



Everglade Snail Kites: Barometer for the Health of the Everglades and Progress of Restoration

The success of the federally listed endangered Everglade Snail Kite (Kite) is a key ecological indicator for the Everglades- one of only three “Total System-wide Performance Measures” for the Comprehensive Everglades Restoration Plan (CERP)¹. This paper describes the Kite’s challenges throughout the three most important breeding and habitat areas remaining in the Greater Everglades: Water Conservation Area 3A (WCA-3A), Lake Okeechobee, and the Kissimmee Chain of Lakes (KCOL). The challenges vary somewhat from place to place but mirror the various difficulties and risks that the Greater Everglades Ecosystem faces. Our analysis shows that Everglades restoration projects and water management decisions that improve conditions throughout the ecosystem must be pursued with urgency.

Water Conservation Area-3A: Fluctuations of High and Low Water Levels

Kites have nested extensively in WCA-3A, a region with vast and relatively intact Everglades ridge and slough and tree island landscapes, since the mid-1960s². Restoring this federally designated critical habitat is of utmost importance because along with Everglades National Park, it is the only remaining habitat of sufficient size and quality to produce enough chicks to recover and perpetuate the Kite population in Florida.

1. RECOVER: Total System Performance Measures. Comprehensive Everglades Restoration Plan website, available at http://www.evergladesplan.org/pm/recover/perf_total_system.aspx, See also TS-1 Snail Kite Foraging Conditions, Comprehensive Everglades Restoration Plan, December 15, 2005, available at http://www.evergladesplan.org/pm/recover/recover_docs/et/ts-01.pdf
2. National Research Council. 2010. Progress toward restoring the Everglades: third biennial review. National Academies of Sciences Press. Washington, D.C. (pg 51.)

Alternating periods of excessively high and low water levels in WCA-3A have contributed to poor reproduction and reduced juvenile survival of Kites. The National Research Council reported a trend of low Kite reproduction in WCA-3A since 2001³. Periods of high water for long durations, such as the period from 2003 to 2005, transform desirable wet prairie communities to longer hydroperiod and less desirable floating leaf communities, creating an inhospitable habitat for the Kite’s exclusive prey, the apple snail.

This is particularly problematic when high water ponds deeply on the southern edge of WCA-3A where Kite nesting is concentrated. Conversely, frequent and prolonged low levels, accentuated by human activities, have driven Kites from the region in dry years and required multi-year habitat and apple snail recovery.

3. *Ibid.*

Species on the Brink of Extinction

The Everglade Snail Kite has experienced an astonishing population decline in the past decade, decreasing from 3400 individuals to less than 700 today.

The Everglade Snail Kite’s range has diminished significantly in Florida and is now restricted mostly to the Central Everglades, Lake Okeechobee, Kissimmee Valley, southern parts of the St. Johns River marshes, and the Loxahatchee Slough. Population models predict that if current trends continue, this majestic species could become functionally extinct in a matter of 20-30 years.

Options to Help Kites Survive in WCA-3A

These ecological problems underscore the importance of Everglades restoration projects and management plans that restore the freshwater flows to a more natural alternation between high and low water levels. The CERP Decompartimentalization (Decomp) project will remove constructed canals, levees and other barriers that impede the natural sheetflow of water through and out of WCA-3A. Bridging the Tamiami Trail beyond the one mile portion currently under construction will allow for increased water flows out of the WCAs and into the appropriate location in Everglades National Park, beginning to restore the ridge and slough landscape through this part of the Kite's critical habitat. Additionally, the Everglades Restoration Transition Plan (ERTP) will consider Kites and other endangered species utilizing WCA-3A by altering water levels when possible to reduce the duration of high and low water events. The Combined Operational Plan will follow ERTP with the opportunity for even more beneficial operations after key projects are constructed. These restoration projects, as well as increasing flows through WCA-3B, must be expedited to improve the current degraded conditions in WCA-3A so that it can function as critical habitat for the endangered Kite.

WCA-3A habitat has been degraded from unnatural periods of prolonged high and low water levels.



Photo by Larry Frogge

Lake Okeechobee: Harm from Low Water Levels

Lake Okeechobee is also designated critical habitat for the Kite by the United States Fish and Wildlife Service (USFWS) and second only in importance to the WCAs for the Kite's long-term population viability⁴. Three separate severe low water events have harmed Lake Okeechobee in the last decade. These events were due to the combination of 1) the Lake Okeechobee Regulation Schedule from 2008 that keeps lake levels lower on average, 2) a new water rationing plan (LOWSM) that delivers water to consumptive users regardless of lake levels, and 3) recent weather patterns that have created more frequent severe droughts. The recent record-breaking low water levels in Lake Okeechobee⁵ have disrupted the Kite's foraging and nesting habitat. Kites exclusively eat an aquatic snail, the apple snail, which depends on adequate water levels for survival. Snails can survive for about three months without standing water, but mortality increases sharply beyond this time.

Excessively low water levels in Lake Okeechobee in 2001, 2007, 2008, and 2011 have led to a sharp decline in availability of apple snails in the lake. It takes a number of years for apple snail populations to recover from the harm caused by these conditions. Moreover, nests are more likely to fail during times of low water levels. In late May 2011, six of the remaining nine Kite nests on Lake Okeechobee failed, almost certainly a result of parental abandonment related to low water levels and lack of food.

