

ENGINEERING & ECOLOGY

WORKING TOGETHER TO DEVELOP FUNCTIONAL TIDAL CREEKS AND PONDS IN MARSH CREATION PROJECTS

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Introduction

Tidal Creeks and Tidal Ponds can provide a beneficial boost to the biodiversity of newly created marsh. There are 34 bird species of conservation concern that use marsh habitat within Louisiana, including wading birds, shorebirds, and passerines (USFWS 2008, Rosenberg et al. 2014). (Referenced in Patton et al. 2020). Tidal creeks and ponds support a high population of post-larval and juvenile organisms. The high concentration of these organisms along the marsh edge are what draw the wetland-dependent mammals, wading birds, and other fishes to these highly productive habitats. They come together along the edge of the marsh where concentrations are the highest (Minello, T.J., et al. 1994). It is imperative that we ensure these important ecological attributes of a marsh ecosystem are incorporated in marsh restoration as we continue to restore thousands of acres of marsh every year.

Method of Constructing Tidal Creeks and Ponds:

Multiple Methods to construct Tidal Creeks and Tidal Ponds

1. Constructing low lying ring levee to limit amount of material
2. Excavating to predetermine depth and filling with material and having differential settlement
3. Excavating and ponds post construction once low-lying areas form.
4. Uses Design Surveys to identify existing deeper mudlines to allow differential settlement to take place.

Conclusion:

Tidal Creeks and Tidal Ponds can provide a beneficial boost to the biodiversity of newly created marsh. Attempts are being made to determine the best practice, however like most things in marsh creation project the details of the construction of tidal creeks and ponds are project specific. Therefore, the collaboration between Ecologist and Engineers is critical to the success of the project.

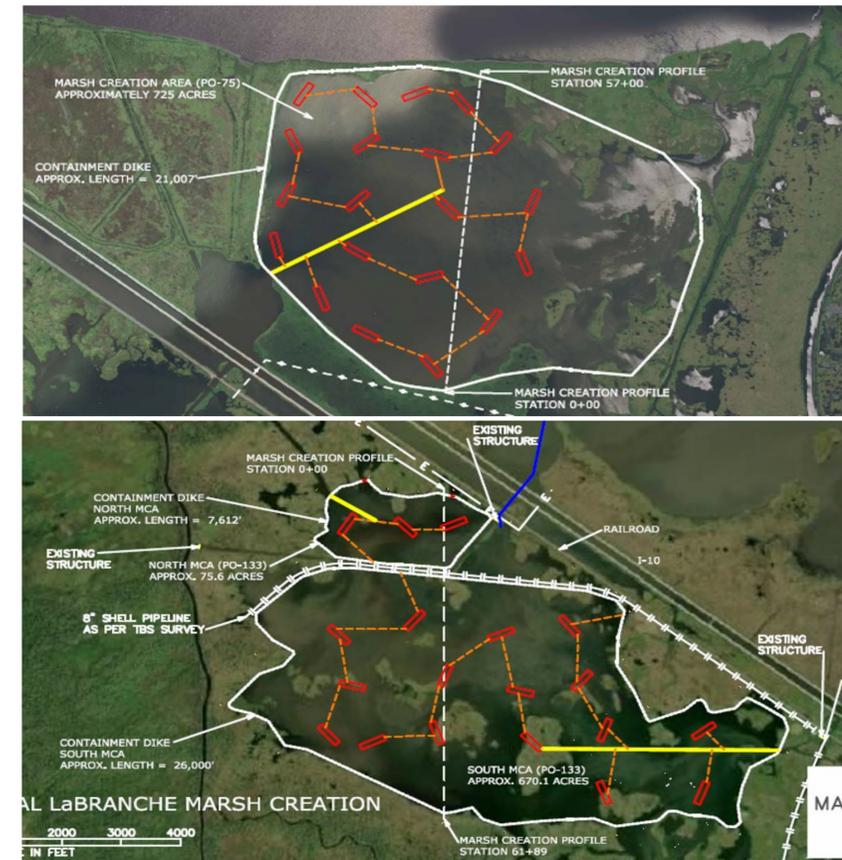
Engineering Considerations:

- Depth of pond and side slope
- Settlement of newly placed material
- Differential settlement of material
- Equipment available for construction
- Water Depth and Tidal Range
- Decision whether to target existing low-lying areas or to excavate

Ecological Considerations:

- Ecological diversity
- Water depth and tidal range
- Species within the area or region
- Varying Marsh platform elevation
- Marsh edge, salinity, aquatic and emergent plants.
- Considerations for recreating this important marsh attribute includes the tidal profile (depth and width), sinuosity of the channel, and density of the number of channels (interspersion)

Ecological Considerations credited to Angela Trahan, NRCS Biologist



Images above Tidal Ponds and Creeks are constructed prior to dredge material. Connectivity between ponds and creeks are complete by Marsh buggy after dredge material is place.

