

Modified Water Deliveries to Everglades National Park: G-3273 Constraint Relaxation and S-356/S-357 N Field Tests and Water Control Plan Update

Background

Everglades National Park (ENP) was established in 1947 to conserve the natural landscape and prevent further degradation of its land, plants, and animals. It was the first national park established solely to preserve its biological resources (SFNRC 2006), including wading bird and endangered species populations, temperate and tropical flora, expansive wet prairies and sawgrass sloughs.

Urban and agricultural expansion, industrial and agricultural practices, water management practices and other human influences on species composition (e.g. introduction of non-indigenous species) have all had negative influences on ENP's biological resources (Ogden 2005). It is water management, however, that is at the center of being able to restore and sustain park resources.

Purpose

The purpose of the Modified Water Deliveries (MWD) Project is to *"improve water deliveries into the park, and ... to the extent practicable, take steps to restore the natural hydrological conditions within the park."* (US Congress 1989). This Congressional action also directed the US Army Corps of Engineers (USACE) to prepare a report on the C-111 Basin and recommend features to restore the ecosystem in Taylor Slough and the eastern panhandle of ENP, while preserving the current levels of flood protection for agricultural activities in the basin (USACE 1994).

An integrated water control plan (Water Control Plan for Water Conservation Areas, Everglades National Park, and ENP-South Dade Conveyance System [USACE 1012]) for the operation of the water management infrastructure connected to the MWD and C-111 South Dade (C-111SD) projects is needed in order to realize the natural system benefits and justify federal and state expenditures associated with these projects. The integrated water control plan will maintain the multiple purposes of the Central and Southern Florida Project for Flood Control and Other Purposes (C&SF Project) to provide: flood control; water supply for municipal, industrial, and agricultural purposes; prevention of saltwater intrusion; water supply for ENP; and protection of fish and wildlife.

Due to the complexities and real-world constraints of the C&SF Project's water management system in the south Miami-Dade County area, a series of two graduated field tests of the MWD Project infrastructure is envisioned. This includes pump station 356 (S-356), the 8.5 Square Mile Area (8.5 SMA) flood mitigation project, and the Tamiami Trail 1-mile bridge and roadway modifications, in conjunction with associated modifications to the Gage 3273 (G-3273) criteria and Levee 29 (L-29) Canal operational constraints (*see Figure 1*). The two field tests, or increments, are each anticipated to last approximately one year, or up to a maximum duration of two years, if conditions warrant. With these proposed cycles of testing, which will include data collection and analysis, operational uncertainty will be reduced and the response of the natural and agricultural / urban systems to project operations will be assessed.

The information obtained from these incremental field tests will be used in the development of an operations plan (increment 3) that will integrate the full build-out of the MWD and C-111SD projects,

and be incorporated in an update to the *Water Control Plan for Water Conservation Areas, Everglades National Park, and ENP-South Dade Conveyance System* (USACE 2012).

The increment 1 field test involves:

1. Raising/relaxing the stage constraint criteria at G-3273 in northeastern ENP to allow increased flow from the spillway structure 333 (S-333) and enhanced water deliveries to Northeast River Shark Slough (NESRS);
2. The operation of S-356 on the L-29 Canal, immediately north of Tamiami Trail, for mitigation of any increased seepage to the east caused by increased water flow into NESRS;
3. When constructed (September 2015), the operation of Structure 357 north (S-357N) and seepage Canal 358 (C-358) in the southwestern corner of the 8.5 SMA, with continued operation of the S-357 pump station, to complete the flood mitigation infrastructure for the 8.5 SMA; and
4. Maintaining the current maximum operating stage limit in the L-29 Canal at 7.5 feet NGVD, as established under the 2012 Everglades Restoration Transition Plan (ERTP).

Information obtained from the successful performance of the increment 1 field test (i.e., achieving objectives without violating constraints) is planned to be used to support subsequent consideration of further incremental modifications to the current ERTP operations. The increment 2 field test involves:

1. Continued operation of the components from increment 1; and
2. Raising the maximum operating stage limit in the L-29 Canal up to 8.5 feet NGVD, to allow for increased flow into NESRS.

As infrastructure becomes available and acquisition of MWD real estate interests along Tamiami Trail is completed (projected by January 2016), increasingly alleviating the physical and operational constraints that currently exist in the area, the field testing will adjust to the new conditions. Increment 1 and increment 2 field tests will be conducted using an adaptive management framework, with continuous assessment of field test performance against the field test goals, objectives, and constraints and periodic operational adjustments, as warranted.

Agency and Tribal Involvement

The action agency for these efforts is the U.S. Army Corps of Engineers (USACE). The USACE and the National Park Service (NPS) entered into an interagency agreement in 1991 to coordinate activities related to the construction of MWD features; as such, the NPS, through ENP, is the federal sponsor for the MWD Project. The South Florida Water Management District (SFWMD) is the non-federal, or local, sponsor for the entire C&SF Project and the C-111SD Project. The Florida Department of Environmental Protection (FDEP) holds responsibility for regulatory matters relating to permitting the construction and operation of project features.

