



Options to Improve Performance of Loxahatchee River Minimum Flow and Level (MFL) Criteria

**Water Resources Advisory Commission
February 3, 2011**

*Dave Swift, Lead Scientist, Federal and State Policy Division
Everglades Restoration and Capital Projects*

Background



- **July 14, 2010** – Received letter from Loxahatchee River Management Coordinating Council (LRMCC) requesting SFWMD staff time to **develop operational criteria** to meet MFL for NW Fork of Loxahatchee River
- **Aug. 3, 2010** – SFWMD Response: A District technical team was convened to **document current actions** implemented within the watershed and **identify possible additional opportunities** that could be implemented to meet the MFL during dry periods
- **Aug./Sept. 2010** – District team prepared a draft technical memo for internal review

Background (Cont.)



- **Oct. 19, 2010** - Meeting called by Palm Beach County Commissioner Karen Marcus to discuss Loxahatchee River MFL issue. Included staff from Palm Beach County, City of West Palm Beach, Loxahatchee River District (LRD), Martin County and SFWMD
- **Nov. 19, 2010** – Meeting called by Chair of Loxahatchee River District to discuss with staff “interim” and “long-term” approaches for providing additional water to river

Background (Cont.)



- **Dec. 10, 2010** - Received letter from Loxahatchee River District stating its position on two priority issues for river: (1) restorative flows (long-term) and (2) minimum flows (immediate)
 - Long-term: LRD supports plans for flow-ways #1, 2 and 3, but not flow-way # 4, as contained in Loxahatchee River Watershed Restoration Project (aka CERP NPB County-Part 1)
 - Immediate: LRD believes infrastructure is in place that can provide supplemental water (15-20 cfs) from L-8 reservoir to river during dry season to meet MFL. Operational protocols need to be developed to deliver this water no later than January or February 2011

Background (Cont.)



- **Dec. 16, 2010** – Second meeting called by Commissioner Marcus to discuss Loxahatchee MFL issue

L-8 reservoir Water Quality Issues:

- **Phosphorus** - FDEP recommended annual load-based P limits be established for Grassy Waters Preserve (GWP). Evaluate existing data to establish limits
- **Chlorides** – FDEP indicated may be some flexibility in setting these limits. Discussions with City of West Palm Beach water plant operators to follow

Proposed Pilot Study (Option 1A):

- Using existing infrastructure, a pilot study is recommended to deliver L-8 reservoir water to Grassy Waters Preserve and the NW Fork of the Loxahatchee River (NWFLR) during 2011 dry season

Background (Cont.)



- **January 12, 2011-** Governing Board Projects and Lands Committee Meeting (Clewiston)
 - Board directed staff to develop operational protocols to deliver water from L-8 reservoir to NWFLR
 - Indicated that SFWMD should move forward to spend budgeted money to design the L-8 reservoir pump station and ask for cost-sharing from USACE later
 - Directed staff to present operational plan to WRAC in February

Summary of MFL Exceedances (1993 - 2010)



Total number days Lainhart Dam flows were less than 35 cfs for more than 20 consecutive days (highlighted in pink)

