

may have also benefitted from the association if the egrets' activities confused the prey and made the fish easier to catch.

The utility of this association to the egrets seems to depend on three prey characteristics. High abundance was essential for the technique to be rewarding to the large numbers of individuals involved. The brief and unpredictable appearance of the prey prevented the egrets from locating the prey themselves with any degree of consistency. Restriction of the prey to one general place gave the egrets time to fly there before the prey disappeared or moved elsewhere.

The highly active foraging techniques employed in this case contrast with the inactive techniques noted by Kushlan (1972) in another instance of high prey abundance. The difference seems to be due to the fact that in the latter case prey were concentrated in a small pond by the drying of the surrounding marsh and, having no escape, could easily be captured by an egret standing still. In the present case active techniques were necessary to follow the rapid movements of the fish schools in the flowing water, and the apparently sudden movements of individual fish. Thus prey mobility and habitat characteristics as well as temporal changes in prey availability (Kushlan 1972) may be important in determining feeding behavior in Snowy Egrets.

These notes were made while I was an intern at Manomet Bird Observatory and supported by an NSF graduate fellowship. I thank R. M. Fagen, B. A. Harrington, G. C. Kulesza, M. Livingston, M. F. Willson, and anonymous reviewers for helpful criticisms of the manuscript.

LITERATURE CITED

- CHRISTMAN, G. M. 1957. Some interspecific relations in the feeding of estuarine birds. *Condor* 59: 343.
- EMLEN, S. T., AND H. W. AMBROSE III. 1970. Feeding interactions of Snowy Egrets and Red-breasted Mergansers. *Auk* 87: 164-165.
- KUSHLAN, J. A. 1972. Aerial feeding in the Snowy Egret. *Wilson Bull.* 84: 199-200.
- LECK, C. F. 1971. Cooperative feeding in *Leucophoyx thula* and *Podilymbus podiceps* (Aves). *Amer. Midl. Naturalist* 86: 241-242.
- MUELLER, H. C., M. G. BIBEN, AND H. F. SEARS. 1972. Feeding interactions between Pied-billed Grebes and herons. *Auk* 89: 190.
- RODGERS, J. A., JR. 1974. Aerial feeding by Snowy and Great Egrets in Louisiana waters. *Wilson Bull.* 86: 70-71.

ROBERT I. BERTIN, *Manomet Bird Observatory, Manomet, Massachusetts 02345. Present address: Vivarium, Wright and Healey Streets, Champaign, Illinois 61820. Accepted 1 Apr. 76.*

Possible ecological role of food caches of Loggerhead Shrike.—The importance and purpose of impaling food items on thorns, barbed wire, and other similar objects by the Loggerhead Shrike (*Lanius ludovicianus*) is not fully known (Ridgway 1889, *The Ornithology of Illinois*, vol. 1, *Illinois Nat. Hist. Surv.* (reprint 1913); Graber et al. 1973, *Illinois Nat. Hist. Surv. Biol. Notes* 83). During April and May 1975 while studying a nesting pair of Loggerheads in Union Co., southern Illinois, I made observations indicating a possible role of food caches.

The male Loggerhead did not participate in incubating, but primarily defended the nesting territory and hunted for live prey within the pair's home range. Occasionally the male took prey items (mostly grasshoppers, Acrididae) to a nearby barbed wire fence and impaled them. During breaks from incubating the female visited the fence to eat from the cached foods.

The female fed the nestlings approximately once per hour during the day and the male fed them approximately once per $\frac{3}{4}$ hour in the evening from about 1700 until 2000. Most of the food that was presented to the young by the female came from the cache maintained by the male. During the evening the female brooded and the male removed food from the fence and presented it at the nest. The female also consumed items brought to her directly from the field.

Although the above observations are limited to one nesting pair of Loggerheads, I wish to offer the following explanation as to the possible ecological function of such behavior. El-Wailly (1966, *Condor* 68: 582) found that metabolized energy of the adults increased during incubation in the Zebra Finch (*Taeniopygia castanotis*) but was divided between male and female as both sexes share in the incubation process. West (1960, *Auk* 77: 306-329) and Kendeigh (1963, *Proc. 13th Intern. Ornithol. Congr.*: 884-904) found higher energy requirements for the female in Tree Sparrows (*Spizella arborea*) and House Wrens

(*Troglodytes aedon*) than occurred in Zebra Finches as the female alone in these two species did all the incubation.

