

GENERAL NOTES

Foraging behavior of *Geranospiza nigra*, the Blackish Crane-hawk.—The foraging habits of the Blackish Crane-hawk (*Geranospiza nigra*) are among the most diversified of any raptor. Crane-hawks hunt by dropping from trees onto their prey, but they also hunt on the wing, both in the forest and in open country. In addition they forage in trees where they search for small vertebrates and large insects on the undersides of limbs and in epiphytes. Few areas in the trees are free from the crane-hawk's activities, for this species' long legs and reversible ankle joints enable it to extract prey from knotholes and other cavities, and thereby to utilize sources of food that are unavailable to other hawks (Sutton, *Wilson Bull.*, 66: 237-242, 1954; Slud, *Bull. Amer. Mus. Nat. Hist.*, 128: 68, 1964; Wetmore, *Smiths. Misc. Coll.*, 150: 254, 1965).

In February, 1966, I observed Blackish Crane-hawks several times near Hacienda Taboga, 12 km south of Cañas, Guanacaste Province, Costa Rica. Birds were usually encountered sitting quietly and tamely in large trees adjacent to a small river. However, once I found one in the semi-open forest on the edge of a cattle pasture, where it was foraging 10 to 12 feet above the ground on the vertical trunk of a large tree from which large slabs of bark were sloughing off.

The hawk's foraging behavior was strongly influenced by the local character of the bark. Where bark had pulled away from the trunk sufficiently, the hawk would land, peer into the crevice between the bark and the trunk, and then extract its prey, a large orthopteran, with its bill. When foraging where the bark was more closely attached to the trunk, the hawk flew tangentially toward the tree, grasped the free edge of the bark with its feet, and inserted its inside foot into the cavity, retaining its balance either by flapping or by propping itself in position with its outside wing extended downward along the trunk.

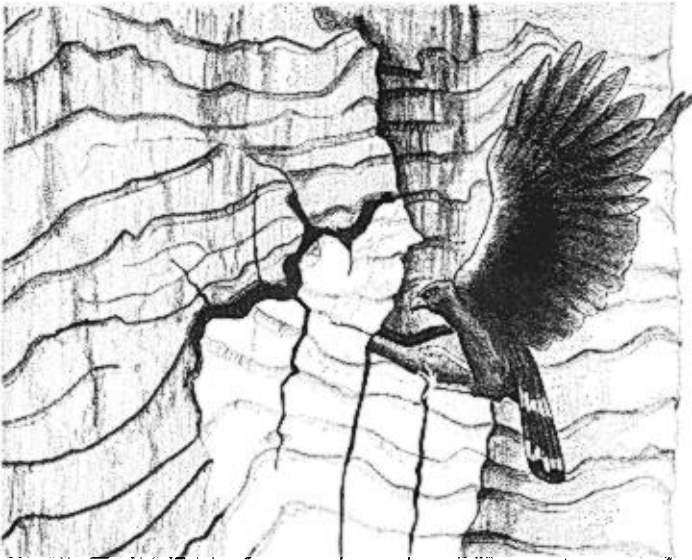


Figure 1. *Geranospiza nigra* foraging on the trunk of a large tree. Drawing by Anne Acevedo from an Ektachrome photograph by the author.

The crane-hawk also approached the tree directly, grasped the bark with both feet, and hung vertically along the trunk maintaining its position by vigorous flapping (Figure 1), the wings clapping against the trunk with each downstroke. It then freed one foot, which it extended into the crevice by rotating the tarsometatarsus backward. On another trip the hawk hung upside down while it plucked an insect from a crevice extending *upward* along the trunk.

I watched the hawk capture food nine times. After each capture it carried its prey to a nearby tree, removed the wings, and ate it in three or four small bites. Approximately 5 minutes elapsed between captures. Later I removed several pieces of bark from the feeding tree, under which I found many katydids (Family Tetigoniidae) averaging 3 inches in length. Wetmore (*Proc. U. S. Natl. Mus.*, 93: 241, 1943) has reported orthopterans in the diet of this hawk.

These observations were made while I was a participant in the Organization for Tropical Studies' field course in the Biology of Tropical Vertebrates. Preparation of this report was supported in part by a National Science Foundation grant to The University of Michigan for research in Systematic and Evolutionary Biology, NSF GB-3366.—JOSEPH R. JEHL, JR., *The University of Michigan Museum of Zoology, Ann Arbor, Michigan, 48104. Present address: San Diego Natural History Museum, P. O. Box 1390, San Diego, California 92112.*

Clutch size, incubation period, and nestling period of the American Goldfinch.—During the period 1947–1963, inclusive, I examined 863 nests of the American Goldfinch (*Spinus tristis*) in the vicinity of Ann Arbor, Michigan. Many of these nests were destroyed or deserted during the egg-laying, the incubation, or the nestling period; a very few nests were visited only once. Some 216 nests were found after one or more eggs had hatched so that a precise determination of the clutch size was impossible. I felt that accurate determination of clutch size was made for 474 nests (Table 1):

TABLE 1

Clutch size	Number of nests
2	4
3	13
4	116
5	242
6	98
7	1

The first nests were found in June in three years: 11 June 1947 (Berger, 1948); 28 June 1954; 30 June 1959. In all the other years, except for three when I was away from Ann Arbor in July, first nests were found under construction during the first week of July (1–7 July).

The first egg in the 2-egg clutches was laid in the four nests, respectively, on or about 8 August, 22 August and 31 August (two nests). The first egg in the 13 3-egg clutches was laid between 10 August and 4 September. The first egg of 6-egg clutches was laid as early as 16 July (nest 30–1955) and as late as 27 August (nest 7–1947). All but four of the 6-egg clutches were begun before 15 August. The first egg in the 7-egg clutch was laid on 9 August (nest 8–1958).

Marked annual differences in the number of 6-egg clutches are suggested by the following data: 5 per cent of 186 clutches, 1955; 16.5 per cent of 127 clutches, 1956; 8.6 per cent of 46 clutches, 1957; 15.1 per cent of 212 clutches, 1958.