

WESTERN EVERGLADES RESTORATION PROJECT

PROJECT DELIVERY TEAM (PDT)
MEETING

November 21, 2016



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US Army Corps of Engineers
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Schedule & Budget Status

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Schedule & Budget Status



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Study Initiation	August 2016
Alternatives Milestone	16 November 2016
Tentatively Selected Plan Milestone	13 April 2018
Agency Decision Milestone	11 December 2018
Civil Works Review Board Milestone	29 August 2019
Chief's Report	17 December 2019



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WERP Alternative Consolidation

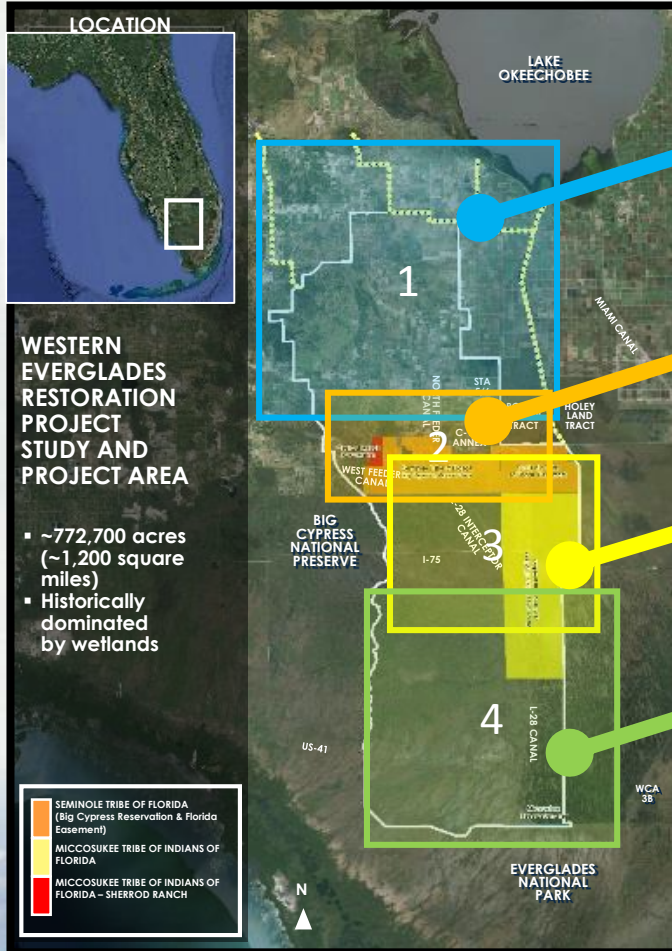
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Reference Regions Used in Alternative Development



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Lake O & C43 Connections / C139 & North Feeder Basins / STA56

West Feeder Basin / Seminole Tribal Area

Downstream of S190 / Miccosukee Tribal Area / Triangle

Big Cypress National Preserve



WERP Alternative Consolidation Strategy



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- The goal of consolidating was to reduce the number of alternatives from seven (7) to a more manageable number based on input from the 10/18/16 PDT meeting and subteams.
- Three (3) alternatives were developed that recombined the major features of the seven (7) alternatives presented to the PDT on October 18.
- The set of alternatives encompasses management measures that were not screened out, in some form or at different scales. These measures were suggested during the charrette, Task-Force hosted workshop, PDT meetings, and by the subteams.
- Selected management measures within each region (1 through 4) work synergistically, and should not pose a major constraint on another management measure from an upstream or downstream region.
- The 3 alternatives provide flexibility during modeling, i.e., we are able to scale the management measures up or down to explore improving performance.
- The alternatives are not mutually exclusive, i.e., some management measures can appear in more than one alternative.
- The alternatives are not **final** at this time. Suggestions for adjustments should be provided **before modeling**.
- We anticipate that the TSP will be a hybrid of the best aspects of the alternatives, which we will identify during modeling.



Alternative Consolidation



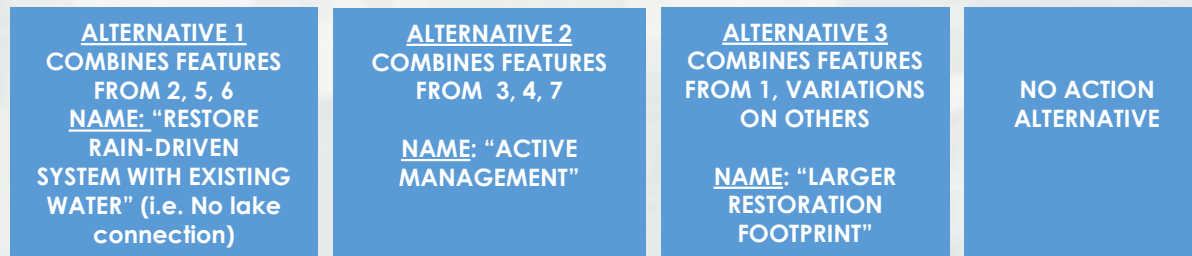
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5

7 CONCEPTUAL ALTERNATIVES, PLUS NO ACTION ALTERNATIVE



CONSOLIDATED THE FEATURES IN THE 7 PRELIMINARY ALTERNATIVES TO FOCUSED ARRAY OF 3 ALTERNATIVES



THE MMS IN THE FOCUSED ARRAY ARE SCALABLE. MMS MAY BE ADDED OR SUBTRACTED IF NEEDED (AS VERIFIED BY MODELING). THE ALTERNATIVES ARE NOT MUTUALLY EXCLUSIVE, i.e., MMS CAN APPEAR IN MORE THAN ONE ALTERNATIVE.