The hunting of prey by the female requires expenditure of energy additional to incubation and brooding and takes time away from the eggs and young as well. My studies suggest that prey caching by the male is a method of conserving the female's energy that otherwise would be expended in this hunting. Prey caching is thus another way of dividing labor between male and female during the nesting period.

I am indebted to E. C. Franks, Dept. Biol. Sci., Western Illinois Univ., Macomb, under whose guidance the study leading to this manuscript was performed. I thank R. R. Graber, Illinois Nat. Hist. Surv., Urbana and M. F. Willson, Dept. Ecol., Ethology, and Evolution, Univ. Illinois, Urbana for critical reading of the script. M. Melampy, Graduate Assistant, Dept. Ecol., Ethology, and Evolution, Univ. Illinois, discussed portions of the manuscript and provided useful ideas.—ROGER D. APLEGATE, *Illinois Natural History Survey, Urbana, Illinois 61801. Present address: Department of Forestry, University of Illinois, Urbana, Illinois 61801.* Accepted 10 Apr. 76.

Roosting habits of the Swallow-tailed Kite.—In Surinam the Swallow-tailed Kite (*Elanoides forficatus*) is one of the commonest raptors. Present all through the year and sociable at all seasons, it usually occurs in flocks of up to 30 individuals. My records show no evidence that its numbers are augmented at any particular season by migrating birds from the north or south. Apart from a nest with a closely sitting bird on 19 March, with the other one circling above the nest tree, I further saw a pair, one of them with a large bunch of moss in its bill, circling above the forest on 6 March but, though they were still present on 13 March, I failed to locate their nest.

In recent studies on its breeding habits by Skutch (1965, *Condor* 67: 235) and Snyder (1975, *Living Bird* 13: 73) its social roosting habits are but casually mentioned. Once at sunrise on 29 October 1961, I flushed a party of about 15 birds from a fully leaved tree on a roadside where they must have spent the night, but in later years I only found them roosting in isolated and tall trees destroyed by fire in forest clearings. On 19 November 1972 I located a small group roosting in such a tall dead tree in a clearing near Zanderij. This roost was used daily till I left in March 1973. Roosts are apparently used for long times at a stretch as I found it occupied when I returned to Surinam on 29 November 1973 and it was still in use when I left the country 3 April 1974. Their numbers varied, and in both years the maximum was 9 birds. Each bird roosted on the very top of a vertical branch. They left rather late in the morning and were apparently unable to make use of any but strong thermal currents. Sunrise in Surinam is between 0600 and 0630 and the birds did not, as a rule, depart before 0800 and at the earliest at 0730, but rainy weather with low clouds prolonged their stay. Sometimes as is usual in this time of the year—the short rainy season—the sky was clear in the early morning but later low dark clouds assembled with heavy showers. Then the kites sometimes returned to their roost as on 25 January and 2 December 1973 when 4 birds were back in the tree at 1130. In the morning they never left together but broke up singly, the first spending some time soaring and circling above the tree. Then a second left and a little later the next one. This went on till all had gone. They spent the time between sunrise and their departure vigorously preening their feathers, but I never saw them sunning on their roost as did a party of Turkey Vultures (*Cathartes aura*) in a nearby tree. I have seen kites sunning only once. This was on the morning of 9 November 1961 when two kites sat on a bare branch in the top of a tall tree towering over the forest near Rama. They sat very upright, close together, with their backs toward the sun, the arms of their wings fully spread, but their wing tips hanging vertically downward, and their tail feathers fully spread. They sat so close that the arm of the right wing of one bird partly overlapped with the left arm of the other and they remained motionless in this strange attitude during all the time I watched them.—F. HAVERSCHMIDT, *16 Wolfskuilstraat, Ommen, Holland.*—Accepted 6 Feb. 76.

Allopreening in the Black Vulture.—Black Vultures (*Coragyps atratus*) regularly feed on offal during low tide on the muddy shore of the Surinam River in the center of Paramaribo. At high tide they rest on roofs of buildings along the waterfront where they spend the time sunning in a very upright stance with widespread wings and their backs to the sun, vigorously preening their feathers. On 22 January 1948, five vultures sat on a roof; two of them very close to each other and almost touching, were preening busily. One nibbled the feathers of the lower neck of the other and the latter responded by nibbling the neck feathers of the first. Harrison (1965, *Behaviour* 24: 161) listed among the Cathartidae species where allopreening has been observed only the Turkey Vulture (*Cathartes aura*), in captive birds, and the California Condor (*Gymnogyps californianus*).—F. HAVERSCHMIDT, *16 Wolfskuilstraat, Ommen, Holland.* Accepted 6 Feb. 76.