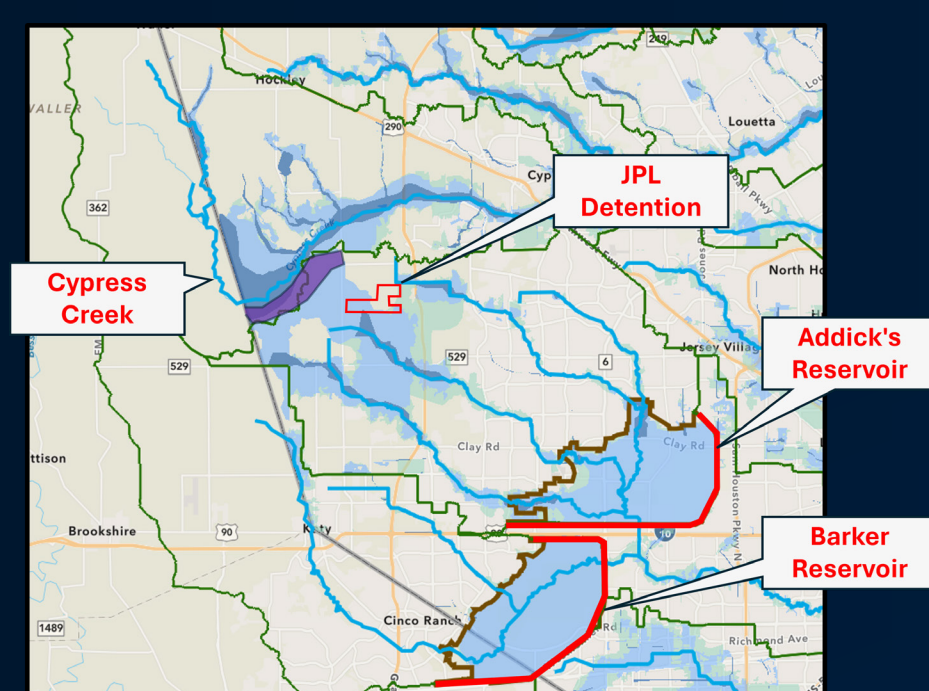
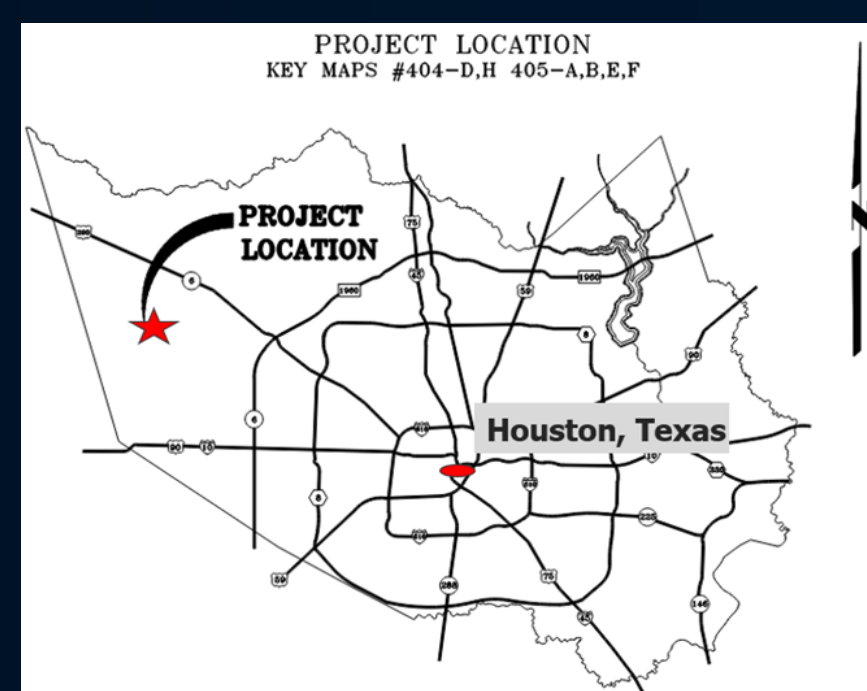


Maximizing Habitat Diversity under Widely Varying Hydrologic Conditions

Restoration Challenge How do you establish and maximize survivorship of native plantings in a system intended to have wide water level fluctuations, and when future conditions are predicted to differ from current conditions? Diversity and flexibility are key.