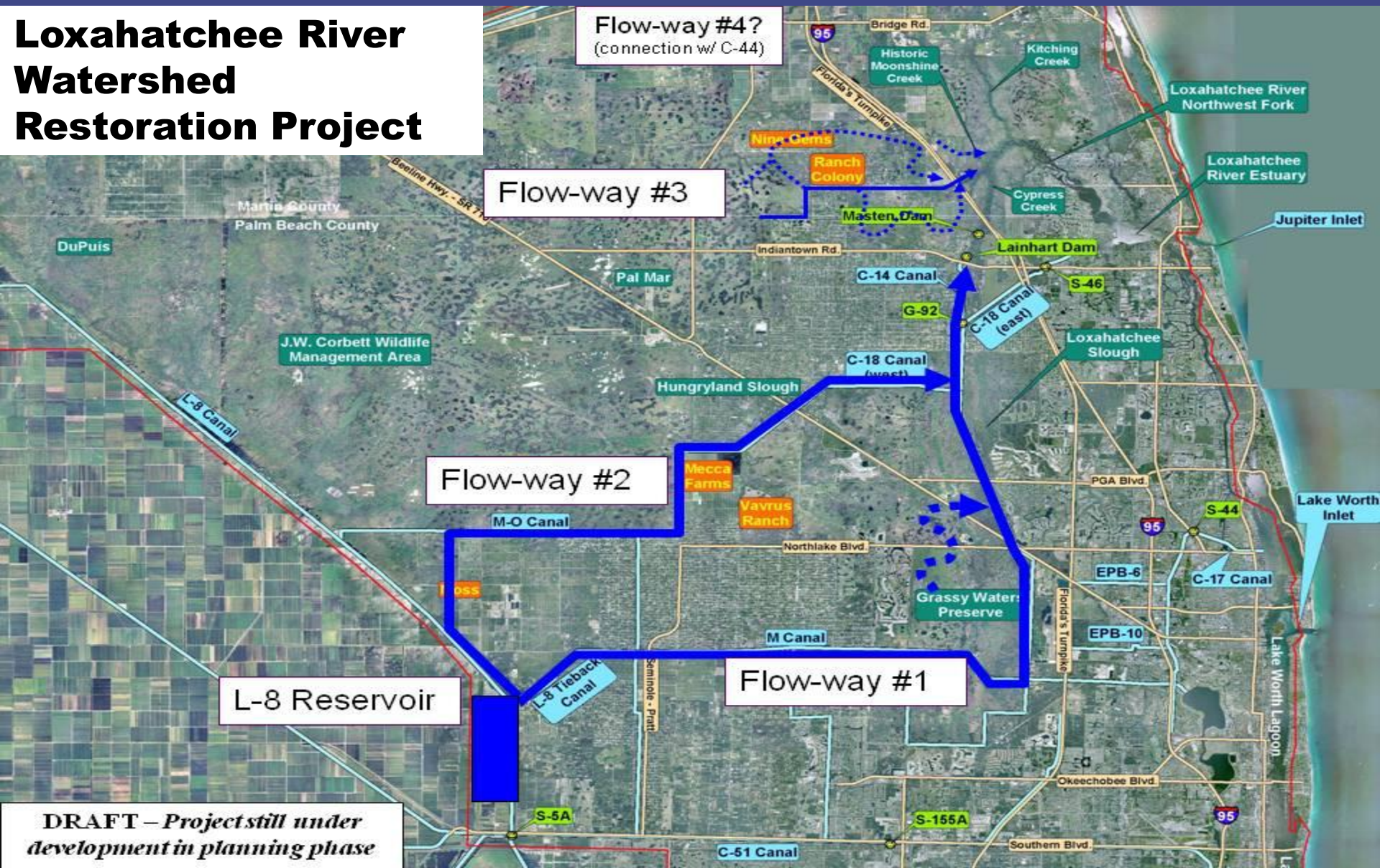
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1993	0	0	0	0	6	1	0	5	0	0	0	0
1994	0	0	0	11	0	1	0	0	0	0	0	0
1995	0	0	0	0	16	20	0	0	0	0	0	0
1996	0	0	0	0	2	0	0	0	0	0	9	13
1997	0	0	0	2	0	0	0	0	0	0	0	0
1998	0	0	0	3	1	11	4	0	0	0	0	0
1999	0	0	6	30	31	7	0	0	0	0	0	0
2000	2	1	28	5	14	30	8	11	19	0	0	0
2001	29	28	31	22	25	13	0	0	0	0	0	0
2002	0	0	13	14	31	16	0	0	0	1	18	17
2003	31	28	15	6	9	0	24	9	0	0	0	0
2004	4	3	23	30	31	30	29	2	0	0	0	0
2005	20	26	3	1	3	0	0	0	0	0	0	0
2006	4	16	31	30	31	24	0	12	0	0	0	1
2007	15	24	31	30	25	1	0	0	0	0	0	0
2008	0	0	0	0	23	1	0	0	0	0	0	0
2009	8	21	5	9	20	0	0	0	0	8	0	0
2010	0	0	0	0	0	0	0	0	0	0	23	21

———— = Date of Rule Adoption

MFL Recovery Plan

SFWMD

Loxahatchee River Watershed Restoration Project



Future Planned and Funded Projects



- Kitching Creek - Central Flow-Way Project (Martin County)
- Lake Point Stormwater Management and Treatment Project (Martin County)
- Loxahatchee River Preservation Initiatives:
 - Nine Gems/Culpepper Ranch (Cypress Creek)
 - Cypress Creek East Natural Area
 - Cypress Creek Phase III
 - Cypress Creek Phase IV
 - Sand Hill Crane East (Loxahatchee Slough)

