Mitigation of Open Water Habitats

Great Lakes Dredging Team

Fall Webinar
November 17, 2015
Agenda

► Introduction
► Great Lakes Open Water Mitigation Opportunities & Challenges
► Mitigation Options
► Case Study: Port of Los Angeles
► Case Study: Port of Virginia
► Discussion
13 years experience leading multidisciplinary teams to deliver innovative approaches to assess and solve natural resource and energy management issues

9 years supporting port clients

Specialties include:
- Marine and coastal studies
- Harbor Monitoring Programs
- Mitigation Banking
- Ecosystem restoration
- Total Maximum Daily Loads
- Regulatory negotiation
- Stakeholder management
- Energy Management for Ports

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What We Do
Among the Industries and Markets We Serve
Great Lakes Open Water Mitigation Opportunities & Challenges
Great Lakes Dredging Team
Evaluation of Beneficial Reuse Options

- Dredging produces 2-3M cu yd of sediment
- 30-50% placement in open waters
- Pursuing multiple beneficial reuse options
  - Beach Nourishment
  - Land Creation
  - Habitat Restoration
  - Fisheries Enhancement
Aquatic Placement for Habitat Restoration & Enhancement

Creation of bottom relief to improve the ecological functions and habitat

► Habitat revegetation
► Raise bottom elevations and capping to create:
  • Clam flats
  • Oyster beds
  • Mussel beds
► Artificial reef creation for habitat
Aquatic Placement for Habitat Restoration & Enhancement – Sediment Handling Process

- Study and design
- Tiered biological/chemical investigations
- Treatment options
- Material transport
- Material placement & construction
- Planting
- Development of success criteria
- Ongoing monitoring
Great Lakes Open Water Mitigation Challenges

- Unclear Regulatory Process
- Timeframe for Receiving Credits
- Lack of Existing Open Water Mitigation Banks
- Inability to Use Other Types of Mitigation for Open Water Impacts
Mitigation Options
2008 USACE/USEPA Mitigation Rule

- CWA Section 404
- Compensatory Mitigation
- One set of regulations for compensatory mitigation
  - USACE 33 CFR 332.8(d)(2)
  - USEPA 40 CFR 230.98(d)(2)
- Hierarchy for Mitigation
  - Mitigation Bank
  - In Lieu Fee Program
  - Permittee Responsible Mitigation
President Memorandum – November 3, 2015

Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment

- Encourages private investment in restoration and public-private partnerships
- Foster opportunities for businesses or non-profit organizations
- Directs agencies to look for and use available advance compensation that has achieved its intended environmental outcomes
  - Mitigation Banks
  - Applicability to Natural Resource Damages
- Directs federal agencies to provide consistent guidance documents

Mitigation Considerations

- Individual Permit
- Regional General Permit
- Mitigation Bank
  - Purchase Credits
  - Single User
  - Multi-user
- Agency Restoration Projects that Require Funding
  - Construction
  - Preservation
Mitigation Banking Process

1. Market Evaluation & Site Selection
2. Entitlement
3. Construction
4. Maintenance & Monitoring
5. Long Term Management

Credit Release Schedule
- 15% (bank approval)
- 25% (as-builts)
- 60% (over 5 years)
Cost-Benefit Analysis: Site Selection Considerations

- **Location of mitigation options**
  - Within the watershed
  - Same water body
  - Coastal region

- **Restoration potential**
  - Acres available
  - Historic use/condition
  - Restoration lift

- **Availability of site for mitigation/restoration efforts**
  - Property rights
  - Stakeholder interests
Cost-Benefit Analysis: Site Selection Considerations

- **Difficulty required to navigate the planning & permitting process**
  - State and federal ESAs
  - NEPA
  - Potential litigation

- **Credit Potential**
  - Anticipated timing for credit realization
  - Types and Quality of credits
    - Habitat equivalency analysis of ecosystem services/functions of habitat lost/impacted relative to services/functions of restored habitat
  - Anticipated cost per credit / Market potential for Credits
Case Study – Port of Los Angeles Umbrella Mitigation Bank
Port of Los Angeles
Umbrella Mitigation Bank: Lessons Learned