A partnering agency on the federal level is the US Fish and Wildlife Service (USFWS). On the state level, partnering agencies include the Florida Fish and Wildlife Conservation Commission (FWC) and the Florida Department of Agriculture and Consumer Services (FDACS). Miami-Dade County is an agency partner on the local level.

There are two federally recognized tribal governments within the action area: the Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Indians. In addition, there are non-federally recognized independent tribal groups that exist within the region. Consultation between the federally recognized

tribes is mandated by federal law while comments can be received by non-recognized independent tribes or groups as interested parties.

Goals of the Incremental Field Tests

The goal of the field tests (increments 1 and 2) is to collect technical information needed to support development of an operations plan (increment 3)¹ whose overarching objective is to improve the timing, location and volume of water deliveries to NESRS. Imbedded in the goal of the field tests is the need to reduce risk and uncertainty as it relates to:

1. Ecological responses due to increased inflows and changes in distribution of water entering ENP;
2. Potential effects on water quality entering ENP;
3. Potential effects on changing water levels in WCA 3A and 3B;
4. Potential effects on levels of service for water supply and flood protection in southern Miami-Dade County;
5. Potential effects on the flood mitigation performance for the 8.5 SMA; and
6. Potential effects on water management operations due to changes in the C&SF Project.

Previous regional operational planning efforts (Interim Operational Plan [IOP], Combined Structural and Operational Plan [CSOP] and E RTP) have also recommended field testing S-356 to aid in determining real-time operational protocols, despite significant hydrologic modeling efforts conducted under each of these projects.

Objectives of the Incremental Field Tests

- A. Improve hydrological conditions in NESRS through incrementally raising G-3273 stage criteria to increase water deliveries from WCA-3A to NESRS, while maintaining other C&SF Project authorized purposes.
- B. Use the S-356 pump station to return seepage to NESRS and mitigate for effects of the incremental increase in seepage from NESRS to the L-31N Canal resulting from raising the G-3273 stage and L-29 canal stage criteria, in conjunction with increased flows through the S-333 spillway to NESRS via the L-29 Canal.
- C. Improve hydrological conditions in NESRS and WCA-3A by maximizing the flexibility and efficiency of the existing infrastructure, including use of seepage management (e.g., S-356) to complement inflows to NESRS from WCA-3A.
- D. Gather and analyze ecologic, hydrologic and water quality data from each increment sufficient to support the next, resulting in:
 - a. Transfer of MWD features to the SFWMD as the local sponsor;

¹ The intent of increment 3 is revision of the 2012 USACE Water Control Plan for Water Conservation Areas, Everglades National Park, and ENP-South Dade Conveyance System to combine the features of the MWD and C-111SD projects. The C-111SD Project has been operational for some time, with the exception of construction of Contracts 8 and 9 (North Dade detention area, which will connect to the southern end of the MWD 8.5 SMA project, and plugging the L-31W canal, respectively). The MWD infrastructure has not been operated, hence the need for the increment 1 and increment 2 field tests.

- b. Data gathering sufficient to support FDEP permitting requirements;
 - c. Operational criteria for the MWD and C-111SD projects; and
 - d. Update the 2012 USACE Water Control Plan for Water Conservation Areas, Everglades National Park, and ENP-South Dade Conveyance System.
- E. Fulfill National Environmental Policy Act, Endangered Species Act and National Historic Preservation Act requirements as they relate to each of the three increments.

Constraints of the Incremental Field Tests and Water Control Plan Update

The following constraints apply to both field tests (increment 1 and 2) and the Water Control Plan Update (increment 3), except where specifically indicated otherwise:

1. Maintain the authorized purposes of the C&SF Project.
2. Maintain the current multi-species objectives of the existing Water Control Plan (ERTP 2012) and comply with the requirements of the current Biological Opinion from the USFWS.
3. Comply with the ERTP Cultural Resources Programmatic Agreement. Applies to increment 1.
4. Protection of the Tamiami Trail roadbed.
5. Compliance with water quality standards for water entering ENP.
6. Available capacity of pertinent water management structures and operating ranges for canal levels (e.g., L-31N canal).
7. Acquisition of real estate interests on the south side of Tamiami Trail. Applies to increment 2 and increment 3.
8. Construction of the C-111SD Project – Contracts 8 and 9. Applies to increment 3.

Evaluation Methodology and Monitoring Protocol

The monitoring, assessment and reporting of hydrological, meteorological, water quality, endangered species and cultural resources will be the purview of the USACE, in cooperation with the SFWMD, ENP and USFWS. ENP will monitor and assess biological resources within ENP. Especial emphasis will be given to data collection and analysis that is critical to achieving the field test objectives.

