Restoration of Everglades National Park

National Park Service
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South Florida Natural Resources Center
Everglades National Park

Established in 1947, Everglades National Park (ENP) is a 1.5 million-acre subtropical wetland preserve located at the southwestern tip of the Florida peninsula. This "river of grass" has been adversely impacted by past human activities that altered freshwater flow through the system. Even today, the park is threatened by human actions as the south Florida population continues to grow and may double to 10.2 million people by 2050. Because biology and hydrology are closely linked, efforts to restore the ecosystem focus on improving the quantity, quality, timing, and distribution of freshwater to the park. While restoration of the overall Everglades ecosystem addresses a suite of environmental challenges, including water quality and exotic species, we focus here on two restoration efforts of particular importance to ENP, the Modified Water Deliveries Project and the Comprehensive Everglades Restoration Plan.

Once a pristine wetland with wading birds "in such numbers to actually block out the light from the sun," ENP now supports 90% fewer nesting birds than it did in the 1930s. This most visible sign of the degraded ecosystem resulted from changes to the natural hydrologic regime. In the mid-1960s, for example, the wetlands upstream of the park were impounded and managed as reservoirs called water conservation areas. For four years, while these areas filled up, no water was delivered to the park. The nation took notice of the damages and began to think about restoration.

Congress responded in 1970, requiring that at least a billion gallons (315,000 acre-ft) of water be delivered annually to sustain the park's resources. This "minimum delivery," however, is only 20% of the park's average natural inflow and provides far too little water to maintain a functional ecosystem. In addition, the fixed quantity of water prescribed is unnatural in this system which used to have strong inter-annual variation.

In 1983, following extremely high discharges of water into ENP, park scientists requested specific changes to the regional water management system that would improve hydrologic and, therefore, ecological conditions in the park. In response, the U.S. Army Corps of Engineers and the National Park Service initiated an experimental program to mimic nature by linking the delivery of freshwater inputs to regional rainfall amounts. The program improved hydrologic conditions, but ecosystem health continued to decline, primarily due to unnatural spatial distribution of water deliveries and poor water quality throughout the system. A series of interim water delivery plans has followed.

Modified Water Deliveries Project

The Modified Water Deliveries Project was initiated by Congress as part of the 1989 Everglades Expansion and Protection Act, which authorized the park to acquire Northeast Shark Slough. The project was designed to correct the unnatural spatial distribution of water in ENP. Historically, 60% of water flowing south across the northern boundary of the park entered Northeast Shark Slough, yet the managed system limits flows to this area to only 20% (see map).

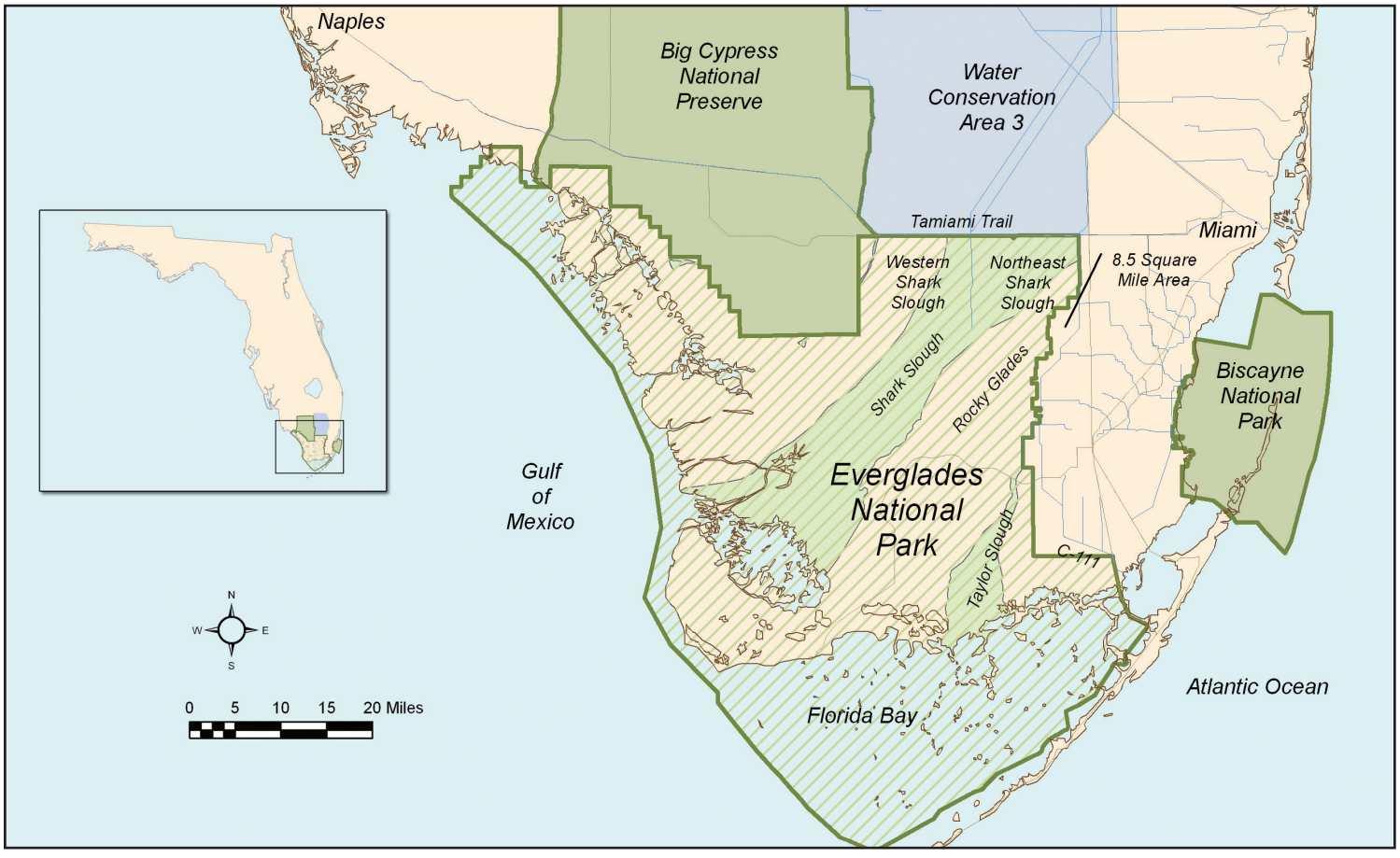
Consequently, open water sloughs filled with dense sawgrass and, in shallower areas, exposed peat subsided due to decomposition. This subsidence lowered the soil surface and contributed to altered patterns of water depth. In addition, water levels were not high enough to flow over the Rocky Glades and south into Taylor Slough, and both areas exhibited shifts in vegetation and wildlife as a result. Without adequate flow through Taylor Slough, salinity levels in eastern portions of Florida Bay increased, contributing to seagrass die-offs.

