Implementing at the project scale to inform regional wetland restoration: the Dutch Slough Tidal Marsh Restoration

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State of the Estuary Conference, September 2011


China Camp State Park
Turtle Back Nature Trail
Welcome to Turtle Back Nature Trail. This ¾ mile accessible path offers you a close look at some of the San Francisco Bay Area's most important natural communities. Follow the trail across open grasslands, along the edge of a rare salt marsh, and through a shaded oak woodland.
Oak woodland
NORTH
0
100 yards


7/14/1999

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Delta Restoration Goals

- Ecosystem Restoration Program
- Bay Delta Conservation Plan
- Delta Plan
- Biological Opinions

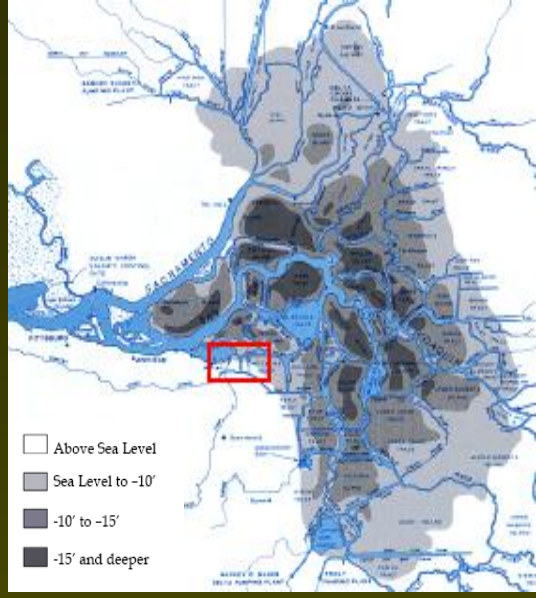
How do we get there?

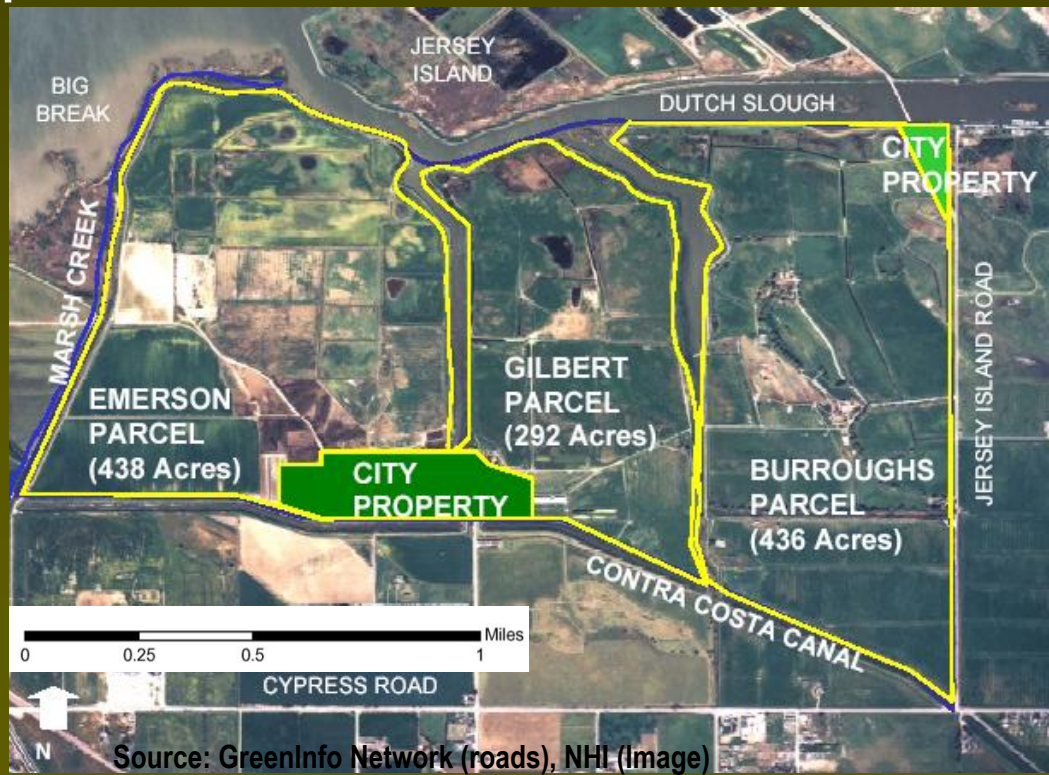
Limited understanding of how habitat goals link to goals for

- Endangered and at-risk species
- Ecological processes
- Water quality

Dutch Slough Tidal Marsh Restoration

- 1,166 acres
- Once slated for 4,500 homes
- Acquired by DWR with funding from CBDA & Conservancy
- Goals
  - Habitat restoration
  - Adaptive management
  - Public access





