

APPENDIX C

PHASE II TECHNICAL PLAN MANAGEMENT MEASURES TOOL BOX

Table C-1 Phase II Technical Plan Management Measure Summary

MM ID	Management Measure	MM Description	MM Level	Alternative Plans			
				Alt 1	Alt 2	Alt 3	Alt 4
1	Agricultural BMPs - Owner Implemented	Conservation plans, including Agricultural Nutrient Management Plans, have enrolled over 527,370 acres in the LOW to reduce TP load to lake. Costs incurred by owner.	1	√	√	√	√
2	Agricultural BMPs - Funded Cost Share	Conservation plans, including Agricultural Nutrient Management Plans, have enrolled over 527,370 acres in the LOW to reduce TP load to lake. Costs to be shared between land owner and the State.	1	√	√	√	√
3	Urban Turf Fertilizer Rule (LOER)	FDACS prepared statewide draft rule to regulate N and P in urban turf fertilizers.	1	√	√	√	√
4	Land Application of Residuals	LOPA requirement that domestic wastewater residuals will not add to TP loadings in Lake Okeechobee.	1	√	√	√	√
5	Florida Yards and Neighborhoods	Educate citizens and builders about proper landscape design to minimize nutrient loading to lake by reducing use of pesticides, fertilizers, and irrigation water.	1	√	√	√	√
7	ERP Regulatory Program	Permit regulating activities involving alteration of surface water flows.	1	√	√	√	√
8	NPDES Stormwater Program	Rules implemented by EPA to reduce stormwater pollutant loads discharged to surface waters.	1	√	√	√	√
99	Taylor Creek Critical Project	142 acre STA located at the Grassy Island Ranch Site on District owned lands. Receives flow from and discharges to Taylor Creek. Provides annual average load reduction of 0.3 mt.	1	√	√	√	√
100	Nubbin Slough Critical Project	809 acre STA located at the New Palm Dairy Site on District owned lands. Receives flow from and discharges to Nubbin Slough. Provides average TP load reduction of 0.9 mt/yr.	1	√	√	√	√
13	Taylor Creek Algal Turf Scrubber Nutrient Recovery Facility	A 15 mgd facility on a District owned property at the Grassy Island Site in S-191 basin. Consists of an engineered system in which attached algae are cultured and biomass is routinely harvested to facilitate recovery of pollutants from impaired waters. Projected average TP-load reduction is approximately 1.82 mt/yr.	1	√	√	√	√
53	Watershed Phosphorus Source Control Projects	About 30 ongoing projects in the four priority basins to treat water and reduce TP loads at source.	1	√	√	√	√
49	Agricultural BMPs - Cost Share Future Funding	Conservation plans, including Agricultural Nutrient Management Plans, have enrolled over 527,370 acres in the LOW to reduce TP load to lake. Costs to be shared between land owner and the State.	1	√	√	√	√
50	Agricultural BMPs - Additional	Advanced level BMPs including chemical treatment and	1	√	√	√	√

MM ID	Management Measure	MM Description	MM Level	Alternative Plans			
				Alt 1	Alt 2	Alt 3	Alt 4
	Agricultural BMPs	retention/detention ponds to treat water and reduce TP load at source in all basins north of Lake Okeechobee.					
93	Kissimmee River ASR Project	Facility is located along the Kissimmee River, 2 miles north of Lake Okeechobee. It is intended to test the feasibility of using ASR technology as part of CERP.	1	√	√	√	√
12a	LOER AWS - Brighton Reservoir	500-acre stormwater storage and treatment area located in the L-61 East Basin.	1	√	√	√	√
12b	LOER AWS - Clewiston Site	728 acres of primarily State and some privately owned land bordering Lake Okeechobee just outside of Clewiston. Temporary 50 cfs pump would deliver C-21 regional water into the site for storage	1	√	√	√	√
12e	LOER AWS - Avon Park Air Force Range	On-site retention on 3,600 acres providing approximately 10,000 ac-ft of storage capacity. Includes restoration of existing levee and water control structures. Will reduce flows and nutrient loading to Arbuckle Marsh.	1	√	√	√	√
12f	LOER AWS - Indiantown Citrus Growers Association	3,550 ac-ft of water storage on 1,775 acres. Includes rehabilitation and relocation of pump stations and widening ditches to reduce surface water volume discharged to St. Lucie Estuary	1	√	√	√	√
12g	LOER AWS - Barron Water Control District	5,000 ac-ft of water storage on 6,129 acres. Includes weir construction and ditch retention to enable water quality improvements and reuse by growers	1	√	√	√	√
12h	LOER AWS - Raulerson and Sons, Inc.	300 ac-ft of water storage on 670 acres. Will reduce flows and nutrient loading to Fish Slough	1	√	√	√	√
12i	LOER AWS - Kissimmee Prairie Preserve State Park	3,800 ac-ft of water storage on 1,920 acres. Will enhance quality of water entering Kissimmee River via Duck Slough, Lake Okeechobee, and the Everglades	1	√	√	√	√
87a_1	FRESP - Alderman-Deloney Ranch (C-25 basin)	43 ac-ft of on-site storage and TP-load reduction of 0.078 mt/yr Located in C-25 basin.	1	√	√	√	√
87a_2	FRESP - Williamson Cattle Company (S-191)	150 ac-ft of on-site storage and TP-load reduction of 0.24 mt/yr. Located in S-191 basin.	1	√	√	√	√
87a_3	FRESP - Buck Island Ranch (C-41)	967 ac-ft of on-site storage and TP-load reduction of 1.5 mt/yr Located in C-41 basin.	1	√	√	√	√
87a_4	FRESP - Lykes Bros (C-40)	5,000 ac-ft of regional water storage and TP-load reduction of 0.2 mt/yr. Located in C-40 basin.	1	√	√	√	√
70a	Local Initiatives - Taylor Creek Sediment Removal (S-133)	Removal of sediment and vegetation from canals tributary to Taylor Creek in the Treasure Island and Taylor Creek Isles residential areas.	1	√	√	√	√
70b	Local Initiatives - Okeechobee City Sediment Trap (S-133)	Two sediment traps installed within the city of Okeechobee to remove P-laden particles that would enter Lake Okeechobee.	1	√	√	√	√

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				Alt 1	Alt 2	Alt 3	Alt 4
70c	Local Initiatives - Nubbin Slough East Diversions (S-133)	Restoration of the east main tributary flow conveyance to Nubbin Slough to reduce flooding.	1	√	√	√	√
116	In-lake Features – Muck Sediment Removal	Involves removal of muck sediments from shore line areas that are completely exposed due to extremely low lake stages. This scraping exposes the natural bottom which in turn promotes re-growth of native vegetation once the lake levels return to normal.	1	√	√	√	√
15	LO WoD Rule Regulatory P Source Control Program	Amend Lake Okeechobee Works of the District rule to meet current needs including: P source control program, BMP optimization, and monitoring network to measure effectiveness of all BMP Programs within the watershed.	2	√	√	√	√
16	Lakeside Ranch STA (LOFT)	2,400 acre STA in western Martin County between Beeline Highway and Lake Okeechobee. Will provide annual average TP-load reduction of 8 mt.	2	√	√	√	√
17	Lemkin Creek Urban Stormwater Facility (LOFT)	150 acre stormwater treatment facility located on District owned lands in Okeechobee County southwest of the City of Okeechobee. Will provide annual average TP-load reduction of 1 mt	2	√	√	√	√
18	Seminole Brighton Reservation ASR Pilot	One 5 mgd ASR well system located along the C-41 Canal on the western edge of the Reservation in Glades County.	2	√	√	√	√
19	Taylor Creek ASR Reactivation	One 6 mgd well system located adjacent to the L-63N Canal in Okeechobee, Florida.	2	√	√	√	√
87b_1	FRESP - C.M. Payne and Son, Inc (Fisheating Creek)	932 ac-ft of on-site storage in Fisheating Creek Sub-watershed	2	√	√	√	√
87b_2	FRESP - Lightsey Cattle Company (Fisheating Creek)	135 ac-ft of on-site water storage in Fisheating Creek Sub-watershed	2	√	√	√	√
87b_3	FRESP - Syfrett Ranch West (C-41A)	140 ac-ft of regional water storage in C-41A basin	2	√	√	√	√
87b_4	FRESP - Rafter T Ranch (Arbuckle Creek)	1,145 ac-ft of on-site storage along Arbuckle Creek	2	√	√	√	√
12c	LOER AWS - Rolling Meadows	Stormwater storage on 400 acres of District-owned land. Will reduce runoff and nutrient loading to Lake Kissimmee.	3	√	√	√	√
12d	LOER AWS - Sumica	1,920 acres of over drained property which has been over drained by adjacent DOT box culverts. Project proposes to install a rip rap weir upstream of the box culverts to maintain stormwater for hydrologic restoration on-site before eventually reaching Lake Kissimmee.	3	√	√	√	√
12k	LOER AWS - Lykes Nicodemus Slough	Design, engineer, and implement a water storage area on 15,129 acres of which a flowage easement exists on the southern most 2,000 acres in an area surrounding Nicodemus Slough near Fisheating Creek. The project will have the potential to store 13,000 to 26,000 ac-ft of water from Lake Okeechobee.	3	√	√	√	√

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				Alt 1	Alt 2	Alt 3	Alt 4
12n	LOER AWS - Fisheating Creek Marsh Watershed Project	Evaluate, engineer, and rehabilitate PL 566 water control structures in the Fisheating Creek Marsh Watershed project area to more effectively store and manage water and reduce phosphorus runoff from more than 50,000 acres in the headwaters of Fisheating Creek.	3	√	√	√	√
120	Central County Water Control District Reservoir	Construct and operate the CCWCD reservoir under a cooperative agreement between the South Florida Water Management District and CCWCD to provide both flood protection and excess water storage in the Caloosahatchee Basin.	3	√	√	√	√
21	LO and Estuary Watershed Basin Rule (LOER)	Develop specific supplemental permit criteria designed to reduce TP loads and total runoff volume from new developments that discharge to Lake Okeechobee, St. Lucie, or Caloosahatchee Estuary.	3	√	√	√	√
23	Taylor Creek Reservoir (LOFT)	Will provide approximately 24,000 ac-ft of storage. 1,600 acre, 16-ft deep reservoir located on District owned lands in at the Grassy Island Ranch Site.	3	√	√	√	--
24	Brady Ranch STA (LOFT)	1,800 acre STA proposed to be located in Western Martin County between the Beeline Highway and Lake Okeechobee immediately east of Lakeside Ranch.	3	√	√	√	√
26	10 Well ASR System (Paradise Run)	50 mgd ASR system along Lake Okeechobee in the area of Paradise Run in Highlands County, south of the S-65E structure.	3	√	√	√	√
28	Paradise Run Wetland Restoration (LOW Project)	3,730 acre wetland restoration site located at the confluence of Paradise Run, oxbows of the Kissimmee River, and Lake Okeechobee.	3	√	√	√	√
62	Florida Power and Light Martin Cooling Pond	95,000 ac-ft cooling pond located north of the C-44 Canal, east of the L-65 Canal, and west of Indiantown in Martin County.	3	√	√	√	√
68	Comprehensive Planning-Land Development Regulations	Basin-wide work with cities and counties to review current plans and ensure promotion of low impact design for stormwater treatment.	3	√	√	√	√
56	Rolling Meadows/Catfish Creek Restoration	Hydrologic restoration of Catfish Creek and the creation of an impoundment to restore littoral wetlands.	3	√	√	√	√
116	Lake Bed Disking/Plowing	Disking involves mixing the organic sediments on the lake bed with the underlying layer of mineral soils, usually sands. Mixing the two soils together is expected to reduce the turbidity production and phosphorus flux into the water column. Mixing of the soils is expected to significantly reduce the amount of the organic sediments that are exposed to the water column. Plowing is a similar action, but is accomplished with a farm implement that is designed, not to mix the soil layers, but to invert the two layers.	3	√	√	√	√
12j	LOER-AWS - Dupuis	Design, engineer, and implement additional 1 to 2 ft of storage in the	4	√	√	√	√

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		Dupuis marsh before on-site stormwater enters the L-8 Canal.					
12l	LOER-AWS - Stokes	Design, engineer and implement an on-site stormwater storage project on a 490 acre site in the Fisheating Creek Basin. The project will have the potential to store approximately 510 ac-ft of water.	4	√	√	√	√
12m	LOER-AWS - Waste Management St. Lucie Site	Enter into a partnership arrangement to modify borrow areas into minor above ground impoundment(s). Preliminary hydrologic investigation is in process.	4	√	√	√	√
12p	LOER-AWS - Istokpoga Marsh Improvement District	Design and construct an agricultural water treatment facility within the Istokpoga Marsh Improvement District to reduce phosphorus runoff and provide additional storm water storage for the 19,209 acre area.	4	√	√	√	√
12q	LOER-AWS - Caulkins	Rehabilitation and relocation of internal pump stations. During regulatory releases to the St. Lucie Estuary irrigation facilities will be utilized to draw excess stormwater into the 3,400 acre project site. The detention of stormwater within the existing ditch system will result in water quality improvements thereby promoting water conservation and reducing the volume of surface water discharge from the site.	4	√	√	√	√
12r	LOER – AWS Lake Wales Ridge State Forest Lake Kissimmee Site	Internal ditch plugs and modified control structures on 800 ac-ft of additional storage.	4	√	√	√	√
29	Kissimmee Reservoir	Will provide approximately 161,263 ac-ft of storage to be provided by 10,281 acre, 16-ft deep reservoir located in Istokpoga/Indian Prairie Sub-watershed and will capture flows from the Lower Kissimmee Sub-watershed.	4	√	√	√	√
30	Istokpoga Reservoir	Will provide storage capacity of 79,560 ac-ft; 5,416 acre, 16-ft deep reservoir located in and will capture flows from the Istokpoga/Indian Prairie Sub-watershed.	4	√	√	√	√
31	Istokpoga STA	Will provide approximately 29 mt/yr of TP-load reduction; 8,044 acre treatment facility; Will target flows from the Istokpoga Sub-watershed.	4	√	√	√	√
107	Kissimmee Reservoir East	Will capture flows from the Kissimmee River and store approximately 200,000 ac-ft of water. 12,500, 16-ft deep reservoir located to the east of the Kissimmee River in the Lower Kissimmee Sub-watershed.	4	--	√	--	√
108	Istokpoga/Kissimmee Reservoir	It would provide a total of 600,000 ac-ft of storage capacity with half the flows coming from the Istokpoga Basin and the other half coming from the Kissimmee River. 42,000 acre reservoir located in the	4	--	√	--	--

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		southern reaches of the Lake Istokpoga/Indian Prairie Sub-watershed. Because of its proximity to Lake Okeechobee and its large size, this feature could also be used to store lake waters, if needed.					
114	Istokpoga/Kissimmee RASTA	Would provide total annual average storage capacity of 273,600 ac-ft and target flows from both, the Istokpoga/Indian Prairie Basin and the Kissimmee River. 8,000 acre STA coupled with a 19,000 acre reservoir. Projected annual average load reduction of 37 mt. Because of its proximity to Lake Okeechobee and its large size, this feature could also be used to store and treat Lake Okeechobee waters, as appropriate.	4	--	--	--	√
61	FEC RASTA I	Will provide annual average P-load reduction of approximately 28 to 29 mt/yr. 9,000 acre STA coupled with a 3,000 acre, 10-ft deep reservoir.	4	--	--	√	√
77	FEC RASTA II	Will provide annual average P-load reduction of approximately 2-3 mt/yr. 1,350 acre, 12-ft deep reservoir coupled with a 450 acre STA.	4	--	--	√	√
109	FEC Reservoir	Will provide approximately 250,000 ac-ft of storage capacity and its primary source of water would be Fisheating Creek. 17,500 acre, 16-ft deep reservoir located in the Nicodemus Slough region of the Fisheating Creek Sub-watershed. Given its proximity to Lake Okeechobee it could also be used to store lake waters, if necessary.	4	--	√	--	--
115	Nicodemus Slough RASTA	Will provide approximately 168,000 ac-ft of storage capacity and an annual average P-load reduction of up to 33 mt/yr. 6,500 acre STA coupled with an 11,000 acre, 16-ft deep reservoir. Given its proximity to Lake Okeechobee it could also be used to store and treat lake waters, if necessary.	4	--	--	--	√
112	Istokpoga Canal RASTA	Located along the boundary of the Lower Kissimmee and the Lake Istokpoga/Indian Prairie Sub-watersheds thereby allowing flows from both sub-watersheds to be captured and treated. Collectively, this RASTA would provide an annual average P-load reduction of approximately 10 to 18 mt/yr. 2,000 acre, 16-ft deep reservoir coupled with a 5,000 acre STA.	4	--	--	√	--
32	(LO) In-Lake Dredging	Involves removal of phosphorus-contaminated mud sediments from the deeper areas of the lake beyond the littoral shelf using innovative technologies. Exemplified by the recently initiated demonstration dredging and habitat restoration project being implemented near Eagle Bay. The area selected for the demonstration project is currently covered with mud sediments which prevent the growth of	4	√	√	√	√

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				Alt 1	Alt 2	Alt 3	Alt 4
		native aquatic vegetation; therefore, the area has limited habitat value					
38	C-44 Littoral	Project includes creation of a littoral zone of native vegetation to “treat” for water entering the C-44 via the S308 can benefit Lake Okeechobee and the St Lucie Estuary	4	--	--	--	--
40	Lake Hicpochee	Project comprises a reservoir and stormwater treatment area along the C-19 and C-43 Canals, degradation of berms, and exotic removal and control. This project could potentially create 55,090 ac-ft of above ground storage.	4	--	--	--	--
41	C-43 Distributed Reservoirs	Project objectives are to capture excess run-off within the West Lake Okeechobee Watershed which will then be operated to achieve both environmental flows to the Caloosahatchee Estuary and agricultural demands in the West Lake Okeechobee Watershed	4	--	--	--	--
47	Upper Kissimmee/Chain of Lakes Reservoir	Supplying surface water from the Kissimmee valley lakes and tributaries for water supply is considered the most viable water supply project in the basin and has been identified priority project with the District. A storage reservoir or ASR is expected to be a component of any withdrawal facility to improve reliability. Reductions in p-loads would be incidental to the water diverted for consumption.	4	--	--	--	--
59	Nicodemus Slough STA	Proposed facility would provide significant load reduction in FEC. Since this feature would draw water from close to the mouth of the creek, it would be able to treat loads from the entire drainage basin.	4	--	--	--	--
60	Fisheating Creek Managed Aquatic Plant Systems	Treatment units consisting of managed aquatic plant systems would be considered for siting in this sub-watershed at selected locations. Such units would be used in conjunction with source control practices to treat agricultural runoff with high phosphorus loads.	4	--	--	--	--
65	L-65 Culvert to L-8 Tieback	Install a high volume (1000+/- cfs) inverted culvert under the C-44 Canal from the L-65 Canal to the L-8 Tieback Canal to facilitate the movement of low nutrient water from Stormwater Treatment Areas north of Lake Okeechobee to the L-8 Reservoir.	4	--	--	--	--
71	KRR in Pool E	Complete backfilling of C-38 in Pool D. Pool E could be managed to maximize nutrient removal. STAs would be constructed on the floodplain adjacent to C-38. Some water moving through C-38 would be directed into the STAs but C-38 would remain intact for flood control.	4	--	--	--	--
73	Central Florida Recharge Project	Supplying surface water from the lakes and tributaries for aquifer recharge may offset a portion of the environment impacts projected to occur and that will limit future use of the Floridan aquifer system.	4	--	--	--	--

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		Water delivered to these RIB would move to the Floridan aquifer and a small percentage would be blended with reclaimed water for irrigation. Water would be moved to these RIBs only during high lake levels. Reductions in p-loads would be incidental.					
74	Indian Prairie Basin Regional STA	Located primarily in the Indian Prairie Sub-watershed this feature would consist of a 6,680 acre STA and a 1,531ac wetland Preservation/Enhancement Area.	4	--	--	--	--
75	In-Lake Chemical Treatment	Will involve application of chemical treatment technologies inside Lake Okeechobee to reduce in-lake TP loads.	4	--	--	--	--
78	Taylor Creek Wetland Restoration (Grassy Island)	Project would provide for incidental water storage and also reduce phosphorus from the runoff; would be sited on District owned lands	4	--	--	--	--
79	Nubbin Slough Wetland Restoration (New Palm Dairy)	Project would provide for incidental water storage and also reduce phosphorus from the runoff; would be sited on District owned lands	4	--	--	--	--
80	ASR-TCNS	New ASR facility in the TCNS Sub-watershed	4	--	--	--	--
81	Managed Aquatic Plant Systems in S-133	Proposed MAPS would target flows and load from a specific portion of the drainage basin and provide a certain amount of localized load reduction	4	--	--	--	--
82	Chemical Treatment in Taylor Creek Reservoir	Addition of a chemical treatment unit to the proposed LOW Project Taylor Creek Reservoir in order to enhance TP load reduction	4	--	--	--	--
85	Three Lakes WMA Hydrologic Restoration	Project is intended to reestablish more natural hydrology and partially restore wetlands on the property. This may provide more temporary water storage and potential for phosphorus removal.	4	--	--	--	--
90	Gardner-Cobb Marsh	Project would be sited on District owned lands in the Upper Kissimmee Sub-watershed and reduce the rate of run-off from this region by holding the water higher, as well as, provide incidental nutrient reductions due to plant uptake from overland flows in the marsh	4	--	--	--	--
91	Farm and Ranchland Protection Program Partnership	Voluntary USDA Natural Resources Conservation Service (NRCS) program that helps farmers and ranchers keep their land in agriculture. The program provides matching funds to State, Tribal or local governments and non-governmental organizations to purchase conservation easements.	4	√	√	√	√
94	Deep Well Injection- C-40 below S-72	Deep-injection well	4	--	--	--	--
95	Deep Well Injection- C-43 at Berry Groves Reservoir	Deep-injection well	4	--	--	--	--
96	Deep Well Injection- C-44 St. Lucie Canal	Deep-injection well	4	--	--	--	--
97	Deep Well Injection- C-41 below S-71	Deep-injection well	4	--	--	--	--

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98	Deep Well Injection- Taylor Creek/Nubbin Slough	Deep-injection well	4	--	--	--	--
104	Larson Dairy Lagoon Treatment System (HWTT)	Hybrid Wetland Treatment Technology™ (HWTT) is an innovative approach that combines beneficial attributes of the two top ranked nutrient removal technologies, namely wetland treatment and chemical injection. Exemplified by four pilot HWTT systems that are currently being tested in the LOW..	4	√	√	√	√
105	Upper Nubbin Slough Tributary Treatment System (HWTT)	Hybrid Wetland Treatment Technology™ (HWTT) is an innovative approach that combines beneficial attributes of the two top ranked nutrient removal technologies, namely wetland treatment and chemical injection. Exemplified by four pilot HWTT systems that are currently being tested in the LOW.	4	√	√	√	√
106	Upper Mosquito Creek Watershed Treatment System (HWTT)	Hybrid Wetland Treatment Technology™ (HWTT) is an innovative approach that combines beneficial attributes of the two top ranked nutrient removal technologies, namely wetland treatment and chemical injection. Exemplified by four pilot HWTT systems that are currently being tested in the LOW.	4	√	√	√	√
63	Wastewater/Stormwater Master Plan	Project involves assessing, planning, and updating wastewater/stormwater master plans to address short term and long term quality and quantity issues dealing with urban stormwater runoff. The updated plans will identify specific projects to be implemented to improve urban wastewater/stormwater quality. Exemplified by the on-going wastewater/master plan update projects in City of Okeechobee.	4	√	√	√	√
64	Unified Statewide Stormwater Rule	Intended to increase the level of nutrient treatment of stormwater from new development and thereby reduce the discharge of nutrients and excess stormwater volume.	4	√	√	√	√
54	S-154 Basin Deep Injection Well	Annual average P-load associated with the lost water is estimated to be approximately 9 mt/yr. Located in the S-154 drainage basin this cluster of deep injection wells would be used to irretrievably pump 16,500 ac-ft of runoff into the boulder zone.	4	--	--	√	√
92	Clewiston STA	Will provide annual average P-load reduction of approximately 2.5 mt/yr. 700 acre STA located south of Lake Okeechobee.	4	--	--	√	√
113	Taylor Creek STA	Projected annual average P-load reduction is approximately 4 mt. 2,000 acre STA located on District owned lands at the Grassy Island Ranch Site in S-191 Basin. Would receive flows from and discharge to Taylor Creek. Since flows in Taylor Creek, which would be the	4	--	--	--	√

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		primary source of water for this STA, are transient, this STA could also treat water from the East Kissimmee Reservoir.					
111	S-68 STA	Will provide approximately 8 mt/yr of P-load reduction on an annual average basis. 5,000 acre STA located in the Istokpoga/Indian Prairie Sub-Watershed.	5	--	--	√	√
110	S-133 Water Quality Treatment Facility	A 4-well cluster with a 1,000 ac-ft storage pond to optimize the removal of flow and well operation.	5	--	--	√	√
48	Compartmentalization of Lake	Establishing compartments within the Lake to facilitate lake stage management.	5	--	--	--	--
55	Construction of S-64 Structure on C-37	This project was part of the original design for the C&SF Project. It would allow greater flexibility for lake management in the upper basin. It may be possible to perform draw downs of Lake Toho without also drawing down Lake Kissimmee.	5	--	--	--	--
57	Istokpoga Creek Reservoir	Proposed reservoir would create extra storage during times of excess water. Water could be withdrawn via Istokpoga Canal from either Lake Istokpoga or the Kissimmee River (under periods of high flow). The reservoir would then serve as a source of water to the Kissimmee River, Lake Istokpoga, or downstream water-users during periods of less abundant rainfall.	5	--	--	--	--
58	Alternative Water Storage in Indian Prairie Region	Maximize water storage and meet all water supply needs within the region by limiting discharges to the Lake to when a standard level of flood protection is needed. This system would have the potential to reduce phosphorus loads by nearly 100 percent.	5	--	--	--	--
67	EAA Flow way	Originally suggested in 1993, the concept of the EAA Flow-way is to convert approximately 120,000 acres of primarily agricultural land into a natural wetland flow-way that would allow water to flow south from Lake Okeechobee to Water Conservation Area 3A (WCA 3A).	5	--	--	--	--
69	Lower Kissimmee Reservoir	One or two reservoir(s) would be constructed on either currently unused land owned by the SFWMD or on new lands to be acquired. It would be sized to provide the lesser of either the maximum required volume of storage capacity, or to utilize the entire available area.	5	--	--	--	--
72	Ice Cream Slough	Creation of a wetland impoundment on SFWMD owned land. Restoration of historic floodplain conditions in this area has the potential to retain water in Pool A as well as remove phosphorus from Ice Cream Slough discharge into C-38.	5	--	--	--	--
84	Yates Marsh Hydrologic Restoration	Wetland restoration project to restore hydrology of the marsh.	5	--	--	--	--
86	Upper Chain of Lakes Sediment Removal	Take advantage of low water levels during droughts to remove	5	--	--	--	--

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				Alt 1	Alt 2	Alt 3	Alt 4
		phosphorus laden sediments; this would enhance the phosphorus assimilation capacity of sediments in the upper basin lakes.					
87c	Florida Ranchlands Environmental Services Project- full implementation	Implementation of this program beyond the ongoing pilot projects	5	--	--	--	--
88	Chemical Treatment in Istokpoga Reservoir	Addition of a chemical treatment unit to the proposed LOW Project Istokpoga Reservoir in order to enhance TP load reduction	5	--	--	--	--
89	Chemical Treatment in Kissimmee Reservoir	Addition of a chemical treatment unit to the proposed LOW Project Kissimmee Reservoir in order to enhance TP load reduction	5	--	--	--	--

**PHASE II TECHNICAL PLAN
MANAGEMENT MEASURES FACT SHEETS**

01-02-49

Northern Everglades- Potential Management Measure

Project Feature/Activity: Agricultural BMPs

Level: 1

General Description/Background: Since 2002, considerable effort has been expended on the implementation of agricultural BMPs and water-quality improvement projects to immediately reduce the discharge of P from the watershed to the lake. Agricultural Nutrient Management Plans (AgNMPs) for the 22 active dairies in the watershed were completed in 2002, covering more than 31,000 acres (12,545 ha). Detailed planning, engineering, and design for implementing the stormwater component of the AgNMPs, at four of the dairies, will be completed by June 2007. Implementation of all of the dairy AgNMPs is expected to be completed by FY 2015.

Completed conservation plans now cover approximately 474,200 acres (191,902 ha) in the watershed, and BMPs are in various stages of implementation. The majority of this acreage lies within the four priority basins. Plans are being developed for an additional approximately 600,000 acres (242,811 ha) of agricultural operations. These figures reveal that more than half of the agricultural acreage in the entire watershed is currently under voluntary FDACS programs to plan and implement practices to control offsite movement of P. At the current rate of participation, FDACS is on schedule to complete BMP-based plans for the remainder of the agricultural acreage in the watershed by July 2010, and fully implement BMPs by 2015, as required by the Lake Okeechobee Protection Plan.

Purpose: Improve water quality by reducing transport of nutrients (primarily phosphorus) via runoff and leaching into regional system from agricultural and non-agricultural land uses

Location/Size/Capacity: Primarily within Lake Okeechobee watershed; expanding into estuary watersheds

Initiative Status:

Agricultural- underway; need update from FDACS

Urban- underway; need update from FDEP

Estimate of Water Quality Benefits

- Minimum: 72 mt/yr
- Maximum: 72 mt/yr
- Most Likely: 72 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Water quality benefits will be rolled up into a single “urban” category

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: Rich Budell; FDACS; 850-488-6249.

Northern Everglades- Potential Management Measure

Project Feature/Activity: Urban Turf Fertilizer Rule (LOER)

Level: 1

General Description/Background: FDACS has prepared draft rule language regulating the content of phosphorus and nitrogen in urban turf fertilizers. The rule will apply statewide and uses FDACS fertilizer labeling authority to regulate the distribution and sale of fertilizer products for urban turf. Rule requires fertilizer bags to have clearer labeling and warning statement regarding overuse/transport into waterways. Most, if not all, fertilizers will have to be rebagged with larger application area, otherwise they will have to reformulate. Use directions on label must be consistent with the application rates identified below.

- Total Phosphorus
 - No more than 0.25 lb total phosphorus per application
 - No more than 0.5 lb total phosphorus per year
 - **Note:** I have requested and FDACS is working on providing an estimate of percent phosphorus reduction which would result from these app rates (similar to that provided for nitrogen below).
- Nitrogen
 - No more than 0.7 lbs soluble nitrogen per application
 - 2-6 lbs nitrogen applied per year (depending on turf type and location)
 - **Note:** There has been much debate about the nitrogen application rate. Some research supports levels as low as 0.5 lbs per application. FDACS noticed a draft rule with 0.5 lbs per application; however their ability to defend that position is questionable. FDEP is funding ongoing IFAS research which should provide definitive answers to this question. In the meantime, FDACS is considering moving forward with the rule with 0.7 lbs per application limit. This would result in approximately a 25 percent reduction of nitrogen throughout the State. FDACS proposes revisiting this limit and potentially revising the rule once the FDEP-funded IFAS research has concluded.

