

Adapting Mangroves on Dinner Key Breakwater Islands

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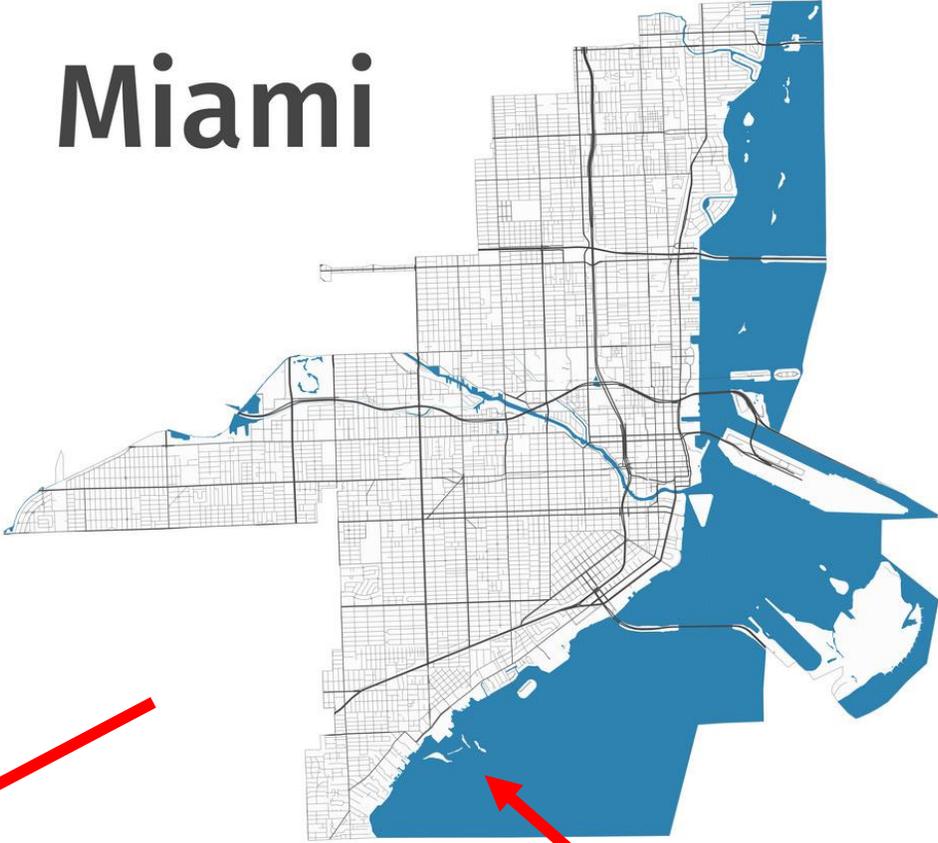
FFWCC Fish & Wildlife Research Institute



Project Location



Miami

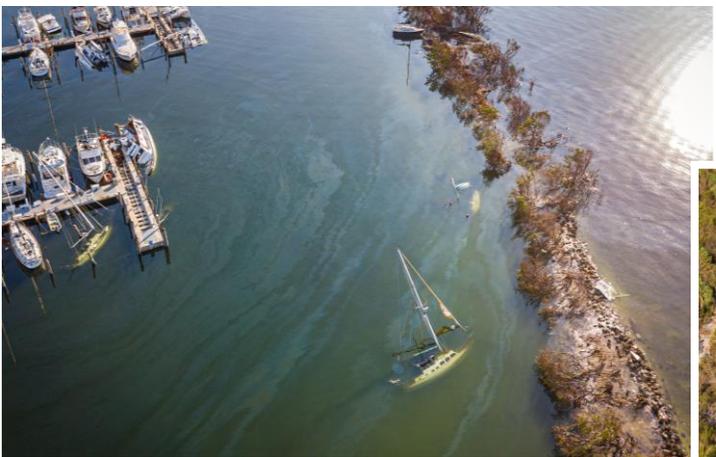


Project Site

Project Location – Miami, Biscayne Bay



Hurricane Irma Post-Storm



Submerged Land History & Ownership

- Islands created by Navy dredged material (~1950) to protect Clipper seaplanes during/after the war, planted
- Pan American Terminal grew into City Marina
- Biscayne Bay Aquatic Preserve - Ch. 18-18, FAC applies outside of 1951 fill line, no new fill to create land in AP



