2014 integrated PIT tag database summary of Colorado Pikeminnow and Razorback Sucker in the San Juan River

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Background/Outline

• PIT tag data
  – Stocking program
  – All fish monitoring projects
  – Non-native fish removal
  – PNM Weir
  – Tagging and recapture efforts outside SJRIP
  – Remote antenna data not included in analysis

• Relational MS Access database
  – Colorado Pikeminnow: 56,452 total records
  – Razorback Sucker: 155,962 total records
  – First encounter table (STOCK and TAG records)
  – Recapture table (CAPTURE records)
  – Queries to produce summaries

• Overview
  – Capture numbers comparison with Adult Monitoring CPUE
  – Colorado Pikeminnow size distribution and post-stockting persistence
  – Untagged Razorback Sucker captures
  – Population trends to investigate progress toward recovery
Number of PIT tagged Colorado Pikeminnow

Year

Number of PIT tagged Colorado pikeminnow

Number of PIT tagged Colorado Pikeminnow and Adult Monitoring CPUE

![Graph showing the number of PIT tagged Colorado pikeminnow and adult monitoring CPUE over the years from 2003 to 2014.](image-url)
Colorado Pikeminnow post-stocking persistence

![Graph showing the number of Colorado Pikeminnow post-stocking.]
Colorado Pikeminnow abundance

- High variance around estimates
  - Limited recaptures
  - Sparse encounter histories
- Post-hoc analysis and violation of model assumptions limits analysis
- Estimates provide population status without additional field effort
- Dedicated field effort?
  - More appropriate model assumptions
  - Likely poor precision due to limited recaptures
Number of PIT tagged Razorback Sucker

![Graph showing number of PIT tagged razorback sucker from 2000 to 2014. The y-axis represents the number of PIT tagged razorback sucker, ranging from 0 to 2000. The x-axis represents the years from 2000 to 2014. The graph shows a gradual increase in the number of PIT tagged razorback sucker from 2000 to 2011, with a significant peak in 2012 and a decline in 2013 and 2014.](image-url)
Number of PIT tagged Razorback Sucker and Adult Monitoring CPUE
## Capture of untagged Razorback Sucker

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>with PIT tags (STOCK)</th>
<th>with PIT tags (TAG)</th>
<th>without PIT tags</th>
<th>Percent without PIT tags</th>
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<tbody>
<tr>
<td>2004</td>
<td>415</td>
<td>381</td>
<td>0</td>
<td>34</td>
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<td>2005</td>
<td>343</td>
<td>305</td>
<td>4</td>
<td>34</td>
<td>9.9</td>
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<td>2006</td>
<td>561</td>
<td>340</td>
<td>8</td>
<td>213</td>
<td>38.0</td>
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<td>2007</td>
<td>1105</td>
<td>708</td>
<td>40</td>
<td>357</td>
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<td>2008</td>
<td>605</td>
<td>382</td>
<td>39</td>
<td>184</td>
<td>30.4</td>
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<td>699</td>
<td>440</td>
<td>75</td>
<td>184</td>
<td>26.3</td>
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<td>2010</td>
<td>1117</td>
<td>873</td>
<td>80</td>
<td>164</td>
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<td>2011</td>
<td>1717</td>
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<td>2207</td>
<td>1797</td>
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<td>318</td>
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<tr>
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<td>1878</td>
<td>1617</td>
<td>125</td>
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<td>2014</td>
<td>1464</td>
<td>1256</td>
<td>118</td>
<td>90</td>
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</tbody>
</table>
2014 Untagged Razorback Sucker length frequency histogram

Size classes (mm):
- 0-299
- 300-349
- 350-399
- 400-449
- 450-499
- 500-599
- 600-649

Percent:
- 0
- 10
- 20
- 30
- 40
- 50
- 60

Histogram showing the frequency distribution of size classes.
Razorback Sucker abundance

1-year post-stocking

2-years post-stocking

3-years post-stocking

4-years post-stocking

>=5-years post-stocking
Summary and discussion points

- **Colorado Pikeminnow recaptures**
  - Most are juveniles that only persist few years post-stocking
  - But increasing proportion of adults in recent years

- **Razorback Sucker without PIT tags**
  - Apparent reduction in PIT tag loss
  - More reliable detection of natural recruitment when it occurs

- **Trends in number of PIT tagged individuals and Adult Monitoring CPUE data track**
  - Sensitive to sampling conditions
  - Do not account for detection probability

- **Colorado Pikeminnow and Razorback Sucker abundance**
  - Difficult to determine patterns but increase due to augmentation efforts
  - High variance due to limited within year recaptures, post hoc analysis, and violation of model assumptions
  - Use as interim benchmark for recovery
  - Continue stocking to sustain populations
Thanks to San Juan P.I.s and Biology Committee

Questions?