

# ALLIGATOR CREEK UPDATE

## SEPTEMBER 21ST, 2022



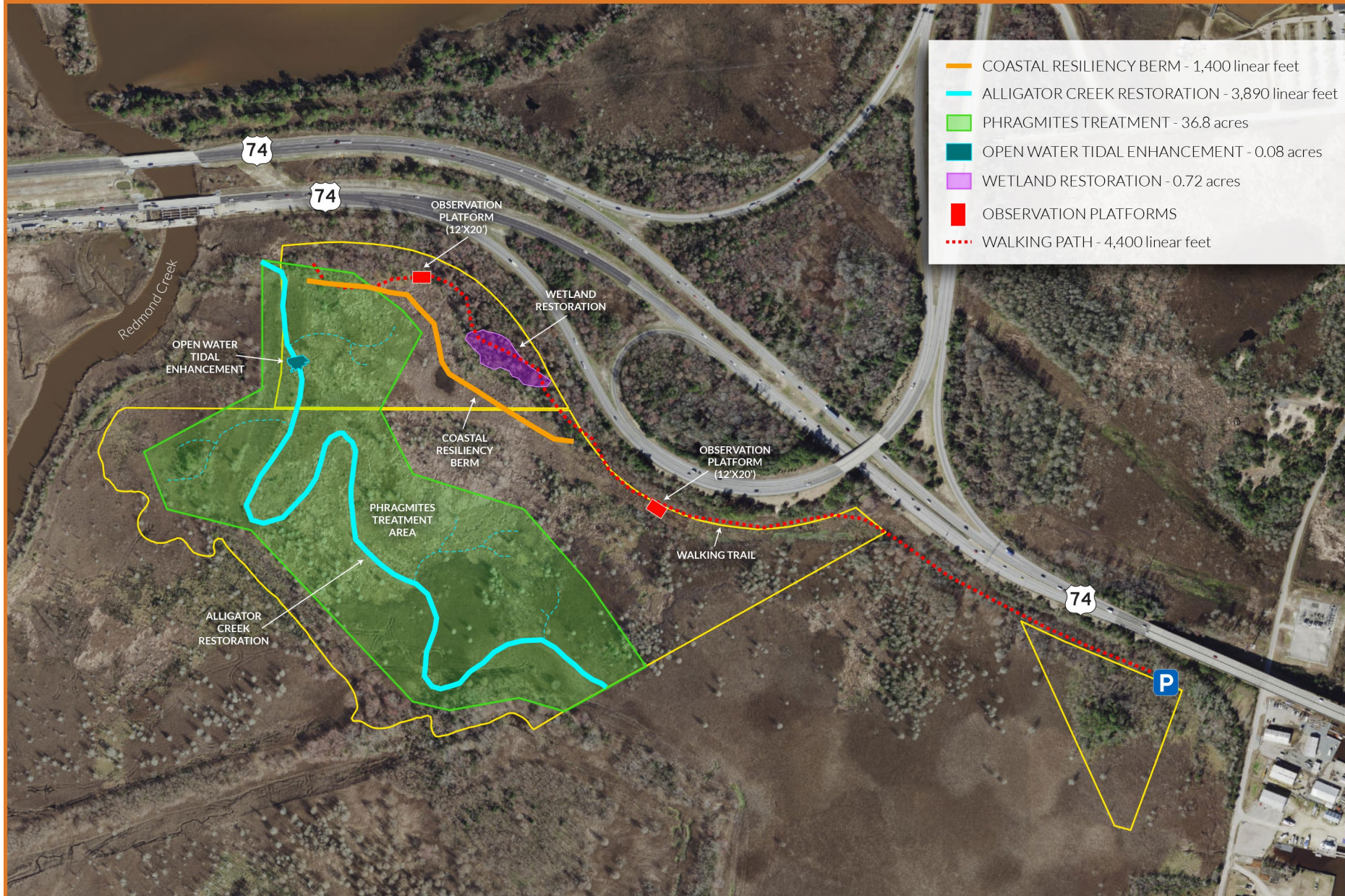


# EAGLES ISLAND GOALS

- Conserve and restore wetlands
  - Benthic habitat
  - Flood resilience and water quality
  - Protect habitat for species of concern
- Provide public access and recreational opportunities
  - Nature trails
  - Paddling access
- Preserve and provide on-site interpretation of cultural and historic significance
  - Gullah Geechee Cultural Heritage Corridor







# Alligator Creek Restoration Detail Plan

Brunswick County, NC



SCALE 1:2,200  
Produced July 2019



The information depicted on this map are for illustrative purposes and do not constitute definitive property or legal descriptions. This map does not represent a legal survey.

