Integrating Restoration Strategies Science and STA Management: Part II Management Strategies

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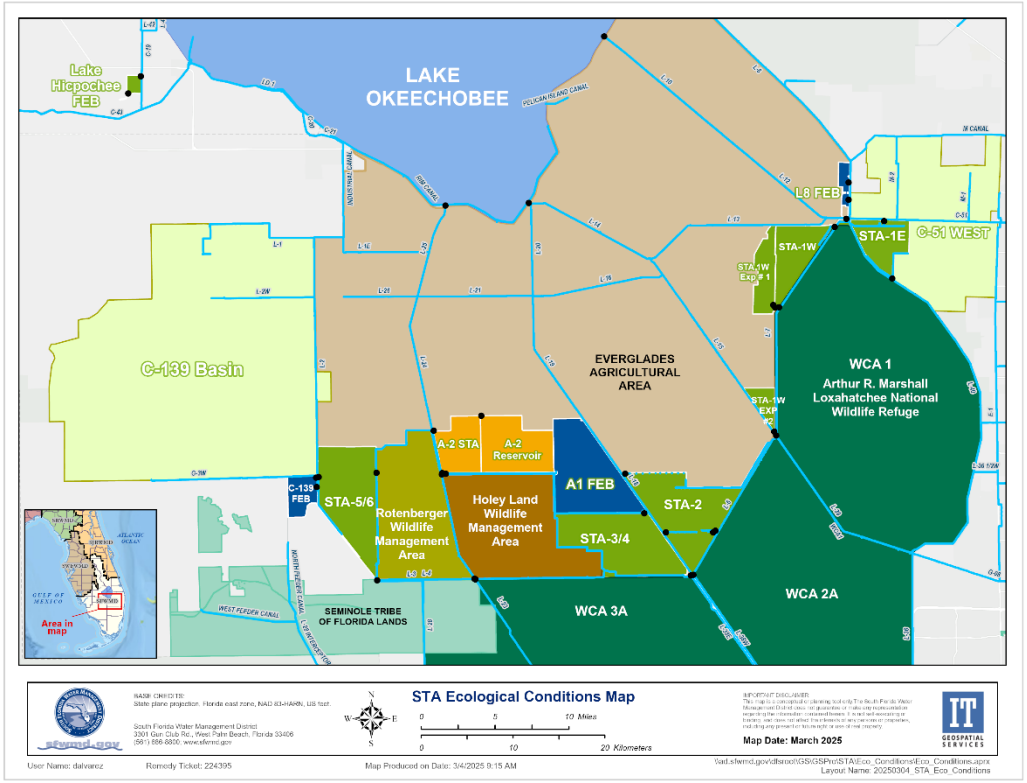
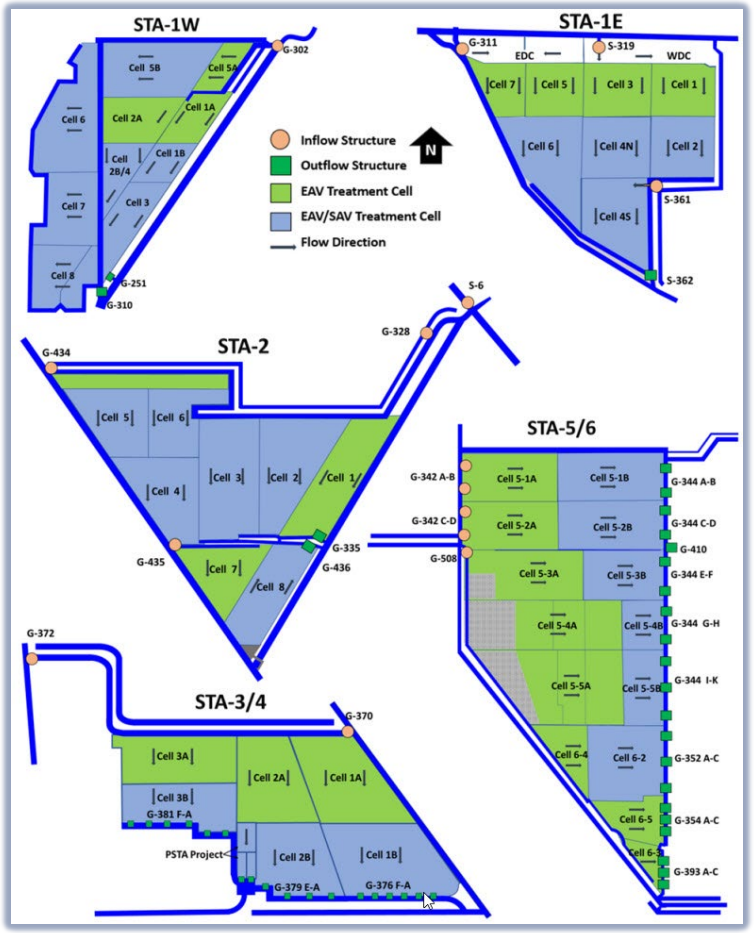
Overall Management Strategies

