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A Mussel (Unionidae) Survey in Selected Martin County Wetlands, Culminating in Site-Specific Total Ammonia Nitrogen Criteria	January 2018- May 2018
Client: Florida Power and Light: Martin County	

Project Summary

Frydenborg EcoLogic conducted an EPA and FDEP-approved semi-quantitative mussel (Unionidae) survey at three wetland sites (test sites, including the Northwest Mitigation Area and the Barley Barber Swamp) and at one flowing slough (Black Bottom Slough, a control site), all located in Martin County. The purpose of the survey was to determine, with 95% confidence, whether Unionid mussels were present or absent in the test wetlands. Additionally, the control system was sampled to determine if the method could successfully locate Unionids from an area where habitat conditions were more conducive to Unionid propagation. Because no Unionid mussels (neither live, un-weathered shells, nor weathered shells) were found at any of the test wetlands, the Total Ammonia Nitrogen (TAN) Recalculation Procedure for Site-specific Criteria Derivation was subsequently utilized to provide for a more accurate, yet protective TAN criterion for these particular wetlands (Equation 1).

Equation 1. EPA Recalculated Chronic Criterion Magnitude for TAN.

$$CCC = 0.9405 \times \left(\frac{0.0278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}}\right) \times MIN\left(6.920, \left(7.547 \times 10^{0.028\times(20-T)}\right)\right)$$

Information and proposed Rule language supporting this Type 2 Site-Specific Alternative Criteria for TAN was provided.

Innovative approach

Frydenborg EcoLogic conducted an extensive literature search, which included academic, EPA, and US Fish and Wildlife recommended survey techniques, and found that there are no existing mussel survey methods developed for wetlands. Therefore, Frydenborg EcoLogic selected a Modified FDEP Wetland Condition Index technique to provide a **systematic, semi-quantitative** framework for surveying mussels potentially present in the FPL wetlands. This novel method was subsequently approved by EPA and FDEP.

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