LOXAHATCHEE RIVER WATERSHED RESTORATION PROJECT

Project Delivery Team Continuation Meeting

(Follow-up to the 30 Mar 2016 PDT Meeting)

April 5, 2016

Federally designated as a National Wild and Scenic River, the Loxahatchee River and its watershed are homes to 33 federally threatened and endangered species, 20 federally protected migratory bird species, and 30 additional State's species of concern

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One of the Last Old Growth Cypress Floodplains in the SE Florida

Last Large Freshwater Wetland Corridor in Project Area

Vulnerable estuarine habitats

Initial Alternatives to a Focused Array

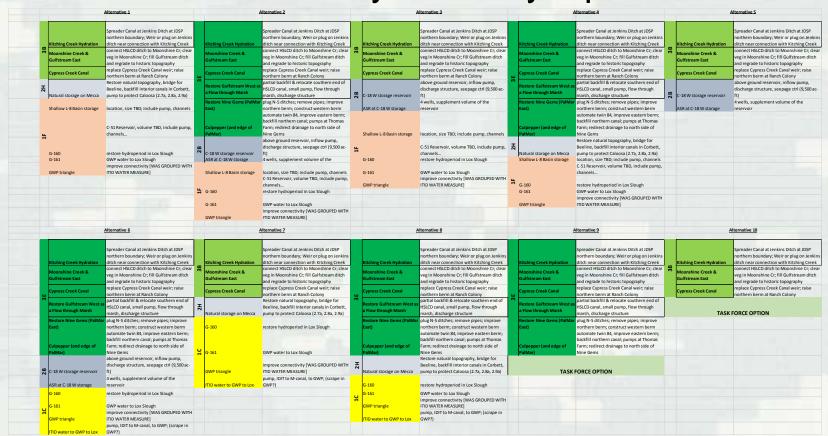Dr Brad Foster

Development of Initial Alternatives

- The Plan Formulation subteam combined the retained Options into complete Project Alternatives
    - Generally, one option per flowway
    - How the options would work together
    - Match volumes of storage so the total would be able to meet targets at Lainhart Dam
    - Alternatives received during earlier PDT meetings and recent Plan Formulation subteam meetings
    - Include some distinctly different alternatives

Initial Alternatives

- Brought10 alternatives to the PDT on 30 Mar 2016
- Brief list of measures by Flowway Option

PDT Actions, 30 Mar 2016

- Added Alt 11 and Alt 12 during the discussion
- Scored all twelve alternative for seven criteria

Screening Scores for Alternatives

Alternative	Level 1 Screening				Level 2 Screening			Level 1	Level 2	Total
	Flow volume to Lainhart Dam	Timing of Discharges to NW Fork	Natural Area Storage	Connectivity	Flexibility (Adaptability)	Adaptability - Robustness (Adaptability)	Nearness to Northwest Fork			
12	4	3.5	4	4	3	3.5	2	15.5	8.5	24.0
11	4	4	3	4	4	4	2	15.0	10.0	25.0
9	4	3.5	3	4	4	3	3	14.5	10.0	24.5
5	4	2.5	3	4	2	2.5	3	13.5	7.5	21.0
13 *	3	2.5	4	4	1	1.5	3	13.5	5.5	19.0
10	4	3	3	3	4	3	3	13.0	10.0	23.0
2	3	3	3	4	3	2	3	13.0	8.0	21.0
8b	2.5	2.5	4	4	3	1.5	3	13.0	7.5	20.5
4	2.5	2.5	4	4	1	1.5	3	13.0	5.5	18.5
6	2	2.5	3	4	2	1.5	3	11.5	6.5	18.0
1	2.5	2	4	3	1	1.5	3	11.5	5.5	17.0
7	1.5	1.5	4	3	1	1	3	10.0	5.0	15.0
3	3	2.5	2	2	3	2	3	9.5	8.0	17.5

* Added Alt 13 after the PDT meeting. The refinement to Alt 4 adds ASR at the L-8 shallow storage reservoir.