Options for Improving Performance of Loxahatchee River MFL



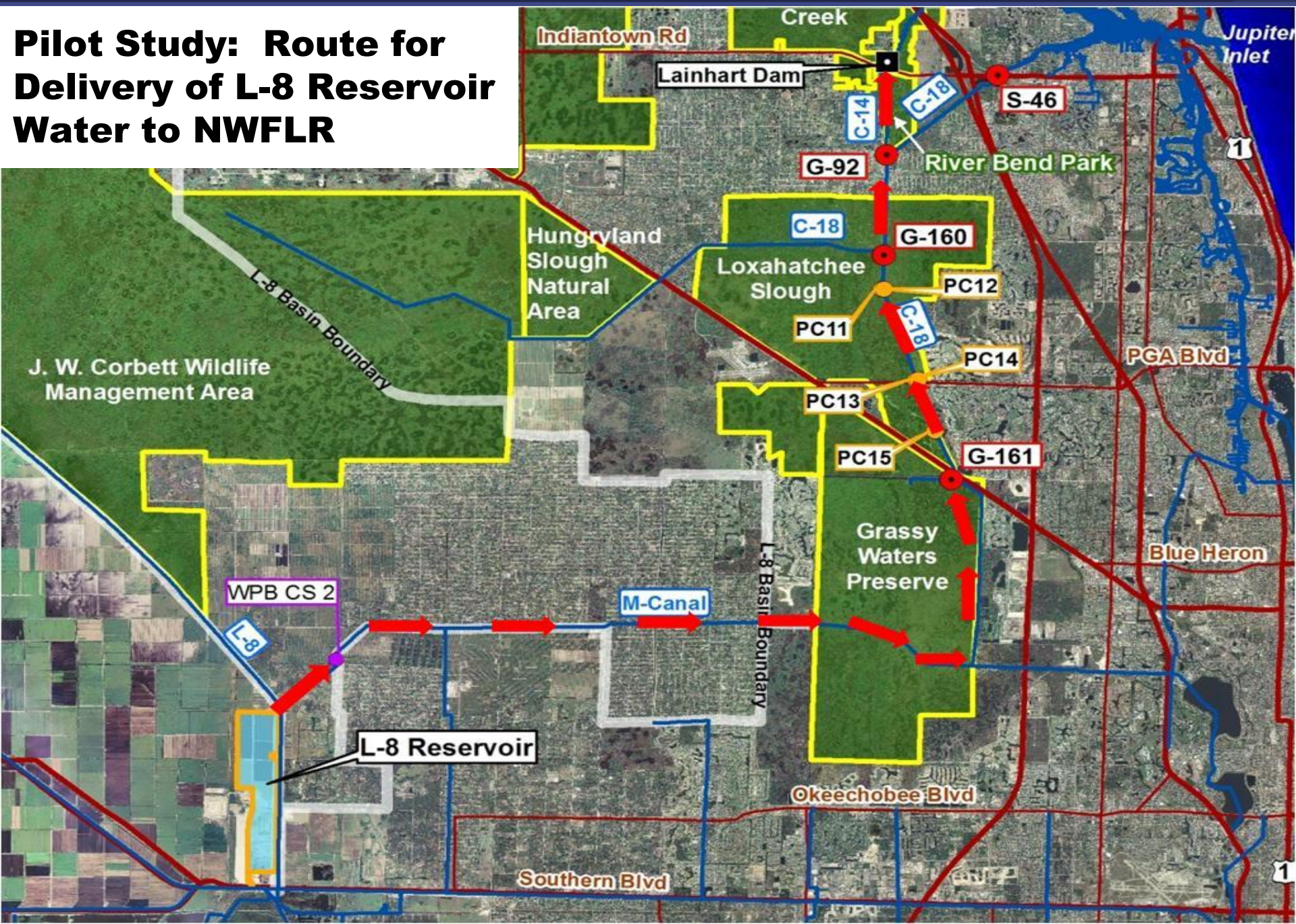
- Options 1A & 1B Proposed pilot studies to develop operational plans for delivering L-8 reservoir water to NWFLR
- Option 2 Water harvesting of C-18 canal water – Loxahatchee Slough
- Option 3 Local storage in Riverbend Park/East Loxahatchee Slough
- Option 4 Local storage on Jupiter-Venture/Hatcher Property
- Option 5 Dispersed Storage/Water Management
- Option 6 Replacement of PC-17 culverts in Loxahatchee Slough

Option 1A: Pilot Study Using Existing Infrastructure

SFWMD

- A pilot study is proposed to develop an operational plan using **existing infrastructure** for delivering L-8 reservoir water to Grassy Waters Preserve and the NW Fork of the Loxahatchee River
- Pilot study will include a **concerted data and operational review** followed by a **pilot test** this dry season

Pilot Study: Route for Delivery of L-8 Reservoir Water to NWFLR



Option 1A: Pilot Study Using Existing Infrastructure (Cont.)



1. Develop **work plan** that identifies existing resources, costs, operational and regulatory requirements needed to make L-8 reservoir deliveries to NWFLR using **existing infrastructure**
2. Obtain **letter of commitment** from City of West Palm Beach to allow District to conduct pilot test to pump L-8 reservoir water to GWP to provide dry season flows to NWFLR
3. Identify permit requirements:
 - Work with FDEP to issue appropriate permits/regulatory authorizations for pilot test
 - Develop operational protocols and operations plan
 - Develop water quality monitoring program that will satisfy FDEP requirements

Option 1A: Pilot Study Using Existing Infrastructure (Cont.)



