South Florida Ecosystem Restoration and the Comprehensive Everglades Restoration Plan

Pervaze A. Sheikh
Specialist in Natural Resources Policy

Nicole T. Carter
Specialist in Natural Resources Policy

January 3, 2008

Congressional Research Service
7-5700
www.crs.gov
RS20702

CRS Report for Congress
Prepared for Members and Committees of Congress

Summary

The Everglades, a unique network of subtropical wetlands in Florida, is half its original size. Many factors contributed to its decline, including flood control projects and agricultural and urban development. Federal, state, tribal, and local agencies collaborated to develop a Comprehensive Everglades Restoration Plan (CERP, or the plan). CERP aims to increase storage of wet season waters to augment the supplies during the dry season for both the natural system and urban and agricultural users. The plan consists of more than 60 projects estimated to take more than 30 years and $10.9 billion to complete. The Water Resources Development Act (WRDA) of 2000 (P.L. 106-541) approved the CERP framework and authorized a first set of projects at $1.4 billion. WRDA 2000 established how CERP costs would be split; the federal government would pay half of construction and operation, and an array of state, tribal, and local agencies the other half. WRDA 2007 (P.L. 110-114) authorized a second set of CERP activities ($2.0 billion). CERP implementation issues include project priorities and funding; timeliness and effectiveness of restoration efforts (e.g., the impacts of delays in the Modified Water Deliveries project); mitigation of excess phosphorous; and technological uncertainties. This report summarizes CERP and its implementation.

