Spawning and Associated Movement Patterns of Pallid Sturgeon in the Lower Yellowstone River

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Study Area – RPMA2

335 km Missouri River below Fort Peck Dam
115 km Lower Yellowstone River

Map showing the study area with locations such as Wolf Point, Milk River, Frazer Rapids, Intake diversion dam, and cities such as Culbertson, Sidney, and Helena.
Adult Larval Drift

Juvenile

Embryo Survival

17 dph

Spawning

Headwater Survival

Larval Survival

Larval Drift
Objectives

1) Determine movements of gravid female pallid sturgeon

2) Identify pallid sturgeon spawning reaches and specific sites when possible

3) Determine if pallid sturgeon will spawn with a transmitter

4) Determine spawning periodicity of pallid sturgeon

5) Attempt to collect eggs and larvae from pallid sturgeon in the wild

6) Assist the pallid sturgeon propagation program
Methods – Part 1: Implant two gravid pallid sturgeon

Two gravid females previously used in the propagation program (2004)

With two years of non-spawning migration data

Use similar reaches of Yellowstone River

Tags working well

But…
Telemetry Cont.

Code 114 had not moved since the fall, 2006 – assumed to have died. Code 79’s transmitter was very difficult to detect.

Implant another gravid female – Code 155

<table>
<thead>
<tr>
<th>Total Telemetered Fish</th>
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</thead>
<tbody>
<tr>
<td>2 Gravid Females</td>
</tr>
<tr>
<td>2 Non-gravid females</td>
</tr>
<tr>
<td>11 Males</td>
</tr>
</tbody>
</table>

Attempt to relocate at least once/day.

Recapture later to verify spawning via gonadal biopsy and blood work.
Methods – Part 2: Larval Fish Collections

Larval sample in lower reaches of the river
- paired D-nets fished on the bottom

Larvae picked on-site

Larvae preserved in alcohol and identified in the lab
Chronology of Code 79 and Code 155

At Intake Dam

Recaptured 5-24
Did not spawn

6-24 recaptured
155 - spawned

6-25 recaptured
79 - spawned

6/15 Suspected
Spawn Date - 155

At Intake Dam

Recaptured 5-24
Did not spawn

6-24 recaptured
155 - spawned

6-25 recaptured
79 - spawned

6/15 Suspected
Spawn Date - 155
Movements of the Aggregation

Suspected spawn date 6-15
Based on:

1) Change in movement pattern

2) 155 was part of an aggregation of males
Steroid Analysis of Code 79 and Code 155

<table>
<thead>
<tr>
<th></th>
<th>Code 79</th>
<th>Code 155</th>
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<tbody>
<tr>
<td></td>
<td>4-5-07</td>
<td>6-25-07</td>
</tr>
<tr>
<td>Weight (W)</td>
<td>18 kg</td>
<td>14 kg</td>
</tr>
<tr>
<td></td>
<td>(22 % loss)</td>
<td>(12.5 % loss)</td>
</tr>
<tr>
<td>KT</td>
<td>5.78</td>
<td>ND</td>
</tr>
<tr>
<td>T</td>
<td>44.19</td>
<td>ND</td>
</tr>
<tr>
<td>E2</td>
<td>13.81</td>
<td>ND</td>
</tr>
</tbody>
</table>
Acipenseriform Larvae CPUE

CPUE (larvae/100 m³)

Date

Polyo. – 458  Eggs – 56  Scaph. – 107  Unk. – 9
Summary

- Pallid sturgeon do spawn in the Yellowstone River near Fairview & somewhere above.

- Upstream migration apex is not necessarily the spawn location.
- Rapid, long-distance downstream dispersal after spawning is not characteristic of female pallids in the Yellowstone River.
- It appears pallid sturgeon spawn on the descending limb of the hydrograph.

- Pallid sturgeon will spawn with transmitters implanted in them. Codes 155 and 79 in the wild, code 31 at GPNFH.

- Spawning periodicity of female pallid sturgeon is 2+ years based on three telemetered fish and several PIT tagged fish.
Assist the pallid sturgeon propagation program

- Lead us to good fishing holes
- 3 telemetered males and 1 telemetered female went to hatcheries in 2007.
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