory of 15 ha, approximating that given by Brackbill (1969) for a banded pair in Maryland.

Effects of a feeding station.—A feeder with suet and sunflower seeds in the territory of 1 pair in the winters of 1968 and 1969 attracted a second pair whose territorial boundary was only 12 m away. Efforts of the second pair to enter the territory of the first pair led to daily conflicts. The second pair usually gave threat displays when they were by their territorial border and trying to reach the feeder. The male not only drove away the intruders, but often his own mate as well. The feeder disrupted the daily movements of the chickadees and nuthatches to such an extent that studies of natural behavior became impossible. Interestingly, Bock (Ecology 50:903–905, 1969), in discussing White-breasted as well as Pygmy (*S. pygmaea*) nuthatches, stated that: "The artifact of having an abundant food source of precise and predictable localities caused a breakdown in flock organization and a rapid sort of 'competitive exclusion' at the feeders." Present studies were made in woods away from feeders.

Reactions to predators.—The most intense reaction witnessed was at 16:00 on 17 January, when a male nuthatch stayed within 5–7 m of a Barred Owl, alternating bouts of displacement pecking with rapid *hn-hns*. The nuthatch's tail was raised slightly and he occasionally flicked his wings. A pair of Hairy Woodpeckers, present part of the time, also engaged in displacement pecking. Perhaps the intensity of the nuthatch's reaction may have been due to the lateness of the afternoon and the proximity of the owl to the nuthatch's (and the woodpecker's) roosting place.

A male nuthatch travelling with chickadees and a Brown Creeper (*Certhia familiaris*) on 2 March encountered a Barred Owl dozing in the open. The male uttered *kun* and harsh *kaan* notes, but did not come close. After 1–2 min the flock departed. Possibly sleepy owls at mid-day evoke different reactions than alert ones at dusk.

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Evasive behavior of American Coots to kleptoparasitism by waterfowl.—On 17 April 1976, at Dewey's Pasture Wildlife Management Area in northwestern Iowa, I saw American Wigeons (*Anas americana*) and Gadwalls (*Anas strepera*) kleptoparasitizing American Coots (*Fulica americana*). One or 2 wigeon or Gadwalls, but not both species at once, closely attended and followed a coot. At times all the coots present (15–25) were attended by kleptoparasites. Both duck species dabbled at vegetation brought to the surface by coots

and stole vegetation directly from the bills of the coots. This note discusses the evasive behavior exhibited by coots when being kleptoparasitized.

Food piracy by Gadwalls has not been previously noted. Wigeon have been reported stealing food from coots (Munro, *Can. J. Res.* 27:289-307, 1949; Hellyer, *Pac. Search* 11:26-27, 1977; Knapton and Knudsen, *Can. Field-Nat.* 92:403-404, 1978), but aggressive or evasive behavior by coots when being kleptoparasitized has not been reported.

The coots I watched (at distances between 35-90 m with a spotting scope) were not aggressive toward their kleptoparasites, but some of them did make evasive maneuvers. When followed by wigeon or Gadwalls, coots dived, brought plant material to the surface, dropped it, swam several meters away and quickly dived again. By dropping the vegetation from the first dive, coots seemingly gained time to dive again and feed unmolested. The wigeon or Gadwalls fed on the plants from the first dive until it was consumed or sank and then pursued the coot again. If sufficient food for the waterfowl was brought to the surface and they were distracted by it, the coot successfully evaded them. When a coot did evade its kleptoparasites, the waterfowl sought out another coot host. During the 2 h that I watched the interactions, food-dropping was rarely successful in allowing coots to completely evade the kleptoparasites. Coots that did not drop food for the waterfowl and attempted to evade them solely by swimming away were not successful.

This evasive behavior is costly in time and energy. Coots attended by kleptoparasites dived more often (median = 4/min, $N = 19$, range 1-6) than did coots foraging alone (median = 3/min, $N = 19$, range 1-4, $P < 0.002$, Mann-Whitney U -test) on the same wetland. If, by leaving the food from the first dive, coots were successful in evading further kleptoparasitism, the strategy is advantageous. Even if the waterfowl were not distracted, if more than half of the food collected during each dive was stolen, it would be advantageous for the coots to leave the food from 1 dive for their kleptoparasites and to feed unmolested on the next dive.

Because many studies have noted the high intensity of interspecific aggressiveness in coots (e.g., Gullion, *Condor* 55:169-186, 1953; Ryder, *Auk* 76:424-438, 1959; but see Ryan and Dinsmore, *Auk* 96:704-713, 1979), the lack of aggression toward kleptoparasites is surprising. Several factors suggest that outright aggression may be less effective than the food-dropping strategy. Aggression may be ineffective because, even if driven off before a foraging dive, nothing prevents the kleptoparasite from returning and stealing food when the coot resurfaces. Knapton and Knudsen (1978) noted the importance of food piracy to wigeon when the only vegetation available was in deep water, as was true in the spring when I made my observations. Opportunistic kleptoparasitism may make the waterfowl tenacious in their piracy attempts and might result in the coot food resources being economically non-defendable. It may also be energetically too costly for coots to defend their food from several attending pirates, the kleptoparasites effectively swamping the aggression.

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