WERP FOCUSED ARRAY OF ALTERNATIVES

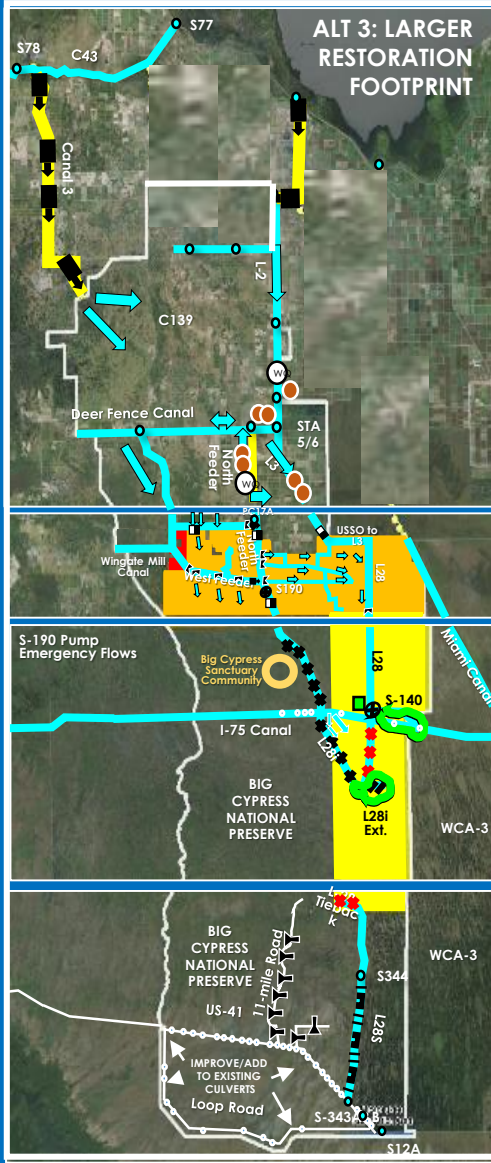
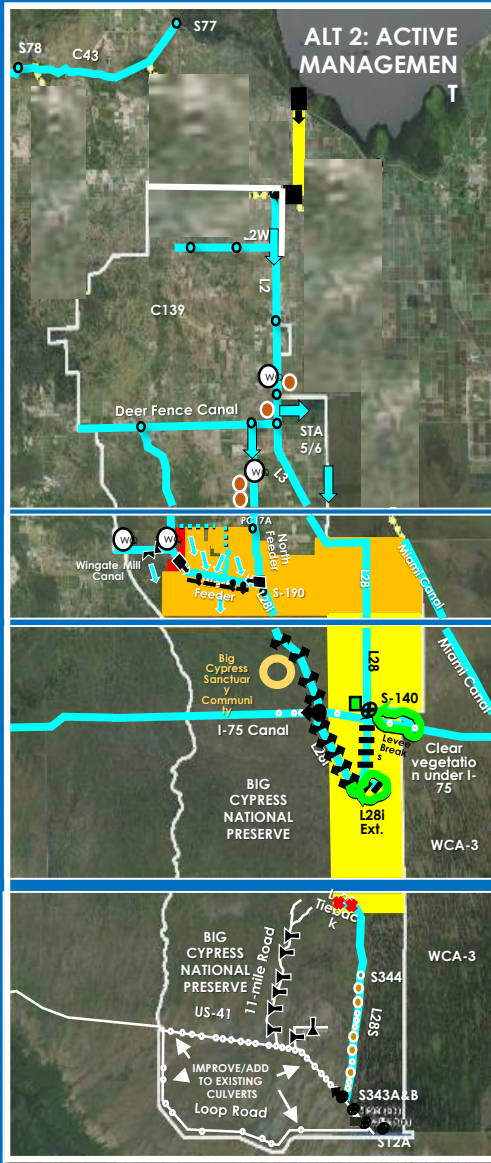
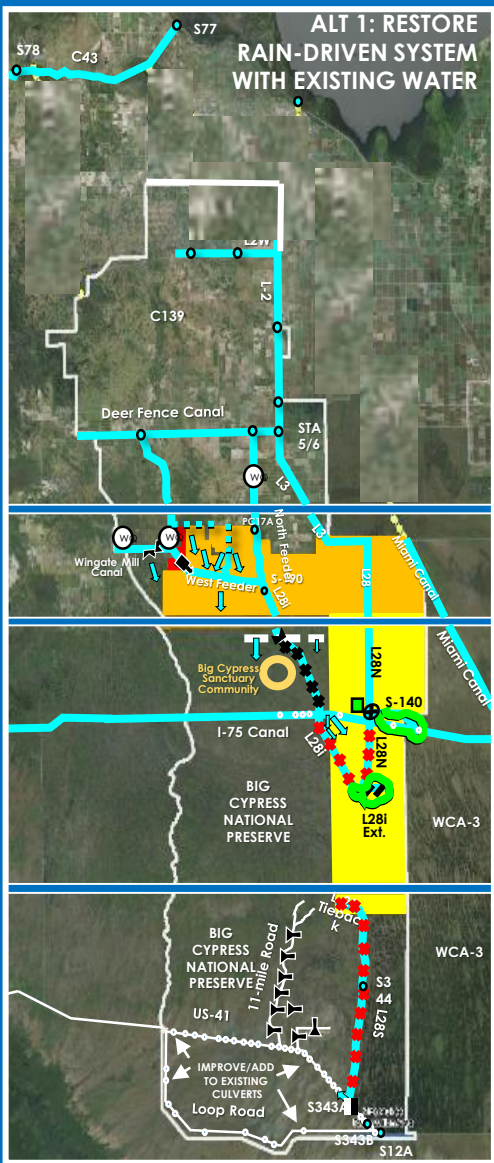
NOT TO SCALE

REGION 1
PROBLEMS:
TOO DRY OR TOO WET,
NUTRIENT CONVEYANCE

REGION 2
PROBLEMS:
ALTERED FLOWS, TOO DRY,
NUTRIENT CONVEYANCE

REGION 3
PROBLEMS:
ALTERED FLOWS,
NUTRIENT CONVEYANCE,
TOO DRY OR TOO WET

REGION 4
PROBLEMS:
ALTERED FLOWS,
TOO DRY OR TOO WET



LEGEND

OPERATIONS	PUMP	CULVERT	SPREADER CANAL	OPERABLE CONTROL STRUCTURE	NEW CONNECTION	PLUGS	BACKFILL/DEGRADE LEVEL	WETLAND RESTORATION	TREATMENT
WEIR (includes variations)	GATED STRUCTURE	DIVIDE	GRAVITY FLOW OR ADDITIONAL FLOW CANAL	ADDITIONAL FLOW CANAL	ASR	DEGRADE	BACKFILL/PARTIAL DEGRADE LEVEL	RESTORE NATIVE VEGETATION	



WERP PLANNING ALTERNATIVE 1 CONCEPT



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“Restore Existing Rain-Driven System With Existing Water”

Overarching Theme:

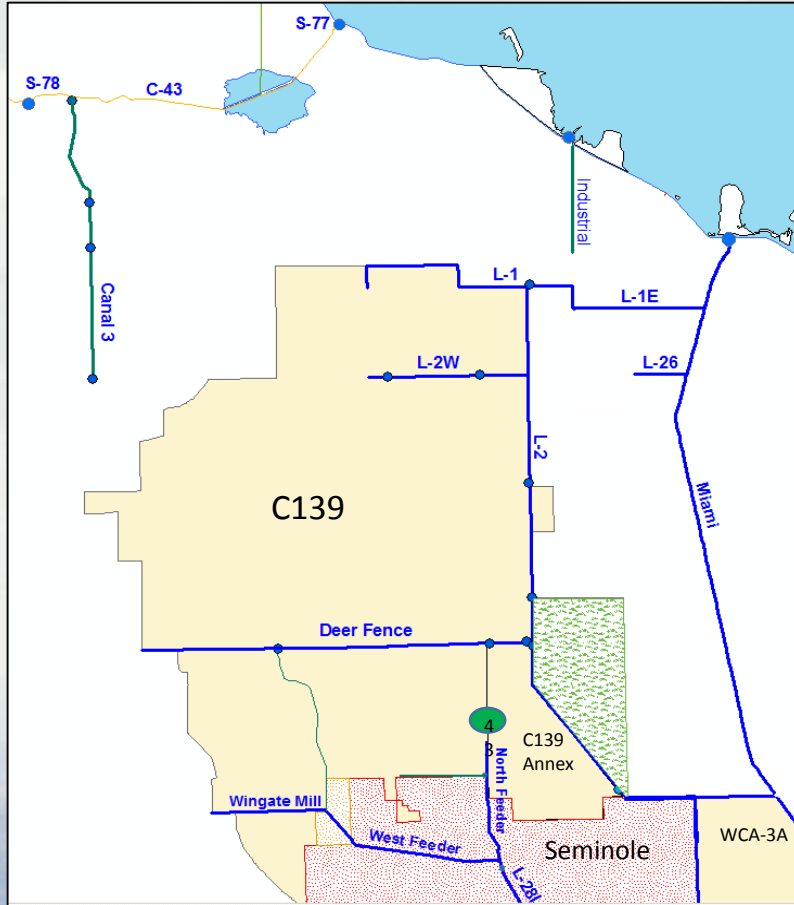
- Restore the ecological function of the Western Everglades sub-watersheds without reliance on upstream water, promoting a more connected and hydrated ecosystem without significant water management operable control.