Project Location The project is located in a public park (John Paul Landing) northwest of Houston, TX. The clients are the Harris County Engineering Department and the Harris County Flood Control District.

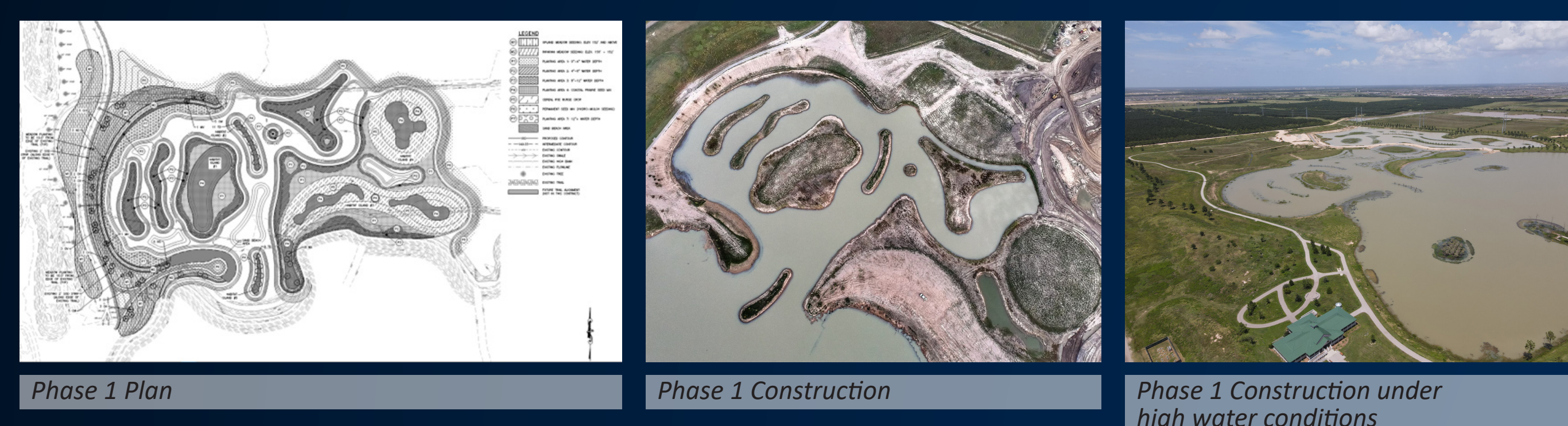


Primary Objective The primary objectives of the John Paul Landing project were to provide regional water quality and flood detention (650 ac-ft) in northwestern Harris County, TX. The project is one part of the overall strategy Harris County is implementing to provide flood storage.

Restoration & Recreation were Secondary Objectives In our design, we took the opportunity to maximize ecological lift and restore lost regional function and values. Located within a public park, the design also includes recreation and educational opportunities for the community.



