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Vascular Plant Community Response to Human Disturbance in
Walton County Coastal Dune Lakes

February 2017- August
2018

Client: Walton County

Project Summary

Walton County contracted with Jones Edmunds, Janicki Environmental, and Frydenborg EcoLogic to develop and implement a study of the anthropogenic impacts on the Walton County Coastal Dune Lake (CDL) ecosystems. The study examined the extent of current human influences and how future



land use changes could affect the CDLs. Frydenborg EcoLogic conducted lake habitat assessment, GIS disturbance analyses, Lake Vegetation Index sampling, and complex statistical analyses for the study.

The percent native taxa, dominant Coefficient of Conservatism (C of C), percent sensitive taxa, and percent Florida Exotic Pest Plant Council (FLEPPC)-listed invasive exotic taxa were used to derive a CDL-specific, multi-metric vascular plant Index of Biological Integrity (IBI), which was significantly related to human disturbance (habitat landscape intensity in the buffer zone).

A Random Forest Model (Incorporated Mean Square Error analysis) indicated that: Degree of stormwater inputs; Bottom substrate quality; Intensity of watershed landuse, and Presence of lakeside alterations were the four most important parameters for predicting biological health of the lakes (measured by vascular plants).

The analyses provided evidence that the elements of the Walton County Lake Protection BMPs are expected to be effective in the future for maintaining and/or restoring biological health in the CDLs.

Innovative approach

Salinity was hypothesized to be a potential confounder for plant metrics. Frydenborg EcoLogic conducted regression analyses between salinity and the FDEP SOP LVI, which yielded a non-significant relationship ($r^2 = -0.06$, $p = 0.76$), suggesting that salinity, *per se*, was not as important as human disturbance in affecting plant community health in the CDLs.

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