Contents

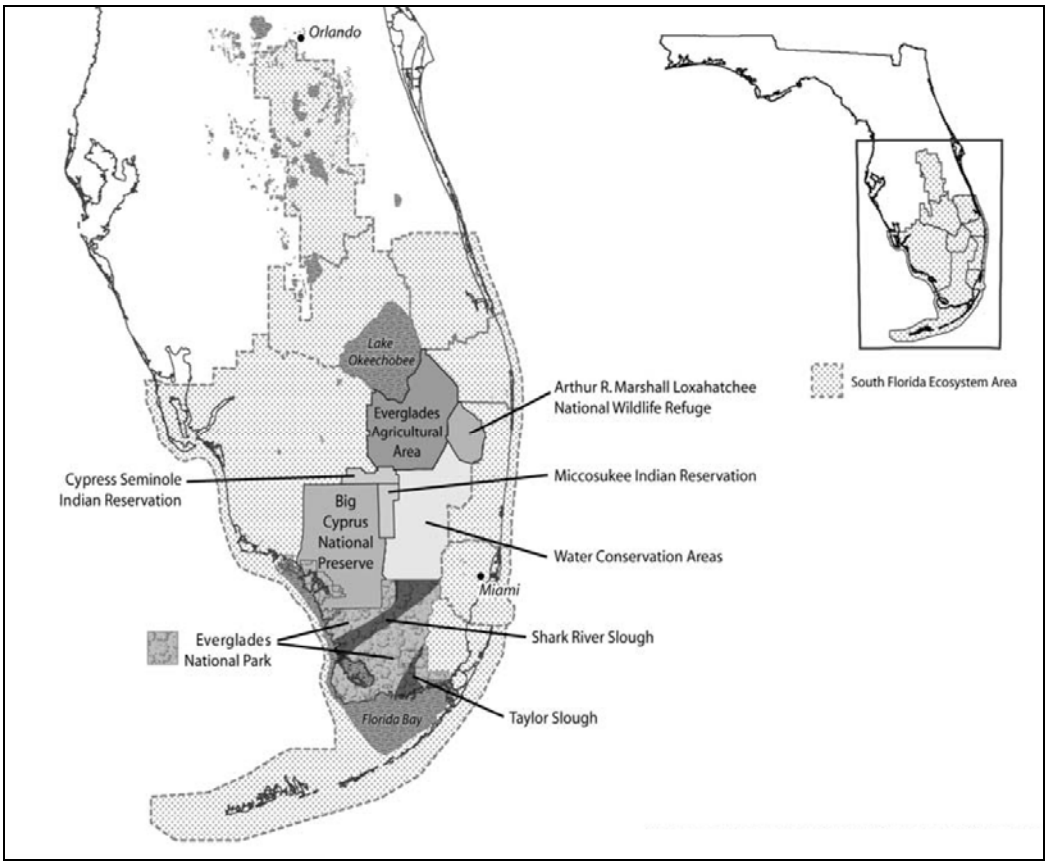
Figures

Contacts

Introduction

The Water Resources Development Act of 2000 (Title VI, P.L. 106-541)[1] authorized involvement of federal agencies in projects to restore the Everglades; these projects are coordinated under a planning framework—the Comprehensive Everglades Restoration Plan (CERP or the plan). The Everglades is the defining component of the South Florida ecosystem (see **Figure 1**), which incorporates 16 national wildlife refuges and four national park units. South Florida is also home to more than six million people and a large agricultural economy. There is wide agreement that major changes in water quantity, quality, timing, and distribution since the 1950s have significantly altered the region's ecology. During the dry season, the current water regime in South Florida is unable to sufficiently supply freshwater to meet both natural system needs and urban and agricultural demand. Water shortages, like those affecting Florida in 2007 because of lower than normal rainfall, are expected to become more frequent as demand by urban and agricultural consumers increases.

Figure 1. Principal Components of the South Florida Ecosystem



Source: Florida Coastal Everglades, Long Term Ecological Research http://fcelter.fiu.edu; nationalatlas.gov; South Florida Ecosystem Restoration Task Force

Note: Map prepared by Congressional Cartography Program, Library of Congress, 2006

[1] For WRDA 2007, see CRS Report RL33504, *Water Resources Development Act (WRDA) of 2007: Corps of Engineers Project Authorization Issues*, by (name redacted) et al.

Everglades History

The Everglades is a network of subtropical wetland landscapes that once stretched 220 miles from Orlando to Florida Bay. Several hundred lakes fed slow-moving creeks, called sloughs, that joined the Kissimmee River. Depending on rainfall, water flowed south down the river or topped the river's banks and flowed through 40,000 acres of marsh to Lake Okeechobee. During the summer rainy season, the lake would overflow its southern shore, spilling water into the Everglades. Due to flat topography, this water moved slowly south to Florida Bay through a shallow 40-mile wide, 100-mile long sawgrass marsh. These wetlands acted as natural filters and retention areas that recharged underlying aquifers. The Everglades' combination of abundant moisture, rich soils, and subtropical temperatures supported a vast array of species. However, by the mid-1800s, many in South Florida viewed the Everglades as an unproductive swamp. Flood control and reclamation efforts that manipulated the Everglades hydrology allowed development of the East Coast of Florida and permitted agriculture on reclaimed marshland. Principal among the human interventions affecting the Everglades is the Central and Southern Florida (C&SF) project of the Army Corps of Engineers (Corps), which was first authorized by Congress in 1948 for flood damage reduction and to satisfy other water management needs of South Florida. Water flows in South Florida are now directed by 1,000 miles of canals, 720 miles of levees, and almost 200 water control structures.

Current Conditions and Recent Restoration Efforts

Management and development activities have markedly changed the Everglades' water regime. Because of the C&SF project, water that once flowed from Lake Okeechobee across the Everglades in a slow-moving sheet is directed into canals and rivers discharging directly to the ocean. Experts now believe that the Everglades ecosystem has changed because it now receives less water during the dry season and more during the rainy season. The altered water regime combined with urban and agricultural development have reduced the Everglades to half its original size. Habitat loss has threatened or endangered numerous plant and animal species.

The Everglades is also harmed by degraded water quality. Pollutants from urban areas and agricultural runoff, including excess nutrients (such as phosphorous and nitrogen), metals, and pesticides, have harmed plant and animal populations. Nutrients entering the Everglades have caused a decline in native vegetation and an overabundance of invasive exotic species. Changes in the quantity, quality, and timing of freshwater flows have also disrupted the equilibrium of coastal estuaries and reef systems.

The federal government and the State of Florida have undertaken many restoration activities, such as acquiring lands and preparing a multi-species recovery plan, to address the health of the Everglades. The South Florida Ecosystem Restoration Task Force (Task Force), which was formalized by WRDA 1996 (P.L. 104-303), coordinates the numerous restoration activities. The Task Force facilitates restoration using the following goals: (1) "get the water right," (2) restore, preserve, and protect natural habitats and species, and (3) foster compatibility of built and natural systems. Achieving these goals for South Florida is estimated at nearly $20 billion, of which $10.9 billion would be spent under CERP. The plan is the principal mechanism for "getting the water right" (i.e., restoring natural hydrologic functions and water quality, and providing water supplies).