Options to Help Kites on Lake Okeechobee

The impacts of excessively low water levels on Lake Okeechobee's Kite habitat highlight the urgent need to store water during the wet season

4. USFWS. 1998. Snail Kite in Multi-species recovery plan for the threatened and endangered species of South Florida. Southeast Region, Atlanta, GA.

5. Each of the past three droughts have broken the previous low water record on Lake Okeechobee of 9.8 feet (1981) going back to 1912.

and conserve as much water as possible during the dry season. CERP projects and dispersed water management projects that store water to the north and south of Lake Okeechobee should be pursued as quickly as possible. Additionally, while water managers cannot control the severity or duration of a drought, water supply deliveries can be managed to minimize loss of Kite habitat. During the onset of droughts, meaningful water rationing should be implemented sooner. There must be a hard look at water shortage management practices to encourage more effective water conservation in the future.

Kissimmee Chain of Lakes: A Temporary Habitat with Exotic Problems

Unlike WCA-3A and Lake Okeechobee, the KCOL is not listed as critical habitat for the Kite. However, as nesting has failed and the foraging habitat has declined in WCA-3A and Lake Okeechobee, Kites have managed to sustain nesting in the KCOL. The KCOL, located in the northern edge of the watershed, does not suffer the high water level problems experienced in Lake Okeechobee and the WCAs because excess water flows to the south. Nevertheless, it is a misconception that the KCOL can successfully support all the Kites which have migrated from other critical habitats in the Everglades. KCOL habitat is simply not large enough to provide the opportunity for Kites to recover their populations. The USFWS states that nesting activity in this region is too limited to fully compensate for the lack of nesting in Lake Okeechobee and WCA-3A⁶.

The Kites' difficulties in the KCOL relate to exotic species and human-induced impacts. On Lake Tohopekeliga (Toho) the native plant and snail community has been mostly replaced by the exotic plant hydrilla and exotic apple snails. Additionally, lakeshore development and dock construction have degraded Kite habitat on the

6. See Final Biological Opinion and Final Fish and Wildlife Coordination Act Report, Lake Okeechobee Regulation Schedule, November 2007 at 60.

Apple Snail Loss on Lake Okeechobee



Photo by Dr. Paul Gray

littoral zones of the lakes by altering foraging habitat. Recently, the potential impacts from a proposed airboat concession in proximity to Kite nesting on Big Grassy Island and Lake Toho's eastern shore has drawn concern from the USFWS⁷.

Options to Sustain KCOL as a Bridge for Kites Until Other Habitats are Restored

While the KCOL is neither ideal nor sufficient to support Kites long-term, the habitat should be sustained until the viability of the Kites' critical habitat is restored. Hydrilla and exotic snails are foreign to Florida but Kites are utilizing the habitat and exotic snails in the KCOL much like a community of native plants and snails. Audubon supports eliminating exotic species when they are damaging an ecosystem. In this case however, aquatic plant management should sustain enough hydrilla to meet Kite habitat needs while maintaining other essential functions of the lake. Additionally, human-induced impacts from development and recreation should be closely monitored to prevent harm and ensure that if harm occurs, it is mitigated somewhere else.

Conclusion

In conclusion, Everglades restoration and improved water and vegetation management will help restore the Kite's most important habitats. A healthy Kite population reflects a healthy Everglades, so urgent action is needed to recover this species from the brink of extinction.

7. June 2 2011 Letter from Paul Souza, USFWS to Osceola Board of County Commissioners, Re: Marsh Landings Adventures.



Everglade Snail Kite - True or False?

- **If Lake Okeechobee's water level declines a few inches during dry season, it does not make a big difference in habitat quality.**

False. Every inch of water level depth decline on Lake Okeechobee dries approximately 3000 acres of habitat- about 4.5 square miles.
- **If WCA-3A and Lake Okeechobee habitats continue to degrade, Kites in these areas will migrate to the KCOL and successfully adapt.**

False. First, most Kites won't know to migrate to this region. More importantly, it is a misconception that the smaller KCOL habitat will be able to fully support Florida's Kite population.
- **If Kites cannot find apple snails to eat, there is a great likelihood they will starve.**

True. Kites feed almost exclusively on apple snails. Maintaining marsh habitat throughout the Everglades required to sustain apple snail populations is critical for Kite survival.
- **Kites cannot survive in habitats invaded by exotic species.**

False. Even though there are exotic species in the KCOL, Kites can survive in this habitat by feeding on the exotic apple snail closely related to our native apple snail. While not ideal and not a long term solution, the habitat serves as a necessary bridge until Lake Okeechobee and WCA-3A are restored.

- **Restoring the WCAs is critical for Kite recovery.**

True. WCA-3A is the only remaining Everglades habitat of sufficient size and quality to produce enough chicks to recover and perpetuate Florida's Kite population.

- **Losing the Kite to extinction won't actually affect Everglades restoration in the long run.**

False. The Kite is one of the most specially adapted animals in the Everglades. Because of this, the Kites' presence or absence is a strong indicator of the success of Everglades restoration and whether we are coming close to recreating natural conditions in the system.

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