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Acknowledgements

Lake Mead Workgroup

Southern Nevada Water Authority
Study Sites and Objectives

• Capture all life stages of Razorback Sucker
• Identify spawning areas
• Monitor movement patterns
• Population and survival estimation
• Collected biological data (i.e.: sex ratios, length and weight, age, etc.)
Methods

• Field work:
  – Sonic Telemetry
    – Implant sonic tags and track
      » Trammel netting
        • Non-lethal aging
      » Larval sampling
    » PIT tag scanners

• Office:
  – Data analysis
  – Prepare and age fin rays in laboratory
  – Population and survival estimates
Sonic Telemetry

- Sonic fish are valuable to guide researchers (i.e.: deploying trammel nets, locating larval fish, PIT scanner deployment, etc.)
- 14 unique fish detected ($n=2-2011$, $n=6-2014$ and $n=6-2017$)
  - 44 active contacts
  - 8,745 passive contacts
- Code 3375: Tagged in Echo Bay 2014, moved to CRI in September 2016, back to Echo Bay in December 2016–June 2017
  - However, most sonic fish stay relatively close to their release location
- Two 2011 sonic-tagged Razorback Suckers were heard from as recently as January 2017
Trammel Netting

- 41 Razorback Suckers Captured
- 20 recaptures/21 new wild
  - 12 in Las Vegas Bay (4 juveniles: 301–361 mm TL)
  - 14 in Echo Bay
  - 15 in Virgin River/Muddy River inflow area (1 juvenile: 319 mm TL)
Larval Sampling and Spawning Locations

- **Las Vegas Bay**
  - 120 larvae captured during 740 minutes
  - Spawned adjacent to wash
- **Echo Bay**
  - 275 larvae captured during 1,100 minutes
  - Small area of gravel on southern shore of bay
- **Virgin River/Muddy River inflow area**
  - 7 larvae captured during 1,060 minutes
  - Rocky bars 3 km south of river inflow
• 531 RZs aged in LTM
• 22 aged at 2017 LTM, 6 from CRI
• Recruitment now documented through 2015
Survival and Population Estimates

Annual apparent survival rate estimate (adults ≥ 450 mm TL)
• 22-year time scale (1996–2017)
• 1996–2017 $\varphi = 0.77$ (95% CI: 0.74–0.81)
  • 1996–2016 $\varphi = 0.77$ (0.74–0.81)

Population Estimate
• 3-year time scale (2015–2017); 32 capture occasions
• 421 (95% CI: 305–615) population size for LTM and CRI sites combined
  • 2014–2016: 418 (327–559)
Summary

- Sonic-tagged Razorback Suckers
  - Help determine trammel netting, larval fishing and PIT scanner locations
- 41 Razorback Suckers captured in 2017
  - Razorback Sucker captures were evenly distributed among study sites
  - 21 new wild Razorback Suckers were captured
  - Unmarked juvenile captures at Las Vegas Bay \((n=4)\) and the Virgin River/Muddy River inflow area \((n=1)\)
- Larvae captured and spawning sites identified at all LTM sites
- Similar population and survival estimates as previous seasons
Questions?