Dutch Slough Adaptive Management

- Adaptive management framework
- Adaptive Management Work Group

  Bruce Herbold, EPA, Chair of Dutch Slough AMWG - *fisheries*

  Si Simenstad, U Washington (honorary) - *fisheries*

  Peter Baye, Consultant – *vegetation, restoration*

  Lars Anderson, UC Davis – *invasive aquatic plants*

  Joan Florsheim, UC Davis - *geomorphology*

  Roger Fuji, USGS – *water quality*

  Lenny Grimaldo, DWR - *fisheries*

  David Sedlak, UC Berkeley – *water quality*

  Stuart Siegel, Consultant - *restoration*

  Mark Stacey, UC Berkeley - *hydraulics*

  John Takakawa, USGS - *birds*

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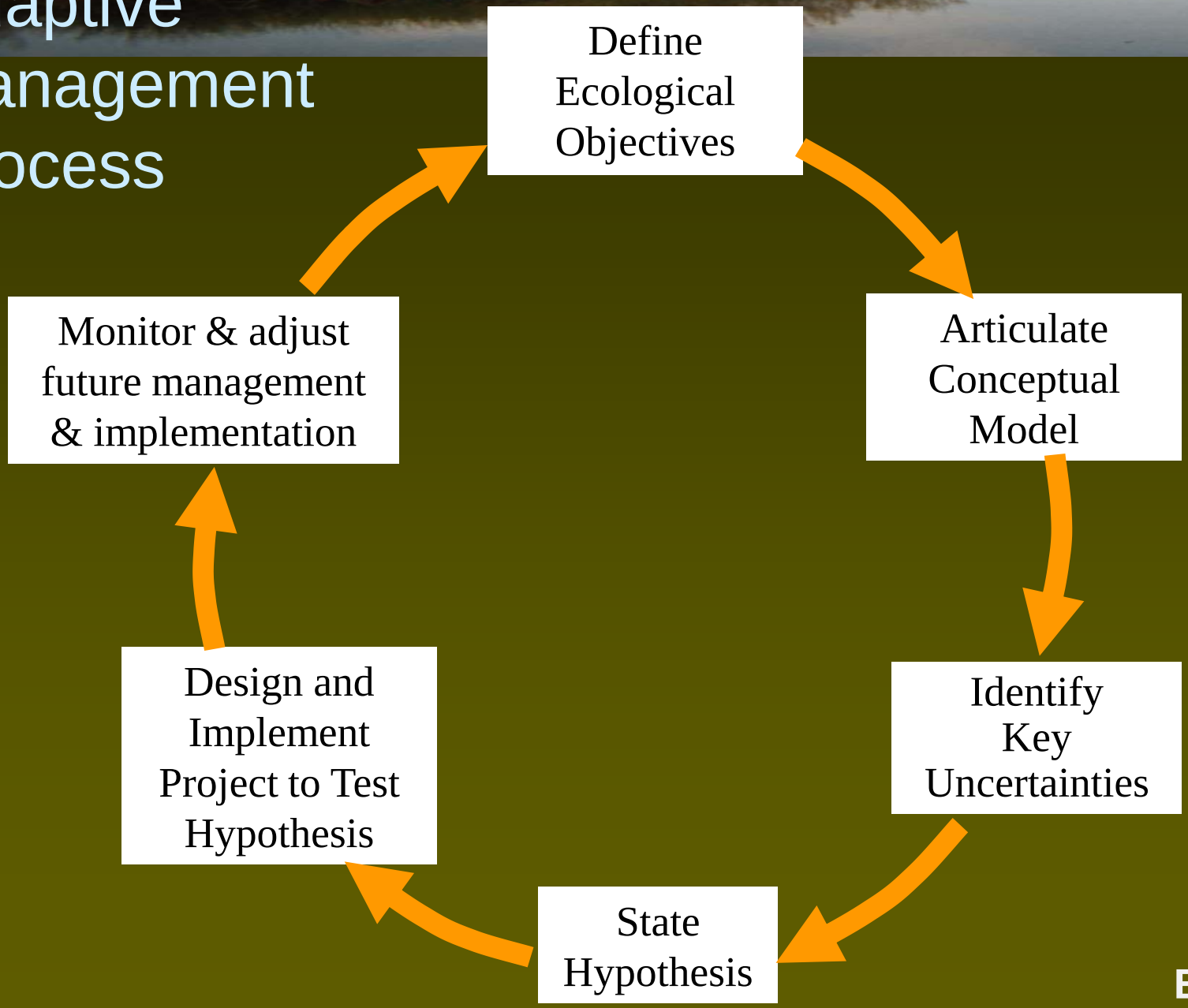
Adaptive Management Process



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Ecological Objectives

1. Reestablish hydrologic, geomorphic, and ecological processes for long-term sustainability.
2. Restore wetland and upland habitats.
3. Contribute to the recovery of endangered and other at-risk species and native biotic communities.
4. Minimize establishment of non-native invasive species.

- Avoid impacts to drinking water quality
- Minimize the potential for mercury methylation

