SUMMARY OF RAZORBACK SUCKER AND BONYTAIL ACTIVITIES CONDUCTED BY THE AZ FISH AND WILDLIFE CONSERVATION OFFICE

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ACTIVITES

- Topock Marsh
  - Telemetry
  - Remote PIT scanning
- Cibola High Levee Pond
  - Monitoring of the native fish population
  - Population estimates
- Office Cove
  - Water quality improvements
  - Improve health of the Razorback Sucker

TOPOCK MARSH

- In 2016, scanned 551 individual Razorback in Topock Marsh
- This was 16% of the fish stocked in 2010
- Evidence of higher survival prompted a telemetry study to examine use of the backwater
  - This would allow for more effective monitoring with remote PIT scanners and traditional gear

STOCKINGS

- Telemetry fish
  - 20 wild fish with ART tags were stocked December 14, 2016 (560 mm)
  - 20 hatchery fish with IBT tags were stocked December 12, 2016 (403 mm)

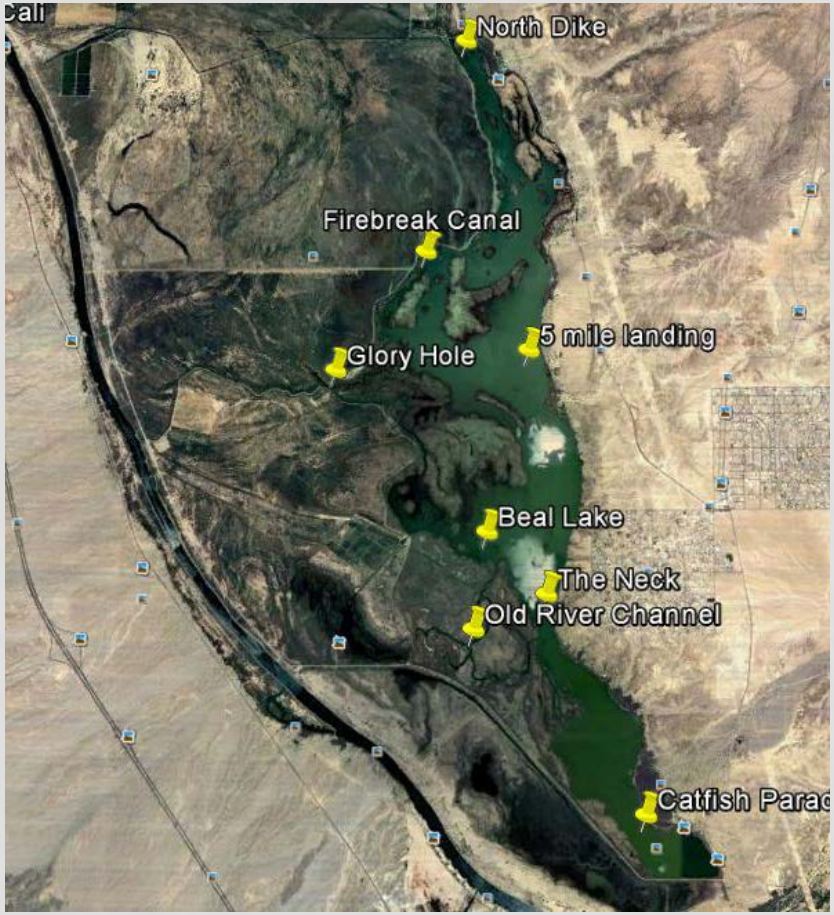
- Stocked fish
  - December 2016 – 250 fish (concurrent with telemetry fish release)
  - May 2017 – 900 fish

TELEMETRY TAGS

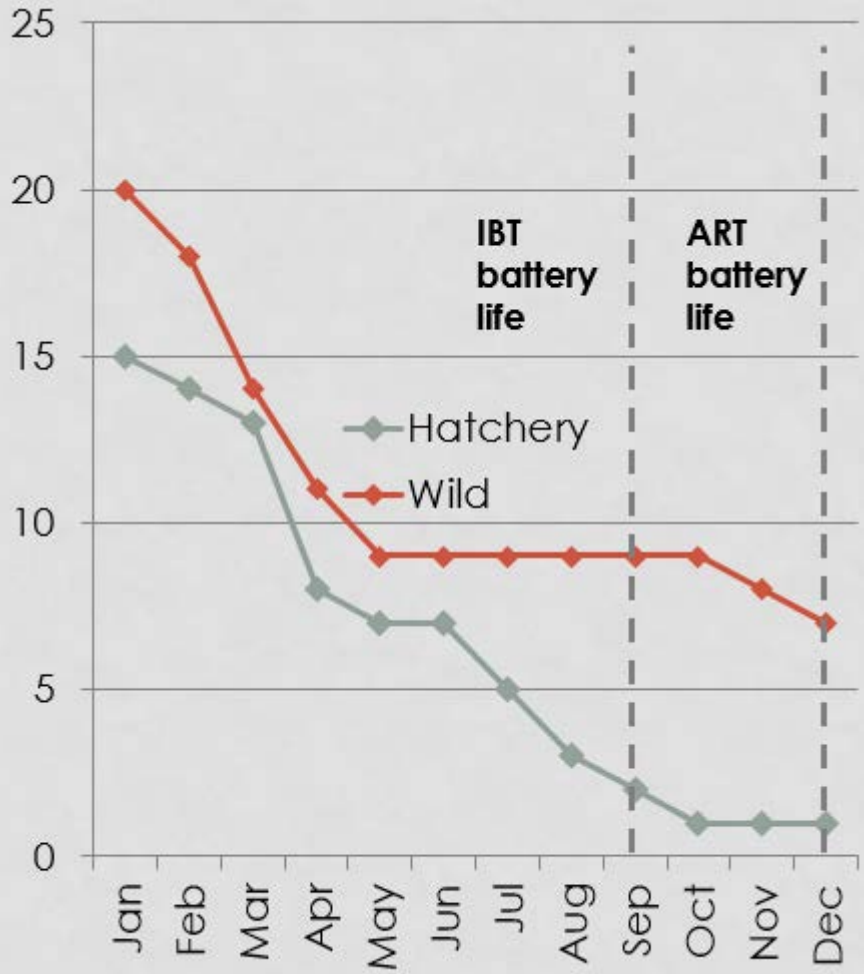
- ART tags
  - Combination radio/acoustic tags
  - 80 mm long
  - 1year battery life
- IBT tags
  - Acoustic tags
  - 50 mm long
  - 9 month battery life