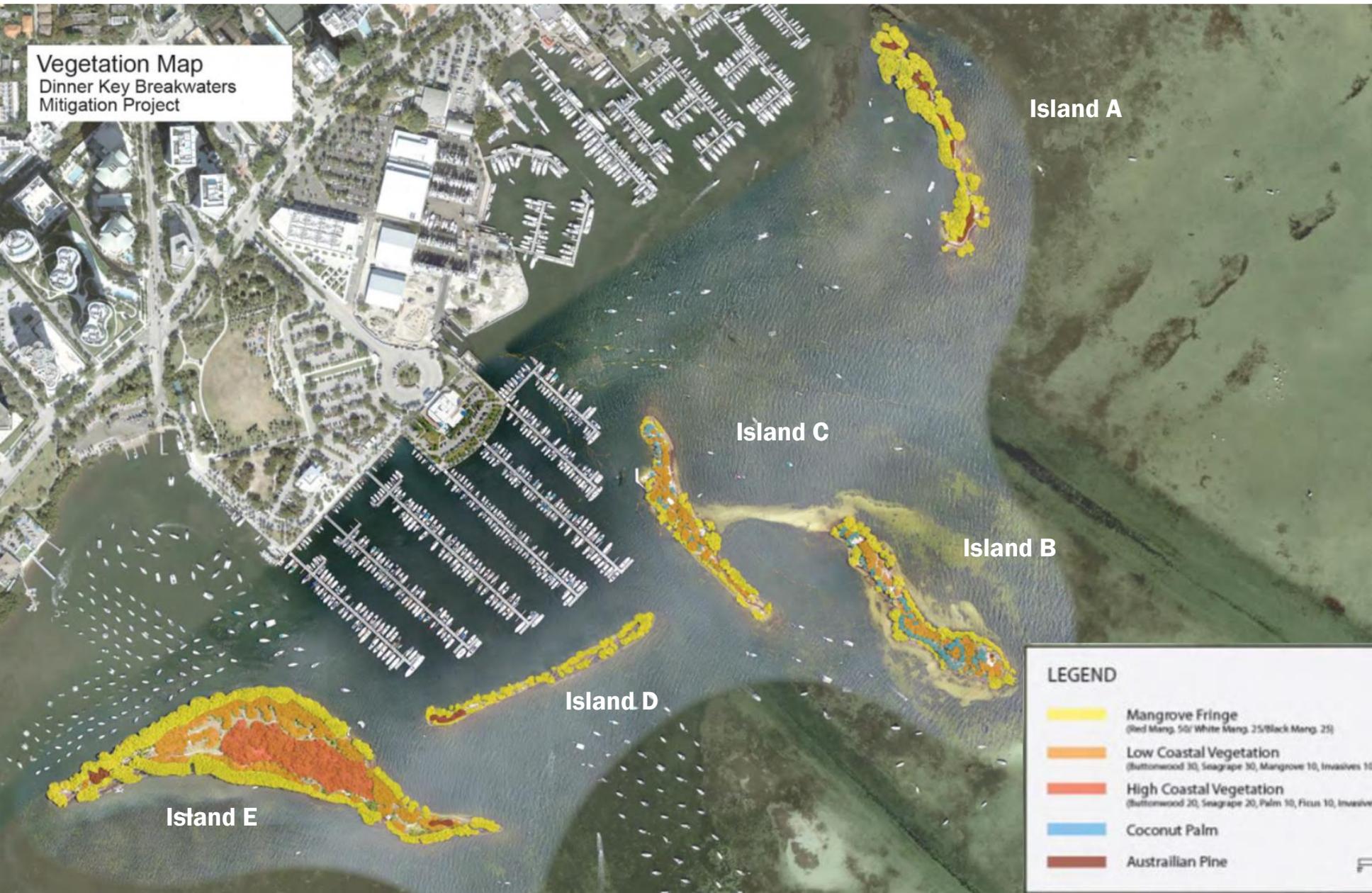
1940 Aerial

S-40 Southern Clipper Ship



The City of Miami owns the submerged lands by right of TIITF Deed No. 19448 (1949) - project is not contrary to deed restrictions

