Monitoring of Razorback Sucker in Topock Marsh

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Background

- Topock Marsh is a large (1618 hectares) backwater adjacent to the Colorado River
- Encompasses a diverse array of habitats including open water, channels lined with cattail and bulrush, flooded timber, and rocky shoreline
- Water is regulated through the firebreak canal and the outlet structure on the south dike

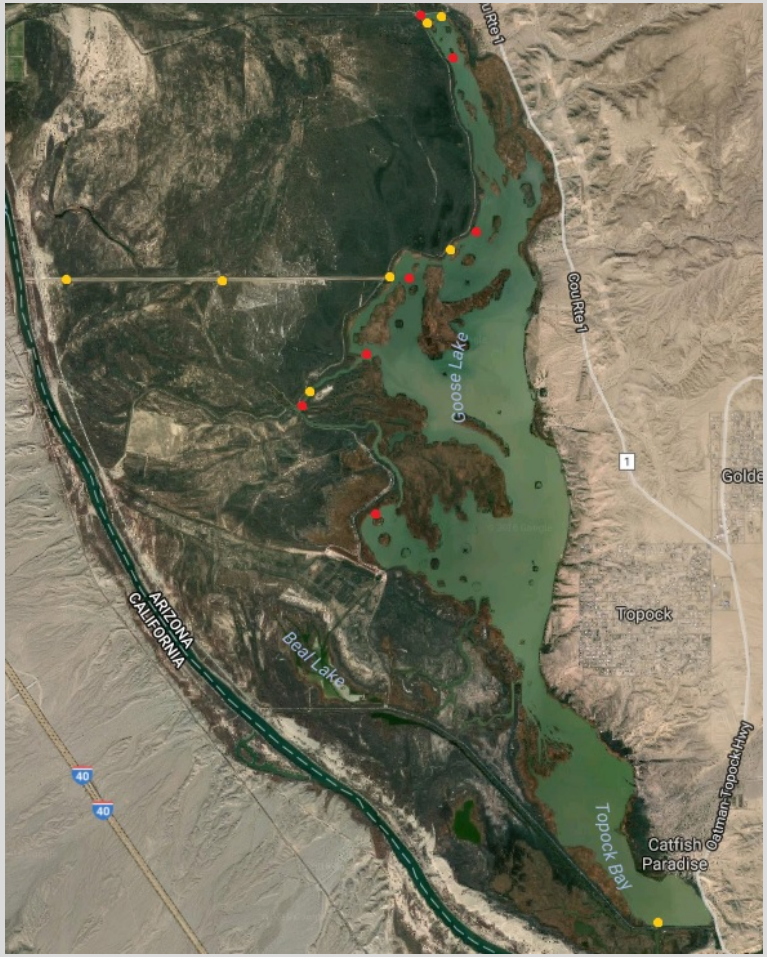
Razorback Sucker

- In December 2010, 3244 Razorback Sucker were stocked into Topock Marsh
  - Tagged with 134.2 kHz PIT tags
  - Mean length of 349 mm
- Arizona Game and Fish captured Razorback Sucker during sampling efforts over the years
- However the extent of the survival is unknown
- AZFWCO staff used a combination of remote PIT scanners and trammel netting to quantify the number of Razorback Sucker in the system

Methods

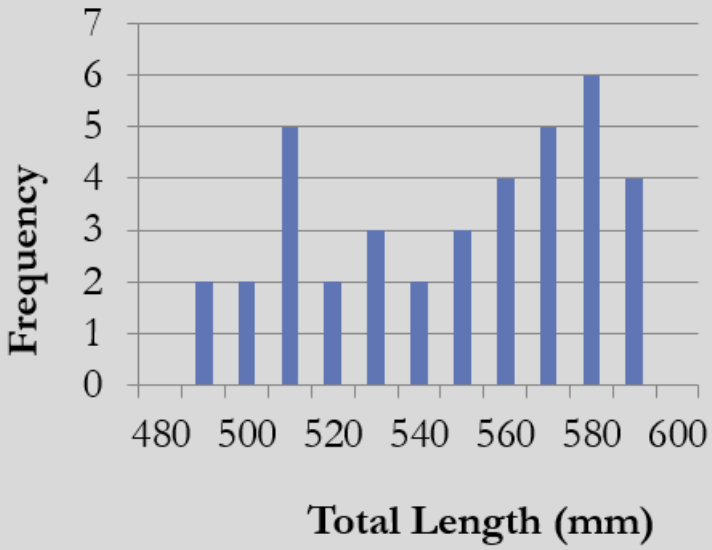
- Trammel Nets:
  - January 2016
  - 150 feet in length and 6 feet in depth
  - 1.5 inch mesh
  - 11 net sets over 2 nights in 7 locations (red dots on map)

- Remote PIT scanners:
  - 14 deployments in January and February 2016
  - 10 deployments in August 2016 (yellow dots on map)