4. Existing pumps will be used to **conduct a one to two-week pilot test** to deliver **~75 cfs of flow** from reservoir to L-8 canal and GWP
5. Conduct water quality monitoring within the L-8 canal, M-canal and GWP for compliance with FDEP water quality criteria
6. Results of pilot test and operational protocols used to make deliveries will be documented in a District technical report

Option 1B: Pilot Study Using Temporary Pumps



1. Develop a work plan to implement a **larger scale pilot study next year**
2. Obtain letter of commitment from City of West Palm Beach to allow District to pump **~160* cfs from L-8 reservoir** to GWP to supplement dry season flows to NWFLR
3. Establish interagency technical team to develop **“Plan of Study”** for coordination with FDEP on water quality issues (Team Leader, Ken Todd, Palm Beach County)
4. SFWMD staff develops operational protocols for delivering L-8 reservoir water to NWFLR using existing and temporary pumps

** May require a permit modification*

Option 1B: Pilot Study Using Temporary Pumps (Cont.)



5. Develop contract to install temporary pumps (85 cfs) along with existing pump (75 cfs) to deliver L-8 reservoir water to L-8 canal, GWP and NWFLR
6. Run temporary and existing pumps to deliver ~160 cfs* of flow from L-8 reservoir to L-8 canal for a period of 120-130 days
7. Conduct water quality monitoring within L-8 canal, M-canal and GWP for compliance with FDEP water quality criteria
8. Prepare draft report documenting operational protocols and water quality monitoring used to make deliveries to NWFLR

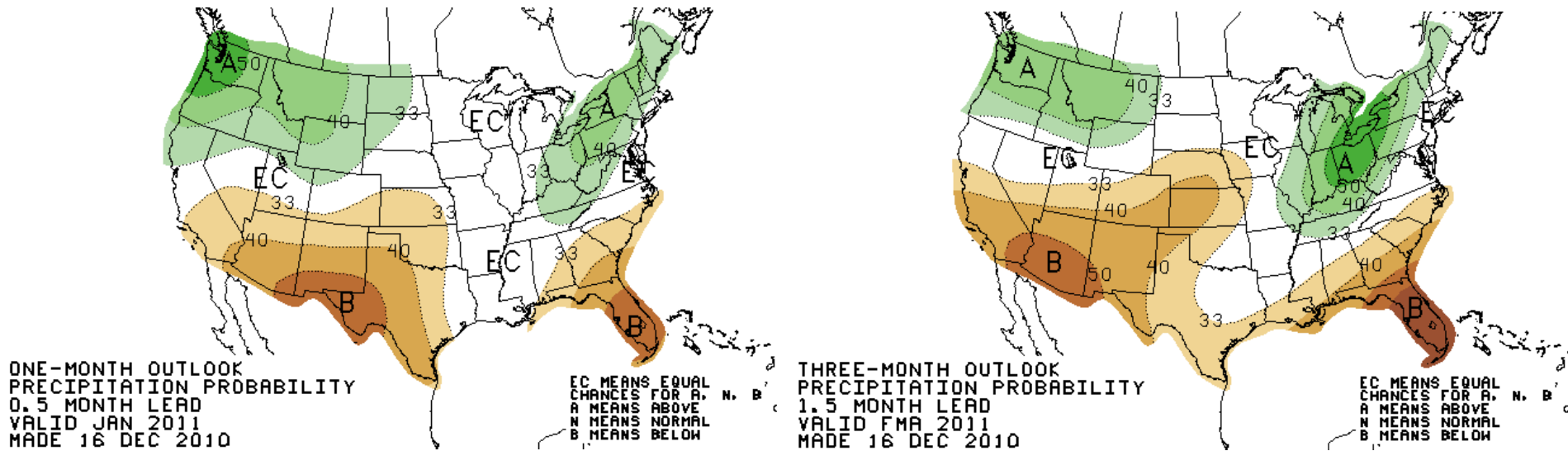
** May require a permit modification*

U. S. Seasonal Precipitation Outlook

National Climate Prediction Center (CPC)

Jan 2011

Feb-Apr 2011



La Niña conditions are expected to continue into the 2010-2011 dry season

The current precipitation outlook for central and southern Florida is:

- increased chance of below-normal (B) rainfall for January
- increased chance of below-normal (B) rainfall for Feb-Apr 2011
- increased chance of below-normal (B) rainfall for the entire 2010-11 dry season