Purpose: Improve water quality by reducing phosphorus and nitrogen runoff and leaching resulting from application of fertilizers to urban turf.

Location/Size/Capacity: Statewide within urban settings.

Initiative Status: Several rule workshops have already been conducted. Will be noticing revised rule language and proceeding with rulemaking. Anticipate rule adoption in summer/fall 2007.

Cost: Not applicable

Documentation: For more information, please see draft Rule Language, PowerPoint presentations, and meeting summaries

Estimate of Water Quality Benefits

- Minimum: Urban Rollup
- Maximum: Urban Rollup
- Most Likely: Urban Rollup
- Level of Certainty: Conceptual
- Assumptions: Water quality benefits will be rolled up into a single “urban” category

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: NA
- Other Impacts: NA

Contact: Rich Budell; FDACS; 850-488-6249

Northern Everglades Potential Management Measures

Project Feature/Activity: Land Application of Residuals

Level: 1

General Description/Background: Subsection 373.4595(3)(c)6. of the LOPA a. requires an affirmative demonstration that domestic wastewater residuals will not add to phosphorus loadings in Lake Okeechobee or its tributaries prior to authorization of disposal. LOPA further specifies that the demonstration will be based on achieving a net balance between phosphorus imports & exports on the permitted application site.

Purpose: Quantify TP reduction benefits resulting from implementation of LOPA requirement for residual applications.

Location/Size/Capacity: Basin wide

Initiative Status: Not initiated

Cost: To be determined (TBD)

Estimate of Water Quality Benefits

- Minimum: Urban Rollup
- Maximum: Urban Rollup
- Most Likely: Urban Rollup
- Level of Certainty: Conceptual
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: NA
- Other Impacts: NA

Contact: Maurice Barker; FDEP; 850-245-8614

Northern Everglades Potential Management Measures

Project Feature/Activity: Florida Yards & Neighborhoods

Level: 1

General Description/Background: The Florida Yards & Neighborhoods program is an excellent example of a nonstructural program that is helping to minimize the use of pesticides, fertilizers, and irrigation water by educating citizens and builders about proper landscape design. This promotes “right plant-right place” and minimizes the amount of fertilizer, pesticide, and irrigation needed for a successful landscape. FDEP has an ongoing monitoring program to determine the effectiveness of this program in reducing nutrient loads.

Purpose: Reduce the use of nutrients and pesticides, and irrigation, thereby reducing nutrient loading and reducing water use.

Location/Size/Capacity: Statewide

Initiative Status: On-going

Cost: TBD

Documentation: For more information, please see

Estimate of Water Quality Benefits

- Minimum: Urban Rollup
- Maximum: Urban Rollup
- Most Likely: Urban Rollup
- Level of Certainty: Conceptual
- Assumptions: Projected benefits will roll up under urban category

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: NA

Screening Criteria

- Proof of Concept: NA
- Other Impacts: NA

Contact: Michael Scheinkman, FDEP Environmental Specialist - Clean Lakes program, lake management. Florida Yards and Neighborhoods. Phone 850-267-2075
Eric Livingston, FDEP, on monitoring project for FYN

Northern Everglades – Potential Management Measure

Project Feature/Activity: ERP Regulatory Program

Level: 1

General Description/Background: The Environmental Resource Permit (ERP) program regulates activities involving the alteration of surface water flows. This includes activities in uplands that alter stormwater runoff, as well as dredging and filling in wetlands and other surface waters. ERP applications are processed by either the Department or the water management districts, in accordance with the division of responsibilities specified in operation agreements between the Department and the water management districts.

Purpose: The purpose of this measure is to ensure that activities do not degrade water quality, impact flood protection or adversely impact the function of wetland systems.

Location/Size/Capacity: SFWMD jurisdiction

Initiative Status: Existing Program Activity

Cost: N/A

Estimate of Water Quality Benefits

- Minimum: Urban Rollup
- Maximum: Urban Rollup
- Most Likely: Urban Rollup
- Level of Certainty: Conceptual
- Assumptions: No increase in phosphorus loads resulting from new development; Applies to new development only; Conversion of intense agricultural uses (dairies, row crops, improved pasture, sod, citrus) with little or no water quality treatment to urban uses with modern surface water management systems with treatment; Projected benefits will roll up under the urban category

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Conceptual
- Assumptions: Applies to new development only; Conversion of intense agricultural uses (dairies, row crops, improved pasture, sod, citrus) with little or no stormwater storage to urban uses with modern surface water management systems with storage; Projected benefits will roll up under urban category

Screening Criteria

- Proof of Concept: NA
- Other Impacts: NA

Contact: Damon Meiers; SFWMD; 561-682-6876

Northern Everglades Potential Management Measures

Project Feature/Activity: NPDES Stormwater Program

Level: 1

General Description/Background: In 1987, the Federal Clean Water Act was amended requiring the U.S. Environmental Protection Agency (EPA) to develop rules to implement the federal National Pollutant Discharge Elimination System (NPDES) stormwater permitting program. Phase I, promulgated in 1990, addresses the following sources:

"Large" and "medium" **municipal separate storm sewer** systems (MS4s) located in incorporated places and counties with populations of 100,000 or more, and eleven categories of **industrial activity**, one of which is large **construction activity** that disturbs 5 or more acres of land.

Phase II, promulgated in 1999, addresses additional sources, including MS4s not regulated under Phase I, and small construction activity disturbing between 1 and 5 acres.

In October 2000, EPA authorized the Florida Department of Environmental Protection (DEP) to implement the NPDES stormwater permitting program in the State of Florida (in all areas except Indian Country lands). FDEP's authority to administer the NPDES program is set forth in [Section 403.0885, Florida Statutes \(F.S.\)](#).

Important note: The NPDES stormwater permitting program is separate from the State's stormwater/environmental resource permitting programs (found under [Part IV, Chapter 373, F.S.](#) (593KB) and [Chapter 62-25, F.A.C.](#) and local stormwater/water quality programs, which have their own regulations and permitting requirements.

Purpose: To reduce stormwater pollutant loads discharged to surface waters, especially from existing land uses and drainage systems. This is especially true for the master drainage systems owned and operated by cities, counties, FDOT, and Chapter 298 water control districts. Also can help to reduce stormwater pollutant loads from existing industrial sites and from new construction sites.

Location/Size/Capacity: Basin wide

Initiative Status: Being implemented by FDEP

Cost: TBD

Documentation: For more information, please see:
<http://www.dep.state.fl.us/water/stormwater/npdes/index.htm>

Estimate of Water Quality Benefits

- Minimum: Urban Rollup
- Maximum: Urban Rollup
- Most Likely: Urban Rollup
- Level of Certainty: Conceptual
- Assumptions: Projected benefits will roll up under urban category

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Conceptual
- Assumptions: Depends if infiltration BMPs or stormwater reuse is done; Projected benefits will roll up under urban category

Screening Criteria

- Proof of Concept: NA
- Other Impacts: NA

Contact: Steven Kelly, Program Administration, NPDES Stormwater Section, Tallahassee, 850-245-7518

Northern Everglades – Potential Management Measure

Project Feature/Activity: Coastal and Estuarine Land Conservation Program

Level: 1

General Description/Background: The Coastal and Estuarine Land Conservation Program (CELCP) was established in 2002. The Federal Office of Ocean and Coastal Resource Management (OCRM) will administer the program which provides up to \$3 million dollars for each eligible project. CELCP federal funds will be provided for eligible activities related to state planning, program administration and project acquisition. Any project approved through the program must provide non-federal matching dollars.

Purpose: Protecting important coastal and estuarine areas that have significant conservation, recreation, ecological, historical, or aesthetic values, or that are threatened by conversion from their natural or recreational state to other uses” (CELCP Final Guidelines, 2003).

Location/size/capacity: Statewide

Initiative Status: On-going

Cost: \$3 million dollars for each eligible project.

Documentation: For more information, please see:
<http://coastalmanagement.noaa.gov/land/welcome.html>

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: Incidental
- Maximum: Incidental
- Most Likely: Incidental
- Level of Certainty: Unknown
- Assumptions: NA

Screening Criteria

- Proof of Concept: NA

- Other Impacts: NA

Contact: W. Kennedy; FDEP; 561-681-6706

Northern Everglades – Potential Management Measure

Project Feature/Activity: C-43 Reservoir (West Storage Reservoir)

Level: 1 (This feature is part of the future base RSM simulation)

General Description/Background: The C-43 Reservoir Project is located on approximately 10,700 acres of land owned by SFWMD. This project comprises a two cell reservoir with a 1500 cfs pump station and is detailed in the Caloosahatchee River (C-43) West Basin Storage Reservoir Project Implementation (PIR).

Purpose: The project objective, as defined in the PIR, is to improve the ecosystem function of the Caloosahatchee Estuary by improving the timing of freshwater deliveries to the estuary resulting in a salinity range suitable for a healthy estuarine system.

Location/Size/Capacity: The project is located in Hendry County, south of the Caloosahatchee River (C-43 Canal), and west of the City of LaBelle.

The project components include a reservoir, a pump station, stormwater treatment areas, canals, embankments, structures, roads, and the temporary reconfiguration of TIWCD canals:

- Reservoir
 - Acreage 10,500 acres
 - Water depth ~ 15 – 25 ft
 - Storage volume 170,000 ac-ft
 - Embankment length 86,064 linear ft
- Pump Station
 - Capacity 1,500 cfs

Initiative Status:

- | | |
|---|-----------|
| • Advance planning phase and associated field work: | Complete |
| • BODR: | Complete |
| • Preliminary Plans and specifications: | Complete |
| • Construction of a Test Cell Program: | Complete |
| • Site Clearing: | July 2007 |
| • Intermediate Design for the PS and Reservoir: | Complete |
| • Pre-final Design: | Feb 2008 |

Cost: **Intermediate** Design Opinion of Probable Construction Cost is \$384 million

Documentation: EvergladesPlan.org the Caloosahatchee River (C-43) West Basin Storage Reservoir Project Draft Integrated Project Implementation Report and Environmental Impact Statement, April, 2007

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: No water quality benefits are expected from this feature because it does not primarily discharge water to Lake Okeechobee.

Estimate of Water Quantity Benefits

- Minimum: 170,000 ac-ft
- Maximum: 170,000 ac-ft
- Most Likely: 170,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions: This is the volume associated with potential impacts to the estuary. No water quantity benefits are expected from this feature because it does not primarily receive water from directly from Lake Okeechobee

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Janet Starnes; SFWMD; 239-338-2929 *7735

12a

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Brighton Reservoir

Level: 2

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Brighton Reservoir

Initiative Status: Planning and design of a 500 acre excess stormwater storage and treatment area in the S71 Basin and Indian Prairie region of the Northern Everglades watershed. This project will provide additional water storage in the basin as well as phosphorus treatment.

Cost: Approximately \$450,000 design, estimated \$5,000,000 for construction.

Documentation:

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: 1.5 mt/yr
- Level of Certainty: 30 percent design
- Assumptions: Not determined

Estimate of Water Quantity Benefits

- Minimum: 500 ac-ft
- Maximum: 2,000 ac-ft
- Most Likely: 1,300 ac-ft

- Level of Certainty: Conceptual
- Assumptions: Not determined

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

12b

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Clewiston Site

Level: 2

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: 728 acres of primarily State and some privately owned land bordering Lake Okeechobee just outside of Clewiston. Temporary 50 cfs pump would deliver C-21 regional water into the site for storage.

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Not determined

Estimate of Water Quantity Benefits

- Minimum: 1,456 ac-ft (2 ft)
- Maximum: 2,912 ac-ft (4 ft)
- Most Likely: 1,456 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Not determined

Screening Criteria:

- Proof of Concept: 1

- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Rolling Meadows

Level: 2

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Utilize 720 acres of District-owned lands for interim on-site stormwater storage before eventually entering Lake Kissimmee. Bermed area already exists – project proposes installing a culvert to restore natural flows and gravity feed into bermed area. Small agricultural pumps could also be used to fill detention area with more agricultural land runoff.

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Not determined

Estimate of Water Quantity Benefits

- Minimum: 1,456 ac-ft
- Maximum: 2,912 ac-ft
- Most Likely: 1,456 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Preliminary engineering design complete

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

12d

Northern Everglades – Potential Management Measure**Project Feature/Activity:** Alternative Water Storage (LOER) – Sumica**Level:** 2

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Polk County property (total site 1,920 acres) which has been over drained by adjacent DOT box culverts. Project proposes to install a rip rap weir upstream of box culverts to maintain stormwater for hydrologic restoration on-site before eventually reaching Lake Kissimmee.

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Not determined

Estimate of Water Quantity Benefits

- Minimum: 281 ac-ft
- Maximum: 3,840 ac-ft
- Most Likely: 281 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Not determined

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Avon Park Air Force Range

Level: 1

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Restoration of existing levee and water control structure replacements within Arbuckle Marsh. This project will impact on-site flows within the Lake Okeechobee Watershed, specifically flows reaching Lake Okeechobee through Lake Istokpoga

Initiative Status: 10,000 ac-ft of water storage on 3,600 acres of project area.

Cost: Total approx. \$400,000 (District so far contributed \$254,242 and APAFR contributed \$33,000).

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: U

Estimate of Water Quantity Benefits

- Minimum: 10,000 ac-ft
- Maximum: 10,000 ac-ft
- Most Likely: 10,000 ac-ft
- Level of Certainty: Final

- Assumptions:

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Indiantown Citrus Growers Association

Level: 1

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Indiantown Citrus Growers Association (ICGA) – Phase 1 of the project consisted of the rehabilitation and relocation of pump stations. The association will utilize their irrigation pumps at the St. Lucie Canal to draw regulatory regional lake releases into their site for disposal which will reduce freshwater volumes to the estuary. Phase 2 of the project will include widening ditches in the ICGA ditch system. The detention of stormwater within the existing ditch system will result in water quality improvements thereby promoting water conservation and reducing the volume of surface water discharge to the St. Lucie Canal and Estuary.

Initiative Status: 3,550 ac-ft of water storage on 1,775 acres of project area.

Cost: Total \$831,531 (District contributed \$220,758; ICGA contributed \$322,965; and FDACS contributed \$287,808).

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: U

Estimate of Water Quantity Benefits

- Minimum: 3,550 ac-ft
- Maximum: 3,550 ac-ft
- Most Likely: 3,550 ac-ft
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

12g

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Barron Water Control District (BWCD)

Level: 1

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: BWCD is constructing a water storage project within its system which includes the construction of two weirs in an existing canal to retain more water within the BWCD canal system. Excess water in the Caloosahatchee River due to Lake Okeechobee regulatory regional releases will be pumped into BWCD for disposal when conditions support additional capacity. Retention within the existing ditch system and detention areas will result in water quality improvements and enable reuse by individual growers, thereby promoting water conservation and reducing the volume of discharge to the Caloosahatchee River.

Initiative Status: 5,000 ac-ft of water storage on 6,129 acres of project area

Cost: Total \$400,000 (District contributed \$200,000 and BWCD contributed \$200,000).

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Not determined

Estimate of Water Quantity Benefits

- Minimum: 5,000 ac-ft
- Maximum: 5,000 ac-ft
- Most Likely: 5,000 ac-ft
- Level of Certainty: Final
- Assumptions: Not determined

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

12h

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Raulerson and Sons, Inc.

Level: 1

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Implementation of a pilot stormwater reuse project which will capture on-site stormwater runoff from the farm and pump it into three stormwater ponds which will be used to meet 82 percent of the farm's irrigation demand. This project impacts flows within Fish Slough of the Lake Okeechobee watershed.

Initiative Status: 300 ac-ft of water storage on 670 acres of project area.

Cost: Total \$1,477,000 (District contributed \$330,000; AWS Grant \$167,000; FDACS contributed \$330,000; Farmer contributed \$200,000; and USDA EQIP contributed \$450,000).

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Not determined

Estimate of Water Quantity Benefits

- Minimum: 300 ac-ft
- Maximum: 300 ac-ft
- Most Likely: 300 ac-ft

- Level of Certainty: Final
- Assumptions: Not determined

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Kissimmee Prairie Preserve State Park (KPPSP)

Level: 1

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Implementation of first phase of a on-site water storage restoration project on the KPPSP site, which is owned by the State of Florida (Trustees of the Internal Improvement Trust Fund) and managed by Florida Department of Environmental Protection, Division of Recreation and Parks (FDEP-DRP). The two phase project will enhance the quality of water entering the Kissimmee River via Duck Slough, Lake Okeechobee, and the Everglades.

Initiative Status: 3,800 ac-ft of water storage on 1,920 acres of project area.

Cost: Total \$150,000 (District contributed \$130,000; and FDEP contributed \$20,000).

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Not determined

Estimate of Water Quantity Benefits

- Minimum: 3,800 ac-ft
- Maximum: 3,800 ac-ft

- Most Likely: 3,800 ac-ft
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Dupuis

Level: 4

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Design, engineer, and implement additional 1 foot of storage in the Dupuis marsh before on-site stormwater enters the L-8 Canal. This project could potentially store 2,500 ac-ft of water.

Cost: Cost for design and implementation is approximately \$1.76 million.

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Not determined

Estimate of Water Quantity Benefits

- Minimum: 0 ac-ft
- Maximum: 2,5000 ac-ft
- Most Likely: 1,250 ac-ft
- Level of Certainty: Conceptual
- Assumptions: NA

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

12k

Northern Everglades – Potential Management Measure**Project Feature/Activity:** Alternative Water Storage (LOER) – Lykes Nicodemus Slough**Level:** 4

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Design, engineer, and implement a water storage area on 15,129 acres of an area surrounding Nicodemus Slough near Fisheating Creek. The project will have the potential to store 15,000 to 30,000 ac-ft of water from Lake Okeechobee.

Cost: Cost for design and implementation could exceed \$5 million. Construction costs for this project are based on the assumption of \$321 per acre

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Not determined

Estimate of Water Quantity Benefits

- Minimum: 15,000 ac-ft
- Maximum: 30,000 ac-ft
- Most Likely: 25,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions: NA

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Stokes

Level: 4

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Design, engineer and implement an on-site stormwater storage project on a 490 acre site in the Fisheating Creek Basin. The project will have the potential to store approximately 510 ac-ft of water.

Cost: Potential cost for Land Acquisition \$5.9 million, potential cost for design and implementation is \$90,000. Construction costs for this project are based on the assumption of \$321 per acre

Estimate of Water Quality Benefits

- Minimum: 0.004 mt/yr
- Maximum: 0.02 mt/yr
- Most Likely: 0.01 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Based on wetland restoration in Bottcher's BMPs for improved pasture.

Estimate of Water Quantity Benefits

- Minimum: 255 ac-ft
- Maximum: 510 ac-ft
- Most Likely: 383 ac-ft
- Level of Certainty: Conceptual

- Assumptions: Average annual discharge rate of 183 ac-ft per year based on a ratio of square miles per ac-ft of discharge in the Indian Prairie Region.

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

12m

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Waste Management St. Lucie Site

Level: 4

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Enter into a partnership arrangement to modify borrow areas into minor above ground impoundment(s). Preliminary hydrologic investigation is in process. Details are being developed.

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

12n

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Fisheating Creek Marsh Watershed Project

Level: 3

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Evaluate, engineer, and rehabilitate PL 566 water control structures in the Fisheating Creek Marsh Watershed project area to more effectively store and manage water and reduce phosphorus runoff from more than 50,000 acres in the headwaters of Fisheating Creek.

Cost: The potential Cost for engineering and hydrologic and hydraulic analysis is \$100,000 and construction could cost around \$2 million to rehabilitate existing structures.

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: TBD

Estimate of Water Quantity Benefits

- Minimum: 11,000 ac-ft
- Maximum: 22,000 ac-ft
- Most Likely: 16,500 ac-ft
- Level of Certainty: Conceptual

- Assumptions: amount of water available to previously drained wetlands on an annual basis.

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Central County Water Control District Reservoir

Level: 3

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Construct and operate the CCWCD reservoir under a cooperative agreement between the South Florida Water Management District and CCWCD to provide both flood protection and excess water storage in the Caloosahatchee Basin. Currently there are conveyance facilities in place which hydraulically connect the CCWCD reservoir to the Caloosahatchee River.

Cost: Community Budget Issue Request by CCWCD for \$500,000 in 2008 and \$1,500,000 in 2009-2010.

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: TBD

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: 4,800 ac-ft

- Level of Certainty: Conceptual
- Assumptions: System can be reevaluated and redesigned to handle additional storage.

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – Istokpoga Marsh Improvement District

Level: 4

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Design and construct an agricultural water treatment facility within the Istokpoga Marsh Improvement District to reduce phosphorus runoff and provide additional storm water storage for the 19,209 acre area. The Istokpoga Marsh Improvement District was created in 1962 and Highlands County is the local sponsoring organization.

Cost: Design costs are approximately \$300,000 and construction costs are estimated to be \$5 million

Estimate of Water Quality Benefits

- Minimum: 0.09 mt/yr at 20 percent reduction
- Maximum: 0.24 mt/yr at 50 percent reduction
- Most Likely: 0.16 mt/yr
- Level of Certainty: Conceptual
- Assumptions: 640 acre retention/detention treatment area

Estimate of Water Quantity Benefits

- Minimum: 640 ac-ft
- Maximum: 2,560 ac-ft
- Most Likely : 1,920 ac-ft
- Level of Certainty: Conceptual

- Assumptions: Based on a 640 acre storage area

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

12q

Northern Everglades – Potential Management Measure**Project Feature/Activity:** Alternative Water Storage (LOER) – Caulkins**Level:** 4

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Rehabilitation and relocation of internal pump stations. During regulatory releases to the St. Lucie Estuary irrigation facilities will be utilized to draw excess stormwater into the 3,400 acre project site. The detention of stormwater within the existing ditch system will result in water quality improvements thereby promoting water conservation and reducing the volume of surface water discharge from the site.

Cost: TBD The cost of this project is approximately \$300,000 with a 50/50 match.

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: TBD

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: TBD

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Alternative Water Storage (LOER) – • Lake Wales Ridge State Forest Lake Kissimmee site

Level: 4

General Description/Background: The 2005 Lake Okeechobee Estuary and Recovery (LOER) action plan was developed to help restore the ecological health of Lake Okeechobee and adjoining estuaries, through a series of fast-track water quality improvement projects and several other far-reaching and innovative components. Among these additional components is an initiative to identify options for storage and/or disposal of excess surface water to aid in reducing lake levels and high discharge volumes to the estuaries. Assessments of available public and tribal lands for storage of excess surface water have been completed for the watershed, with assessments continuously ongoing for private lands. Eight water storage/disposal projects have been completed including Lykes Basinger Grove, Phase II Indiantown Citrus Growers Association. Additional water storage projects are under way (i.e. Avon Park Air Force Range, Kissimmee Prairie Preserve State Park, etc.), with investigations and designs continuing for additional water storage projects with a goal of 450,000 ac-ft.

Purpose: To assess, plan, design, and construct water storage/disposal projects on public, private, and tribal lands.

Location/Size/Capacity: Internal ditch plugs and modified control structures on 800 acres of the site are estimated to provide approximately 800 ac-ft of additional storage.

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: TBD

Estimate of Water Quantity Benefits

- Minimum: 300 ac-ft
- Maximum: 1,200 ac-ft
- Most Likely: 800 ac-ft
- Level of Certainty: Conceptual
- Assumptions: NA

Screening Criteria:

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades- Potential Management Measure

Project Feature/Activity: Taylor Creek Algal Turf Scrubber® Nutrient Recovery Facility

Level: 1

General Description/Background: This is a scaled-up demonstration of HydroMentia's proprietary water treatment technology that employs algae to remove pollutants from water. Algal Turf Scrubbers® are engineered systems in which attached algae are cultured and biomass is routinely harvested to facilitate recovery of pollutants from impaired waters. The cost analysis of the S-154 pilot investigations of the ATS™ technology provided basis for this project.

O & M costs are for one year only. Operation of the facility after the first year is contingent upon system performance and availability of funds. Because of the drought, the system is currently not performing under design conditions. Water within Taylor Creek is being recycled due to lack of new flows from runoff. We expect to see better performance with higher nutrient levels and higher flows in the source water.

Purpose: The objectives of the facility are to: (1) reduce total phosphorus loads from stormwater runoff associated with the Taylor Creek drainage basin; (2) provide secondary enhancement of water quality associated with the targeted flows from Taylor Creek through increased dissolved oxygen levels; and (3) recover and recycle captured nutrients through the harvesting and composting of harvested algae biomass.

Location/Size/Capacity: The project is located on a District-owned property in S-191 Basin, Okeechobee, FL. The facility is designed to treat 15 mgd of water rerouted from Taylor Creek, a tributary to Lake Okeechobee. The facility is expected to remove 4,000 lbs of total phosphorus per year.

Initiative Status: The facility is fully constructed and operational. Water quality data collected thus far show relatively modest performance.

Cost: The cost to build the facility was \$3.05 M. Operation and maintenance (O&M) cost for first year was \$281,610.

Documentation: HydroMentia, Inc. 2006. Taylor Creek 15 mgd Algal Turf Scrubber® (ATS™) Basis of Design.

Estimate of Water Quality Benefits

- Minimum: 1.29 mt/yr
- Maximum: 2.39 mt/yr
- Most Likely: 1.82 mt/yr
- Level of Certainty: Conceptual

- Assumptions: The “most-likely” value was model-projected using the mean TP concentration of 506 ppb (derived from the 1989-2005 dataset), which served as the basis of design for the project. The “minimum” value was set at the mean TP concentration less 2 standard deviations, with the “maximum” value set at a value of the mean plus 2 standard deviations.

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: 0
- Other Impacts: 0

Contact: Odi Villapando; SFWMD; 561-682-2936

Northern Everglades- Potential Management Measure

Project Feature/Activity: C-44 Reservoir / STA

Level: 1 (This feature is part of the future base RSM simulation)

General Description/Background: The C44 Reservoir/ STA Project is located on approximately 12,000 acres of land owned by SFWMD. This project comprises three components (Reservoir, West STA, and East STA) identified in the Indian River Lagoon south (IRL-S) Project Implementation (PIR).

Purpose: The project objectives, as defined in the PIR, are to capture local runoff from the C44 Basin, treat some or all of it via sedimentation and natural transformation of nutrients, and return it to the C-44 Canal when there is a need. The components are designed for flow attenuation to the St. Lucie Estuary, water quality benefits from reduced loading of nutrients, pesticides, herbicides, and other pollutants contained in runoff presently discharged to the estuary, and water supply benefits. Additional future benefits include the ability to remove the increased phosphorous load in the C-23 diverted water.

Location/Size/Capacity: The project is located in Martin County, directly north of the C-44 Canal (St. Lucie Canal), halfway between Lake Okeechobee and the Atlantic Ocean. The project components include a reservoir, a pump station, stormwater treatment areas, canals, embankments, structures, roads, and the temporary reconfiguration of TIWCD canals:

- Reservoir
 - Acreage 3,400 acres
 - Water Depth ~ 15 ft
 - Storage volume 50,600 to 55,000 ac-ft
 - Embankment length 48,600 linear ft
- Pump Station
 - Capacity 1,100 cfs
- TIWCD Irrigation Pump Station
 - 85,000 gallons per minute (gpm)
- STA
 - Acreage 6,300 acres
 - Intake/Discharge Canals 20,000 linear ft
 - Perimeter Canals 92,500 linear ft
 - Conveyance/Control Structures 19
 - Storage Volume: 8,505 ac-ft (based on 90 percent footprint area available for storage and 1.5 ft standard operating depth)

Initiative Status: Final plans and specs submitted June 29, 2007

Cost: Pre-final Design Opinion of Probable Construction Cost is \$339.8 million

Documentation: For more information, please see Formal BODR and Final Design Report and calculations.

Estimate of Water Quality Benefits

- Minimum: 4 mt/yr
- Maximum: 4 mt/yr
- Most Likely: 4 mt/yr
- Level of Certainty: Conceptual
- Assumptions: This is the load reaching Lake Okeechobee. Period of Record for Modeling is 1968-2000.

Estimate of Water Quantity Benefits

- Minimum: Reservoir (55,000 ac-ft); STA (8,505 ac-ft)
- Maximum: Reservoir (55,000 ac-ft); STA (8,505 ac-ft)
- Most Likely: Reservoir (55,000 ac-ft); STA (8,505 ac-ft)
- Level of Certainty: Conceptual
- Assumptions: STA storage volume based on 90 percent footprint area X 1.5 ft standard operating depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Sue Ray; SFWMD; 561-242-5520 *4019

Northern Everglades – Potential Management Measure

Project Feature/Activity: Lake Okeechobee Works of the District Regulatory Phosphorus Source Control Program

Level: 2

General Description/Background: Chapter 40E-61, F.A.C., the Lake Okeechobee Works of the District rule, which was adopted in 1989 as a result of the Lake Okeechobee Surface Water Improvement and Management plan, limits the amount of phosphorus that can be discharged from lands within the regulatory boundary defined by the rule regardless of whether the land use is agricultural or nonagricultural. This is accomplished by issuing permits that approve a phosphorus control plan. The rule criteria are based on initiatives in place at the time the rule was adopted. These criteria need updating.

Purpose: The original purpose of the current rule was to establish criteria to ensure that discharges to Lake Okeechobee Works of the District are compatible with the District's ability to carry out the objectives of the legislative declarations of policy in 373 FS. The current rule is no longer compatible with current initiatives and amendments to the statute. The District is in the rule development process to update the criteria of the rule. More specifically, the goal is to amend the rule to:

- implement a phosphorus source control program utilizing best management practices for all lands within the Lake Okeechobee Watershed;
- allow agricultural land uses, greater than 100 acres, the option of participating in the FDACS Notice of Intent Program to meet the intent of the rule;
- establish expected percent load reductions from BMPs per individual basin based on data presented in LOPP and use those to develop BMP compliance methodologies and as the basis for inflow loads to downstream WQ projects;
- define the monitoring network necessary to monitor the rule's effectiveness and to make compliance determinations;
- establish a plan for optimizing the BMP program should the expected percent load reductions not be met.

Location/Size/Capacity: The location is the Lake Okeechobee Watershed as defined by the Lake Okeechobee Protection Act.

Initiative Status: The Governing Board authorized staff, November 2006, to initiate rule amendments. Four rule development workshops were conducted in early 2007 with limited public input. The original timeline for rule development proposed an optimistic completion date of September 2007; however, with the latest legislative changes, the District rulemaking team is re-evaluating the effort and the timeline to ensure that the latest authorizations are considered in proposed amendments. Staff are also conducting internal technical working group meetings to optimize the phosphorus monitoring network, to review permit criteria, and to consider compliance strategies.