TELEMETRY

- Active tracking
  - Intensive manual tracking the first 6 months of the study
  - A combination of spiny naiad and water levels made tracking difficult for the remainder of the study
  - ART tags had limited functionality in the backwater
- Rely heavily on a network of 8 SURs
  - These were downloaded monthly
  - Calculated monthly relative contact rates.
  - Queried out mortality contacts and the first two weeks of data post-release.

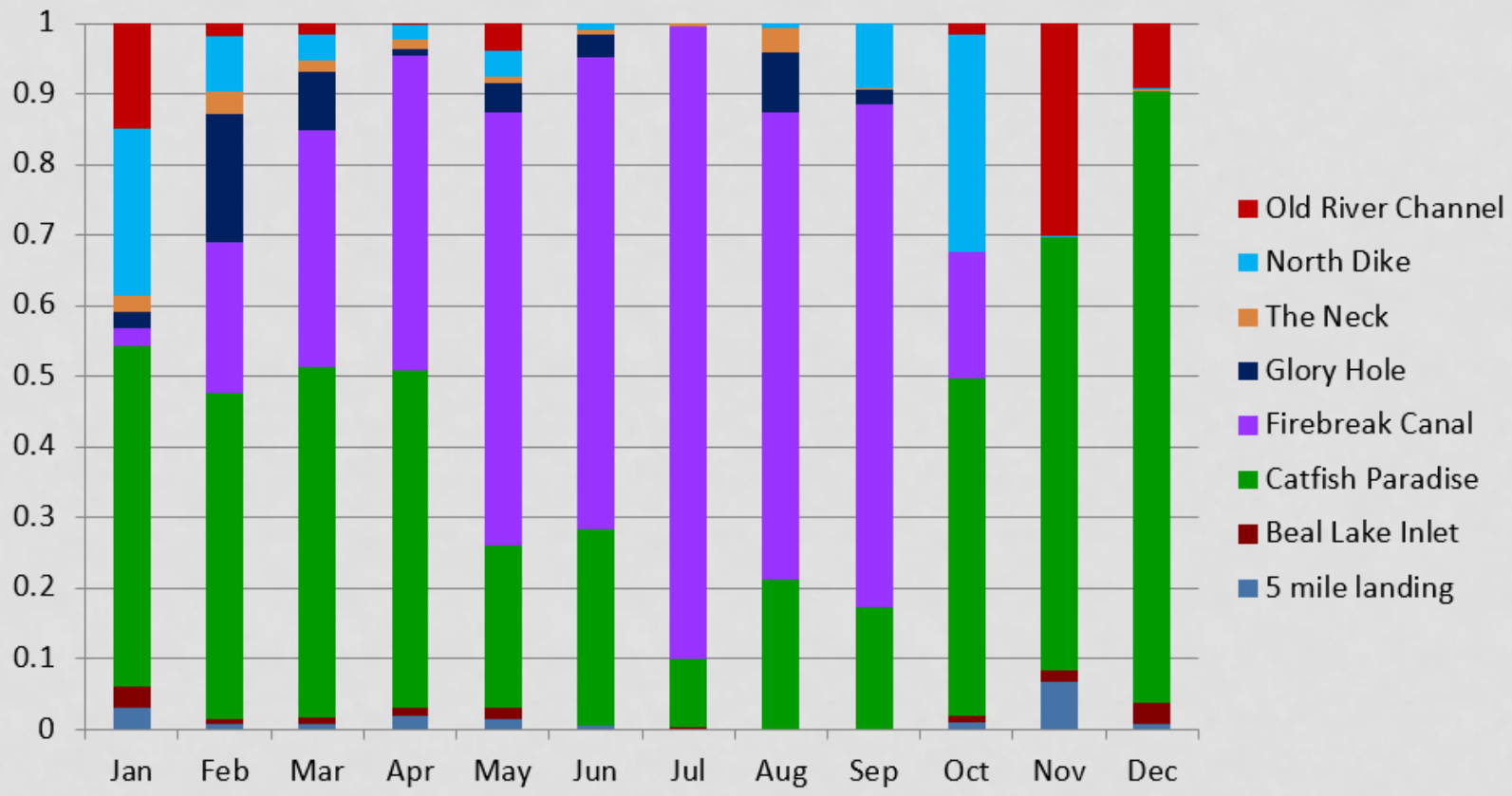


FATE OF TELEMETRY FISH

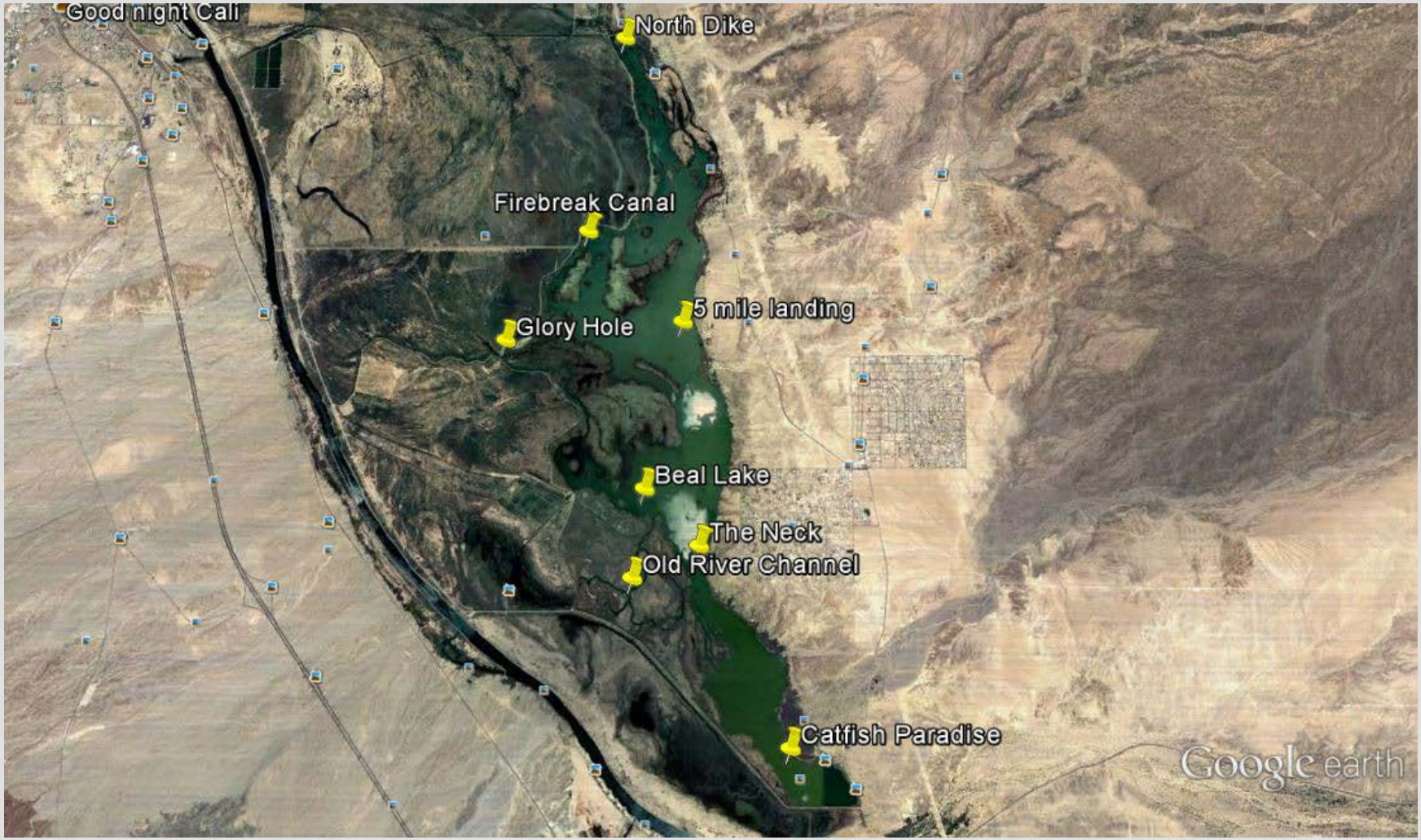


- 17 confirmed dead with manual tracking
- SUR data at the end of the IBT battery life
  - 8 active wild fish
  - 2 active hatchery fish
- MSCP SUR network in the River had no contacts from study fish