Options 1A & 1B: Constraints



- **Water Shortage Management:** Strong drought forecast for South Florida; high probability of regional water shortage cutbacks or termination of water supply withdrawals for some users
- **Cost:** Option 1B will need to be budgeted for 2012. For Option 1B, preliminary estimates for renting a temporary pump and running it with the existing L-8 reservoir pump to provide ~160 cfs* of flow for four months totals more than \$500,000
- **Water Quantity and Quality Issues:**
 - Letter of commitment from City of West Palm Beach to deliver L-8 reservoir water to Grassy Waters Preserve
 - No water available in regional system to dilute chloride concentrations within L-8 canal
 - Potential impacts to agricultural users due to elevated chlorides within L-8 canal

Options 2 through 6

SFWMD

Other Proposed Near-term Options

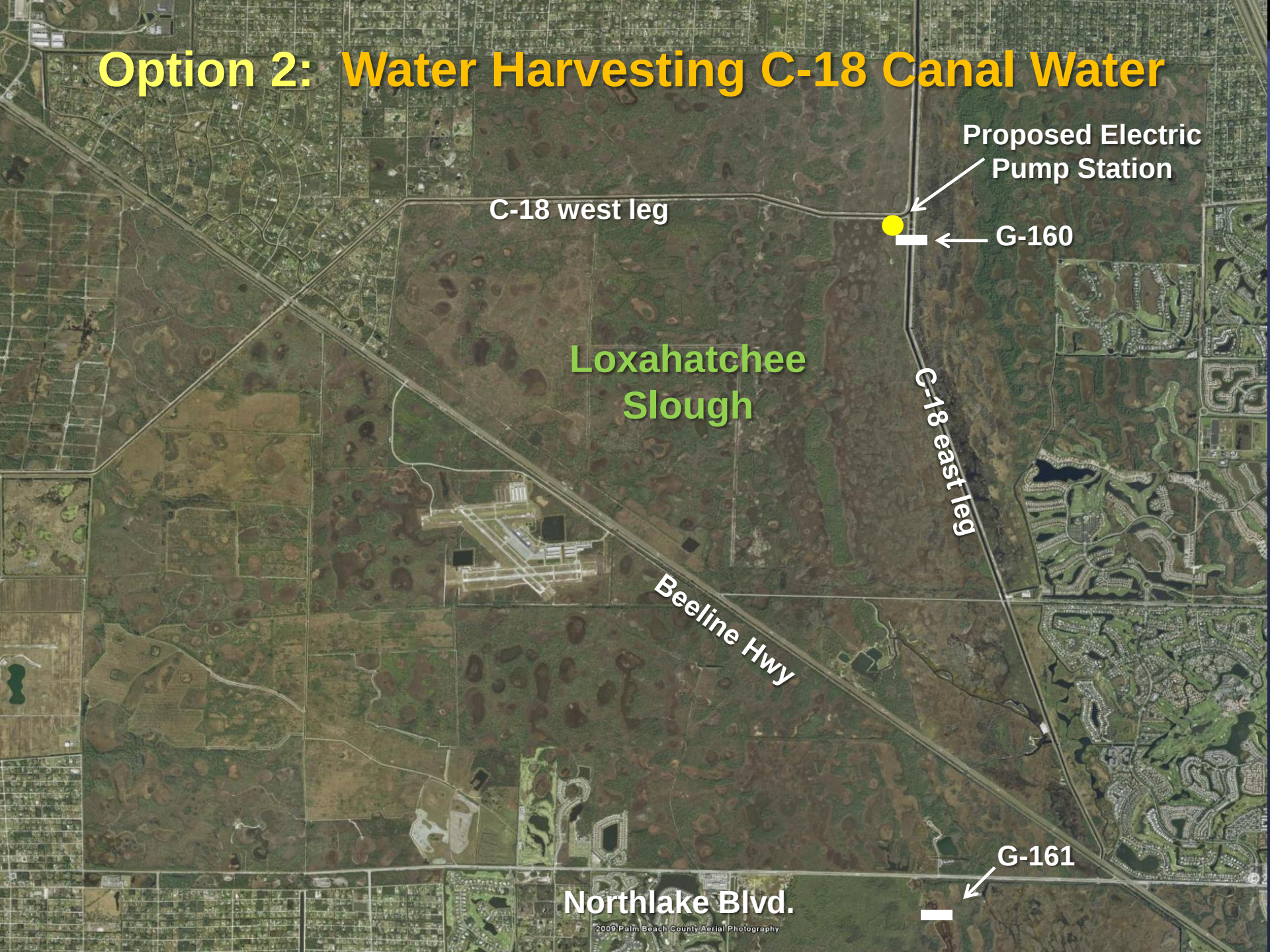


Option 2: Dry Season Water Harvesting



- Option 2 is based on the concept of harvesting and storing C-18 canal water that is currently **discharged to tide via S-46** during the non-hurricane months of **December and January**
- C-18 canal water would be harvested using an electric pump installed upstream of G-160 and moved into the Loxahatchee Slough for short-term storage
- Stored water would be slowly bled down in accordance with the slough's current regulation schedule to augment dry-season flows to the river
- Initial review of C-18 water quality data shows that it meets Class I and Class II water quality standards

Option 2: Water Harvesting C-18 Canal Water



Proposed Electric
Pump Station

C-18 west leg

G-160

Loxahatchee
Slough

C-18 east leg

Beeline Hwy

G-161

Northlake Blvd.

