

Nesting of Turkey and Black vultures in Panama.—On 23 March 1976 I found a Turkey Vulture (*Cathartes aura*) nest with 1 young, and a Black Vulture (*Coragyps atratus*) nest with 2 young on a 0.5 ha island in Gatun Lake, Panama Canal Zone. The island is 525 m from the nearest mainland and 275 m offshore Barro Colorado Island, the Smithsonian Tropical Research Institute's biological reserve. The vegetation is young secondary forest about 20 m high with a relatively open canopy and a predominance of palms. The undergrowth is not dense and consists of tree seedlings, vines, and grasses. One-third of the island has been cleared for an experiment and there has been almost daily human activity there since January 1976. Other than vultures, the largest animals regularly encountered on the island are basilisk lizards (*Basiliscus basiliscus*) and marine toads (*Bufo marinus*). One armadillo was seen on the island for a short time. The scarcity of animals which might prey on the eggs or nestlings may make the island a particularly favorable nesting site.

The Turkey Vulture nest encompassed an area of about 1 m² under a tangle of grass and brush at one end of the island. Leaves and debris under this cave-like shelter had not been arranged in any way. It appeared that the 24-day-old nestling moved about in the entire area.

The nestling was removed from the nest 8 April 1976 and hand-reared. From photographs and descriptions of the development of a Turkey Vulture (Bent, U.S. Natl. Mus. Bull. 167:18, 1937) I estimated its age on 8 April to be about 24 days. Egg-laying, therefore, was the first week of February for incubation is "almost 40 days" (Coles, Studies in the Life History of the Turkey Vulture, Ph.D. thesis, Cornell Univ., Ithaca, N.Y., 1938) and hatching occurred the week of 14 March. The bird fledged when 70 days old, on 21 May, which age corresponds to that provided by Coles (1938) of 70 to 80 days. The nest site was periodically examined for 4 months after the young had been removed and there was no evidence of a second nesting attempt.

A Black Vulture nest was 35 m from the Turkey Vulture nest. The nest was located at the base of a clump of palms in a small tunnel-like shelter formed by dead palm leaves among the trunks. No nest material appeared to have been brought in or arranged by the adults. Both the Turkey and Black vulture nesting sites were similar in being somewhat concealed from view, providing some shelter from rain, and encompassing about the same area.

The Black Vulture young had apparently left the nest at least 17 days before fledging; no young had been seen after 23 March until 7 April when one flightless young observed near the site was easily captured. By 9 April, however, 2 young and 2 adults were seen on the shore of the island. I believe that the young were fully capable of flight by this time, and that the 4 were the 2 adults and young from the nest on the island, although none had been banded. Subsequent observations reinforced that assumption. Four Black Vultures were commonly observed on the island for 15 weeks after the young had fledged; a tall tree at the edge of the cleared area was a favorite roost. The 4 Black Vultures formed a cohesive group, flying in together to perch in the tree, and always flying off together. The composition of the group was always 2 young and 2 adults; it was unusual to see vultures other than these 4 roosting on the island.

Incubation for Black Vultures has been reported as 38 days, and the young fledge in 80 days from hatching (Stewart, Auk 91:595-600, 1974). Thus, the Black Vultures which had fledged by 9 April probably hatched the first week of February; egg-laying then would have occurred the last week of December 1975.

For at least 5 weeks after fledging the 2 Black Vulture young would beg for and receive food from the adults. The young would vigorously flap their wings, bob their heads,

and emit a low-pitched hissing sound. On 26 July, more than 15 weeks after fledging, the young were still begging food but were not fed on the one occasion I observed them. Long post-fledging dependence is also indicated for the Turkey Vulture by the hand-reared young's recognition of and behavior towards me. For 7 weeks after fledging the young Turkey Vulture would, upon my appearance, assume a posture with wings slightly spread and arched downwards, the head lowered, and the tail inclined upwards with the feathers separated. There was much head-bobbing and wing-flapping when food was presented, but no vocalizations. The Turkey Vulture did not behave in this manner if approached or fed by other individuals.

The nesting of Turkey and Black vultures I observed corresponds to the dry season in Panama which is from January to April. Wetmore's (Smithsonian Misc. Coll., 150(1): 160-161, 1965) incidental reports of Black Vulture nesting activity, nestlings, fledglings, and an egg collection also indicate that nesting occurs during the dry season in Panama for this species. His only information on *Cathartes* sp. nesting in Panama is for the Yellow-headed Vulture, *C. burrovianus*, for which he reported 2 young "only recently able to fly" on 14 May 1953. The Turkey Vulture from the nest on the island fledged 21 May.

Vulture nesting activity correspondence with the dry season may be due to several factors. Carrion resources for vultures may be greater during the dry season. However, for frugivorous animal populations at least, highest mortality might be expected at the end of the wet season, during November, December, and January, when fruit abundance is lowest (Smythe, Am. Nat. 104:25-35, 1970). Alternatively, the dry season weather may be more favorable for raising young. The dry season months are windier and drier than the rest of the year and foraging time is likely maximal then. The wet season's rains and calmer weather may make soaring difficult and thus make hunting less energetically efficient. Also, the higher relative humidity and rainfall then might be detrimental to the health and development of the terrestrial young.

I thank Eugene S. Morton for commenting on the manuscript.—LAURIE A. MCHARGUE, *Smithsonian Tropical Research Institute, Box 2072, Balboa, Canal Zone. Accepted 11 Nov. 1976.*

Fulvous Whistling Duck populations in Texas and Louisiana.—Numbers of Fulvous Whistling Ducks (*Dendrocygna bicolor*) declined rapidly in the 1960's apparently from exposure to pesticides applied to rice (Flickinger and King, J. Wildl. Manage. 36: 706-727, 1972). The species was listed as endangered by the Texas Organization for Endangered Species since 1972. However, numbers have increased since 1970 when many rice growers began to voluntarily discontinue the use of aldrin-treated rice seed in Texas and to substitute drill planting for aerial seeding of treated seed in Louisiana. Aldrin treatment of rice seed was suspended by the U. S. Environmental Protection Agency in 1974.

Ground or aerial surveys of Fulvous Whistling Ducks were made at all their traditional concentration areas in 14 southeast Texas counties or 4 Parishes of southwest Louisiana along the Gulf Coast. Counts and estimates were alternated between Texas and Louisiana between 1968 and 1974 when the first late summer estimates were made for both states. Spring and later summer censusing was done in Texas for the first time in 1975. Most spring counts were made from the ground from mid-April through May with the exception of the count in Texas in 1975 (made 15 to 30 April). Late summer birds in both states were estimated from aircraft during mid-September except in Texas in 1975 when a ground count was taken.

In the spring of 1968 only 1123 Fulvous Whistling Ducks were counted in both states