Target Species

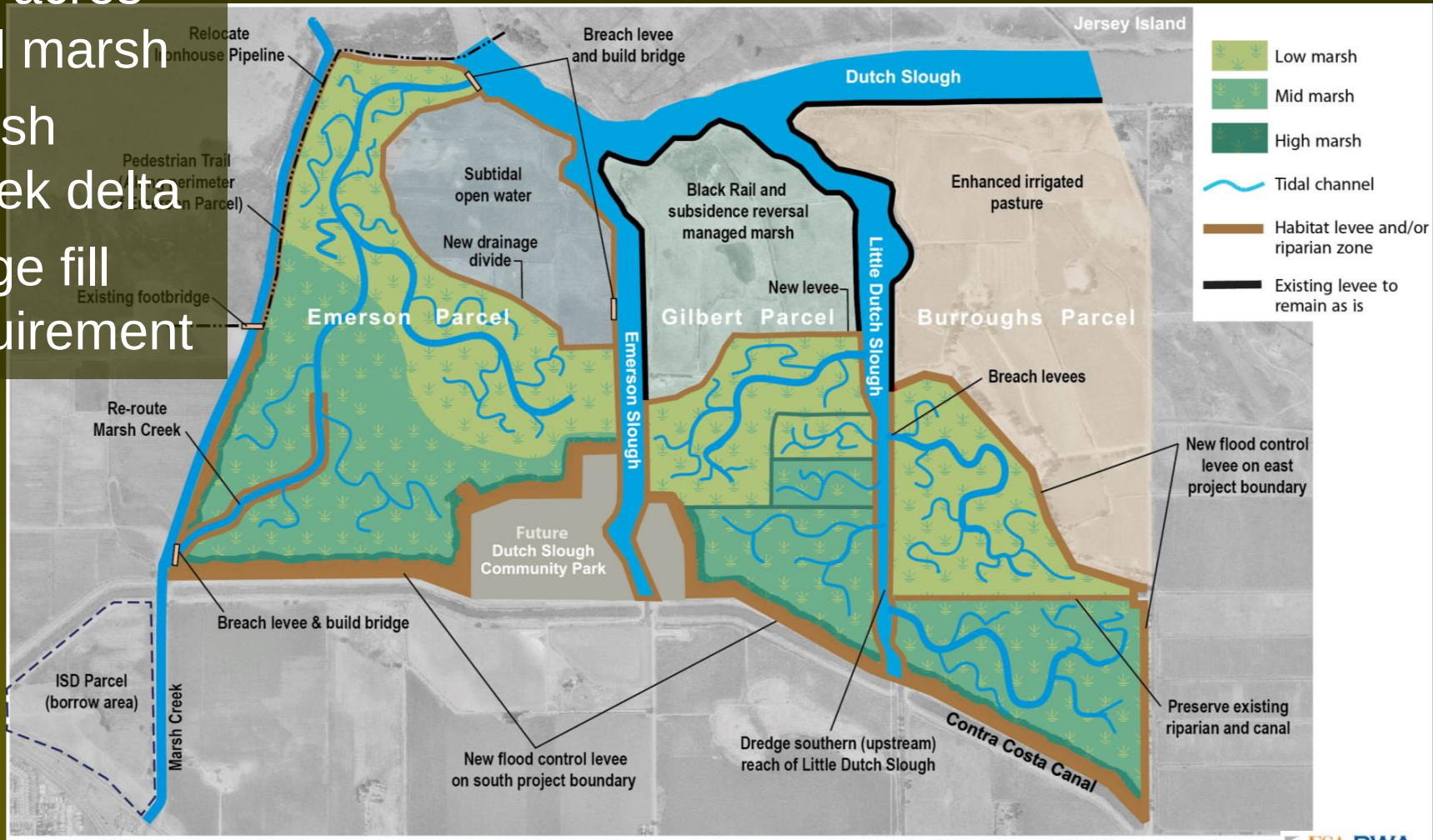
- Chinook Salmon Juvenile Rearing

- Splittail Spawning and Rearing

- Delta smelt spawning (if possible)