WERP PLANNING ALTERNATIVE 1 CONCEPT: “Restore Existing Rain-Driven System With Existing Water”



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Region 1 Highlights:

- No new water from Lake Okeechobee.

43 North Feeder WQ Treatment

Additional considerations:

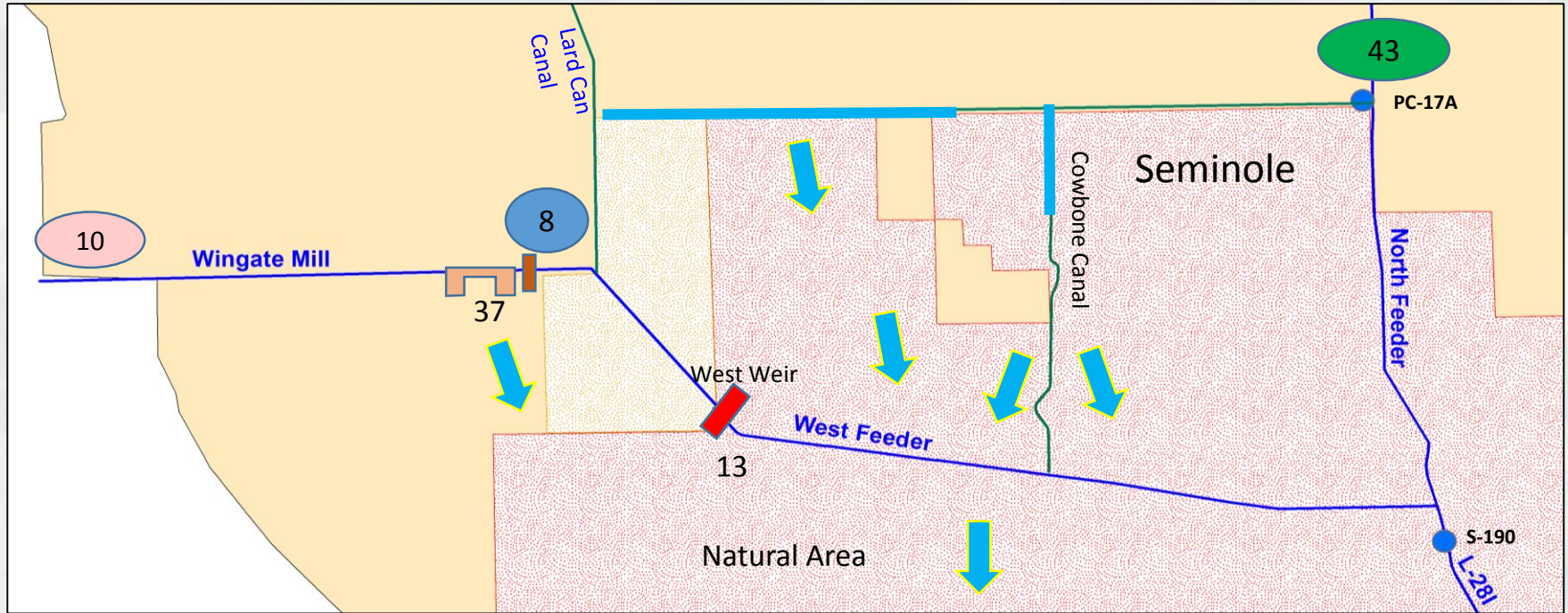
- Assumes restoration in the western basins can be accomplished without the added costs of bringing in water from Lake Okeechobee



WERP PLANNING ALTERNATIVE 1 CONCEPT: “Restore Existing Rain-Driven System With Existing Water”



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Water quality features:

- 10 Inflow water treatment
- 8 West Feeder treatment
- 43 North Feeder treatment

Water quantity features:

- 37 Wingate Mill Canal Cypress Strand lateral weir
- 13 West Weir spillway
- Passive inline weir east of #37
- Additional canals

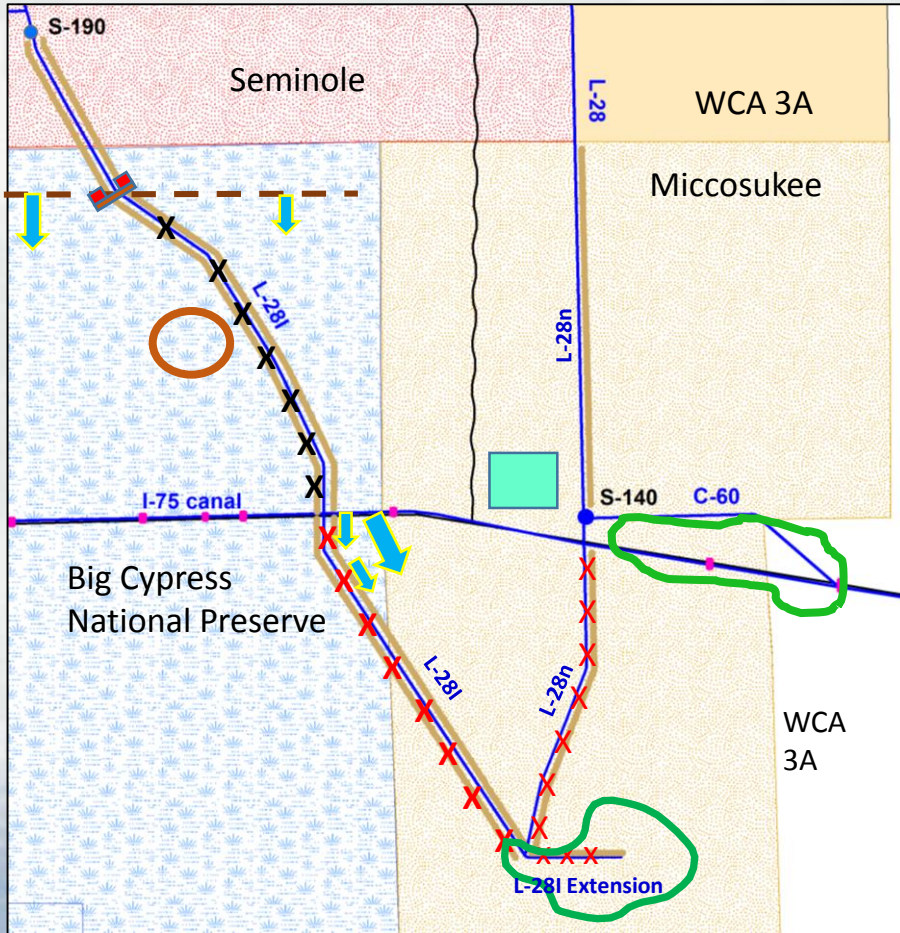
Anticipated gravity flows



WERP PLANNING ALTERNATIVE 1 CONCEPT: “Restore Existing Rain-Driven System With Existing Water”



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Restore hydrology:

- Modify S-140 operations
- XX** Fill in L-28n and L-28i canals & remove levees south of I-75; keep a portion of L28i Extension for a Check Station
- XX** Backfill L-28i canal north of I-75 with partial levee degrade

Spreader canal with levee breaks and weir

Anticipated gravity flows from I-75 canal into NW Triangle

Restore wetlands:

