

ADDENDUM**Central and Southern Florida Project
Indian River Lagoon – South
Final Integrated Project Implementation Report and Environmental Impact
Statement, March 2004**

The North Fork component of the St. Lucie River is an ecologically and economically valuable ecosystem and a vital reach for maintaining the health of the total St. Lucie River Estuary. This reach will receive an additional 64,500 acre-feet per year of flow via the northern diversion efforts and is the location of two of the four sites for muck remediation. The North Fork is itself a defining characteristic of the St. Lucie watershed, and restoration of its floodplain and preservation of its remaining valuable habitat also help to meet the CERP-wide goal of increasing the spatial extent and functional quality of the wetland-upland mosaic as well as the project-specific objective of mimicking historic and natural flow patterns to the estuary. The North Fork component of the St. Lucie River was dredged during the 1920's as a part of the early drainage improvements in the region. The dredging operation cut off many oxbows and created berms that disconnected the river channel from the adjacent floodplain. Since those changes, the North Fork area has continued to grow with urban and agricultural expansion. Though not quantified, the changes have had a significant adverse effect on the health of the ecosystem. The North Fork area is prime for continued development. As development continues to occur, stressors such as habitat loss, polluted stormwater runoff, increased flow, and increased sediment will continue to degrade the overall North Fork ecosystem and downstream water bodies. The North Fork component will complement and enhance performance of the other IRL-S Project components by improving the certainty and extent of benefits to be achieved by the overall IRL-S Project.

As part of the Indian River Lagoon South improvements, it is proposed that 3,089 acres of floodplain and adjacent lands be acquired. It is proposed that the North Fork lands would be acquired in fee; however, during the PED phase other lesser estates will be given consideration, including a conservation easement, flowage easement, channel improvement easement, temporary construction easement or some combination of these estates. At this stage of the analysis and project development, 3,089 acres is the upper limit of area for potential restoration and reconnection of oxbows and wetlands; therefore, it is recommended that authorization include all 3,089 acres so that the required lands are available for restoration should further analysis result in the need for this upper limit. Additionally, a more detailed assessment with refined cost estimate will be made during the PED phase to determine the specific cost and beneficial effects that will be achieved by

reconnecting oxbows and degrading berm areas for wetlands reconnection as well as how much of the land area to include.

The North Fork is not a stand alone project element. Restoring this reach of the North Fork provides significant environmental improvements in the health of the St. Lucie River and Estuary by preventing such degradation as habitat loss, increased stormwater runoff, increased turbidity, and increased influence of exotic plants and animals from the surrounding areas that are under significant development pressures. The North Fork Floodplain Restoration is extremely important in linking the natural areas of the watershed to the estuary and the ultimate influence of the estuary on the Indian River Lagoon. This component (preservation and reconnection) will provide water quality benefits to the Estuary by reducing suspended solids, nutrients, heavy metals, other pollutant loads, and muck; resulting in an increase in water clarity that will allow greater seagrass productivity and expansion of existing seagrass beds, a primary objective of the IRL-S Project. Further, restoring the river/floodplain interaction will significantly increase the utilization of the area by aquatic organisms (particularly juvenile fish and invertebrates); serving as a nursery for many of the recreationally and commercially important fish species (including snook, mullet, sea trout, redfish, and tarpon) that spend certain life stages in this area. This will in turn significantly increase biomass and thereby provide a substantial forage base for other critically important species including wading birds. Maintaining and restoring valuable wading bird habitat is critical to the overall success of the Everglades Restoration program. Unfortunately, the benefit models for the estuarine aquatic ecosystem resources are not of such resolution to fully quantify these beneficial effects. However, the PIR report does provide quantification of ecosystem benefits to the 3,089 acres of land. Restoration of the North Fork will also support the recovery of federally threatened and endangered species (Everglade snail kite, eastern indigo snake, and wood stork). This component will also serve to maintain and preserve open spaces for public recreation in an area where these opportunities are limited and dwindling due to rapid urban expansion.