Restoration Plan

- 570 acres tidal marsh
- Marsh Creek delta
- Large fill requirement

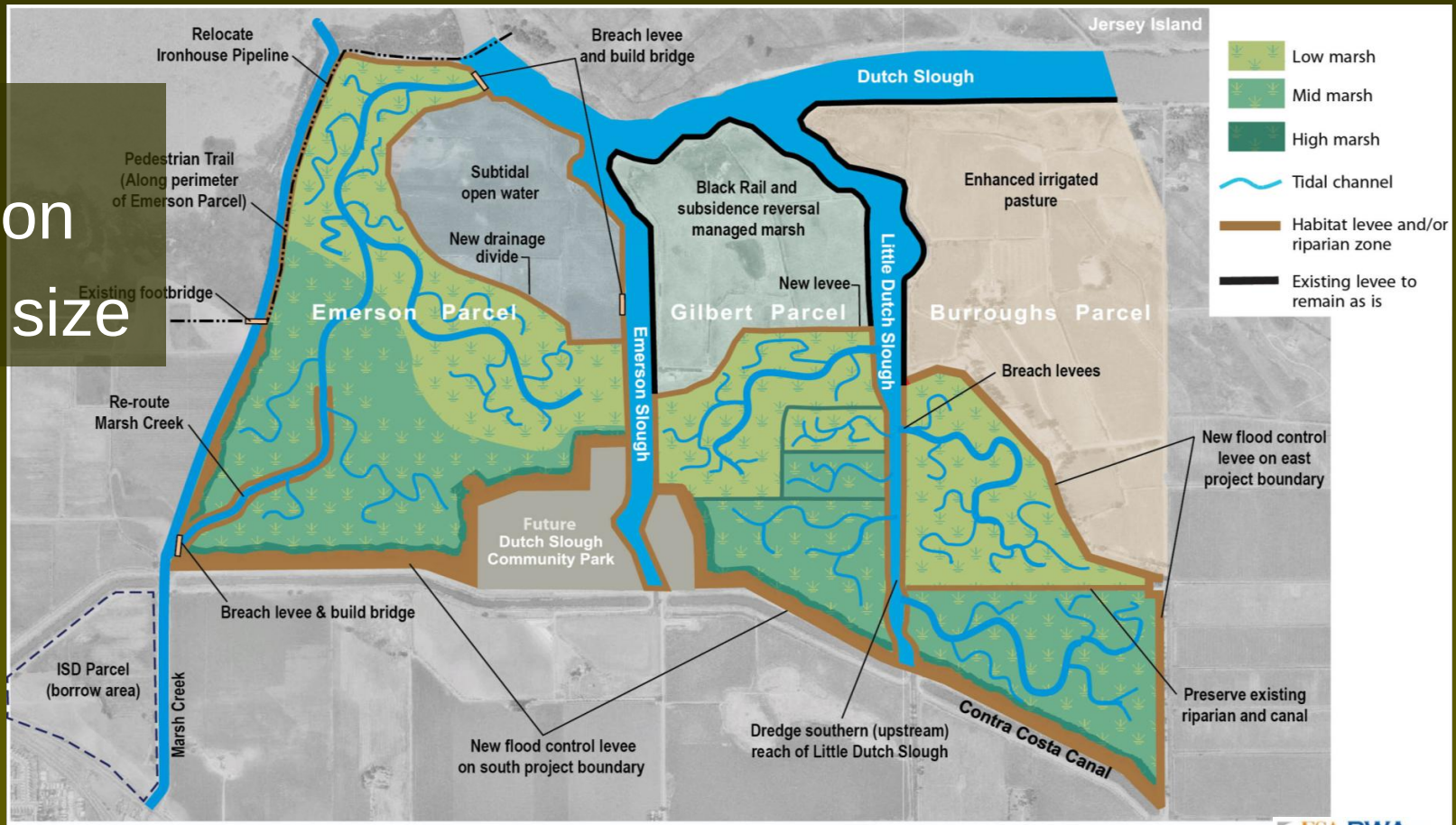


Adaptive Management Questions

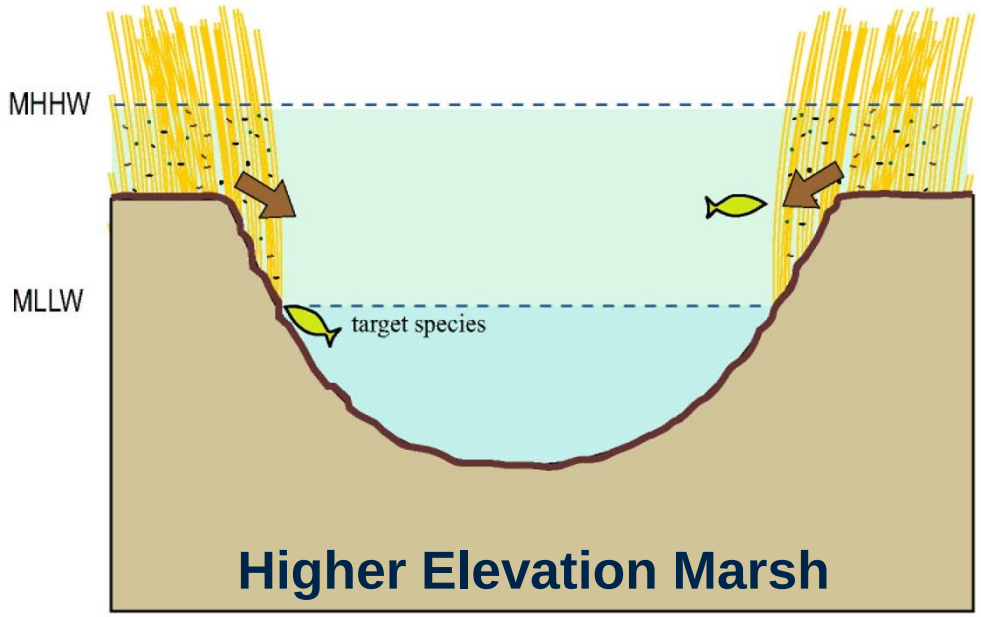
1. Which parameters are both most uncertain and most important to test? Which are most likely to affect ecosystem benefits and management decisions related to cost and selection of future restoration sites?
2. How important is experimental replication? How many experiments can we realistically include?
3. Which parameters require testing at a large scale? Which can be tested on a smaller scale?
4. How do we balance trade-offs between learning and restoration?

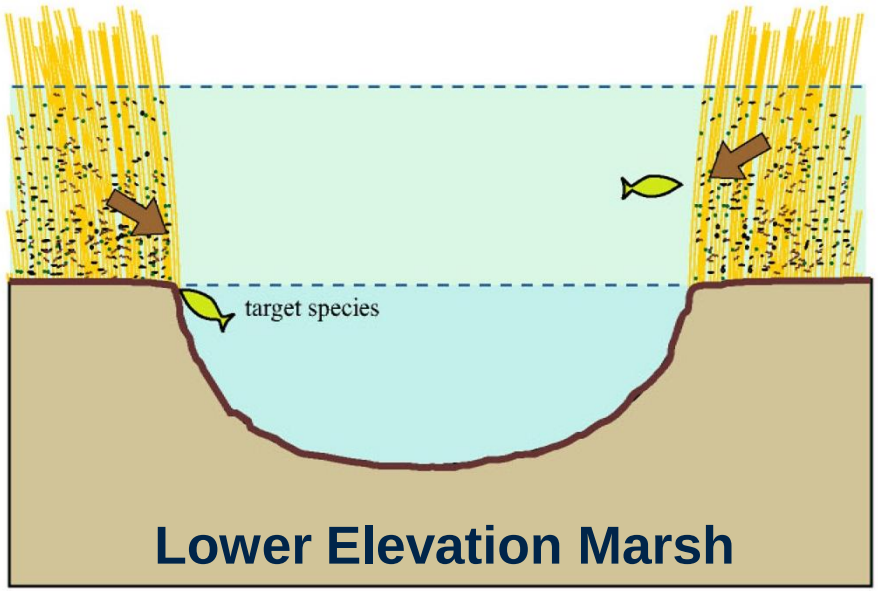
1. Which parameters are both most uncertain and most important to test? Which are most likely to affect ecosystem benefits and management decisions related to cost and selection of future restoration sites?