Despite the water deficit in the eastern Everglades and across the park as a whole, the unnatural distribution of water left western Shark Slough too wet. A critical sub-population of the federally-endangered Cape Sable Seaside Sparrow in western Shark Slough experienced a number of unsuccessful breeding seasons due to high water levels, which flooded the birds' nests. The U.S. Fish and Wildlife Service responded by issuing a biological opinion indicating that water management operations jeopardized the continued existence of the bird.

Tamiami Trail looking east toward Northeast Shark Slough. Water Conservation Area-3 is north and ENP is south of the road.
photo by William Perry, ENP

The goal of the Modified Water Deliveries Project was to shift water deliveries from west to east in order to protect sparrow populations and rehydrate Northeast Shark Slough. Yet, increased water delivery to the slough was expected to saturate the roadbed of Tamiami Trail, a major thoroughfare that connects Miami to Naples and forms the northern boundary of the park. These waters were also expected to increase flood frequencies in the nearby residential and agricultural 8.5 Square Mile Area. Plans to mitigate these effects include construction of a new levee and drainage canal in the 8.5 Square Mile Area. And, because the culverts under Tamiami Trail neither convey sufficient quantities nor appropriately distribute water to Northeast Shark Slough, two bridges along Tamiami Trail – a two-mile and a one-mile bridge – are planned. Rules for operating the water management system with these new features are under development.

Comprehensive Everglades Restoration Plan

While the Modified Water Deliveries Project will greatly improve ecological conditions in ENP, it was never intended to address regional degradation. A much larger effort was needed to accomplish restoration of the Greater Everglades ecosystem. A plan, developed by scientists, policy makers, and public stakeholders, addressed environmental concerns, including increased population growth and water use. In 2000, Congress approved this plan, which became known as the Comprehensive Everglades Restoration Plan (CERP). A $10.5 billion project that is expected to take 30+ years to complete, CERP's goal is to use the best available science to restore the "right quantity, quality, timing, and distribution" of freshwater. The plan will increase freshwater storage capacity and distribute this freshwater for urban, agricultural, and environmental purposes while reducing damaging floodwater discharges in the coastal estuaries. ENP is working to ensure that water for the natural system remains a CERP priority.

Of the 68 CERP project components, three are of particular importance to the park. The first, Decompartmentalization of Water Conservation Area-3, includes filling canals and removing levees to restore natural sheetflow and ecological connectivity. The goal of the second project, ENP Seepage Management, is to reduce water loss along the eastern boundary of the park. This seepage is caused by water levels kept artificially low outside the park in order to provide flood protection to adjacent urban and agricultural lands. Finally, the C-111 Spreader Canal Project is designed to restore natural flows to Florida Bay and rehydrate the southeastern coastal marshes.