Juvenile (JUV) and Adult (LTM) Razorback Sucker Research and Monitoring in Lake Mead, Nevada and Arizona

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Summary-LTM

- 10 sonic RZ contacted
  - 127 active contacts
  - 7,224 passive contacts

- 60 total captures; 25 recaps; 86 net-nights
- 2013 aged RZ 7-10 years old
- Population estimated at 597
  - 95% CI: 474-776
Juvenile Razorback Sucker, Lake Mead 2006-2013

TL (mm)  215-350  351-400  401-450  Total
Captured    11   43   35    89
Overview, Objectives-JUV

- Investigate and define recruitment habitat
  - Juvenile RZ movement
  - Associated fish community
  - Habitat characterization
  - Explain variation seen

- Two field efforts:
  - Intensive Community Sampling (ICS) = weekly efforts, 3 months seasonally
  - Additional Habitat Sampling (AHS) = Monthly efforts, 12 months annually
Methods-JUV

• Sonic telemetry
  – 18 individuals (233–295 mm TL)
    • 6 at each location (LB, EB, OA); R-cc

• Fish community sampling
  – Trammel nets, hoop nets, minnow traps, fyke nets, seines
  – Understand fish community associations

• Physicochemical and habitat quantification
  – 5 replicates for each sampling area (per contacted juvenile)
  – Temp (°C), DO (mg/L), conductivity (µS/cm), pH, turbidity (NTU), depth (m)
  – Substrate type (%), cover type (%), algal/detrital presence or absence
Statistical Analyses-JUV

• Canonical correspondence analysis (CCA)
  – Utilizes environmental, seasonal, and site data in conjunction with species abundances to explain ecological relationships

• Principal component analysis (PCA)
  – More specifically describes spatiotemporal differences in juvenile RZ habitat and identifies important environmental gradients

• Analysis of variance (ANOVA)
  – Describe differences between and among samples
Sonic Telemetry-JUV

- 98 active contacts \((n=16)\)
- 1,988 passive contacts \((n=3)\)
Fish Sampling-JUV

• May–July, 2013 (ICS)
• 158 nets/traps set, 687 fish caught
• 4 new, wild Razorback Suckers
  – 521–561 mm TL (aged 7-12 years)
• 683 nonnative fishes, 12 species
  – Mainly Gizzard Shad, small Bluegill
    (very few large predators)

• RZ near mouth of Gypsum Wash and
  along northern shore of Cliffs area
  – No vegetation, silt, 2.3–10.0 m deep
  – 28.1 °C, 10.2 mg/L, 1.5 µS/cm, 8.7 pH,
    40.6 NTU
Physicochemical Quantification-JUV

- May–December (ICS & AHS)
  - 98 habitats described
- Inshore habitat
  - Shallow, silt, IV, algae and detritus
- Offshore habitat
  - Deep, variety of substrate, no veg cover
- Monthly means for all habitat sampled
  - Lakewide sonic fish similarity (i.e., LB, EB, OA)

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<th>Depth (m)</th>
<th>Temp (°C)</th>
<th>DO (mg/L)</th>
<th>Cond (µS/cm)</th>
<th>pH</th>
<th>Turb (NTU)</th>
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Continuing Efforts, Conclusions-JUV

- Run multivariate analyses (CCA and PCA)
- Produce annual report, anticipated spring 2014
- Additional AHS through year
- Additional ICS during fall and winter/spring

- A better understanding of Razorback Sucker recruitment habitat
  - Summer conditions, high temps, areas of potential refuge*
  - Cover in the forms of IV and turbidity appear to be vital
  - Young fish can lead us to other Razorback Sucker
  - More data to come/needed

- Lake Mead may be valuable for future species conservation efforts
  - Recruitment in the face of a suite of non-native fish predators
  - Similarities of use between bays may indicate recruitment is rooted in habitat
Thank You