The Use of Rapid Assessment Methods during the National Wetland Condition Assessment

Rick Savage, Virginia Baker, James Graham, and Anthony Scarbraugh

North Carolina Depart of Environment and Natural Resources

Division of Water Quality
Ohio Rapid Assessment Method (ORAM)

- Wetland Rapid Assessment Method
- Assess wetland condition
- Numeric scoring system
- Metrics include:
  - Wetland area
  - Upland buffers and surrounding land use
  - Hydrology
  - Habitat alteration and development
  - Plant communities, interspersion, microtopography
NC Wetland Functional Assessment Team (WFAT)

• Developed by interagency team from 2003 to 2008
  – Federal agencies
    • US Army Corps of Engineers
    • Environmental Protection Agency
    • Federal Highway Administration
    • US Fish and Wildlife Service
NC Wetland Functional Assessment Team (WFAT)

— State agencies
  • NC Department of Transportation (co-chair)
  • NC Division of Coastal Management
  • NC Division of Water Quality (co-chair)
  • NC Ecosystem Enhancement Program
  • NC Natural Heritage Program
  • NC Wildlife Resources Commission

— Consultants
  • Ecoscience, Corp. (Now Atkins)
Background

• Presently, DWQ and Corps regulate stream and wetland fill by length and acres, respectively

• Interest in DENR, DOT and Corps of Engineers administration to regulate based on wetland and stream value (quality)
Progress to date

• NC Wetlands Assessment Method (NC WAM) completed
• Interagency Team met for past six years
  – Developed rapid assessment method
    • “Rapid” method defined as taking no more than 15 minutes per site after training
  – Beta-tested method with Regional staff and others including consultants
  – Final method done April 2008
  – Training for RO and Corps staff begun in fall 2008
What is NC WAM?

General considerations

• High, Medium and Low values – by separate function and overall
• Within wetland type
• Comparisons between wetland type – regulatory agency decision
• Condition – compare to reference site
• Opportunity noted – used as appropriate
Three Main Functions

• Hydrology
• Water Quality
• Habitat
Hydrology

- Surface storage and retention
- Subsurface storage and retention
Water Quality

• Particulate change
• Soluble change
• Pathogen change
• Physical change
• For interstream flat wetlands – NC WAM uses “Pollution Change” instead
Habitat

- Physical structure
- Vegetation composition
- Landscape patch structure
- Uniqueness
Stressors

• Hydrological modifications
• Surface discharge into/out of wetland
• Sub-surface discharge into/out of wetland
• Habitat/Plant Community alteration
• Signs of vegetation stress
Key to Wetland Types

• Identified and described 16 general wetland types with dichotomous key
• Narrative descriptions with soil, plant species, landscape position, etc.
• Correlated with
  – Natural Heritage Types,
  – NC CREWS (Coastal Management) Types, and
  – HGM Types
The 16 General Wetland Types

- Mountain Bogs
- Salt/Brackish Marsh
- Estuarine Woody
- Non-Tidal Freshwater Marsh
- Tidal Freshwater Marsh
- Pine Savannas
- Seeps
- Bottomland Hardwood Forest
- Riverine Swamp Forest
- Headwater Forest
- Floodplain Pool
- Pocosin
- Hardwood Flats
- Pine Flats
- Small Basin Wetlands
- Non-Riverine Swamp Forest
Overall Evaluation Process

• One Field Assessment Form (four pages) with all metrics
• Form completed in field with some office map work
• Evaluate with rating calculator (computer program)
  – Boolean logic completed by Team for each wetland type
  – Systematic combination of each subfunction
• Generates rating of High, Medium or Low for each of up to ten sub-functions, three functions and then one overall rating
Implementation

• Will use NC WAM for
  – Watershed assessment
  – Wetland monitoring and functional uplift
  – Avoidance and minimization
  – Mitigation
  – Training
Avoidance, minimization and mitigation

• In general, impacts to lower quality wetlands will require less mitigation and be easier to permit.
• Impacts to higher quality wetlands will require more mitigation and be harder to permit.
• Essentially, we will replace functions instead of acres for wetlands.
Differences between NCWAM and ORAM

• NCWAM is a functional assessment method
• ORAM is a condition assessment method
• NCWAM assigns a high, medium, low rating
• ORAM assigns a numeric score
• NCWAM: Hydrology, Water Quality, Habitat
• ORAM: No emphasis on Water Quality, more emphasis buffer, habitat, stressors
Results from the NWCA sites

- NC had 47 sites selected

<table>
<thead>
<tr>
<th>NCWAM type</th>
<th>Number of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottomland Hardwood Forest</td>
<td>4</td>
</tr>
<tr>
<td>Brackish/Salt Marsh</td>
<td>18</td>
</tr>
<tr>
<td>Estuarine Woody</td>
<td>3</td>
</tr>
<tr>
<td>Hardwood Flat</td>
<td>8</td>
</tr>
<tr>
<td>Pine Flat</td>
<td>3</td>
</tr>
<tr>
<td>Pocosin</td>
<td>6</td>
</tr>
<tr>
<td>Riverine Swamp Forest</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>
## Overall Scores

<table>
<thead>
<tr>
<th>NCWAM Score</th>
<th>Number of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>38</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>8</td>
</tr>
<tr>
<td>LOW</td>
<td>1</td>
</tr>
<tr>
<td>total</td>
<td>47</td>
</tr>
<tr>
<td>ORAM</td>
<td>65.8</td>
</tr>
</tbody>
</table>
# Results by NCWAM Wetland Type

<table>
<thead>
<tr>
<th>Wetland Type</th>
<th>NCWQM</th>
<th>N</th>
<th>ORAM</th>
<th>ORAM Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottomland Hardwood Forest</td>
<td>HIGH</td>
<td>1</td>
<td>66.5</td>
<td>73.89</td>
</tr>
<tr>
<td>Bottomland Hardwood Forest</td>
<td>MEDIUM</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brackish/Salt Marsh</td>
<td>HIGH</td>
<td>18</td>
<td>72.9</td>
<td>81.00</td>
</tr>
<tr>
<td>Estuarine Woody</td>
<td>HIGH</td>
<td>3</td>
<td>66</td>
<td>73.33</td>
</tr>
<tr>
<td>Hardwood Flat</td>
<td>HIGH</td>
<td>6</td>
<td>49.6</td>
<td>55.11</td>
</tr>
<tr>
<td>Hardwood Flat</td>
<td>MEDIUM</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pine Flat</td>
<td>LOW</td>
<td>1</td>
<td>46.7</td>
<td>51.89</td>
</tr>
<tr>
<td>Pine Flat</td>
<td>MEDIUM</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pocosin</td>
<td>HIGH</td>
<td>5</td>
<td>65.6</td>
<td>72.89</td>
</tr>
<tr>
<td>Pocosin</td>
<td>MEDIUM</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riverine Swamp Forest</td>
<td>HIGH</td>
<td>5</td>
<td>78.8</td>
<td>87.56</td>
</tr>
<tr>
<td>Overall Mean</td>
<td></td>
<td></td>
<td>65.8</td>
<td>73.11</td>
</tr>
</tbody>
</table>
Summary of Results

• NCWAM seems a little biased toward rating wetland function “high”
• ORAM seems to have a more “normal” distribution for wetland condition
• There is a weak relationship between the two rapid assessments
• Remember, the rapid assessments have different purposes!
• USA-RAM next?
Questions

• Thanks to the EPA for funding
• Contact Rick Savage
  – rick.savage@ncdenr.gov
  – 919-733-5715