Modified from Original Presentation by
Kat Prickett
Port of Los Angeles
Port of Los Angeles

- 7,500 acres of land and water
- 3,200 acres of US Waters
- 43 miles of waterfront
- 27 passenger and cargo terminals
- 7.9 million TEUs in 2013
Port of Los Angeles

- Over 900 acres of new land created since 1985
- Established 4 mitigation Banks
  - POLA
    - Inner Harbor (1984)
    - Outer Harbor Banks (1997)
  - Outside POLA
    - Batiquitos Lagoon
    - Bolsa Chica Wetland
Meeting Future Mitigation Needs

- Port Development/Fill Projects
- Scarce Coastal Mitigation Opportunities
- Establish Bank Enabling Instrument
- MOU to Streamline Process
- Broad Service Area
Port of Los Angeles Umbrella Mitigation Banking Instrument

Service Area
Southern California Bight

Impact Area
Port of Los Angeles

Habitats
- Harbor Habitat
- Wetlands
- Eelgrass
- Reefs

Technical Guidance
- Mitigation site selection factors
- Use of credits
- Roles and responsibilities
- Functional assessment methods

Southern California Bight: Potential location of mitigation bank sites
POLA Lessons Learned

- UMBI was more trouble than it was worth
- Focusing on an MOU
- In-perpetuity vs. Long-term
- Consider Variable Site Restrictions for In-Harbor Mitigation
POLA Lessons Learned Continued

► BEI Template Modification for Public Agencies
► Negotiate the Types of Impacts that Require Mitigation
► Develop Mitigation Bank Handbook
Case Study – Craney Island, Virginia
Habitat Equivalency Assessment
Habitat Equivalency Assessment

- Balance losses & gains of ecosystem services
- Service-to-service approach to restoration scaling
- Avoided controversy of monetary valuation and high cost of contingent valuation
- Can be used for interim and permanent losses
- Does not require the presence of the same habitat
HEA Case Study – Out of Kind Mitigation

Craney Island 580 Acre Land Expansion
Dredged Material Beneficial Use
Loss of Soft Bottom & Water Column Habitat
NRDA HEA Analysis by Charles Peterson (U. of North Carolina)
HEA Case Study - Out of Kind Mitigation

Determination of Lost Ecosystem Services:

- Based on measured densities and literature assessments of production
- Benthic Community Production Loss
  - Up to 34,000 kg/yr
- Zooplankton Production Loss
  - Up to 76,000 kg/yr
- Total Loss of Production
  - Up to 110,000 kg/yr
HEA Case Study - Out of Kind Mitigation

Restoration Options included:

Oyster Reef Creation

Salt Marsh Restoration
Oyster Reef Restoration Scaling

- Estimated Annual Production of 12,000 kg/yr/acre
  - Based on Production : Biomass

- Factored Success Rate of 50%
- Factored Annual Production = 6,000 kg/yr/acre
Salt Marsh Restoration Scaling

- Estimated Annual Primary Production
- Secondary Trophic Transfer to:
  - Insects – 98 kg/yr/acre
  - Detritivores – 130 kg/yr/acre
  - Herbivores – 9 kg/yr/acre
  - 5% Margin of Safety
  - 100% increase for Habitat Structure Effects
- Total Annual Production = 450 kg/yr
Comparison of Restoration Alternatives

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Annual Production</th>
<th>Restoration Acres Needed</th>
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<tbody>
<tr>
<td>Oyster Reef</td>
<td>6000 kg/yr/acre</td>
<td>110,000/6000</td>
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<tr>
<td>Salt Marsh</td>
<td>450 kg/yr/acre</td>
<td>100,000/450</td>
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</tbody>
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Mitigation Included:

- Wetland Restoration
  - Restoring Hydrology
  - Revegetation
- Oyster Reef Creation
- Sediment Remediation
Discussion
CREATE AMAZING.