Towards a National Evaluation of Compensatory Mitigation Sites

II. Results of Pilot Studies
Pilot Studies

- Designed to test study design and evaluate mitigation projects in North Carolina and Ohio
- Both compared results to existing biological assessment data
- Both had readily available electronic data on mitigation sites in the state
- Illustrate modifications that can be made to study design based on local circumstances
Ohio Pilot Study

Great Lakes Basin Evaluation of Compensation Sites
Report

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Ohio Pilot Study

- Limited to Lake Erie Watershed
- 60 wetland mitigation project points (Assessment Areas)
- ILF not used in State; study limited to MB and PRM projects
  - 30 AA points in 18 MB projects
  - 30 AA points in 30 randomly selected PRM projects
  - Target population defined as projects of at least 0.1 ha permitted/approved in 1995 or later
Ohio Pilot Study: Sample Methods

- Methods based on National Wetland Condition Assessment (NWCA)
- Modification to Soils Protocol
  - Sampled to 10-15 cm for chemical analysis
- Success Criteria based Vegetation IBI scores
  - Must meet criteria for “good” ecological condition
VIBI Parameters Measured Include...

- Presence/absence
- % cover herb and shrub stratum
- Stem density and basal area shrub and tree stratum (shrub and forest only)
- Standing biomass (emergent only)
- FQAI and other metrics
Landscape Development Index (LDI)

- Remote assessment of surrounding land-use
- Each land use assigned coefficient based on human activity
- A weighted average of land use intensity

\[ LDI_{\text{total}} = \sum \% L_{ui} \times LDI_i \]

<table>
<thead>
<tr>
<th>Ohio Land Cover Distinctions</th>
<th>LDI coefficient</th>
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<tbody>
<tr>
<td>Forest and open water</td>
<td>0.00</td>
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<tr>
<td>Pasture</td>
<td>1.08</td>
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<tr>
<td>Crop</td>
<td>3.25</td>
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<tr>
<td>Urban/Recreational Open Space</td>
<td>3.57</td>
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<tr>
<td>Residential</td>
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<tr>
<td>Commercial/Industrial/Transportation</td>
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</tbody>
</table>
Standard Assessment Area and Buffer Plot for Ohio Sample Sites
Results: VIBI Scores for natural, MB and PRM sites

Boxplot of VIBI
Results: VIBI Score Distributions for PRM vs MB Projects
North Carolina Pilot Study
North Carolina Pilot Study

- 30 mitigated wetlands across NC
- Included 16 ILF, 8 MB, and 6 PRM sites

**Land use settings:**
- 27 sites in rural watersheds
- 2 adjacent to parking lots
- 1 in residential neighborhood
- Target population defined as projects of at least 0.1 ha permitted between 2002-2006
North Carolina Pilot Study: Sample Methods

- Methods based on National Wetland Condition Assessment (NWCA)
- Also modified the soil protocol
- Success Criteria based on Modified Ohio VIBI scores (Tiered Aquatic Life Uses)
  - VIBI Scores
    - 0 – 29: Low Quality Wetland Habitat
    - 30 - 59: Restorable Quality Wetland Habitat
    - 60 - 75: Wetland Habitat
    - 76 – 100: Superior Quality Wetland Habitat
- Used opportunity to test assessment methods
VIBI Scores for North Carolina Wetlands
VIBI Score Distributions for NC Mitigation Projects

PRM

Number of Sites

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Number</th>
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<tr>
<td>Low Quality</td>
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<td>Restorable</td>
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<td>Wetland Habitat</td>
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<td>Superior Wetland</td>
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MB

Number of Sites

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<th>Habitat Type</th>
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<tr>
<td>Wetland Habitat</td>
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</tr>
<tr>
<td>Superior Wetland</td>
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ILF

Number of Sites

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<th>Number</th>
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<td>Restorable</td>
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<tr>
<td>Wetland Habitat</td>
<td>5</td>
</tr>
<tr>
<td>Superior Wetland</td>
<td>4</td>
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Lessons Learned in Pilot Studies

- The method’s flexibility allows it to be adapted to a range of local conditions and mitigation programs.
- In NC and OH, changes made to the proposed methodology included:
  - Smaller target population led to smaller than recommended sample size (30 vs. 50 sites)
  - Simplification of soil protocol
  - Multiple point in single MB, better represents larger sites
- Benchmarking against existing ambient monitoring data is essential to evaluate performance
Opportunities to Improve Future Studies

- The NWCA data can provide a consistent ‘universal’ data set for evaluating mitigation performance nationwide
  - Includes data from USA-RAM and the VIBI
- Archive the data in a nationally-consistent framework / database
- Invest in creation of state/regional/tribal databases of compensatory mitigation projects
- Adaptive management: use data to develop better performance standards and monitoring protocols
Recommendations for Mitigation Performance Assessment

- Develop a targeted set of questions to focus the assessment of your particular program
- Select sites based on design best suited to answer those questions
- Access NWCA sampling protocols and data
- Map the mitigation sites, banks, and in-lieu fee programs
- Conduct the assessment
## Fennessy Recommendations

<table>
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<th>Cause of Failure</th>
<th>Recommendation</th>
<th>Selected Measures</th>
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| Studies of performance often limited in scope, making comparisons difficult (through time and across regions) | States need consistent methods to evaluate mitigation projects and program performance. | • Adopt standard methodology as proposed  
• Benchmark with NWCA and/or statewide data |
| Many states have incomplete or inaccessible project records that prevents ability to track and assess   | Electronic databases of compensatory mitigation projects are needed  | • Funding needed to gather and organize current and historic data on compensatory mitigation and improving the our ability to track these data into the future  
• Use database to initiate studies of compensatory mitigation using the study design |
| Consistent performance standards lacking, prevents adaptive management and project improvement | Use the data collected to develop better performance standards and monitoring protocols | • Pilot studies can show relationship between performance standards and project success  
• Standards must be ecologically relevant, use existing biological assessment methods (VIBI) |
Thank You!

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