Environmental Conditions – Mangroves (yellow)



- Mangrove fringe
- Some riprap
- Tidal inundation worst on Island E
- Invasive/nuisance vegetation mixed in

Conceptual Plan – FEMA Original

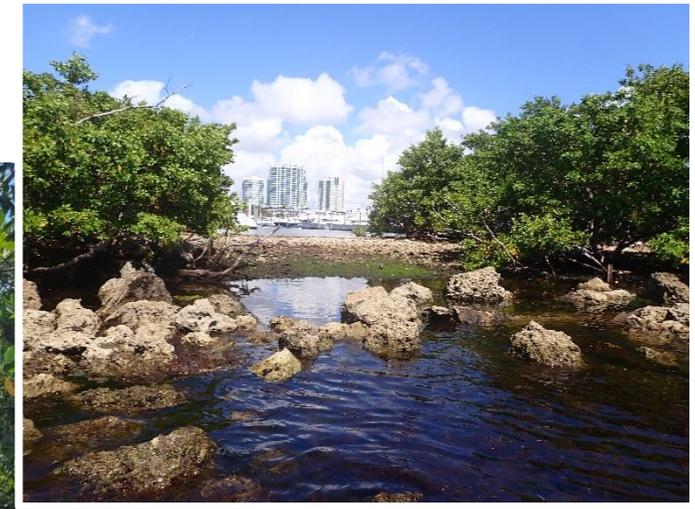


- New Breakwater
 - 350' north of marina
- Island C
 - 750' revetment
 - 60' groin
- Island D
 - 1,200' revetment
- Island E
 - 780' revetment
- Top elevation of structures = +5' NAVD
- Impacts mangroves, public access areas