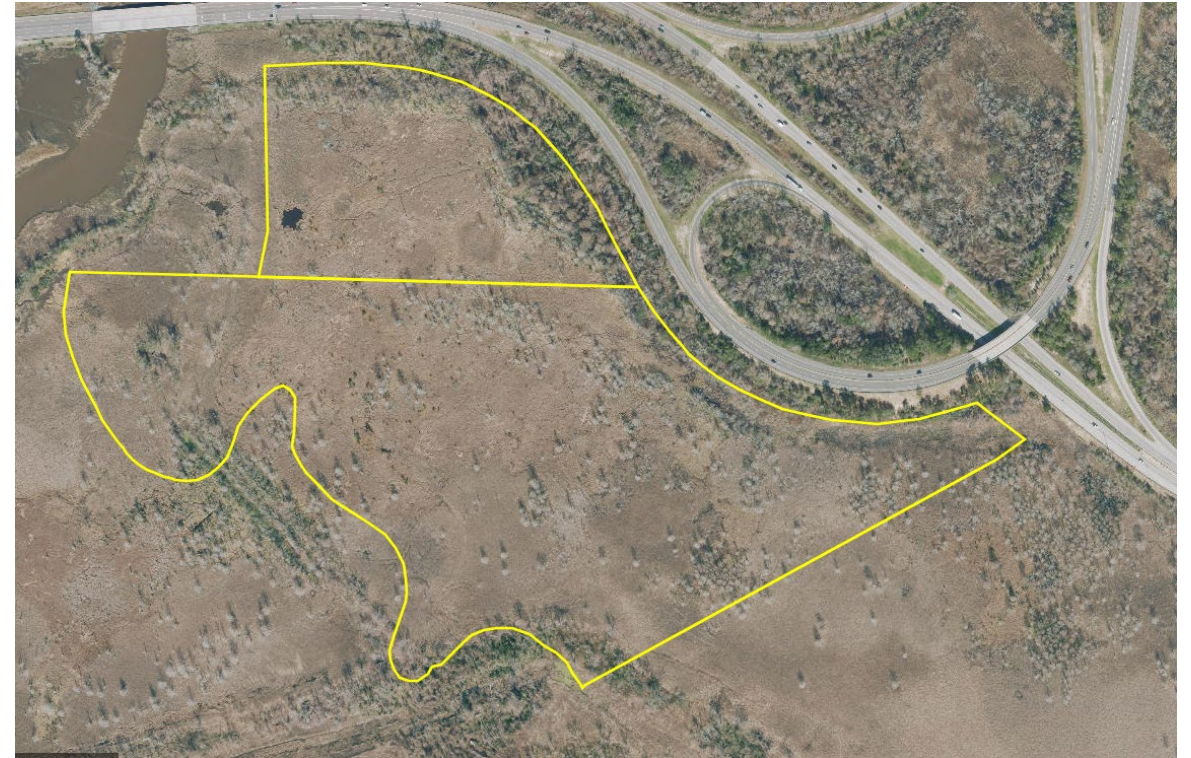


# ALLIGATOR CREEK UPDATE



## Project Goals

- Reestablish 1900' main channel and 2000' tributaries for benthic habitat.
- Increase tidal exchange in project area.
- Reduce acreage of invasive *Phragmites*.
- Increase resilience of uplands to future expected conditions.
- Purchase parcel with creek mouth.
  - Phase I ESA done, getting appraisal.
- Currently: Baseline Assessment
  - Davey Resource Group
  - Vegetation mapping
  - Water level gauges installed
  - Hydrologic modeling has started