- Marsh elevation
- Marsh size

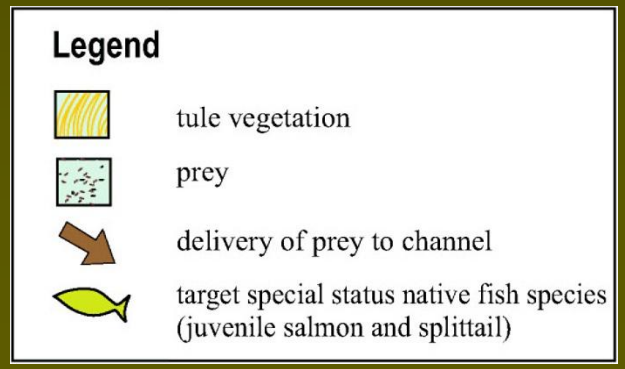


Marsh Elevation





- Management decisions
- Ecosystem benefits



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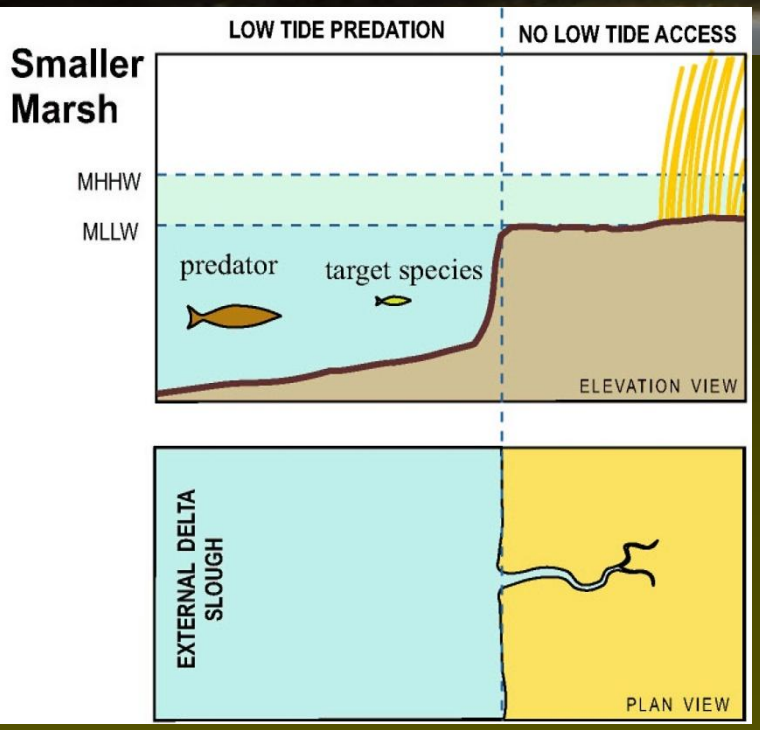
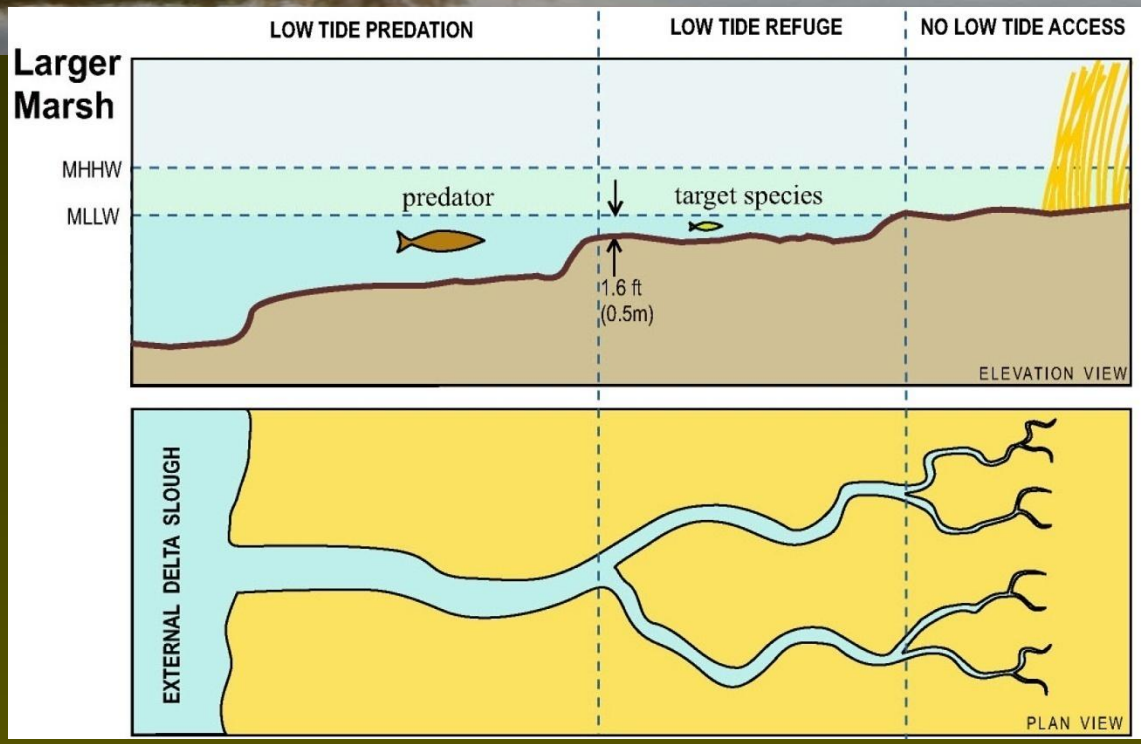
Marsh Size