RELATIVE CONTACT RATE



A VISUAL LOOK

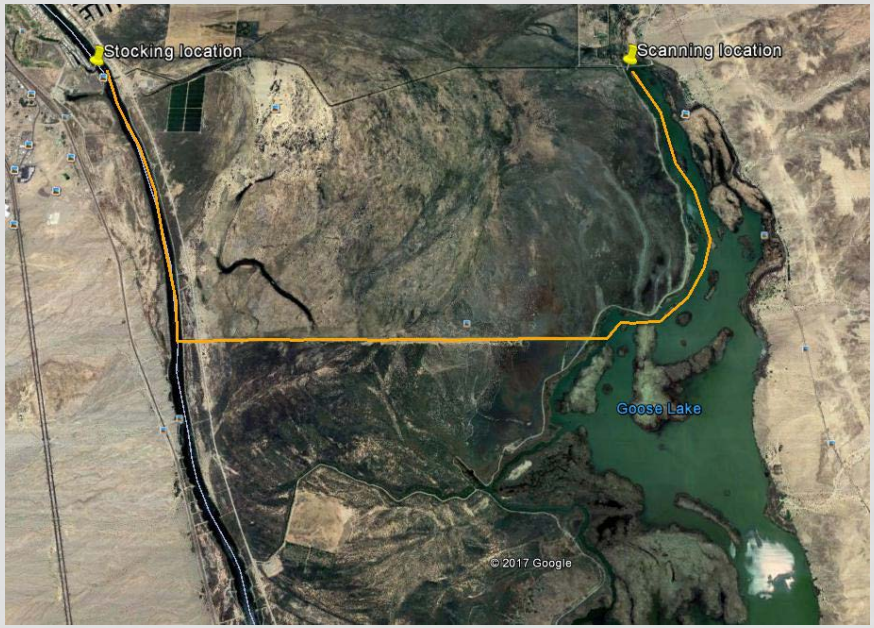


REMOTE PIT SCANNING

- Aprill 11, 2017-April 14, 2017
  - 3 deployments
  - 149 unique individuals
  - 70 were newly stocked fish (all from December 2016 stocking)
- April 21, 2017-April 26, 2017
  - 6 deployments
  - 145 unique individuals
  - 57 were newly stocked fish (all from December 2016 stocking)
- May 11, 2017-May 17, 2017
  - 5 deployments
  - 85 unique individuals
  - 18 newly stocked fish (6 from Dec 2016 and 12 from May 2017)
- June 27, 2017-June 30, 2017
  - 56 deployments
  - 3123 contacts
  - 325 Unique individuals (215 at Firebreak)
  - 58 newly stocked fish (12 from Dec 2016 and 46 from May 2017)
- A total of 509 individual Razorback Sucker AND……

A BONYTAIL

- Stocked at Jack Smith April 5, 2017 at 393 mm
- Scanned on the North Dike April 25, 2017
- Movement of approximately 12 kilometers from the stocking site.



FUTURE OF TOPOCK

- Leave the 8 SURs in the water to continue to track acoustic fish through the end of the battery life
- Telemetry on Bonytail – March/April 2018
  - 20 fish with 9 month IBT tags
  - Simultaneously stock with 200-300 PIT tagged Bonytail
  - Bigger SUR network
  - miniSURs from MSCP
- Continue scanning
  - Scheduled for February
  - Mark-recap to estimate survival of recent stockings
- Other activities
  - Look for Razorback Sucker larvae
  - E-fishing in February to assess growth and health of fish

CIBOLA HIGH LEVEE

- Located on the Cibola National Wildlife Refuge
- Renovated in 1993 and again in 2008
- Supports naturally recruiting Bonytail and maybe recruiting Razorback Sucker.

