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2020 Wading Bird Nesting in the Greater Everglades Ecosystem:

Mixed nesting results show benefits of recent restoration projects and urgency of those still to come.

Overview

Are restoration and conservation efforts improving the health of the Everglades? The birds tell us. Wading birds are important indicators of ecosystem health in the River of Grass, and each year the South Florida Water Management District – in collaboration with Audubon Florida and other partners – synthesizes wading bird survey data from across the Everglades to examine system-wide trends. When wading birds nest in large numbers and fledge chicks most years, they tell us that our efforts to improve the hydrology of South Florida ecosystems are successful.

Despite the challenges of COVID-19, researchers adjusted their reporting methodology and overcame obstacles to collect data to inform the 2020 Wading Bird Report. Audubon commends these efforts and the resilience of these scientists in the face of such hardship, but notes that some data are incomplete compared to previous wading bird reports.

White Ibis and Roseate Spoonbills had a successful nesting season in 2020, but many other species failed when and early arriving rainy season impacted the availability of food for chicks. Years of monitoring show us that in recent decades, wading bird nesting in South Florida has increased but is still a fraction of the target for a restored Everglades ecosystem.

Nesting numbers in 2020 were an order of magnitude higher than those seen in historically-low nesting years in the 1980s and 90s. However, 2020 nesting still fell short of the historically-high nest numbers of the 1930s and 40s. This suggests that restoration efforts since the 1990s have improved the foraging conditions that lead to increased nesting, but significant room for improvement remains as Everglades restoration continues.

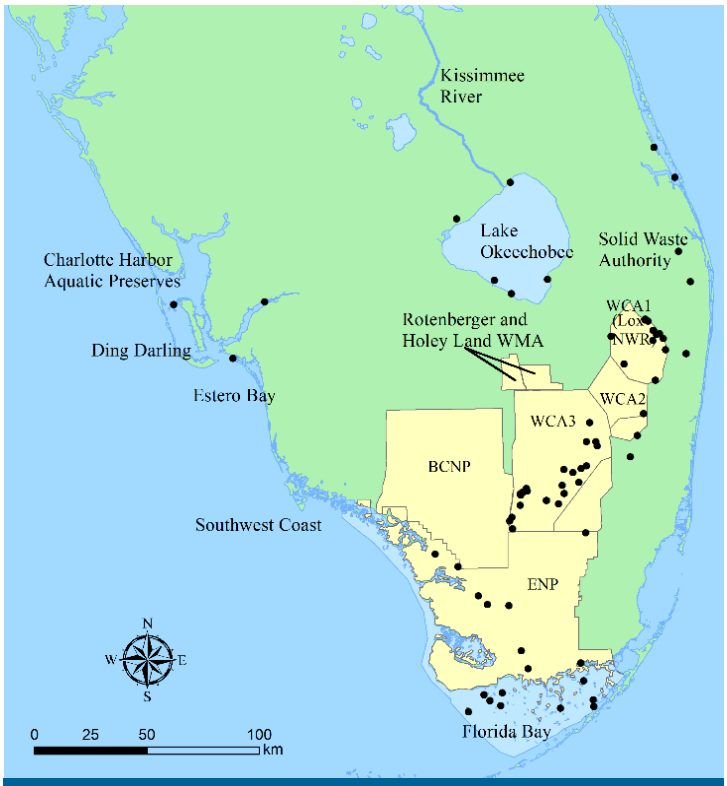
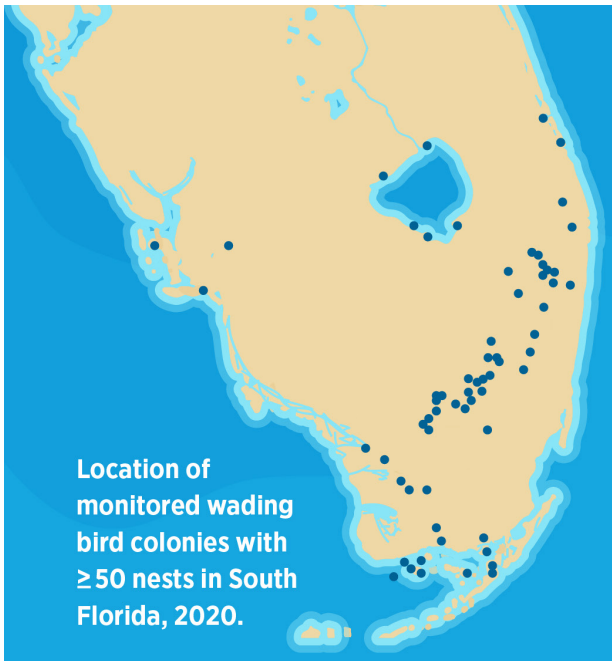