- Enhanced wetland restoration
- Restore native wetland vegetation

Maintain Access:

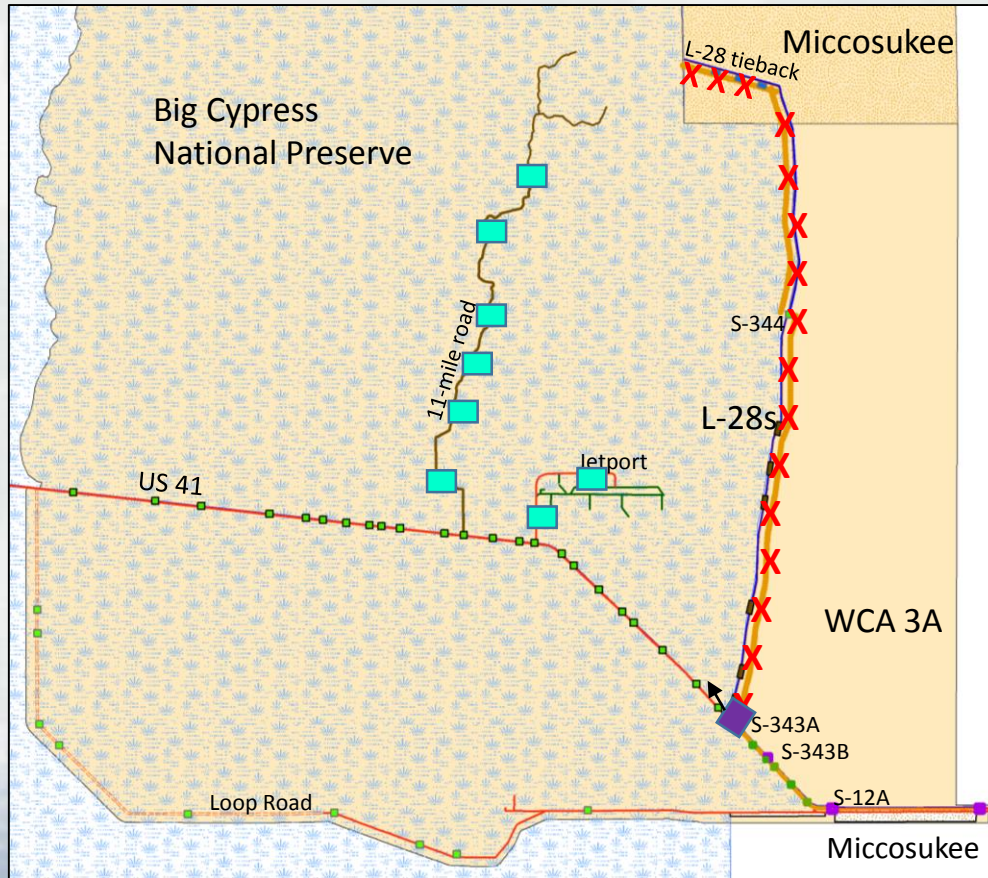
- Big Cypress Sanctuary community



WERP PLANNING ALTERNATIVE 1 CONCEPT: “Restore Existing Rain-Driven System With Existing Water”



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Restore hydrology:

- XX** Degrade levee/backfill L-28s & L-28 tieback canals
- Add conveyance
- Improve/add to existing culverts
- ▼** S-343A used as Divide Structure if needed for CSSS-A.

Other important considerations:

Cape Sable Seaside Sparrow subpopulation A is south of the S-343A&B and S-12A structures.



WERP PLANNING ALTERNATIVE 2 CONCEPT



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“Active Management”

Overarching Theme:

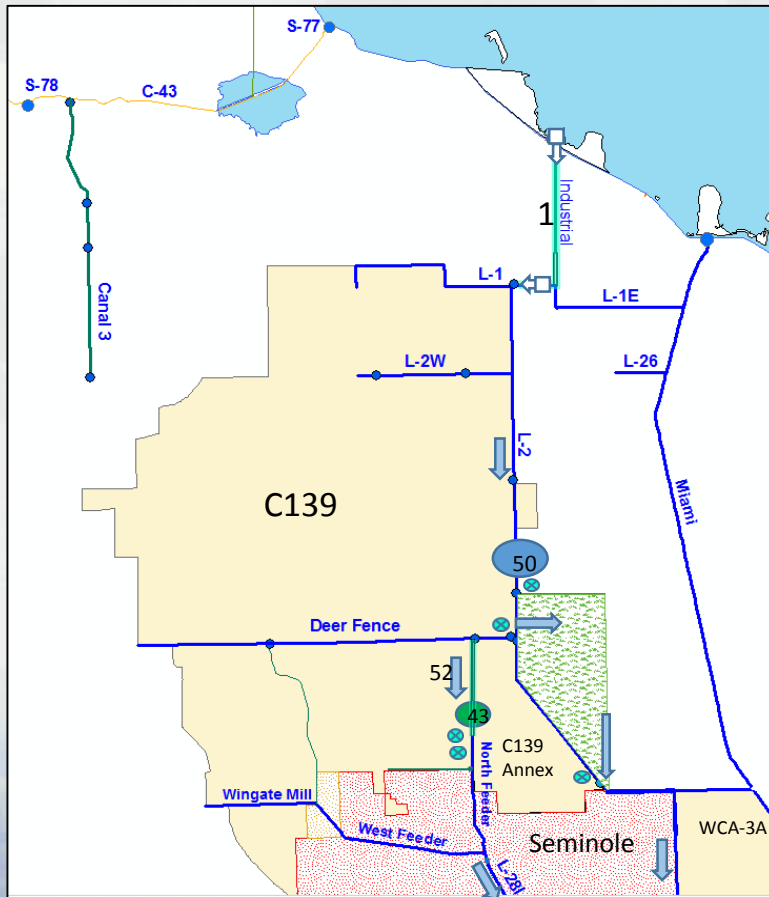
- Provide a series of operable features and lower cost levee/canal improvements along with a connection to Lake Okeechobee to actively operate the system to provide ecological restoration for the Western Everglades area.



WERP PLANNING ALTERNATIVE 2 CONCEPT: "Active Management"



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Potential Lake Okeechobee Connection