MARK-RECAPTURE

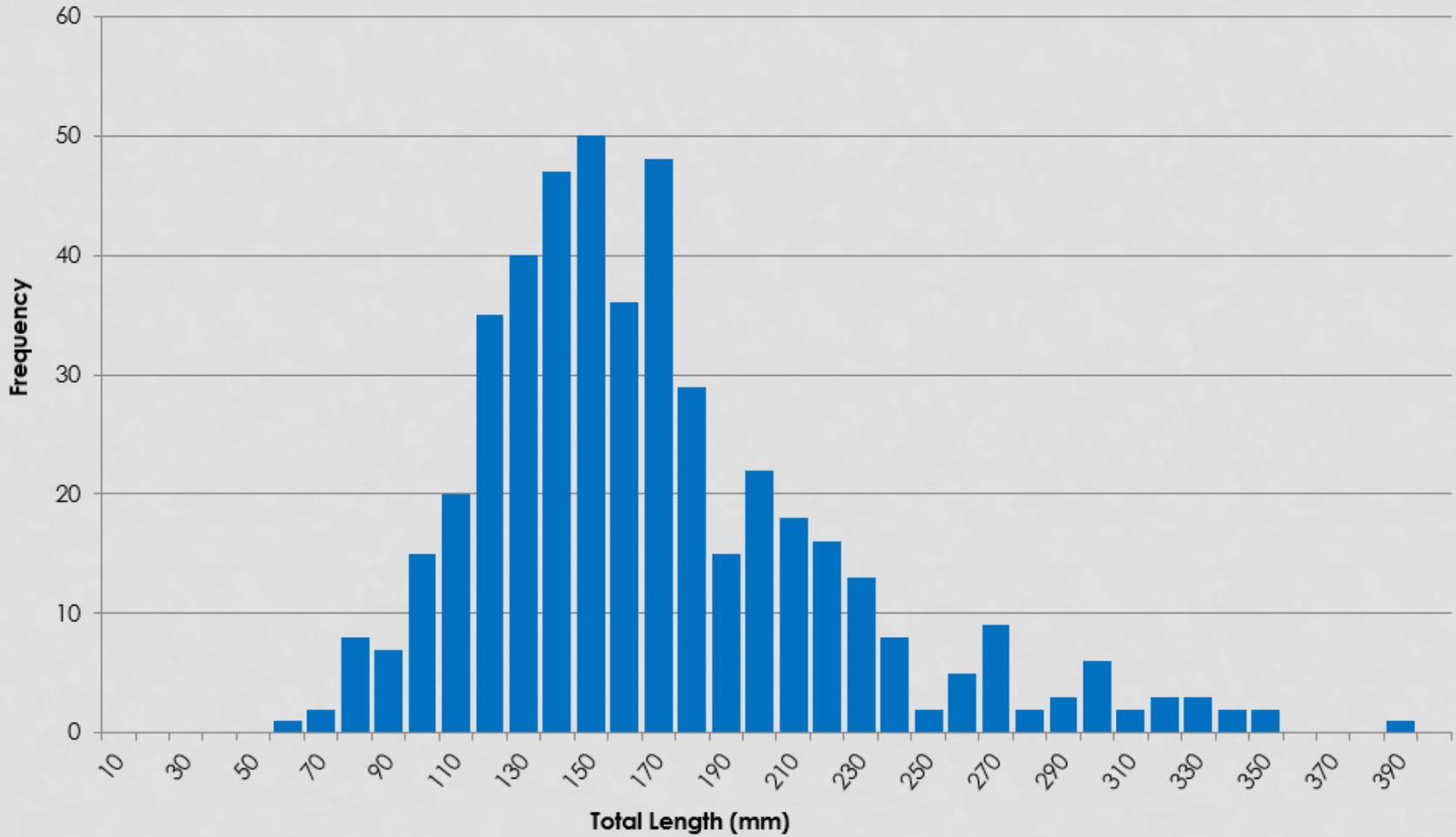
- Boat electrofishing for 2 consecutive nights (2700 sec each night)
- Bonytail were fin-clipped on the first night of electrofishing
- Using fin-clips as marks for Bonytail and PIT tags as marks for Razorback Sucker population was estimated using the Lincoln-Peterson method

$$N^{\wedge *} = \frac{(M+1)(C+1)}{(R+1)}$$

BONYTAIL

- 269 Bonytail first night of sampling (marked individuals [M])
- 201 second night of sampling (captured individuals [C])
- 8 recaptures (R)
- Estimate (95% Confidence Interval) of 6,060 (3,246-12,395) individuals.
- Mean length (range) of 164 mm (60-382 mm)

LENGTH-FREQUENCY



RAZORBACK SUCKER

- 39 Razorback Sucker the first night of sampling (marked indiviuals [M])
- 30 in the second night (captured individuals [C])
- 10 recaptures (R)
- Population estimate (95% Confidence Interval) of 113 (64-218) individuals.
  - Last scanning trip contacted 160 Razorback Sucker
- Mean length (range) of 532 mm (445-615 mm)
- All but 4 were PIT tagged

SMALLMOUTH BASS

- 1 Smallmouth Bass (380 mm) was collected on the second night of sampling
- Immediately removed from the pond
- Likely a levee road introduction

