Missouri River Recovery Program

Photo Credit: NEBRASKAland Magazine/Nebraska Game and Parks Commission
Presentation Summary

• River History

• Missouri River Recovery Program
  – Habitat Creation
  – Hatchery Support
  – Flow Modification
  – Science Program
  – Adaptive Management
  – Public Involvement
River History
Missouri River Recovery Program

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MO
KS
NE
CO
WY
ND
SD
MT
IA

3,768 km long
(2341 miles)

Pick-Sloan Plan
-Flood Control
-Navigation
-Irrigation
-Power Supply
-Water Supply
-Water Quality
-Recreation

Navigation Channel (BSNP)
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Hydrologic Alteration, Sioux City, Iowa (RM 735)

Current Water-Control Plan

Discharge, kcfs

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## Corps of Engineers Structures
### Lower 500 miles of the Missouri River

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of New Dikes</th>
<th>Miles of Revetment</th>
<th>Number of Dike Extensions</th>
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<td>0</td>
<td>5</td>
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<td>1890</td>
<td>3</td>
<td>17</td>
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<td>1900</td>
<td>107</td>
<td>36</td>
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<td>1910</td>
<td>120</td>
<td>39</td>
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<td>1920</td>
<td>241</td>
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<td>1930</td>
<td>681</td>
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<tr>
<td>1940</td>
<td>2,572</td>
<td>328</td>
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<td>1950</td>
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<td>1977</td>
<td>4,745</td>
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</tbody>
</table>
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Suspended Sediment Changes

Meade & Moody 2008
Missouri River Recovery Program

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Meade & Moody 2008
Missouri River Recovery Program

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MO  KS  NE  CO  WY  ND  SD  MT  IA

Great Falls  Yankton  Williston  Kansas City  Boonville  Sioux City  Fort Peck

3,768 km long (2341 miles)

Credit: Wayne Nelson-Stastney
Ecosystem Impacts

- Three million acres of natural habitat altered
- Nonnative fish dominate many reaches
- 51 of 67 native fish species listed as rare or decreasing
- Production of key food sources for native fish reduced by 70%

-National Research Council, 2002
Ecosystem Impacts

• 80% reduction in piping plover habitat
  - 2000 BiOp

• Under current management practices, cottonwood forest will essentially be lost as a significant community on remnant floodplain is less than half a century
  - Galat et al, 2005
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A sustainable ecosystem supporting thriving populations of native species while providing for current social and economic values.
Mission

Implement actions to accomplish Missouri River ecosystem recovery goals in coordination and collaboration with agency partners and stakeholders.

“There are not many rivers, one for each of us, but only this one river, and if we all want to stay here, in some kind of relation to the river, then we have to learn, somehow, to live together.”

Daniel Kemmis
Community and the Politics of Place, 1990.
Key Authorities and Mandates

- **Flood Control Act of 1944**
  - Master Water Control Manual
- **Endangered Species Act**
  - 2003 Amended Biological Opinion
- **WRDA 1986, 1999, 2007**
Key Recovery Elements

• Habitat Creation
  – Shallow Water
  – Emergent Sandbar
  – Floodplain Restoration

• Hatchery Support

• Flow Modification

• Science Program

• Adaptive Management

• Public Involvement
Missouri River Recovery Program

Habitat Creation

GOAL

Provide habitat for native fish and wildlife by restoring natural features and functions.
Habitat Creation

Floodplain Restoration

- Map, evaluate, and restore cottonwood forests – Bald Eagle Habitat
- Create wetlands & reconnect floodplains
- Restore native vegetation
- Restore 32% (166,750 acres) of habitat lost to the BSNP
Floodplain Reconnection

May 11, 2007
Habitat Creation

The **SHALLOW WATER HABITAT PROGRAM**

- Creating 20 - 30 acres per mile of shallow water habitat by 2020
- Restoring river width and diversity
- Restoring chutes, backwaters, and side channels
Habitat Creation

The **SHALLOW WATER HABITAT PROGRAM**

- 2010 acreage goal: 5,870 acres
- 2015 acreage goal: 11,739 acres
- 2020 acreage goal: 19,565 acres
- On target with BiOp through 2007

Replaces approximately 20% of the aquatic habitat lost to the BSNP
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Shallow Water Habitat Construction

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Dredged Backwater
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Revetment Chute
Wolf Creek – RM 480

October 2006

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August 2008
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Tadpole Island
Oct 3, 2006