- 1 Industrial canal
- 52 North Feeder Extension

Lake Okeechobee Water Treatment options

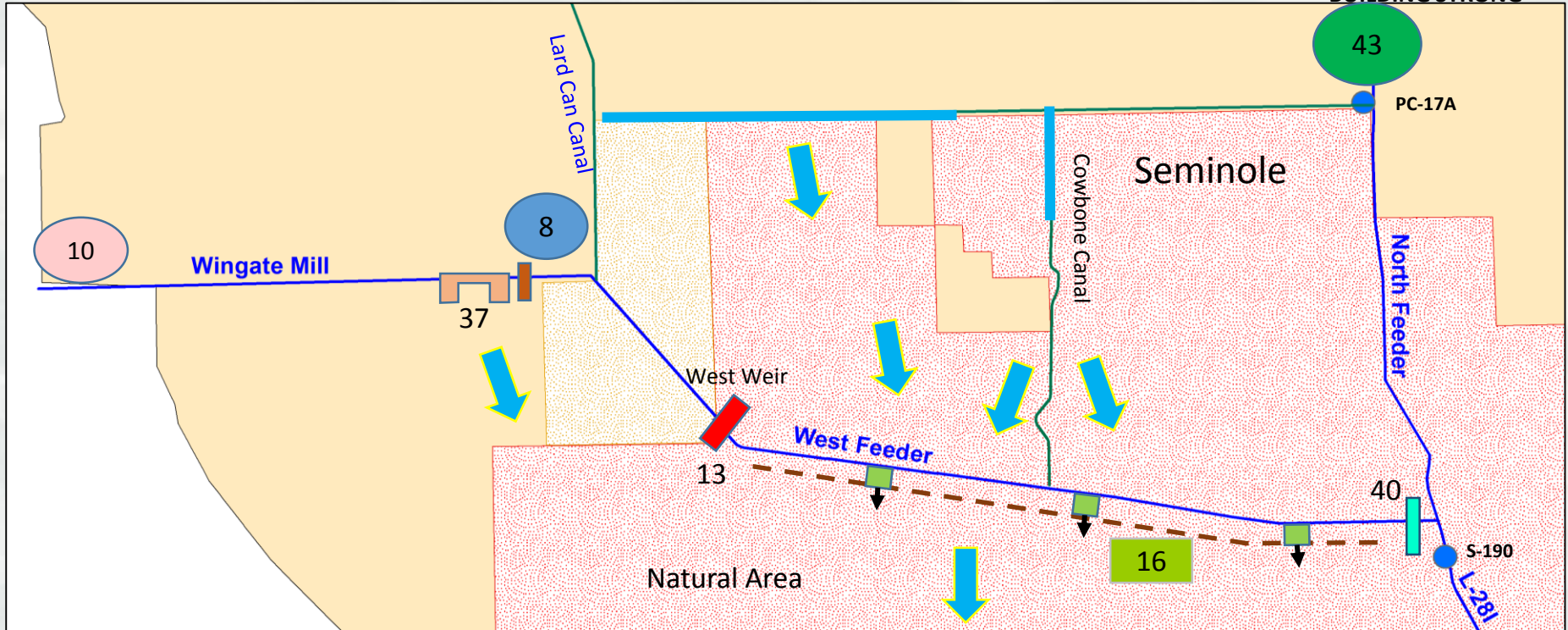
- 50 STA 5/6 extended capacity
- 43 North Feeder

Storage and more routing options

- ASR
 - Deer Fence
 - L2
 - L3



WERP PLANNING ALTERNATIVE 2 CONCEPT: "Active Management"



Restore water quality with treatment facilities (STA or FEB):

- 10 Inflow water treatment
- 8 West Feeder treatment
- 43 North Feeder treatment

Restore hydrology in Reservation and to Big Cypress National Preserve (BCNP):

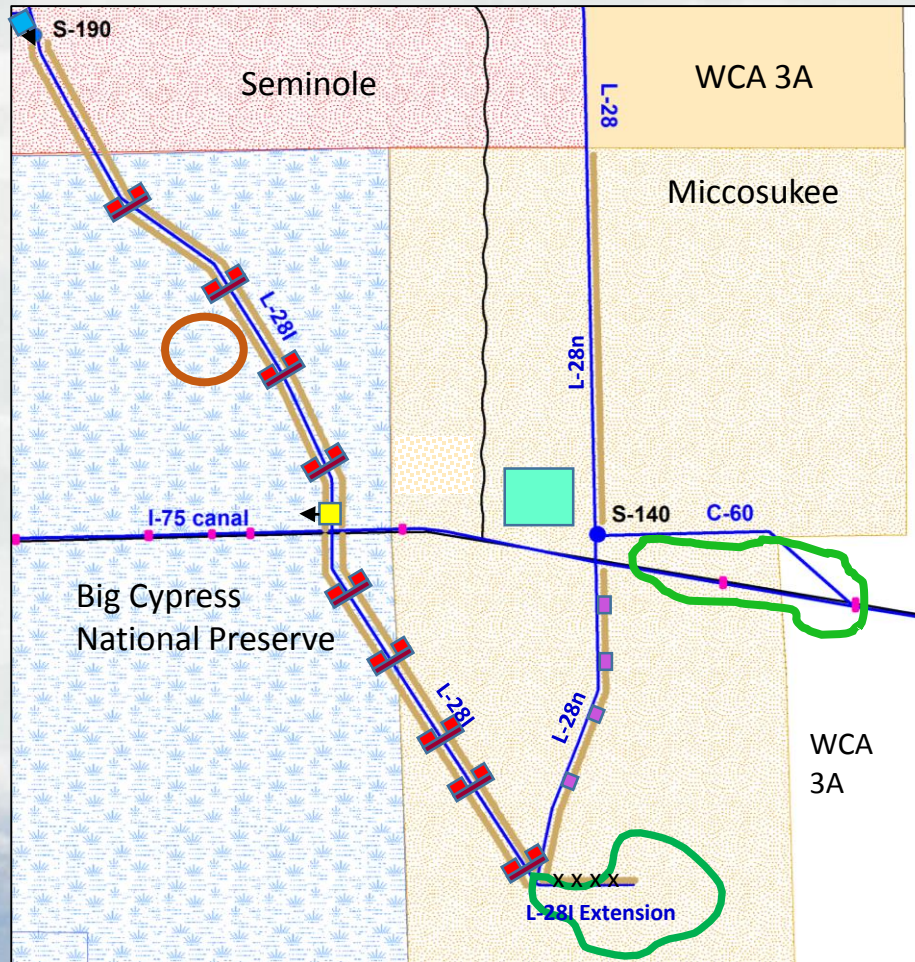
- 37 Wingate Mill Canal Cypress Strand outlet/weir
- 13 West Weir spillway
- 16 West Feeder pumps & spreader canal
- Active inline weir
- 40 West Feeder spillway
- Anticipated gravity flows
- Spreader canal
- Additional canals



WERP PLANNING ALTERNATIVE 2 CONCEPT: "Active Management"



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Restore hydrology

- Modify S-140 operations
- L-28n levee breaks south of I-75
- ◀ S-190 pump & operations
- ▧ Levee breaks and step down weirs
- X Remove L-28I extension (except for check station)
- ◀ ■ Pump water into I-75 canal

Restore water quality:

- Enhanced wetland restoration

Reset habitat:

- Restore native wetland vegetation
- Clear vegetation from conveyance under I-75

Other important considerations:

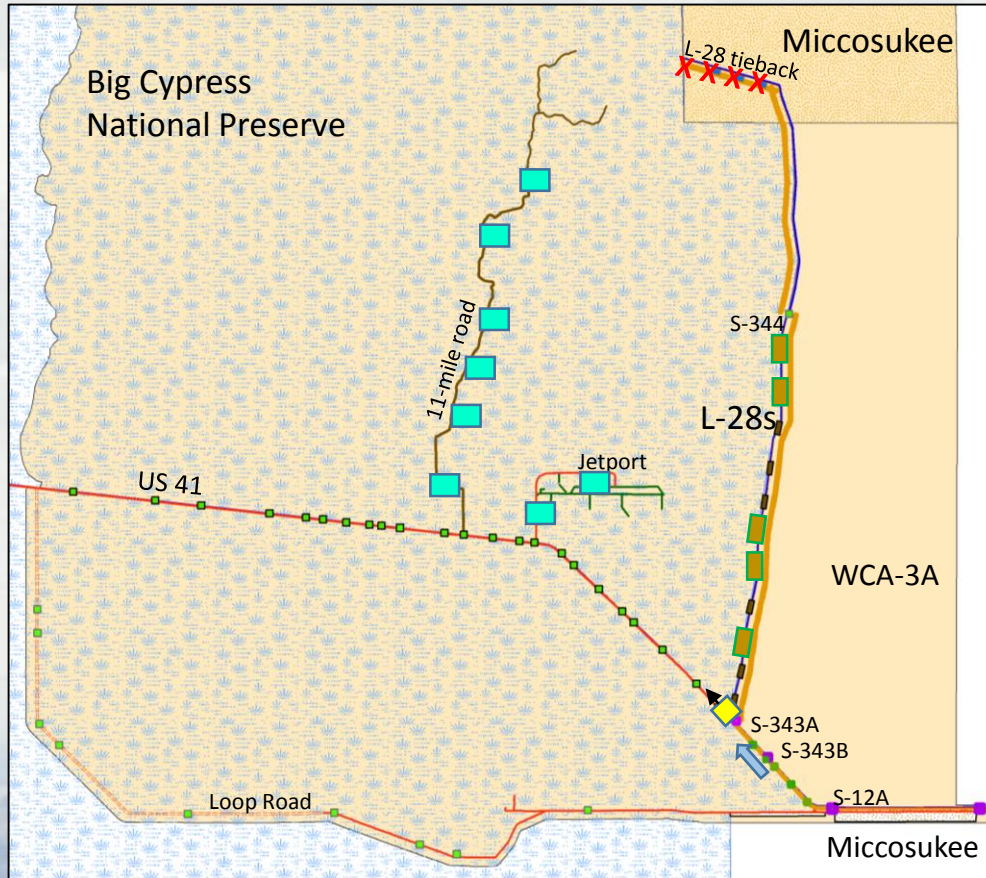
- Big Cypress Sanctuary community, uses L-28I for access. 26°13'39"N 80°55'40"W



WERP PLANNING ALTERNATIVE 2 CONCEPT: "Active Management"



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Restore hydrology:

- XX** Degrade levee/backfill L-28 tieback
- Cyan square** Add conveyance culverts
- Green square** Improve/add to existing culverts
- Yellow square with arrow** Pump to send water NW along US-41, away from CSSS-A
- Orange square** 30 Create more plugs in L-28 south of S-344, divert flow into dwarf cypress
- Purple square** 57 Modify S-343A&B, S-12A schedules move water northwest

Other important considerations:

Cape Sable Seaside Sparrow subpopulation A is south of the S-343 and S-12 structures.



WERP PLANNING ALTERNATIVE CONCEPT 3



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“Larger Restoration Footprint”

Overarching Theme:

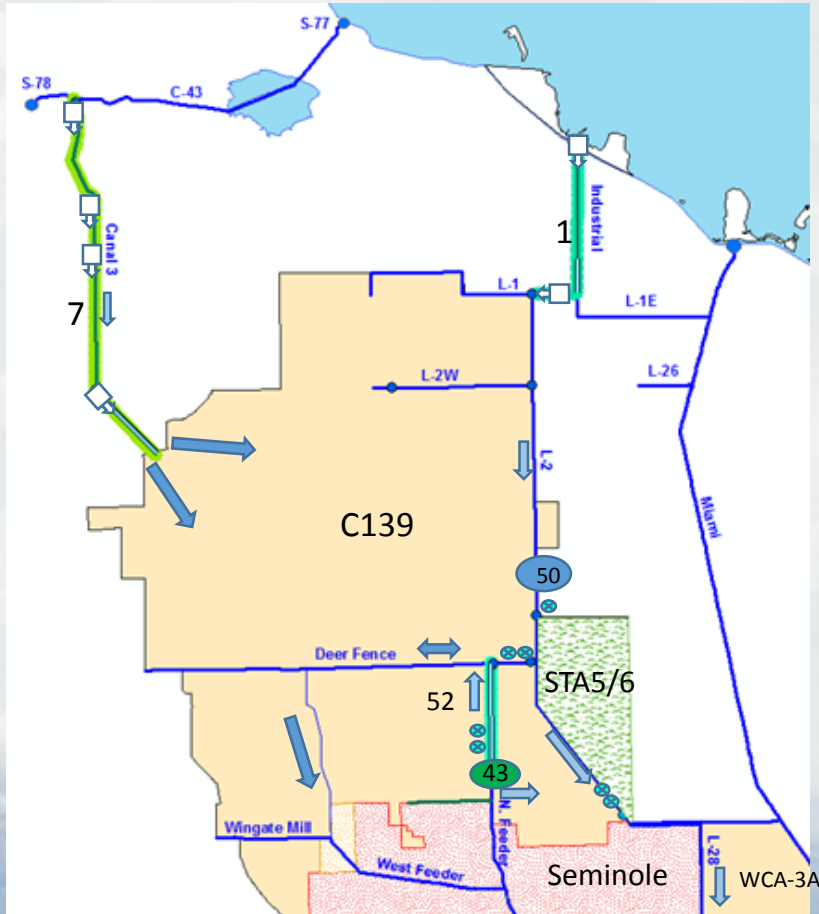
- Seek to restore Big Cypress National Preserve and also the upstream watersheds by providing multiple Lake Okeechobee connections and recommendations from the Seminole and Miccosukee Tribes. Manage potential differences in water levels between WCA3A and BCNP with operable structures.



WERP PLANNING ALTERNATIVE CONCEPT: “Larger Restoration Footprint”



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Potential Lake Okeechobee Connections