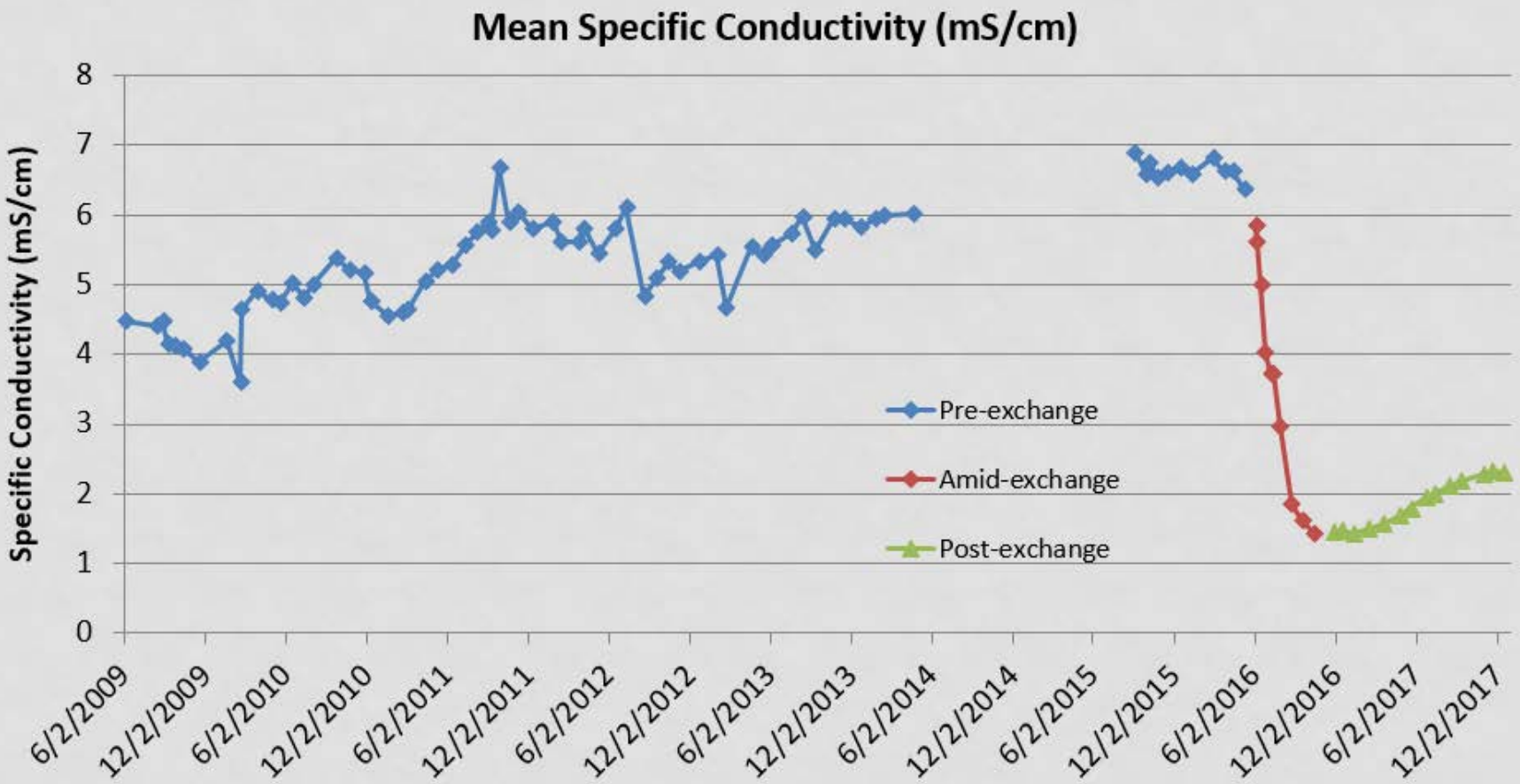
FUTURE OF CIBOLA HIGH LEVEE

- Bonytail are prolific
- Razorback Sucker are showing few signs of recruitment (very limited)
- Good growth on the Razorback Sucker
- Is this going to be a problem in other ponds?
  - Maybe try culling the Bonytail to see if there are any reproductive responses by Razorback Sucker?
- Visit monthly to ensure there are no more nonnative fish

