

# **COMPLETE STATEMENT OF**

**COLONEL ROBERT M. CARPENTER  
COMMANDER, JACKSONVILLE DISTRICT  
U.S. ARMY CORPS OF ENGINEERS**

**DEPARTMENT OF THE ARMY**

**BEFORE THE**

**Transportation and Infrastructure Committee  
UNITED STATES HOUSE OF REPRESENTATIVES**

**JULY 22, 2004**

## **Introduction**

Mr. Chairman, Members of the Committee, I am Colonel Robert M. Carpenter, Commander, Jacksonville District, U.S. Army Corps of Engineers. I am pleased to be here today and to have the opportunity to speak to you on the Indian River Lagoon – South (IRL-S) Project Implementation Report (PIR), the first major report being finalized as part of the most innovative, challenging, and necessary environmental restoration program ever undertaken, known as the Comprehensive Everglades Restoration Plan (CERP). This part of Indian River Lagoon is an estuary of national significance, recognized by the U.S. Environmental Protection Agency National Estuary Program and designated a Florida Aquatic Preserve and Outstanding Florida Water. This important project is a culmination of efforts by the Corps of Engineers, its partner, the South Florida Water Management District, the State of Florida, and many other dedicated partnerships between Federal, state and local governments, with invaluable support from local communities. My testimony today will provide information on the background of the CERP, the problems and opportunities in the southern portion of the Indian River Lagoon, the recommended plan features, project cost, the expected benefits of the project, authorization requirements, and the current status of the PIR. As you know, the PIR is currently under final policy review in the Corps Headquarters and the recommendations of the Chief of Engineers will be forwarded to the Assistant Secretary of the Army for Civil Works by July 30, 2004 for review by the Administration.

## **Background**

Because this is the first major project to come before you since WRDA 2000, I would like to take a moment to summarize the current situation in South Florida.

The Florida Everglades have been significantly impacted by the continuing development of south Florida and the numerous changes to the natural system affecting the quantity, quality, timing, and distribution of water to that system. In order to stop

the continued decline of the Everglades and the estuaries, and restore the natural functioning of this unique ecosystem, the Federal Government and the State of Florida have launched a massive effort, unparalleled in history, to preserve, protect, and restore the Everglades. Congress approved the framework for this restoration effort in the Water Resources Development Act (WRDA) of 2000. The framework Congress approved in WRDA 2000 is the Comprehensive Everglades Restoration Plan (CERP). As stated in WRDA 2000, “The overarching objective of the Plan is the restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection”.

Success for the natural system of South Florida will be achieved by restoring and sustaining those hydrological and biological characteristics that both defined the original pre-drainage greater Everglades and made it unique among the world’s wetlands. These defining characteristics include the great extent of naturally interconnected and interrelated wetlands; sheet flow; extremely low levels of nutrients in freshwater wetlands; high levels of estuarine productivity; and the great resilience of the plant community mosaics and abundance of native wetland animals. Although the future Everglades ecosystem will be a “new” Everglades because it will be smaller than the pre-drainage system, restoration will be successful if the new system behaves as a wild Everglades system rather than as a set of managed, disconnected wetlands.

The Indian River Lagoon, St. Lucie River and St. Lucie Estuary, like the Everglades and Lake Okeechobee, are natural systems in distress; suffering from water levels that fluctuate drastically with inundations of fresh water during the storm season and very little fresh water in times of drought. These problems have been studied for many years and we have a have confidence that the stress to fish, oyster beds, and sea grasses will be alleviated by the Indian River Lagoon – South project producing substantial benefits to this portion of the south Florida ecosystem. Under present conditions, the southern portion of Indian River Lagoon will continue to deteriorate and will remain in imminent danger of ecological collapse as a result of the current regional water management practices for which there are no viable alternatives.

