Historical Ecology and Landscape-Scale Restoration

Application to the McCormack-Williamson Tract
Long term opportunities

Short term opportunities

Site scale restoration

Landscape scale restoration

SIZE

TIME
Role of Historical ecology

- Historical ecology is one way to get to that landscape-scale vision
- Encourages landscape understanding of underlying physical and ecological drivers
- Not recreating the past
- Looks for patterns, connectivity, gradients, transitions
Outline

1. What is landscape scale restoration from the lense of historical ecology?
2. Using historical ecology to enhance landscape scale restoration
3. Application of these principles to the McCormack-Williamson Tract
4. What could landscape scale restoration look like?
Historical Habitats c. 1850
“The lake was situated far out in an impenetrable tule swamp of immense extent...it was a sort of "sanctuary" to which birds came...”

“nothing but tule, without a tree under which the navigator may find shade”

“In a grass-covered area between the forest and swamp”

“lagoons...whose waters flowed back swiftly into the Sacramento with the ebbing tides”

“the river was filled with drift wood, forming a raft”
Delta Historical Ecology

Key findings:

- The Delta had many deltas
  - Multiple landscapes
  - Range of habitat types
Delta Historical Ecology

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Delta Historical Ecology

Key Findings

- Made up of many gradients
  - Connectivity along gradients
  - Temporal variability
Case study: McCormack-Williamson Tract

- Opportunities
- Large restoration opportunity
- Variable topography
- Connection to uplands and tides
- Remnant historical features
Case study: McCormack-Williamson Tract

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  - Short term constraints
    - Flooding bottleneck
  - Long term constraints
    - Radio tower, access
    - Land ownership
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MWT
Translating historical ecology to landscape scale restoration

1) It is important to know how we got here:

- How the formation of the tract underlies “constraints”

- What are the physical drivers of this landscape?

  - Transition between tidal/non-tidal, transition to upland habitat types etc.

2) How do these drivers influence restoration potential?
Topographic Variability

Legend
Elevation (meters)

- <0.5
- 0.5-1
- 1-1.5
- 1.5-2
- 2-2.5
- 2.5-3
- 3-5
- 5-10

Natural levee
Lake/low spot
MWT
Tyler Island
Staten Island
Tidal influence and indicators
1930s elevation data from Boyd 1930
1930s elevation data from Boyd 1930!
Vegetation patterns

Gibbes 1850
Vegetation patterns

Debris Commission 1914
Vegetation patterns
What can historical ecology tell us about a vision for landscape scale restoration?

It is important to know how we got here!

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Historical area (km²)</th>
<th>Current area (km²)</th>
<th>% of historical</th>
<th>% of current MWT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riparian Forest/Natural Levee</td>
<td>0.96</td>
<td>0.68</td>
<td>13.83</td>
<td>9.91 (distributed around edge)</td>
</tr>
<tr>
<td>Marsh plain</td>
<td>5.98</td>
<td>0.12</td>
<td>86.17</td>
<td>1.72</td>
</tr>
</tbody>
</table>
But what if?
This is not what the landscape looked like in 1850.
Long term opportunities

- Enhance lateral and longitudinal connectivity
- Acquire land between MWT and Cosumnes Preserve
- Acquire Dead Horse Island
- Enhance lateral and longitudinal connectivity
- Acquire Dead Horse Island
- Lake reconnection
- 35 year lease on radio tower

Short term opportunities

- Degrade levees, tidal channels
- MWT

Site scale restoration

Landscape scale restoration
Thank you. Questions?

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Thanks to funder:

Other SFEI-ASC talks on Delta Historical Ecology and Delta Landscapes:

Alison Whipple: “Building a Landscape Perspective for Ecosystem Planning: Lessons from Historical Ecology” Wednesday afternoon October 17

Robin Grossinger and Letitia Grenier: “Envisioning a Reconciled Delta Based on Empirical Data from Healthy Landscapes” Wednesday afternoon October 17

Poster: “Developing tools for Landscape Scale Restoration in the Delta”