Figure 1. Location of monitored wading bird colonies with ≥ 50 nests in South Florida, 2020. Credit: South Florida Water Management District

Wading birds need dry conditions in the late spring and early summer to concentrate the prey needed to feed their voracious young.In 2020, Wood Storks initiated nesting earlier than some recent years but not as early as they did historically (which is the restoration target). With this delayed nesting, May rainfall resulted in a reversal of drying conditions and widespread abandonment of Wood Stork nests. Other wading birds also struggled to feed their chicks, however, they were less affected because they have a shorter period of chick development and/or had already fledged their chicks prior to May.

Climate change-induced changes in seasonal rainfall patterns, including stronger and more frequent storms, will continue to negatively impact wading bird nesting.



Location of monitored wading bird colonies with ≥ 50 nests in South Florida, 2020.

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2020 EVERGLADES WADING BIRD REPORT

Each year, researchers from nonprofits, agencies, universities, and more work together to combine wading bird survey results from across the Everglades and in turn, the success of progress made on restoring the River of Grass.

White Ibis and Roseate Spoonbills had a successful nesting season in 2020, but many other species failed when an early arriving rainy season impacted the availability of food for chicks. Years of monitoring show us that in recent decades, wading bird nesting in South Florida has increased—but is still a fraction of the target for a restored Everglades ecosystem.

43,680 EVERGLADES WADING BIRD NESTS INITIATED

10-YEAR AVERAGE: 46,841

2020 is typical for nesting in recent decades, but still substantially greater than in the 1980s and 1990s.

↓ 20%

While White Ibises had higher nesting success than Wood Storks, the overall number of nests for WHITE IBISES, GREAT EGRETS, AND WOOD STORKS was approximately 20% lower than the 10 year average.

↑ DOUBLE

ROSEATE SPOONBILL nest numbers were more than double the decadal average.

TRICOLORED HERONS, SNOWY EGRETS, AND LITTLE BLUE HERONS

<10,000 NESTS PER SPECIES ↓

WOOD STORKS were forced to nest late, but the rainy season arrived early, and nest devastation resulted.

↓ 27%

SNOWY EGRETS, unfortunately, posted numbers 27 percent lower than average.

Despite the challenges of COVID-19, researchers adjusted their reporting methodology and overcame obstacles to collect data to inform the wading bird report. However, it should be noted that data from 2020 is not as complete compared to previous years.

THESE NUMBERS SHOW US THAT RESTORATION PROJECTS WORK.
AUDUBON CONTINUES TO BE A LEADING VOICE FOR EVERGLADES RESTORATION FOR THE BENEFIT OF BIRDS AND PEOPLE.

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Key Findings of 2020 South Florida Wading Bird Report

System-wide Indicators

• **Many species met restoration targets.** Great Egret, Wood Stork, and White Ibis nesting increased steadily beginning in 1986, meeting restoration targets in most years since 2000, including 2020.

• **Twenty-five percent of nests were in coastal Everglades National Park.** In the 1990s and 2000s, only 2-10% of all nests occurred in the coastal habitats of Everglades National Park. This has improved in recent years, ranging from 15-41%. The restoration target is 50%.