## **Indian River Lagoon South Restoration - PIR**

### Problems

Martin and St. Lucie counties – Florida’s “Treasure Coast” – encompass some of the state’s most productive and most threatened estuarine treasures, the Indian River Lagoon and St. Lucie Estuary. Home to more than 4,300 species of plants and animals, of which 35 are threatened or endangered species, and supporting an annual economic activity of more than \$730 million, the lagoon region is identified as the most biologically diverse estuarine system in all of North America (Gilmore 1986).

The lagoon and estuary have suffered from altered water flow patterns and degraded water quality. In the past few years, intensive rains required additional

floodwater releases from Lake Okeechobee, this combined with storm water runoff arriving in the estuary through drainage canals, altered the salinity balance in the estuary, stressing its unique ecosystem. In the South Florida ecosystem, roughly 50 percent of the pre-drainage wetland area and 90 percent of pinelands have been lost to development. Within the Indian River Lagoon watershed, neighborhoods and farms popped up all around the estuary's 827-square mile watershed. Outdated storm water management systems and runoff from urban and agricultural areas caused an increase in the volume of fresh water, sediment, and nutrients entering the estuary and lagoon.

### Opportunities

The Indian River Lagoon - South Restoration Project will significantly reduce the damaging inflows of pollution and unnaturally large freshwater discharges into these ecologically vital water bodies. The delicate balance of fresh and salt water in the lagoon and estuary will be restored, polluted water will once again be naturally treated and depleted habitats will be allowed to revitalize. The IRL-S plan provides a unique opportunity to increase the spatial extent of short hydroperiod wetlands and restore habitat for a myriad of species dependant on this habitat for their survival.

The Indian River Lagoon - South PIR employs a regional approach to the problems of the combined Martin County and St. Lucie County portion of the lagoon, and provides five major features and/or operational modifications that working together would: restore a more natural volume and location of freshwater deliveries; store more water on land; reduce excessive nutrient loads contributing to muck formation, plankton blooms and fish kills; restore natural water storage functions to terrestrial wetlands in the watershed; and restore water quality and more natural estuarine bottom communities. The Chief of Engineers Report and PIR for the project are currently under final review at this time. The five features recommended in the PIR are:

a. Aboveground Water Storage Reservoirs. Construction and operation of four new above-ground reservoirs, and their connecting canals, control structures, levees and pumps providing approximately 130,000 acre-feet or 44 billion gallons of water storage to capture water from the C-44, C-23, C-24, and C-25 canals of the C&SF project, reducing extreme peaks of freshwater discharge and delivery of suspended sediment and muck to the estuary.

b. Storm Water Treatment Areas (STA). Construction and operation of four new storm water treatment areas; providing 35,000 acre-feet of storage, to reduce delivery of sediment, phosphorus, and nitrogen to the estuary. Two STAs will be provided in the C-44 basin, one will be in the C-23/24 basin, and one will be in the C-25 basin.

[STAs are constructed shallow reservoirs managed to maximize the removal of nutrients via uptake by submerged and emergent aquatic plants. Natural storage and water quality treatment areas (see below) consist of lands where restoration of natural hydrologic regimes returns the historic upland/wetland storage and water quality

treatment function. Natural storage and treatment areas are managed to mimic natural wetland functions.]

c. Natural Storage and Water Quality Treatment Areas and North Fork Floodplain Restoration. Restoration of approximately 90,000 acres of upland/wetland mosaic by ditch plugging, berm construction and periodic fire maintenance and exotic plant maintenance at three locations in the watershed (Palmar, Allapattah, and Cypress Creek/Trail Ridge) will provide about 30,000 acre-feet of storage, nutrient load reduction, and habitat improvement. About 3,100 acres of floodplain along the North Fork of the St. Lucie River will receive diverted freshwater flows and will link the watershed to the estuary.

d. Diversion of Existing Watershed Flows. Approximately 64,500 acre-feet will be redirected from the C-23/24 basin to the North Fork of the St. Lucie River. Residual flows from C-23 will be diverted to C-44 for discharge into the South Fork of the St. Lucie River or Lake Okeechobee. These changes will mimic historic flow patterns and reduce damage associated with high freshwater discharges to the middle estuary.

e. Muck Removal and Artificial Habitat Improvement. Approximately 7,900,000 cubic yards of muck will be removed from the North and South Forks of the St. Lucie River and the middle estuary and placed in an upland disposal site. Muck removal will create about 2,650 acres of clean substrate suitable for recolonization of bottom-dwelling organisms. Oyster shell, reef balls, and artificial submerged aquatic vegetation will be placed near the muck removal sites to create an additional 90 acres of habitat and jump start the recovery process by establishing the foundation for new oyster reefs and sea grass beds.