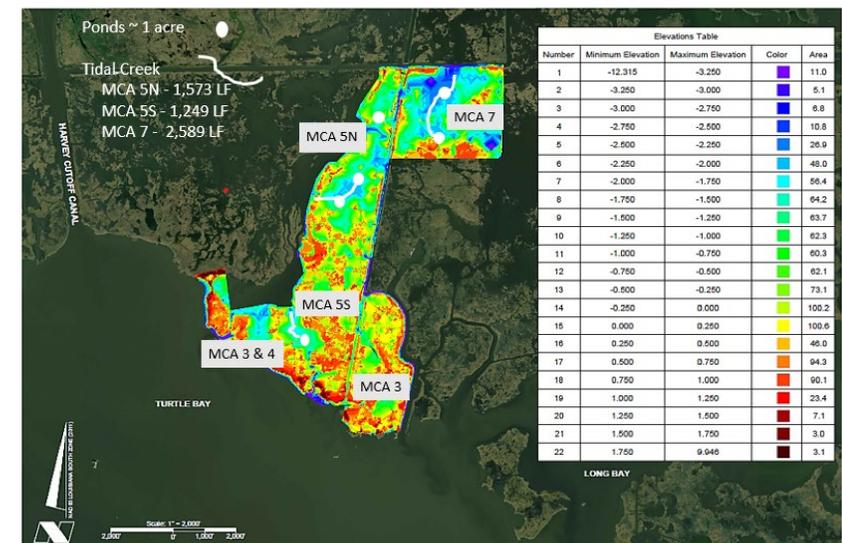
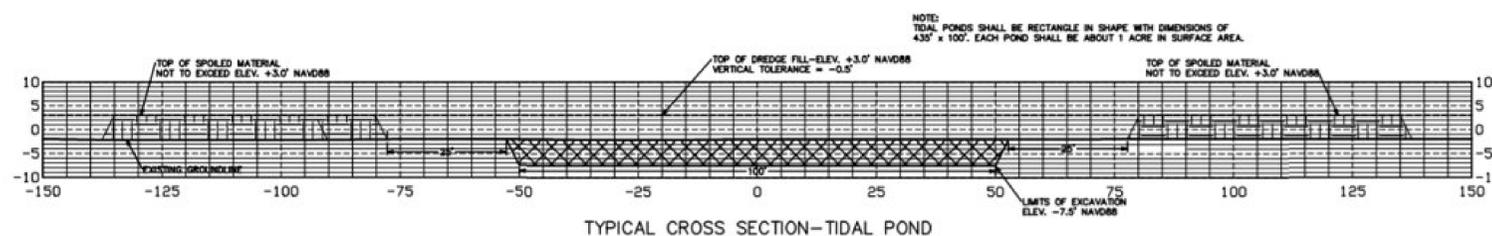
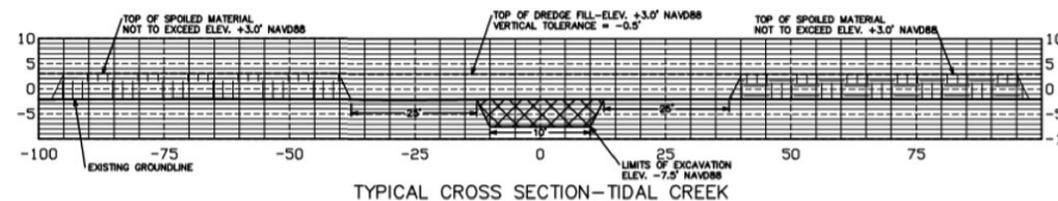


Image above Tidal Ponds and Creeks are planned by choosing existing low-lying areas and only excavating after dredging is complete to help facilitate tidal exchange.