

# Water Quality Conditions for the Arthur R. Marshall Loxahatchee National Wildlife Refuge, 2024 and 2025 – continued Update on Activities

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Everglades Technical Oversight Committee

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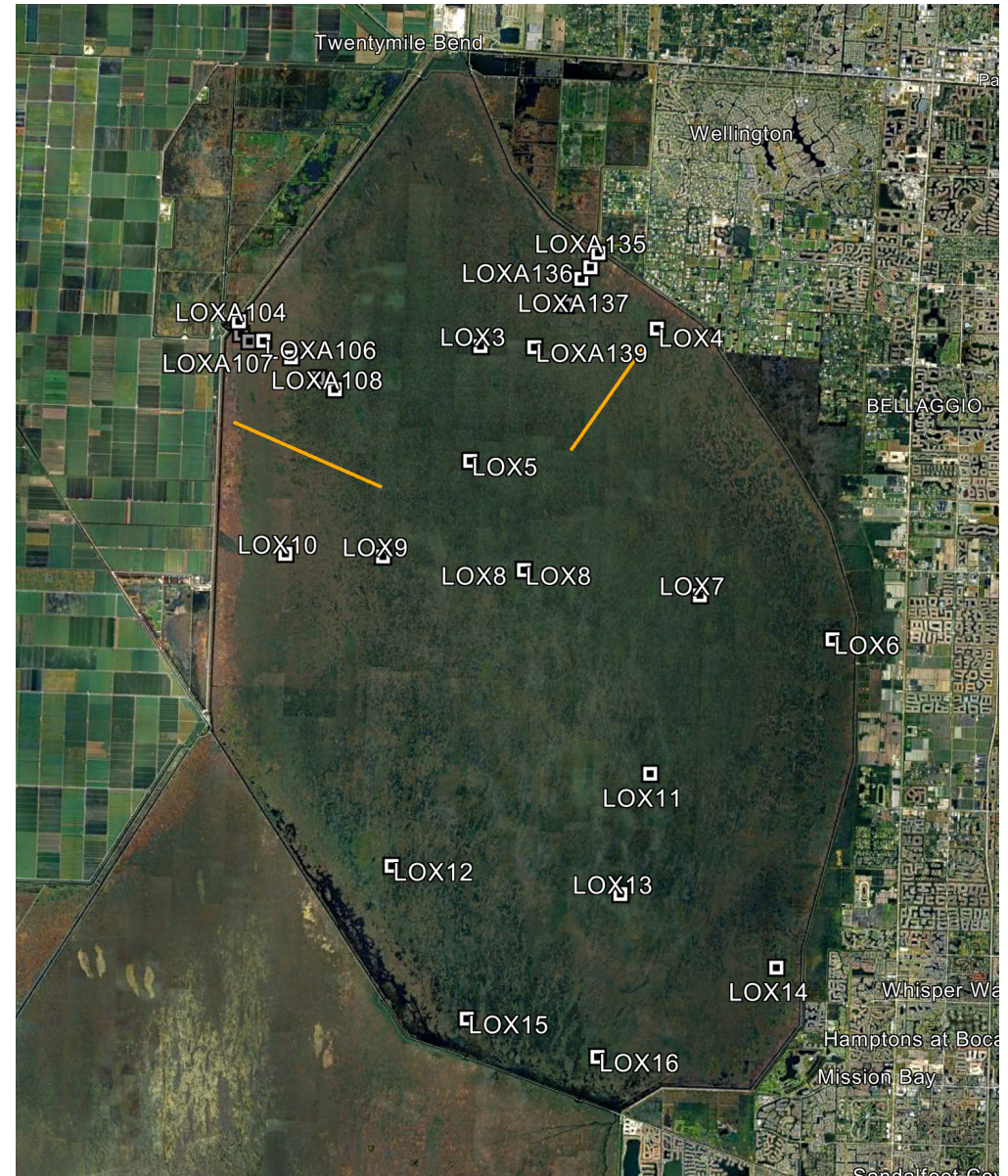
# USFWS activities initiated to investigate water quality conditions in the Refuge