### Expected Benefits

#### General

The project will lead to the recovery of the ecological, hydrologic, and water quality functions of the St. Lucie River and St. Lucie Estuary and the southern Indian River Lagoon ecosystem. The recommended plan will result in the restoration of approximately 36,000 acres of aquatic riverine and estuarine habitat in the north and south forks of the St. Lucie River, the St. Lucie Estuary, and the southern portions of the Indian River Lagoon. This restoration will be accomplished by reducing the frequency and duration of damaging freshwater discharges to the receiving water bodies, while redirecting flows to their historic headwaters (thus restoring more natural salinity gradients in the estuaries), and by the retention of watershed flows in the natural system, thereby restoring the functions of the natural system. The recommended plan also provides for water quality treatment of captured water, benefiting both freshwater and estuarine components of the southern Indian River Lagoon natural system. The recommended plan also includes the restoration of about 92,000 acres of historic natural wetland-upland mosaic systems, resulting in the preservation, protection, and increase in the spatial extent of wetlands in the study area.

## Wetland Restoration and Creation

The southern Indian River Lagoon region is one of the few areas where this wetland restoration and creation objective, as identified in the CERP study, can be reasonably met in all of South Florida, as large areas of undeveloped land still remain available. However, even in this region development pressures are beginning to be felt and the opportunity to reestablish these critical areas may soon be lost. Providing an increase in the spatial extent of wetland communities is instrumental in providing habitat restoration opportunities for fish and wildlife resources both within the South Florida ecosystem and within the St. Lucie watershed. The restoration plan for the Indian River Lagoon project will provide habitat and favorable breeding colony locations for such Everglades- associated species of birds as the federally listed endangered wood stork and snail kite, the threatened Audubon's crested Caracara, and the state listed sandhill crane. In addition, the U. S. Fish and Wildlife Service has designated the Allapattah Ranch property, part of the project's restored wetland-upland mosaic system, as recovery habitat for the critically endangered Florida panther, a species whose future survival is inextricably linked to the recovery of the Everglades ecosystem.

## Additional Water for the Ecosystem

The IRL-S recommended plan offers another advantage yet to be fully utilized. Due to the substantial increase in drainage and lowering of groundwater tables in the region provided by the existing canal system and its subsequent development, there is approximately 50% more stormwater runoff than what the natural drainage system yielded to the St. Lucie River and the southern Indian River Lagoon. This volume of water, estimated at 30,000 – 60,000 acre-feet on an average annual basis, is not needed by the River or Lagoon, but could provide benefits elsewhere. By constructing the reservoirs in the recommended plan, the delivery of this water is controllable and could be directed under certain circumstances to other parts of the south Florida ecosystem via the C-44 (St. Lucie) Canal, which connects the Indian River Lagoon region to Lake Okeechobee and ultimately to the Everglades. While this water is available for other needs, there are no current plans to redirect the water to other parts of the South Florida ecosystem.

## Economic Values and Social Well Being

The IRL-S recommended plan also improves economic values and social well being in the study area by increasing surface water supply, maintaining current levels of flood protection, and improving regional economic opportunities. This will be accomplished by providing additional water storage areas, capturing water that was being lost from the watershed, and creating an additional source for agricultural water supply. These new sources of agricultural water supply will result in a reduction in demand on the Floridian aquifer system. This shift in source will reduce operating costs required to recover water used for irrigation purposes and is expected to result in increased agricultural productivity of \$6.1 million annually. Improved regional economic

opportunities, including recreational opportunities, will result from the improved overall health of the southern Indian River Lagoon ecosystem, upon which the local economy is primarily dependent. This will be accomplished by reducing the frequency and duration of damaging discharges to the St. Lucie River, the St. Lucie Estuary and the Indian River Lagoon and by remediating the existing unacceptable level of muck in the estuarine system through the removal of accumulated muck sediments and by controlling future inputs of muck-forming sediments.