Whiteboard: 9 to 5 Alternatives

- <u>Objective:</u> Minimize number of alternatives to a manageable number (5) that can be further developed and modeled in accordance with MG Walsh's 3x3x3 guidance. Key to this objective is that alternatives are <u>*unique*</u> and <u>*distinguishable.*</u>

- <u>Process:</u>
  - Categorized alternatives into 5 categories
  - We choose the "best" alternative in each category using the following logic:
    - "Local Alternative". **Decision**: Select Alternative 10 because it would represent flowway 3 differently than any other alternative. **Result:** Option 9 and 10 were eliminated from other categories.
    - "Natural Storage at Mecca". **Decision:** Eliminate Alternative 8b because it would not meet intent of having a completely natural flowway at Mecca and add 2 ASR on Alternative 4 to address the low score that it received (Later becomes Alternative 13). **Discussion:** At this point Alternatives 13 and 12 were the only remaining Alternatives in the "Natural Storage at Mecca" and the "No ASR" categories. **Decision:** Both Alternative 13 and Alternative 12 would be carried forward representing both categories.

Category	Alternatives
Natural Storage at Mecca	13, 8, 4, 12
Reservoir w/ or w/o ASR on Mecca	2, 11, 5
No C-51	4, 5, 2, 8, 13
Local Alternative	9, 10
No ASR	9, 10, 4, 12

- **Discussion:** Two categories remain ("No C-51" and "Reservoir and/or ASR on Mecca") of which Alternatives 2 and 5 are included in both. Alternative 11 also remained in "Reservoir and/or ASR at Mecca" **Decision:** Alternative 11 was considered a "Cadillac" solution that was similar to Alternative 2 and Alternative 10 which have been retained. Eliminate Alternative 11.

- <u>Results:</u>
  - Retained Alternatives: 2, 5, 10, 12, 13
  - Eliminated Alternatives: 4, 8, 9, 11
  - *More analysis to follow.*

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Alternative 2

3E	Kitching Creek Hydration	Spreader Canal at Jenkins Ditch at JDSP northern boundary / Weir or plug on Jenkins ditch near connection with Kitching Creek
	Moonshine Creek & Gulfstream East	Connect HSLCD ditch to Moonshine Cr; Clear veg in Moonshine Cr; Fill Gulfstream Ditch; Regrade to historic topography
	Cypress Creek Canal	Replace Cypress Creek Canal Weir / Raise Northern Berm at Ranch Colony / Automate twin 84
	Restore Gulfstream West as a Flow through Marsh	Partial backfill & relocate southern end of HSLCD canal; Small pump; Flow through marsh; Discharge structure
	Connect PalMar	Plug N-S ditches; Remove pipes; Improve northern berm; Construct western berm; Improve eastern berm; Backfill northern canal;
2B	C-18 W storage reservoir	Above ground reservoir, Inflow pump, Discharge structure, Seepage ctrl (7,200 ac-ft)
	ASR at C-18 W storage	2 wells, supplement volume of the reservoir
1F	Shallow L-8 Basin storage (10,000 ac-ft)	10,000 ac-ft Shallow Storage Includes Pump & Channels
	G-160	Restore hydroperiod in Lox Slough
	G-161	GWP water to Lox Slough
	GWP triangle	Improve Connectivity

Alternative 5

3E	Kitching Creek Hydration	Spreader Canal at Jenkins Ditch at JDSP northern boundary / Weir or plug on Jenkins ditch near connection with Kitching Creek
	Moonshine Creek & Gulfstream East	Connect HSLCD ditch to Moonshine Cr; Clear veg in Moonshine Cr; Fill Gulfstream Ditch; Regrade to historic topography
	Cypress Creek Canal	Replace Cypress Creek Canal Weir / Raise Northern Berm at Ranch Colony / Automate twin 84
	Restore Gulfstream West as a Flow through Marsh	Partial backfill & relocate southern end of HSLCD canal; Small pump; Flow through marsh; Discharge structure
	Connect PalMar	Plug N-S ditches; Remove pipes; Improve northern berm; Construct western berm; Improve eastern berm; Backfill northern canal;
2B+	C-18 W storage reservoir	Above ground reservoir, Inflow pump, Discharge structure, Seepage ctrl (9,500 ac-ft)
	ASR at C-18 W storage	4 wells, supplement volume of the reservoir
1A	G-160	Restore hydroperiod in Lox Slough
	G-161	GWP water to Lox Slough
	GWP triangle	Improve Connectivity