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Habitat Creation

The EMERGENT SANDBAR HABITAT PROGRAM

- Mechanically building and maintaining sandbars
- Clearing existing sandbars of vegetation
- Continue to use flows within constraints of the Master Manual
- Investigate potential reservoir habitat
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Emergent Sandbar Habitat Construction
Missouri River Recovery Program

Emergent Sandbar Habitat

ESH Site 761.4 – 2006 Nest Locations

- Yellow Boxes – Piping Plovers
- Red Triangles – Least Terns
Emergent Sandbar Habitat

- Yellow Boxes - Piping Plovers
- Red Triangles - Terns
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Hatchery Support

Raising pallid sturgeon in hatcheries and stocking them in the river are temporary solutions that help recovery while habitat is being restored.
Hatchery Support

- Hatchery capacity increased from 6,000 to 60,000 fish in 2008
- Can provide 2,973 one year old fish each year
- Fish stocked in 1993 now used as brood fish
- Stocked fish provide an important tool for evaluating spring pulse and habitat creation actions
- Excess hatchery production used in research and education
Population Monitoring Summary - 2006

- 123,638 fish collected in Upper Basin  
  – 53 individual species  

- 91,713 fish collected in Lower Basin  
  – 97 individual species  

- 222 pallid sturgeon were sampled
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Pallid Sturgeon Populations

Figure 3. Mean annual catch per unit effort (± 2 SE) for wild, unknown, and hatchery reared pallid sturgeon using gill nets from 2003 - 2006, and cumulative annual stocking history (fingerlings counted as yearling equivalents (number of fingerlings released/4)) in the lower basin monitoring area of the Missouri River from 1997 – 2006.
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Pallid Sturgeon Populations

2006 Sampling Season

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GOAL

Implement a more natural flow regime to benefit native fish and wildlife while seeking balance with social, economic, and cultural resources.
Flow Modification

The **SPRING PULSE PROGRAM**

- Stored water is released from Gavins Point Dam during March and May to mimic natural spring river rise

- **Goals:**
  - Evaluate sediment movement
  - Contribute to pallid sturgeon reproduction/recruitment

- Dependent on storage/runoff
GOAL
Ensure that management decisions are based on the best available science.
Science

- Research
- Monitoring
- Evaluation
- Independent review
- Education/outreach
Adaptive Management

• More informed decisions
• Reduces uncertainty
• Improves public involvement
• Provides transparency
Public Involvement

GOAL

Establish collaborative stakeholder processes and educational opportunities to provide insight and recommendations on recovery activities.
Stakeholder Collaboration - Missouri River Resource Implementation Committee (MRRIC)

- 28 Stakeholders, 8 States, 14 Federal Agencies, 18 Tribes = Table for 68
Presentation Summary

• River History

• MRRP Elements
  – Habitat Creation
  – Hatchery Support
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  – Science Program
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Missouri River on America’s Most Endangered Rivers List (top ten rivers listed annually)

1994 - Dams and channelization
1995 - Navigation and agricultural runoff
1996 - Dams, flood control
1997 – Navigation
1998 - Channelization, dams
1999 - Channelization, dams, etc
2000 - Dam operations
2001 - Dam operations
2002 - Dam operations
Extension creates highly complex aquatic habitat. Sandbar formation downstream of extension and secondary channel next to bank.
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Mile 215
Mile 480
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Islands created using excavated material

Mile 459
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Construction Summary
(2000 to 2006)

- 825 Dike Notches (mile 0 to 500)
- 185 Revetment Notches (mile 0 to 500)
- 85 Bank Notches (mile 130 to 481)
- 16 Revetment Chutes (mile 170 to 481)
- 22 Chutes (mile 132 to 750)
- 3 extension / notching projects
- 135 + acres of backwaters (mile 507 to 750)
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Placement Rate


- Water Discharge (cubic feet per second)
- Sediment Discharge (tons / hour)

- Land-Based Equipment
- Either Method
- Dredging Equipment

River Sediment Transport Rate

Maximum Placement Rate

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Existing Conditions Model Example

Legend
- WS crp
- Ground
- Bank Sta
- Ice
- Ground

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Water Resources Development Act of 2007

2003 Biological Opinion

MRRIC

Provide Recommendations

The Corps’ Study of the Missouri River and its Tributaries

The Corps’ Current Missouri River Mitigation and Recovery Plan

Missouri River species recovery work by USFWS and basin agencies

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