Island D - Mangroves



Red Mangrove

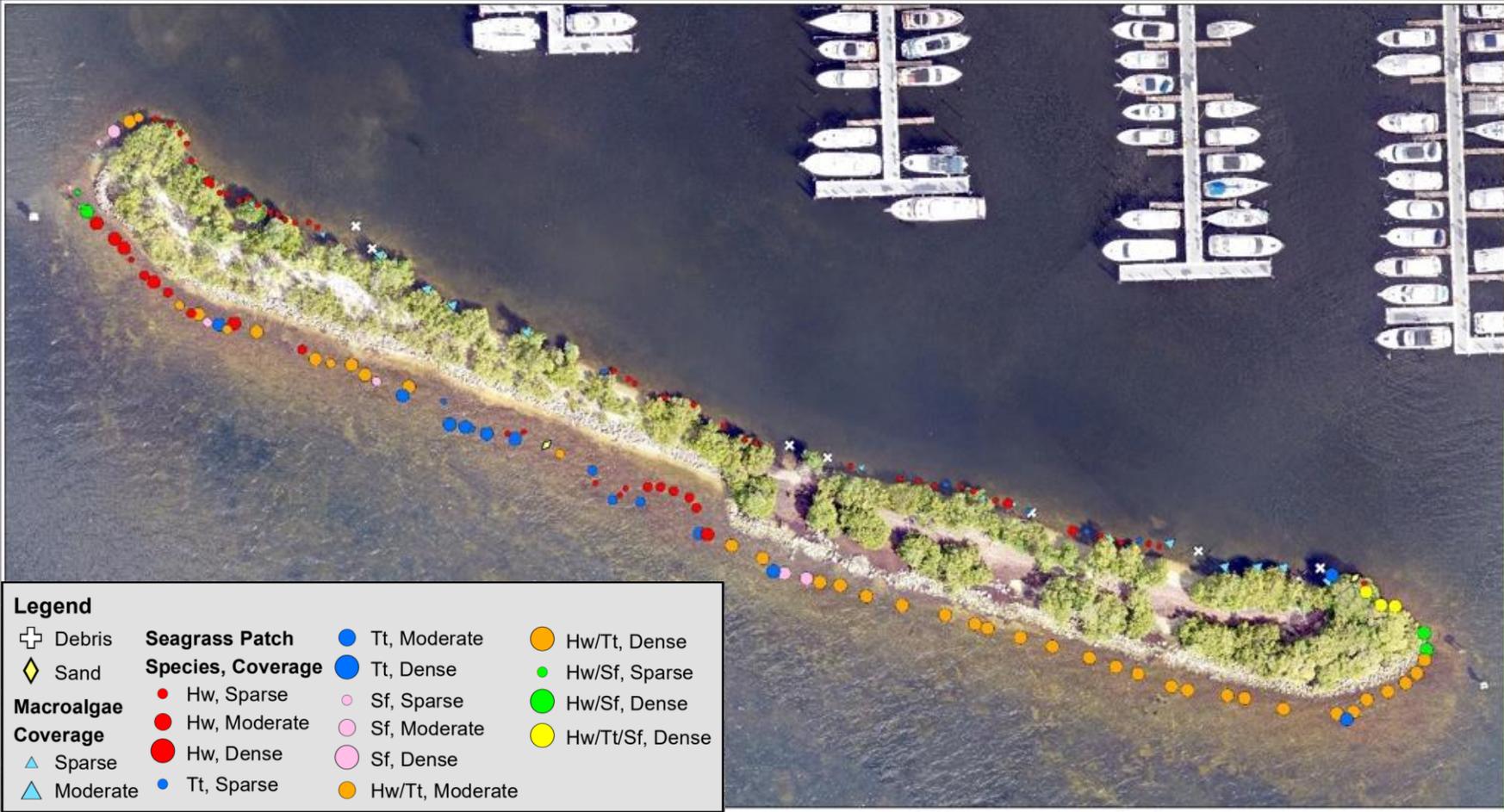


- No leaf litter, organic matter, seedlings
- Broken limbs, missing trunks, bare areas
- Invasive/nuisance vegetation mixed in

Scientific Name	Common Name
<i>Avicennia germinans</i>	Black mangrove
<i>Casuarina equisetifolia</i>	Australian pine*
<i>Coccoloba uvifera</i>	Seagrape
<i>Conocarpus erectus</i>	Green buttonwood
<i>Distichlis spicata</i>	Saltgrass
<i>Laguncularia racemosa</i>	White mangrove
<i>Rhizophora mangle</i>	Red Mangrove
<i>Sesuvium portulacastrum</i>	Sea purslane
<i>Thespesia populnea</i>	Seaside mahoe*