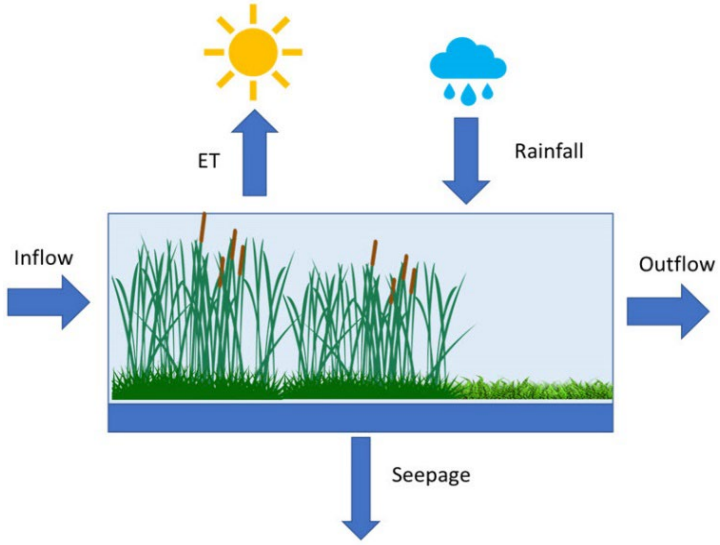
- Each flow-way (FW) is different
  - Type, location, and number of control structures
  - Prior land uses
  - Soil types
  - Soil TP content
  - Inflow waters
  - Topography
  - Plants
  - Hydrology





Management Strategies: Flows and Loads

- Maintain annual FW PLR below 1.3 g/P/m^2/yr
- During periods of flow, maintain HLR between 5 and 15 cm/day
- On an annual basis, maintain HLR < 3.5 cm/d
- High flows should be avoided after periods of no-flow conditions to the extent practicable
- After substantial periods of no-flow (weeks to months) introduce low flows gradually to reduce effect of high TP and high flows



Management Strategies: EAV

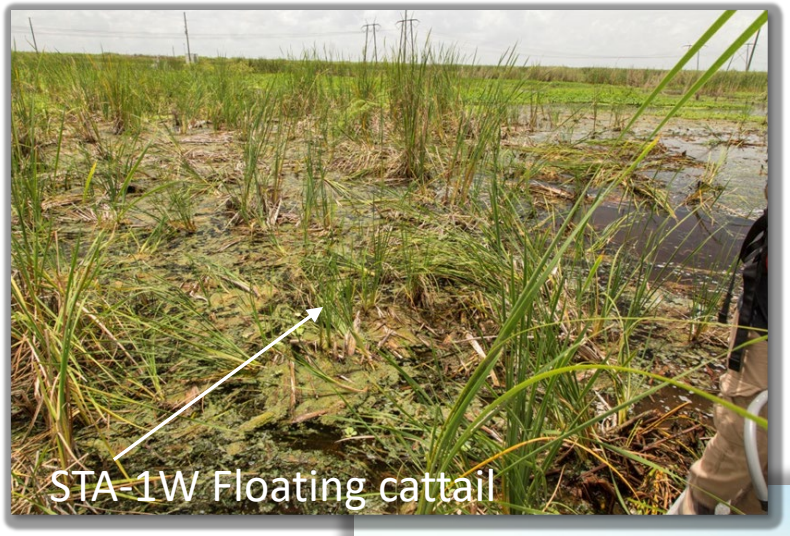
- To support healthy cattail areas and minimize tussock formation, avoid water levels > 2.75 feet (>84 cm) for > 8 weeks
- If water levels above 3 feet for > 4-6 weeks, avoid rapid water level declines to minimize cattail lodging