A preliminary estimate of habitat unit outputs derived from the North Fork component (3,089 acres) was developed for the Project Implementation Report (see page 6-68 of the PIR) and are summarized herein. The quality index values were developed by the US Fish and Wildlife Service as 0.01 for developed areas, 0.25 for significantly impacted areas due to encroachment by development, 0.50 for existing conditions in the North Fork floodplain, and 1.0 for a fully functioning ecosystem. In the future without condition, it is estimated that development will occur on approximately 50 percent of the area, significantly impacting the remaining area as a result of habitat loss, increased stormwater runoff (including nutrients), increased turbidity, and

increased exotic plant and animal species. (The estimate that approximately 50 percent of the area will be developed in the future without project condition is based on St. Lucie County future land use projections, volume of permit applications received by the South Florida Water Management District, and information contained in "Feasibility Study for the Reconnection of Wetlands and Oxbows Along the North Fork St. Lucie River," Florida Department of Environmental Protection, June 2003). With 50 percent of the area developed and fifty percent significantly impacted by that development, the 2050 "snapshot" future without project condition would produce 400 HU's estimated as follows:

0.01 quality index x 1,545 acres = 15 HU's (rounded)
0.25 quality index x 1,545 acres = 385 HU's (rounded)
2050 Without Project = 400 HU's.

However, when the future without project conditions are averaged over the period 2004 through 2050, assuming that environmental conditions deteriorate over time from the present value of 1,545 HU's, the future without condition is 477 average annual HU's.

For the preservation element (acquisition of the North Fork floodplain without further construction related to re-connection of the marshes and oxbows to the river), all 3,089 acres would be preserved at the existing condition quality value of 0.5. This would yield 1,545 average annual HU's. The difference between the preservation feature (1,545 average annual HU's) and the without project condition (477 average annual HU's) would yield a net increase of 1,067 average annual HU's.

For the preservation element plus floodplain marsh and oxbow reconnection and exotic species removal (pending further on-site investigations and modeling with other Federal, state, and local agencies), 2,915 average annual HU's are estimated to be produced (1.0 quality value x 3,089 acres = 3,089 HU's at year of estimated full project functioning in 2020; however, fewer outputs in years previous to 2020 lower the annual average over the period of analysis. This lag is due to the fact that immediate colonization of the restored area by fish, invertebrates, and aquatic vegetation will occur, but recruitment of such longer-lived wetland hardwood species as red maple, birch, water oak, and willow will occur over ten or so years). The difference between the preservation plus reconnection feature (2,915 HU's) and the without project condition (477 HU's) would yield a net increase of 2,438 HU's.

Thus, the first increment to the North Fork component (land acquisition) would cost \$13,017,000 (see Appendix D, Cost Engineering) and

provide a net increase of 1,067 average annual HU's. Incremental cost per unit of output for the first increment is \$12,200/AAHU and \$4,213/acre. The second increment of the North Fork component (restoration through reconnection of oxbows and wetlands) is estimated to cost \$3.32 million. (This estimate is based on the Florida Department of Environmental Protection's June 2003 report, "Feasibility Study for the Reconnection of Wetlands and Oxbows along the North Fork St. Lucie River", which estimated \$3.32 million for oxbow reconnection and wetlands reconnection at 42 sites.) This second increment would produce an additional 1,371 average annual Habitat Units at an incremental cost per unit of output of \$2,422/AAHU. The most efficient investment would therefore be to acquire the lands (in fee or lesser estate) and restore the floodplain through oxbow and wetlands reconnection. For both acquisition and reconnection the cost per unit of output would be \$6,701/AAHU and \$5,289/acre. Due to the need to conduct additional hydrologic and hydraulic analyses prior to such structural modifications to the floodplain as oxbow reconnection and berm degradation, the spatial extent of the restoration element (number and location of sites, number and location of breaches) cannot be fully determined at this time. In summary, implementation of the first increment (floodplain acquisition) is a prerequisite to realization of the greater output (and more efficient cost/ output) of the second increment (reconnection). The cost per acre of the North Fork floodplain restoration component (\$5,289/acre) compares favorably with the cost per acre of the Natural Storage and Treatment Area components (\$5,083/acre). Similarly, the cost per average annual habitat unit of the North Fork floodplain restoration component (\$6,701/AAHU) is less expensive than the cost per average annual habitat unit of the Natural Storage and Treatment Area components (\$8,723/AAHU).