Comprehensive Everglades Restoration Plan

CERP focuses on water quantity, quality, timing, and distribution. The plan is designed to capture and store freshwater, which is currently discharged to the ocean, for use during the dry season. An *estimated* 80% of the captured water would be directed to the natural system, and the remaining 20% would be for agricultural and urban consumption. CERP calls for removing 240 miles of levees and canals, and building a network of reservoirs, underground storage wells, and pumping stations that would capture water and redistribute it to replicate natural flow.

Authorizations and Appropriations

Title VI of WRDA 2000 approved CERP as contained in the *Final Integrated Feasibility Report and Programmatic Environmental Impact Statement*, as modified by the act. It also authorized $700 million in federal funds for an initial set of CERP projects. As other CERP projects are prepared, the Administration proposes them for authorization and inclusion in the next WRDA. WRDA 2007 (P.L. 110-114) authorized a second set of activities, including the Indian River Lagoon (IRL) and Picayune Strand restoration projects; CERP activities in the legislation represented roughly $2.0 billion in authorizations (not counting $240 million in related deauthorizations also included in the legislation).[2]

Title VI of WRDA 2000 established that construction as well as operation and maintenance (O&M) costs of CERP projects would be equally shared by Floridian stakeholders and the federal government.[3] CERP authorization was achieved after years of delicate negotiations among federal, state, local, and tribal stakeholders. Federal agencies responsible for components of CERP receive appropriations for these activities through their annual appropriations bills. Information on the status of appropriations for CERP activities performed by the Corps is available in CRS Report RL34009, *Energy and Water Development: FY2008 Appropriations*, by (name redacted) et al. Appropriations status for CERP activities performed by Department of the Interior agencies is available in CRS Report RL34011, *Interior, Environment, and Related Agencies: FY2008 Appropriations*, by (name redacted) et al.

Current CERP Issues

While support for CERP remains broad, reservations remain over its implementation. Recent concerns have included how projects are being prioritized, the pace of federal efforts and investments, and the pace of mitigation efforts for excess phosphorous. Other issues include effectiveness of restoration efforts and uncertainties in technologies.

[2] For more information on these projects, see CRS Report RL33504, *Water Resources Development Act (WRDA) of 2007: Corps of Engineers Project Authorization Issues*, by (name redacted) et al.

[3] O&M is estimated at more than $180 million annually for the completed plan.

Project Priorities, Costs, and Funding

Since enactment of WRDA 2000 and though FY2007, $0.37 billion in federal funds and $1.63 billion in state funds have been put toward CERP projects.[4] Much of the state's funds have gone toward projects that are part of the state's Acceler8 effort to accelerate the design, construction, and funding for eight priority CERP projects. Some stakeholders are concerned that the Acceler8 prioritization may increase effort on meeting water supply needs of agricultural and urban users, and decrease attention to investments for ecosystem restoration. This concern is raised by those wanting to maintain a focus on restoration and by those concerned with the Corps' mission being expanded into water supply projects for municipal and agricultural users. Proponents of Accerler8 argue that the priority projects have both water supply and restoration benefits and were agreed to as part of the CERP program; these proponents also perceive the pace of federal funding as being too slow.

Federal water resources policies justify federal participation in ecosystem restoration projects, like CERP projects, based on the projects' environmental benefits for the nation. A concern of some stakeholders is that some specific Everglades restoration projects proposed for authorization or under development have primarily local benefits, rather than national benefits.[5] Another concern has been that the CERP costs have increased, with increasing costs associated with land acquisition being one factor. Acceler8 proponents argue that these increasing costs are a reason to move more quickly. The increasing costs are of particular concern to stakeholders who worry that the commitment of federal funds to CERP might limit the funds available for other ecosystem restoration projects across the nation. The sponsors and beneficiaries of traditional Corps projects that provide navigation and flood control are concerned that not only Everglades restoration but also other large-scale restoration activities, such as wetlands restoration in coastal Louisiana, may divert funds away from their projects.

Timely Completion of Restoration

No CERP projects have been completed since enactment, and all 15 CERP components scheduled for completion by 2007 have been delayed.[6] There exists serious concern that delays may jeopardize the plan's feasibility. For example, delays in the Modified Waters Deliveries Project (Mod Waters), a pre-CERP project to restore flows to Everglades National Park, may result in insufficient water flows for the implementation of CERP components on the eastern side of the Everglades National Park. This interdependency of CERP and non-CERP projects for achieving ecosystem restoration goals was codified in WRDA 2000, which restricted appropriations for specific components of CERP until Mod Waters is complete.

[4] Since enactment of WRDA 2000 and through FY2007, Everglades restoration activities undertaken outside of the CERP framework have received $2.44 billion in federal funds and $3.85 billion in state funds.