- 1 Industrial canal
- 7 C-43 – Canal 3
- 52 North Feeder Extension

Lake Okeechobee Water Treatment options

- 50 STA 5/6 extended capacity
- 43 North Feeder

Storage and more routing options

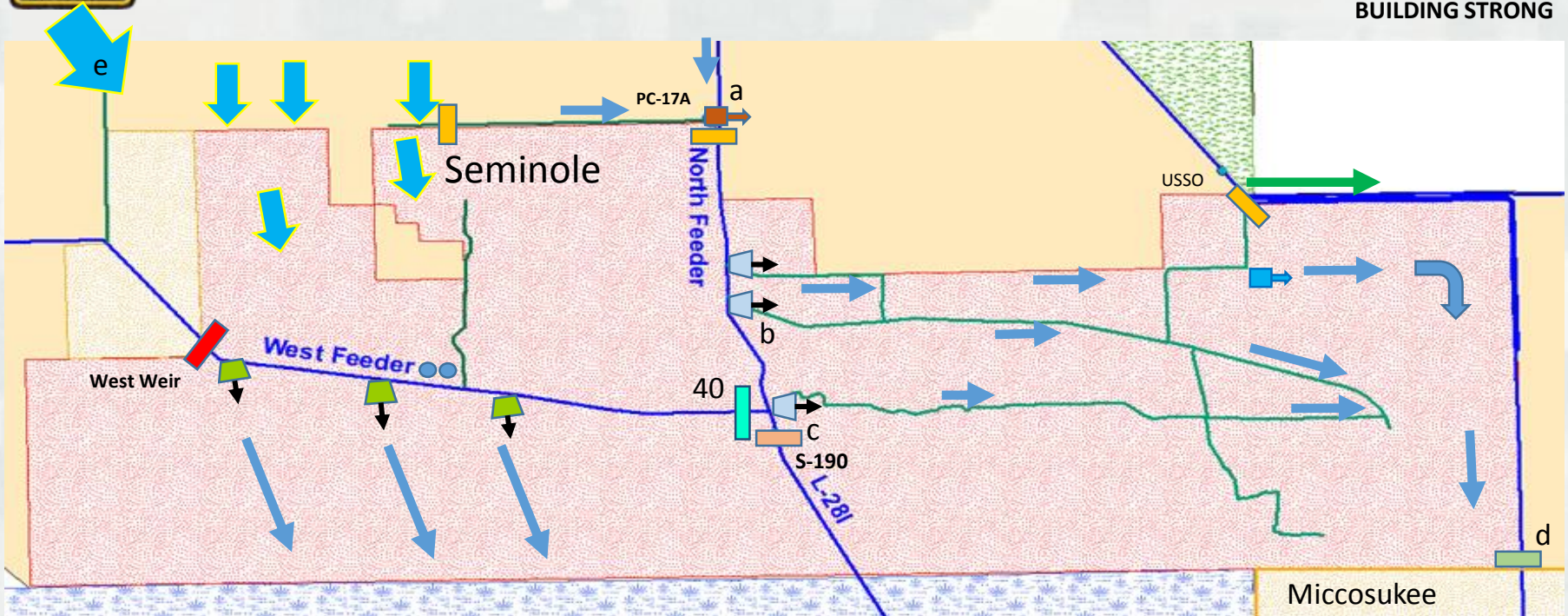
- ASR
 - Deer Fence
 - L2
 - L3



WERP PLANNING ALTERNATIVE CONCEPT: "Larger Restoration Footprint"



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Restore hydrology in Reservation:

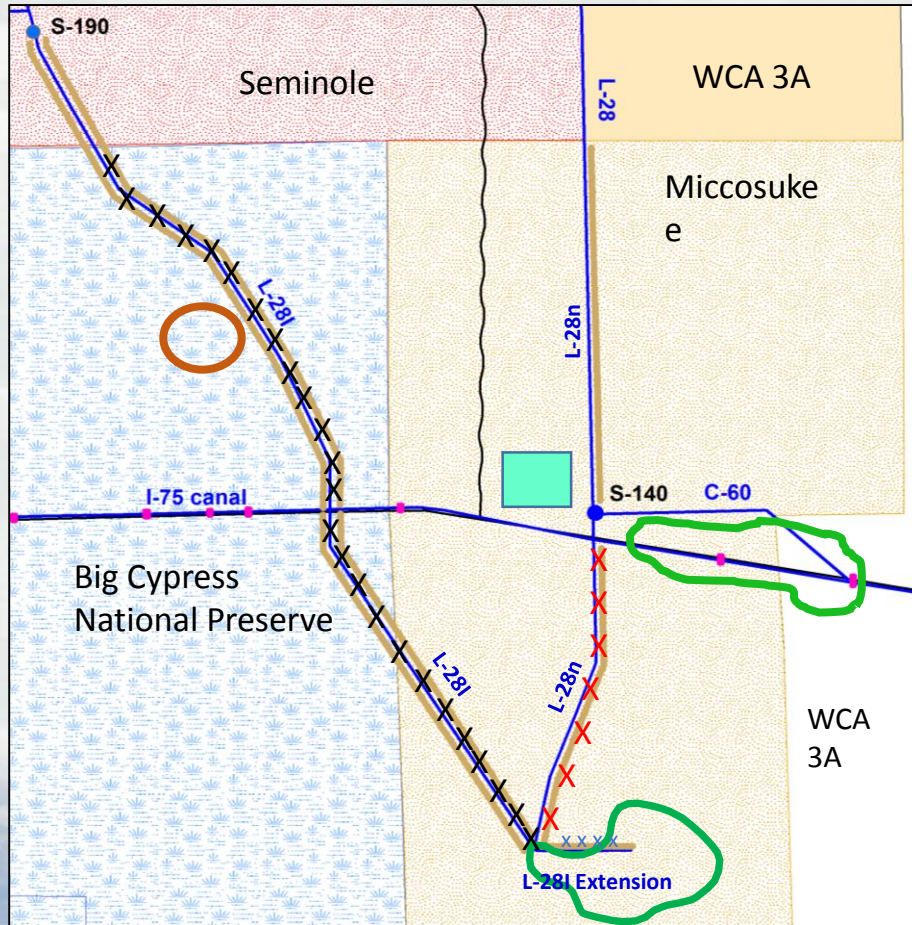
- | | | | | | |
|---|------------------------------|----|-----------------------------------|--|------------------------------|
| a | PC-17A pump & emergency weir | 40 | West Feeder spillway | | Canal block/divide structure |
| b | East canals hydration | | West Feeder adjustable weirs | | East marsh hydration pump |
| c | Cease S-190 discharge | 13 | West Weir modification or removal | | East marsh rehydration |
| | USSO to L-3 | e | New water supply/gravity flows | | |
| d | L28 adjustable weir | | Adjust siphons | | |



WERP PLANNING ALTERNATIVE CONCEPT: “Larger Restoration Footprint”



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Restore hydrology:

- Modify S-140 operations
- XX** Fill in L-28n canal & remove levee, south of I-75
- XX** Fill in L-28I & remove levee except to retain access
- xx** Remove L-28I extension (except for check station)
- S-190 emergency flows only

Restore wetlands:

- Enhanced wetland restoration
- Restore native wetland vegetation

Other important considerations:

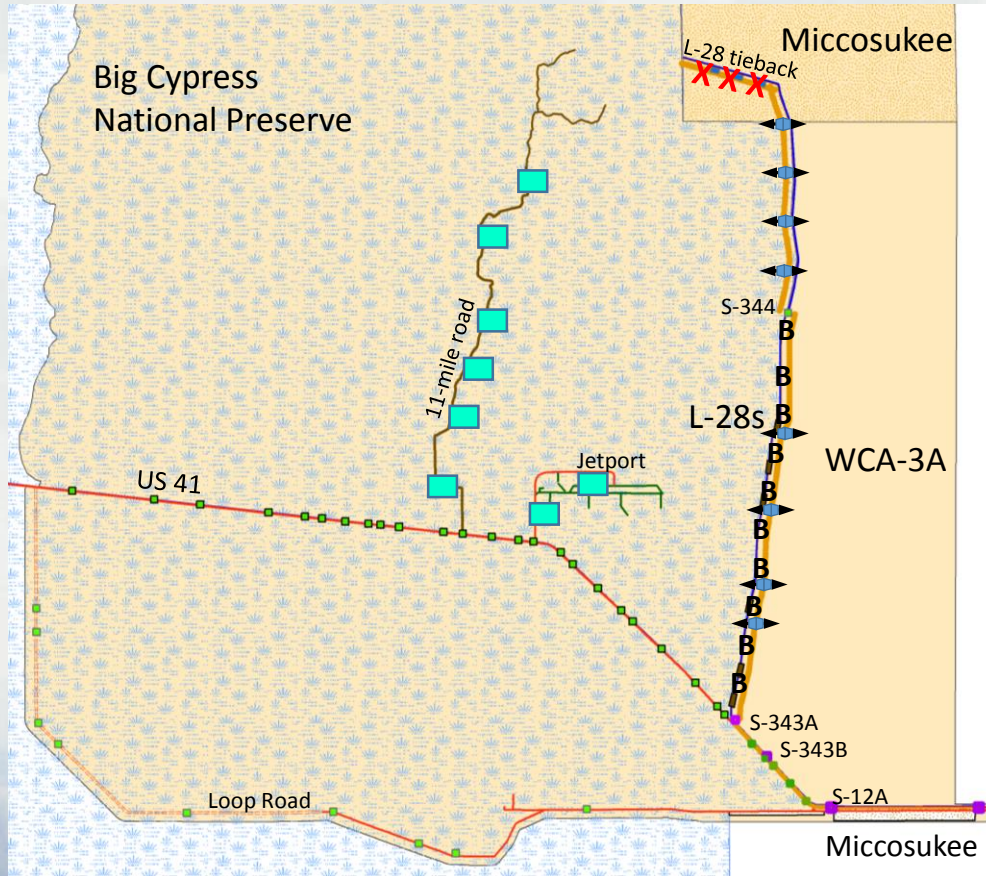
- Big Cypress Sanctuary community, uses L-28I for access. 26°13'39"N 80°55'40"W