Cost: FY08 \$891,986 ad valorem

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Projected benefits will roll up under urban category; n/a (Based on LOPP, we might expect to accomplish a 20-25 percent load reduction when comparing pre and post BMP periods for individual basin that are primarily agricultural. Less reduction would be anticipated for areas with a higher proportional area that is urban.) Because basins are typically made up of agricultural *and* nonagricultural land uses and because of the disparate expected load reductions for each category (2-2.5 percent for Non-Ag and 20-25 percent for Ag), we will need to look at the proportion of Ag to Non-Ag in each basin to determine what percent reduction can be expected based on current conditions.

Keep in mind that these predicted percentages are what can be expected from *each* property implementing BMPs within an individual basin, which is impossible, from a resource perspective, to track at that level thus the reason for looking at land use area proportions. These estimates could be considered as the planning basis for quantifying the input load for other downstream water quality projects in the treatment train. New development will have to be looked at separately as added future benefit that is unpredictable assuming the ERP rule is adopted. These benefits will roll up under the urban category.

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: 0
- Other Impacts: 0

Contact: Steffany Gornak; SFWMD; 561-682-6600

Northern Everglades – Potential Management Measure

Project Feature/Activity: Lakeside Ranch STA

Level: 2

General Description/Background: The Lakeside Ranch STA is a proposed 2,400 acre STA in western Martin County between the Beeline Highway and Lake Okeechobee.

Purpose: This STA will treat water to remove phosphorus before it enters Lake Okeechobee.

Location/Size/Capacity: The Lakeside Ranch STA is a proposed 2,400 acre STA in western Martin County between the Beeline Highway and Lake Okeechobee.

Initiative Status: Basis of Design Report completed.

Cost: \$137 million

Documentation: Lakeside STA Basis of Design Report

Estimate of Water Quality Benefits

- Minimum: 8 mt/yr
- Maximum: 19 mt/yr
- Most Likely: 8 mt/yr
- Level of Certainty: Conceptual
- Assumptions: BMPs in place for minimum estimate, not in place for maximum estimate. Most likely estimate assumes BMPs in place. Period of record: 1965-2005. Inflow concentration: 345 ppb without BMPs, 122 ppb with BMPs. Cultural resource mitigation is assumed to not impact treatment area available. BMP estimates based on LOPD 2007 update. BMP estimations are based on LOPP 2007 Update.

Estimate of Water Quantity Benefits

- Minimum: 3,240 ac-ft
- Maximum: 3,240 ac-ft
- Most Likely: 3,240 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Period of record: 1965-2005. STA storage volume based on 90 percent of footprint area of 2,400 acres X 1.5 standard operating depth

Screening Criteria

- Proof of Concept: 1

- Other Impacts: 1

Contact: Mark Long; SFWMD; 561-242-5520 *4061

Northern Everglades – Potential Management Measure

Project Feature/Activity: Lemkin Creek Urban Stormwater Facility

Level: 2

General Description/Background: The Lemkin Creek Urban Stormwater Facility is a proposed 150 acre STA in Okeechobee County southwest of the City of Okeechobee. This STA will treat water to remove phosphorus before it enters Lake Okeechobee. This feature will be implemented as one of the LOFT components of the LOER.

Purpose: This STA will treat water to remove phosphorus before it enters Lake Okeechobee.

Location/Size/Capacity: The Lemkin Creek Urban Stormwater Facility is a proposed 150 acre STA in Okeechobee County southwest of the City of Okeechobee. This STA will treat water to remove phosphorus before it enters Lake Okeechobee.

Initiative Status: Preliminary design in progress

Cost: \$18 million

Estimate of Water Quality Benefits

- Minimum: 0.5 mt/yr
- Maximum: 1.5 mt/yr
- Most Likely: 1 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Detailed phosphorus removal estimates will be available after design is completed.

Estimate of Water Quantity Benefits

- Minimum: 500 ac-ft
- Maximum: 500 ac-ft
- Most Likely: 500 ac-ft
- Level of Certainty: Conceptual
- Assumptions: 240 acre site with max 3 ft deep storage.

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Lisa Kreiger; SFWMD; 863-462-5260 *3026

Northern Everglades – Potential Management Measure

Project Feature/Activity: Seminole - Brighton Reservation ASR Pilot Project

Level: 2

General Description/Background: Assist the Seminole Tribe to design, permit, construct and test a pilot ASR system at the Brighton Reservation.

Purpose: The purpose of the project is to expand water resources in the Indian Prairie Basin and answer technical questions regarding aquifer storage and recovery (ASR) technology in the vicinity north of Lake Okeechobee, Florida. The initial contract is to have the Seminole Tribe of Florida (Tribe) perform services related to construction of an exploratory well at the Brighton Reservation, in conjunction with the South Florida Water Management District (SFWMD). If the results of the exploratory well indicate that favorable hydrogeologic conditions exist, then the Tribe may proceed with further development of an ASR facility at the location under another future contract with the District.

Location/size/capacity: One 5 mgd ASR well system along the C-41 Canal on the western edge of the Reservation in Glades County.

Initiative status: The exploratory well presently under construction. Total system construction should be complete by late 2009.

Cost: Total system construction should be approximately \$5,000,000. Operational costs have yet to be determined.

Documentation: For more information, please see...

Estimate of Water Quality Benefits

- Minimum: 3 mt/yr
- Maximum: 1.73 mt/yr
- Most Likely: 0.86 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Water quality benefits associated with the 30 percent of the pumped volume that is not returned back to the surface.

Estimate of Water Quantity Benefits

- Minimum: 1,350/945 ac-ft
- Maximum: 5,400/3,780 ac-ft
- Most Likely: 2,700/1,890 ac-ft
- Level of Certainty: Conceptual

- Assumptions: In each of the estimates above, the first number reflects quantity of water stored and the second number reflects quantity of water recovered

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: Bob Verrastro; SFWMD; 561-682-6139

Northern Everglades – Potential Management Measure

Project Feature/Activity: Taylor Creek ASR Reactivation

Level: 2

General description/Background: The project involves the assessment and eventual re-activation of the Taylor Creek/Nubbin Slough Aquifer Storage and Recovery (ASR) system, which was originally constructed and operated by the SFWMD during the mid-1980's. Since that time, the system has been inactive. Project tasks will include mechanical evaluations of the existing system, permitting, design studies, construction of new appurtenances and eventual operation and maintenance of the system.

Purpose: The primary objective of this project is to reactivate the existing Taylor Creek/Nubbin Slough ASR system using as many of the original facility components as possible. The new water treatment system should use a combination of filtration and ultraviolet disinfection to meet primary drinking water standards, prior to recharge into the existing Floridian Aquifer well.

Location/size/capacity: One 6 mgd well system adjacent to the L-63N Canal in Okeechobee, Florida.

Initiative status: Currently under design and permits are pending. Anticipate construction by 2009.

Cost: System construction should be approximately \$2,500,000. Operational costs have yet to be determined.

Estimate of Water Quality Benefits

- Minimum: 0.62 mt/yr
- Maximum: 4.12 mt/yr
- Most Likely: 1.23 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Water quality benefits associated with the 30 percent of the pumped volume that is not returned back to the surface.

Estimate of Water Quantity Benefits

- Minimum: 2,700/1,890 ac-ft
- Maximum: 5,400/0 ac-ft
- Most Likely: 5,400/3,780 ac-ft
- Level of Certainty: Conceptual
- Assumptions: In each of the estimates above, the first number reflects quantity of water stored and the second number reflects quantity of water recovered

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: Bob Verrastro; SFWMD; 561-682-6139

Northern Everglades – Potential Management Measure

Project Feature/Activity: Lake Okeechobee and Estuary Watershed Basin Rule (LOER)

Level: 3

General Description/Background: This management measure originated as a component of the Lake Okeechobee and Estuary Recovery (LOER) plan. The component was titled Environmental Resource Permit (ERP) Revisions. The intent is to develop specific supplemental permit criteria for new permitted projects to demonstrate that they will not cause or contribute to the impairment of the targeted water bodies by discharging lower phosphorus loads and runoff volume on an average annual basis.

Purpose: The purpose of this measure is to reduce phosphorus loads and total runoff volume from new development that discharge ultimately to Lake Okeechobee or the Caloosahatchee or St. Lucie estuaries.

Location/size/capacity: The basin rule would cover the Lake Okeechobee Watershed and the Caloosahatchee and St. Lucie Estuary Watersheds

Initiative Status: The District initiated the rule development process on February 8, 2006. Several workshops have been conducted to solicit input from stakeholders in the subject basins. The District is in the process of developing technical criteria and draft rule language necessary to conduct additional workshops. The original goal for requesting rule adoption from the Governing Board is December 2007.

Cost: TBD

Documentation: For more information, follow: <https://my.sfwmd.gov/portal/page> and choose the Lake Okeechobee and Estuary Watersheds Basin Rule PowerPoint.

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Projected benefits will roll up under urban category

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown

- Assumptions: NA

Screening Criteria

- Proof of Concept: 0
- Other Impacts: 0

Contact: Damon Meiers; SFWMD; 561-682-6876

Northern Everglades – Potential Management Measure

Project Feature/Activity: Taylor Creek Reservoir (LOFT)

Level: 3

General Description/Background: The Taylor Creek Reservoir is a proposed reservoir on District owned land (Grassy Island Ranch) in Okeechobee County.

Purpose: The reservoir will be designed to capture water from Taylor Creek and release it back into the creek during drier periods. This water will then be available for treatment in the existing Taylor Creek STA and the proposed Lakeside Ranch STA.

Location/Size/Capacity: The Taylor Creek Reservoir is a proposed 24,000 acre-foot reservoir located just north of the City of Okeechobee.

Initiative Status: Basis of Design Report completed.

Cost: \$240 million

Estimate of Water Quality Benefits

- Minimum: 2 mt/yr
- Maximum: 6 mt/yr
- Most Likely: 2 mt/yr
- Level of Certainty: Conceptual
- Assumptions: BMPs in place for minimum estimate, not in place for maximum estimate; Most likely estimate assumes BMPs in place; Period of record: 1965-2005; Inflow concentration: 728 ppb without BMPs, 255 ppb with BMPs; BMP estimate based on 2007 LOPP update

Estimate of Water Quantity Benefits

- Minimum: 24,000 ac-ft
- Maximum: 40,000 ac-ft
- Most Likely: 24,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Period of record: 1965-2005

Screening Criteria

- Proof of Concept: 0
- Other Impacts: 1

Contact: Mark Long; SFWMD; 561-242-5520 *4061

Northern Everglades- Potential Management Measure

Project Feature/Activity: Brady Ranch STA (LOFT)

Level: 3

General Description/Background: The Brady Ranch STA is a proposed 1,800 acre STA in western Martin County between the Beeline Highway and Lake Okeechobee immediately east of Lakeside Ranch.

Purpose: This STA will treat water to remove phosphorus before it enters Lake Okeechobee.

Location/Size/Capacity: The Brady Ranch STA is a proposed 1,800 acre STA in western Martin County between the Beeline Highway and Lake Okeechobee immediately east of Lakeside Ranch.

Initiative Status: Conceptual project, land acquisition in progress

Cost: \$101 million

Estimate of Water Quality Benefits

- Minimum: 5 mt/yr
- Maximum: 9 mt/yr
- Most Likely: 5 mt/yr
- Level of Certainty: Conceptual
- Assumptions: BMPs in place for minimum estimate, not in place for maximum estimate; Most likely estimate assumes BMPs in place; Period of record: 1965-2005; Inflow concentration: 332 ppb without BMPs, 118 ppb with BMPs; Cultural resource mitigation is assumed to not impact treatment area; BMP estimate based on 2007 LOPP update

Estimate of Water Quantity Benefits

- Minimum: 2,430 ac-ft
- Maximum: 2,430 ac-ft
- Most Likely: 2,430 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Period of record: 1965-2005. STA storage volume based on 90 percent footprint area of 1,800 X 1.5 ft standard operating depth.

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Mark Long; SFWMD; 561-242-5520 *4061

Northern Everglades- Potential Management Measure

Project Feature/Activity: 10-Well ASR System (Paradise Run)

Level: 3

General description/Background: The project involves the planning, siting, design, construction and operating a new 10-well Aquifer Storage and Recovery (ASR) system as a means of managing water levels and water quality in Lake Okeechobee while minimizing harmful discharges to the estuaries. The study will look at the technical, environmental and regulatory issues associated with undertaking such a project.

Purpose: The project purpose is to develop a 50 million gallons per day (mgd) ASR system along Lake Okeechobee designed to store treated surface water (filtration and disinfection) during periods of elevated water levels in Lake Okeechobee for recovery during drier weather conditions. It is desired that this system be operational within the next 5 years.

Location/size/capacity: The siting evaluation has determined that the area of Paradise Run in Highlands County, south of the S-65E structure would be a good spot for the system.

Initiative status: Design evaluations (geotech, surveying and hydraulic modeling) have just gotten underway. An exploratory well will be constructed in late 2007. Anticipate permitting in 2008 and initiation of system construction in 2009. Construction complete in 2010.

Cost: Yet to be determined, based on extent of associated floodplain re-hydration and environmental enhancements. Expect an engineer's estimate when the conceptual design is complete.

Documentation: For more information, please see

Estimate of Water Quality Benefits

- Minimum: < 1 mt/yr
- Maximum: < 1 mt/yr
- Most Likely: < 1 mt/yr
- Level of Certainty: Conceptual
- Assumptions: nutrient load reduction associated with the 30 percent of the water that does not return back to the surface.

Estimate of Water Quantity Benefits

- Minimum: 11,475 ac-ft
- Maximum: 22,950 ac-ft
- Most Likely: 17,213 ac-ft
- Level of Certainty: Conceptual

- Assumptions: 5 mgd per well X 10 wells = 50 mgd (or 150 ac-ft/day). Maximum volume will be associated with daily pumping for the entire 5 month (Jun – Oct) wet period = 153 days X 150 ac-ft/day = 22,950 ac-ft. Most likely value is estimated at 75 percent of the maximum and min volume estimated at 50 percent of the max.

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: Bob Verrastro; SFWMD; 561-682-6139

Northern Everglades – Potential Management Measure

Project Feature/Activity: Paradise Run Wetland Restoration (LOW Project)

Level: 3

General Description/Background: Water from the watershed and the lake will be detained in large storage areas during wet periods for later use during dry periods. The increased storage capacity will reduce the duration and frequency of both high and low water levels in the lake that stressful to its littoral zone ecosystems and will reduce discharges from the lake that are damaging to the downstream estuarine ecosystems. Water from upstream tributaries will be diverted to storm water treatment areas to reduce nutrient loading into the lake. In addition, the project will also address restoration of the hydrology of isolated wetlands by plugging connections to drainage ditches and diverting canal flows to adjacent wetlands and water resources problems in the Lake Istokpoga Drainage Basin through changes in the currently implemented Lake Istokpoga Regulation Schedule. Real Estate acquisition near completion. Awaiting WRDA legislation authorization

Purpose: The primary objective of the Lake Okeechobee Watershed (LOW) project is to increase aquatic and wildlife habitat in Lake Okeechobee by providing the capability to better manage water levels in Lake Okeechobee and to reduce nutrient loading into Lake Okeechobee. Lake Okeechobee is one of the primary sources of water for natural system areas of South Florida.

Location/Size/Capacity: This 3,730 acre wetland restoration site is located at the ecologically significant confluence (under pre-development conditions) of Paradise Run, oxbows of the Kissimmee River, and Lake Okeechobee. Under restored conditions it would have a rain-driven hydrology unless future efforts to further enhance watershed conditions could link the site to the surface flows from the C-38 (Kissimmee River) or C-41A (Istokpoga) Canals.

Initiative Status: Alternative Formulation

Cost: \$62 million (RE & Construction)

Documentation: Alternatives Formulation Briefing meeting read-ahead, Lake Okeechobee Watershed Project

Estimate of Water Quality Benefits

- Minimum: < 1 mt/yr
- Maximum: < 1 mt/yr
- Most Likely: < 1 mt/yr
- Level of Certainty: Conceptual
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: Incidental
- Maximum: Incidental
- Most Likely: Incidental
- Level of Certainty: Conceptual
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Armando Ramirez; SFWMD; 561-686-2563

Northern Everglades – Potential Management Measure

Project Feature/Activity: Kissimmee Reservoir

Level: 4

General Description/Background: Water from the watershed and the lake will be detained in large storage areas during wet periods for later use during dry periods. The increased storage capacity will reduce the duration and frequency of both high and low water levels in the lake that stressful to its littoral zone ecosystems and will reduce discharges from the lake that are damaging to the downstream estuarine ecosystems. Water from upstream tributaries will be diverted to storm water treatment areas to reduce nutrient loading into the lake. In addition, the project will also address restoration of the hydrology of isolated wetlands by plugging connections to drainage ditches and diverting canal flows to adjacent wetlands and water resources problems in the Lake Istokpoga Drainage Basin through changes in the currently implemented Lake Istokpoga Regulation Schedule. Awaiting WRDA legislation authorization.

Purpose: The primary objective of the Lake Okeechobee Watershed (LOW) project is to increase aquatic and wildlife habitat in Lake Okeechobee by providing the capability to better manage water levels in Lake Okeechobee and to reduce nutrient loading into Lake Okeechobee. Lake Okeechobee is one of the primary sources of water for natural system areas of South Florida.

Location/Size/Capacity: This 10,281 acre above ground reservoir will provide a maximum storage capacity of 161,263 ac-ft at 16 ft average depth. The feature will be located in the C-41A sub basin within the Kissimmee River drainage basin. It will receive flow from and discharge back to the C-38 canal (Kissimmee River).

Initiative Status: Alternative Formulation

Cost: \$500 million (RE & Construction)

Documentation: Alternatives Formulation Briefing meeting read-ahead, Lake Okeechobee Watershed Project

Estimate of Water Quality Benefits

- Minimum: 4.5 mt/yr
- Maximum: 13.5 mt/yr
- Most Likely: 9 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Modeling period of record is 1965-2000; modeling assumed full implementation of LOPP recommended BMPs; as described in the 2004 LOPP.

Estimate of Water Quantity Benefits

- Minimum: 161,000 ac-ft
- Maximum: 161,000 ac-ft
- Most Likely: 161,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Period of record is 1965-2000

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Armando Ramirez; SFWMD; 561-686-2563

Northern Everglades – Potential Management Measure

Project Feature/Activity: Istokpoga Reservoir

Level: 4

General Description/Background: This project feature would consist of a reservoir located at Site I-17 as shown in Figure 1.

Purpose: The reservoir will provide a maximum storage capacity of 79,560 ac-ft at an average depth of 16 ft. It will receive inflow from and discharge back to the C-41A canal. A 500 cfs inflow pump will be needed to operate this reservoir. The reservoir would also provide approximately 7 mt/yr of P-load reduction.

Location/Size/Capacity: This 5,416 acre storage facility will be located in the C-40A and C-41A sub-basins of the Istokpoga sub-watershed, approximately 1200 ft south of the C-41A canal. The reservoir will provide a maximum storage capacity of 79,560 ac-ft at an average depth of 16 ft.

Initiative Status: This feature is a component of the LOW Project and therefore would be funded once the LOW Project Implementation Report is approved by Congress.

Cost: LOW Project planning level cost estimates for this feature include approximately \$50M for real estate and \$250 M for construction.

Documentation: Alternatives Formulation Briefing meeting read-ahead, Lake Okeechobee Watershed Project

Estimate of Water Quality Benefits

- Minimum: 3.5 mt/yr
- Maximum: 10.5 mt/yr
- Most Likely: 7 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Period of record is 1965-2000

Estimate of Water Quantity Benefits

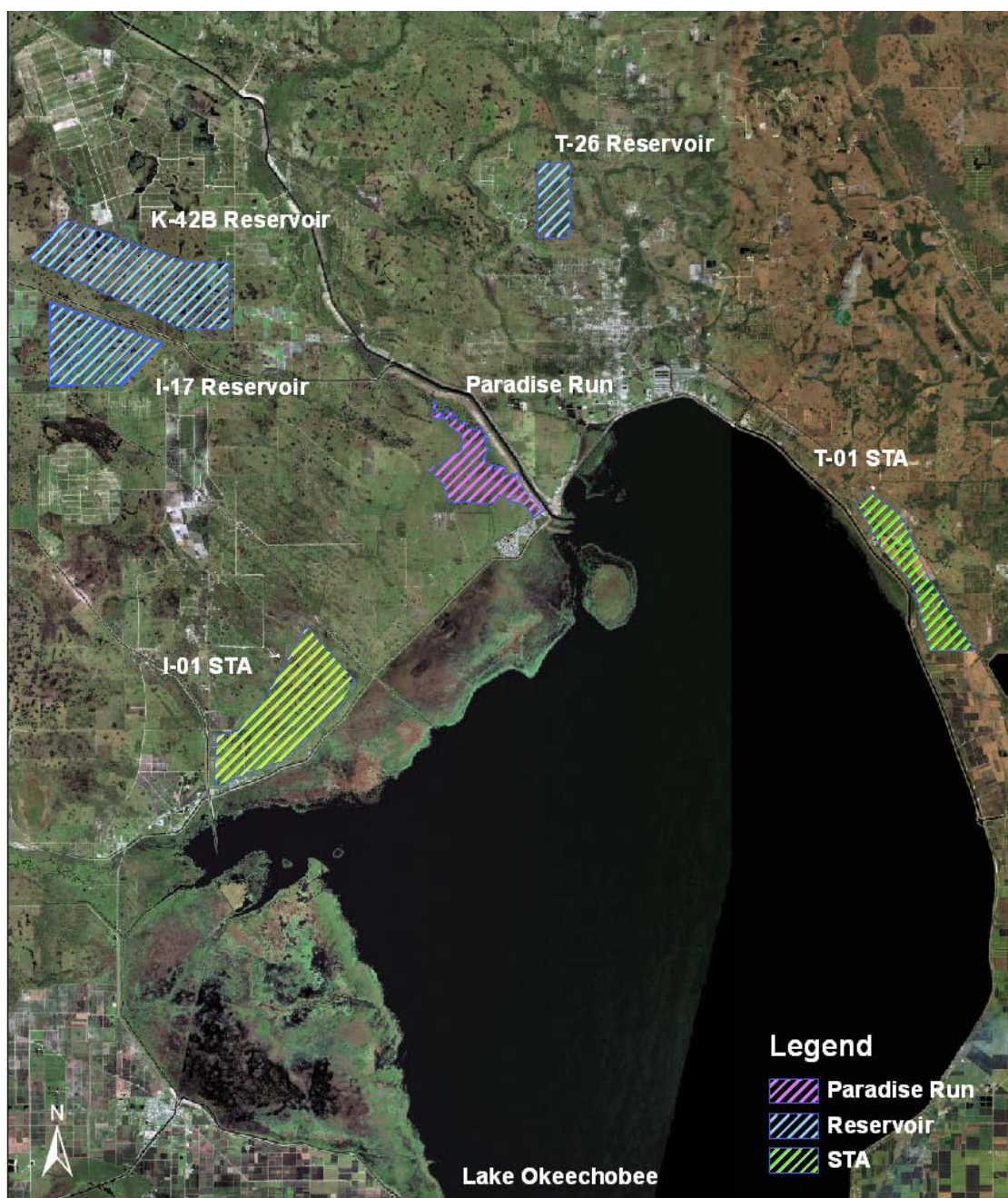
- Minimum: 79,560 ac-ft
- Maximum: 79,560 ac-ft
- Most Likely: 79,560 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Period of record is 1965-2000

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Armando Ramirez; SFWMD; 561-686-2563

Figure 1 – Location of Proposed Istokpoga Reservoir



Northern Everglades – Potential Management Measure

Project Feature/Activity: Istokpoga STA

Level: 4

General Description/Background: This project feature would consist of a STA located at Site I-01 as shown in Figure 1.

Purpose: This 8,044 acre treatment facility will be located in the L-49 subbasin of the Istokpoga sub-watershed, approximately 2,100 ft east of C-41 canal. The STA will receive flow from the C-41 canal and discharge treated water to Lake Okeechobee. It is expected to provide approximately 29.1 mt of annual average P-load reduction.

Initiative Status: This feature is a component of the LOW Project and therefore would be funded once the LOW Project Implementation Report is approved by Congress.

Cost: LOW Project planning level cost estimate for this feature include approximately \$65 M for real estate and \$ 150 M for construction.

Documentation: Alternatives Formulation Briefing meeting read-ahead, Lake Okeechobee Watershed Project

Estimate of Water Quality Benefits

- Minimum: 14.5 mt/yr
- Maximum: 43.5 mt/yr
- Most Likely: 29 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Period of record is 1965-2000

Estimate of Water Quantity Benefits

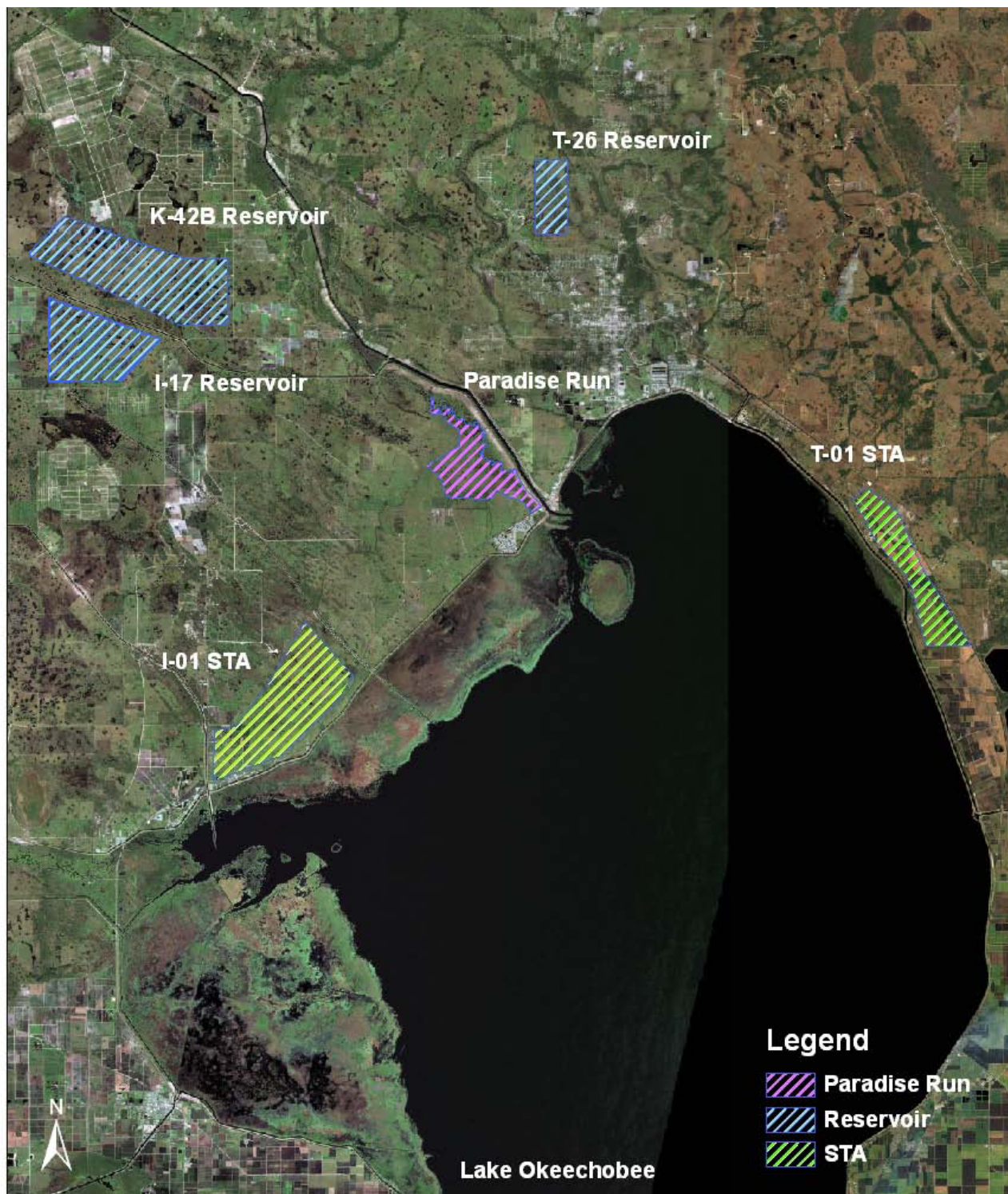
- Minimum: 10,860 ac-ft
- Maximum: 10,860 ac-ft
- Most Likely: 10,860 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Period of record is 1965-2000. STA storage volume based on 90 percent of footprint acreage x 1.5 ft standard operating depth.

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Armando Ramirez; SFWMD; 561-686-2563

Figure 1 – Location of Proposed Istokpoga STA



Northern Everglades – Potential Management Measure**Project Feature/Activity:** (Lake Okeechobee) In-Lake Dredging**Level:** 4

General Description/Background: In recent years, along the northwest corner of Lake Okeechobee, the near shore bottom has become covered by a layer of fine grained organic and inorganic sediments. These sediments have resulted in the elimination of Submerged Aquatic Vegetation (SAV) in the area around Eagle Bay Island. The South Florida Water Management District (SFWMD) is working to reestablish a suitable substrate in the Eagle Bay region for the growth of submerged vegetation, which in turn, will provide habitat for other aquatic biota. This project will design a sediment removal methodology to restore productive benthic conditions for SAV at Eagle Bay. The design will include features for protecting the restored area from future sediment deposition by internal redistribution and deposition from river inflows.

Purpose: The Eagle Bay Island Habitat Enhancement Dredging Project will provide true habitat restoration benefits to this near shore region of Lake Okeechobee and secondly will demonstrate conceptually a chosen technology for the effectiveness of mud sediment removal from the near-shore regions of the Lake. The chosen technology must be designed to minimize the amount of solids required for disposal, not cause excessive turbidity at the dredging site, and reduce the amount of phosphorus in return water to 40 ppb of total phosphorus (TP), while maintaining defined production rates. In addition, a project goal will be exploring technologies which would stabilize or retain mud sediments adjacent to the dredge site and prevent rapid re-burial of dredged areas.

Location/size/capacity: Eagle Bay Island is located in the northwest corner of Lake Okeechobee west of Taylor Creek and north of the Kissimmee River inlet. There is approximately 1.7 million cubic yards of invasive muck sediments located in this region.

Initiative Status: The preliminary Sediment Characterization Study has been completed for the Eagle Bay Island region. This data will be utilized in the current design phase of the project. Once design is complete the permit application process will begin. Mobilization of dredging equipment is slated for Fiscal Year 2008.

Cost: The Sediment Characterization Study was completed under a GES contract for \$150,000. The current design budget is \$700,000. The actual dredging portion of this project expected to be \$15-\$20 million.