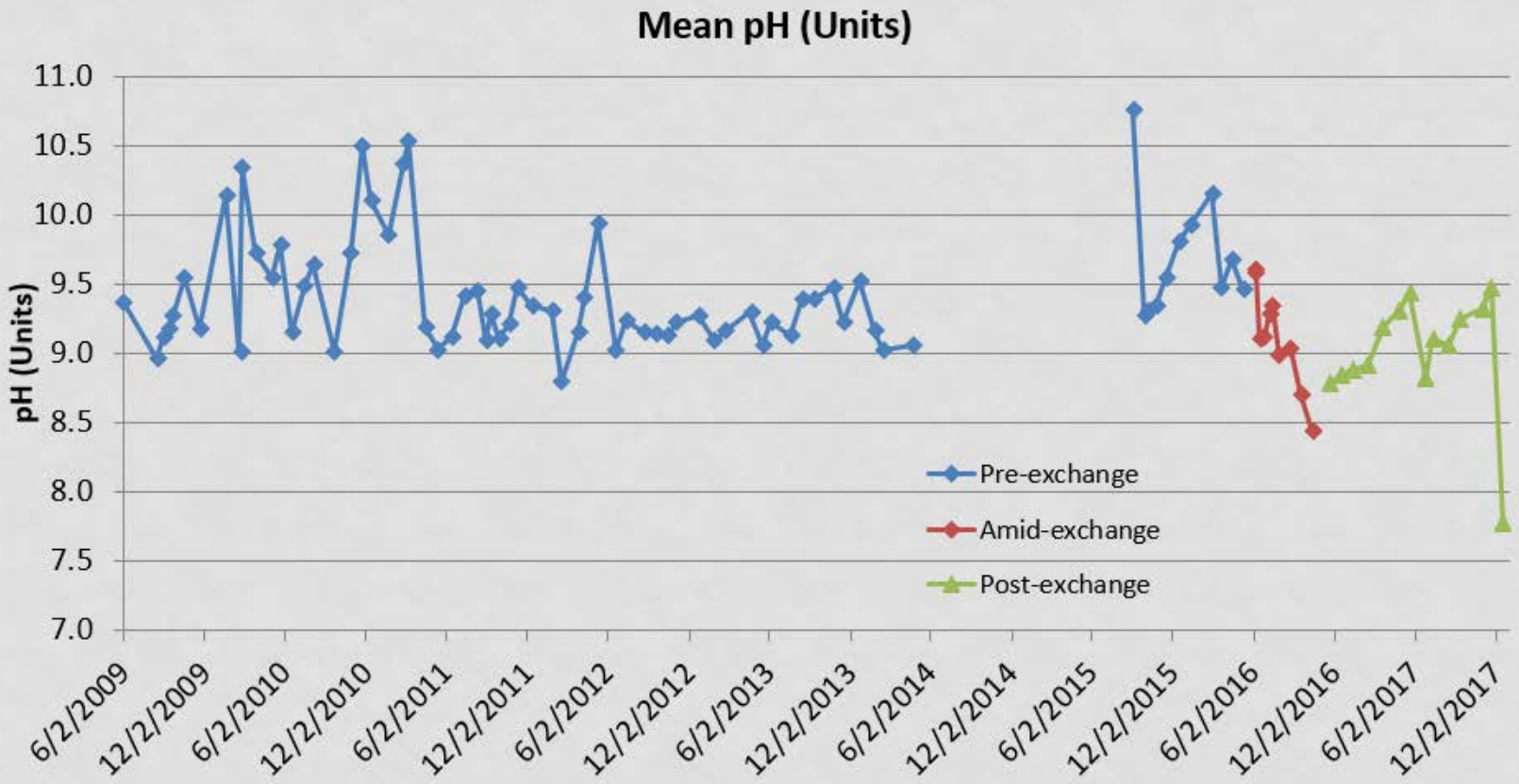
OFFICE COVE PUMPING

- Located on the Bill Williams National Wildlife Refuge
  - Constructed in 1993 as a grow out pond for razorback sucker and bonytail
- Sampled in Nov. 2015 and fish were in rough shape
  - High conductivity and High pH
- Started pumping water out to create negative head pressure
  - 4 inch trash pump

