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Fate of artificially supported Snail Kite *Rostrhamus sociabilis* nests in central Florida, U.S.A.

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Summary

Twenty Florida Snail Kite *Rostrhamus sociabilis plumbeus* nests in imminent danger of collapsing at four lakes in central Florida, U.S.A. during 1987–1993 were stabilized or artificially supported. Most nests (n=17, 85.0%) were in either cattail *Typha* spp. or bulrush *Scirpus validus*. Nine supported nests (45.0%) successfully fledged young; the remaining nests were either abandoned (n=8, 40.0%) or ultimately collapsed (n=3, 15.0%). The overall rate of 0.75 fledgling per nest for supported nests was similar to the 0.79 fledgling per nest for unaltered nests. If the 160 nests that collapsed during the study had been supported, 72 nests saved from collapsing could have produced an additional 54 fledgling kites. Nest support may be effective where kite populations are low or during drought conditions.

Introduction

The endangered Florida Snail Kite *Rostrhamus sociabilis plumbeus* has a restricted distribution on central Florida lakes (East Tohopekaliga, Tohopekaliga, Tiger, Kissimmee), the headwaters of the St Johns River, Lake Okeechobee and the Everglades (Water Conservation Areas 1, 2A, 2B, 3A and 3B, and the northern portions of Everglades National Park) (Sykes 1984, Snyder *et al.* 1989, Rodgers 1992). Kites breed in a variety of both woody and non-woody vegetation throughout their range but regularly nest in non-woody species such as cattail *Typha* spp. and bulrush *Scirpus validus* on lakes (Sykes 1987). Nests in non-woody habitats often collapse due to the effects of strong winds (Figure 1) or dropping water levels that no longer provide the buoyancy needed to support the cattail or bulrush upright (Sykes and Chandler 1974, Beissinger 1986, Sykes 1987, Snyder *et al.* 1989). Lake levels in Florida normally fall during the dryer spring to summer breeding period but also are subject to manipulation by various state and federal regulatory agencies. Lower water levels result in kites breeding mostly in non-woody vegetation that collapses about twice as frequently (23.4%) as nests in woody vegetation (12.3%) in central Florida lakes (Rodgers 1992). Snyder *et al.* (1989) considered nest collapse of 12.6–30.8% per year the most important source of breeding failure.

Sutton nest structures and Chandler nest baskets were used on Lake Okeechobee during the 1970s and 1980s and prevented nests collapsing, thereby increasing breeding success (Sykes and Chandler 1974, Snyder *et al.* 1989, Sykes *et al.* 1995). Both of these types of support consist of a nest placed in a wire basket

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Figure 1. A Snail Kite nest (arrow) that has collapsed in cattail during a wind storm on Lake Kissimmee, Florida, U.S.A.

mounted on a pole that is driven into the bottom sediments (Figure 2). However, relatively little data are available on how effective these structures are in supporting nests that are in danger of collapsing and if the procedure is a viable conservation technique to increase the fledging success of kites (Snyder *et al.* 1989). I monitored the nesting status of Snail Kites on several central Florida lakes and determined the fate of those nests placed in structures which were repositioned and stabilized to prevent their imminent collapse. These nests provided an opportunity to evaluate a conservation technique of artificially supported kite nests built in non-woody vegetation.

Methods

I monitored Snail Kites nesting on East Lake Tohopekaliga (n=59), Lake Tohopekaliga (n=170), Lake Kissimmee (n=250) and Lake Okeechobee (n=417) during 1987–1993. A subset of 20 nests was selected to determine if intervention and support would prevent nest collapse and allow kites to successfully fledge young. All 20 nests contained either eggs or nestlings, were in imminent danger of collapsing, and had at least one adult kite in attendance. Nine nests on Lake Okeechobee were placed in Chandler baskets by National Audubon Society personnel. Nests on East Lake Tohopekaliga (n=2), Lake Tohopekaliga (n=6), and Lake Kissimmee (n=3) were either placed in similar baskets, repositioned and stabilized with wire and poles, or placed on inflated, plastic life-rings. These last nests had settled in their cattail or bulrush habitat and were in danger of flooding and the inflated rings maintained the low height at which the nest was found. Each nest was monitored every 1–2 weeks during the rest of the breeding season.

Figure 2. A Snail Kite nest that has been placed in a Chandler basket on Lake Okeechobee, Florida, U.S.A.

Results

The 20 supported Snail Kite nests were in cattail (*n*=14), bulrush (*n*=3), sesban *Sesbania* sp. (*n*=2), and buttonbush *Cephalanthus occidentalis* (*n*=1). A combination of wind and wave activity had caused the nests either to drop down into the vegetation or the substrate to lean over and endanger the contents. Nine of the supported nests (45.0%) with either eggs or young nestlings successfully fledged young; the remaining nests either were abandoned (*n*=8, 40.0%) or ultimately collapsed (*n*=3, 15.0%), when the surrounding vegetation was flattened by high winds.

The success of unaltered Snail Kite nests was 45.5% (*n*=876 nests) during my entire study; nest collapse (*n*=18.3%) ranked second after abandonment (35.2%) as a source of nest failure. Kites abandon nests for a variety of reasons but mostly due to lack of water underneath nests, loss of mate, or unknown reasons. The slightly higher rate of abandonment of the supported nests may be because action to support them was not taken until after they had nearly collapsed into the water. The overall rate of 0.75 fledgling per nest for supported nests was similar to the rate of 0.79 fledgling per nest for unaltered nests.

Discussion

Sykes and Chandler (1974) reported that two of four supported nests fledged five young. Snyder *et al.* (1989) found supported nests during the 1970s and early 1980s exhibited a 47.8% success in fledging young from the egg stage and produced 99 fledglings from 74 nests transferred from cattail to baskets. They

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also reported a success rate of 47% for supported nests originally in cattail compared with only 3% for unaltered nests in cattail. I found a 42.1% success rate for unaltered nests in cattail. If all 160 nests that collapsed during my study had been supported, 72 nests (i.e. 45.0%) would probably have produced an additional 54 fledgling kites. These additional fledglings would represent an increase of about 7.8% to the Florida population.

Whereas supporting Snail Kite nests prevented the collapse of 17 of 20 nests and improved productivity almost to that of unaltered nests in this study and to that of Snyder *et al.* (1989), the costs/benefits of an intensive conservation effort of supporting nests in non-woody vegetation remain problematical. Considerable effort (e.g. 1 or 2 people) and costs (e.g. airboat and other equipment) are involved in monitoring nesting of kites. Because kites apparently will not reuse nest baskets (Sykes and Chandler 1974, Rodgers, pers. obs.), an annual programme would be required to support most nests and gain the maximum advantage of reducing nest collapse. Further, during years when lake levels are high enough to allow access to flooded woody species (kites normally do not nest in unflooded vegetation), it would be desirable for kites to nest in more stable woody vegetation where failure due to collapse is only about 12.3%. Kites will renest if failure in non-woody habitats occurs early in the breeding season (Beissinger 1986). A nest support programme probably would be most effective where kite populations have decreased to low numbers and maximum productivity is desirable. Further, nest support would be advisable during drought conditions because non-woody vegetation is the only flooded habitat available for nesting in the littoral zone of central Florida lakes.

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