Habitat Restoration in the Research Reserve

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Advancing Restoration Science

LIST OF RESERVES

Great Lakes
1. Lake Superior, Wisconsin
2. Chi  WOMEN Creek, OhI

Northeast
3. Wells, Maine
4. Great Bay, New Hampshire
5. Wauquid Bay, Massachusetts
6. Narragansett Bay, Rhode Island

Mid-Atlantic
7. Hudson River, New York
8. Maurice River, New Jersey
9. Delaware
10. Chesapeake Bay, Maryland
11. Chesapeake Bay, Virginia

Southwest
12. North Carolina
13. North Inlet-Winyah Bay, South Carolina
14. ACE Basin, South Carolina
15. Sapelo Island, Georgia
16. Guana Estero de Matanzas, Florida

Gulf of Mexico
17. Bonner Bay, Florida
18. Apalachicola, Florida
19. Weeks Bay, Alabama
20. Grand Bay, Mississippi
21. Mission-Aransas, Texas

West
22. Tijuana River, California
23. Elders Slough, California
24. San Francisco Bay, California
25. South Slough, Oregon
27. Kachemak Bay, Alaska

Pacific
28. Hawai‘i, Hawai‘i

Caribbean
29. Jolene Bay, Puerto Rico
Side Channel Restoration

Stockport Flats

## The Hudson River Estuary Habitat Restoration Plan

<table>
<thead>
<tr>
<th>Restoration Actions</th>
<th>Priority Habitats for Restoration</th>
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<tbody>
<tr>
<td>Protect and conserve existing estuary habitats</td>
<td>Intertidal Habitats</td>
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<tr>
<td></td>
<td>X</td>
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<tr>
<td>Restore side channels</td>
<td>X</td>
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<tr>
<td>Promote and implement construction of fish passage (FP) structures, dam removal (DR) and culvert right-sizing &amp; placement (CRS)</td>
<td>DR, CRS</td>
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<tr>
<td>Promote and implement use of ecologically enhanced shoreline treatments</td>
<td>X</td>
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<tr>
<td>Implement programs to control invasive plant species</td>
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Historic Losses of Habitat

- River channel straightened and deepened
- Loss of >4,000 acres of shallow water and intertidal habitats
- Near complete elimination of side channels in upper third of estuary
Stockport Flats
Design

- Intertidal benches
- Deep pools
- Alcoves
- Rootwads

Informed by reference site
Side Channel Construction
Channel completed in 2017

- ~ 1,200’ L x 100’ W
- ~ -2’ MLLW
Monitoring

- Current velocity
- Shoreline & channel morphology
- Sediment characteristics
- Water quality
- Intertidal plant community
- Benthic invertebrate community
- Fish community
Information Gaps

• Abundance & condition of larval fishes
• SAV habitat model
Oyster Habitat Restoration

Tappan Zee
Tappan Zee Oysters

Restoration in low salinity waters

- High annual recruitment
- Low disease pressure
- Potential for high mortality during heavy rainfall events
- Low growth rate
Design

- Two substrate types
- Array of clusters
- Three sites
Reef Construction

- Reefs completed in 2018
- 881 reef balls, 422 gabions
- ~ 5 acres
Monitoring

- Oyster size and density
- Non-oyster epibenthos
- Water quality
Information Gaps

- Oyster fecundity & population dynamics
- Use of artificial reefs by fishes, crabs and other nekton
Marsh Edge Protection

Piermont Marsh
Marsh Edge Erosion

- At least 50 feet of marsh has eroded since the 1920’s
- Losing native Spartina fringe
Conceptual Planning 2020

Stabilization Techniques

Examples from marshes in South Carolina
Monitoring

- Shoreline change
- Marsh elevation
- Wave energy
- Vegetation
Information Gaps

- Shoreline dynamics
- Impacts of goose grazing
- Causes and impacts of interior ponding

Photo by Brian DeGasperis, NYSDEC
Thank You

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Questions?

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