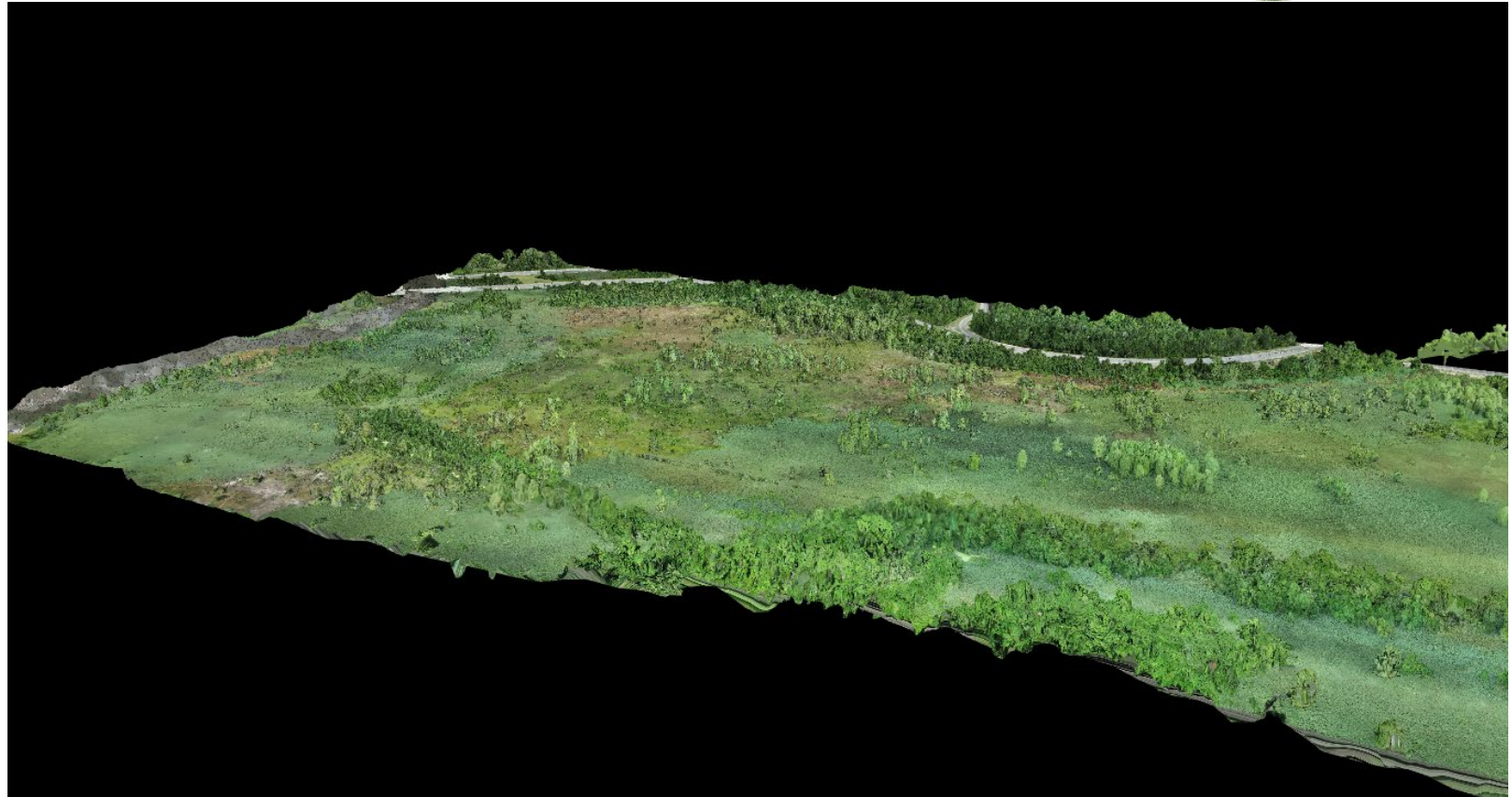


# ALLIGATOR CREEK INITIAL DATA



## Vegetation Community

- *Typha*-dominated, with some *Spartina cynosuroides*
- *Phragmites* dominant at slightly higher elevation.
- Cypress clusters
- Cypress/Gum Swamp
- Upland trees: Cypress, Gum, Black Cherry, Red Maple, Tallow, Live Oak





# PHRAGMITES TREATMENTS



## Primary Treatment:

- Alter hydrology through reestablishment of the tidal creek.
  - Increased depth, duration, and frequency of flooding will stress *Phragmites*.
  - Years with higher salinity will further stress *Phragmites*.
  - Pay attention to soil pH, sulfides/soil redox potential

## Follow up on Novel Sugar Treatment:

- Burdick et al. 2017 field and greenhouse experiments tested sugar as an innovative *Phragmites* control approach.
- Strong response in the greenhouse, not replicated in the field.
- Not recommended for use at scale.
- Mechanism of impact:

Sugar stimulated anaerobic bacterial respiration



Porewater sulfide concentrations increased



*Phragmites* roots re-oxidized sulfides



Porewater pH decreased



# PHRAGMITES TREATMENTS



## Possible Secondary Treatment:

- Novel application of herbicide (**under consideration**)
  - Map the patches first.
  - Drone directly applies herbicide (glyphosate) to the *Phragmites*.
  - High precision: very little waste, less human interaction.
  - Used by NCDOT on NPS land (Bodie Island Lighthouse in 2019)

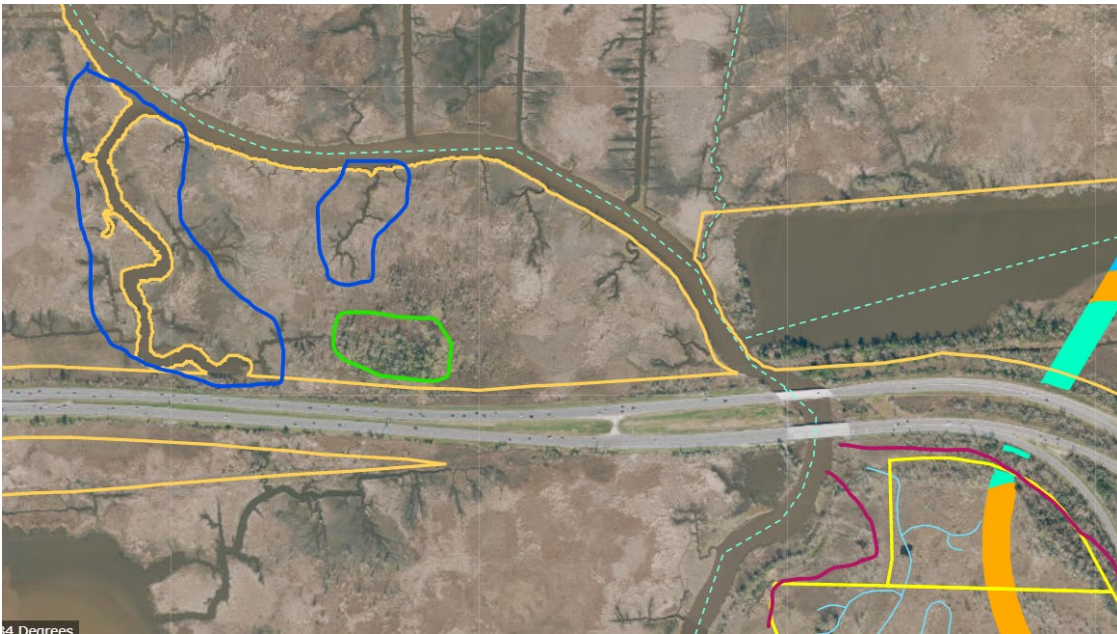


# ALLIGATOR CREEK MONITORING



## Experimental Design Approach

- Before-After-Control-Impact (BACI)
- Pre- vs. Post-restoration (Before/After)
- Reference site vs. Restored site (Control/Impact)



## Metrics

- Reestablish tidal creek for benthic habitat
  - Tidal creek characteristics
  - Vegetation and benthic communities
- Increase tidal exchange
  - Hydrology (wells)
  - Salinity and pH
- Reduce invasive *Phragmites*
  - Assess effectiveness of treatments
  - Drone or other aerial imagery
  - Growth metrics
- Upland resilience
  - Highly dependent on design
  - Hydrology, imagery, growth metrics





# THANK YOU

## Funding provided by:

National Fish and Wildlife Foundation, Damage Assessment Response and Restoration Program under the direction of the Natural Resource Trustee Council (National Oceanic and Atmospheric Administration, US Fish and Wildlife Service, and NC Department of Environmental Quality)



## Support from:

New Hanover Soil and Water Conservation District

Dru Harrison and Board of Supervisors

Wilmington Outdoor Adventures & Vacations by Greg

Kay Lynn Hernandez and Greg Gordon

Davis Imagery

Rich Davis

Over 60 Community Members!





# CONTACT INFORMATION



Christine Pickens, PhD  
Science Director, Unique Places to Save  
[cpickens@uniqueplacestosave.org](mailto:cpickens@uniqueplacestosave.org)  
225-931-2073