CONDUCTIVITY



PH

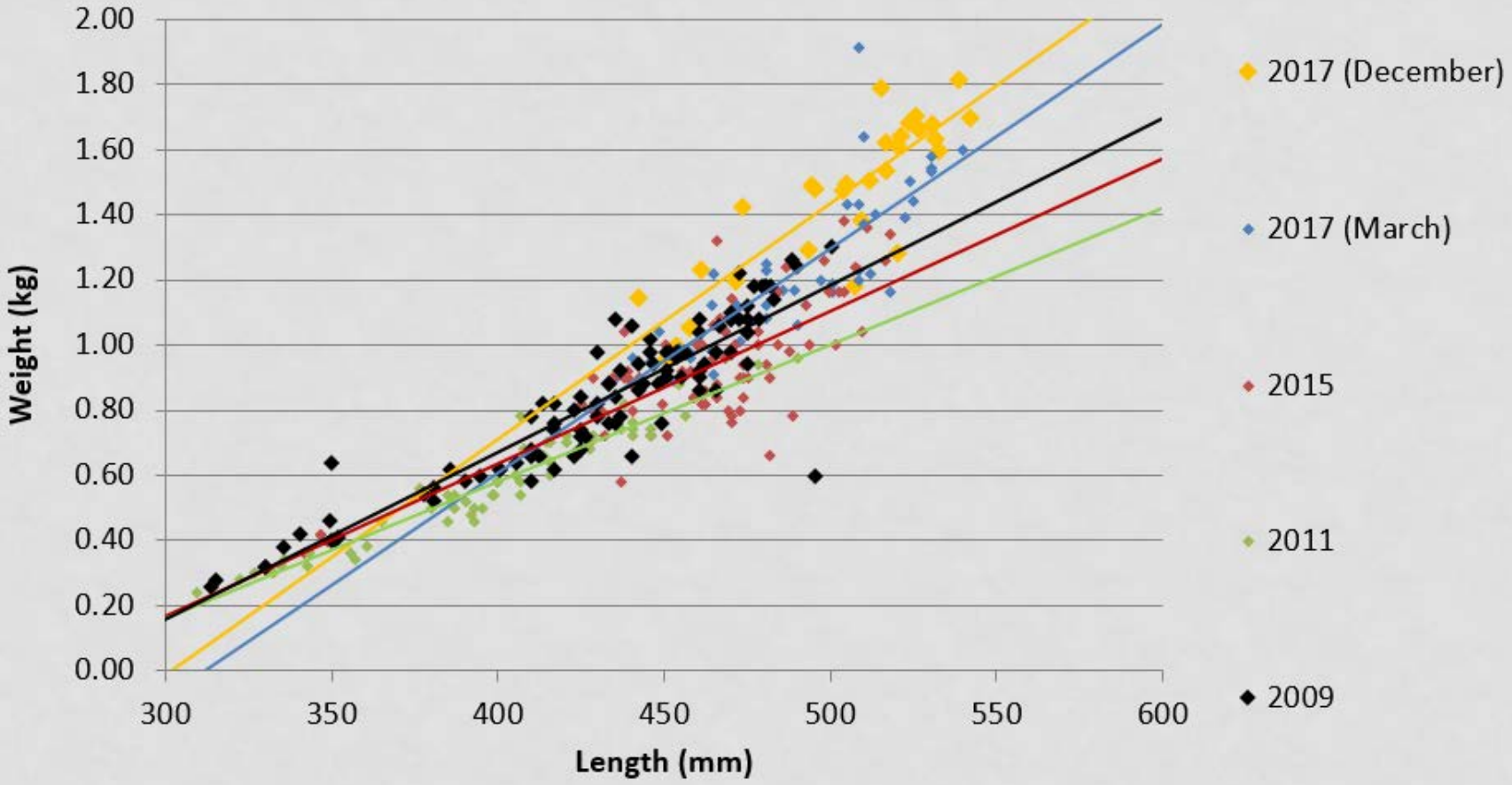

Mean pH (Units)
pH (Units)
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6/2/2009
12/2/2009
6/2/2010
12/2/2010
6/2/2011
12/2/2011
6/2/2012
12/2/2012
6/2/2013
12/2/2013
6/2/2014
12/2/2014
6/2/2015
12/2/2015
6/2/2016
12/2/2016
6/2/2017
12/2/2017
Pre-exchange
Amid-exchange
Post-exchange