The Project Implementation Report includes an analysis of both the preservation and reconnection elements of the North Fork component. That analysis along with the supplemental information in this addendum further supports both elements of the restoration of the North Fork Floodplain. However, a detailed cost estimate and hydrologic modeling of the reconnection element was not completed. The report includes the cost of the preservation element (acquisition of the floodplain and adjacent lands) but not the reconnection and identifies the need to complete further analysis and refinement prior to implementation of these reconnection aspects of the project recommendation. This investigation would include an assessment of the optimal land area and consideration of lesser estates consistent with the reconnection element to maximize the net benefits.

The Recommended Alternative in the Project Implementation Report (and FEIS) includes only the preservation element of the North Fork Floodplain Restoration component and a recommendation for further

investigation of the reconnection element. The benefit analysis and evaluation of impacts for the EIS supports both elements of the restoration of the North Fork Floodplain component. However, a detailed cost estimate and hydrologic modeling of the reconnection element was not completed for the report. Therefore, the PIR only recommends the preservation element (acquisition of the floodplain and adjacent lands) and identifies the need to complete further investigation and refinement prior to implementation of these reconnection aspects of the component. This investigation would include an assessment of the optimal land area and consideration of lesser estates consistent with reconnection alternatives to maximize the net benefits. The District recommends including the reconnection element as part of the Recommended Plan in the Chief's Report, and modifying the Draft Record of Decision (ROD) explaining why the plan recommended in the FEIS has been changed. The inclusion of the reconnection element in the IRL-S Project will increase total project costs by \$3.3 million dollars (see Table below). The benefits from this additional expenditure are significant (1,371 additional AAHU).

**TABLE 7 - 4 (REVISED*): ESTIMATED INITIAL COST FOR
CONSTRUCTION FEATURES**

(October 2003 Price Levels)

CONSTRUCTION FEATURES	Construction	Real Estate	Total Initial Cost
C-44 Basin			
C-44 Reservoir & STA's	\$118,859,000	\$125,879,375	\$244,738,375
Palmar Complex – Natural Storage and Treatment Areas	\$15,710,378	\$92,051,479	\$107,761,857
C-23, C-24 Basin			
C-23 North Reservoir	\$70,381,000	\$60,458,121	\$130,839,121
C-23 South Reservoir	\$72,153,000	\$57,098,572	\$129,251,572
C-23/C-24 STA	\$36,698,000	\$35,356,682	\$72,054,682
Allapattah Complex – Natural Storage And Treatment Areas	\$36,701,230	\$142,841,121	\$179,542,351
Cypress Creek Complex – Natural Storage And Treatment Areas	\$29,911,392	\$151,060,400	\$180,971,792
C-25 Basin			
C-25 Reservoir And STA	\$31,665,000	\$12,498,740	\$44,163,740
Muck Remediation And Habitat	\$83,353,000	\$8,675,000	\$92,028,000
North Fork Floodplain Restoration	\$3,320,000	\$13,016,700	\$16,336,700
PMP Development	\$300,000	\$0	\$300,000
Monitoring During Construction	\$12,619,770	\$0	\$12,619,770
Total	\$511,671,770	\$698,936,190	\$1,210,607,960
Total (rounded)	\$511,672,000	\$698,936,000	\$1,210,608,000

* Includes Construction cost for the North Fork Floodplain Restoration Component