

**RECORD OF DECISION
CENTRAL AND SOUTHERN FLORIDA PROJECT
INDIAN RIVER LAGOON – SOUTH**

DECISION

The Final Integrated Project Implementation Report (PIR) and Environmental Impact Statement (EIS) for the Central and Southern Florida Project, Indian River Lagoon – South, in Martin, St. Lucie and Okeechobee Counties, Florida address the restoration opportunities for Indian River Lagoon – South (IRL-S). Based upon the PIR/EIS, views of other Federal, State, and local agencies, Native American Tribes, non-governmental organizations, the general public, and the review by my staff, I find the plan recommended by the District Engineer, Jacksonville District, U.S. Army Corps of Engineers, as modified, to be technically feasible, environmentally justified, cost effective, in accordance with environmental statutes, and in the Public interest. The recommendation is to implement the plan identified as Alternative 6, as modified during the Washington level review of the project. The revised final plan described below, continues to be the National Ecosystem Restoration Plan and best meets the overall Indian River Lagoon – South (IRL-S) planning objectives (restoration of the estuarine aquatic ecosystem and increased spatial extent of watershed wetlands and uplands), and reasonably maximizes ecosystem outputs while being cost effective.

The recommended plan consists of five 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. All of these are essential features of the recommended plan. The five features are:

- **Reservoirs.** Construction and operation of four above ground freshwater storage reservoirs, and their connecting canals, control structures, levees and pumps, providing approximately 130,000 acre-feet of storage. These would capture water from the C-44, C-23, C-24, and C-25 canals of the Central and Southern Florida Project, reducing the extreme peaks of freshwater discharge to the estuary. Though not designed specifically to reduce nutrient loads, these reservoirs would reduce total phosphorus and total nitrogen loads. They would also reduce suspended sediment and muck deliveries to the estuary. The storage reservoirs would cover about 12,610 acres in Martin and St. Lucie Counties. Water stored in the reservoirs would also be available to agriculture, in substitution for well water from the Floridan Aquifer, reducing dependency on the aquifer. Water stored in reservoirs would also be higher in quality (lower in alkalinity and chloride concentration) than that which is withdrawn from the Floridan Aquifer.

- **Stormwater Treatment Areas.** Construction and operation of 4 stormwater treatment areas. These stormwater treatment areas would be built on approximately 8,730 acres of existing agricultural and pastureland, and provide about 35,000 acre-feet of storage. Their operation would reduce sediment, phosphorus and nitrogen deliveries to the estuary and allow for restoration of estuarine water quality.
- **Natural Storage and Treatment Areas and North Fork Floodplain Restoration.** The natural storage and water quality treatment areas include acquisition and restoration of approximately 92,130 acres of upland/wetland mosaic in Martin, St. Lucie and part of Okeechobee Counties, through alteration of drainage ditches to provide multiple benefits. These areas would provide additional freshwater storage of about 30,000 acre-feet. On-site retention in these areas would further reduce phosphorus loads to the estuaries, while providing increased spatial extent of natural wetlands and upland habitat for wildlife. On site water storage would also recharge the superficial aquifer.
- **Diversion.** The diversion of existing flows via a canal connection and operating rules on new reservoirs and STAs reduces negative impacts from C-23 and C-24 to the middle estuary and provides a more natural freshwater flow pattern in the North Fork. Discharges from the C-24 outlet, S-49, are only shifted to the North Fork through the associated C-23/24 STA outlet. No C-24 flows are directed to the C-44 canal. Northerly diversion will direct approximately 64,500 acre-feet from the C-23 basin and C-24 basin into the North Fork of the St. Lucie River. Residual C-23 flows, above the natural system flows through Bessey Creek, will be directed to the C-44 canal via the proposed new canal. New C-44 flows originating in C-23 will be discharged to the estuary through the S-80 structure.
- **Muck Removal.** Removal of 7.9 million cubic yards of muck located in the North Fork and South Fork, as well as the Middle Estuary, of the St. Lucie River will provide immediate, and potentially dramatic, improvement in water quality, as well as improvements in habitat quality and extent. The Corps will prepare a report during preconstruction engineering and design (PED) to document the continued feasibility and optimal sequencing of this element. The report prepared will be approved by the Secretary of the Army and provided to Congress.

ALTERNATIVES AND CONSIDERATIONS BALANCED IN MAKING THE DECISION

An interagency, multidisciplinary Project Delivery Team participated in formulating, evaluating, refining and selecting alternatives, which resulted in the recommended plan. In addition to the no action alternative (Alternative 1), five other alternatives were carried through the final plan evaluation and selection process. The alternative plans were formulated and evaluated beginning with the development of four

single-purpose alternatives. The single-purpose alternative plans were then merged into four multipurpose alternatives (Alternatives 2-5), which were optimized by the team until a recommended plan was determined. The single-purpose alternatives provided a focused examination of the problems and opportunities associated with each of the following areas: water quality, estuarine ecosystem restoration, watershed ecosystem restoration, and the area of recreation, flood control and water supply. The multipurpose plans focused on combinations of components that would address various levels of performance. Performance measures were developed to evaluate the local and system-wide effects of the alternative plans on the study area and the Central and Southern Florida Project area. Water quality analyses/modeling and optimization modeling were used in the evaluation of the performance of these alternatives. The iterative planning process of evaluation and subsequent formulation of the multipurpose alternatives led to the identification of the preliminary recommended plan (Alternative 6).