Option 3: Riverbend Park and East Loxahatchee Slough

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- Riverbend Park (680 acres) and East Loxahatchee Slough (158 acres) are located on the NWFLR
- Three existing culverts would capture excess S-46 water currently discharged to tide, storing this water within its system of lakes, wetlands and interconnected waterways
- Once stored, this water could be slowly bled down over dry season to provide additional flows to river
- Increased water levels during the dry season would benefit public recreation (canoeing, kayaking) and help maintain existing wetlands



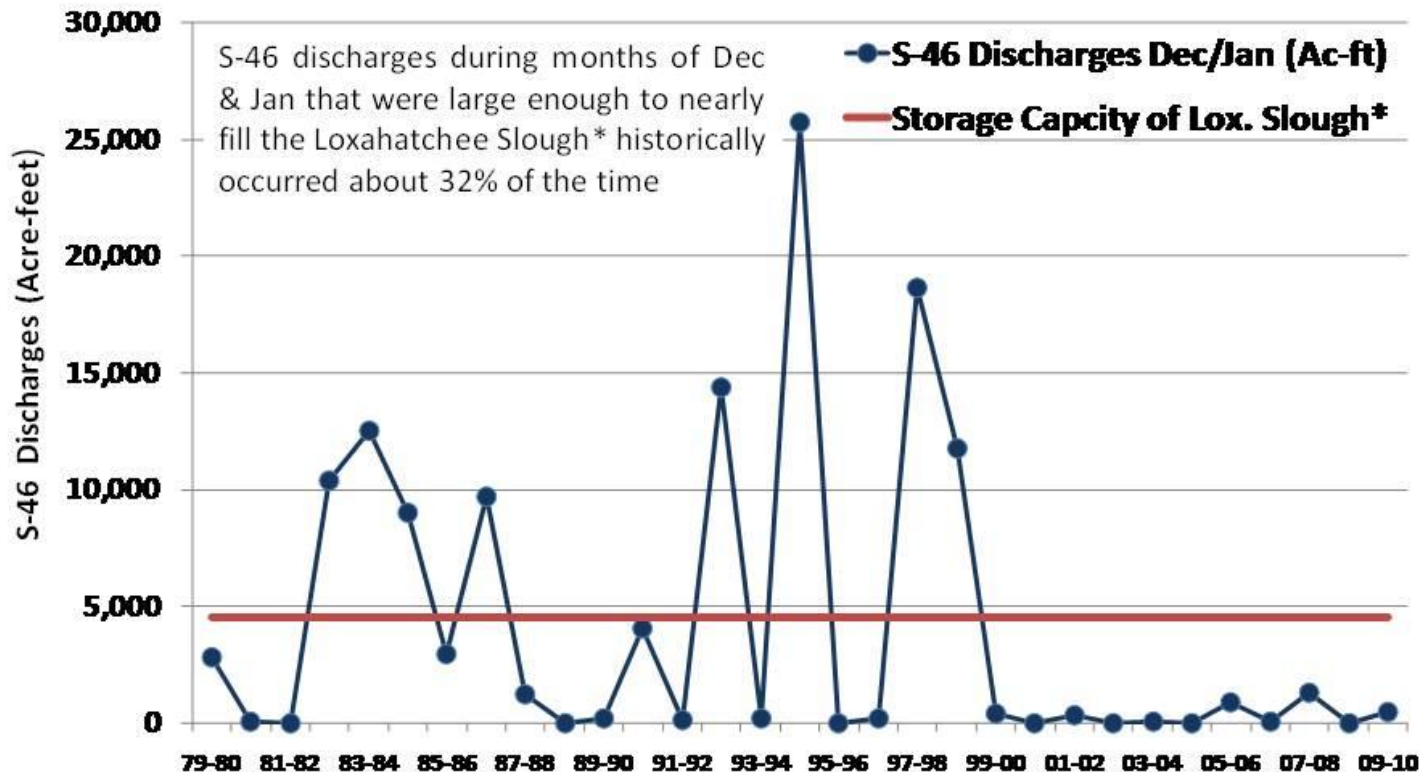
Riverbend Park and East Loxahatchee Slough

Water Availability Challenges for Options 2 and 3



What is the frequency that S-46 flows could be captured and stored within Loxahatchee Slough or Riverbend Park?

