Notes on Everglade Kite Reproduction

by Roderick Chandler and John M. Anderson

The Everglade Kite, *Rostrhamus sociabilis plumbeus*, formerly bred and wintered abundantly in many parts of the Florida Everglades. At present, the species is largely restricted to the southwest portion of Lake Okeechobee and, to a lesser extent, in the nearby Loxahatchee National Wildlife Refuge.

According to Howell (1932), it bred abundantly in the Loxahatchee Marsh in 1921, but was absent there in 1923. He reported that drainage operations in the vast saw-grass marshes around Lake Hicpochee and the southern shore of Lake Okeechobee had driven the kites almost completely from this region by 1930.

In 1966, the Bureau of Sport Fisheries & Wildlife, U.S.D.I., described the status of the species as follows: "Endangered, because of the very small population and increasingly limited amount of fresh marsh with sufficient water to insure an adequate supply of snails on which it depends for food."

The report adds the following observations: "Fifteen birds including six adult males and nine brown plumaged females or young males seen at Loxahatchee Refuge on June 17, 1964. A pair seen at Lake Okeechobee all winter and spring may have been included in the group seen at Loxahatchee in June. In 1965, only 10 kites were counted."

Since 1938, the National Audubon Society has maintained a wildlife sanctuary in southwestern Lake Okeechobee. In 1972-73, about 80 per cent of the known kite population was found there, according to the U.S. Bureau of Sport Fisheries & Wildlife. The area is patrolled by the Society's wildlife warden throughout the year. The senior author currently holds this position, and the following data are taken from his field notes.

From 1966 through the 1973 nesting season, the total population on Lake Okeechobee, age and sex classes combined, fluctuated very widely. For example, 31 kites were seen on June 1, 1971, but none was seen in the same area on June 29, 1971. No young were fledged and to our knowledge no nesting attempt was made that year.

It appears likely that fluctuating water levels in the vicinity of Lake Okeechobee and the lake itself account for much of this variation. As surrounding marshes are drained or dry up as a result of prolonged drought, the kites congregate where there is sufficient fresh water to support the fresh water snail (*Pomacea paludosa*), apparently the sole item in the kite's diet. Total numbers of kites seen at certain times, therefore, show no correlation with known breeding populations or nesting success.

Table 1 summarizes the nesting data from 1966 through 1973.

Table 1: Observed Nests, Eggs, Fledglings

Year	*Observed Nests*	*Eggs Laid*	*Eggs Hatched*	*Young Fledged*	*Adult Population*[1]
1966	1			1	5
1967	1		0	0	5
1968	1	3	3	3	6
1969	0	0	0	0	3
1970	2		2	1	5
1971	0	0	0	0	31
1972	5	11	9	4	14
1973	28	68	30	22	21
	38	82	44	31	

[1]Estimated maximum.

The blank spaces in Table 1 indicate a lack of information. In 1967, however, we feel confident that no young fledged. In 1969 and 1971, we believe no nesting attempt was made. Repeated patrol of the kite habitat in 1969 revealed a maximum 3 adults, which apparently did not nest In 1971, a total of 31 adults was seen in one day, but no nesting attempt was made. We believe the extreme drought concentrated the kites on Lake Okeechobee, but with the usual nesting clumps of cattail, bulrushes, or willows left high and dry, with water and snails nearly a mile away, nesting was inhibited.

The 1973 nesting season was remarkably successful compared to the previous 7 years. This provided a better opportunity to gather some information on various phases of reproduction During the eight years for which we have data, a total of 82 eggs was observed, of which only 44 (53.7%) hatched. Of these, a total of 31 (70.2%) young fledged. These data suggest a significant loss during the egg stage, and a relatively good survival of nestlings.

Although quantitative data are lacking, it definitely appeared to the senior author that the nesting efforts of the kites in 1973 were more "determined" than in previous years. Several renesting attempts were observed, usually in the immediate vicinity of the unsuccessful nest.

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Another nest contained one egg when visited on Mar. 15 and again on Mar. 19, 1973. By Mar. 21, a second egg was laid. One egg hatched Apr. 12, and by Apr. 18 the second was hatched, indicating an incubation of 28 days for the first and possibly 30 for the second egg. Unfortunately, the nest could not be checked between Apr. 12 and 18, so the exact period is unknown. Our studies thus far indicate an average incubation period between 26 and 28 days. Bent (1937) wrote, "The period of incubation seems to be unknown."

Losses from strong winds and predation by Boat-tailed Grackles are frequent causes of nesting failure. In 1973, grackles apparently destroyed nine clutches of eggs, five were victims of high winds, two were abandoned for unknown reasons, and two clutches were apparently infertile. In one instance, a nest built in a clump of willows was abandoned during late incubation when a nesting colony of over 500 White Ibis, Louisiana and Little Blue Herons was established around the kite's nest.

Nesting habits of the species have been adequately described in the literature. (Bent, 1937; Sprunt, 1954). Our studies confirm the spread of activities from January through June, the peak being March, April, and May. At any time during the nesting season, one can expect to find some pairs building, some incubating, some with flying young. The earliest known nesting record is that of C.C. Sherman who discovered four nests in November, 1941, on Lake Okeechobee. (Sprunt, 1942).

We can detect no set pattern for nest building or egg laying. For example, a nest discovered Jan. 25, 1973, was about half complete. Six days later, no additional work on this nest was evident. Unfortunately, it was 13 days before this nest could be checked again; by then it was completed and contained three eggs. Instances in which a pair seems to delay for several days in completing a partially built nest are not uncommon. About six days is probably the most common period required to finish a nest.

Similarly, the interval between laying the first, second, and third eggs may vary from two to four days. While our data are too limited to warrant conclusions, they indicate that six days are usually required to complete a clutch of three eggs. One record of six eggs, presumably by the same female, exists, but we have found no clutches over three. About 64% of the 1973 kite nests with complete clutches contained three eggs, the remainder two. We found no evidence of incubation beginning before the clutch was complete. We found that the time from hatching to flight varied from 23 to 28 days.

MANAGEMENT POSSIBILITIES

In 1973, high winds destroyed at least five nests of the 28 under observation. On several occasions, by rebuilding the structure with cattails, leaves, and small sticks, the senior author was able to rescue eggs or young that had been tipped out of the nest. The adult kites showed little or no reluctance in accepting the rebuilt nests.

The senior author has also successfuly transferred two poorly supported nests into aluminum baskets, supported by a single metal pole. The kites readily accepted the "wind-proof" nests and continued incubation. This technique, which is currently being studied and reported on by the U.S. Bureau of Sport Fisheries & Wildlife, shows considerable promise.

As is true of many rare and endangered species and habitats, the Corps of Engineers may determine the fate of the Everglade Kite. Drainage and stream channelization have destroyed most of the kites' habitat. Sudden fluctuations in the level of Lake Okeechobee during the nesting season sould be disastrous. Rapid lowering of the water has been known to weaken the cattail stems in which a colony of kites was nesting, with the result that all eggs were toppled into the water as the plants could no longer support the nests

From the standpoint of food supply, we believe a lake level of 14 feet above sea level would be ideal for the kites and wading birds in the area, as well as for fishermen and duck hunters.

Why the 1973 nesting season was so outstanding we do not know. Although we lack quantitative data on snail populations, cursory observations indicate that this was the highest snail population in the memory of the senior author. The U.S. Bureau of Sport Fisheries & Wildlife is currently doing research and developing management plans for the snail. These should shed light on the factors limiting the reproduction of the kites, and, hopefully, promote the restoration of this very unique raptor.

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