• **Supercolony formation is on track.** Before widespread drainage of the Everglades, large nesting events, sometimes exceeding 100,000 nests, formed every two years. Today, the restoration target is for these supercolonies to form every 1.6 years on average. A supercolony has formed 12 out of the last 13 years, including in 2020 in WCA3, and wading birds are meeting this target with a supercolony forming every 1.4 years.

• **Wood Storks nested earlier, but still too late.** To meet restoration targets, Wood Storks must begin nesting in November or December. Currently, the loss and degradation of short hydroperiod wetlands, which Wood Storks rely on early in their nesting cycle, has resulted in nest initiation occurring from January to March. In 2020, many began nesting in mid-January, which is relatively early compared to the last 50 years.

• **Wood Stork nesting was below average.** Wood Stork nesting has been trending upwards in the Everglades system in recent years, but 2020 nest numbers were 28% lower than the ten-year average. This demonstrates the vulnerability of South Florida Wood Stork colonies to variations in annual rainfall patterns and sporadic water levels. This variability is predicted to increase under current climate change models.

Wood Stork chick. Photo: Cheryl Black

• **Regional hydrology problems remain.** Continued poor nesting numbers from historic colonies like Corkscrew Swamp Sanctuary, despite improvements elsewhere in the system, reflect significant regional decline in the hydrologic conditions that promote prey production and availability.

Not All Wading Birds Are Created Equal

Wood Storks have more specific foraging preferences and a relatively long period of chick development, requiring two months of high-quality conditions to successfully fledge chicks after they hatch. This period is much shorter for the other species. If Wood Storks had initiated nesting in November or December, as they did historically, chicks would have successfully fledged prior to May. In South Florida, wetland loss to drainage and development has caused Wood Storks to initiate nests later, resulting in widespread failure when summer rains arrive early.

Nesting by Region

Northern Everglades

Okeechobee and Kissimmee Valley

Due to COVID-19, no wading bird surveys were flown over the Kissimmee River or Chain of Lakes.

Lake Okeechobee wading bird nesting was the lowest it has been since the extreme drought year of 2008. Researchers documented 1,951 nests; the 10-year average is 5,319 nests. Nest numbers for Great Egrets, Snowy Egrets, and White Ibises were down 44%, 48%, and 66%, respectively. Dry spring weather lowered the lake to 11 feet, which dried almost the entire marsh. Therefore, nesting in the marsh was non-existent; the few colonies that had nests were on islands and at an alligator farm near Lake Okeechobee. Importantly, the alligator farm had 52 Wood Stork and 51 Roseate Spoonbill nests, representing the highest number of spoonbill nests ever recorded at this location.

Wood Stork nesting colony in Southwest Florida.

As the U.S. Army Corps of Engineers (Corps) works to change the Lake Okeechobee water management plan (known as LOSOM) it is notable that nesting under the present lake plan (2008-present) averaged 3,261 nests per year, up from an average of 2,601 nests from 1977-2007. The recent increase was due to the Lake being kept shallower and having smaller, more consistent water drawdowns which benefit wading birds. In an attempt to reduce harmful discharges to the St. Lucie and Caloosahatchee estuaries, the new preferred plan the Corps has identified would return the Lake to deeper levels, lead to more significant drawdowns, and as a result poses a significant threat to future wading bird nesting in Lake Okeechobee.

In good news, in Savannas Preserve State Park – a 5,000-acre property in northern Martin County and southern St. Lucie County – researchers counted 127 nests of eight wading bird species, about three times the numbers of the past couple of years. Similarly, nine colonies from Martin County to the Palm Beaches produced 867 nests of 11 species of wading birds, of which about half were Wood Storks and were up slightly from recent years.

Policy Recommendations

Lake Okeechobee

- Work with the Corps' LOSOM process to build in operational flexibility in the lake schedule – ensuring that water is sent south through the Everglades, harmful discharges to the estuaries be minimized, and lake health be considered whenever possible.