- OERI-funded consultant working on multiple analyses including:
  - Assessing phosphorus loads at each inflow & outflow structure
  - Simulation of Refuge water & phosphorus mass balances
  - Testing for statistical outliers in the marsh phosphorus data to provide a partial basis for interpreting the high values observed at LOX8 over the past two years
  - Analyzing relationships between phosphorus in the marsh and hydraulic gradients between the rim canal and marsh
- Cattail expansion maps to be updated using USFWS funds



# USFWS identifying resources for:

- Additional monitoring sites to increase understanding of nutrient movement from canal to marsh (orange lines on map on right)
- Updating Refuge-wide soil phosphorus maps
- Refreshing and running the 39Box Model developed by USFWS using current data



Map of Loxahatchee with existing water quality monitoring sights, and proposed site of expanded monitoring (orange lines)



# Activities initiated by State parties to investigate water quality conditions in the Refuge (WCA1)

## November 2025

- Deployed three trail cameras and a data sonde in the vicinity of LOX 8 – with the goal of further documenting conditions at LOX 8
- Initiated additional monthly sample collection in the vicinity of LOX 8 following a monthly rotating pattern of sampling north, south, east, and west of LOX 8
- Data collection and analysis are ongoing

## December 2025

- Initiated monthly technical staff-level and principal-level SFWMD and USFWS staff discussions of investigatory activities to answer the question of what may be influencing Refuge water quality conditions.
- SFWMD prepared, discussed, and shared an ion-pair analysis with USFWS
- Monthly meetings and coordination are ongoing

## March 2026

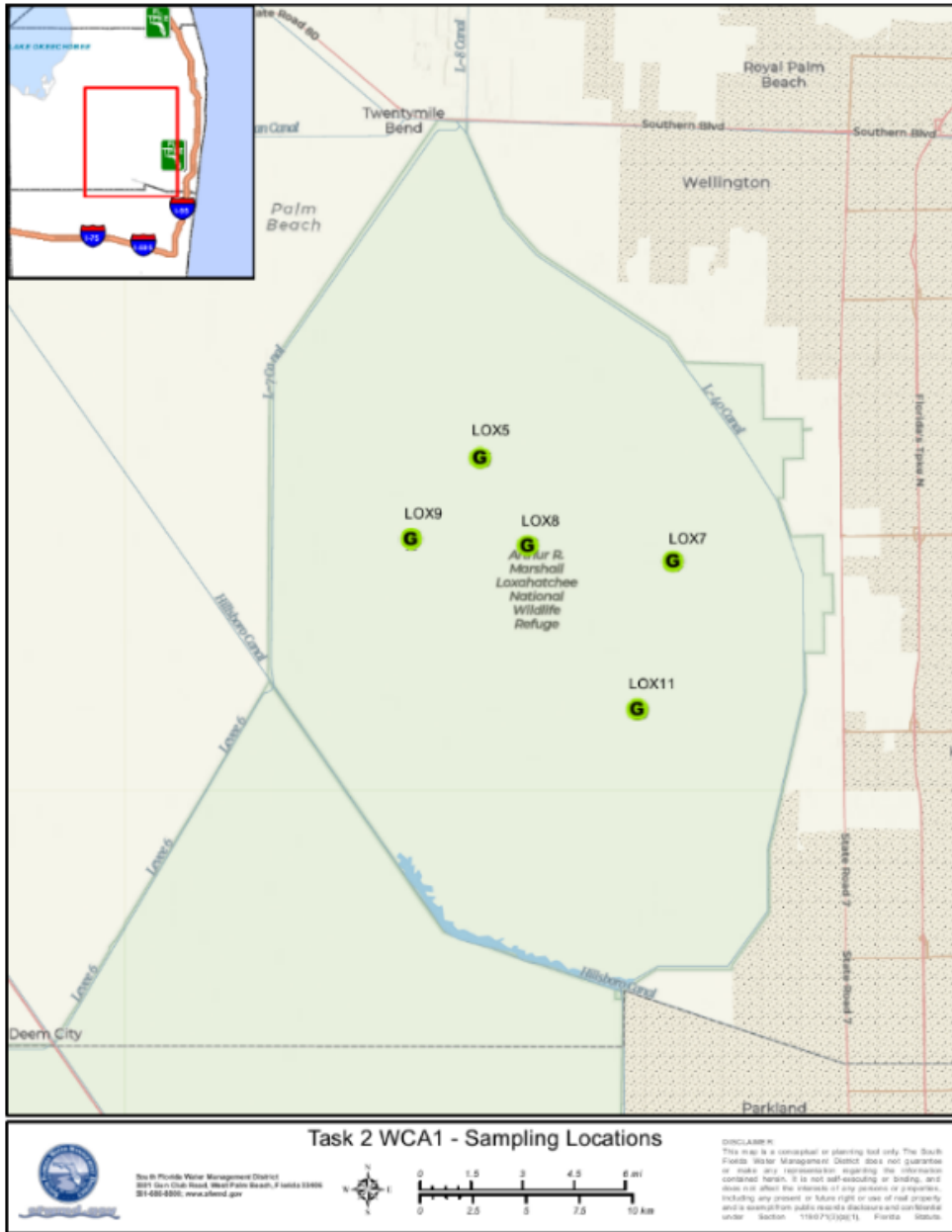
- Utilizing DEP-provided financial resources, a short-term study has been initiated to investigate surface water TP concentration at key locations within the middle of WCA 1 through collection of floc and soil samples to understand soil characteristics at LOX8 and if they are different from nearby stations. Relative elevations will also be measured around LOX8 to assess microtopography of the site.