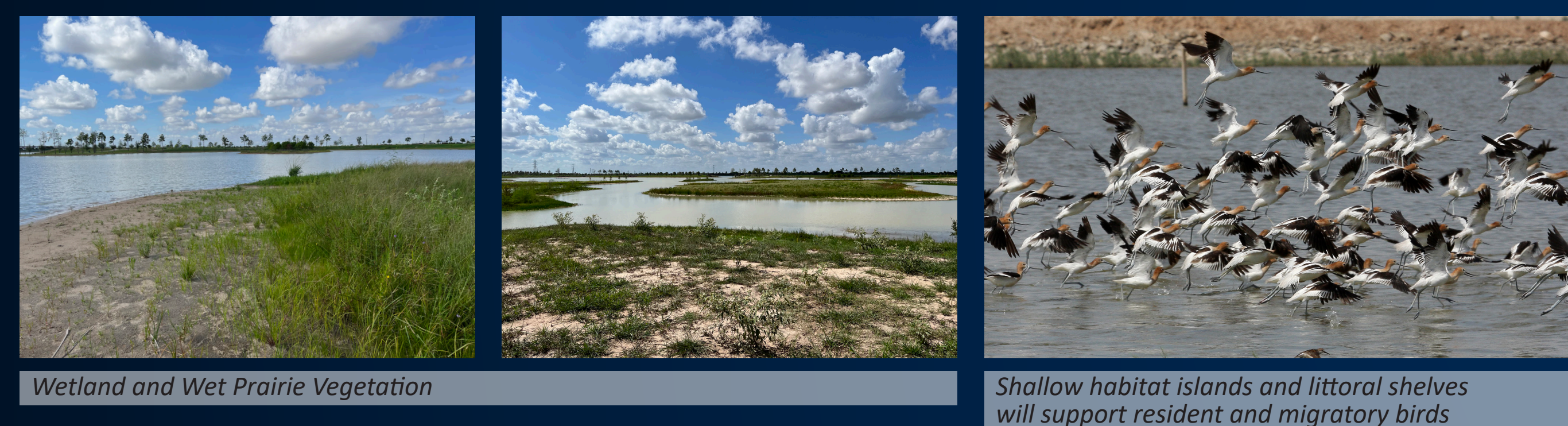
Master Plan (all phases of John Paul Landing North Basin construction)



Phase 1 Plan

Phase 1 Construction

Phase 1 Construction under high water conditions



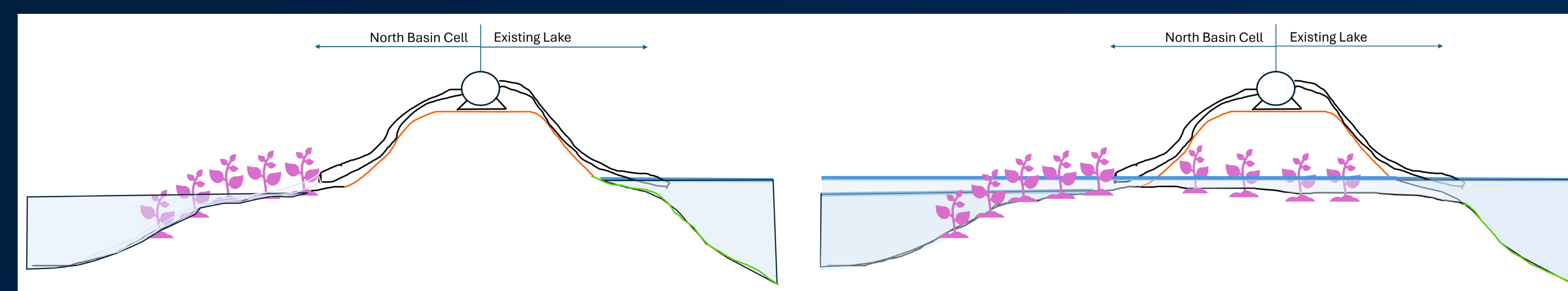
Wetland and Wet Prairie Vegetation

Shallow habitat islands and littoral shelves will support resident and migratory birds

