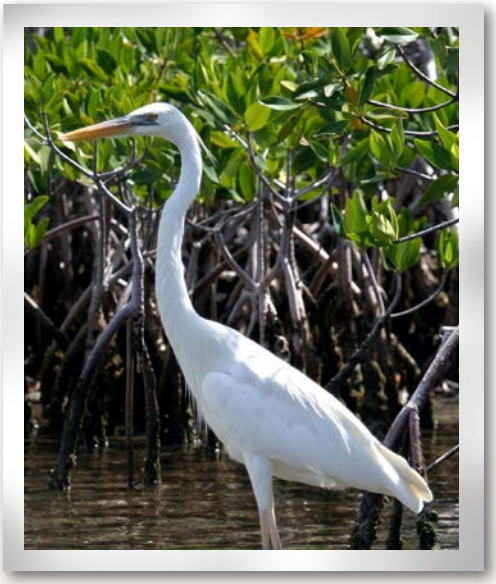
# Great White Herons in the Backcountry

## Florida Keys National Marine Sanctuary

### Lower Keys Refuges Set Aside to Protect Herons

By the early 1900s, snowy egrets, great white herons and other wading birds had been hunted nearly to extinction on their breeding grounds in south Florida. Great white herons may have even been reduced to only one hundred nesting pairs. Used to decorate fashionable ladies hats, the attractive breeding plumes of these and other wading birds garnered high prices when sold to hat-makers. In 1901, Florida passed legislation protecting non-game birds and in 1908 the Key West National Wildlife Refuge (NWR) was established to protect native birds and their habitats. In 1938, the Great White Heron National Wildlife Refuge was created in the backcountry of the Lower Keys. Managed by the U.S. Fish and Wildlife Service, the refuges are havens for over 250 bird species, including great white herons. Together, they preserve about 400,000 acres of "backcountry" shallow waters, seagrass flats and low-lying mangrove islands. Nearly 4,000 acres within the two refuges have been congressionally designated as wilderness. Wilderness areas are managed to preserve their natural condition and are places where people are considered "visitors".



Great white herons nest on mangrove islands.
Photo: Andy Collins for FKNMS

**When first described by ornithologists, great white herons were considered to be a separate species from great blue herons. Although some scientists have suggested that they have at least subspecies status, at present, great white herons are considered a color variation or "morph" of a subspecies of great blue herons found in southern Florida and the Florida Keys. Blue and white birds are known to breed with one another and their offspring may have a mixture of blue and white plumage. Because of their small population size and highly localized occurrence, great white herons qualify for the highest action level, Critical Recovery, in the Fish and Wildlife Service's Regional Waterbird Conservation Plan 2006. This designation resulted, in part, from the nesting surveys taken in Florida Bay and the refuge backcountry.**

### Scientists Study Heron Foraging Habits and Habitats

In the early 1940s, the U.S. Fish and Wildlife Service reported that the great white heron population was recovering, a trend that continued until the mid-1990s when their numbers began to decline for unknown reasons. Recent population assessments show that herons have been experiencing a steady decline for an extended period of time. Specifically, decreases have been observed in the subpopulation that resides in Florida Bay. Another smaller subpopulation resides in the backcountry of the refuges and appears more stable, although it experienced losses due to hurricanes in 2005. To better understand what may be impacting these birds, biologists from Avian Research and Conservation Institute received funding from the Florida Fish and Wildlife Conservation Commission and U.S. Fish and Wildlife Service to document heron foraging and nesting patterns. The study took place in the Great White Heron NWR and western Florida Bay from 2007 through 2010.

Great white herons feed on fish they see while wading through shallow waters. Toadfish, red porgy, pipefish and needlefish are some of the more common prey. Using a striking motion, herons capture fish with their strong beaks. In this project, scientists used spotting scopes and binoculars to log over 3,000 observations of heron feeding behavior from a distance that did not disturb feeding birds. During the observation periods, the number of feeding strikes per minute, catches per strike, number of catches per minute and prey size were recorded. Prey fish were classified into one of five size categories. Scientists also followed five GPS (satellite) tagged adult birds and calculated the amount of time foraging and the type of foraging habitat selected.

http://floridakeys.noaa.gov/

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## Shallow Seagrass Meadows are Critical Feeding Grounds

Field observations made on foraging birds and location data from the tagged adults confirmed that seagrass, specifically turtle grass (*Thalassia testudinum*), habitat was the most commonly selected habitat for foraging. Approximately 60% of the available seafloor consisted of dense to moderate continuous seagrass beds and yet 92% of the feeding locations were in this habitat. Foraging great white herons were found in only three other habitats, and then only minimally: patchy seagrass, hardbottom with seagrass, and bare substrate. Foraging birds were concentrated near the largest grassbeds and clearly favored continuous, not patchy, grass beds. Intact expanses of seagrass appear to be important both in and out of the nesting season. Data tracking the five tagged herons show that foraging herons exhibited fairly high site fidelity, that is, individual birds tended to use the same area repeatedly. In terms of bird foraging decisions and performance, water depth, which is tied to the tidal cycle, appears to be more important than time of day.

## Bay and Refuge Herons Show Differences in Foraging and Nesting Success

Observations of foraging great white herons found birds in the refuge generally caught larger fish than birds in Florida Bay and had better foraging success as measured by the number of catches per minute (.094 verses .036). The potential to support fish-eating birds is clearly different between the two areas and could be significant to breeding birds who are feeding their young.

Scientists also monitored nests on mangrove islands in Florida Bay and the refuge during the breeding seasons of 2008 and 2009. They recorded the size and number of eggs and/or chicks, nest height, tree height and type, color of chicks (blue or white) and tracked each nest to determine its success. Of the nests for which the final outcome was known, 57% in the refuge were successful, having produced at least one young, and only 40% were successful in the bay. Nesting success in the refuge exceeded that of the bay by clear margins and may be related to factors that differ between the two areas, including lower food supply in grassbeds. In the late 1980s, Florida Bay began experiencing significant ecological changes, including the widespread mortality of turtle grass beds that had typically supported a variety of small prey fish.

Predation may play a role in mortality of nestlings in Florida Bay. An analysis using only nests that were successful in producing young revealed that the number of surviving chicks per nest was similar in the refuge and bay. This observation implicates predation as a cause of mortality because predation would likely result in the loss of all young from the nest, whereas reduced food supply would probably result in some young surviving. Researchers noted the high prevalence of crows on or near nesting sites in Florida Bay and suggested that nest failures during this study may have resulted from predation by crows on unattended nests when birds were flushed by some disturbance, including from passing motor boats.


Some areas in the refuge are closed to entry to protect wildllife and habitats.
Photo: Great White Heron National Wildlife Refuge

## Preserving the Wilderness Character is Essential to Survival of Great White Herons

Backcountry seagrass flats and mangrove islands are critical for survival of the small isolated population of great white herons. Birds forage on large, intact grassbeds during a limited part of the tidal cycle and nest on nearby mangrove islands. Vessel exclusion areas, no-motor, no-entry and buffer zones in the refuge help preserve the quality of these critical habitats by protecting flats from boating impacts and keeping people and noise away from feeding, resting and nesting birds. Similar to other birds, great white herons often fly when disturbed by people approaching too closely or by loud noises from vessels. Restrictions that apply to people and vessels, including non-motorized ones, are in place to prevent such disturbances, thereby protecting the vulnerable population of herons and other wildlife that reside in the remote backcountry of the Great White Heron NWR.

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Publication Date: February 2013