Audubon | Everglades Science Center

History and Research

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History about the office

Audubon's Everglades Science Center (ESC) was established in the Florida Keys in 1939, by National Audubon's first Director of Research, Robert Porter Allen. Allen began a full-time study of the Roseate Spoonbill, living among them in a tent for weeks at a time. At the time, scientists would typically study birds' eating habits by killing them and examining their stomach contents. However, the spoonbill was so scarce by this time, Allen had to find another way to study them. His research changed how scientists studied birds and began 75 years of data investigating the spoonbill and its habitat.

ESC has had a continuous history of research and recovery efforts by some of the nation's brightest ornithologists. As a result, research and recovery efforts of Bald Eagles, California Condors, Whooping Cranes, Flamingos, and even Ivory-billed Woodpeckers were put in place long before the government took action.

During the 1950s and later years, Audubon expanded the ESC's focus to encompass all natural aspects of the Florida Bay and Florida Keys, including corals, seagrasses, mangroves, game fishes, crocodiles, wading birds, White-crowned Pigeons and many ecosystem-level studies. Studies of White-crowned Pigeon foraging habitat in the Keys hardwood hammocks led to the state's acquisition of the Tropical Flyways project, a collection of tropical hardwood hammocks in the Keys.

Currently, ESC scientists are studying the flow of freshwater into Florida Bay and the impacts that the diversion of water has had throughout the Everglades ecosystem. Our experiments link changes in freshwater flow to decreased plant production and subsequent loss of small fishes. These are vital parts of the ecosystem, making up the food base for many higher predators such as game fishes, crocodilians, wading birds and birds of prey.

Dr. Jerry Lorenz continues the Roseate Spoonbill studies today, working with staff and volunteers to collect nesting information across Florida Bay. Data analyses show shifts in nesting distribution due to habitat destruction in the Keys. Recently nesting success has decreased and nest distributions have moved westward due to poorly timed water releases and high water conditions in the spoonbills' foraging habitats of the Everglades. Lorenz has demonstrated how spoonbills are sensitive to changes in the quantity and quality of their foraging habitat.

Current information about the office

The Everglades ecosystem has historically depended on a flow of freshwater from Lake Okeechobee that flows through the Everglades and into Florida Bay (Figure 1). Many animal and plant species in the Everglades depend on this freshwater influx. With the development of manmade canals starting in the 1940s, freshwater was directed away from the Everglades and allowed saltwater to intrude upon the ecosystem (Figure 2). Restoration projects have been put in place to recreate some of the historic flows through the Everglades, but there are still plenty more that needs to be done.

At the Everglades Science Center (ESC), we study the overall health of the Everglades ecosystem by monitoring hydrology, submerged aquatic vegetation (SAV), prey base fish and roseate spoonbills (ROSP) in Everglades National Park (ENP), Florida Bay and the surrounding wetlands. We have three crews in the office that work in each of these linked areas.

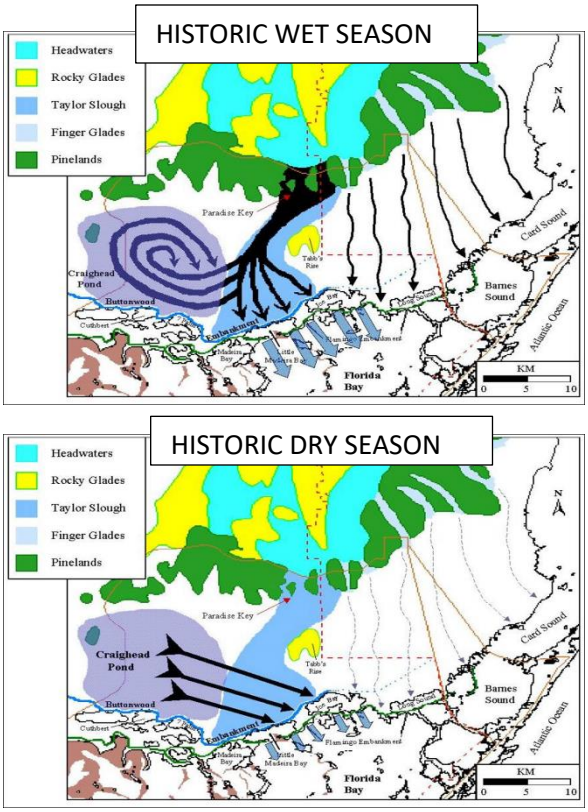

Figure 1. Historic wet and dry season water flows

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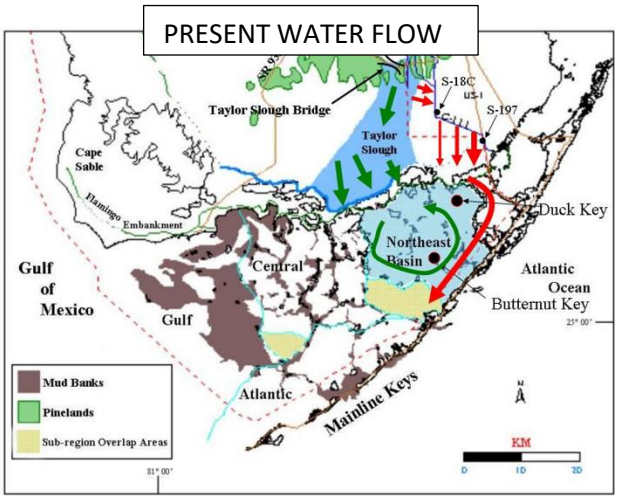

Figure 2. Present water flow

Hydrology and SAV

The Hydrology/SAV crew studies hydrologic trends for water depth, salinity and temperature, as well as submerged aquatic vegetation. Saltwater intrusion into the Everglades has caused the composition of SAV to change drastically. The SAV crew conducts bimonthly randomized SAV surveys along a transect at numerous sites throughout the Everglades to monitor the presence and change in SAV species. These long-term data sets have been used to set performance measures and targets for the Comprehensive Everglades Restoration Plan. Several efforts that are more recent have established relatively long-term continuously collected data sets examining aspects of Everglades ecology that have been vital to setting targets, performance measures, models, and project validations. Some examples where our data has been used: wading birds, nutrients, seagrasses, mangroves, crocodilians, and fishes.