Documentation: Lake Trafford Dredging Project, Feasibility Study by BBL

Estimate of Water Quality Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: The projected water load reduction does not count towards the TMDL

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: -1

Contact: Sam Palermo; SFWMD; 561-682-2581

Northern Everglades – Potential Management Measure

Project Feature/Activity: C-44 Littoral

Level: 4

General Description/Background: The creation of a littoral zone of native vegetation to “treat” for water entering the C-44 via the S308 can benefit Lake Okeechobee and the St Lucie Estuary. The project will maintain boat navigation through the lake.

Purpose: The C-43 canal receives a significantly larger volume of water the C44. However the loads entering the C44 are higher than the C43 because the C43 water passes through the Lakes natural littoral zone before leaving Lake Okeechobee. The manmade littoral zone for the C44 will uptake nutrients, remove particulate and provide wildlife benefits.

Location/size/capacity: Inside and parallel to the Herbert Hoover Dike from the S308 structure to the North (see photo)

Initiative Status: Idea.

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: NA

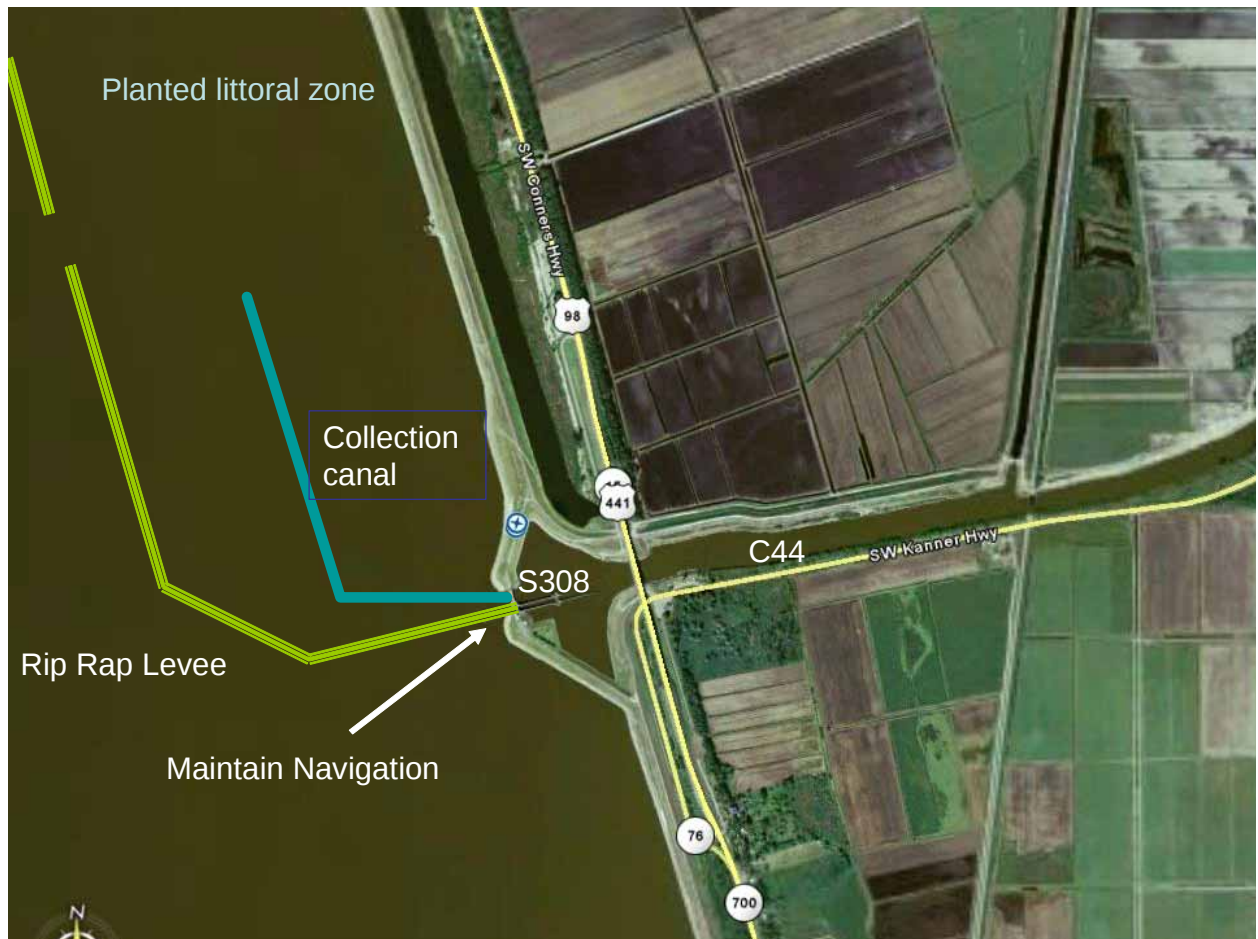
Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: 0
- Other Impacts: 0

Contact: Chad Kennedy; FDEP; 561-681-6706



Northern Everglades – Potential Management Measure

Project Feature/Activity: Easements

Level: 5

General Description/Background: Conservation Easements represent an alternative to fee simple acquisition of public lands. Under these less-than-fee simple interests, the District (or other partnering agency) acquires the right to conserve and protect resources on the property at a lesser cost to taxpayers, while keeping the land in private ownership and on the tax rolls. However, land acquired through less-than-fee usually doesn't allow for public access.

Purpose: The basic philosophy and purpose of a Conservation Easement is to preserve and retain land or water areas in their natural, scenic condition. This includes a wide range of goals such as conserving open space, water recharge areas, floodplains, wetlands, environmentally sensitive lands, wildlife habitat or historic features. Through the easement agreement, the landowner retains title to the land but gives up certain rights or uses. For example, a cattle rancher may enter into an agreement whereby he or she is allowed to continue cattle operations in existing areas of improved pasture and to conduct other activities such as hunting, fishing and hiking. Generally, these uses are to be undertaken in conformity with an approved management plan or other performance standards. The easement prohibits or limits activities that are detrimental to or inconsistent with the overall conservation and preservation purpose such as extraction of minerals, construction of improvements, development of residential communities and destruction of trees.

Conservation easements may provide some economic benefits to the adjacent landowners. In fact, studies suggest that properties located in close proximity to preserved lands retain their value better than properties that are not located near preserved lands. Landowners can also receive certain tax advantages for entering into a conservation easement. When making a land donation for a qualified conservation purpose, federal income tax deductions can be made. Internal Revenue Service (IRS) regulations require the property to have significant conservation values, and the property must meet IRS tax code provisions. Savings in estate taxes can be made when passing on land protected by a conservation easement. Though the payment of property taxes is still a responsibility of the landowner, a reduction in that amount is a possible tax benefit.

Additionally, if an owner does not wish to sell the subject property at the present time, he or she could offer the District a first-right-of-refusal. That gives the District the chance to try to buy the land in the future, if circumstances change and an owner decides to put the property on the market. These and other methods of resource protection planning can often solve the needs of the owner and also save part of Florida's natural or cultural heritage for the future.

It is important to remember that conservation easements must be properly managed in order to provide maximum benefits for people and the environment. The easements essentially create a public and private relationship of shared control over the future of the land. Though usually there

is no public access granted, the District is granted access to monitor and assure the landowner's compliance with the terms and conditions of the easement.

Through the use of conservation easements, landowners and the District are preserving land and protecting water resources. A conservation easement is a perpetual, legal agreement specifically tailored to meet the needs of both the landowner and the District, and transferred with the land from owner to owner when the property is sold.

In addition to the previously described conservation easements that are acquired by the District through purchase or donation, "regulatory conservation easements" represent another category that are acquired by the District as an offset to environmental impacts from development. Most land developments require permits from the District to ensure that development will not: degrade water bodies; cause flooding; or adversely impact wetlands or other natural resources. To protect wetlands or to offset impacts from permitted construction projects, the wetlands that remain on a permitted property, along with natural areas bordering them, often are placed in a conservation easement. Conservation easements are often granted as part of a District approved mitigation plan. Frequently, these easements are located on or behind future developable land.

Location/size/capacity: Within Northern Everglades watersheds are defined by legislation.

Initiative Status: Programs are currently being implemented by federal and state agencies, special districts, local governments, and non-governmental organizations. Examples of programs include the Wetland Reserve Program, Florida Forever, Save Our Rivers, Martin County Greenways Program, and the Nature Conservancy.

Cost: Negotiated easements are based upon appraised values. With property values continuing to increase throughout the Northern Everglades project area, adequate funding continues to be a critical issue.

Documentation: Due to the general nature of this Management Measure, there is no specific documentation.

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: Land protected through easements will maintain water quality associated with existing land use.

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD

- Level of Certainty: Conceptual
- Assumptions: Land protected through easements will maintain water quantity associated with existing land use.

Screening Criteria

- Proof of Concept: 0
- Other Impacts: 0

Contact: John Morgan; SFWMD; 561-681-2563 *3703

Northern Everglades – Potential Management Measure

Project Feature/Activity: Lake Hicpochee

Level: 4

General Description/Background: The Lake Hicpochee Project is located on approximately 7500 acres which is currently in private ownership. This project comprises a reservoir and stormwater treatment area along the C-19 and C-43 Canals, degradation of berms, and exotic removal and control. This project could potentially create 55,090 ac-ft of above ground storage.

Purpose: The project objectives are to restore the ecological functioning of Lake Hicpochee. Some of the benefits that would be achieved are use of less water during the dry season due to altered operation of water levels which might involve higher water levels during the wet season and lower wet season and lower water levels during the dry season that currently occurs. Slowly drawing down the pool during the dry season would provide more water for the estuary during that time of year. Additional benefits include improved areas for potential recreation and public use, improvement of an already diverse area of wildlife, and improvement of lake fisheries.

Location/Size/Capacity: The project is located in Glades County, directly west of Lake Hicpochee on the west side of C-19 north of the Lake and along the Caloosahatchee River on the south side, west of the Lake. The project components include a reservoir and STA, degradation of berms, exotic plant removal, stormwater treatment areas, canals, embankments, structures, roads, and the temporary reconfiguration of TIWCD canals:

Initiative Status:

- | | |
|--|-----|
| • Advance planning phase and associated field work | TBD |
| • PIR/BODR | TBD |
| • Preliminary Plans and specifications | TBD |
| • Intermediate Design for the PS and Reservoir | TBD |
| • Intermediate Design for the STA | TBD |
| • Pre-final Design | TBD |

Cost: Not yet determined

Documentation: For more information, please see Evergladesplan.org, C-43 Basin Storage Reservoir Project

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown

- Assumptions: It is assumed that there will be some level of water quality treatment by simply holding water for a period of time before releasing in to the river. Level of treatment is unknown at this time.

Estimate of Water Quantity Benefits

- Minimum: 21,490 ac-ft of above ground storage (2,880 acres)
- Maximum: 55,090 ac-ft of above ground storage (7,500 acres)
- Most Likely: 21,490 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Acquisition of approximately 7500 acres immediately adjacent to Lake Hicpochee.

Screening Criteria

- Proof of Concept: 0
- Other Impacts: 1

Contact: Janet Starnes; SFWMD; 239-338-2929 *7735

Northern Everglades – Potential Management Measure

Project Feature/Activity: C-43 Distributed Reservoirs

Level: 4

General Description/Background: The Caloosahatchee Water Management Plan and preliminary work on the Caloosahatchee.

Purpose: The project objectives are to capture excess run-off within the West Lake Okeechobee Watershed which will then be operated to achieve both environmental flows to the Caloosahatchee Estuary and agricultural demands in the West Lake Okeechobee Watershed (Lake Okeechobee Service Area [LOSA]).

Location/Size/Capacity: The reservoirs are located in Hendry and Glades counties. Between Lake Okeechobee and S-78 (Ortona Lock and Dam). The project components include up to 4 reservoirs with a total storage capacity of 85,410 ac-ft.

- Reservoir (up to
 - Acreage
 - Water Depth
 - Storage volume 85,410 ac-ft (total all reservoirs)
 - Embankment length
 - Pump Station

Initiative Status:

- | | |
|--|-----|
| • Advance planning phase and associated field work | TBD |
| • BODR | TBD |
| • Preliminary Plans and specifications | TBD |
| • Intermediate Design for the PS and Reservoir | TBD |
| • Intermediate Design for the STA | TBD |
| • Pre-final Design | TBD |

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Unknown
- Assumptions: TBD

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: TBD

Screening Criteria

- Proof of Concept: NA
- Other Impacts: NA

Contact: Janet Starnes; SFWMD; 239-338-2929 *7735

Northern Everglades – Potential Management Measure

Project Feature/Activity: Upper Kissimmee/Chain of Lakes Reservoir

Level: 4

General Description/Background: Under the 2005/2005 Kissimmee Basin Water Supply Plan the District identified a project to investigate the feasibility of diverting surface water from the upper basin lakes and tributaries for the purpose of meeting future public water supply demands in central Florida. SFWMD has begun the Kissimmee River/Chain of Lakes Water Supply Feasibility Study. In addition, recent Consumptive Use Permits issued to local utilities requires them to investigate and build, if feasible, a water supply facility on the Kissimmee River/Chain of Lakes system.

Purpose: Supplying surface water from the Kissimmee valley lakes and tributaries for water supply is considered the most viable water supply project in the basin and has been identified priority project with the District. A storage reservoir or ASR is expected to be a component of any withdrawal facility to improve reliability. Reductions in p-loads would be incidental to the water diverted for consumption.

Location/Size/Capacity: Potential locations of the storage reservoirs or withdrawal facilities are currently be evaluated under the feasibility study, but are most likely to be needed in the area Lake Toho and Lake Kissimmee. Initial design estimates of water supply demand will center around 30 mgd with subsequent estimates reaching between 65 and 80 mgd of demand by 2030. System construction is desired to begin by 2013.

Conceptual design of a 25–30 mgd facility requires approximately 10,000 ac-ft of storage with a diversion of approximately 38,500 ac-ft/yr from the surface water system. A long term design of 65-80 mgd would be proportionally higher.

Initiative Status: Feasibility evaluation phase with an expected deliver date of February 2008. Reservoir and project sighting is expected concurrent with the northern everglades project.

Costs: Planning level cost estimates for a 30 mgd facility withdrawing from Lake Toho using a 9,000 ac-ft reservoir were estimated at \$42 million dollars. The cost estimate is deemed low due to a low land cost value.

Documentation: For more information, please see 2005/2006 Kissimmee Basin Water Supply Plan – Appendices F and I.

Estimate of Water Quality Benefits

- Minimum: 0.40 mt/yr
- Maximum: 1.1 mt/yr
- Most Likely: 0.72 mt/yr

- Level of Certainty: Conceptual
- Assumptions: Nutrient load reduction estimates based on annual average flows and loads and assume a 600 acre reservoir at 15 ft depth.

Estimate of Water Quantity Benefits

- Minimum: 9,000 ac-ft
- Maximum: 9,000 ac-ft
- Most Likely: 9,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Assuming a 600 ft footprint and 15 ft deep.

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Dave Anderson; SFWMD; 561- 682-6717

Northern Everglades- Potential Management Measure

Project Feature/Activity: Compartmentalization of Lake Okeechobee

Level: 5

General description/Background:

Purpose: The idea is to partition the lake into one or two eastern storage compartments that maximize water storage and isolate poor inflow water quality, while managing the western littoral zone for maximum environmental benefits. Considering the magnitude of the high discharge problem, the current and growing land costs, and the rising economic impacts from damaging discharges to the estuaries, this idea may be the most cost-effective way of achieving massive storage capacity.

Location/size/capacity: Located inside the Herbert Hoover Dike and within the mud zone of Lake Okeechobee. Size to be determined but could exceed 2-3 million ac-ft depending on footprint and maximum depth. Cost/benefit analysis necessary to identify the most cost-effective geometry.

Initiative status: Conceptual. Initial hydrologic modeling was done as part of the 1999 Central and Southern Florida Project Comprehensive Review Study. Further feasibility-level analysis needed to quantify benefits, adverse impacts, and costs.

Cost : TBD; probably several billion dollars. Minimal real estate costs.

Documentation: Conceptual idea documented in two reports:

1. An Assessment of Water Resource Management in the Central and Southern Florida Flood Control District. A report prepared for the USACE by Atlantis Scientific in 1973.
2. Central and Southern Florida Project Comprehensive Review Study, Final Integrated Feasibility Report and Programmatic Environmental Impact Statement. USACE and SFWMD. April, 1999.

Estimate of Water Quality Benefits

- Minimum: Reduced sediment re-suspension impacts to Littoral Zone
- Maximum: Decreased P-load to Littoral Zone and estuaries.
- Most Likely: Better management of water levels in the Littoral Zone (promotes better plant growth and stability, light penetration, and reduces high water impacts). Eliminates environmental damage from high Lake O discharges.
- Level of Certainty: Promising. Has been modeled to estimate water quantity benefits to estuaries, Lake O littoral zone, and water supply. No water quality analysis yet.
- Assumptions: Wet years will continue and require more storage capacity to reduce damage to estuaries and the Lake ecosystem, and to reduce risk of failure of the HH Dike.

Estimate of Water Quantity Benefits

- **Minimum:** Amount of benefits depends on magnitude of storage capacity constructed. Benefits Lake littoral zone, estuary ecology, flood protection for Herbert Hoover Dike, and water supply.
- **Maximum:** Amount of benefits depends on magnitude of storage capacity constructed. Could eliminate Lake O high discharge impacts to the Estuaries and provide optimal water level management for the Lake O littoral zone.
- **Most Likely:** Significant reduction in Lake O high discharges to the Estuaries, better management of water levels in the Lake O littoral zone, improved water supply capability for the region, including environmental water supplies for the Everglades and Estuaries.
- **Level of Certainty:** High. The construction technology exists and similar efforts have been done. For example, in the early 1930's the Netherlands built the 20-mile long Afluitskijk, an earthen dam which separated a salt water inlet of the North Sea and turned it into the fresh water lake of the IJsselmeer
- **Assumptions:** Wet years will continue and require more storage capacity to reduce damage to estuaries and the Lake ecosystem, and to reduce risk of failure of the Herbert Hoover Dike.

Screening Criteria

- **Proof of Concept:** Screening-level hydrologic modeling shows the in-lake storage concept performs similar to the north-of-the-lake storage.
- **Other Impacts:** Need to be evaluated through feasibility-level analysis. Lake circulation pattern changes need to be analyzed.

Contact: Cal Neidrauer, P.E., Chief Engineer, Operations Department, SFWMD.

Northern Everglades – Potential Management Measure

Project Feature/Activity: Agricultural BMPs - Additional Agricultural BMPs (Urban Rollup)

Level: 1

General Description/Background: This is an advanced level of BMPs with chemical treatment, plus retention/detention pond to treat discharge from higher P loading land uses.

Purpose: To treat water and reduce phosphorus loads at source

Location/Size/Capacity: All basins north of Lake Okeechobee

Initiative Status: Starting implementation in 2010

Cost: 143.6 million capital and 86.1 O&M cost from 2010 to 2015

Documentation: For more information, please see Table 6 from 2007 LOPP Update.

Estimate of Water Quality Benefits

- Minimum: 36 mt/yr
- Maximum: 36 mt/yr
- Most Likely: 36 mt/yr
- Level of Certainty: Conceptual
- Assumptions: It was calculated based on phosphorus concentrations after implementing typical cost-share BMPs. It was applied to citrus, dairy, row crop, ornamentals, and sod

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: Joyce Zhang; SFWMD; 561- 682-6341

Northern Everglades – Potential Management Measure

Project Feature/Activity: Watershed Phosphorus Source Control Projects

Level: 1

General Description/Background: It includes about 30 ongoing multi-year projects under phosphorus source control grant, dairy best available technology, former dairy remediation, and alternative water storage programs.

Purpose: To treat water and reduce phosphorus loads at source

Location/Size/Capacity: Mainly in the four priority basins (lower Kissimmee, TCNS, and IP)

Initiative Status: Completed and operational

Cost: 1.3 million for O&M cost per year

Documentation: For more information, please see Table 6 from 2007 LOPP Update

Estimate of Water Quality Benefits

- Minimum: 31 mt/yr
- Maximum: 31 mt/yr
- Most Likely: 31 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Calculated based on the existing (current) phosphorus concentrations

Estimate of Water Quantity Benefits:

- Minimum: Incidental
- Maximum: Incidental
- Most Likely: Incidental
- Level of Certainty: Conceptual
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: Joyce Zhang, SFWMD, 561- 682-6341

Northern Everglades – Potential Management Measure

Project Feature/Activity: S-154 Basin Deep Injection Well

Level: 4

General Description/Background: Construction of a deep injection well system upstream of the intersection of the S-154 connection to the C-38 Canal.

Purpose: Water and Phosphorus load disposal.

Location/Size/Capacity: Specific location and size as of yet undetermined. A 4-well cluster with a 1,000 acre foot storage pond to optimize the removal of flow and well operation.

Initiative Status: TBD

Cost: \$60,000,000

Estimate of Water Quality Benefits

- Minimum: 11 mt/yr
- Maximum: 11 mt/yr
- Most Likely: 9 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Used results from the Disposal Well Simulation Model (DWSM). A simple model developed in STELLA™. (See appendix). Monthly flow values for S-154 from 1972 to 2007. P concentration 451 ppb. Flow to storage pond limited only by spare capacity to pond. No evaporation or rainfall. Four wells at 10 mgd (123 ac-ft) as minimum. Four wells at 17 mgd (209 ac-ft/day) as maximum. Most likely value is the average of these two results.

Estimate of Water Quantity Benefits

- Minimum: 15,000 ac-ft
- Maximum: 25,000 ac-ft
- Most Likely: 19,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions: See above.

Screening Criteria

- Proof of Concept:
- Other Impacts:

Contact: Bob Verrastro; SFWMD; 561-682-6139 and Tom James; SFWMD; 561-682-6356

Northern Everglades – Potential Management Measure

Project Feature/Activity: Construction of S-64 structure on C-37

Level: 5

General Description/Background: This project was part of the original design for the C&SF Project

Purpose: This project has the potential to allow greater flexibility for lake management in the upper basin. It may be possible to perform draw downs of Lake Toho without also drawing down Lake Kissimmee.

Location/Size/Capacity: TBD

Initiative Status: Conceptual

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Unknown
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: John Morgan; SFWMD; 561-681-2563 *3703

Northern Everglades – Potential Management Measure

Project Feature/Activity: Rolling Meadows/Catfish Creek Restoration

Level: 3

General Description/Background: Rolling Meadows/Catfish Creek is located on the south end of Lake Hatchineha on SFWMD/FDEP owned land. This project would include hydrologic restoration of Catfish Creek and the creation of an impoundment to restore littoral wetlands.

Purpose: Creation of a wetland can potentially hold excess water in the Kissimmee Upper Basin as well as remove phosphorus by assimilation in the impounded wetland.

Location/Size/Capacity: TBD

Initiative Status: Conceptual. Rolling Meadows/Catfish Creek may already be funded under another separate project.

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: < 1 mt/yr
- Maximum: < 1 mt/yr
- Most Likely: < 1 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Hydrologic restoration of littoral wetlands will have incidental water quality benefits.

Estimate of Water Quantity Benefits

- Minimum: 1,200 ac-ft
- Maximum: 6,000 ac-ft
- Most Likely: 2,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions:

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Dave Anderson; SFWMD; 561-682-6717

Northern Everglades – Potential Management Measure

Project Feature/Activity: Istokpoga Creek Reservoir

Level: 5

General Description/Background: A reservoir could be constructed on District-owned land north of the Istokpoga Canal.

Purpose: The purpose of the reservoir is to create extra storage during times of excess water. Water could be withdrawn via Istokpoga Canal from either Lake Istokpoga or the Kissimmee River (under periods of high flow). The reservoir would then serve as a source of water to the Kissimmee River, Lake Istokpoga, or downstream water-users during periods of less abundant rainfall.

Location/Size/Capacity: A 2,000 acre reservoir could be site at this location on the Putnam Ranch site owned by the District.

Initiative Status: Conceptual

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: 0.63 mt/yr
- Maximum: 1.4 mt/yr
- Most Likely: 1.1 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Conceptual load reduction estimates based on annual average flows and loads.

Estimate of Water Quantity Benefits

- Minimum: 27,000 ac-ft
- Maximum: 27,000 ac-ft
- Most Likely: 27,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Based on 90 percent footprint acreage X footprint at 15 ft depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: David Anderson, SFWMD, 561-682-6717

Northern Everglades– Potential Management Measure

Project Feature/Activity: Alternative Water Storage in Indian Prairie Region

Level: 5

General Description/Background: Utilize the existing water management system in the Indian Prairie Region and strategically locate, design, and engineer a facility to maximize water storage, meet regional water supply needs, and limit the discharges to the Lake for flood protection only. Prior to the implementation of the Central and Southern Florida Flood Control system Lake Okeechobee received the majority of its water from the Kissimmee Region, Fisheating Creek, and direct rainfall. Today the Kissimmee Region, Fisheating Creek, and Lake Istokpoga can account for about 70 percent of Lake Okeechobee's water budget. Other basins such as Indian Prairie, Taylor Creek, and Nubbin Slough only contributed runoff to the Lake during extreme events. The current water management system in the Indian Prairie Region has altered the timing of discharge and subsequently increased runoff rates to the Lake while losing the storage capacity that historically existed within the area. From 1991 through 2005 more than 2.5 million ac-ft of water delivered to the Lake (excluding rainfall) and 514 metric tons of phosphorus of which the Indian Prairie region contributed 242,000 ac-ft of discharge and 87 metric tons of phosphorus.

Purpose: Maximize water storage and meet all water supply needs within the region by limiting discharges to the Lake to when a standard level of flood protection is needed. This system would have the potential to reduce phosphorus loads from by nearly 100 percent. Additional benefits would include minimizing discharges to the estuaries, providing regional water management options for alternative water supplies such as drinking water and agricultural irrigation, and improving the ecological health of the Lake by providing more flexibility in managing discharges to the Lake.

Location/size/capacity: Indian Prairie Region 320,000 acres (C-40, C-41, C-41A, S-127, S-129, L-59E, L-59W, L-60E, L-60W, L-61E, L-61W, S-131, Nicodemus Slough Culvert 5)

Initiative Status: concept

Cost: Potential \$650 million based on \$12,000 per acre real estate cost and \$13,000 per acre in construction costs.

Documentation: N/A

Estimate of Water Quality Benefits

- Minimum: 52 mt/yr /yr assuming a wet year and a standard level of flood protection is needed. In this case 25 percent of the regions discharge along with 40 percent of the total load gets to the Lake.
- Maximum: 87 mt/yr assuming no discharge to the Lake

- Most Likely: 78 mt/yr assuming only 10 percent discharge and 10 percent of the phosphorus load from the region gets to the Lake due to the need for flood protection.
- Level of Certainty: Conceptual
- Assumptions: Maximizing water storage, closed system, discharges for flood protection only.

Estimate of Water Quantity Benefits

- Minimum: 182,000 ac-ft of storage assuming 75 percent of the total discharge to the Lake is captured within the basin during a wet year and a standard level of flood protection is needed.
- Maximum: 242,000 ac-ft of storage assuming 100 percent of the 15 year average discharge is captured.
- Most likely: 218,000 ac-ft of storage assuming 90 percent of the 15 year average discharge is captured and a minimum level of flood protection is needed.
- Level of Certainty: Conceptual
- Assumptions: Based on 15 year period of record discharge rates for the region.

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Gary Ritter; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Nicodemus Slough STA

Level: 4

General Description/Background: Fisheating Creek is the only free flowing tributary to Lake Okeechobee and it drains approximately 289,366 acres of the Lake Okeechobee Watershed (LOW). Current average annual phosphorus loading from the creek to the lake, based on measured loads from 1991 to 2005 is approximately 54.70 mt/yr. Several P-load reduction initiatives are planned for the FEC watershed under LOPP and these projects are projected to cumulatively reduce roughly 15.5 mt/yr of load, which leaves approximately 39.5 mt/yr of incoming load. To achieve the Lake Okeechobee phosphorus TMDL a large fraction of this load will have to be removed as part of the Phase II Technical Plan implementation. One or more stormwater treatment areas (STA) could be considered for providing the required load reduction.

Purpose: The proposed Nicodemus Slough STA would provide significant load reduction. Since this feature would draw water from close to the mouth of the creek, it would be able to treat loads from the entire drainage basin.

Location/Size/Capacity: The proposed STA would be located on the 6,500 acre sugarcane plantation located towards the southern end of the slough (Figure 1). This location would ensure that the proposed STA would be not impact any of the known cultural resource sites in the slough and would also protect the swallow tail kite populations that use the slough for foraging and breeding.

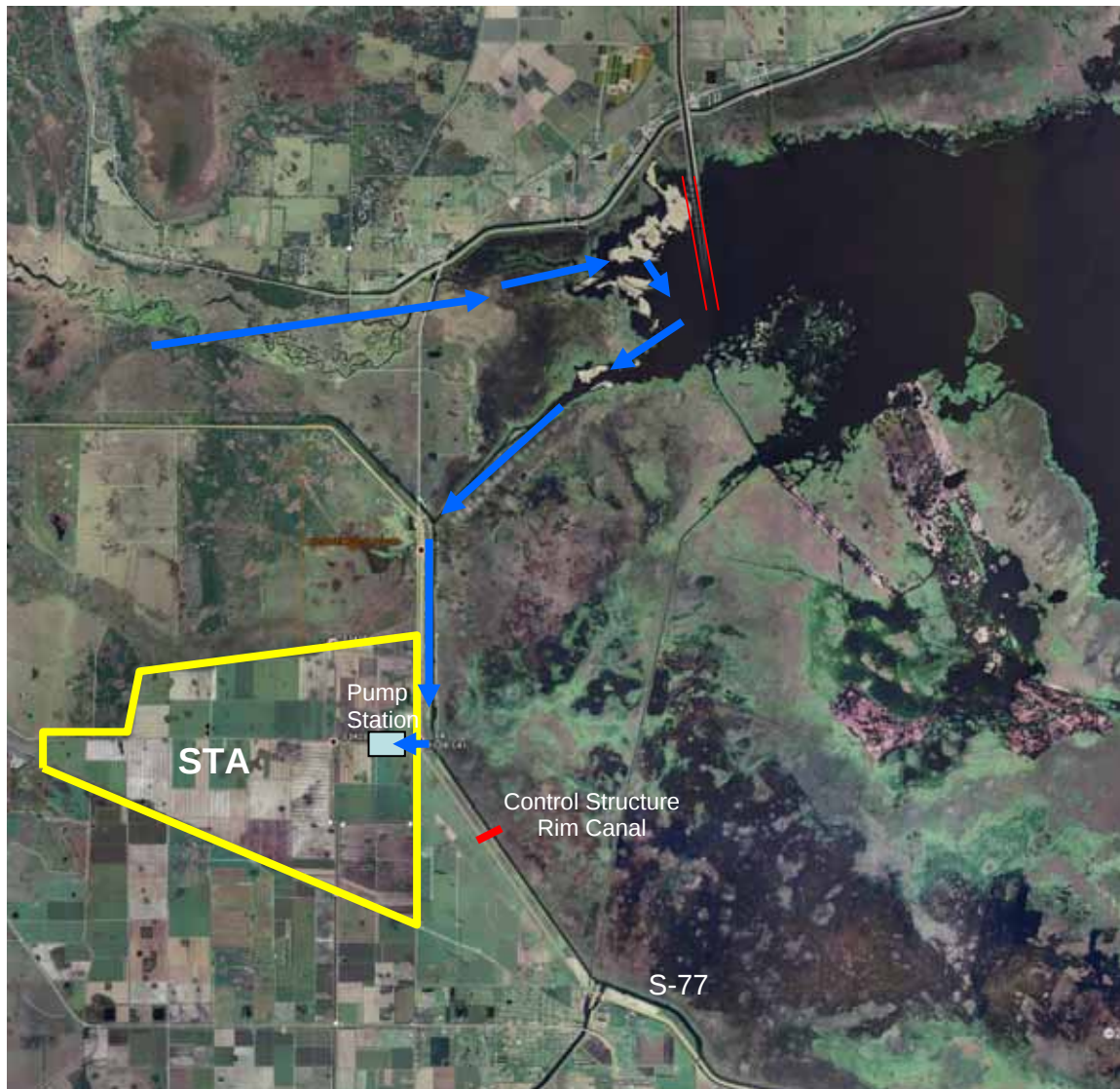
The proposed configuration has been adopted from the LOW Project. The STA would consist of which would consist of a 6,300 acre STA consisting of 75 percent emergent macrophyte (EMA) cell coupled with a 25 percent submerged aquatic vegetation (SAV) cell. To avoid navigation impacts in the Creek likely to be associated with constructing an inflow structure within the creek, an alternative flow path as shown in Figure 1 could be considered. This alternative flow path has the added advantage of allowing for lake water to be pumped to the STA to prevent dehydration.

