Use of Habitat Credit Trading as a Mitigation Tool for Transportation Projects: A Federal Highways Administration Pilot Project in Arkansas

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Mitigation Banking

- Primary Authorities:
  - CWA, RHA, etc

- Mitigation Type:
  - Mandated via “sequencing”

- Objective:
  - Ecosystem Form and Function

- Typical Mitigation Type:
  - Advanced Mitigation
  - On/off-site and In-kind

Habitat Credit Trading (HCT)

- Primary Authorities:
  - Endangered Species Act

- Mitigation Type:
  - One *voluntary* option among others

- Objective:
  - Habitat Conservation of Listed Species

- Typical Compensation Type:
  - Advanced Mitigation
  - Off-site and In-kind
Functional Roles of HCT Programs

- Core habitat protection
- Core habitat buffer
- Establishment of migration corridors
- Source population protection
Habitat Credit Trading Options

- Conservation Banking (CB)
- Recovery Credit System (RCS)
Conservation Banking is...

- a market-based solution to regulation under ESA
  - Private sector participation in conservation
  - Regulated by the public sector
  - New revenue streams for private sector entities

- a tool capable of meeting the advanced off-site compensation option under ESA sequencing

- not expected, nor designed, to reduce development pressures, patterns, or trends

- a potential tool in the de- or down-listing of T&E species; not THE reason for de- or down-listing.
Conservation Banking Examples

- Existing conservation bank types:
  - Privately Sponsored Species Banks
    - Gopher Tortoise (AL)
    - Red - Cockaded Woodpecker (Multiple)
    - Delta Smelt (CA)
    - Salmon (pending, OR)

- What happens when a Federal Action Agency seeks T&E Species Credit acquisition but:
  - no bank currently exists in the project area
  - a bank exists, but has sold out of credits or does not fit agency needs
  - no private entities are interested in developing a bank site within the project area
Recovery Credit System (RCS)

- **What is a Recovery Credit System?**
  - Provides advanced, off-site compensation, on non-federal lands, for projects with a federal nexus
  - Avenue for federal agencies to meet obligations under ESA Sections 7 (a) (1) and 7 (a) (2)

- **Establishing Authorities:**
  - Section 4 (f) of ESA
    - Establishes Recovery Plans for T&E Species
  - ESA Section 7 (a) (1) (87 stat. 884, as amended; 16 U.S.C 1531 et seq)
    - Requires federal agencies to use existing authorities in recovery of listed species via USFWS Consultation
  - Recovery Crediting Guidance (Federal Register 73 [148])
    - Establishes RCS as formal program
RCS Rules and New Concepts

- Intended to facilitate recovery beyond federal boundaries
  - Conservation action must occur on non-federal lands
  - Project must, however, have a federal nexus

- Introduces and Requires “Net Benefit to Recovery”
  \[ \text{Adverse Actions} + \text{Beneficial Actions} = \text{Net Benefit to Recovery} \]
  - Adverse and beneficial actions determined via Recovery Plans

- Introduces “Temporary Credits”
  - Compensation for temporary impacts (e.g., construction landings)
  - Temporary impacts compensated with permanent or temporary benefit
  - Non-permanent easements acceptable
    - Possibly more attractive to some landowners
Unique Flexibility of RCS

- Flexibility to meet unique project demands
  - Credit generation and debiting:
    - Temporary/Permanent Credits, Species Enhancements
  - Credit types beyond habitat:
    - Water Quality, Species Credits, etc.

- Allows credit trading among federal entities

- May ensure credit availability in high demand areas

- May provide credit availability to areas or species underserved by private bank operations

- Allows activities similar to In-Lieu Fee (research, etc.)

- Permits direct payment to private landowners for species recovery purposes
Challenges to RCS

- Limited experience with application
  - Fort Hood, TX

- Purposefully vague guidance

- Appropriate application and definition of Temporary Credits

- Likelihood of “level playing field” debate
  - Conservation Banking vs. In-Lieu Fee
Challenges Facing HCT Programs

- Often target T&E Species with insufficient management information, requiring adaptive management philosophies.

- Multiple projects compensated for at a single location increasing the consequences of success and/or failure

- Monitoring by the scientific community and regulators has been lacking

- Aquatic systems and biota are difficult to address due to life history, habitat ownership, and regulatory responsibility
A Proposed RCS Framework for Freshwater Mussels in Arkansas
Complexities of a Mussel “Bank”
Project Description

• Infrastructure Activity: AR Hwy 18 Widening
  • From 2-lane to 4-lane

• Projected Impacts:
  • Big Lake National Wildlife Refuge
    • 2.7 hectares
    • Vehicle Access patterns
    • Interpretive Trail
  • *Potamilus capax* (Green 1832)
    • ESA Listing in 1976 by USFWS
    • Recovery Plan 1989 (outdated)
      • Preserve existing *P. capax* populations and habitat in the St. Francis Floodway and St. Francis River in Arkansas

• Stream Crossings

• No Conservation Banks exist
Option 1

- Riparian Buffer - 50 acres
- Wetland Restoration - 222 acres
Multi-Agency RCS: Scenario 2

Species Present Multiplier:

Direct Habitat (Riparian): 25%
In-Direct Habitat (Wetland): 15%

Population Mgt. Option:
Low Density:
  Direct: 10%
  In-direct: 5%
Medium Density:
  Direct: 15%
  In-direct: 7.5%
High Density:
  Direct: 20%
  In-direct: 10%