Alternative 1 the no-action alternative, is also the Future Without Project condition. This alternative or condition assumes that the other components of the Comprehensive Everglades Restoration Plan (CERP) are in place, the Ten Mile Creek Critical Project is constructed, local government stormwater retrofits have been constructed in urban areas, and that State and Water Management District Surface Water Improvement and National Estuary projects would all be in place. Even with these programs and features in place, degradation of the SLE would continue to occur.

Alternative 2 was developed to evaluate the minimal approach to restoration in the study area. This alternative simulates the CERP recommendation for this area and can be considered a 'starting point' for the IRLS multi-purpose alternative formulation. Alternative 2 relies solely on surface reservoirs to attenuate watershed runoff for the purpose of salinity control in the SLR, SLE and the southern IRL, however, does not achieve ecosystem restoration in the estuary. Therefore, Alternative 2 does not meet the planning objectives for the IRL-S.

Alternative 3 was formulated by combining the preferred alternatives of each of the Single Purpose Plan Reports with some limited exception. The primary focus of this alternative is to address the full range of planning objectives of the study. The combination of the single purpose alternatives was an attempt to achieve a reasonable and practical solution to the problems in the study area with the expectation that some tradeoffs would be identified. Alternative 3 consisted of above ground reservoirs, stormwater treatment areas, pumping to divert existing flows from C-23 & C-24 to the North Fork of the SLR to mimic natural flow patterns, and added the use of natural storage and water quality treatment areas for multiple project benefits. Although the natural storage and water quality treatment component was included in Alternative 3, it did not include the full extent of the watershed sub-team's single purpose preferred alternative. The STAs included in this alternative plan were placed to provide treatment of watershed flows captured into the reservoirs. The intent was to provide a minimum of 80 percent reduction in phosphorus load of captured waters prior to discharge into the receiving water bodies.

Alternative 4 was developed to make improvements over the performance of Alternative 3. Additional water quality treatment components (STAs and increased natural storage and water quality treatment area) were included in this alternative. The watershed sub-team's single purpose preferred alternative was included in Alternative 4 significantly increasing the natural storage and water quality treatment areas subsequently resulting in a reduction in reservoir storage. The natural areas included configurations or grouping of parcels that were both small and large in size that were distributed throughout the study area. The concept of diversion of flows from the C-23 basin to the C-44 Canal was introduced in this alternative. The goal of this component is to reduce or remove the damaging discharges of the C-23 Canal through Structure S-49 directly into the middle of the estuary. The diversion from the C-23 Basin to the C-44 Canal is achieved through the operational rules of the reservoirs and construction of a new canal to connect the C-23 Canal and the C-44 Canal.

Alternative 5 was developed to further improve on the performance of Alternative 4 by increasing the opportunities to mimic natural flow patterns and by providing additional water quality treatment of basin runoff. This plan included three different diversion opportunities: diversion from the C-23 & C24 basins to the North Fork of the SLR, diversion from the C-23 & C-24 basins to the C-44 basin, and diversion from the C-44 basin to the historic South Fork of the SLR through the Palmar Complex natural storage and water quality treatment area.

This plan proposes diversion of existing C&SF canal hydrologic flow patterns through multiple routes in the watersheds to both the North Fork and South Fork of the SLR. Three different routes were discussed for the diversion of the C-23 Canal and the C-24 Canal flows to the North Fork of the SLR. This alternative added two reservoir assisted stormwater treatment areas (RaSTA): one in conjunction with the diversion to the South Fork via the Palmar natural storage and water quality treatment area and the second to treat flows diverted to Five Mile Creek via the C-25 Canal.

Alternative 6 is a refinement of Alternative 5. Modifications include removing components that did not prove to be cost effective and/or did not produce a significant increase in benefits to the sub-regional system. Those components removed included the Five Mile Creek reservoir assisted stormwater treatment area (RASTA), the diversion from the C-44 Canal to the historic South Fork of the SLR, and a bi-directional connection between the C-23 Canal and the C-44 Canal. Alternative 6 diverts the C-23/24 flows through Ten Mile Creek to the North Fork. The connection between the C-23 Canal and the C-44 Canal allows water deliveries to the C-44 Canal only and prevents flows from the C-44 Canal to the C-23 Canal. This diversion feature includes a stormwater treatment area in the canal alignment to provide water quality treatment to the diverted flows prior to discharge into the C-44 Canal. This alternative modified the alignment of the diversion canal between the C-23 Canal and the C-44 Canal. The alignment used in Alternative 4 and 5 created an artificial separation within one of the natural storage and water quality treatment areas that reduced the ecological connectivity benefits of the habitat created.