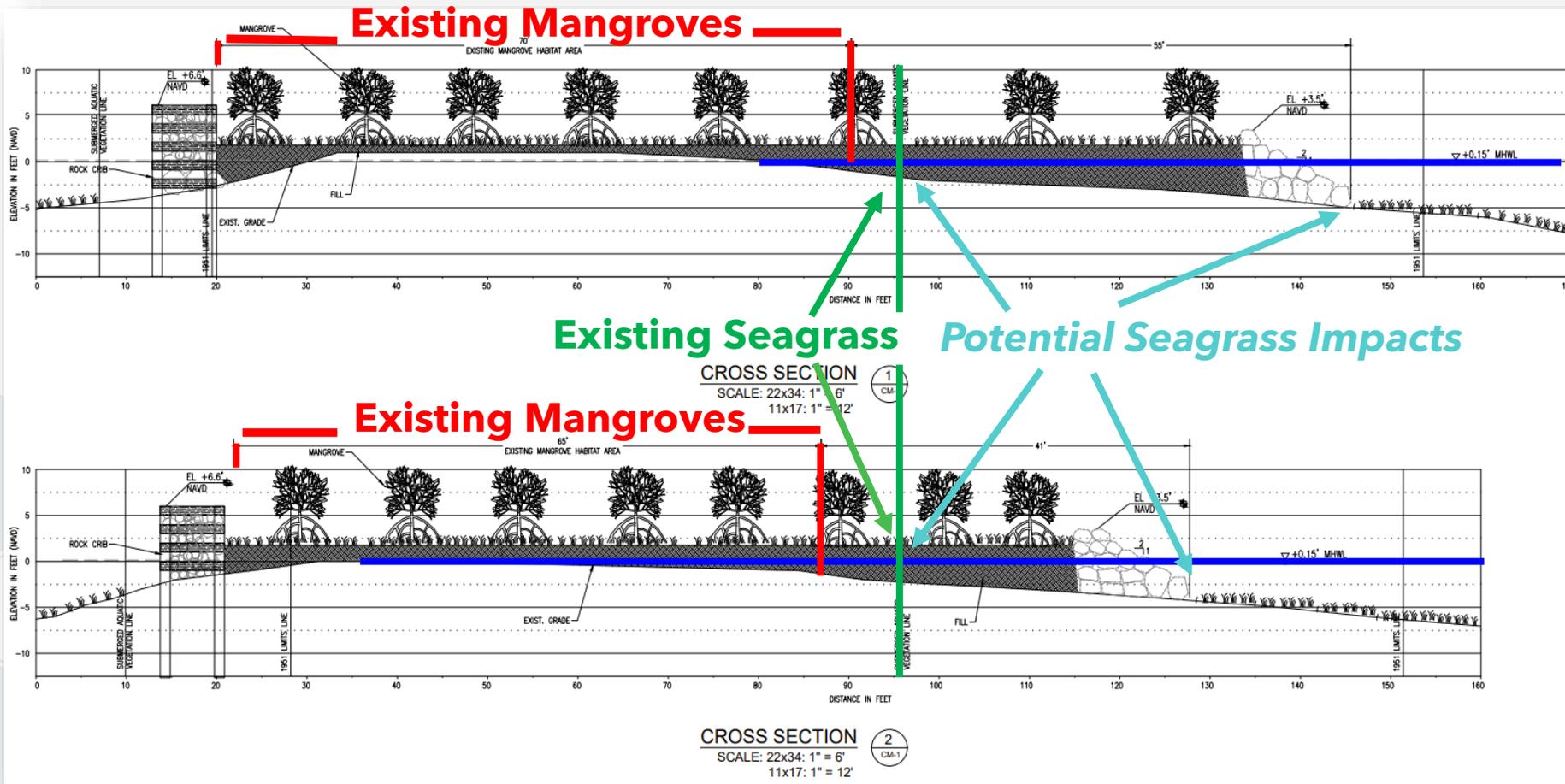
*Invasive vegetation

Island D – Seagrass Constraints



Potential Resource Impacts

Island D Proposed Cross Sections



Mangrove



Seagrass



Thin Layer Placement – no mangrove case studies yet

Photo Credit: U.S. Fish and Wildlife Service - Northeast Region



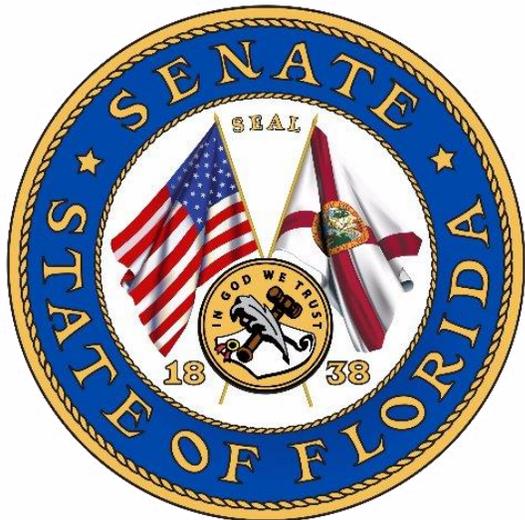
For Discussion:

- + How much fill can mangroves withstand?
- + Does fill tolerance vary with mangrove species?
- + What construction means / methods can be used to raise mangrove fringe elevations?
- + How should filling shorelines to create new / adapt mangrove fringe be regulated?



Legislation

- + SB 32 - Mangrove Replanting & Restoration
 - Modifies Mangrove Trimming and Preservation Act (403.9324, FS)
 - Needs to modify 373.4131, FS (ERP), and 258.397, FS (BBAP) to be most effective
- + HB 1531 - Climate Resilience and Drinking Water Standards
 - Creates Ocean State Climate Adaptation & Resilience Grant Fund (OSCAR Grant)
 - \$\$ not allowed for filling coastal, estuarine, or riverine habitats



Thank you!



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