Initiative Status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: LOW Project planning level estimated costs for this configuration are close to \$200 Million.

Documentation: For additional information, refer to LOW Project document entitled: *“Fisheating Creek Alternative Plan Evaluation Document, Prepared by HDR Engineering, Inc for the South Florida Water Management District, March 2006.”*

Figure 1 – Location of Proposed Nicodemus Slough STA



Estimate of Water Quality Benefits

- Minimum: 15 mt/yr
- Maximum: 30 mt/yr
- Most Likely: 25 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Phosphorus load reduction estimates are planning level projections; Period of record is 1965 to 2000.

Estimate of Water Quantity Benefits

- Minimum: 8,505 ac-ft
- Maximum: 8,505 ac-ft
- Most Likely: 8,505 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Storage volume based on 90 percent footprint acreage X 1.5 ft standard operating depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: David Unsell; SFWMD; 561- 682-6888

Northern Everglades – Potential Management Measure

Project Feature/Activity: Fisheating Creek Managed Aquatic Plant Systems

Level: 4

General Description/Background: Fisheating Creek is the only free flowing tributary to Lake Okeechobee and it drains approximately 289,366 acres of the Lake Okeechobee Watershed (LOW). Current average annual phosphorus loading from the creek to the lake, based on measured loads from 1991 to 2005 is approximately 54.70 mt/yr. Several P-load reduction initiatives are planned for the FEC watershed under LOPP and these projects are projected to cumulatively reduce roughly 15.5 mt/yr of load, which leaves approximately 39.5 mt/yr of incoming load. To achieve the Lake Okeechobee phosphorus TMDL a large fraction of this load will have to be removed as part of the Phase II Technical Plan implementation.

Treatment units consisting of managed aquatic plant systems could be considered for siting in this sub-watershed at selected locations. Such units would be used in conjunction with source control practices to treat agricultural runoff with high phosphorus loads. MAPS units would also be susceptible to periodic dry outs due to low flows in the creek. But these systems would get rehydrated and become functional much faster than a STA would.

Purpose: The MAPS would target flows and load from a specific portion of the drainage basin and provide a certain amount of localized load reduction.

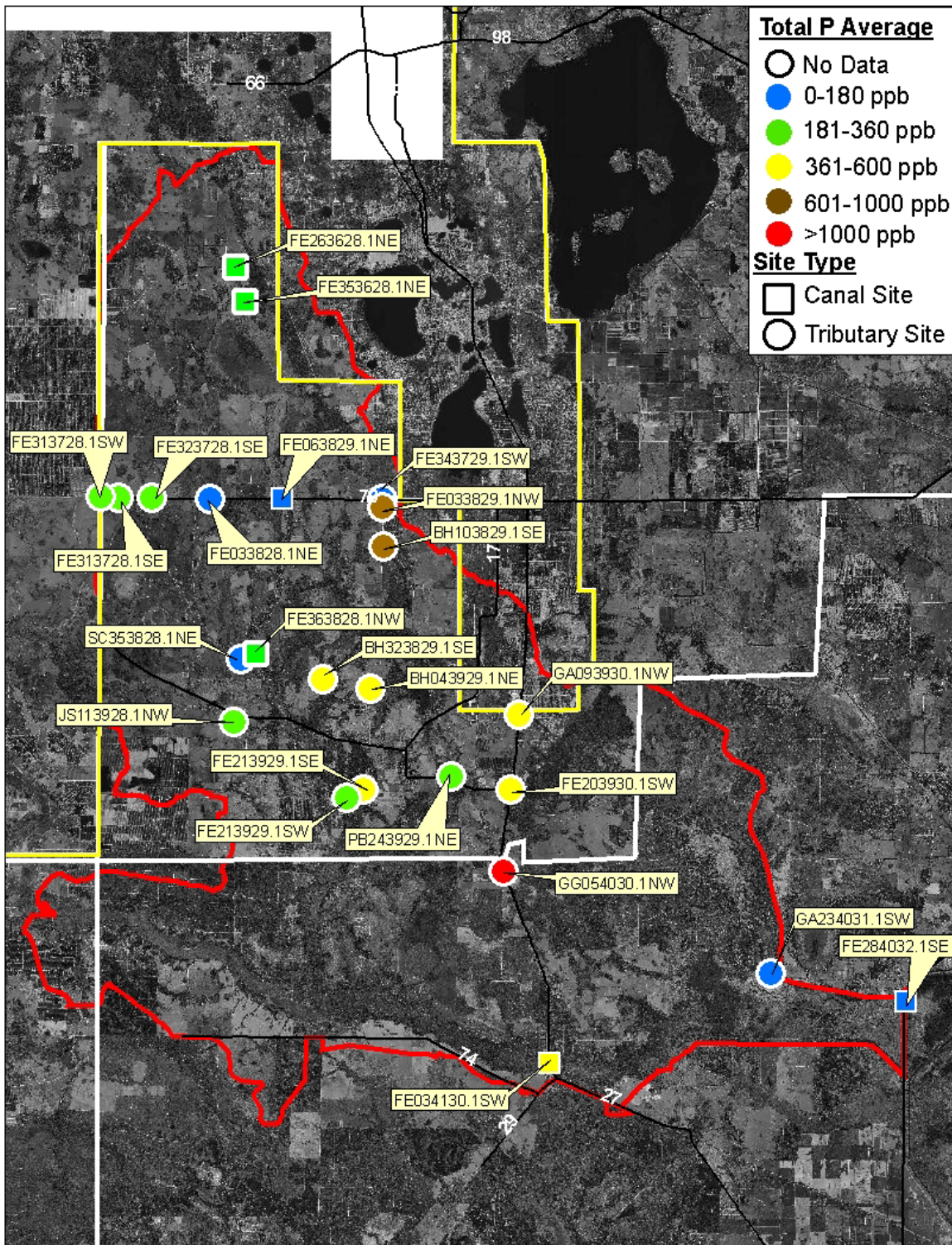
Location/ Size/Capacity: A potential location for siting such units could be the area around the headwaters of the creek near Henscratch Ranch (Site FE35362812 in Figure 1) where concentrations as high as 454 ppb have recently been detected. Locations in the vicinity of Route 70 (Site FE033829.1NW) have also been shown to have relatively high P concentrations and could be considered for siting a MAPS. A typical 25 mgd module with a 300 ft flow-way needs approximately 18 acres of land (12 acres for siting the facility and 6 acres for supporting infrastructure) and removes about 0.75 mt/yr of P (based on an inflow concentration of 80 ppb).

Initiative Status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: Planning level cost estimate of capital costs for a 25MG is approximately \$200,000.

Documentation: For additional information, refer to LOW Project document entitled: *“Fisheating Creek Alternative Plan Evaluation Document, Prepared by HDR Engineering, Inc for the South Florida Water Management District, March 2006.”*

Figure 1 – Location of Proposed FEC MAPS



Estimate of Water Quality Benefits

- Minimum: 0.50 mt/yr
- Maximum: 1 mt/yr
- Most Likely: 0.75 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Water quality benefits are estimated for one 25 mgd module. Multiple modules can be linked together to get increased benefits.

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: -1
- Other Impacts: 0

Contact: David Unsell; SFWMD; 561- 682-6888

Northern Everglades – Potential Management Measure

Project Feature/Activity: Fisheating Creek RASTA 1

Level: 4

General Description/Background: Fisheating Creek is the only free flowing tributary to Lake Okeechobee and it drains approximately 289,366 acres of the Lake Okeechobee Watershed (LOW). Current average annual phosphorus loading from the creek to the lake, based on measured loads from 1991 to 2005 is approximately 54.70 mt/yr. Several P-load reduction initiatives are planned for the FEC watershed under LOPP and these projects are projected to cumulatively reduce roughly 15.5 mt/yr of load, which leaves approximately 39.5 mt/yr of incoming load. To achieve the Lake Okeechobee phosphorus TMDL a large fraction of this load will have to be removed as part of the Phase II Technical Plan implementation.

Due to the extremely flashy nature of flows in this sub-watershed standalone STA's would not provide load reduction benefits for a large part of the year. Therefore reservoir assisted stormwater treatment areas are recommended for consideration. The reservoir component would capture and store peak flows and provide the STA with a sustained source of water for a much larger part of the year.

Purpose: This RASTA would provide significant load reduction in the northern part of the sub-watershed.

Location/Size/Capacity: A 12,000 acre RASTA consisting of 3,000 acre reservoir (@10 ft deep) and 9,000 acre STA is proposed for siting in the upper reaches of Fisheating Creek.

Initiative Status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Documentation: For additional information, refer to LOW Project document entitled: *“Fisheating Creek Alternative Plan Evaluation Document, Prepared by HDR Engineering, Inc for the South Florida Water Management District, March 2006.”*

Estimate of Water Quality Benefits

- Minimum: 16 mt/yr
- Maximum: 28 mt/yr
- Most Likely: 22 mt/yr
- Level of Certainty: Conceptual
- Assumptions: POR is 1965 to 2000

Estimate of Water Quantity Benefits

- Minimum: 39,150 ac-ft
- Maximum: 39,150 ac-ft
- Most Likely: 39,150 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Reservoir storage volume based on 90 percent area X 10 ft depth; STA storage volume based on 90 percent footprint acreage X 1.5 ft standard operating depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: David Unsell; SFWMD; 561- 682-6888

Northern Everglades- Potential Management Measure

Project Feature/Activity: Florida Power and Light Martin Cooling Pond

Level: 3

General Description/Background: The Florida Power and Light Martin Cooling Pond is a 7,000 acre impoundment that provides power plant cooling water. Originally designed to store water at elevation 37 ft NGVD 29, the maximum storage capacity of the impoundment is 95,000 ac-ft. The current maximum impoundment elevations authorized by permit are: dry season - 33.67 ft; wet season 32.83 ft. The impoundment carries a high hazard classification. Rainfall is the primary source of water for the impoundment and withdrawals from the C-44 canal provide make up water to maintain authorized water elevations in the impoundment.

Purpose: Reduce harmful discharges to the St. Lucie Estuary by diverting Lake Okeechobee regulatory discharges to the Martin Cooling Pond. Approximately 29,190 ac-ft (9.5 billion gallons) could be diverted to the impoundment if the maximum elevation were increased to 37'.

Location/Size/Capacity: North of the C-44 Canal, east of the L-65 Canal, and west of Indiantown in Martin County. The pond is a 7,000 acre impoundment and the maximum storage capacity of the impoundment is 95,000 ac-ft.

Initiative Status: A feasibility study (cost shared with Florida Power and Light) has been completed. Capital improvements to the embankments, seepage management system, and emergency spillway are necessary to meet regulatory criteria at elevation 37'. Federal and state regulatory approvals would be necessary to increase the water levels in the impoundment. Shared use of the impoundment raises policy issues which will need to be addressed by both SFWMD and FPL. The results of the feasibility study will be presented to the Governing Board and staff will request direction regarding this proposed partnership project.

Cost: Cooling pond and emergency spillway capital improvements are estimated at \$50 million (rough order of magnitude). Seepage management system improvements require further analysis before cost estimates can be developed. FPL's operations and maintenance costs are estimated to increase by approximately \$1 million per year.

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: Lake Okeechobee discharges diverted to the impoundment will not be discharged back into the system and phosphorus load will be assimilated in the impoundment. Diverting discharges to the impoundment can help in maintaining the estuary salinity target.

Estimate of Water Quantity Benefits

- Minimum : 29,190 ac-ft
- Maximum: 43,000 ac-ft
- Most Likely: 29,190 ac-ft every other year
- Level of Certainty: Conceptual
- Assumptions: High lake levels result in regulatory discharges to C-44 canal, power plant consumptive use, impoundment evaporation, and seepage losses.

Screening Criteria

- Proof of Concept:
- Other Impacts:

Contact: John Morgan; SFWMD; 561-681-2563 *3703

Northern Everglades- Potential Management Measure

Project Feature/Activity: Wastewater & Stormwater Master Plans

Level: 4

General Description/Background: Initiative to work with entities (e.g. Cities and Counties) in the Lake Okeechobee basin responsible for wastewater & stormwater programs. Work with those entities to review existing wastewater & stormwater Master Plans to identify planned or possible projects that will provide additional phosphorus reductions that could be implemented in the service area.

Purpose: Implement urban stormwater retrofitting projects or wastewater projects to achieve additional phosphorus reductions and water storage.

Location: Basinwide

Initiative Status: Not initiated

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: Urban Rollup
- Maximum: Urban Rollup
- Most Likely: Urban Rollup
- Level of Certainty: Unknown
- Assumptions: Projected benefits will roll up under urban category

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Projected benefits will roll up under urban category

Screening Criteria

- Proof of Concept:
- Other Impacts:

Contact: Frank Nearhoof; FDEP

Northern Everglades- Potential Management Measure

Project Feature/Activity: Unified Statewide Stormwater Rule

Level: 4

General Description/Background: Florida’s stormwater treatment rules are technology-based and rely upon BMP design criteria that are presumed to achieve a specified level of stormwater treatment. The rule’s original performance standard was “secondary treatment”, or 80 percent average annual load reduction of Total Suspended Solids (TSS). However, the minimum level of treatment in Chapter 62-40, F.A.C., is “80 percent average annual load reduction of pollutants that cause or contribute to violations of water quality standards”. Nutrients are the biggest source of water body impairment throughout the state and the Governor has directed FDEP to increase the level of stormwater nutrient treatment. Accordingly, FDEP and SFWMD staff are working on a statewide stormwater treatment rule that will be based on a performance standard of post-development nutrient loading does not exceed pre-development nutrient loading.

Purpose: To increase the level of nutrient treatment of stormwater from new development and thereby reduce the discharge of nutrients and excess stormwater volume.

Location: Basinwide

Initiative Status: Beginning July 07, Rule in effect January 09

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Conceptual
- Assumptions: Rule will be adopted

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Conceptual
- Assumptions: Depends on how much infiltration and reuse is done

Screening Criteria

- Proof of Concept:
- Other Impacts:

Contact: Eric Livingston, FDEP, Tallahassee, 850/245-8430

Northern Everglades- Potential Management Measure

Project Feature/Activity: L-65 Culvert to L-8 Tieback

Level: 4

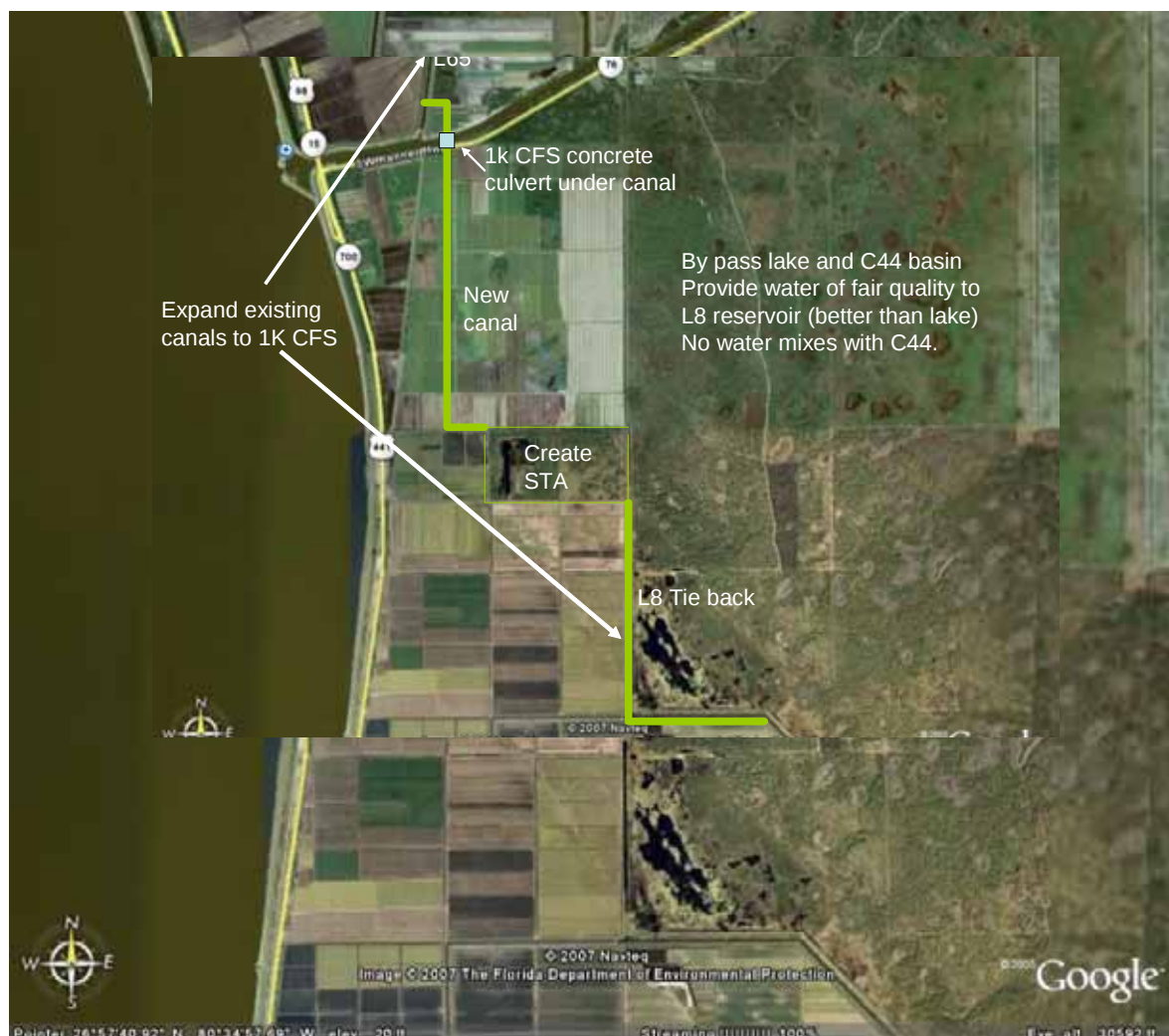
General Description/Background: Install a high volume (1000+/- cfs) inverted culvert under the C-44 Canal from the L-65 Canal to the L-8 Tieback Canal to facilitate the movement of low nutrient water from Stormwater Treatment Areas north of Lake Okeechobee to the L-8 Reservoir.

Purpose: To route STA-treated water from the Taylor Creek/Nubbin Slough area to the L-8 Reservoir via a new connection between the L-65 and L-8 Canals. The isolated connection prevents treated water from coming in contact with un-treated C-44 Canal water.

Location/Size/Capacity: Isolated connection of up to 1,000 cfs.

Initiative Status: Conceptual

Cost: TBD



Estimate of Water Quality Benefits

- Minimum: 0 mt/yr
- Maximum: 38.4 mt/yr
- Most Likely: 3.84 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Assume all proposed improvements within the Taylor Creek/Nubbin Slough area are completed to provide 38.4 mt/yr of remaining P load. Assume that L-8 system could only take approximately 10 percent of average annual discharge of 187,583 ac-ft. This provides approximately 18,758 ac-ft of water and 3.84 mt/yr of P diverted from Lake Okeechobee

Estimate of Water Quantity Benefits

- Minimum: 0 ac-ft
- Maximum: 187,583 ac-ft

- Most Likely: 18,758 ac-ft (diverted from Lake Okeechobee)
- Level of Certainty: Conceptual
- Assumptions: An evaluation of the L-8 Basin system would need to be performed to determine the amount of water that could be brought into this system.

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: Michael Voich, SFWMD, 561-681-2563 *3720

Northern Everglades – Potential Management Measure

Project Feature/Activity: L-8 Reservoir Phase I

Level: 1 (This feature is part of the future base RSM simulation)

General Description/Background: The C-51 and Southern L-8 Reservoir (L-8 Reservoir) is part of CERP North Palm Beach County – Part 1 and is located at the northwest corner of the intersection of the L-8 and C-51 Canals in Palm Beach County. The L-8 Reservoir is designed to store water in-ground in a converted mining site that has natural geologic properties that are beneficial to reduce groundwater seepage.

Purpose: The main purpose of the reservoir is to capture excess water from the L-8 Basin that would otherwise be lost to tide and use this to provide restorative water flows and levels in the Grassy Waters Preserve, Loxahatchee Slough and Northwest Fork of the Loxahatchee River. In addition, by providing storage in the L-8 Basin, this reservoir will allow us to improve management of stages in the L-8 Canal. By reducing the amount of time that the L-8 Canal is at elevated, undesirable stages, the amount of water that flows to Lake Okeechobee from the L-8 Basin through Culvert C-10A (by gravity) may be reduced.

Location/Size/Capacity: The site is located at the former Palm Beach Aggregates site on State Road 80 approximately 20 miles west of I-95. The SFWMD has purchased approximately 45,000 ac-ft of storage that is currently under construction.

Cost: \$4,500 - \$5,000/ac-ft

Documentation: L-8 Reservoir Testing Project Final Report, May 2005; L-8 Reservoir Pilot Water Storage Project, July 2003; L-8 Reservoir Consent Final Judgments, Dec 2002 and Dec 2003.

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: Full implementation of CERP North Palm Beach County – Part 1

Estimate of Water Quantity Benefits

- Minimum: 44,500 ac-ft
- Maximum: 48,000 ac-ft
- Most Likely: 44,500 ac-ft
- Level of Certainty: Final (storage area complete September 2007)
- Assumptions: Full implementation of CERP North Palm Beach County – Part 1 by 2015

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Michael Voich; SFWMD; 561-681-2563 *3720

Northern Everglades – Potential Management Measure

Project Feature/Activity: EAA Flowway

Level: 5

General Description/Background: Originally suggested in 1993, the concept of the EAA Flowway was to convert approximately 120,000 acres of primarily agricultural land into a natural wetland flow-way that would allow water to flow south from Lake Okeechobee to Water Conservation Area 3A (WCA 3A). The conceptual design included approximately 6,600 cubic ft per second of inflow pumping capacity into the flow-way that would have a maximum depth of 3 ft and function like a Stormwater Treatment Area. The south end of the flow-way would provide uncontrolled weir flow into WCA-3A.

Purpose: Provide storage and treatment capacity and connectivity to improve the quality and quality of water discharged south through the Everglades.

Location/Size/Capacity: Conceptual Design included approximately 120,000 acres of primarily agricultural land that would be converted to a natural wetland, a 6,600 cfs Inflow Pump Station, and various control structures (overflow weirs) at the south end.

Initiative Status: This concept was evaluated during both the Reconnaissance Phase (Report in 1994) and the Feasibility Phase (Report in 1999) of the Comprehensive Review of Central and Southern Florida (C&SF) Project (note – The Feasibility Report in 1999 became what we now know as the Comprehensive Everglades Restoration Plan). Although there were some limited benefits with this option, it was determined during this study that this concept was not the most effective plan. It was determined that that water fluctuations would be different that natural wetlands, flood crests in WCA-3A were still too high, flows to Everglades National Park remained too low and the flow-way had very low habitat suitability. In summary, the flow-way is a concept that creates a water supply burden on the system without clear hydrologic benefits.

Cost: Potential Multi-Billion Dollar Project

Documentation: Regional Storage/Treatment and Conveyance Issues Presentation, Tommy Strowd and Richard Punnett, 10-County Coalition Meeting - June 7, 2007.

Estimate of Water Quality Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: NA
- Other Impacts: NA

Contact: Michael Voich; SFWMD; 561-681-2563 *3720

Northern Everglades- Potential Management Measure

Project Feature/Activity: Comprehensive Planning – Land Development Regulations (LDR)

Level: 3

Description: Initiative to work with entities (e.g. Cities and Counties) in the Lake Okeechobee basin responsible for comprehensive planning and land development approvals. Work with those entities to review current comprehensive plans and associated land development regulations to assure that they promote low impact design and proper stormwater treatment.

Purpose: Implement low impact design measures in Okeechobee basin to achieve addition phosphorus reductions and water storage.

Location: Basin wide

Initiative Status: Not initiated

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Assume LDRs are changed to promote LID

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: Assume LDRs are changed to promote LID

Screening Criteria

- Proof of Concept:
- Other Impacts:

Contact: Eric Livingston; FDEP; 850/245-8430

Northern Everglades- Potential Management Measure

Project Feature/Activity: Lower Kissimmee Reservoir

Level: 5

General Description/Background: One or two reservoir(s) would be constructed on either currently unused land owned by the SFWMD or on new lands to be acquired. It would be sized to provide the lesser of either the maximum required volume of storage capacity, or to utilize the entire available area. The maximum required storage volume would be estimated as the total average wet season flow. Actual storage requirements would be established through follow-on period of record simulations to establish an optimum design configuration.

Purpose: The reservoir(s) would provide storage capacity for stormwater runoff for the purposes of: reducing peak flows into Lake Okeechobee and managing inflows to downstream STAs to optimize P reduction performance. The reservoir(s) would also achieve P reduction through sedimentation.

Location/Size/Capacity: A 1,000 acre, 15-ft deep reservoir is initially proposed. The size, location, and potential capacity would have to be refined through additional analyses.

Initiative Status: This is a conceptual idea that needs to be assessed for potential benefits and costs.

Cost: TBD

Estimate of Water Quality Benefits

- Minimum : 0.09 mt/yr
- Maximum: 0.89 mt/yr
- Most Likely: 0.62 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Conceptual load reduction estimates based on annual average flows and loads (1970 to 2005). Assume a 1,000 acre reservoir

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: Storage volume based on 90 percent footprint acreage X average depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Dave Anderson; SFWMD; 561- 682-6717

Northern Everglades– Potential Management Measure

Project Feature/Activity: Local Initiatives

Level: 1

General Description/Background: The Northern Everglades Initiative directs the District and the Florida Department of Environmental Protection to plan, assess, and implement local initiatives, including efforts with local governments, to reduce phosphorus loads to Lake Okeechobee and provide additional water storage opportunities on the watershed. Currently these projects are either in the planning and assessment or implementation stages of development. There is a planned Okeechobee County road connection between Highway 70 and 78; roadside stormwater conveyance potential expansion to include S-154 basin runoff and routing to expanded Lemkin Creek project.

Planning and Assessment Projects:

- **Okeechobee City/County Stormwater Master Plan Update** – Assess, plan, and update a stormwater master plan to address short term and long term quality and quantity issues dealing with urban stormwater runoff. Plan will identify projects to be implemented.(Will Salters, x3029)
- **Okeechobee County East-West Stormwater Conveyance** – Plan, acquire and implement a stormwater conveyance system with retention and treatment components from east to west through the City of Okeechobee and Okeechobee County. Following water quality treatment and storage, the water will be conveyed into the District’s Lemkin Creek urban water storage and treatment facility before making its way into the Rim Canal and Lake Okeechobee. (Will Salters, x3029)
- **Moore Haven/Glades County Water and Stormwater Master Plan** – Assess, plan and develop a water supply and update a stormwater master plan to address short term and long term quality and quantity issues dealing with water supply and urban stormwater runoff. (Missie Barletto, x3006)
- **Okeechobee Utility Authority Water and Wastewater Master Plan** – Assess, plan, and develop a water and wastewater master plan for the Okeechobee Utility Authority service area with emphasis on prioritizing expansion of the wastewater gravity system (replacing septic systems) into high phosphorus source areas and alternative sources for drinking water supply. (Gary Ritter, x3017)
- **Highlands County Arbuckle Creek and Southern Lake Istokpoga Watershed Assessments** – Assess the stormwater management and floodplain restoration potential in the Southern Lake Istokpoga area to improve water quality and flood protection for homes, businesses, agriculture, and CR 621. Potential projects and a preliminary cost versus benefit analysis of proposed alternatives will also be developed. Additionally, an assessment will be conducted of the Arbuckle Creek area north of Lake Istokpoga for potential floodplain and wetland restoration projects. This assessment will provide an analysis of water quality and quantity improvements that can be attained through these projects and the potential flood protection benefits for downstream communities. A cost versus benefit analysis and

discussion on potential land acquisition issues and recreational opportunities on project lands will also be included in this assessment. (Angela Hendrichsen-Sandoval, x 3008)

- **PL566** – Assess the possibilities, through modeling and evaluation, of maximizing water detention and nutrient (total phosphorous – TP) reduction in Taylor Creek through the rehabilitation of one or all of the three PL-566 structures in the main channel of Taylor Creek. The assessment will include a conceptual level cost versus relative benefit analysis for the integration with the current LOFT water storage and treatment reservoir in the process of being designed along Taylor Creek. (Gary Ritter, x3017)

Implementation Projects:

- **Taylor Creek Canals Sediment Removal** – Removal of sediment and vegetation from canals tributary to Taylor Creek in the Treasure Island and Taylor Creek Isles residential areas. The implementation of this project has resulted in the removal of residual phosphorus in the sediment and vegetation of these canals. (Gary Ritter, x3017)
- **Okeechobee City Sediment Trap Installation** – Installed two (2) sediment traps within the city of Okeechobee at specific locations identified by the city's Comprehensive Stormwater Master Plan as good candidates for the removal of phosphorus-laden particulates and other constituents in runoff that otherwise would contribute to the load entering Lake Okeechobee.
- **Nubbin Slough East Flow Diversion** – Restoring the east main tributary flow conveyance to Nubbin Slough and, consequently, into the Nubbin Slough Stormwater Treatment Area (STA) for treatment; and to reduce flooding in adjacent residential areas. West main tributary flow restoration is identified in Okeechobee Stormwater Master Plan as future project.