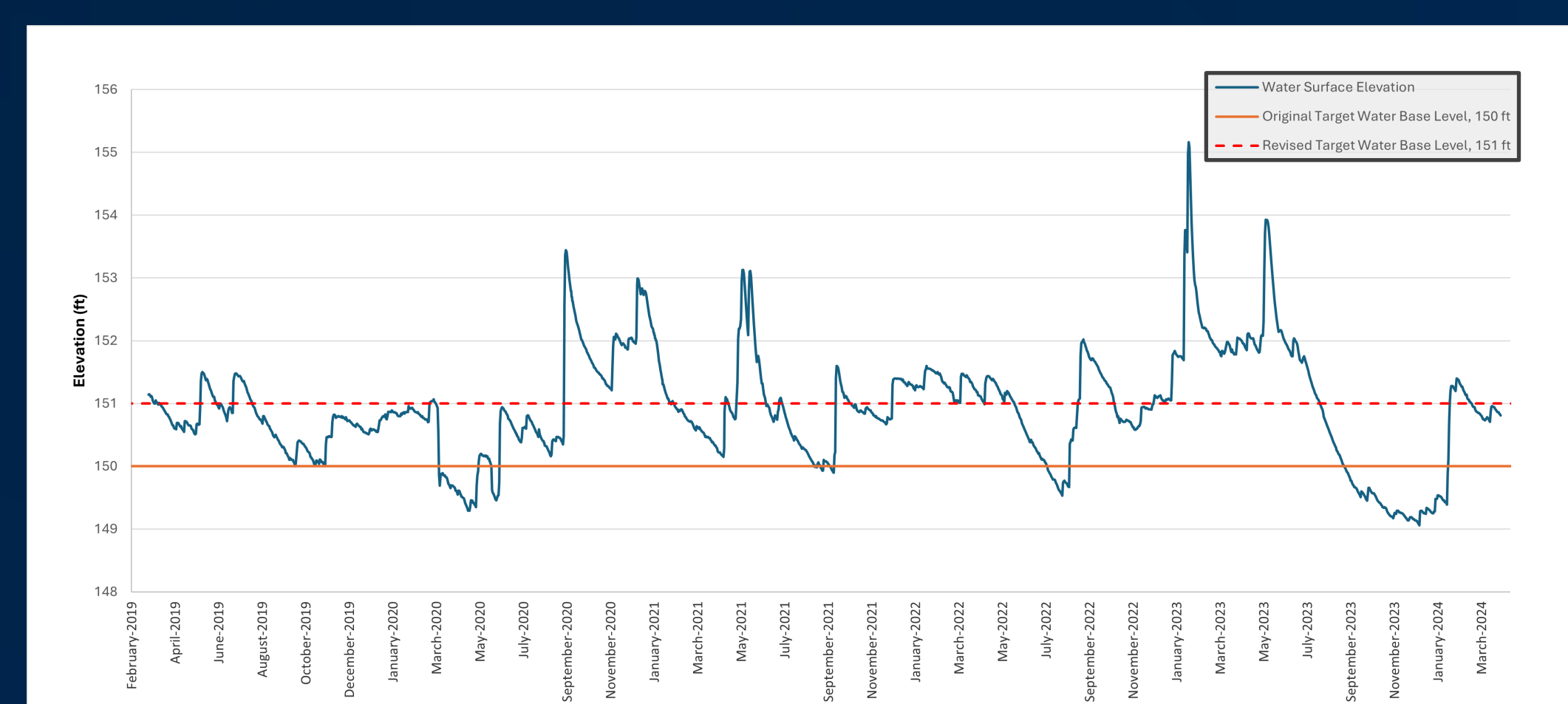
Scheduling of Construction to Maximize Wetland Planting Survivorship

The project has been designed and constructed in phases. Scheduling construction and removal of berms to manage water levels while also trying to establish wetland plants in completed phases is challenging.