Overall

- All regions will benefit from ensuring that sufficient funding is maintained for wetland and wading bird monitoring.
- It is critical to effectively identify causes for nesting declines and to determine whether Everglades restoration projects are achieving their intended benefits.
- In 2011, SFWMD and Army Corps administrators froze monitoring program budgets under the Restoration Coordination and Verification (RECOVER) Monitoring and Assessment Plan (MAP). As a result, monitoring has diminished as costs have increased. This monitoring is critical not only to gauge restoration effectiveness but also to inform adaptive management integral to the Combined Operational Plan (COP) and Biscayne Bay Southeastern Everglades Ecosystem Restoration (BBSEER). Monitoring program budgets must be funded at contemporary levels to ensure we have the data to make CERP succeed.
- Prioritize hydrologic restoration of the full suite of wetland types to address the single element that has historically determined success or failure of greater Everglades wading bird reproduction.
- This includes possible regulatory improvements and incentives for hydrologic restoration of wetlands, public funding, and collaboration amongst landowners, agencies, researchers, and other resource entities.

Western Everglades

Nesting numbers were incomplete in the Western Everglades in 2020 due to the COVID-19 pandemic.

Wood Stork nesting initiated in March, which is late for this region, due to significant dry-season reversals in December and January. No nesting was observed at Corkscrew Swamp Sanctuary (once the largest Wood Stork nesting colony in the country) for the ninth time in the past 14 years. Wood Stork colonies in inland Collier County (BC-29) and on the Caloosahatchee River (Lenore Island) had initiated a total of 35 nests by mid-March when monitoring flights were suspended. While many more Wood Storks were present in these colonies, peak nest numbers and the fate of the nests is not known.

Failure to initiate nesting at the Corkscrew Colony, despite nest initiation at another inland colony, suggests inadequate prey production in wetlands in and around the Corkscrew Regional Ecosystem Watershed (CREW). Loss and decline of wetlands, due to development and hydrologic disruption, reduces the standing stock of small fish and crayfish that provide critical energy resources needed for nesting. Further, over-drying of Corkscrew Swamp Sanctuary and CREW lands due to downstream water management activities, has increased the rate of drydown which may affect Wood Storks' choice of nesting location.

Policy Recommendations

- Continue to work with regional partners to develop a plan for reducing over-drainage and restoring the hydrology of Corkscrew Swamp Sanctuary.
- Revisit permitting practices to strengthen protection of short-hydroperiod wetlands which serve as critical foraging grounds for wading birds early in the hydrologic year.
- Ensure permitting for land use changes throughout the region does not allow alteration of the hydrology of remaining wetlands, including wetland hydroperiod, timing of inundation, and connectivity/flow.
- Advocate for burden shifting policies to ensure that water managers and developers are required to demonstrate that land use changes will not adversely affect hydrology of wetlands, hydroperiods, inundations times, and connectivity or flow.
- Prioritize short hydroperiod restoration through permitting incentives, public funding (such as Everglades restoration), and collaborative agreements.

Central Everglades

Water Conservation Areas (WCAs)

In 2020, hydrologic conditions did not support an abundance of prey, particularly during the early and late nesting season. The availability of prey for wading birds impacts their nesting patterns and ability to rear their young. Nest numbers (27,507 nests) were very similar to what they have been for the last decade, but this is a vast improvement over the numbers recorded prior to 2000.

Roseate Spoonbills in Florida Bay

Spoonbill nesting in Florida Bay is still lagging, and the birds continue to initiate nesting more than a month later than they did historically. While Florida Bay is seeing hydrological benefits of Everglades Restoration, sea level rise is counteracting these gains. Spoonbill success in Florida Bay was moderate this year, with young fledged from 47% of nests. Audubon has found that low water levels at the time of hatching are the greatest determinant of spoonbill nest success. This data suggests that in order to best protect spoonbills, rising sea levels should continue to be incorporated into the planning and operation of Everglades restoration projects.

Roseate Spoonbills. Photo: Cheryl Black

Since 2000, Roseate Spoonbill nesting has increased in the WCAs – in contrast to Florida Bay. The highest number of Roseate Spoonbill nests ever observed in the WCAs occurred in 2020, indicating that ecological conditions within the WCAs have become more suitable in recent decades for this once-rare indicator species. Furthermore, the aerial survey techniques used in this region do not yield accurate counts for this species, so the actual number of spoonbill nests was likely much higher than that observed.