[5] For example, some stakeholders argued for Indian River Lagoon project authorization because it would restore a national significance estuary. The project would restore the seabed floor, revive bottom-dwelling communities, and enable excess freshwater to be stored in reservoirs, instead of going to the ocean. Some critics contended that the project serves local interests and its environmental benefits largely are local rather than for the larger Everglades ecosystem.

[6] National Research Council (NRC), *Progress Toward Restoring the Everglades: The First Biennial Review, 2006*, Prepublication version (Washington, DC: September 27, 2006).

Phosphorus Mitigation

Another area of controversy that is related to potential delays in restoration stems from a May 2003 Florida state law (Chapter 2003-12)[7] that authorizes a plan to mitigate phosphorus pollution reaching the Everglades. Some critics of the law argue that the plan extends previously established phosphorus mitigation deadlines and may compromise restoration efforts. The law's proponents argue that the plan represents a realistic strategy for curbing phosphorus. In the Interior and Related Agencies Appropriations Act, FY2006 (P.L. 109-54), there were several provisions that conditioned funds for restoration on the achievement of water quality standards in federal properties.[8] These provisions were also included in the FY2004 and FY2005 Interior appropriations. If water quality standards are not achieved, appropriations for restoration may be reduced according to provisions in these acts. The enacted language indicates congressional interest in overseeing the achievement of water quality standards for waters entering federal lands in Florida.

Restoration Effectiveness

Some environmental groups question the extent to which CERP contributes to Everglades restoration and whether so complicated and costly a plan is necessary. There also is concern that the plan does not include enough measures to improve water quality in the Everglades. Some groups and federal agencies have noted that CERP does not explicitly give natural systems precedence in water allocation, and that it is focused first on water supply rather than on ecological restoration. To address this point, the Corps revised the project implementation sequencing to include restoration activities in earlier phases. These changes have not satisfied some groups and scientists who continue to oppose CERP. Some environmental groups, which support CERP and Florida's financial participation in the effort, worry about the source of Florida's contribution. They argue against using funds designated for the purchase of land needed for restoration to finance other types of CERP projects. These groups contend that land acquisition is essential for successful Everglades restoration. A report by the National Research Council also suggests that acquiring needed land early in the restoration process is important for lowering the potential for *irreversible damage* due to development within the Greater Everglades.[9]

Others have raised questions regarding the management of Lake Okeechobee and other aspects of flood management for central Florida on the Caloosahatchee River's ecosystem and how these water management issues are being integrated into Everglades restoration efforts and planning. Others also have questioned the extent to which the impacts of sea level rise and climate change have been integrated into CERP, and their potential effects on the future of the Everglades ecosystem.

[7] This law amends the Everglades Forever Act of 1994 (Florida Statutes §373.4592). Excess phosphorus is a primary water pollutant of the Everglades and its main source is agricultural runoff. Excessive phosphorus and other nutrients stimulate the conversion of native sawgrass marshes and sloughs to cattails, resulting in less habitat for wading birds and other wildlife.

[8] For more on FY2007 Interior appropriations, see CRS Report RL33399, *Interior, Environment, and Related Agencies: FY2007 Appropriations*, by (name redacted) et al.

[9] NRC, *Re-engineering Water Storage in the Everglades: Risks and Opportunities* (Washington, DC: January 2005).

Technological and Cost Uncertainties

Ecosystem restoration is a relatively young applied science, and, in many cases, the technologies and scientific data to support it are still being developed. To manage the resulting uncertainty, CERP is being implemented using *adaptive management*—a flexible learning-based approach that integrates new information into the restoration effort as it proceeds. Consequently, CERP is not as detailed as a typical Corps feasibility proposal. Another mechanism for coping with uncertainty of ecosystem restoration outcomes is the use of pilot projects. WRDA 2000 authorized four pilot projects, including projects to test aquifer storage and recovery (ASR), a water management strategy that has never been used on such a large scale as proposed under CERP. ASR uses aquifers as underground reservoirs to store surface water that will be withdrawn later during dry periods. These pilot projects have not been completed, and as a result, there are uncertainties in their effectiveness of early water storage projects.[10]

Author Contact Information

(name redacted)
Specialist in Natural Resources Policy
-redacted-@crs.loc.gov, 7-....

(name redacted)
Specialist in Natural Resources Policy
-redacted-@crs.loc.gov, 7-....

[10] NRC, *Progress Toward Restoring the Everglades: The First Biennial Review, 2006*.