Purpose: The purpose of these projects is to undertake local initiatives, including project work with local governments to assess, plan, design, and construct facilities to capture, store and treat stormwater runoff prior to entering Lake Okeechobee and subsequently being released to the estuaries.

Location/size/capacity:

Implementation Projects:

Okeechobee City and County – S133 Basin, Taylor Creek/Nubbin Slough Region

Initiative status:

- Taylor Creek Canals Sediment Removal – Level 1
- Okeechobee City Sediment Trap Installation – Level 1
- Nubbin Slough East Flow Diversion – Level 1

Cost:

- Taylor Creek Canals Sediment Removal – \$950,000 State, \$60,000 County. Total \$1,010,000.

- Okeechobee City Sediment Trap Installation - \$150,000 District; \$10,000 FDEP; \$15,000 City of Okeechobee. Total \$175,000.
- Nubbin Slough East Flow Diversion - \$370,889 District; \$37,089 Okeechobee County. Total \$407,978.

Estimate of Water Quality Benefits

- Taylor Creek Sediment Removal – 1 mt/yr, Conceptual
- Okeechobee City Sediment Trap Installation – Unknown, Unknown
- Nubbin Slough East Flow Diversion - Unknown, Unknown

Estimate of Water Quantity Benefits

- Taylor Creek Sediment Removal – Incidental, Unknown
- Okeechobee City Sediment Trap Installation – NA, Final
- Nubbin Slough East Flow Diversion – Incidental, Unknown

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Kissimmee River Restoration in Pool E

Level: 4

General Description/Background: Complete backfilling of C-38 in Pool D. Pool E could be managed to maximize nutrient removal. STAs would be constructed on the floodplain adjacent to C-38. Some water moving through C-38 would be directed into the STAs but C-38 would remain intact for flood control.

Purpose: The meandering river channel and floodplain in Pool D would likely slow delivery of water to Lake Okeechobee as well as provide incidental reduction in phosphorus due to uptake by floodplain and littoral river channel vegetation. STAs in Pool E would remove additional nutrients before discharge to Lake Okeechobee.

Location/Size/Capacity: Pool D and E of the Kissimmee River. Approximately 7000 acres of river channel and floodplain wetlands.

Initiative Status: Conceptual.

Cost: Unknown

Estimate of Water Quality Benefits

- Minimum : TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Unknown
- Assumptions :(e.g. for features- sub-watershed; period of record; inflow concentration/load; did you assume BMPs were implemented or not) (e.g. for activities- location/sub-watershed where activity will apply; what does percent reduction apply to-which land uses, only new development, etc.)

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: (e.g., sub-watershed; period of record; flow/volume; operational assumptions)

Screening Criteria

- Proof of Concept: 1

- Other Impacts: 1

Contact: John Moyr; SFWMD; 561-682-6000

Northern Everglades – Potential Management Measure

Project Feature/Activity: Ice Cream Slough

Level: 5

General Description/Background: Ice Cream Slough is a tributary to the Kissimmee River in Pool A, south of Westgate River Ranch on the west side of the C-38 canal. This project would include the creation of a wetland impoundment on SFWMD owned land.

Purpose: Restoration of historic floodplain conditions in this area has the potential to retain water in Pool A as well as remove phosphorus from Ice Cream Slough discharge into C-38.

Location/Size/Capacity: TBD

Initiative Status: Conceptual

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions leading to benefit estimate: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: David Anderson, SFWMD, 561- 682-6717

Northern Everglades – Potential Management Measure

Project Feature/Activity: Central Florida Recharge Project

Level: 4

General Description/Background: Under the 2005/2005 Kissimmee Basin Water Supply Plan the District identified a project to investigate the feasibility of diverting surface water from the upper basin lakes and tributaries towards aquifer recharge areas and thereby allowing for additional groundwater withdrawals. Because central Florida has areas of high aquifer recharge, this project offers opportunities to use surface water for aquifer recharge by placing the water into rapid infiltration basins (RIB) during periods of high surface water availability. This project would take advantage of existing reclaimed water RIBs and pipeline infrastructure owned by the Toho Water Authority and Reedy Creek Improvement District.

Purpose: Supplying surface water from the lakes and tributaries for aquifer recharge may offset a portion of the environment impacts projected to occur and what will limit future use of the Floridan aquifer system. Water delivered to these RIB would move to the Floridan aquifer and a small percentage would be blended with reclaimed water for irrigation. Water would be moved to these RIBs only during high lake levels. Reductions in p-loads would be incidental.

Location/Size/Capacity: Locations of the rapid infiltration basins are in western Orange County, northwest Osceola County. Current capacity that might be used initially in this project is approximately 10 mgd. An independent study completed for the water use application of the City of St. Cloud (using OKISS) showed the withdrawals could occur as much as about 40 percent of the time over the 30-year period of record. Conservatively, the system withdrawals may average closer to 20 percent of the time for operation. Minimum use would be zero during drought periods and reach a peak of 10 mgd when water is available.

Initiative Status: Feasibility evaluation phase. Pipeline Infrastructure and RIBs currently exist from reclaimed water use and the utilities are aware of the effort to review this option.

Costs: If existing utility infrastructure can be utilized, costs would be primarily operational. The current system access exists at Shingle Creek (for Toho Water Authority) and is permitted up to 4 mgd. Increasing system capacity to 10 mgd would require lift station improvements.

Documentation: 2005/2006 Kissimmee Basin Water Supply Plan – Chapter 6.

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: 2,200 ac-ft
- Maximum: 2,200 ac-ft
- Most Likely: 2,200 ac-ft
- Level of Certainty: Conceptual
- Assumptions:

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Chris Sweazy; SFWMD; 407- 858-6100 x3822

Northern Everglades – Potential Management Measure

Project Feature/Activity: Indian Prairie Basin Regional Stormwater Treatment Area

Level: 4

General Description/Background: STA and Wetland Preservation Enhancement Area

Purpose: Reduce Phosphorus Load to Lake Okeechobee

Location/Size/Capacity: Located primarily between the C41A and C-40 canals in Highlands Country, this 6,680 acre Stormwater Treatment Area and a 1,531 acre Wetland Preservation/Enhancement Area is capable of receiving 1,450,000 ac-ft of water per year if operated at capacity of 2,000 cfs

Initiative Status: 15 percent Conceptual Design Completed

Cost: (2006 \$) Capital \$183 million, Operations and Maintenance \$9 to 15 million

Estimate of Water Quality Benefits

- Minimum: 7 mt/yr
- Maximum: 33 mt/yr
- Most Likely: 22 mt/yr
- Level of Certainty: Conceptual
- Assumptions leading to benefit estimate: Inflow between 111 and 103 ppb, flows between 150 and 900 cfs (min and max), discharge of 62 ppb, settling rate of 30 m/year, Portion of inflow rerouted from Kissimmee

Estimate of Water Quantity Benefits

- Minimum : 13,353 ac-ft
- Maximum: 13,353 ac-ft
- Most Likely: 13,353 ac-ft
- Level of Certainty: Conceptual
- Assumptions: From Lbfh Inc.2003 Conceptual Design Memorandum: Lake Okeechobee Water Quality Improvement Project. Aquaflorida Inc. Volume 1 Table V1-B.1 cell characteristics

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Northern Everglades – Potential Management Measure

Project Feature/Activity: In-Lake Chemical Treatment

Level: 4

General Description/Background: Lake Okeechobee is a multiple use natural resource that provides flood control, acts as a reservoir for both potable and irrigation waters for much of south Florida, and supports valuable commercial and sport fisheries. In the last decade, concerns about the lake have centered on the deterioration of ecosystem values as a result of human-related impacts; in particular, the excessive inputs of nutrients from intense agricultural activities in the surrounding watershed, managed flood control and water storage hydrology, and the invasion of exotic species. Excessive nutrient levels have led to conditions that are favorable for blooms of blue-green algae and contributed to the accumulation of phosphorus-rich mud sediments on the lake bottom. During high water levels this phosphorus-rich mud sediment is frequently re-suspended into the water column by wind and waves. When this occurs, the lake water becomes highly turbid and the phosphorus-laden sediments are transported from mid-lake towards environmentally sensitive near-shore and littoral regions.

Purpose: The In-Lake Chemical Treatment Project will provide a feasible methodology for phosphorus treatment in selected regions of Lake Okeechobee and acquire all regulatory agency permits.

Location/size/capacity: The project location is to be determined.

Initiative Status: A Request for Proposals has been developed by the Lake Okeechobee Division.

Cost: The costs associated with this project are to be determined.

Documentation: For more information, please see information on previous In-Lake Chemical Treatment projects can be found from various sources through out the Lake Management Society. Projects on going in and out of the State of Florida can be found in various stages. Additional chemical treatment reference can be found in the BBL Feasibility Study of the Lake Okeechobee dredging Project.

Estimate of Water Quality Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum : NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: NA
- Other Impacts: NA

Contact: Samuel Palermo; SFWMD; 561-682-2581

Northern Everglades – Potential Management Measure

Project Feature/Activity: Fisheating Creek RASTA II

Level: 4

General Description/Background: Fisheating Creek is the only free flowing tributary to Lake Okeechobee and it drains approximately 289,366 acres of the Lake Okeechobee Watershed (LOW). Current average annual phosphorus loading from the creek to the lake, based on measured loads from 1991 to 2005 is approximately 54.70 mt/yr. Several P-load reduction initiatives are planned for the FEC watershed under LOPP and these projects are projected to cumulatively reduce roughly 15.5 mt/yr of load, which leaves approximately 39.5 mt/yr of incoming load. To achieve the Lake Okeechobee phosphorus TMDL a large fraction of this load will have to be removed as part of the Phase II Technical Plan implementation.

Due to the extremely flashy nature of flows in this sub-watershed standalone STA's would not provide load reduction benefits for a large part of the year. Therefore reservoir assisted stormwater treatment areas are recommended for consideration. The reservoir component would capture and store peak flows and provide the STA with a sustained source of water for a much larger part of the year.

Purpose: This RASTA would provide significant load reduction in the northern part of the sub-watershed.

Location/Size/Capacity: A 1,800 acre RASTA consisting of 1,350 acre reservoir (@12 ft deep) and 450 acre STA is proposed for siting in the lower reaches of Fisheating Creek.

Initiative Status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Documentation: For additional information, refer to LOW Project document entitled: *“Fisheating Creek Alternative Plan Evaluation Document, Prepared by HDR Engineering, Inc for the South Florida Water Management District, March 2006.”*

Estimate of Water Quality Benefits

- Minimum: 2.5 mt/yr
- Maximum: 7.5 mt/yr
- Most Likely: 5 mt/yr
- Level of Certainty: Conceptual
- Assumptions: POR is 1965 to 2000

Estimate of Water Quantity Benefits

- Minimum: 15,187 ac-ft
- Maximum: 15,187 ac-ft
- Most Likely: 15,187 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Reservoir storage volume based on 90 percent area X 10 ft depth; STA storage volume based on 90 percent of footprint acreage X 1.5 ft standard operating depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: David Unsell; SFWMD; 561- 682-6888

Northern Everglades – Potential Management Measure

Project Feature/Activity: Taylor Creek Wetland Restoration (Grassy Island)

Level: 4

General Description/Background: The SFWMD owns 5,000 acres of land at the Grassy Island Ranch Site; Taylor Creek cuts through this parcel. Existing projects (Grassy Island STA, Algal Turf Scrubber Demonstration Project), proposed projects (LOFT Grassy Island Reservoir), and long-term leases (Okeechobee School Board) account for close to 2,500 acres of the available land. The remaining 2,500 acres is available for siting restoration projects.

Under the proposed Grassy Island Wetland Restoration Project, areas along both banks of the creek which were previously occupied by wetlands would be restored to the pre-drainage conditions by plugging the drainage ditches and establishing berms, if necessary, to retain water. The proposed project would be rain driven and therefore no inflow pumps or intake structures would be required.

Purpose: The proposed wetland project would provide for incidental water storage and also reduce phosphorus from the runoff.

Location\ Size/Capacity: Figure 1 shows the location for the proposed project. Almost 2,500 acres are available towards the northern portion at this site. The entire acreage within these 2,500 acres that is characterized by hydric soils could be targeted for wetland restoration.

Initiative Status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: < 1 mt/yr
- Maximum: <1 mt/yr
- Most Likely: <1 mt/yr
- Level of Certainty: Conceptual
- Assumptions: NA

Estimate of Water Quantity Benefits

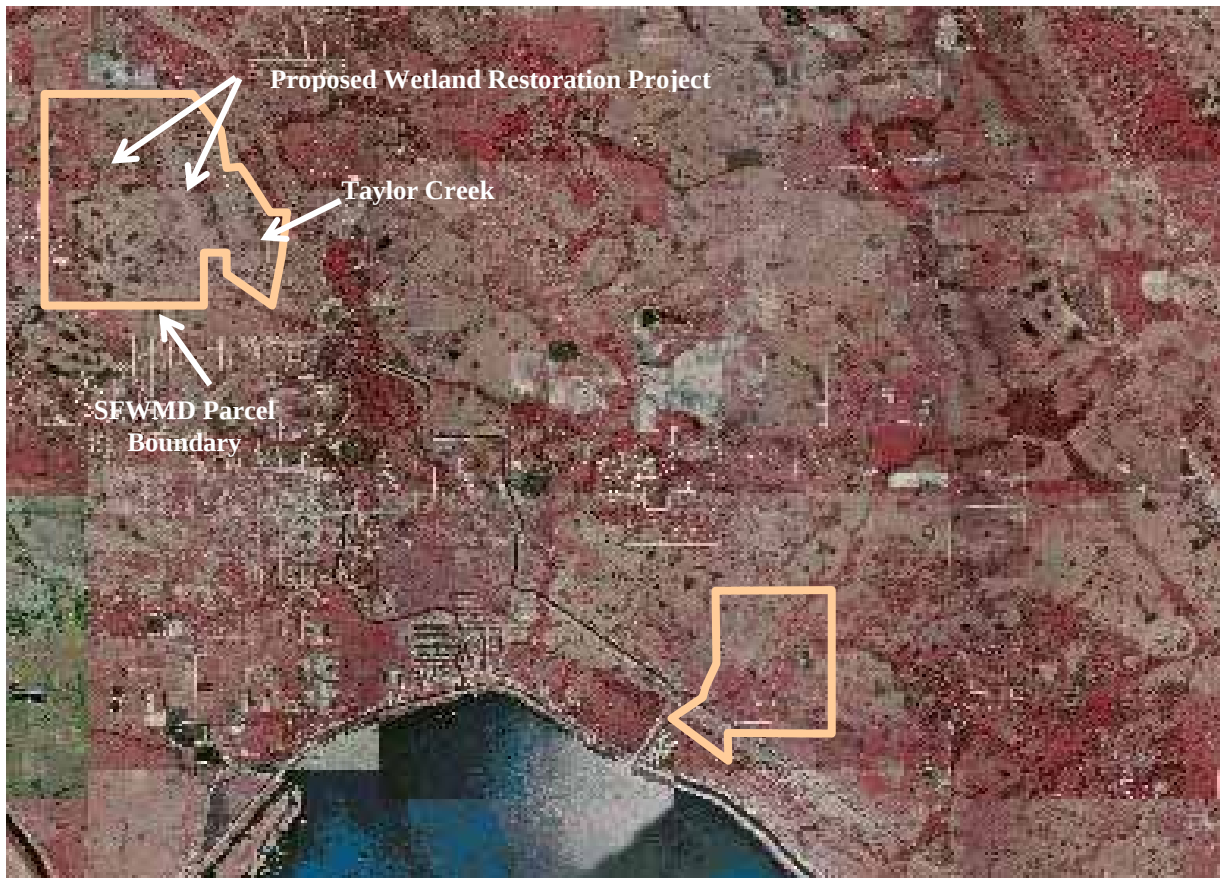
- Minimum: Incidental
- Maximum: Incidental
- Most Likely: Incidental
- Level of Certainty: Conceptual
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Mark Long; SFWMD; 561-242-5520 *4061

Figure 1 – Location of Proposed Grassy Island Wetland Restoration Project



Northern Everglades – Potential Management Measure

Project Feature/Activity: Nubbin Slough Wetland Restoration (New Palm Dairy)

Level: 4

General Description/Background: The SFWMD owns approximately 2,100 acres of land at the New Palm Dairy Site; Nubbin Slough cuts through this parcel. Existing projects (Critical Project STA) and proposed projects (wetland restoration project) account for close to 1,600 acres of the available land. Roughly 500 acres are available for siting new restoration projects.

Under the proposed New Palm Dairy Wetland Restoration Project, areas to the northeast and east of the parcel which are not currently occupied by the Critical Project STA or proposed for wetland restoration would be restored to the pre-drainage conditions by plugging the drainage ditches and establishing berms, if necessary, to retain water. The proposed project would be rain driven and therefore no inflow pumps or intake structures would be required.

Purpose: The proposed wetland project would complement the current wetland restoration project that is being planned for at this site. It would provide for incidental water storage and also reduce phosphorus from the runoff.

Location/ Size/Capacity: Figure 1 shows the location for the proposed project. Almost 500 acres are available at this site. The entire acreage within this 500 acres that is characterized by hydric soils could be targeted for wetland restoration.

Initiative Status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: < 1 mt/yr
- Maximum: <1 mt/yr
- Most Likely: <1 mt/yr
- Level of Certainty: Conceptual
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum: Incidental
- Maximum: Incidental
- Most Likely: Incidental
- Level of Certainty: Conceptual
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Mark Long, SFWMD, 561-242-5520 *4061

Figure 1 – Location of Proposed New Palm Dairy Wetland Restoration Project



Northern Everglades – Potential Management Measure

Project Feature/Activity: Managed Aquatic Plant Systems in S-133

Level: 4

General Description/Background: There is approximate 5 mt/yr of phosphorus loading that originates in this basin. The LOFT conceptual plan called for the flows from this basin to be rerouted to S-135 for treatment at the proposed Lakeside STA. Further analysis has indicated that rerouting flows from S-133 to S-135 is not a cost effective option. Therefore to treat the loads in this basin a treatment train consisting of managed aquatic plant systems, such as *Hydromentia* could be considered for siting in this sub-watershed. Such units could be used in conjunction with source control practices to treat agricultural runoff with high phosphorus loads. MAPS units would be susceptible to periodic dry outs due to low flows in the subbasin. But these systems would get rehydrated and become functional much faster than a STA would. Also depending upon the location, lake water could be used for keeping these systems hydrated.

Purpose: The MAPS would target flows and load from a specific portion of the drainage basin and provide a certain amount of localized load reduction.

Location/ Size/Capacity: A potential location for siting a MAPS could be the 67-acre state owned lands adjacent to Limken Creek (Figure 1). A typical 25 mgd module with a 300 ft flow-way needs approximately 18 acres of land (12 acres for siting the facility and 6 acres for supporting infrastructure) and removes about 0.75 mt/yr of P (based on an inflow concentration of 80 ppb). Seven (7) such modules will be required to target the available load in the S-133 basin. Additional lands will have to be purchased adjacent to the state owned lands to site this system.

Initiative Status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation.

Cost: Planning level cost estimate of capital costs for a 25MG is approximately \$200,000.

Estimate of Water Quality Benefits

- Minimum: 2.5 mt/yr
- Maximum: 7.5 mt/yr
- Most Likely: 5 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Load reduction estimates are based on pilot study; results from a larger demonstration project are still awaited

Estimate of Water Quantity Benefits

- Minimum: NA

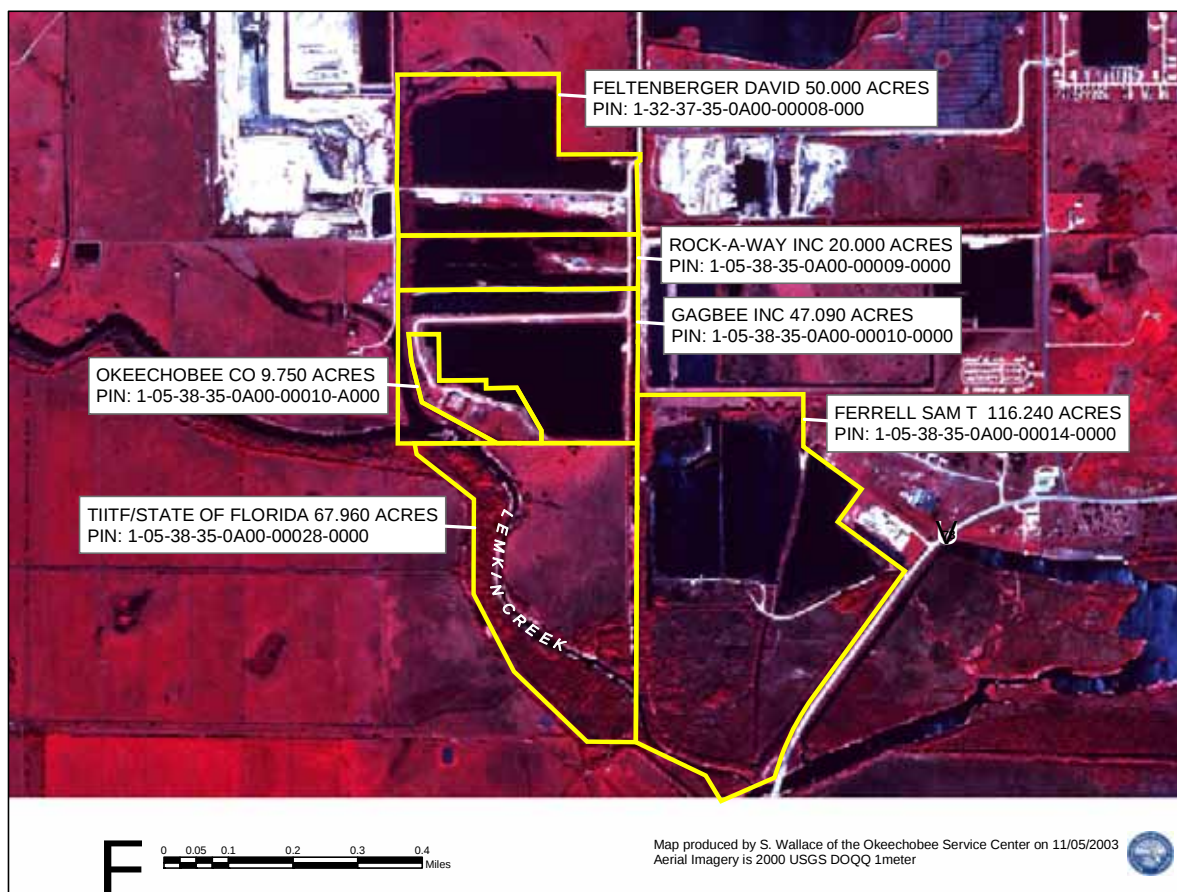
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: 0
- Other Impacts: 1

Contact: Mark Long; SFWMD; 561-242-5520 *4061

Figure 1 – Location of Proposed S-133 MAPS



Northern Everglades – Potential Management Measure

Project Feature/Activity: Chemical Treatment in Taylor Creek Reservoir

Level: 4

General Description/Background: Reservoirs proposed under the LOW and LOFT Projects are expected to reduce certain amount of P-loads in the stored water. This reduction can be primarily attributed to sedimentation; a secondary factor is biological uptake within the system. The proposed project will add a chemical treatment unit at the front end of the reservoir to increase the phosphorus load reduction capacity. Chemical treatment with alum, for example, has been previously shown to be quite effective in reducing phosphorus loads.

Purpose: To enhance reservoir P-load reduction capacity

Location/Size/Capacity: The LOFT Taylor Creek Reservoir is located on approximately 2,000 acre at the Grassy Island Ranch Site that is owned by the SFWMD. The size and capacity of the proposed chemical treatment unit will have to be determined through further engineering evaluations.

Initiative Status: This project will be implemented as part of the Phase II Technical Plan implementation.

Cost: Planning level cost estimates are: Capital cost: \$500K; O&M cost including alum: approximately \$4.5M

Estimate of Water Quality Benefits

- Minimum: 8 mt/yr
- Maximum: 8 mt/yr
- Most Likely: 8 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Load reduction estimates based on 15-year period of record (1991 – 2005); assumed typical cost share BMPs are implemented; Inflow concentration of 265 ppb. Period of record 1965-2000

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: Joyce Zhang; SFWMD; 561-682-6341

Northern Everglades – Potential Management Measure

Project Feature/Activity: Yates Marsh Hydrologic Restoration

Level: 5

General Description/Background: Yates Marsh could be hydrologically restored to pre C & SF conditions

Purpose: Hydrologic restoration of this area

Location/Size/Capacity: TBD

Initiative Status: Conceptual

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: <1 mt/yr
- Maximum: <1 mt/yr
- Most Likely: <1 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Hydrologic restoration should lead to a net decrease in P loads to Lake Okeechobee; however these reductions would be incidental.

Estimate of Water Quantity Benefits

- Minimum: Incidental
- Maximum: Incidental
- Most Likely: Incidental
- Level of Certainty: Conceptual
- Assumptions: Wetland restoration may have some water retention benefits and should attenuate peak flows.

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: David Anderson, John Moyer; SFWMD; 561-682-6717

Northern Everglades – Potential Management Measure

Project Feature/Activity: Three Lakes Wildlife Management Area Hydrologic Restoration

Level: 4

General Description/Background: The Three Lakes Wildlife Management Area is located east of Lake Kissimmee in the upper Kissimmee Basin. The Florida Freshwater Fish and Conservation Commission (FWC) manages this property which includes Lake Marian and Lake Jackson.

Purpose: This project is intended to reestablish more natural hydrology and partially restore wetlands on the property. This may provide more temporary water storage and potential for phosphorus removal.

Location/Size/Capacity: TBD

Initiative Status: The SFWMD and the FWC are developing a model of the Three Lakes area that will be used for planning this study.

Cost: TBD

Estimate of Water Quality Benefits

- Minimum : TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: Hydrologic restoration should lead to a net decrease in P loads to Lake Okeechobee; however these reductions would be incidental.

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: Wetland restoration may have some water retention benefits and should attenuate peak flows

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: David Anderson; SFWMD; 561- 682-6717

Northern Everglades – Potential Management Measure

Project Feature/Activity: Upper Chain of Lakes Sediment Removal

Level: 5

General Description/Background: Concern has been raised that the phosphorus assimilation (buffering) capacity of sediments in some of the upper Kissimmee basin may be approaching saturation. This project would take advantage of low water levels during droughts to remove phosphorus laden sediments.

Purpose: The purpose of this project is to maintain and possibly enhance the phosphorus assimilation capacity of sediments in the upper basin lakes by removing phosphorus-laden sediments.

Location/Size/Capacity: TBD based on sediment phosphorus analysis and assimilation capacity.

Initiative Status: Conceptual

Cost: TBD

Estimate of Water Quality Benefits

- Minimum : TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Unknown
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: David Anderson; SFWMD; 561- 682-6717

Northern Everglades – Potential Management Measure

Project Feature/Activity: Florida Ranchlands Environmental Services Project (FRESP) – 4 Existing Pilots

Level: 1

General Description/Background: Launched in October 2005, the Florida Ranchlands Environmental Services Project (FRESP) will design a program in which ranchers in the Northern Everglades' sell environmental services of water retention, phosphorus load reduction and wetland habitat expansion to agencies of the state and other willing buyers.

These ranches can bring services on line quickly as compared to other options and will complement public investment in regional water storage and water treatment facilities. The sale of the services will be additional income for ranchers who face low profit margins and will provide an incentive against selling land for more intensive agriculture and urban development—land uses that will further aggravate water flow, pollution, and habitat problems.

FRESP is being implemented through collaboration between World Wildlife Fund (WWF), 8 participating ranchers, USDA's Natural Resources Conservation Service and state agencies – the Florida Department of Agriculture and Consumer Services, the South Florida Water Management District, and the Florida Department of Environmental Protection. Technical support is being provided by scientists from the MacArthur Agro-Ecology Research Center and the University of Florida. Funding from Federal, state and private sources exceeds \$5 mil for Phase One – pilot project implementation and program design.

Key Accomplishments

Developed procedures to compare different protocols for documenting environmental services from ranchlands. FRESP will field test different methods of using monitoring and modeling of hydrology, water and soil chemistry, and vegetation change to document the level of environmental services provided by ranch water management projects.

Completed the design, permitting and construction of water management projects on 4 ranches; additional water management projects will be implemented by four additional ranchers. Projects include rehydrating drained wetlands, water table management, and pumping water from a nearby canal through existing ranch wetlands and flowing back into the canal. Based on available information the 8 water management projects occupy some 8,500 acres not including drainage acres. A planning level estimate of the static water retention capacity of the eight projects is 8,260 ac-ft of water for a single storm event with the average ac-ft of storage per acre being 0.98 ft.

LEVEL 1 (Implemented or to be Implemented)

Four Ranchlands Environmental Services Pilot Projects (FRESPP) have been constructed with Alderman-Deloney Ranch (43 ac-ft of on-site water storage and treatment, 0.078 mt/yr, C-25), Williamson Cattle Company (150 ac-ft of on-site water storage, 0.09 mt/yr, S-191), Buck Island Ranch (967 ac-ft of on-site water storage and treatment, 0.37 mt/yr, C-41), and Lykes Bros., Inc. (5,000 ac-ft of regional water storage and treatment, 0.2 mt/yrC-40). Total \$1,000,000 (District contributed \$500,000 through Highlands Soil & Water Conservation District, FDACS \$500,000 through Okeechobee Soil & Water Conservation District). \$1,000,000 Conservation Innovation Grant is funding the monitoring and pay-for-performance program development.

Four additional Rancher Agreements for implementation of FRESPP have been developed with C. M. Payne & Son, Inc. (932 ac-ft of on-site water storage, Fisheating Creek) - total of \$298,489; Lightsey Cattle Company (135 ac-ft of on-site water storage, Fisheating Creek) - total of \$137,280; Syfrett Ranch West (140 ac-ft of regional water storage, C-41A) - total of \$183,500; and Rafter T Ranch (1,145 ac-ft of on-site water storage, Arbuckle Creek) - total of \$609,151. The District provided State Community Budget Issue Request (CBIR) funding which was specifically appropriated by the State through the CBIR process for additional pilot projects implementing water management alternatives to store and treat runoff on private lands.

Developing the design of a pay for services program. Essential program design questions—such as how to assure a dedicated, multiyear funding source to meet contract payment obligations; how to establish what prices that will be paid for services and how to integrate a new pay-for-services program with other state and federal programs will be addressed and answered through the deliberations of the collaboration team, in cooperation with multiple stakeholders and with state agency officials.