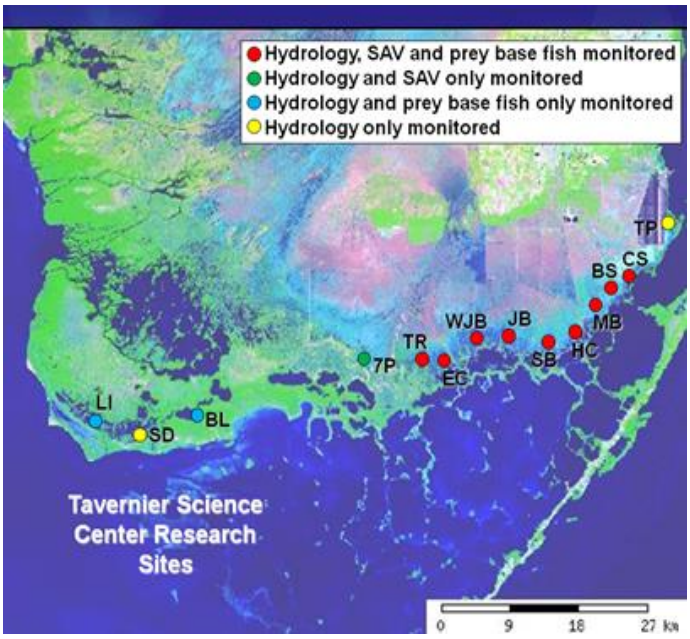

Figure 3. ESC research sites

Roseate Spoonbill

The Spoonbill crew monitors spoonbill nesting activity throughout Florida Bay and Everglades National Park. The spoonbill is considered an indicator species for the Everglades ecosystem. If the roseate spoonbill is doing well, the ecosystem is most likely healthy. Spoonbills depend heavily on the wet/dry seasons as they time their nesting to the seasonal drawdown of water in the winter.

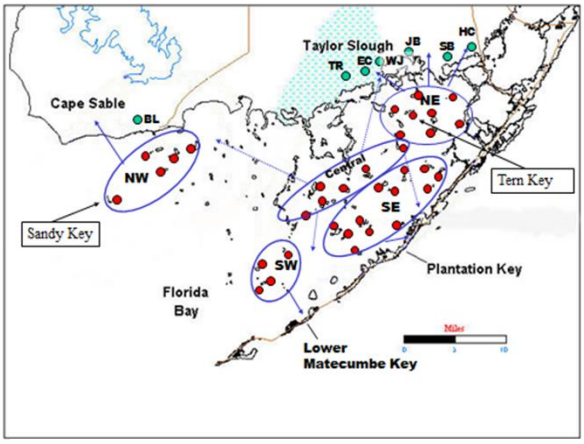

Figure 5. Nesting colonies

Fish

The fish crew measures the density, biomass and availability of fish throughout the red dwarf mangrove ecosystem. Eleven sites are currently sampled, but a total of 21 sites have been sampled throughout the entirety of the project, which was started in September 1990 (Figure 3). Fish are the most abundant food source in the Everglades, and many species depend upon prey base fish for their survival. They provide food for the spoonbill and other wading birds, crocs, alligators, and game fish. We measure and weigh the fish that we catch in our nets to be able to estimate the approximate biomass available for birds. We also monitor fish density at each site as well as the % of each species present in each sample. Additionally, our data is used to monitor the influx of exotic species.

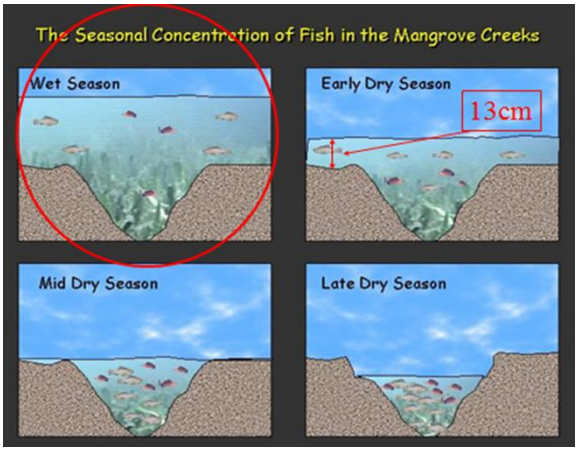

Figure 4. seasonal concept of fish in the mangrove zone

As this drawdown concentrates fish into smaller pools of water, it creates an abundant food source for spoonbills (Figure 4). Spoonbills time their nesting so that their chicks are hatching during this time of abundance. We study the success of the spoonbill by sectioning the bay into five parts and studying nesting colonies within each section of Florida Bay (Figure 5). We study the amount of eggs laid, the number of the eggs that hatch, and the number of chicks that survive to become fledglings.