S-46 Discharges during Months of December & January (1979-2010)



* Storage capacity of Loxahatchee Slough is 4,546 acre-feet @ elevation 17.5 ft. NGVD

Option 4: Local Storage on Hatcher Property

SFWMD

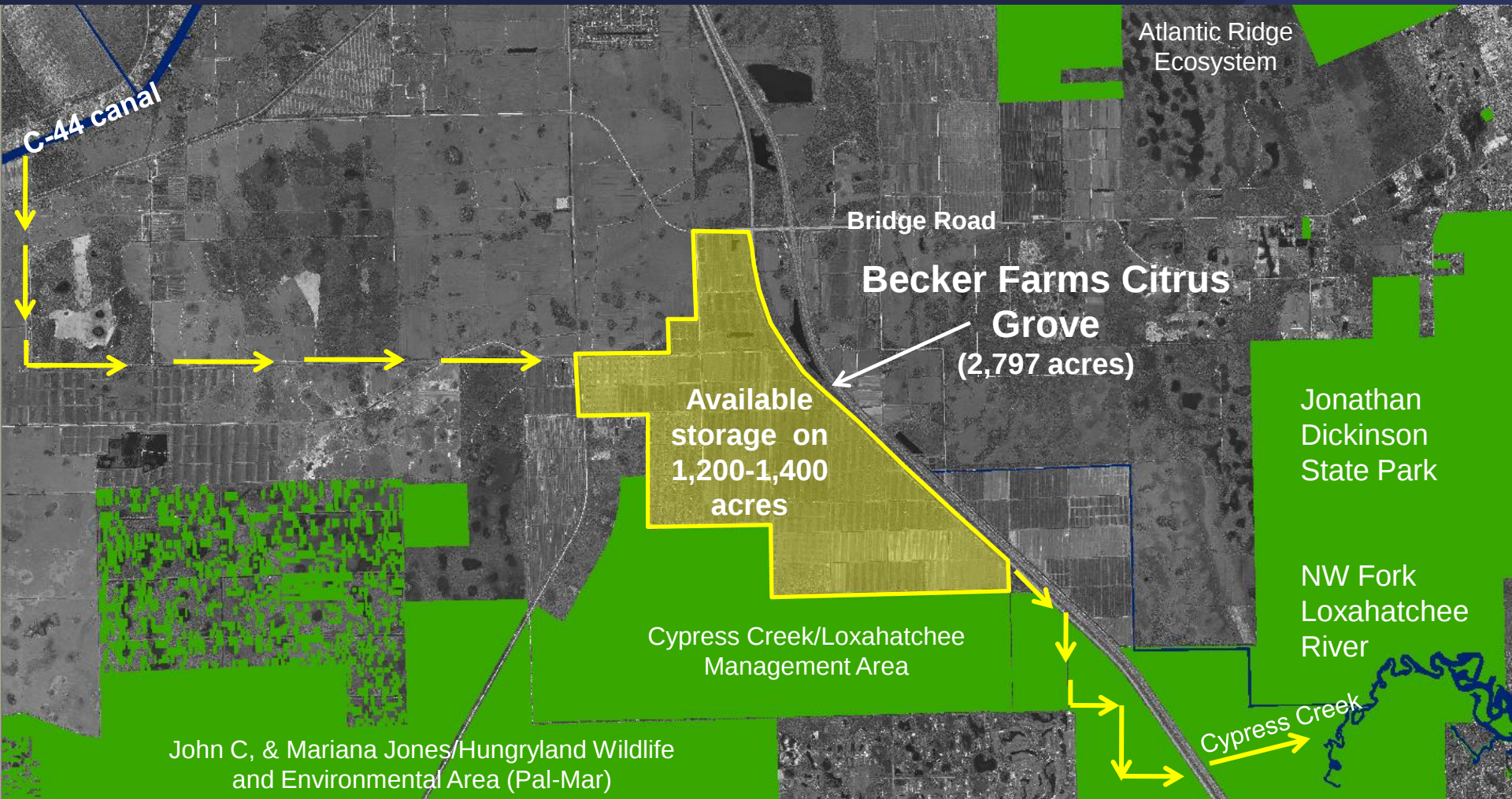
- Jupiter-Venture/Hatcher property (230 acres) is a Palm Beach County environmental restoration project located west of Riverbend Park and is directly connected to NWFLR
- Project designed to restore two natural slough systems and provide two open water storage facilities (lakes)
- Water captured by the two lakes provide 460 acre-feet of flood storage and water releases to NWFLR (about 5 cfs for 46 days)
- Palm Beach County has submitted plans to District for permit, which is under review