Watershed Static Water Retention Potential

Planning level estimates generated by the existing pilot projects were used to derive conservative estimates of potential static storage – maximum capacity to hold water from a single storm event. If FRESPP contracts covered only 15 percent of improved pasture acreage in the Northern Everglades, using the average ac-ft/acre estimate of the 8 existing FRESPP sites of 0.98, the potential storage estimate is 118,000 ac-ft of water ($800,500 \times 15 \text{ percent} = 120,000 \text{ acres} \times 0.98 \text{ ac-ft / ac}$). If 15 percent of the unimproved pasture acreage is included the potential storage is 151,800 ac-ft ($1,029,500 \times 15 \text{ percent} = 154,400 \text{ acres} \times 0.98 \text{ ac-ft / ac}$). Because these estimates are for a single storm event, they are conservative estimates of annual on-ranch water retention.

Location/Size/Capacity:

	Improved Pasture in LOPP Watershed	Acre-Ft Static Storage on Improved Pasture (0.98 ac-ft/ac)	Improved and Unimproved Pasture	Acre Ft Static Storage on Improved & Unimproved Pasture (0.98 ac-ft/ac)
Total Acres	800,464		1,029,509	
Assumptions re percent Acres in FRESP for Different Land Use Combinations				
10%	80,046	78,706	102,951	101,226
15%	120,070	118,058	154,426	151,840
20%	160,093	157,411	205,902	202,453

Initiative Status: Developed procedures to compare different protocols for documenting environmental services from ranchlands. FRESP will field test different methods of using monitoring and modeling of hydrology, water and soil chemistry, and vegetation change to document the level of environmental services provided by ranch water management projects.

Completed the design, permitting and construction of water management projects on 4 ranches; additional water management projects will be implemented by four additional ranchers. Projects include rehydrating drained wetlands, water table management, and pumping water from a nearby canal through existing ranch wetlands and flowing back into the canal. Based on available information the 8 water management projects occupy some 8,500 acres not including drainage acres. A planning level estimate of the static water retention capacity of the eight projects is 8,260 ac-ft of water for a single storm event with the average ac-ft of storage per acre being 0.98 ft.

Developing the design of a pay for services program. Essential program design questions—such as how to assure a dedicated, multiyear funding source to meet contract payment obligations; how to establish what prices that will be paid for services and how to integrate a new pay-for-services program with other state and federal programs will be addressed and answered through the deliberations of the collaboration team, in cooperation with multiple stakeholders and with state agency officials.

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: conceptual/final/unknown
- Assumptions: Planning level estimates generated by the existing pilot projects were used to derive conservative estimates of potential static storage – maximum capacity to hold water from a single storm event. If FRESP contracts covered only 15 percent of improved pasture acreage in the Northern Everglades, using the average ac-ft/acre estimate of the 8 existing FRESP sites of 0.98, the potential storage estimate is 118,000 ac-ft of water (800,500 X 15 percent = 120,000 acres X 0.98 ac-ft / ac). If 15 percent of the unimproved pasture acreage is

included the potential storage is 151,800 ac-ft ($1,029,500 \times 15 \text{ percent} = 154,400 \text{ acres} \times 0.98 \text{ ac-ft / ac}$). Because these estimates are for a single storm event, they are conservative estimates of annual on-ranch water retention.

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Chemical Treatment in Istokpoga Reservoir

Level: 5

General Description/Background: Reservoirs proposed under the LOW and LOFT Projects are expected to reduce certain amount of P-loads in the stored water. This reduction can be primarily attributed to sedimentation; a secondary factor is biological uptake within the system. The proposed project will add a chemical treatment unit at the front end of the reservoir to increase the phosphorus load reduction capacity. Chemical treatment with alum, for example, has been previously shown to be quite effective in reducing phosphorus loads.

Purpose: To enhance reservoir P-load reduction capacity

Location/Size/Capacity: The size and capacity of the proposed chemical treatment unit for the I-17 LOW Project Reservoir will have to be determined through further engineering evaluations.

Initiative Status: This project will be implemented as part of the Phase II Technical Plan implementation.

Cost: Planning level cost estimates are: Capital cost: \$500K; O&M cost including alum: approximately \$4.5M

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: Joyce Zhang; SFWMD; 561-682-6341

Northern Everglades – Potential Management Measure

Project Feature/Activity: Chemical Treatment in Kissimmee Reservoir

Level: 5

General Description/Background: Reservoirs proposed under the LOW and LOFT Projects are expected to reduce certain amount of P-loads in the stored water. This reduction can be primarily attributed to sedimentation; a secondary factor is biological uptake within the system. The proposed project will add a chemical treatment unit at the front end of the reservoir to increase the phosphorus load reduction capacity. Chemical treatment with alum, for example, has been previously shown to be quite effective in reducing phosphorus loads.

Purpose: To enhance reservoir P-load reduction capacity

Location/Size/Capacity: The size and capacity of the proposed chemical treatment unit for the K-42 LOW Project Reservoir will have to be determined through further engineering evaluations.

Initiative Status: This project will be implemented as part of the Phase II Technical Plan implementation.

Cost: Planning level cost estimates are: Capital cost: \$500K; O&M cost including alum: approximately \$4.5M

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: Joyce Zhang; SFWMD; 561-682-6341

Northern Everglades – Potential Management Measure

Project Feature/Activity: Gardner-Cobb Marsh

Level: 4

General Description/Background: Gardner-Cobb marsh is the largest parcel of District owned lands in the Upper Kissimmee Chain of Lakes. The 10,893 acre recreational area located between Cypress Lake and Lake Kissimmee is a mosaic of swamp, pine flatwoods, wet prairie and oak hammock. Installation of canal plugs, berms and fixed crest weirs to store and provide overland flow between Cypress and Kissimmee lakes.

Purpose: Reduce the rate of run-off from this region by holding the water higher, as well as, provide incidental nutrient reductions due to plant uptake from overland flows in the marsh.

Location/Size/Capacity:

Initiative Status: Conceptual. The District's 2003 General Water Management Plan Annual Report indicates that 1000 acres of Gardner-Marsh needs restoration; 2007 SFER indicates \$130,000 is available for FY-07 for restoration also.

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: Hydrologic restoration should lead to a net decrease in P loads to Lake Okeechobee; however these reductions would be incidental.

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Final
- Assumptions: An undetermined amount of storage will be associated with the proposed project

Screening Criteria

- Proof of Concept: +1
- Other Impacts: +1

Contact: Dianne Hughes; FDEP

Northern Everglades – Potential Management Measure

Project Feature/Activity: Farm and Ranchland Protection Program Partnership

Level: 4

General Description/Background: The Farm and Ranchland Protection Program (FRPP) is a voluntary USDA Natural Resources Conservation Service (NRCS) program that helps farmers and ranchers keep their land in agriculture. The program provides matching funds to State, Tribal or local governments and non-governmental organizations to purchase conservation easements. The proposal is that the NRCS, The Nature Conservancy (TNC), local agricultural landowners, and the District enter into a agreement to each contribute \$5 million dollars toward a long-term partnership.

Purpose: The partnership would acquire easements on private lands to remain in agriculture and provide water quality and storage benefits in support of the Northern Everglades initiative.

Location/Size/Capacity: Northern Everglades watershed; Over fifteen large landowners are interested in participating in this partnership. Over 3000 acres of property in 42 states are currently under the FRPP.

Initiative Status: FRPP is an established program and landowners are waiting to participate.

Cost: The proposal is that the NRCS, The Nature Conservancy (TNC), local agricultural landowners, and the District enter into a agreement to each contribute \$5 million dollars toward a long-term partnership. The partnership would bring federal, state, not-for-profit, and private funding together.

Estimate of Water Quality Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: Unknown
- Maximum: Unknown
- Most Likely: Unknown
- Level of Certainty: Unknown
- Assumptions:

Screening Criteria

- Proof of Concept: NA
- Other Impacts: NA

Contact: Benita Whalen; SFWMD; 863-462-5260

Northern Everglades – Potential Management Measure

Project Feature/Activity: Clewiston STA

Level: 4

General Description/Background: The State of Florida (TIITF) currently owns a parcel of land along the southwestern boundary of Lake Okeechobee in Clewiston (see attached site map Parcel HH200-004). This land in both Hendry and Glades Counties is approximately 766 acres in size and is bordered by Lake Okeechobee on the north side and Canals C-21 and C-20 on the south side. The land is currently in a natural state although it is reportedly impacted by invasive plant species. The potential exists for this land to be used as a natural treatment area for water that is currently discharged to Lake Okeechobee.

Purpose: The purpose of this potential Management Measure is to convert existing State owned land into a Stormwater Treatment Area to treat storm water from the S4 Basin and surrounding area that is currently sent to either Lake Okeechobee (via Culvert 2, S-310 lock Structure and/or S4 Pump Station) or the Caloosahatchee River (via S-235).

Location/Size/Capacity: The land area is approximately 766 acres of which approximately 700 – 750 acres could be used as “treatment area” with the remaining area used for levees and other infrastructure. The current estimated average load is 6.87 mt/yr from the S-4 Basin. It is assumed that a percentage of this water could be routed through the proposed STA.

Initiative Status: Conceptual

Cost: To Be Determined – Note: Other efforts (public and private) in the immediate area could potentially provide funding for all or portions of this proposal. The two main efforts include the S-169 Relocation Study – General Reevaluation Report by the U.S. Army Corps of Engineers and a development proposal by a private developer in Clewiston.

Documentation: Lake Okeechobee Protection Plan Evaluation Report – February 23, 2007

Estimate of Water Quality Benefits

- Minimum: 0 mt/yr
- Maximum: 6.87 mt/yr
- Most Likely: 2.5 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Flow rate = 40 cfs; Inflow P Concentration = 200 ppb; STA size = 750 acres; Outflow P Concentration = 130 ppb

Estimate of Water Quantity Benefits

- Minimum: 1,013 ac-ft

- Maximum: 1,013 ac-ft
- Most Likely: 1,013 ac-ft
- Level of Certainty: Conceptual
- Assumptions: STA storage volume based on 90 percent of footprint acreage X 1.5 ft standard operating depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Mike Voich, SFWMD, 681-2563 *3720



Northern Everglades – Potential Management Measure

Project Feature/Activity: Kissimmee River ASR Project

Level: 1

General Description/Background: One of the proposed CERP Lake Okeechobee Aquifer Storage and Recovery (ASR) Pilot Projects.

Purpose: The purpose of the Kissimmee River (KRASR) Pilot Project is to test the feasibility of using ASR technology as part of the CERP. ASR would be used to store excess water during times of excess, and provide water during times of need. The pilot project will be operated a minimum of two years.

Location/Size/Capacity: Along the C-38 Canal (Kissimmee River) about 2 miles upstream (north) of the confluence with Lake Okeechobee.

Initiative Status: Currently under construction. Construction is due to be complete in October 2007. Operation/testing is expected to begin in late 2007.

Cost: Approximately \$7 million for construction.

Documentation: Pilot Project Design Report (September 2004)

Estimate of Water Quality Benefits

- Minimum: < 1 mt/yr
- Maximum: < 1 mt/yr
- Most Likely: 0.1 mt/yr
- Level of Certainty: Conceptual
- Assumptions: Estimate based on previous ASR project recovery efficiencies

Estimate of Water Quantity Benefits

- Minimum: 7,650 ac-ft
- Maximum: 7,650 ac-ft
- Most Likely: 7,650 ac-ft
- Level of Certainty: Final
- Assumptions: Assuming one well only

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Mike Voich, SFWMD, 681-2563 *3720

94-98

Northern Everglades- Potential Management Measure**Project Feature/Activity:** Deep Well Injection**Level:** 5**General description/Background:** Construction of deep, high-capacity injection wells for water disposal. Wells would be constructed in “clusters” along canal right-of-ways.**Purpose:** Disposal of water at selected locations in the watershed.**Location/size/capacity:** C-40 below S-72; C-43 at Berry Groves; C-44 at St. Lucie; C-41 below S-71; Taylor Creek/Nubbin Slough**Initiative status:** Conceptual**Cost:** TBD**Estimate of Water Quality Benefits**

- Minimum: NA (Completely eliminates water (and nutrients) from the system)
- Maximum: NA
- Most Likely: NA
- Level of Certainty: Conceptual
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: NA (Completely eliminates water (and nutrients) from the system)
- Maximum: NA
- Most Likely: NA
- Level of Certainty: NA
- Assumptions: Conceptual

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 0

Contact: : Bob Verrastro; SFWMD; 561-682-6139

Northern Everglades – Potential Management Measure

Project Feature/Activity: Taylor Creek Critical Project STA

Level: 1

General Description/Background: This project consists of design and construction of a stormwater treatment area to be located on District owned lands at the Grassy Island Ranch Site along the banks of Taylor Creek. The purpose of the project is to capture and attenuate peak flows from portions of the watershed and to improve water quality. This project is part of the Critical Restoration Project Program, was authorized through the federal Water Resources Development Act of 1996. The United States Army Corps of Engineers was responsible for the design and construction of the Stormwater Treatment Areas and the South Florida Water Management District is responsible for operations and maintenance.

Purpose: The purpose of this project is to retain stormwater runoff and to reduce phosphorus from Taylor Creek.

Location/ Size/Capacity: Figure 1 shows the location for the project. The Taylor Creek Stormwater Treatment Area is located on a portion of the publicly owned Grassy Island Ranch. Approximately 142 acres of the 193 acre property is incorporated in the Stormwater Treatment Area.

Initiative Status: Construction of this project is completed.

Cost: \$3,045,096.85

Documentation: Lake Okeechobee Water Retention/Phosphorus Removal Project Design Documentation Report Final Submittal, June 2003

Estimate of Water Quality Benefits

- Minimum: 1 mt/yr
- Maximum: 1 mt/yr
- Most Likely: 1 mt/yr
- Level of Certainty: Estimated
- Assumptions: The anticipated long-term “maximum” phosphorus reductions within the Stormwater Treatment Areas were estimated during the design phase. The “minimum” and “most likely” values are estimated with the assumption that all Best Management Practices are in place for upstream landowners.

Estimate of Water Quantity Benefits

- Minimum: 159.3 ac-ft

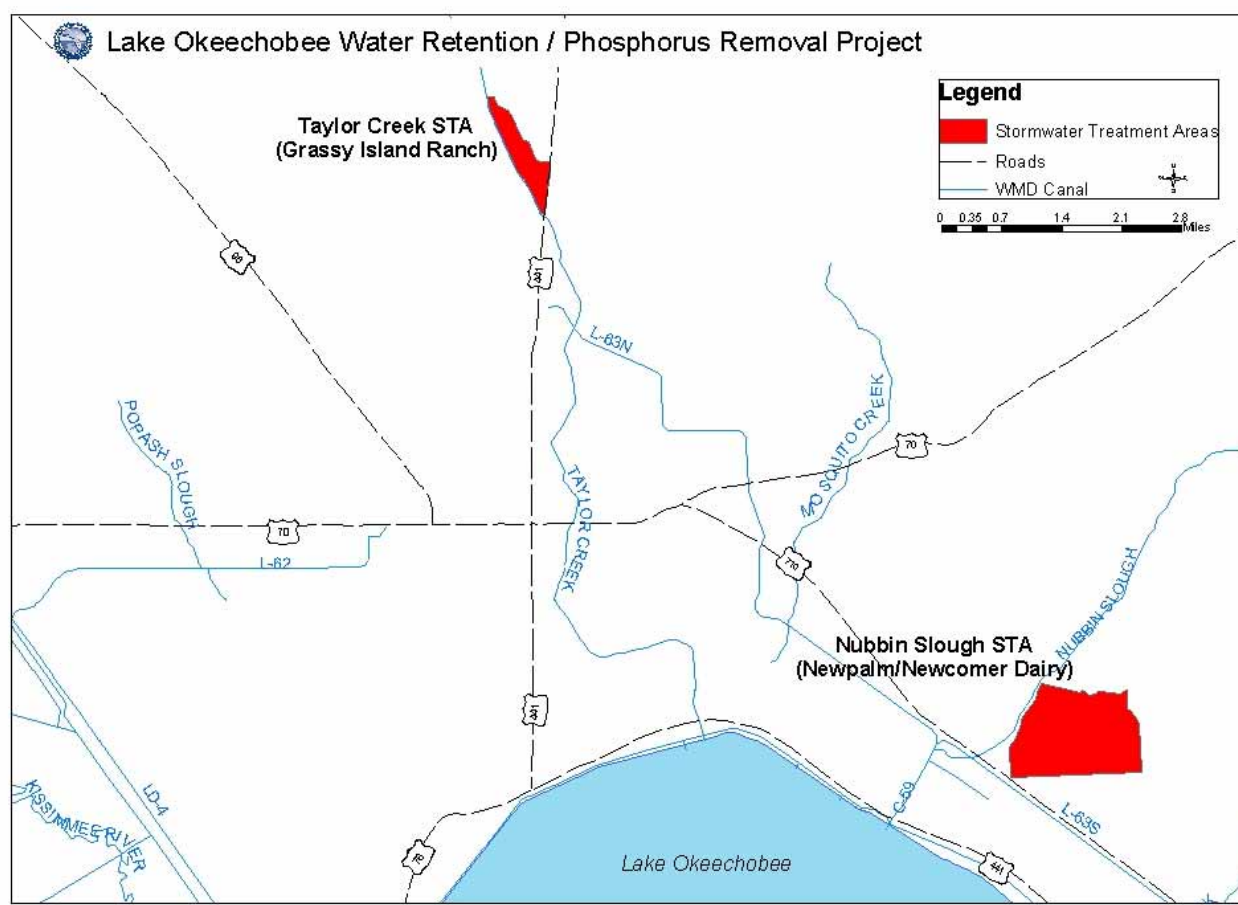
- Maximum: 159.3 ac-ft
- Most Likely: 159.3 ac-ft
- Level of Certainty: Estimated
- Assumptions: Calculations based on 90 percent effective treatment area at 1.5 ft of water operating depth.

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Lisa Kreiger, SFWMD, 863-462-5260 *3026

Figure 1 – Location of Taylor Creek STA



Northern Everglades – Potential Management Measure

Project Feature/Activity: Nubbin Slough Critical Project STA

Level: 1

General Description/Background: This project consists of design and construction of a stormwater treatment area to be located on District owned lands at the New Palm Dairy Site along the banks of Nubbin Slough. The purpose of the project is to capture and attenuate peak flows from portions of the watershed and to improve water quality. This project is part of the Critical Restoration Project Program, was authorized through the federal Water Resources Development Act of 1996. The United States Army Corps of Engineers was responsible for the design and construction of the Stormwater Treatment Areas and the South Florida Water Management District is responsible for operations and maintenance.

Purpose: The purpose of this project is to retain stormwater runoff and to reduce phosphorus from Nubbin Slough.

Location/ Size/Capacity: Figure 1 shows the location for the project. The STA is located on the site of the former New Palm/Newcomer Dairy. The property totals 2,135 acres with 809 acres incorporated in the Stormwater Treatment Area.

Initiative Status: Construction of this project is completed.

Cost: \$9,172,696.84

Documentation: Lake Okeechobee Water Retention/Phosphorus Removal Project Design Documentation Report Final Submittal, June 2003

Estimate of Water Quality Benefits

- Minimum: 1 mt/yr
- Maximum: 1 mt/yr
- Most Likely: 1 mt/yr
- Level of Certainty: Estimated
- Assumptions: The anticipated long-term “maximum” phosphorus reductions within the Stormwater Treatment Areas were estimated during the design phase. The “minimum” and “most likely” values are estimated with the assumption that all Best Management Practices are in place for upstream landowners.

Estimate of Water Quantity Benefits

- Minimum: 1043.55 ac-ft
- Maximum: 1043.55 ac-ft

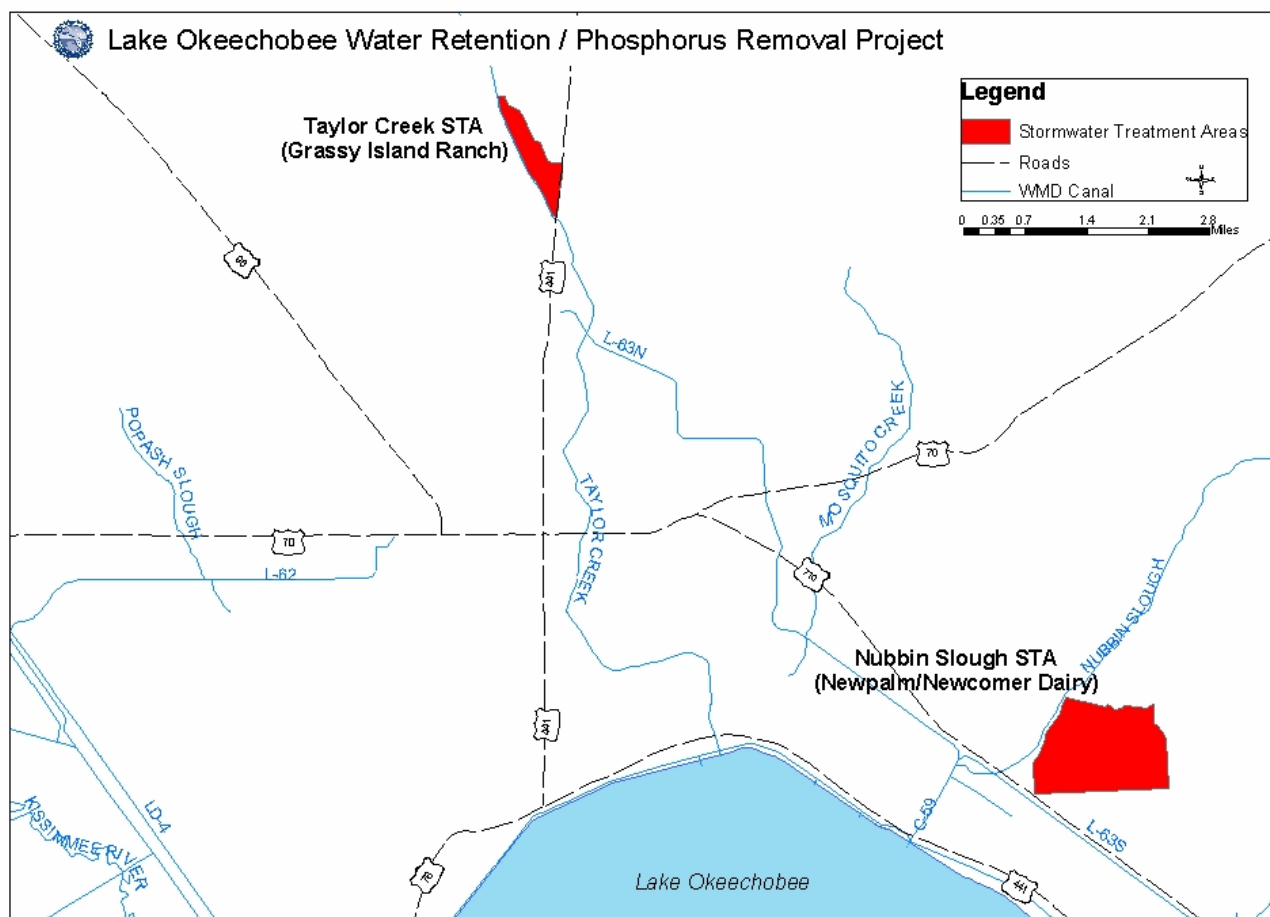
- Most Likely: 1043.55 ac-ft
- Level of Certainty: Estimated
- Assumptions: Calculations based on 90 percent effective treatment area at 1.5 ft of water operating depth.

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Lisa Kreiger, SFWMD, 863-462-5260 *3026

Figure 1 – Location of Nubbin Slough STA



Northern Everglades- Potential Management Measure**Project Feature/Activity:** ECP Diversions**Level:** 1

General description/Background: The "Everglades Program Implementation: Program Management Plan" describes the projects that comprise the major elements of the Everglades Program restoration. Of these projects, Everglades Construction Project-10 (the "Diversion Project") is the plan for specified Chapter 298 Districts and Lease Number 3420 (Closter Farms) to divert discharges away from the Lake Okeechobee (Lake), south to the EAA, by modifying their surface water management system.

Purpose: To minimize water quality impacts to the Lake by diverting discharges away from the Lake, south to STAs via Everglades Agricultural Area (EAA).

Location/size/capacity: Four diversion discharge pump stations and associated tributary areas located south and southeast of the Lake.

Initiative status: Construction of all stations was complete as of June 2005.

Cost : \$ 22.8 Million

Estimate of Water Quality Benefits

- Minimum: 80 percent of historical long-term average TP load diverted to STAs
- Maximum: 100 percent of historical long-term average TP load diverted to STAs
- Most Likely: 80 – 100 percent of historical long-term average TP load diverted to STAs
- Level of Certainty: Final
- Assumptions: Period of record, discharge volume and concentration

Estimate of Water Quantity Benefits

- Minimum: 80 percent of historical long-term average flow diverted to STAs
- Maximum: 100 percent of historical long-term average flow diverted to STAs
- Most Likely: 80 – 100 percent of historical long-term average flow diverted to STAs
- Level of Certainty: Final
- Assumptions: Period of record, discharge volume and concentration (load)
- **Screening Criteria**
- Proof of Concept: NA
- Other Impacts: NA

Northern Everglades- Potential Management Measure

Project Feature/Activity: EAA Reservoir

Level: 1

General description/Background: This Acceler8 project is a component of the larger Everglades Agricultural Area (EAA) Reservoir Project and is designed to provide significant additional water storage in the southern region of the Everglades Agricultural Area. The project is an above-ground reservoir for water storage, with a capacity of 190,000 ac-ft, or 62 billion gallons, at a maximum depth of 12.5 ft. The reservoir will be constructed on a 16,700-acre parcel of land situated north of Stormwater Treatment Area 3/4 and between the Miami and North New River canals.

Purpose:

- Capture, move and store regulatory releases from Lake Okeechobee, reducing the number and volume of harmful discharges to coastal estuaries
- Reduce water levels in Lake Okeechobee when needed, benefiting the lake's environmental health and recovery
- Capture, move and store agricultural stormwater runoff, reducing the need for emergency flood control backpumping into Lake Okeechobee
- Provide additional water to meet Everglades water demands, lessening water supply dependency on Lake Okeechobee
- Improve operational flexibility to move water within the EAA, including flow equalization and optimization of Stormwater Treatment Area performance to further reduce phosphorus inflows to the Everglades
- Improve flood protection for lands adjacent to the Bolles canal
- Provide public access and recreational opportunities

Location/size/capacity: Southern region of the Everglades Agricultural Area. An above-ground reservoir for water storage, with a capacity of 190,000 ac-ft, or 62 billion gallons, at a maximum depth of 12.5 ft. The reservoir will be constructed on a 16,700-acre parcel of land situated north of Stormwater Treatment Area 3/4 and between the Miami and North New River canals.

Initiative status: Under construction

Estimate of Water Quality Benefits

- Minimum: 11 metric tons
- Maximum: 11 metric tons
- Most Likely: 11 metric tons
- Level of Certainty: Final
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: 190,000 ac-ft
- Maximum: 190,000 ac-ft
- Most Likely: 190,000 ac-ft
- Level of Certainty: Final
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: John Mitnick, SFWMD, 561-686-8800

Northern Everglades- Potential Management Measure

Project Feature/Activity: Kissimmee River Restoration

Level: 5

General description/Background: Construction of STAs in the floodplain of Pool E of the Kissimmee River (C-38) to allow nutrient removal. Water could be diverted from the C-38, passed through the STAs, and returned to the C-38 before entering Lake Okeechobee. C-38 would remain intact for flood control.

Purpose: STAs in Pool E would remove additional nutrients before discharge to Lake Okeechobee.

Location/size/capacity: Size, location, and other details will have to be determined through additional studies.

Initiative status: Conceptual.

Cost : TBD; but likely to be expensive to purchase developed lands in floodplain of Pool E.

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: NA

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: NA

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: David Anderson, SFWMD, 561-686-8800

Northern Everglades- Potential Management Measure

Project Feature/Activity: Larson Dairy Lagoon Treatment System (HWTT)

Level: Level 2

General description/Background: The Hybrid Wetland Treatment Technology combines the desirable attributes of treatment wetlands and chemical treatment systems.

Purpose: High phosphorus (P) lagoon waters can result in P loadings to tributaries via surface discharge or seepage. The Larson Dairy Lagoon HWTT will reduce P concentrations in the second and third stage of the dairy lagoon, thereby reducing potential P loadings to downstream areas.

Location/size/capacity: This multi-stage HWTT will be approximately 0.2 acre in size, and will be deployed within the second stage of Larson Dairy Barn #8 Lagoon. The system will be designed to treat ~100,000 gallons of lagoon water per day, which is comparable to the daily hydraulic loading of barn wash into the lagoon.

Initiative status: Deployment scheduled for December 2007 – January 2008.

Cost: Will be available upon project completion.

Documentation: Executed contractual services agreement between the Florida Department of Agriculture and Consumer Services (FDACS) and Watershed Technologies, LLC (Contract #13489).

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: The HWTT will be designed to reduce total P concentrations in the dairy lagoon from the range of 6 – 10 mg/L to below 0.2 mg/L.

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: NA
- Assumptions: No effects on water quantity.

Screening Criteria

- Proof of Concept: Has been successfully demonstrated in pilot test projects.
- Other Impacts: None

Contact: Odi Villapando (rvillap@sfwmd.gov) Ext. 2936.

Northern Everglades- Potential Management Measure

Project Feature/Activity: Upper Nubbin Slough Tributary Treatment System (HWTT)

Level: Level 2

General description/Background: The Hybrid Wetland Treatment Technology combines the desirable attributes of treatment wetlands and chemical treatment systems.

Purpose: The Upper Nubbin Slough HWTT will be utilized to demonstrate the technical feasibility and cost-effectiveness of this technology for removing P from a range of stream flow rates.

Location/size/capacity: Located adjacent to Nubbin Slough on Davie Dairy, this 1.4 acre system will be sized to treat stream flows from < 1 to 25 cfs.

Initiative status: Deployment scheduled for December 2007 – January 2008.

Cost: Will be provided upon project completion.

Documentation: Executed contractual services agreement between the Florida Department of Agriculture and Consumer Services (FDACS) and Watershed Technologies, LLC (Contract #13489).

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: The HWTT will be designed to reduce total P concentrations in the tributary waters from the range of 0.4 – 0.9 mg/L to below 0.08 mg/L.

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: NA
- Assumptions: No effects on water quantity.

Screening Criteria

- Proof of Concept: Has been successfully demonstrated in pilot test projects.
- Other Impacts: None

Contact: Odi Villapando (rvillap@sfwmd.gov) Ext. 2936.

Northern Everglades- Potential Management Measure

Project Feature/Activity: Upper Mosquito Creek Watershed Treatment System (HWTT)

Level: Level 2

General description/Background: The Hybrid Wetland Treatment Technology combines the desirable attributes of treatment wetlands and chemical treatment systems.

Purpose: The Upper Mosquito Creek HWTT will be utilized to demonstrate the technical feasibility and cost-effectiveness of this technology for removing P from a range of stream flow rates.

Location/size/capacity: Located adjacent to Mosquito Creek on Larson Dairy property, this two-pond, 1.5 acre system will be sized to treat stream flows from < 1 to 15 cfs.