The decline of small heron species continues to alarm Audubon. The 2020 surveys show only 10% of the Tricolored Heron and Little Blue Heron nesting numbers recorded in the 1980s and 1990s. Small herons are notably more difficult to survey, and reduced survey activity due to COVID-19 may have contributed to the low nest counts in 2020, but this cannot explain the extreme difference between current levels and those counts from previous decades. Possible reasons for low numbers are the increase in Black-crowned Night Herons, which are formidable nest predators of other wading bird species, and the possible movement of small herons to coastal habitats.

Policy Recommendations

Central Everglades

- Prioritize construction of the Central Everglades Project to break down barriers to flow in the WCAs by removing more than 25 miles of canals and levees.
- Continue to prioritize funding and construction of the Everglades Agricultural Area Reservoir to increase water management flexibility in the WCAs.
- Increase funding for invasive species control to maintain critical wading bird habitat, like the Arthur R.

Marshall Loxahatchee National Wildlife Refuge in WCA-1.
• Fund and construct the Broward County Water Preserve Areas.

Southern Everglades

Mainland Everglades National Park
While foraging was difficult for wading birds in the WCAs, Everglades National Park conditions proved more favorable, and nest numbers were relatively high (10,138 nests). 2020 marks only the sixth time in the last 20 years that wading birds made more than 10,000 nests in this region, continuing the positive trend seen in recent years. Despite high nesting effort, nesting success – defined by the number of fledged chicks – varied, based on the timing of nesting in relation to the high rainfall events in May.

Only three colonies had greater than 1,000 nests, and all three were in the coastal mangrove habitat, which may be in response to ongoing restoration activities inland. This area historically hosted the large supercolonies observed in the 1930s and 40s, but was largely abandoned from 1980 to 2000.

Florida Bay and Southern Estuaries
Nesting effort in the southern estuaries (Florida Bay, Biscayne Bay, Estero Bay and Charlotte Harbor) was similar to that seen in recent years, but still well below what historic accounts from the area suggested.

Great Egrets. Photo: Charles Lee

Florida Bay accounts for 64% of the Tricolored Heron nests in the system, even though Tricolored Herons were not thoroughly surveyed. These were similar to nest numbers found in Florida Bay in the late 1980s. Unlike the rest of the Everglades, Tricolored Herons in Florida Bay are not declining and are possibly increasing. Scientists hypothesize that although sea level rise is making the habitat less suitable for Roseate Spoonbills, it may be resulting in novel habitats being exploited by Tricolored Herons.

Policy Recommendations

• Implement the Combined Operational Plan (COP) for the Modified Water Deliveries Program, C-111 Spreader Canal, and South Dade projects, applying adaptive management to make changes where needed. Remove high and low water constraints from the COP.
• Develop the Biscayne Bay Southeastern Everglades Ecosystem Restoration plan that provides regional benefits to both Florida Bay and Biscayne Bay as envisioned in the C-111 General Reevaluation Plan and that includes the incorporation of Bird Drive Basin.
• Ensure optimal water levels in the C-111 Spreader Canal Western project by raising water levels at S-18C and greatly curtailing dumping water to tide via S-197. It is also important to execute Comprehensive Everglades Restoration Plan state and federal agreements.

This report was produced in Sept. 2021 by Audubon Florida in collaboration with South Florida Water Management District, University of Florida, Everglades National Park, National Park Service, Florida Fish and Wildlife Conservation Commission, Ding Darling National Wildlife Refuge, Charlotte Harbor Aquatic Preserve, Estero Bay Aquatic Preserve, Florida Department of Environmental Protection, Florida Atlantic University, Palm Beach County, Florida State Parks, and Zoo Miami.

Find the full 2020 South Florida Wading Bird Report at Fl.Audubon.org/wading-birds.

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