STA-2 Cell 4


Cattail health assessment in STA-3/4

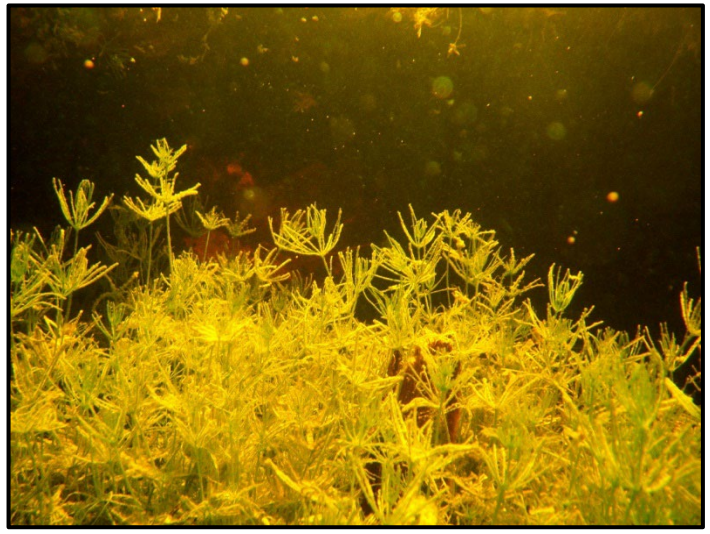
Management Strategies: Avoid tussock formation

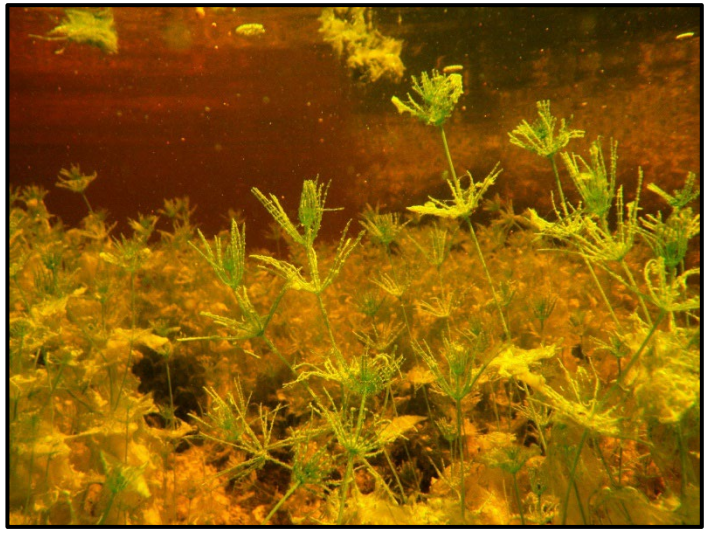
- Fallow ag land preferred over active farmland for new STAs
- Survey tussock prone areas with UAVs as means of early detection
- Reduce tussock formation by planting deeply rooted species
- Where tussocks formation observed, lower water levels below 1.0 feet water depth



Management Strategies: SAV

- Avoid high P loading to SAV communities
- Maintain healthy SAV at outflow regions
- Maintain SAV regions that support sunlight penetration
- Support SAV ecotopes of *Chara* and *Naiad* at outflow regions
- In areas of SAV collapse, reduce water levels to support germination





Management Strategies: Vegetation

- *Typha* and bare soil should be discouraged near outflow structures
- Minimize rFAV at outflow regions