Initiative status: Deployment scheduled for January - February 2008.

Cost: Will not be available until the project is completed.

Documentation: Executed contractual services agreement between the Florida Department of Agriculture and Consumer Services (FDACS) and Watershed Technologies, LLC (Contract #13489).

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: The HWTT will be designed to reduce total P concentrations in the tributary waters from the range of 0.4 – 0.8 mg/L to below 0.08 mg/L.

Estimate of Water Quantity Benefits

- Minimum: NA
- Maximum: NA
- Most Likely: NA
- Level of Certainty: NA
- Assumptions: No effects on water quantity.

Screening Criteria

- Proof of Concept: Has been successfully demonstrated in pilot test projects.
- Other Impacts: None

Contact: Odi Villapando (rvillap@sfwmd.gov) 561-682-2936.

Northern Everglades- Potential Management Measure

Project Feature/Activity: Kissimmee Reservoir East

Level: 4

General description/Background: The primary intent of the NEEPP legislation is to protect and restore surface water resources and achieve and maintain compliance with water quality standards in the Lake Okeechobee Watershed, the Caloosahatchee River Watershed, and the St. Lucie River Watershed, and downstream receiving water through the phased comprehensive, and innovative protection program which includes long-term solutions based upon the total maximum daily loads. The proposed project feature would help meet the intent of the legislation by providing additional storage in the Lake Okeechobee Watershed (LOW).

Purpose: Enhance existing storage capacity in the LOW.

Location/size/capacity: This proposed feature would provide up to 200,000 ac-ft of storage capacity and would be located to the east of Kissimmee River in the Lower Kissimmee Sub-watershed. It consists of a 16 ft deep, 14,000 acre reservoir that would primarily receive flows from and discharge back to the Kissimmee River. Water stored in this reservoir can potentially also be diverted to the Taylor Creek/Nubbin Slough Sub-watershed for additional treatment.

Initiative status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation.

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: 6.48 mt/yr
- Maximum: 14.1 mt/yr
- Most Likely: 9.43 mt/yr
- Level of Certainty: Conceptual
- Assumptions: POR 1965-2000

Estimate of Water Quantity Benefits

- Minimum: 201,600 ac-ft
- Maximum: 201,600 ac-ft
- Most Likely: 201,600 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Reservoir storage volume based on 90 percent area X 16 ft depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Armando Ramirez; SFWMD; 561-681-2563

Northern Everglades- Potential Management Measure

Project Feature/Activity: Istokpoga/Kissimmee Reservoir

Level: 4

General description/Background: The primary intent of the NEEPP legislation is to protect and restore surface water resources and achieve and maintain compliance with water quality standards in the Lake Okeechobee Watershed, the Caloosahatchee River Watershed, and the St. Lucie River Watershed, and downstream receiving water through the phased comprehensive, and innovative protection program which includes long-term solutions based upon the total maximum daily loads. The proposed project feature would help meet the intent of the legislation by providing additional storage in the Lake Okeechobee Watershed (LOW).

Purpose: Enhance existing storage capacity in the LOW.

Location/size/capacity: This facility would provide a total of 600,000 ac-ft of storage capacity with flows coming from the Istokpoga Basin and the Kissimmee River. The configuration for this proposed reservoir was developed by modifying a feature evaluated by the CERP LOW Project during early planning stages. The reservoir would occupy 42,000 acres in the southern reaches of the Lake Istokpoga and Indian Prairie Sub-watersheds. Because of its proximity to Lake Okeechobee and its large size, this feature could also be used to store lake waters, if needed.

Initiative status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: 28.9 mt/yr
- Maximum: 82.9 mt/yr
- Most Likely: 55.2 mt/yr
- Level of Certainty: Conceptual
- Assumptions: POR 1965-2000; Reservoir P-load reduction estimates based on Bob Knights' report

Estimate of Water Quantity Benefits

- Minimum: 600,000 ac-ft
- Maximum: 600,000 ac-ft
- Most Likely: 600,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Reservoir storage volume based on 90 percent area X 16 ft depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Armando Ramirez; SFWMD; 561-681-2563

Northern Everglades- Potential Management Measure

Project Feature/Activity: Fisheating Creek Reservoir

Level: 4

General description/Background: The primary intent of the NEEPP legislation is to protect and restore surface water resources and achieve and maintain compliance with water quality standards in the Lake Okeechobee Watershed, the Caloosahatchee River Watershed, and the St. Lucie River Watershed, and downstream receiving water through the phased comprehensive, and innovative protection program which includes long-term solutions based upon the total maximum daily loads. The proposed project feature would help meet the intent of the legislation by providing additional storage in the Lake Okeechobee Watershed (LOW).

Purpose: Enhance existing storage capacity in the Lake Okeechobee Watershed.

Location/size/capacity: This facility would provide 250,000 ac-ft of storage capacity in the Fisheating Creek Sub-watershed. It consists of a 17,500 acre, 16-ft deep reservoir that would primarily receive flows from Fisheating Creek. Because of its proximity to Lake Okeechobee, it could also be used to store lake waters, if necessary.

Initiative status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: 15.5 mt/yr
- Maximum: 38.5 mt/yr
- Most Likely: 27.7 mt/yr
- Level of Certainty: Conceptual
- Assumptions: POR 1965-2000; Reservoir P-load reduction estimates based on Bob Knights' report

Estimate of Water Quantity Benefits

- Minimum: 250,000 ac-ft
- Maximum: 250,000 ac-ft
- Most Likely: 250,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Reservoir storage volume based on 90 percent area X 16 ft depth

Screening Criteria

- Proof of Concept:
- Other Impacts:

Contact: Armando Ramirez; SFWMD; 561-681-2563

Northern Everglades- Potential Management Measure

Project Feature/Activity: S-133 Water Quality Treatment

Level: 5

General description/Background: It is important to locate a water quality improvement feature in the S-133 sub-basin of the Lower Kissimmee Sub-watershed because the original plan of treating flows from this sub-basin using one of the LOFT STAs has recently been shown to be impracticable.

Purpose: Provide additional water quality improvement in the S-133 Basin.

Location/size/capacity: The exact nature of this feature (STA, deep well, expansion of the existing Lemkin Creek Urban Stormwater Treatment Area, or a combination of these) would be determined during the implementation stage through a feasibility study.

Initiative status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions:
-

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions:
-

Screening Criteria

- Proof of Concept: TBD
- Other Impacts: TBD

Contact: Armando Ramirez; SFWMD; 561-681-2563

Northern Everglades- Potential Management Measure

Project Feature/Activity: S-68 STA

Level: 5

General description/Background: One of the major sources of TP loading in the Istokpoga/Indian Prairie Sub-watershed is flows from the intense agricultural operations located to the south of Lake Istokpoga. The proposed feature would target flows from the agricultural operations before they reached the regional drainage system.

Purpose: Provide additional water quality improvements in the Indian Prairie Sub-Watershed

Location/size/capacity: A 5,000 ac STA is proposed to be located in the Indian Prairie Sub-Watershed.

Initiative status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Estimate of Water Quantity Benefits

- Minimum: 6,750 ac-ft
- Maximum: 6,750 ac-ft
- Most Likely: 6,750 ac-ft
- Level of Certainty: Conceptual
- Assumptions: STA storage volume is based on 90 percent area X 1.5 ft depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: David Unsell; SFWMD; 561- 682-6888

Northern Everglades- Potential Management Measure

Project Feature/Activity: Istokpoga Canal RASTA

Level: 4

General description/Background: The primary intent of the NEEPP legislation is to protect and restore surface water resources and achieve and maintain compliance with water quality standards in the Lake Okeechobee Watershed, the Caloosahatchee River Watershed, and the St. Lucie River Watershed, and downstream receiving water through the phased comprehensive, and innovative protection program which includes long-term solutions based upon the total maximum daily loads. The proposed project feature would help meet the intent of the legislation by providing additional storage and water quality improvement in the Lake Okeechobee Watershed (LOW).

Purpose: Enhance existing storage and capacity and provide additional water quality improvement in the Lake Okeechobee Watershed.

Location/size/capacity: This feature would consist of a 2,000 acre, 16-ft deep reservoir coupled with a 5,000 acre STA. This feature would target runoff from the Lower Kissimmee, the Lake Istokpoga, and the Indian Prairie Sub-watersheds.

Initiative status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: 10 mt/yr
- Maximum: 18 mt/yr
- Most Likely: 10 mt/yr
- Level of Certainty: Conceptual
- Assumptions: POR 1965-2000; Reservoir P-load reduction estimates based on Bob Knights' report

Estimate of Water Quantity Benefits

- Minimum: 28,000 ac-ft
- Maximum: 28,000 ac-ft
- Most Likely: 28,000 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Reservoir storage volume based on 90 percent area X 16 ft depth; STA storage volume is based on 90 percent area X 1.5 ft depth

Screening Criteria

- Proof of Concept: TBD
- Other Impacts: TBD

Contact: Armando Ramirez; SFWMD; 561-681-2563

Northern Everglades- Potential Management Measure

Project Feature/Activity: Taylor Creek STA

Level: 4

General description/Background: The primary intent of the NEEPP legislation is to protect and restore surface water resources and achieve and maintain compliance with water quality standards in the Lake Okeechobee Watershed, the Caloosahatchee River Watershed, and the St. Lucie River Watershed, and downstream receiving water through the phased comprehensive, and innovative protection program which includes long-term solutions based upon the total maximum daily loads. The proposed project feature would help meet the intent of the legislation by providing additional water quality improvement in the Lake Okeechobee Watershed (LOW).

Purpose: Provide additional water quality improvement in the LOW.

Location/size/capacity: This proposed 2,000 ac STA would replace the LOFT 2,000 ac reservoir at the same location that is currently under consideration. Since flows in Taylor Creek, which would be the primary source of water for this STA, are transient, this STA could also treat water from the East Kissimmee Reservoir.

Initiative status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: 4 mt/yr
- Maximum: 4 mt/yr
- Most Likely: 4 mt/yr
- Level of Certainty: Conceptual
- Assumptions: POR 1965-2000

Estimate of Water Quantity Benefits

- Minimum: 2,700 ac-ft
- Maximum: 2,700 ac-ft
- Most Likely: 2,700 ac-ft
- Level of Certainty: Conceptual
- Assumptions: STA storage volume is based on 90 percent area X 1.5 ft depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Armando Ramirez; SFWMD; 561-681-2563

Northern Everglades- Potential Management Measure

Project Feature/Activity: Istokpoga/Kissimmee RASTA

Level: 4

General description/Background: The primary intent of the NEEPP legislation is to protect and restore surface water resources and achieve and maintain compliance with water quality standards in the Lake Okeechobee Watershed, the Caloosahatchee River Watershed, and the St. Lucie River Watershed, and downstream receiving water through the phased comprehensive, and innovative protection program which includes long-term solutions based upon the total maximum daily loads. The proposed project feature would help meet the intent of the legislation by providing additional storage in the Lake Okeechobee Watershed (LOW).

Purpose: Enhance existing storage and capacity and provide additional water quality improvement in the Lake Okeechobee Watershed.

Location/size/capacity: This proposed feature would collect runoff from the Lake Istokpoga and Indian Prairie Basin Sub-watersheds and the Kissimmee River Sub-watershed. It includes an 8,000 ac STA coupled with a 19,000 ac reservoir and it would be located in the Indian Prairie Basin Sub-watershed. Because of its proximity to Lake Okeechobee and its large size, this feature could also be used to store and treat Lake Okeechobee waters, as appropriate.

Initiative status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Estimate of Water Quantity Benefits

- Minimum: 273,600 ac-ft
- Maximum: 273,600 ac-ft
- Most Likely: 273,600 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Reservoir storage volume based on 90 percent area X 16 ft depth; STA storage volume is based on 90 percent area X 1.5 ft depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Armando Ramirez; SFWMD; 561-681-2563

Northern Everglades – Potential Management Measure

Project Feature/Activity: Nicodemus Slough RASTA

Level: 4

General Description/Background: Fisheating Creek is the only free flowing tributary to Lake Okeechobee and it drains approximately 289,366 acres of the Lake Okeechobee Watershed (LOW). Current average annual phosphorus loading from the creek to the lake, based on measured loads from 1991 to 2005 is approximately 54.70 mt/yr. Several P-load reduction initiatives are planned for the FEC watershed under LOPP and these projects are projected to cumulatively reduce roughly 15.5 mt/yr of load, which leaves approximately 39.5 mt/yr of incoming load. To achieve the Lake Okeechobee phosphorus TMDL a large fraction of this load will have to be removed as part of the Phase II Technical Plan implementation.

Due to the extremely flashy nature of flows in this sub-watershed standalone STAs would not provide load reduction benefits for a large part of the year. Therefore reservoir assisted stormwater treatment areas (RASTAs) are recommended for consideration. The reservoir component would capture and store peak flows and provide the STA with a sustained source of water for a much larger part of the year.

Purpose: Enhance existing storage and capacity and provide additional water quality improvement in the LOW.

Location/Size/Capacity: This proposed feature would provide approximately 168,000 ac-ft of storage capacity and reduce TP loads by 33 mt/yr in the lower reaches of the Fisheating Creek Sub-watershed. The RASTA complex consists of a 6,500 ac STA coupled with an 11,000 ac, 16-ft deep reservoir. Because of its proximity to Lake Okeechobee, it could also be used to store and treat lake waters, if necessary.

Initiative Status: This is a proposed initiative that would be funded and executed as part of Phase II Implementation

Cost: TBD

Documentation: For additional information, refer to LOW Project document entitled: *“Fisheating Creek Alternative Plan Evaluation Document, Prepared by HDR Engineering, Inc for the South Florida Water Management District, March 2006.”*

Estimate of Water Quality Benefits

- Minimum: 27.90 mt/yr
- Maximum: 51.80 mt/yr
- Most Likely: 53.90 mt/yr

- Level of Certainty: Conceptual
- Assumptions: POR is 1965 to 2000. P-load reduction based on STA projections from LOW Project (min = 15 mt/yr; likely = 25 mt/yr; max = 30 mt/yr) and Reservoir P-load reduction from Bob Knight's spreadsheet analyses min = 27.90 mt/yr; likely = 51.80 mt/yr; max = 53.90 mt/yr). Note that these projections are on the high side because LOW Project estimates are based on a stand-alone STA and do not account for load reduction that occurs in the reservoir

Estimate of Water Quantity Benefits

- Minimum: 167,175 ac-ft
- Maximum: 167,175 ac-ft
- Most Likely: 167,175 ac-ft
- Level of Certainty: Conceptual
- Assumptions: Reservoir storage volume based on 90 percent area X 10 ft depth; STA storage volume based on 90 percent of footprint acreage X 1.5 ft standard operating depth

Screening Criteria

- Proof of Concept: 1
- Other Impacts: 1

Contact: Armando Ramirez; SFWMD; 561-681-2563

Northern Everglades – Potential Management Measure

Project Feature/Activity: Lake Okeechobee Disking/Plowing

Level: 3

General Description/Background: There are two distinct types of soil tilling, both of which may be useful in dealing with lake sediments. They are disking and plowing. Disking involves mixing the organic sediments with the underlying layer of mineral soils, usually sands. Mixing the two soils together is expected to reduce the turbidity production and phosphorus flux into the water column. Mixing of the soils is expected to significantly reduce the amount of the organic sediments that are exposed to the water column. Plowing is a similar action, but is accomplished with a farm implement that is designed, not to mix the soil layers, but to invert the two layers. If the organic layer is about one foot or less in thickness, it should be possible to plow the soil and leave about one foot or so of mineral soil over the organic soils. Some mixing will occur, but it should be much less than with the disking approach. Plowing should result in a more nearly complete sequestration from the water column of the organic sediments below a layer of mineral soils.

Purpose: To reduce TP loading from the sediment bed in Lake Okeechobee

Location/Size/Capacity: Locations for pilot project are currently being scoped.

Initiative Status: A pilot project will be undertaken later this year to demonstrate the efficacy of this method.

Cost: TBD

Estimate of Water Quality Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: TBD

Estimate of Water Quantity Benefits

- Minimum: TBD
- Maximum: TBD
- Most Likely: TBD
- Level of Certainty: Conceptual
- Assumptions: TBD

Screening Criteria

- Proof of Concept: 0
- Other Impacts: 0

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**WATER RESOURCES ADVISORY COMMISSION
RECOMMENDATIONS**

**DRAFT RECOMMENDATIONS TO PROTECT AND RESTORE LAKE OKEECHOBEE AND THE
CALOOSAHATCHEE AND ST. LUCIE ESTUARIES**
South Florida Water Management District Water Resources Advisory Commission, Lake Okeechobee Committee
June 4, 2007

#1 or #3 Recommendations Being Done or Begun but Needing Support

Recommendations were scored by the Committee as to relative importance. This is not a “priority ranking” of the recommendations because information about cost and feasibility was not available for all of the recommendations when the scoring was done in February and March, 2007.

The recommendations were rated by SFWMD staff at 1 or 3 (“being done” or “begun but needing support”; or 2, as explained below).

- “Score” is the total of points for each recommendation.
- Committee asked staff to determine which strategies are underway, which are not, and the rough estimates of cost (provided for only a few recommendations).
- “Staff Eval” is the preliminary evaluation by staff:
 - o 1 – Being done (LOPP, LOER, A8/CERP, LORSS)
 - o 2 – Not Being done
 - o 3 – Begun but needs higher priority or more funding
 - o 4 – Cost Estimate
- On March 28, and April 25, the Committee made comments (**shown in red**), recommended deletion of goals and objectives, and combining of Recommendations.

Crosswalk between Draft Recommendations and Lake Okeechobee Phase II Technical Plan or other processes

The Lake Okeechobee Phase II Technical Plan process identified a large number of potential management measures to be considered in the alternative formulation process. Each of these management measures received a numerical designation. Many of these management measures have also been identified in this set of Draft Recommendations from the WRAC Lake Okeechobee committee. In cases where the draft recommendation was considered as a management measure in the Phase II Technical Plan the left column of this crosswalk shows a number or numbers. In cases where the draft recommendation was outside the scope of the Phase II Technical Plan the letter “S” was used as the designation followed by the lead agency, department or process that would be considering the draft recommendation. A key to the crosswalk designations in the left column of the table are shown below:

Numbers shown in the left column relate to the Lake Okeechobee Phase 2 Technical Plan Management Measures

For draft recommendations receiving “S” the following designations applied where applicable:

CERP-RECOVER- Comprehensive Everglades Restoration Plan- RECOVER process
FDEP- Florida Department of Environmental Protection
LOD- Lake Okeechobee Division/Watershed Management Department-SFWMD
LORSS- U. S. Army Corps of Engineers- Lake Okeechobee Regulation Schedule Study
O&M- Operations and Maintenance Department-SFWMD
SRWPP- St. Lucie River Watershed Protection Plan
USACE- U. S. Army Corps of Engineers
WS- Water Supply Department-SFWMD

Phase 2 Tech Plan Management Measure #	1/39/41	Score <u>81/67/59</u>	1. Revise the Lake Okeechobee Regulation schedule to benefit the lake and estuarine ecosystems while providing for appropriate water supply and flood protection and to take into account long term climate trends. 39. Need to quickly resolve issue of temporary vs. permanent forward pumps and impacts on water supply, Lake and Estuarine Ecology; and, recreation. 41. Rapidly complete and implement the SFWMD Lake Okeechobee Water Shortage Management Plan. No change.				
<i>S-1-LORSS</i> <i>2- LOD/WS</i>		Staff Eval:	1/1/1/ LORSS	4 – N/A			
	3	Score <u>65</u>	Develop an action plan and criteria to periodically lower the water level of Lake Okeechobee to 12' for a minimum of 12 weeks. Need to manage the high levels to get to 12 ft but be extremely careful of doing more managed recessions.				
<i>S</i>		Staff Eval:	1	4 – TBD			
	4/6	Score <u>72/69</u>	Vegetation management: 4: Evaluate methods to reduce harmful exotic species and replenish native species to benefit the lake ecosystem. 6: Improve coordination and communication between spraying agencies and the public. Evaluate the impact of aquatic plant control activities, including controlled burning, on the health of the lake ecosystem with opportunities for stakeholder input. More closely monitor the spraying activities of independent contractors and post such activities on the appropriate WEB sites. 4: No change on the lake. Upper chain of lakes a problem. Need to				

			do more work on chain of lakes.				
S-FDEP		Staff Eval:	1	4 – N/A			
	5	Score <u>70</u>	Create measurable objectives for the conservation of plant and animal communities and fisheries in the lake. Some already established. SFWMD, USACE, USFWS, FWCC need to reexamine.				
S-CERP-RECOVER		Staff Eval:	3	4 – TBD			
	7	Score <u>61</u>	Continue to assess seed bed viability for submerged aquatic vegetation. No change.				
S-LOD		Staff Eval:	1 – LOPP	4 – N/A			
	8/20	Score <u>81/70</u>	8: Evaluate options to store water north of Lake Okeechobee, including the evaluation of operational plans and regulations schedules for all basins north of the Lake. Also evaluate Aquifer Storage and Recovery, and Lake Okeechobee and Estuary Recovery Plan components. 20: Assess need to add more water storage and Stormwater Treatment Area capacity to store and treat excess Lake Okeechobee water. 8: <u>Options to Store Water:</u> Legislation will dictate developing plan north of lake. SFWMD now looking at water balance north of lake. <u>Lake Operational Plans and Schedules:</u> SFWMD developing model as tool to evaluate this for changes by 12/07. 2x2 model does not exist for north of lake. <u>ASR and LOER.</u> Continue to fast track. No change.				
93, 12, 87, 16, 17, 19, 23, 24, 26, 29, 30, 31, 47, 54, 59, 61, 74, 77, 80, 94, 97, 98, 57, 58, 69		Staff Eval:	8: 1 – LOPP & LOERR. 20: 3	4 – TBD; \$5-10m/yr.			

	9	Score <u>79</u>	Evaluate, and implement if feasible, additional storage, conveyance and treatment options in the EAA, Caloosahatchee Basin, St. Lucie Basin, and other basins to reduce harmful discharges. Legislation requires estuary plans by 2/09. Phil Flood and Karen Smith will continue putting those plans together (by 2/09). EAA will be evaluated in same time frames.				
14, 66, 102, 12, 87, 62, 38, 65, 96, 40, 41, 95, 92, 67		Staff Eval:	3	4 - TBD			
	10/16/21/ 33/36/37	Score <u>71/73/63/</u> <u>70/59/54</u>	10: Evaluate, and implement if feasible, additional water storage on private and public lands. 16: Implement Lake Okeechobee and Estuary Recovery Plan component regarding water storage on public and private lands. 21: Explore additional storage opportunities through programs such as World Wildlife Fund's Florida Ranch Lands Environmental Service Project. 33. Provide credits, compensation or other incentives for landowners who store more water on their land. 36. For Lake tributary basins, evaluate leasing vs. acquiring land for storage and treatment, especially in areas impacted by citrus canker. 37. When using private and public lands for storage and treatment, evaluate feasibility of restoring wetlands. 10: USACE and SFWMD currently doing this. Will be ongoing. Combine 33/36. Add water quality as well as water storage. Evaluate opportunities provided by federal Farm Bill ecosystem provisions.				
12, 87, 91		Staff Eval:	1/1/1/3/3/2	4 TBP (LOERR)			
	12/29	Score: <u>81/76</u>	12: Complete LOER "Fast Track" and water quality improvement components as quickly as possible. 29: Implement LOER water quality improvement programs. 12: No change; moving ASAP.				

15, 16, 17, 21, 23, 24		Staff Eval:	1 LOERR	4 - TBP			
	13	Score <u>72</u>	Evaluate feasibility of in-lake sediment dredging as quickly as possible. Eagle Bay Pilot Project moving ASAP (Indian River near shore project).				
32		Staff Eval:	3	4 - TBD			
	14/30/46	Score <u>68/71/66</u>	14. Meet the current Lake Okeechobee “Total Maximum Daily Load” (TMDL) an average of 140 mt/yr of phosphorous. Implement the Lake Okeechobee Protection Plan, which is the implementation plan for the TMDL. 30. Establish and meet estuary Total Maximum Daily Loads (TMDLs) and other water quality standards. 46. The Florida Department of Environmental Protection should establish Lake Okeechobee tributary Total Maximum Daily Loads and implementation plans to achieve the targets. No change. Regulatory process in place. Combine 14/30/46. Implement as quickly as possible.				
numerous		Staff Eval:	3/1/1	4 TBP			
	15/48	Score <u>54/52</u>	15. Evaluate alum, calcium carbonate or other appropriate cleanup methods for use in treating appropriate segments of the lake to gain rapid water quality improvement. 48. Evaluate aeration and chemical treatment in canals at strategic inflow points to settle out nutrients and solids flowing into the lake. Leave 13 as stand alone. Combine 15 and 48.				
75		Staff Eval:	3	4 - TBD			
	17	Score <u>73</u>	Implement sustainable agricultural practices. Delete.				
		Staff Eval:	3	4			
	18	Score	Evaluate and implement Deep Aquifer Recharge Injection wherever				

		<u>72</u>	feasible, as soon as possible. Proceed with expedited pilot projects.				
54, 94, 95, 96, 97, 98		Staff Eval:	3	4 - TBD			
	19	Score <u>72</u>	Implement Aquifer Storage and Recovery (ASR) well construction to the extent feasible.				
18, 19, 26, 80, 93		Staff Eval:	3	4 - TBD			
	22/47	Score <u>57/64</u>	22: Determine the feasibility of and need for reconfiguring discharge structures to enable mid-stage discharge capability so that less sediment is sent downstream to the estuaries. 47: Determine the feasibility of and need for reconfiguring discharge structures to enable mid-stage discharge capability so that less sediment enters the lake.				
S-USACE		Staff Eval:	3/3	4 - TBD			
	28	Score <u>54</u>	Evaluate the need to create works necessary to reestablish a more natural distribution and timing of water from the C-25 basin to the St. Johns River Water Management District when there is excess water in the system.				
S-SRWPP		Staff Eval:	3	4 - TBD			
	31	Score <u>75</u>	Complete the Long Term Management Plan for the Kissimmee Chain of Lakes to better asses water management needs in that region. Staff currently doing this. It will be part of the Northern Everglades Comprehensive Plan.				
Underway		Staff Eval:	1	4 – TBD			
	34	Score <u>61</u>	Determine appropriate phosphorous reduction requirements for conversion of land uses in the Lake Okeechobee and tributary watersheds. SFWMD currently addressing the ERP rules and hiring consultant to do technical analysis to determine if revisions can be made. Add estuaries to this.				

15, 7, 21		Staff Eval:	1	4 – TBD			
	38/40	Score <u>67/65</u>	Continue efforts to reduce water supply dependence on Lake Okeechobee by creating alternative water supply solutions. 40. Support desalination plants, water reuse, and water conservation programs to augment public water supply. Combine 38/40. Delete “in coastal counties” from 40.				
12, 87, 50		Staff Eval:	1/1	4 – TBP			
	42	Score <u>77</u>	Implement the State of Florida’s initiative regarding use of phosphorous and nitrogen fertilizers for urban turf applications in Lake Okeechobee and tributary basins. Continue to implement. DEP working on model ordinance for local government and DACS is working on statewide rule for labeling to accomplish this.				
3		Staff Eval:	1	4 – N/A			
	43	Score <u>76</u>	Evaluate and implement alternatives to the land application of non-agricultural bio-solids in the Lake Okeechobee watershed. DEP is working on this.				
4		Staff Eval:	1	4 – TBD			
	44/45	Score <u>73/71</u>	44. Implement agricultural and urban BMP programs for any water sources flowing into the lake and estuaries. 45. Speed up the timeframe for implementation of agricultural and urban “Best Management Practices” (BMPs). Add: “Support additional funding for these programs”. Northern Everglades Comprehensive Plan will include BMP programs.				
1, 2, 3, 4, 5, 7, 8, 53, 49, 50		Staff Eval:	3/3	4 – TBD			
	49	Score <u>81</u>	Expedite rehabilitation of the Hoover dike and all other appropriate flood protection. No change.				
S-USACE		Staff Eval:	1	4 - TBD			

#2 RECOMMENDATIONS: NOT BEING DONE

These are the recommendations rated by staff as “Number 2” (those that staff suggested were not being done”.

	2	Score <u>67</u>	Determine whether pulse releases or continuous releases are appropriate for each estuary receiving Lake Okeechobee water and implement appropriate changes to the Lake Okeechobee Regulation Schedule.				
S-LORSS		Staff Eval:	2	4 – Up to 5 FTE			
	11	Score <u>40</u>	Investigate the feasibility of constructing levees within the Lake Okeechobee dike to create compartments within the lake to enable more efficient water and nutrient management. Real expensive but it may work. Most Committee members voted it low for esthetic reasons. Should not be totally thrown out until we have a satisfactory comprehensive plan.				
48		Staff Eval:	2	4 – TBD w/b high			
	23	Score <u>73</u>	Evaluate the need for and feasibility for additional conveyance capacity, flow ways, reservoirs, etc., to send Lake Okeechobee water to the south (re: Corps of Engineers Reconnaissance Study, mid-1990s). Change Staff Eval to a 3.				
S-USACE		Staff Eval:	3	4 - TBD			
	24/25	Score <u>63/63</u>	24. Evaluate a plan, with appropriate conveyance to water utilities, to reduce the harmful discharge of water to tide. 25. Evaluate the feasibility of providing excess Lake Okeechobee water to water utilities as needed. SFWMD is working on this. Change Staff eval to a 3 and combine with 25.				
Numerous		Staff Eval:	3	4 - TBD			
	26/27/28	Score <u>58/5654</u>	26. Evaluate existing SFWMD plans and projects to determine the need for conveyance of Lake Okeechobee water to the C-23, C-24, and C-25 basins for				

			beneficial uses when there is excess water in Lake Okeechobee. 27. Interbasin/Interdistrict Transfers: Determine the feasibility of using excess Lake Okeechobee water in the SFWMD Big Cypress basin, and the Southwest Florida and St. Johns River Water Management Districts. 28. Evaluate the need to create works necessary to reestablish a more natural distribution and timing of water from the C-25 basin to the St. Johns River Water Management District when there is excess water in the system. Combine 26, 27 and 28 and change Staff Eval to a 3.				
S-SRWPP		Staff Eval:	3	4 - TBD			
	32	Score <u>72</u>	Initiate a study to determine watershed storage and nutrient needs in Lake Istokpoga's watershed. Leave as is but change Staff eval to a 3				
S		Staff Eval:	32	4 -TBD			
	37	Score <u>54</u>	When leasing lands for storage and treatment, evaluate feasibility of restoring wetlands as a lease provision. Combine with 10/16/21. Change to: "When using private and public lands for storage and treatment, evaluate feasibility of restoring wetlands."				
12, 87, 91		Staff Eval:	2	4 - TBD			

Deleted #50 re: evaluating the outflow capacity of the lake.