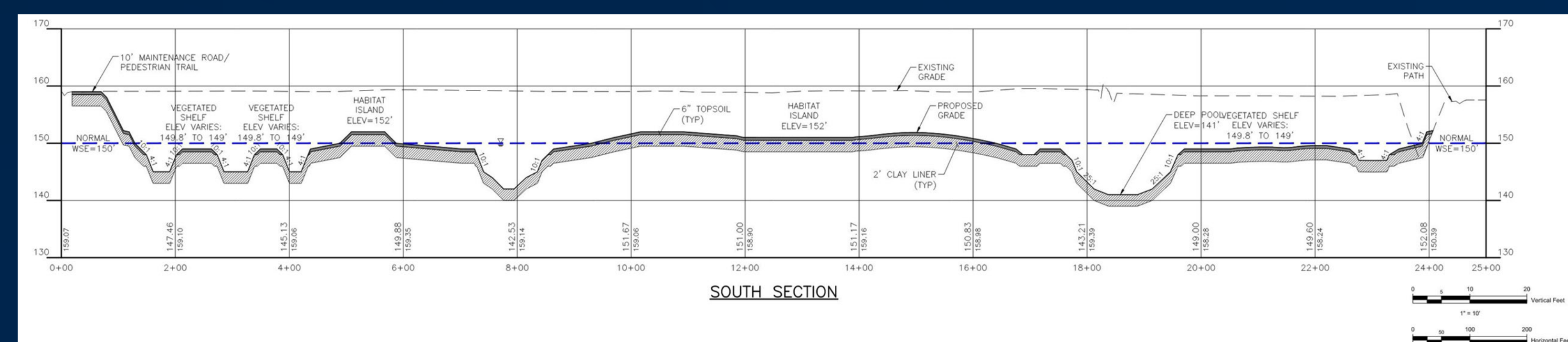
1. Construct breaching berm and excavate / grade project area.
2. Control water surface elevation in project via pumping.
3. Plant wetland plants and allow them to be established (~ 90 days).
4. Remove berm (breach), finalize grading and plant remaining plants.



Rethinking the Landscaping Plan The critical challenge was establishing wetland plants under both flood and drought conditions. Thus far, the system has been incredibly variable.



Originally, the littoral shelves, bald cypress islands, and wet prairie islands were designed with a target water base level of 150 feet. This is the intended control elevation for the basin.

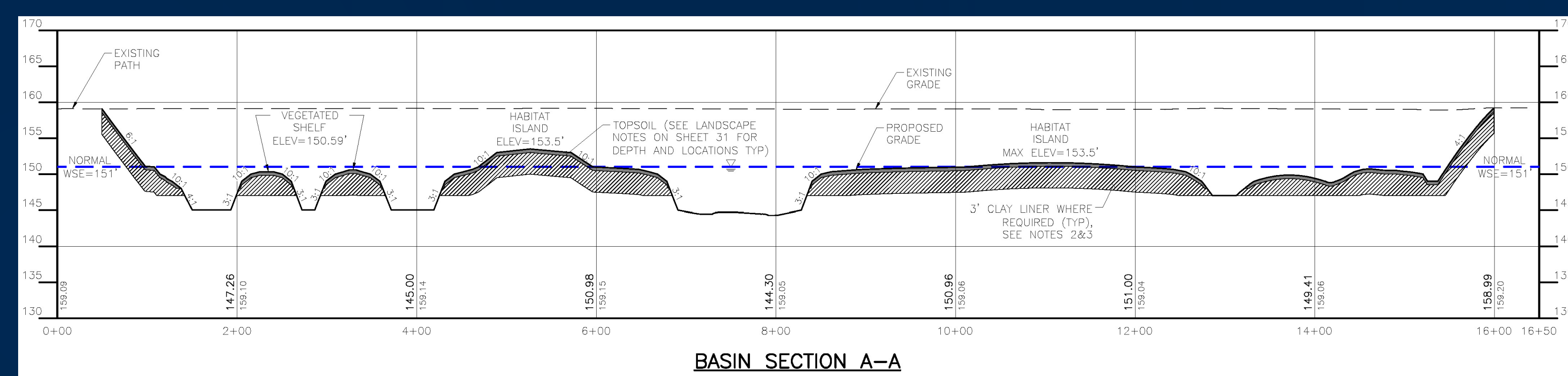


Original Example Cross Section

Before Phase 1 went to bid, there was a concern that water levels were too high for planting, and the water levels remained too high for establishment.

The grading and target water base level were revised to 151 feet. All grading and planting plans were revised.

Under lower water levels, we can rely on capillary action and watering to establish plantings.



Revised Example Cross Section

