Missouri River Recovery Program

Current Adaptive Management Activities

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Missouri River Recovery Program

• GOAL: The creation of “a sustainable ecosystem supporting thriving populations of native species while providing for current social and economic values”.
Presentation Overview

1. MRRP Adaptive Management (AM) Strategy (i.e., AM Framework)
2. Emergent Sandbar Habitat AM Plan (least tern and piping plover recovery)
3. Annual AM Report
Missouri River Recovery Program
Adaptive Management Strategy

• A roadmap for decision making to produce the best results with the least uncertainty
• A how-to guide showing how the processes, products, and people involved in the Missouri River Recovery Program will be integrated and the various adaptive management programs will be conducted.
Phase 1: Ongoing Corps of Engineer Actions

- Using staff and experts to frame decision problems
- Develop AM support: analyses, models, monitoring, assessment
- Develop decision process

Phase 2: Long-Term Solution

- Missouri River Ecosystem Restoration Plan and EIS
- From Communication to Collaboration
Long-Term Solution

- Missouri River Ecosystem Restoration Plan and EIS
- From Communication to Collaboration
Emergent Sandbar Habitat Program Roles

Adaptive Management Team

Adaptive Management Plan

Planning

Cooperating For Recovery Team

Assessment Of Program

Stakeholders

Senior Product Delivery Team

ESH Program Manager

ESH Product Delivery Team

Detailed implementation
Decision-Making
Interagency Management Team

Decision

Which Reach?

How many resources to program?

How many / How wide?

Resource constraints and Objectives

Sandbar Complex

Performance Predictions
### Emergent Sandbar Habitat Program Objectives

<table>
<thead>
<tr>
<th>Objective 1:</th>
<th>Meet ESH acreage goals as stated in the Biological Opinion for tern and plover.</th>
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<tbody>
<tr>
<td>Objective 2:</td>
<td>Meet or exceed tern and plover fledge ratios outlined in the Biological Opinion.</td>
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<td>Objective 3:</td>
<td>Increase and subsequent stabilization of tern and plover population abundance.</td>
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<td>Objective 4:</td>
<td>Minimize socioeconomic impacts to stakeholders.</td>
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<td>Objective 5:</td>
<td>Minimize impacts to other sensitive resources (including Outstandingly Remarkable Values, free-flowing condition, and water quality of the Recreational River).</td>
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**ESH Objectives, Performance Metrics and Criteria by 2015 (from Biological Opinion)**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Metric</th>
<th>Criterion</th>
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<tbody>
<tr>
<td>Increase ESH habitat area</td>
<td>Acreage of ESH at the baseline flow</td>
<td>11,888 acres</td>
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<tr>
<td>Positive fledge ratio to support population</td>
<td>3-year average fledge ratio</td>
<td>Tern $\geq 0.94$ Plover $\geq 1.22$</td>
</tr>
<tr>
<td>Increase population size in region</td>
<td>Total population size</td>
<td>Tern $\geq 800$ Plover $\geq 1050$</td>
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Assessment and Decision Making

- Decision makers
- Action implemented
- Findings and Recommendations
- Monitor progress toward goals
- Compare results
- Prediction models
**Example Results from Scenario Modeling**

Consequence Table: *Action scenarios that meet two criteria and authorized purposes (minimize socioeconomic impacts) by 2015 for Piping Plover -*

<table>
<thead>
<tr>
<th>Objective</th>
<th>Scenario 1</th>
<th>Scenario 13</th>
</tr>
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<tbody>
<tr>
<td>Acres of ESH (95% CI)</td>
<td>898 (892, 905)</td>
<td>971 (910, 923)</td>
</tr>
<tr>
<td></td>
<td>(criterion not met)</td>
<td>(criterion not met)</td>
</tr>
<tr>
<td>3-yr avg. fledgling ratio (95% CI)</td>
<td>1.27 (1.17, 1.37)</td>
<td>1.24 (1.15, 1.34)</td>
</tr>
<tr>
<td>Tot. population size (95% CI)</td>
<td>2025 (1872, 2196)</td>
<td>2007 (1855, 2174)</td>
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</table>
Emergent Sandbar Habitat Adaptive Management Timeline

Stakeholders

Missouri River Recovery Program Vision

Implement Actions (scenarios) for each ESH Objective

Monitoring

Data Entry, Modeling & Analysis

CORE TEAM

October

Oct-April

April - Aug

Aug - October

Program Assessment
Cooperating for Recovery Team & Stakeholders

Every 3rd year

Annual
Annual Adaptive Management Report

Objectives:
1. Review current experimental results
2. Analyze monitoring data
3. Forecast outcomes of management scenarios
4. Present recommendations to the interagency management team
Action Recommendations

Preferred Scenario
Continue with conducting all habitat construction in Gavin’s Point reach with flow to target and power peaking.

3 Year Assessment
It is not possible to make a recommendations on next actions until the 2008 monitoring data is analyzed – expected October 2009.
Critical Uncertainties

1. Habitat availability associated with flow rate is highly variable and not easily predicted based on present information – resolving uncertainty requires field validation data and improved knowledge of area-discharge relationships.

2. Amount and rate of loss of ESH area to vegetation and erosion are highly variable and difficult to predict based on present information – resolving this uncertainty requires field validation of the habitat dynamic model and improvement in the process model for habitat.

3. Predictions of fledgling ratio and it’s relationship to population size of plovers is highly uncertain because bird productivity has not been fully evaluated – requires further analysis of existing monitoring data on productivity (fledglings per pair).
Questions?