### Summary

The IRL-S project achieves much of its ecological outputs from features controlling runoff and restoring natural areas within the IRL watershed. The only physical hydrologic connection between the IRL-S project and the larger CERP is through the C-44 canal. Historically large releases from the Lake were combined with runoff from within the basin and resulted in the degradation of the St. Lucie River and Estuary and the southern Indian River Lagoon. The Corps, its partners, and other Federal and state agencies, have determined through the best models, information, and professional expertise at their disposal that substantial restoration will occur in the study area from the IRL-S project due to the features of the IRL-S project that better manage runoff. The high flows from Lake Okeechobee and their impacts would still occur until other CERP features are implemented. The impacts of these flows, however, are significantly reduced by the IRL-S project. Specifically, the team estimated that 88% of the estuarine benefits (oyster, submerged aquatic vegetation, and benthic habitats) and 100% of the watershed benefits (wetlands and uplands habitats) estimated to occur from the implementation of the IRL-S project would still be achieved in the absence of the construction of other CERP projects. These figures are based on average annual outputs over the period of analysis that take into account which CERP projects affect Lake Okeechobee discharges to the St. Lucie estuary, when such projects are expected to be constructed, and information regarding ecological response to changes in water quality and substrate conditions. Due to the early acquisition efforts by the State of Florida, benefits to natural systems are already occurring. Under the construction schedule contained in the report, we could begin to accrue benefits for physical changes to the system by the end of 2007. The implementation of the project has been integrated into the overall CERP schedule to achieve restoration of the total ecosystem.

### Project Cost

The first (construction) cost of the recommended plan, based on October 2003 price levels, is estimated to be \$1,207,000,000, including \$699,000,000, for real estate to be provided by the State of Florida and the SFWMD. The scale of the recommended plan features was selected based on cost effectiveness and incremental cost analysis. The recommended plan is the national ecosystem restoration plan and is justified by the restoration of approximately 54,000 watershed habitat units and approximately 4,000 estuarine habitat units. An estimated \$6,100,000 in average annual national economic development benefits for agricultural water supply are incidental to the ecosystem restoration purpose of the plan.

## Authorization Requirements

### C-44 Basin

The CERP was authorized by Section 601 of the WRDA of 2000 with 50 percent Federal and 50 percent non-Federal cost sharing for projects and for operation, maintenance, repair, replacement, and rehabilitation (OMRR&R). Section 601(b)(2)(C)(i) of the WRDA of 2000 specifically authorized the C-44 Basin Storage Reservoir component of the recommended plan for Indian River Lagoon—South at a total cost of about \$112,562,000 (October 1999 costs). Adaptive assessment of the needs of the C-44 basin area during the completion of the Project Implementation Report for Indian River Lagoon—South has resulted in substantial change to this component of the plan. Namely, the improvements focus on the need for additional water quality improvements to achieve restoration, an increase in the overall performance of the C-44 reservoir and STA to achieve better water management, the resiting of some project features to avoid cultural resources, and other changes to improve environmental benefits of the overall plan. The current C-44 basin features include a revised storage reservoir, as well as stormwater treatment and natural storage areas, which together function to meet the needs of the St. Lucie Estuary and the ecosystem at large. Due to the extensive changes in the C-44 Reservoir and the addition of the STAs and natural storage features noted above, there is a significant increase in the overall performance of the plan which justifies the increased costs. The report recommends that the C-44 Basin Storage Reservoir authorized by WRDA 2000 be deauthorized; and, that feature be replaced by the C-44 Reservoir and STA features recommended in the PIR for IRL-South.