WERP PLANNING ALTERNATIVE CONCEPT: “Larger Restoration Footprint”



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Restore hydrology:

- XX** Degrade levee/backfill L-28 tieback.
- BB** Only backfill canal south of S-344.
-  Operable control structures through levee
-  Add conveyance
-  Improve/add to existing culverts

Other important considerations:

Cape Sable Seaside Sparrow subpopulation A is south of the S-343 and S-12 structures.



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Alternatives Milestone Meeting Highlights

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Alternatives Milestone Meeting (AMM)



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- This meeting does not finalize our alternatives*
- Held on November 16, 2016 (46 working days from kickoff meeting)
- USACE Vertical Team members from Headquarters (DC), Atlanta, Jacksonville
- Agenda covered:
 - WERP background – historic and current conditions
 - POOC
 - Work the team has done – Meetings, management measure screening and alternative formulation & consolidation
 - Schedule & budget
- Vertical Team gave approval to move forward into Alternative Evaluation & Analysis phase ✓



AMM - What We Heard



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- Team is doing a great job with a tough project! Keep going!
- Questions about objectives
 - Fire Risk
 - Resilience
- Questions about evaluation of benefits
 - Benefits to estuaries
 - Connectivity
- Connection to Lake Okeechobee as part of this plan
 - Not originally part of the Yellow Book projects
 - Make sure we're telling the right story



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Water Quality Subteam

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Engineering Subteam

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Engineering Subteam



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Progress:

- Collaborated with other sub-teams to develop alternatives and alternatives maps
- Developed draft Existing Conditions Baseline (ECB) and Future Without (FWO) condition assumptions
- Inventoried existing model platforms and available data; developed modeling needs
- Conceptualized modeling strategy

What's next?

- Next subteam meeting is Monday, Nov. 28 at 1:30pm
 - AMM recap – potential discussion on Regions 1 and 4
 - Finalize FWO/ECB assumptions table
 - Further discuss upcoming modeling needs (Tamiami Trail culverts, Loop Rd.)



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Eco Subteam

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ECO SUB TEAM TASKS

- Support plan formulation efforts in development of management measures and alternatives
 - Identify environmental screening criteria
- Identify performance measures (PMs) to be used in WERP plan formulation efforts
 - Support selection of the Recommend Plan with development of a planning model
- Support the evaluation of environmental effects (NEPA)
- Develop monitoring and adaptive management plan
- Coordinate environmental concerns

PERFORMANCE MEASURE OVERVIEW

DEFINITIONS

- PMs are indicators of conditions in the natural system that have been determined to be characteristic of a healthy, restored ecosystem.
 - Role of Conceptual Ecological Models (CEMS) in CERP
- Each PM should address at least one or more of the project objectives within the period of analysis.
- PMs are used to predict performance of alternative plans.
 - Metric
 - Target
 - Spatial Extent (Location)

PERFORMANCE MEASURES

PLANNING – BIG PICTURE (WHAT’S TO COME!)

- Habitat Unit (HU): USACE metric used for environmental benefits
 - Habitat Quality Index (HSI): Measured over a geographic area; scores assigned: 0 = worst, 1 = best
 - Quantity = Acres
 - Quantity X Quality = HU
- Methodology used to calculate HUs (i.e. Planning Model) requires review by the National Ecosystem Restoration Planning Center of Expertise and subsequent approval by USACE Headquarters Model Certification Panel



EVALUATION OF ALTERNATIVES

Develop/refine predictive performance measures & targets to evaluate and compare a alternatives to help choose Tentatively Selected Plan.

Step 1

FINISH DEVELOPING H&H MODEL,

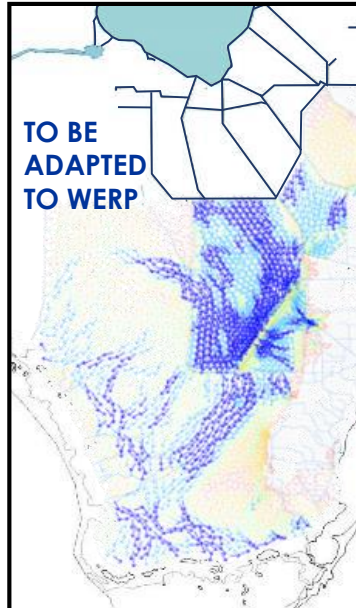
FINISH DEVELOPING PREDICTIVE PERFORMANCE MEASURES (PMs) AND TARGETS,

ECO-PCX COORDINATION AND APPROVAL



Step 2

HYDROLOGIC MODEL RUNS: BASE CONDITIONS AND ALTERNATIVES



OUTPUTS: WATER DEPTHS, DURATIONS, DISTRIBUTION, TIMING

Step 3

CALCULATE % OF TARGETS ACHIEVED (PERFORMANCE MEASURES) PER ZONE

Use Approach Similar to Prior Studies: PMs apply to zones to calculate habitat quality changes per area.



Step 4

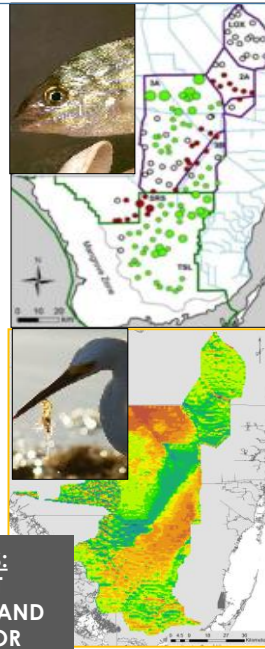
ASSESS ADDITIONAL ECOLOGICAL EFFECTS AND SYSTEMWIDE ANALYSIS

EXAMPLE: SMALL FISH



WADING BIRDS

OUTPUTS: HABITAT SUITABILITY AND CHECK FOR TRADE-OFFS





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Next Steps, Action Items & Wrap Up



PDT Action Items and Wrap Up



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- **PDT Meetings:**

- December 19th or 20th: 1 – 5:00PM
- January 24th: 1 - 5:00PM

- **Identify WQ needs per habitat**

- Send any data you might have that identifies water quality thresholds per habitat in WERP. We need your help on this! Please send! E.g. do you have results that show how many ppb of P trigger a change in a specific habitat type in the WERP area?
- kelly.j.keefe@usace.army.mil

- **Subteam Meetings:**

- Engineering: Mondays, 1 - 2:30PM
- Plan Formulation: Tuesdays, 1 - 4:30PM
- Water Quality: Thursdays, 10 – 12:00PM
- Eco: Thursdays, 1 - 3:00PM



Next Steps



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