## April 2026

- Next joint SFWMD/USFWS technical staff meeting is planned for April 23rd



# DEP-funded short-term study - sampling details



The scope of work will include the collection of floc and soil sampling parameters, specifically dry weight (g), percent moisture, calculated bulk density (BD), total carbon, total nitrogen, total phosphorus, total calcium, total sulfur, and ash content at 5 specified sampling locations.

- At LOX8, a 40,000 m<sup>2</sup> grid (200 m x 200 m) will be established and divided into 10 m<sup>2</sup> grid sections.
- Within 20 randomly selected grids, relative elevation will be measured.
- Within 10 of the 20 selected grids, floc depths will be measured, and floc samples will be collected and analyzed for the above parameters.
- In addition, triplicate soil cores will be collected at LOX8, LOX5, LOX7, LOX9, and LOX11.
- Cores will be sectioned into floc, 0-5 cm, 5-10 cm, 10-20 cm, and 20-30 cm depth increments and analyzed for the above parameters (Table 1).

**Table 1. Soil Sampling Plan**

Sample	Location	Parameters	Sample #
Floc	Lox8	Dry wt, % moisture, BD, C, N, P, Ash	10
Floc	Lox8, 5, 7, 9, 11	Dry wt, % moisture, BD, C, N, P, Ca, S, Ash	15
0-5 cm	Lox8, 5, 7, 9, 11	Dry wt, % moisture, BD, C, N, P, Ca, S, Ash	15
5-10 cm	Lox8, 5, 7, 9, 11	Dry wt, % moisture, BD, C, N, P, Ca, S, Ash	15
10-20 cm	Lox8, 5, 7, 9, 11	Dry wt, % moisture, BD, C, N, P, Ca, S, Ash	15
20-30 cm	Lox8, 5, 7, 9, 11	Dry wt, % moisture, BD, C, N, P, Ca, S, Ash	15
<b>Total</b>			<b>85</b>



# Questions?

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