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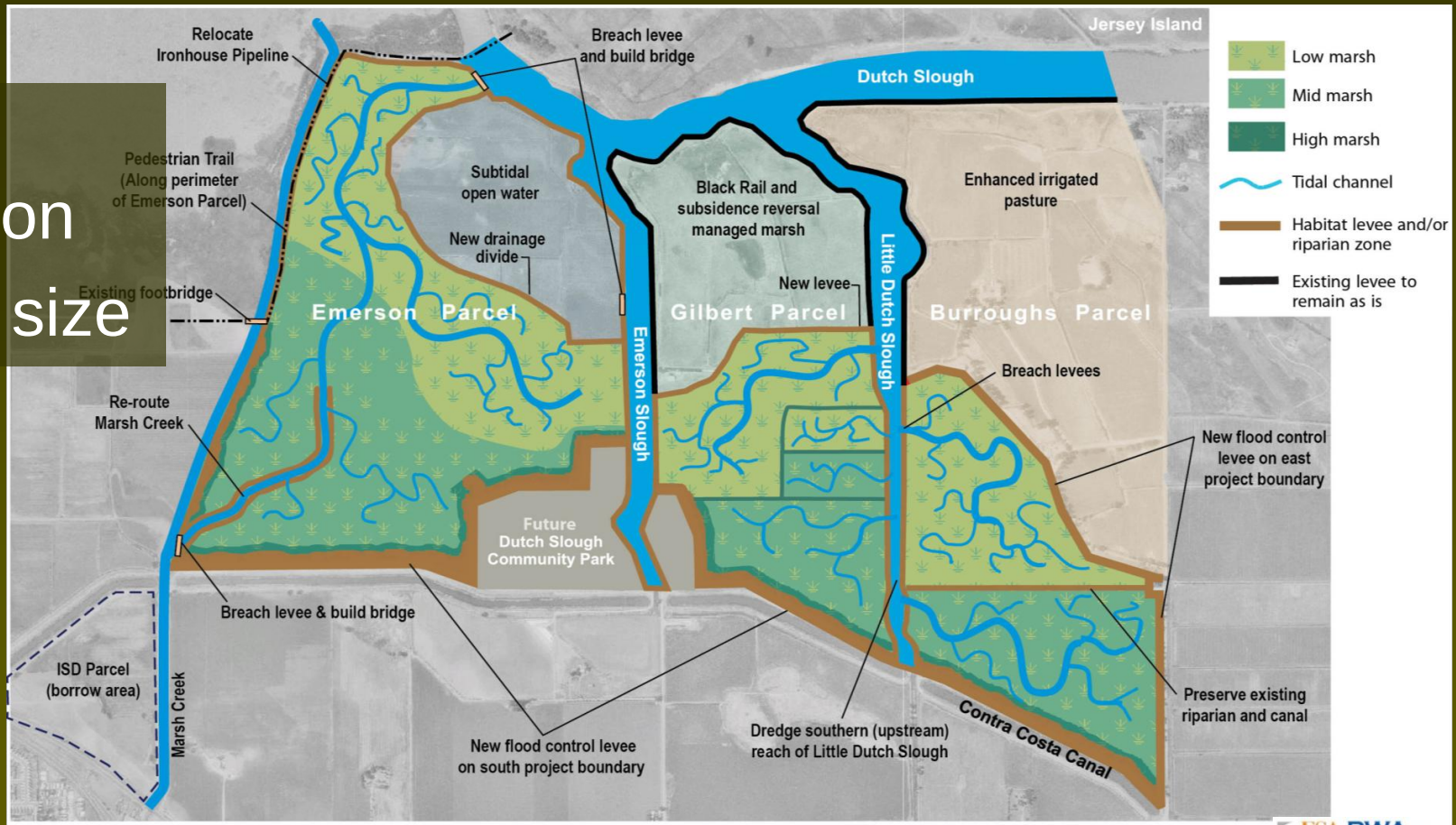