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Alternative 12

3E	Kitching Creek Hydration	Spreader Canal at Jenkins Ditch at JDSP northern boundary Weir or plug on Jenkins ditch near connection with Kitching Creek
	Moonshine Creek & Gulfstream East	Connect HSLCD ditch to Moonshine Cr; Clear veg in Moonshine Cr; Fill Gulfstream Ditch; Regrade to historic topography
	Cypress Creek Canal	Replace Cypress Creek Canal Weir Raise Northern Berm at Ranch Colony Automate twin 84
	Restore Gulfstream West as a Flow through Marsh	Partial backfill & relocate southern end of HSLCD canal; Small pump; Flow through marsh; Discharge structure
	Connect PalMar	Plug N-S ditches; Remove pipes; Improve northern berm; Construct western berm;
2H	Natural storage on Mecca	Restore Natural Topography; Bridge/Culverts for Beeline; Backfill Interior Canals in Corbett; Pump to protect Caloosa
1F	Shallow L-8 Basin storage (10,000 ac-ft)	10,000 ac-ft Shallow Storage Includes Pump & Channels
	G-160	Restore hydroperiod in Lox Slough
	G-161	GWP water to Lox Slough
	GWP triangle	Improve Connectivity
	C-51 Storage	Deep Storage Includes Pump & Channels

Alternative 13

3E	Kitching Creek Hydration	Spreader Canal at Jenkins Ditch at JDSP northern boundary Weir or plug on Jenkins ditch near connection with Kitching Creek
	Moonshine Creek & Gulfstream East	Connect HSLCD ditch to Moonshine Cr; Clear veg in Moonshine Cr; Fill Gulfstream Ditch; Regrade to historic topography
	Cypress Creek Canal	Replace Cypress Creek Canal Weir Raise Northern Berm at Ranch Colony Automate twin 84
	Restore Gulfstream West as a Flow through Marsh	Partial backfill & relocate southern end of HSLCD canal; Small pump; Flow through marsh; Discharge structure
	Connect PalMar	Plug N-S ditches; Remove pipes; Improve northern berm; Construct western berm;
2H	Natural storage on Mecca	Restore Natural Topography; Bridge/Culverts for Beeline; Backfill Interior Canals in Corbett; Pump to protect Caloosa
1F+	Shallow L-8 Basin storage (10,000 ac-ft)	10,000 ac-ft Shallow Storage Includes Pump & Channels
	G-160	Restore hydroperiod in Lox Slough
	G-161	GWP water to Lox Slough
	GWP triangle	Improve Connectivity
	ASR at L8	2 wells, supplement volume of the reservoir

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Alternative 10		
3B	Kitching Creek Hydration	Spreader Canal at Jenkins Ditch at JDSP northern boundary Weir or plug on Jenkins ditch near connection with Kitching Creek
	Moonshine Creek & Gulfstream East	Connect HSLCD ditch to Moonshine Cr; Clear veg in Moonshine Cr; Fill Gulfstream Ditch; Regrade to historic topography
	Cypress Creek Canal	Replace Cypress Creek Canal Weir Raise Northern Berm at Ranch Colony Automate twin 84
	LOCAL	OPTION

Major Features of the Focused Array of Alternatives

Alternative	C-51 Res. (yes)	L-8 Impoundment (yes)	Mecca Impoundment (acre-feet)	Mecca Natural Storage	ASR (number of wells)	FW3 option	Level 1 Score Subtotal	Total Score
12	Y	Y		Y		3E	15.5	24.0
5			9,500		4	3E	13.5	21.0
13		Y		Y	2	3E	13.5	19.0
10	Y		7,200			3B	13.0	23.0
2		Y	7,200		2	3E	13.0	21.0

What if…

- What if one of the major storage features cannot be implemented? What would be our alternatives?

"What if" Problem	Alternatives Unaffected	Potential Revision or Replacement Alternatives
C-51 cannot be used	2, 5, 13	Use 4 for 12
Natural Storage does not produce the expected benefits	2, 5, 10	Use 11 for 12
ASRs do not perform as expected	10, 12	Use 4 for 13
Cannot acquire land for a shallow storage reservoir in the L-8 basin	5, 10	Use 8b for 13 Use 4 for 12