Option 2
- Riparian Buffer - 370 acres
- Wetland Restoration - 3,756 acres
Credit Generation Framework

- No species credits *per se*, rather increased credit generation achieved through management intensity

- **Baseline:**
  - Determine credit generation using conventional methods within region (i.e. Charleston Method)

- **Enhancement 1: Species Presence/Absence**
  - Applied to each habitat type but greater enhancement applied to habitats directly supporting populations

- **Enhancement 2: Population Management (optional)**
  - Applied to each habitat type with greater enhancement applied to habitats directly supporting high densities
## Credit Generation Results

<table>
<thead>
<tr>
<th></th>
<th>Public Mitigation Bank</th>
<th>RCS with Species Occurrence Multiplier</th>
<th>RCS with Species Density Multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scenario 1</td>
<td>Scenario 2</td>
<td>Scenario 1</td>
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<tr>
<td><strong>Base Level Credits</strong></td>
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<tr>
<td>Wetland</td>
<td>821.4</td>
<td>13,264.50</td>
<td>821.4</td>
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<td>Stream</td>
<td>102,336.00</td>
<td>734,013.00</td>
<td>102,336.00</td>
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<td><strong>Occurrence Credits</strong></td>
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<tr>
<td>Wetland (Indirect)</td>
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<tr>
<td>Stream (Direct)</td>
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<td><strong>Density Credits</strong></td>
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<td>Wetland (Indirect)</td>
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<td>Low</td>
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<tr>
<td>High</td>
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<td>Stream (Direct)</td>
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<td><strong>Credits Generated</strong></td>
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<tr>
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<tr>
<td>Stream</td>
<td>102,336.00</td>
<td>734,013.00</td>
<td>127,920.00</td>
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# RCS Establishment Costs

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Scenario 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wetland Total Cost</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Cost/credit</strong></td>
<td>$1,109.42</td>
<td>$964.71</td>
<td>$897.41</td>
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<tr>
<td><strong>Credits/acre</strong></td>
<td>3.7</td>
<td>4.26</td>
<td>4.57</td>
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<tr>
<td><strong>Scenario 2</strong></td>
<td>$1,150.24</td>
<td>$1,000.21</td>
<td>$930.43</td>
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<tr>
<td><strong>Credits/acre</strong></td>
<td>3.53</td>
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<tr>
<td><strong>Stream Total Cost</strong></td>
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<tr>
<td><strong>Cost/credit</strong></td>
<td>$13.89</td>
<td>$12.05</td>
<td>$11.50</td>
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<tr>
<td><strong>Credits/acre</strong></td>
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<td><strong>Credits/acre</strong></td>
<td>1983.82</td>
<td>2479.77</td>
<td>2851.74</td>
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</tbody>
</table>
Debiting process guards against effects to conservation priority areas

Baseline:
- Determine credit generation using conventional methods within region (i.e. Charleston Method)

Enhanced 1: Species Presence/Absence
- Applied to each habitat type but greater compensation required for habitats directly supporting populations

Enhancement 2: Population Management (optional)
- Applied to each habitat type with greater compensation required for habitats directly supporting high densities
## Highway 18 Impact Compensation

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<tr>
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<th>Baseline Compensation (Credits)</th>
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<th>RCS with Species Density Multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Mitigation Bank</td>
<td>![](Wetland: 76.3)</td>
<td>![](Stream: 6,993.00)</td>
<td>![](Wetland: 76.3)</td>
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<tr>
<td>Wetland</td>
<td>76.3</td>
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<td>76.3</td>
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<td>Stream</td>
<td>6,993.00</td>
<td>6,993.00</td>
<td>6,993.00</td>
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<tr>
<td>Total Compensation Credits Needed</td>
<td>![](Wetland: 76.3)</td>
<td>![](Stream: 6,993.00)</td>
<td>![](Wetland: 95.38)</td>
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</tbody>
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# Highway 18 Credit Acquisition Costs

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<tr>
<td>Wetland Cost/Credit</td>
<td>$1,109.42</td>
<td>$1,205.89</td>
<td>$1,200.29</td>
</tr>
<tr>
<td>Stream Cost/Credit</td>
<td>$13.89</td>
<td>$12.05</td>
<td>$11.50</td>
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<td>$11.17</td>
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</table>
The Scenario 1 RCS produced a cost savings of 13-19% over a conventional public mitigation bank, depending on the level of management selected.

The Scenario 2 RCS produced a cost savings of 13-23% over a conventional public mitigation bank, depending on the level of management selected.

Both of these Scenarios meet the “Net Benefit to Recovery” standard via establishment of protected populations and habitat as identified by the species recovery plan.
Flexible, cost effective, and biologically relevant compensation alternative

Encourages fulfillment of ESA Section 7 (a) (1) and exceeds current efforts of Section 7 (a) (2)

Capable of meeting the Conservation Banking and In-Lieu Fee Guidelines, while maintaining cost effectiveness

Consideration of “species” or “biological” credits may become a source of “ecological lift” and influence site selection

Meets streamlining needs with clear expectations and responsibilities.

Agency partnerships may improve programmatic efficiency and biological relevance.
Acknowledgements

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- John Marshall, Oregon Fish and Wildlife Office

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