Although Alternative 6 as just described was formulated, evaluated, and compared to other alternatives by the Project Delivery Team, further refinement of the Alternative 6 preliminary designs occurred during early detailed design work. A Value Engineering (VE) study initiated to specifically explore potential design refinements to the C-44 Reservoir and West stormwater treatment area (STA) sites recommended relocating these components. During the course of the VE study, the scope of the study was expanded to consider the other C-44 basin components, including the C-44 East STA and the C-23/44 STA. The changes in the design and location of these components provide the same level of benefits of storage and nutrient load reduction as the C-44 storage and STA components in the original Alternative 6.

Late in the PIR phase, two new alternatives, the “estuary-only” single-purpose alternative (7a) and the “watershed-only” single purpose alternative (7b) were developed. Alternative 7a includes the features required to bring about full restoration of the estuary without the natural lands components. Reservoirs and stormwater treatment areas had to be expanded in Alternative 7a to provide the same level of water storage and water quality treatment (and associated improvement to estuary health) as would have been provided by the natural area component. Alternative 7b included the same natural lands components as Alternative 6. When the costs and ecosystem outputs of 7a and 7b were added together (combined as “Alternative 7”), the costs were calculated to be 17% higher than Alternative 6 while the benefits were identical. This demonstrated the cost savings and synergistic effects of employing the natural area components along with the reservoir, STA, muck removal, and flow diversion components to bring about both estuary and watershed restoration.

During Washington level review of Alternative 6, it was determined that additional analysis of proposed muck removal actions will need to be conducted during PED and that the project authorization should provide that appropriations will not be made available for implementation of muck removal actions until that analysis has been prepared and approved by the Secretary of the Army. In addition, it was determined that the benefits of the proposed artificial oyster habitat were not supported by the incremental costs. Hence, these features were dropped from the recommended plan.

MEANS TO AVOID OR MINIMIZE ADVERSE EFFECTS

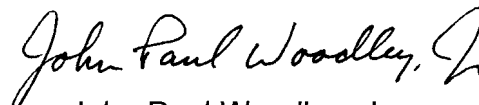
All practicable means to avoid or minimize adverse environmental effects have been incorporated into the recommended plan. The removal or destruction of ecologically valuable habitat has been minimized by siting many structures (reservoirs and STAs) on existing citrus agricultural lands. However, in some cases, due to the large acreage needed, pastures containing small isolated wetlands and uplands may be located within the construction footprint. The loss of this habitat is more than offset by the lands being acquired and conserved for the natural storage and water quality treatment areas, combined with the overall project’s restoration of the SLR, SLE and southern IRL.

During the construction phase for all components of the project, standard construction precautions will be implemented for the bald eagle, eastern indigo snake, and West Indian manatee to avoid any adverse effects on those federally listed species. As land is acquired for the project, detailed surveys will be conducted to determine the presence of listed species. If listed species are found, the Corps and the U.S. Fish and Wildlife Service will determine if additional consultation under the Endangered Species Act is necessary. The Corps has committed to providing manatee barriers where appropriate to ensure that IRL-S project facilities will pose no additional threat of structure-caused mortality or injury, entrapment in culverts or canals, or any other form of take as defined in the Endangered Species Act.

As land is acquired for the project, surveys for cultural resources and site evaluations will be conducted. Once the cultural resource surveys have been completed and sites evaluated, mitigation measures will be developed. Where possible the project design will be modified to avoid impacting significant historic properties. Where avoidance is not possible, other mitigation measures including data recovery excavation will be conducted. The mitigation measures will be developed in consultation with the Florida State Historic Preservation Officer (SHPO), tribal groups, and other interested parties as established in implementing regulations for Section 106 of the National Historic Preservation Act (36CFR800).

SUMMARY

Technical environmental, and economic criteria used in the formulation of alternative plans were those specified in the Water Resources Council's *Principles and Guidelines*. All applicable laws, executive orders, regulations, and local plans were considered in evaluating the alternatives. Based on review of these evaluations, I find that any adverse affects of the recommended action, described in the Final Integrated Project Implementation Report and Environmental Impact Statement, with addition of the oxbow re-connection element of the North Fork Floodplain Restoration, have been avoided and/or minimized to the extent practicable, and am confident that the recommended plan, as modified, best meets the overall Federal objectives. The recommended action is consistent with all applicable laws, regulations, national policy, and administrative directives. The total public interest will be best served by implementing the recommended plan as described in the Final Integrated PIR and EIS, as modified herein. This Record of Decision completes the National Environmental Policy Act process.



John Paul Woodley, Jr.
Assistant Secretary of the Army
(Civil Works)

Date: January 25, 2006