Beneficial Use of Dredged Material at Horseshoe Bend: An Engineering With Nature Case Study

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USACE Case Study

Atchafalaya River
Federal Navigation Channel

Environmental Benefits Derived from a Novel Dredged Material Placement Practice at Horseshoe Bend
Problem
Capacity of Bankline Disposal Areas Exhausted

Alternatives
Conversion of Wetland Disposal Areas into Upland Open Water Disposal in Atchafalaya Bay
Mid-River Mounding of Dredged Material
Initial Dredged Material Mounds (2002-2004)
Developed Island with Upriver Feeder Mounds (2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (acres)</th>
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<tbody>
<tr>
<td>2008</td>
<td>66.1</td>
</tr>
<tr>
<td>2009</td>
<td>60.3</td>
</tr>
<tr>
<td>2010</td>
<td>55.9</td>
</tr>
<tr>
<td>2011</td>
<td>71.1</td>
</tr>
<tr>
<td>2012</td>
<td>70.1</td>
</tr>
<tr>
<td>2013</td>
<td>77.0</td>
</tr>
<tr>
<td>2014</td>
<td>87.6</td>
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Quantification of the Environmental Benefit

- Identify and Classify Distinct Habitat Types
- Catalogue Plants and Animals
- Evaluate Soil Horizons
Habitat Classification

Habitat Classification

- Mature Forested & Scrub-Shrub Wetlands
- Young Forested & Scrub-Shrub Wetlands
- Emergent Wetland Transition Zone
- Aquatic Bed Features

Stability
Complexity
Age
Elevation

Photo Area (at Right)
Navigation Benefit

Modeling: Implement LTFATE to characterize study area hydrodynamics
20” Soil Plugs Evaluated for Zonation, Color, Texture & Redox Features
Summary of Environmental Benefits

• Four distinct wetland habitats within a small area (35 ha), supporting a larger than expected variety of plants and animals

• 81 plant species observed on island, compared to 53 plant species noted for natural wetlands along the lower river

• Island performs like a natural wetland, traditional dredge and fill wetlands take 5-10 years to develop

• Soils are active, function to cycle nutrients and sequester carbon
What Happens Next?

• Continue scientific research (hydrology and environment)
• Document positive / negative channel maintenance impacts
• Identify and quantify benefits
• Communicate findings widely (publications, conferences, press releases)
• Seek other applications for this novel placement practice