Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Role of Artificial Habitat in Survival of RASU and BONY (2011-2015)

CRAB Meeting
January 5, 2016

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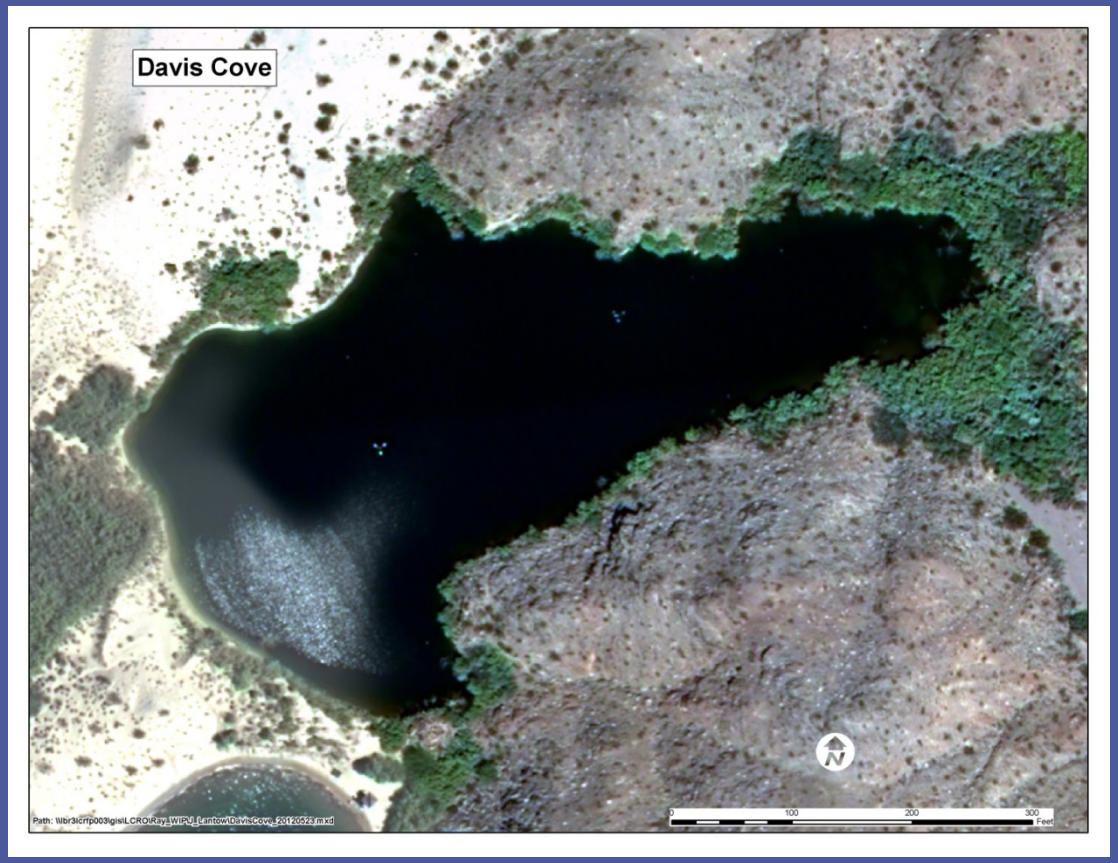
Study Plan Objectives

- Will native fish select artificial habitat within an isolated backwater that is free of non-native fish?
- If they do then what type of habitat is selected at the greatest frequency by native fish?
- Can we use artificial habitat to improve survival of stocked native fish within systems that contain non-native fish?

Study Site: Davis Cove



Study Site: Davis Cove

- Isolated 3-acre backwater on the Arizona shoreline of Lake Mohave.
- Free of non-native fish.
- Depth at center ranges from 2.5 m (autumn-winter) to 5.5 m (spring and summer).
- Stable water quality.
- Resident population of bonytail.

Methods

- Stock fish
- Scan habitat and nearby control antenna
- Analyze contact rates

2011: RASU

- 376 PIT-tagged razorback suckers (mean TL = 218 mm) were stocked on April 29, 2011.
- Three locations around the cove were selected for pairing habitat near control antennas.
- Weeks 1-5: tamarisk brush bundles.
- Weeks 6-12: 10⅜” diameter, stacked, black, plastic pipe.