STA-2 Cell 3 B Transect

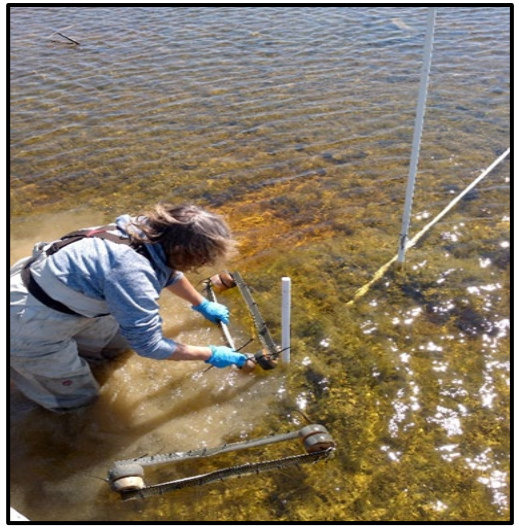

STA-5/6 Spatterdock

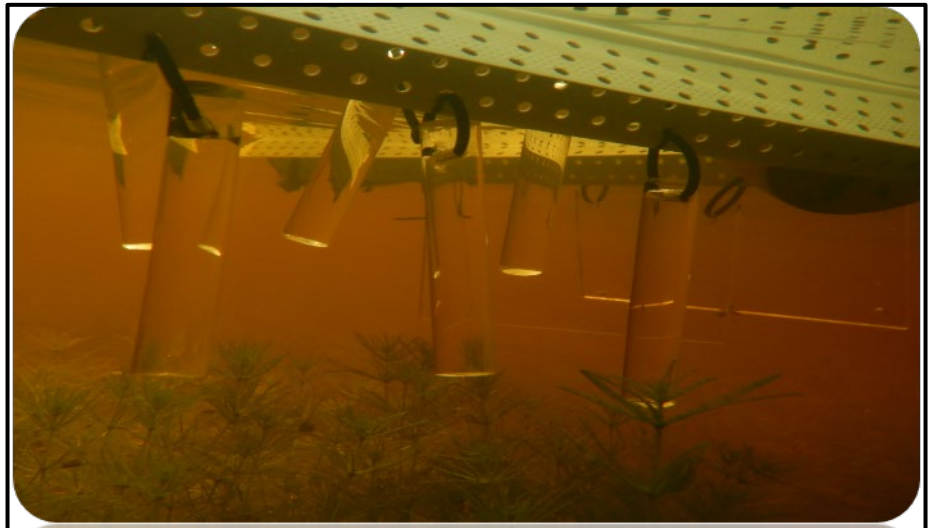
Management Strategies: Fauna

- Limit fish density and nesting in STA outflow regions
- Selective EAV planting in these areas
- Manage fish populations in dry season to concentrate fish in deeper areas to enhance predation

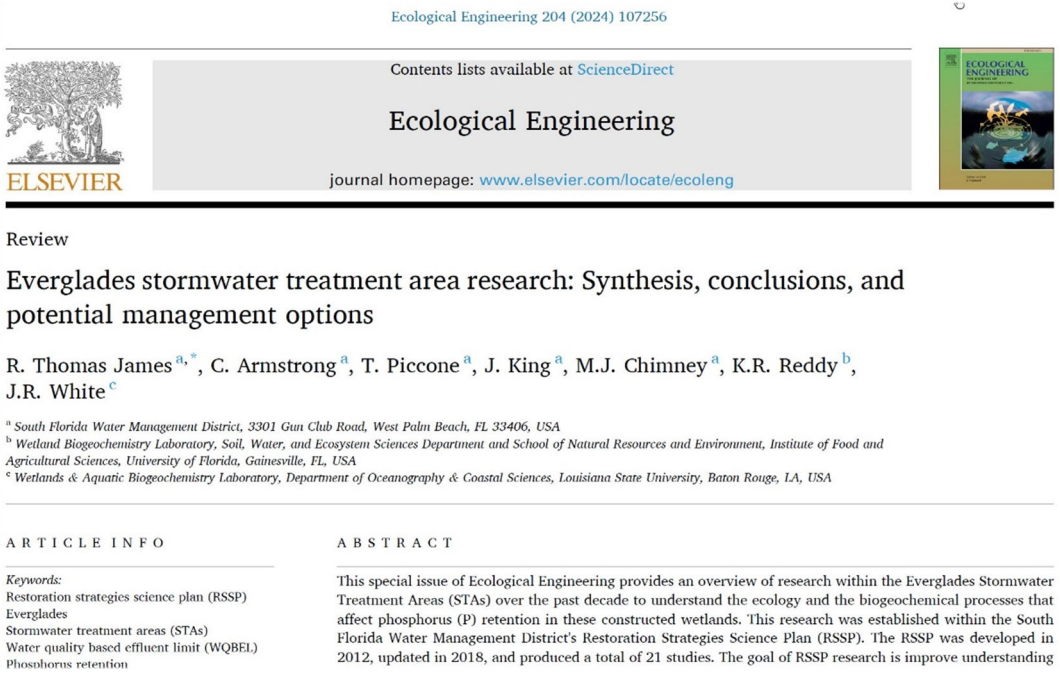
Management Strategies: Periphyton/PSTA

- For FWs requiring further water quality improvements, consideration to PSTA implementation
- Where soil removal not feasible, consider limerock capping of soil
- Mixed marsh (EAV interspersed with SAV) increases the diversity of the microbial community to breakdown more DOP





Final Takeaways



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Review

Everglades stormwater treatment area research: Synthesis, conclusions, and potential management options

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ABSTRACT

This special issue of Ecological Engineering provides an overview of research within the Everglades Stormwater Treatment Areas (STAs) over the past decade to understand the ecology and the biogeochemical processes that affect phosphorus (P) retention in these constructed wetlands. This research was established within the South Florida Water Management District's Restoration Strategies Science Plan (RSSP). The RSSP was developed in 2012, updated in 2018, and produced a total of 21 studies. The goal of RSSP research is improve understanding

Ecological Engineering Special Issue

- RSSP completed in 2024
- 21 studies conducted over 12 years

- P retention varies among STAs due to their different land use histories, soil types, soil TP content, inflow waters, topographies, vegetation, hydrology, and the type, location, and number of control structures
- 20 proposed management strategies to help optimize P retention in the STAs to achieve WQBEL
- Not all considerations are appropriate for each STA

Thank you!

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Links:

South Florida Environmental Report (SFER):
South Florida Environmental Report and Other Publications | South Florida Water Management District (sfwmd.gov)

Ecological Engineering Special Issue:
https://www.sciencedirect.com/special-issue/10B60WZB3QL