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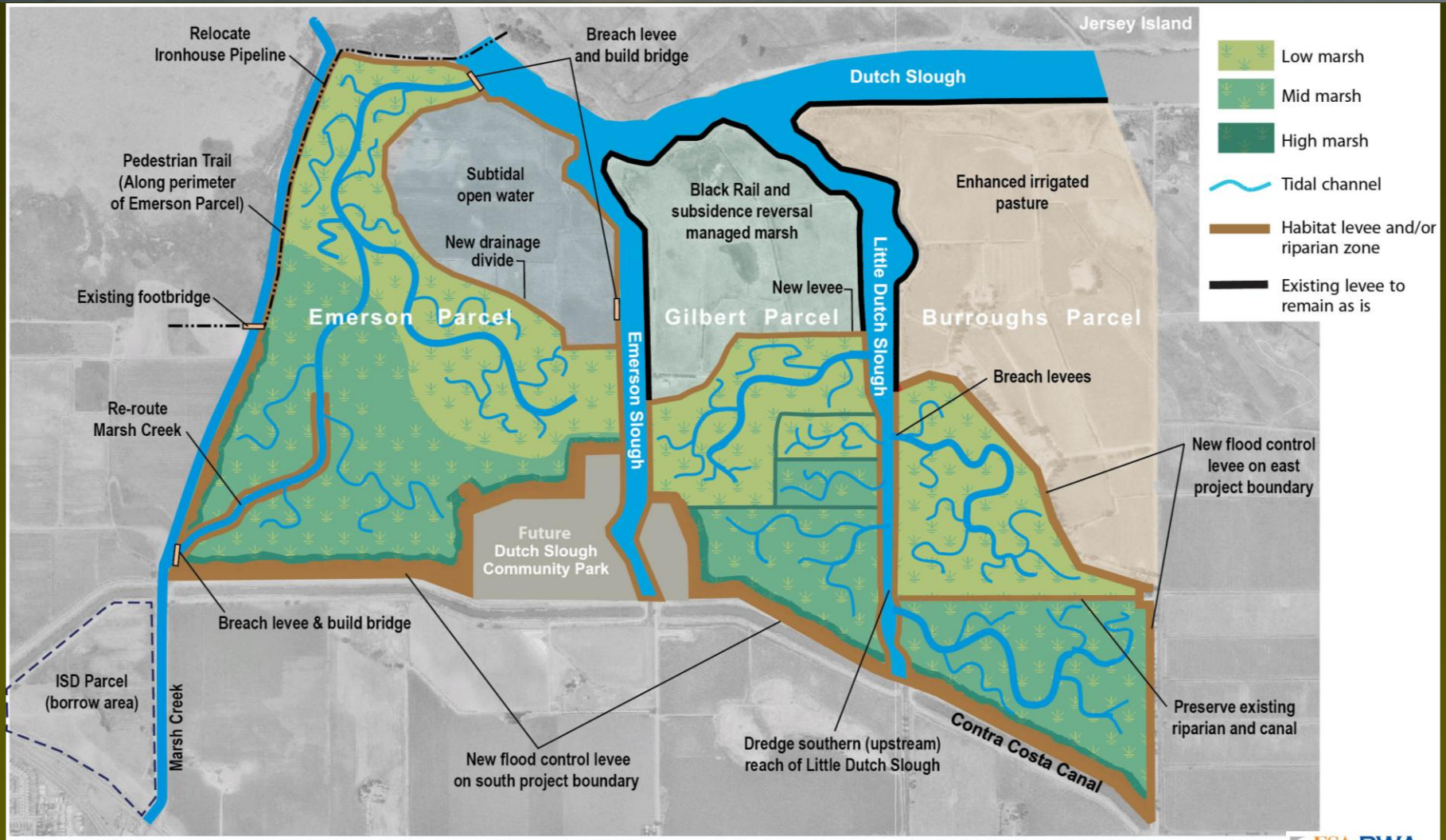