TRAMMEL NETTING

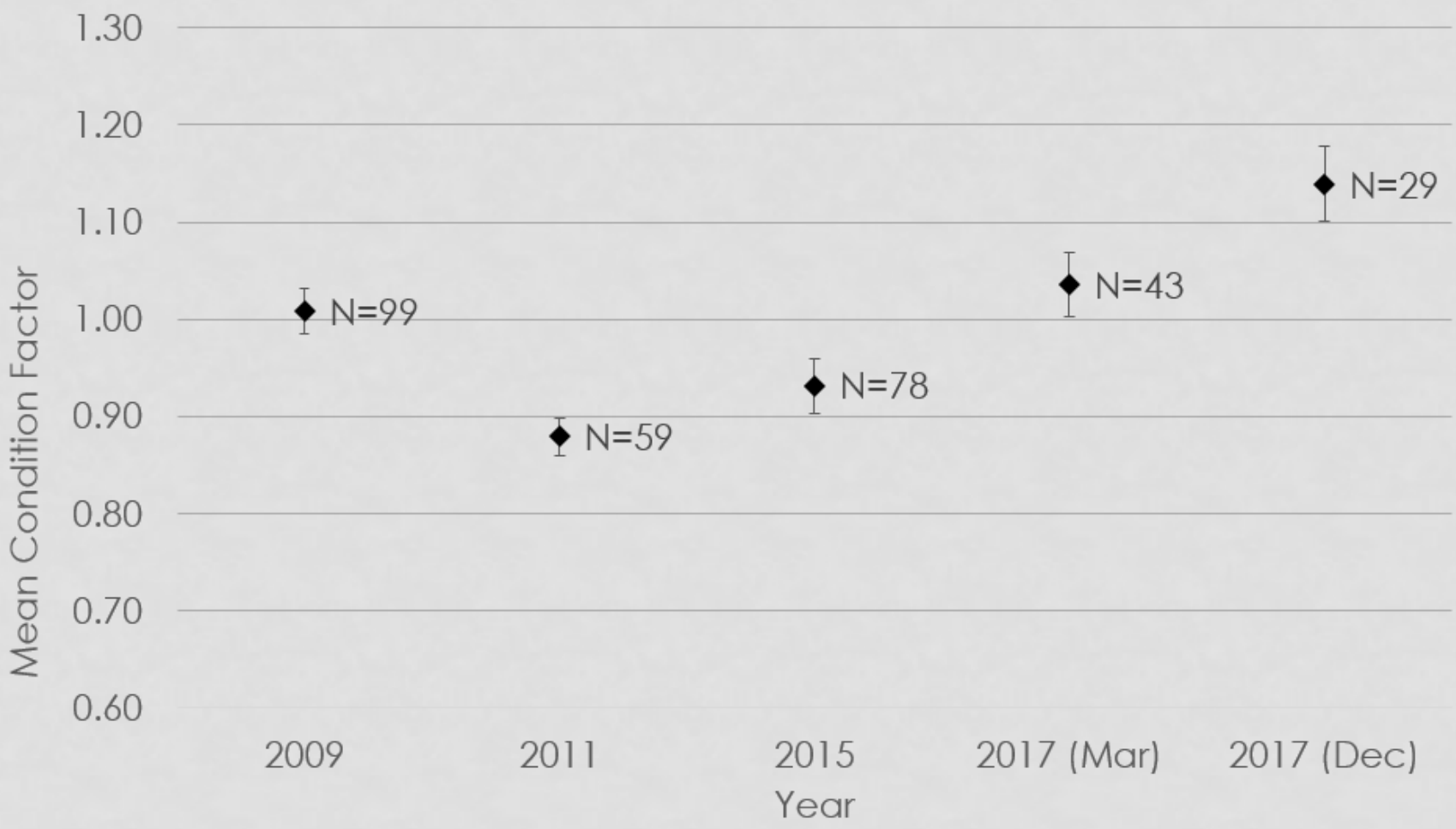
- March 2017
  - Four 3” mesh 150’ long trammel nets set overnight
  - Captured 43 Razorback Sucker at a mean length of 488 mm (435 mm – 540 mm)
- December 2017
  - Five 1.5” mesh 150’ long trammel nets set overnight
  - Captured 29 Razorback Sucker at a mean length of 502 mm (442 mm – 542 mm)
  - Transported and released into Topock Marsh
- Length-weight regression (2009, 2011, 2015, March 2017, and December 2017)
  - Assumed that steeper slope = higher condition
- Fulton’s Condition Factor
  - Calculated for 5 different sampling events (2009, 2011, 2015, March 2017, and December 2017)

$$K = 100\left(\frac{W}{L^3}\right)$$

LENGTH-WEIGHT REGRESSION



MEAN CONDITION FACTOR



2015 VS 2017

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