2011: Habitat

2011: Habitat

2011: Habitat

2011: Results

- Several scanner malfunctions occurred throughout the study time.
- There was no significant difference between brush and control.
- Control antenna contacted 7X the number of fish as the pipe.

2012: RASU

- 372 PIT-tagged razorback suckers (mean TL = 258 mm) were stocked on April 11, 2012.
- All three units were set along the western shoreline due to its homogeneous substrate.
- Five sonic-tagged razorback suckers (mean TL = 239 mm) were stocked on May 21, 2012.

2012: Habitat

- Brush and pipe habitat deployed near the control antenna at the same time.
- PIT tag antenna integrated habitat was constructed similar to those used in 2011.
- One brush and one pipe habitat were deployed at the east side of Davis cove for by sonic-tagged fish.

2012: Results

- Malfunctioning scanners.
- There was no significant difference in unique or total contacts between brush and pipe habitats.
- The control antenna received significantly more unique contacts than brush and pipe habitats.
- Sonic-tagged fish were not detected near any of the habitats.

2013:RASU and BONY

- 52 PIT-tagged razorback suckers (mean TL = 218 mm) were stocked on March 4, 2013.
- 301 PIT-tagged bonytail (mean TL = 307 mm) were stocked on April 22, 2013.
- Four sonic-tagged bonytail (mean TL = 327 mm) were stocked on April 22, 2013.
- 12 scanning intervals.

2013: Habitat

- Brush, pipe, and control antenna were similar in dimension to 2012 and 2011.
- Brush, pipe, and control antenna were deployed along the western shoreline in the same manner as 2012.
- Similar habitat deployed on the eastern side of Davis cove for sonic-tagged bonytail.

2013: Results

- No significant difference in unique or total contacts between brush or pipe habitats.
- Evidence of more total contacts at the pipe habitat by bonytail.
- One sonic-tagged bonytail was detected between the brush and pipe habitats at 5:55 AM on July 26, 2013.

2014: BONY

- 450 PIT-tagged bonytail (mean TL = 137 mm) stocked on February 18, 2014.
- 299 PIT-tagged bonytail (mean TL = 121 mm) stocked on May 14, 2014.
- Lack of available bonytail >250 mm.
- 11 scanning intervals.

2014: Habitat

- Smaller, 4-inch drainage pipe was used.
- Pipe was stacked and placed inside of the 97”×28”×24” cuboidal PVC frame.
- Habitat/ control antenna pairings deployed in three separate locations.

2014: Habitat

2014: Habitat

2014: Results

- Fewer malfunctions = greater number of pairings between the habitat and control antenna.
- Habitat scanned more PIT tags per hour than the control 12 out of 27 pairings.
- Control antennas contacted more unique bonytail per hour.

2015: BONY

- 400 PIT-tagged bonytail (mean TL = 176 mm) stocked on March 20, 2015.
- 11 scanning intervals.
- Data used for analyses ended in the first week of September, 2015 due to low dissolved oxygen causing aberrant behavior in the fish.

2015: Habitat

- Only pipe paired with a control antenna, similar to 2014.
- Habitats were similar in dimensions to 2014.
- Deployed in four locations to increase replication.

2015: Results

- Malfunctioning units resulted in 17 pairings.
- Preliminary analyses suggests the control antenna received more total and unique contacts than the habitat.

Future Work

- Different sized pipe habitat for bonytail.
- Find another habitat type for razorback sucker.
- Transition the testing to a site with non-native fish.

Interesting Events

- November of 2011, more than 100 bonytail were discovered within the PVC of one of the frames.
- Six YOY bonytail were found in the cap of a water quality probe.
- Fish populations decrease after November- December.

BONY in probe (2014)

Easy targets for…

Avian Predation

Other Predation?

Acknowledgements

- **Very special thanks to**:

- Jeff Lantow, Sarah Bousquet, Mitch Urban, Wendy Brewer, Richard Ciolfi, Trish Delrose, Andi Finnegan, Gregg Garnett, Jeff Lantow, Eric Laux, Mitch Urban, Nathan Lenon, Eric Loomis, Julia Mueller, Jon Nelson, Thomas Reeves, Jennifer Rottinghaus, Nathan Rudd, Margie Shaffer, Jenny Smith, Jim Stolberg, Randy Thomas, Dan Townsend, Mitch Urban, Jeff Lantow, Todd Wright.