3. Which parameters require testing at a large scale? Which can be tested on a smaller scale?

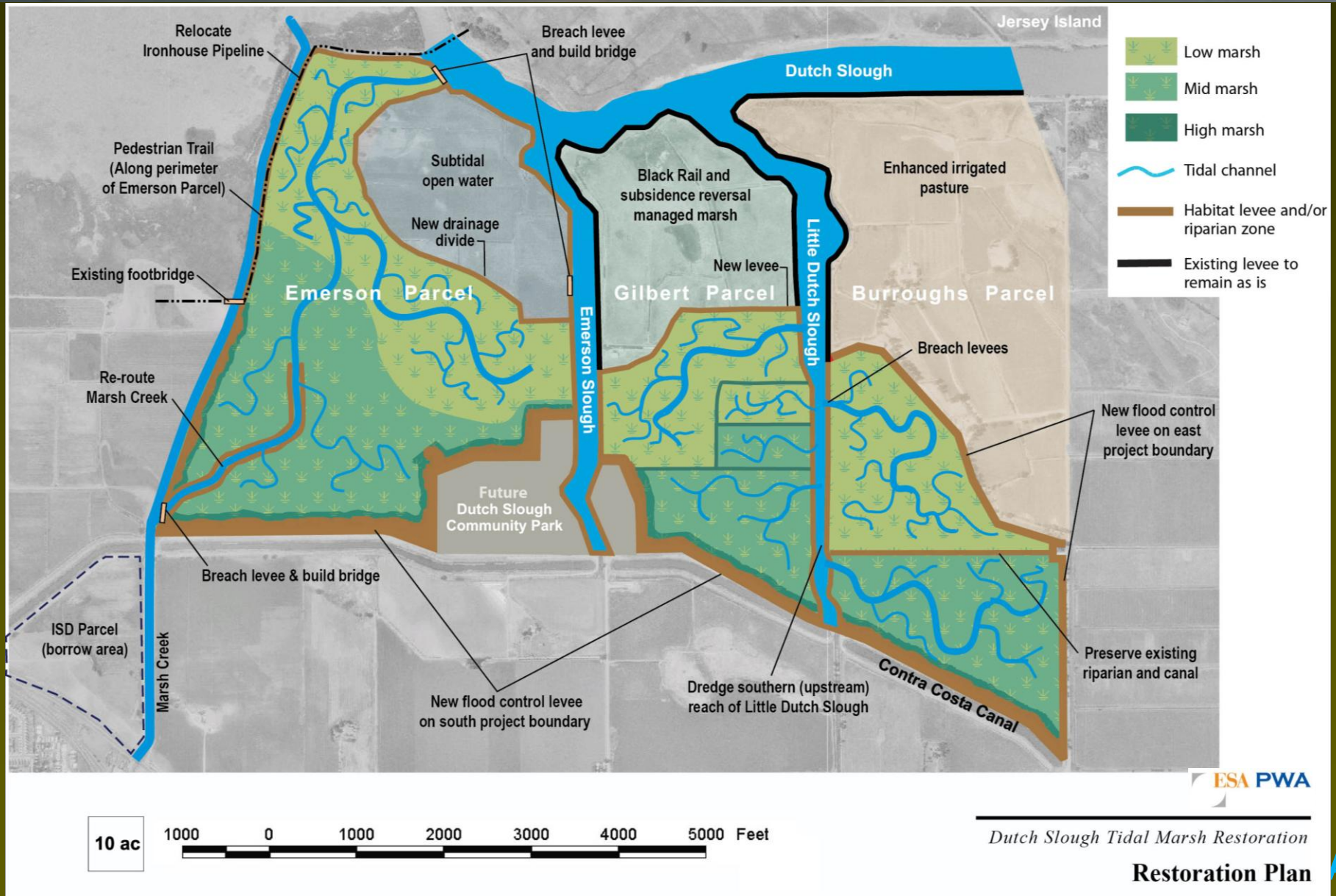
Large-scale

- Tidal marshplain elevation
- Marsh scale

Small-scale (<1-2 acres)

- DOC production
- Mercury methylation and bioaccumulation
- Techniques for minimizing invasive SAV
- Techniques for subsidence reversal
- Extent of channel formation through tidal scour

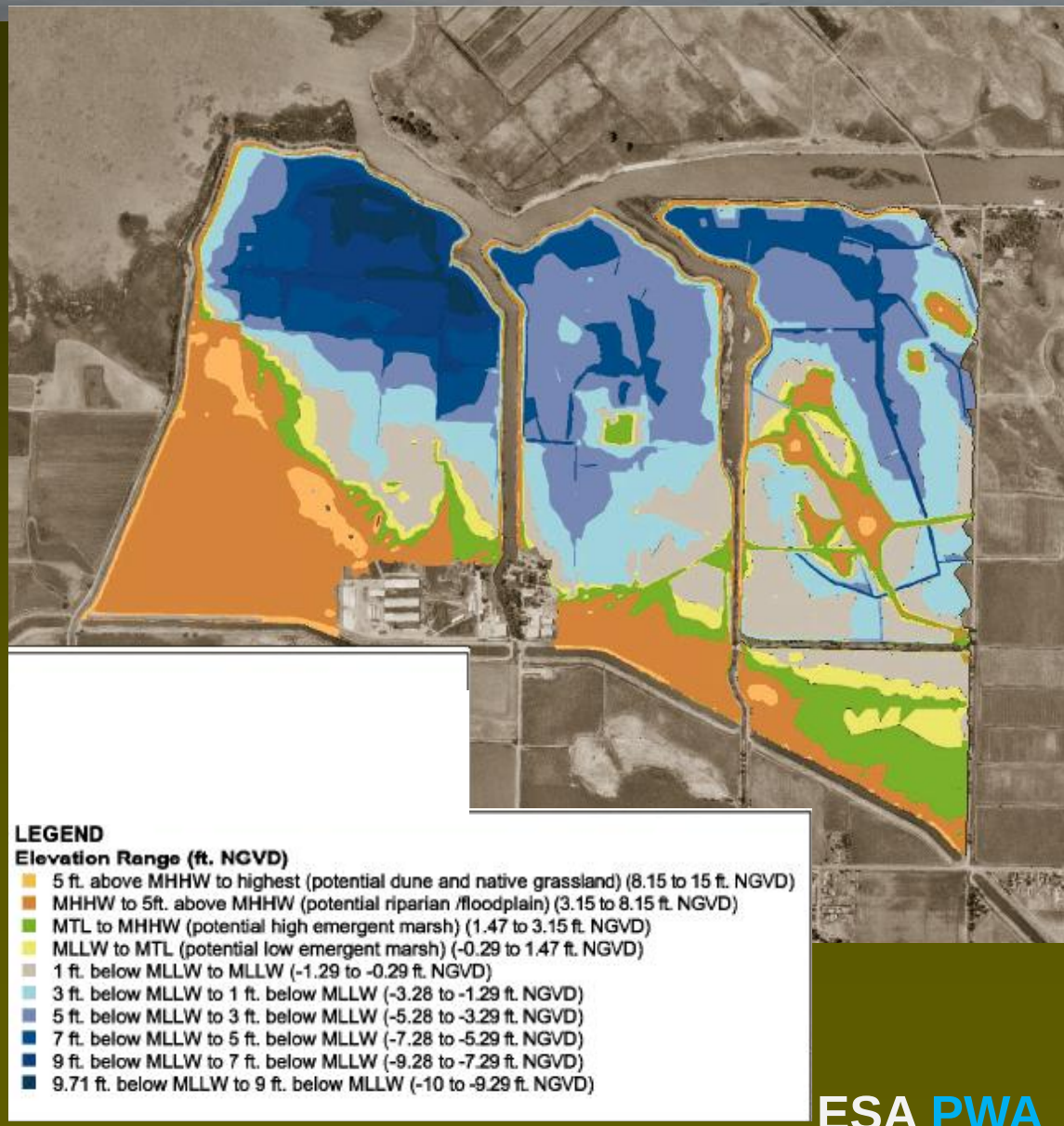
4. How do we balance trade-offs between learning and restoration?



Making Adaptive Management Real

How do we address sea level rise?

- Grade to maximize wetland creation
- Trade-off: less space for wetlands to move in response to sea level rise
- SLR acceleration from current rates of ~2 mm/yr to ~15 mm/yr by Year 50
- Limited observations of accretion of 9-18 mm/yr in the Delta (BREACH)
  - over decades
- Sustainability
  - Mid-marsh resilient
  - Low marsh may see conversion to open water



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