Project features and flow paths for Jupiter-Venture/Hatcher site

Option 5: Dispersed Storage/ Water Management

SFWMD



Option 5: Dispersed Storage/ Water Management - Becker Farms

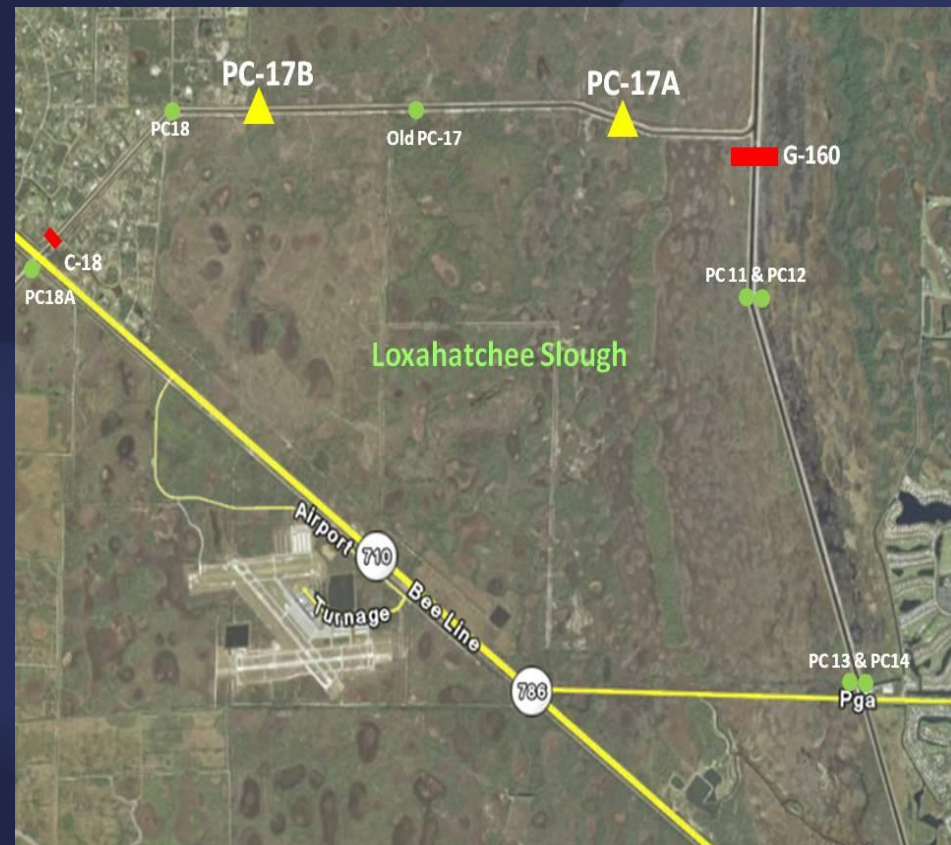


- Becker Farms has a large citrus grove (2,797 acres) located northwest of Loxahatchee River
- Approximately 1,200 – 1,400 acres of grove are out of production due to citrus canker and may be available for dispersed storage
- District staff members have met with property owners who have expressed interest in SFWMD's program
- During late wet season, C-44 canal water that would otherwise be discharged to the St. Lucie Estuary could be diverted and temporarily stored on Becker Farm to be later released downstream to a tributary of Loxahatchee River (Cypress Creek)
- If water quality standards can be met, this option could provide environmental benefits to both St. Lucie Estuary and Loxahatchee River

Option 6: Repair/Replacement of PC-17 Culverts

SFWMD

- Project includes demolition of four existing culverts known as PC-17 located within the Loxahatchee Slough
- To be replaced with four new culverts, two sited east and two sited west along west leg of the C-18 canal within the slough
- New culverts will (a) provide more controlled release of flows from slough to west leg of C-18 canal to river and (b) help prevent over-drainage of slough
- Construction expected in January 2011



Location of water management structures, new and existing project culverts within Loxahatchee Slough

Loxahatchee River Management Coordinating Council



Jan. 24, 2011 - Presentation to Loxahatchee River Management Coordinating Council (Jupiter)

The LRMCC voted to:

1. Fully support Option 1A as it represents the only immediate opportunity to try and meet the MFL this dry season
2. Requested a presentation by District on permitting and proprietary issues associated with utilizing Flow-way #1 to move water from L-8 canal through GWP, G-161 to C-18 canal
3. Requested same information for Flow-way #2, including land acquisition issues

Next Steps



- Assemble interagency technical team to develop the “Plan of Study” for proposed options 1A & 1B - February 1
- Present proposed options to WRAC - February 3
- Present proposed options to Governing Board



Questions