### C-23, C-24, and C-25 Basins / Other Components

The other components of the recommended plan for Indian River Lagoon—South, namely the C-23, C-24 and C-25 components, were included in the original Comprehensive Plan, but require specific authorization in accordance with Section 601(d) of WRDA 2000. The natural storage areas and muck removal components are new features that significantly enhance the overall performance of the Plan and also require specific authorization.

## Cost-Sharing Requirements

In accordance with the cost-sharing requirements of Section 601(e) of the WRDA 2000, the Federal cost of the total recommended plan would be about \$603,500,000 and the non-Federal cost would be \$603,500,000. The estimated annual costs for OMRR&R are \$6,145,000, which includes adaptive assessment and monitoring activities recommended by the reporting officers to ensure success of the project at an estimated average annual cost of \$1,900,000. In accordance with Sections 601(e)(4) and 601(e)(5)(D), OMRR&R costs and adaptive assessment and monitoring costs will be shared equally between the Federal Government and the non-Federal sponsor.

Section 601(e)(5)(B) of the WRDA of 2000 authorizes credit toward the non-Federal share for non-Federal design and construction work completed during the period of design or construction, subject to the execution of the design or project cooperation agreement, and subject to a determination by the Secretary that the work is integral to the project. The Allapattah– Natural Storage and Treatment Area components of the recommended plan, with an estimated first cost of about \$179,500,000 is being considered for implementation by the non-Federal sponsor, the South Florida Water Management District (SFWMD), using Wetlands Reserve Program funds provided by the U.S. Department of Agriculture under the authority of the Farmland Security and Rural Investment Act of 2002. Corps policy defers to the contributing department regarding the use of its funds as part of the local cost share. The Department of Agriculture has determined that these funds can be used as credit for another Federal project.

Also in an effort to achieve early benefits and reduce the demands on Lake Okeechobee, the Governor has identified three high priority projects for implementation, one of which is the C-44 Reservoir and STAs. The South Florida Water Management District and the State of Florida are currently pursuing a private/public partnership for design and construction of the C-44 Reservoir and STAs. I have recommended that the State be afforded credit for those portions of this work that are determined to be consistent with the recommended plan and in the Federal interest.

### Project Deauthorizations

The IRL-S PIR recommends the deauthorization of several projects totaling \$417,365,000, including the C-44 storage reservoir identified in the Comprehensive Review Study authorized for construction in WRDA 2000 at an updated October 2003 cost of \$131,528,000; and the Martin County irrigation, flood control and backflow projects authorized by the Flood Control Act of 1968, totaling \$285,837,000, which have not been constructed and are not included in the IRL-S recommended plan.

### PIR Status

I signed the final PIR on March 24, 2004 and the South Atlantic Division Commander issued the Division Engineer's Public Notice on completion of the PIR on March 31, 2004. The Indian River Lagoon – South PIR is currently under final policy review at the Corps of Engineers Headquarters. On June 7, 2004, the mandatory 30-day state and agency review was completed and the scheduled date for signing of the Chief of Engineer's report by 30 July 2004 at which time the Chief's recommendation(s) will be transmitted to the Assistant Secretary of the Army (Civil Works) for review and approval within the Administration.

### Conclusion

The Army and this Administration are committed to saving the Everglades ecosystem, one of America's most precious natural wonders. Maintaining and restoring one of the most diverse and thriving ecosystems in the world is a daunting challenge in and of itself, but when that ecosystem must reside next door to a diverse and thriving human population the complexity of the challenge is compounded exponentially.

The Indian River Lagoon – South project represents a major step in the overall effort to restore this nationally significant ecosystem. The plan that we have developed enjoys strong support from state and local governments, as well as the business and environmental communities. We have had an independent science team review the report and its plan and they have concurred in its findings.

Mr. Chairman, that concludes my statement. Again, I appreciate the opportunity to testify today before the Committee. I would be pleased to answer any questions you or other Members of the Committee may have.