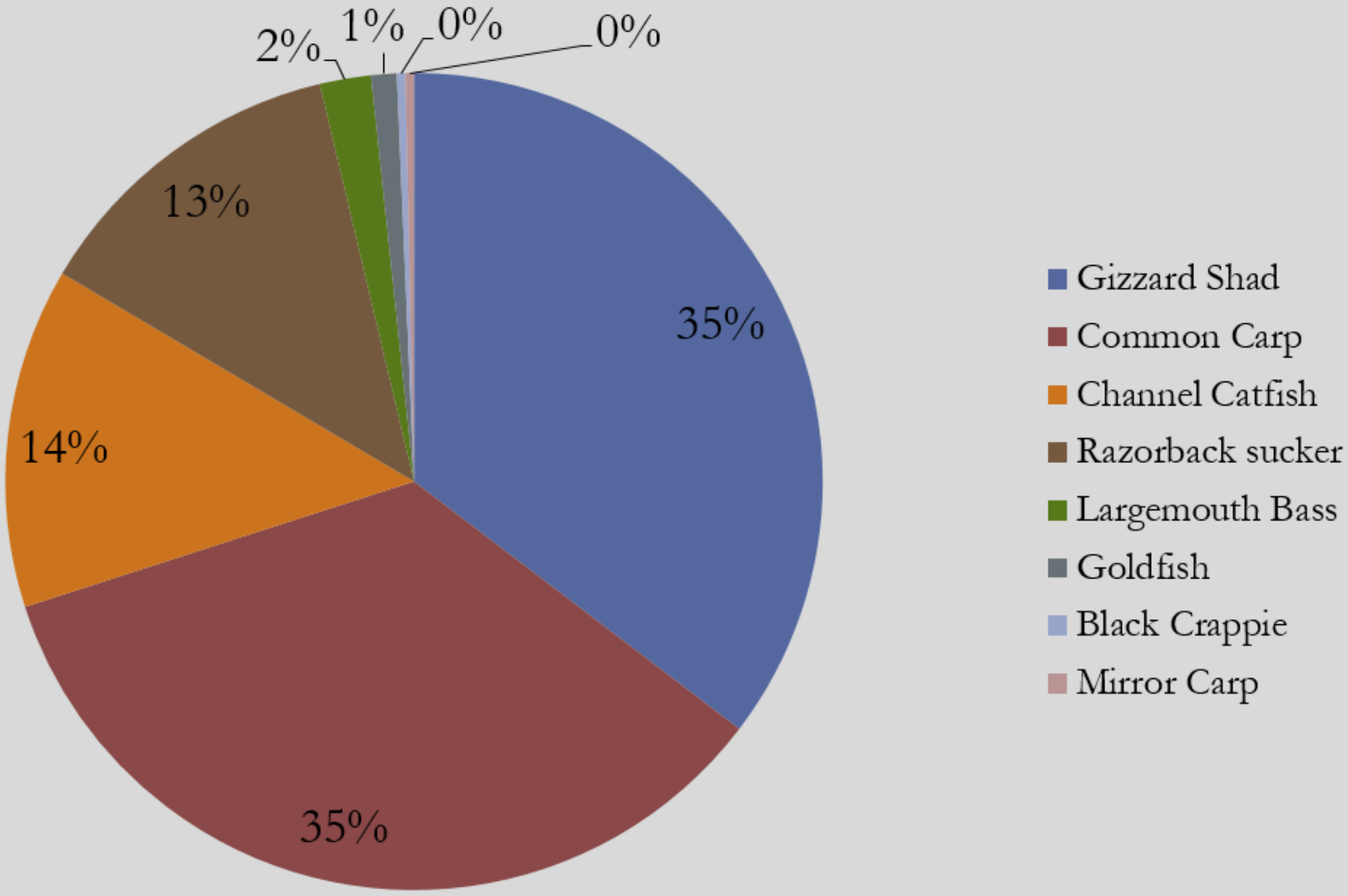


Trammel Netting

- 38 Razorback Sucker captured in trammel nets
- Mean length of 544 mm (488-590 mm)
- Majority of by-catch was Common Carp and Gizzard Shad

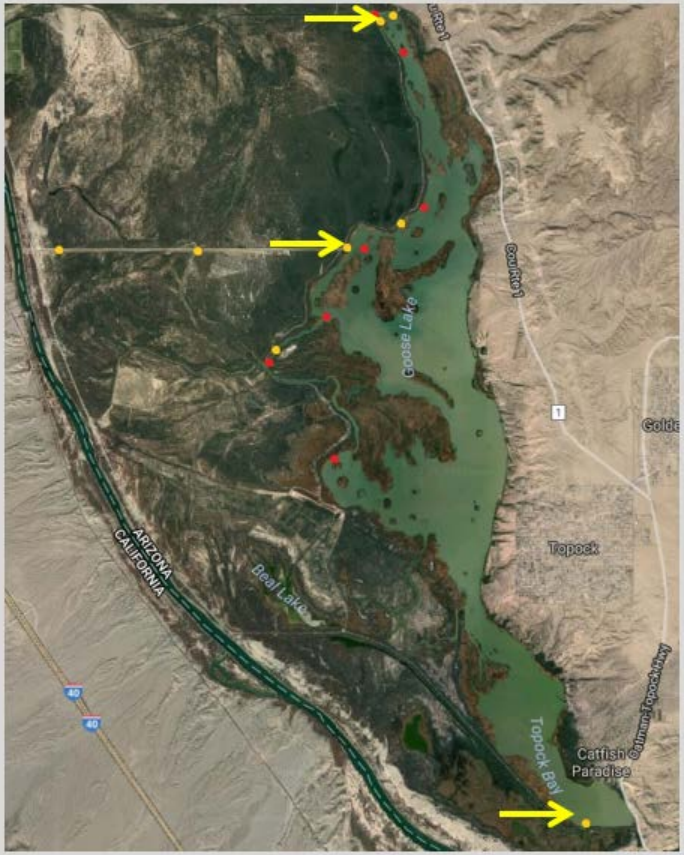


Goose Lake
Beal Lake
Topock
Topock Bay
Catfish Paradise
ARIZONA
CALIFORNIA
40
40
1


2%
1%
0%
0%
13%
35%
14%
35%
Gizzard Shad
Common Carp
Channel Catfish
Razorback sucker
Largemouth Bass
Goldfish
Black Crappie
Mirror Carp

Spring Scanning

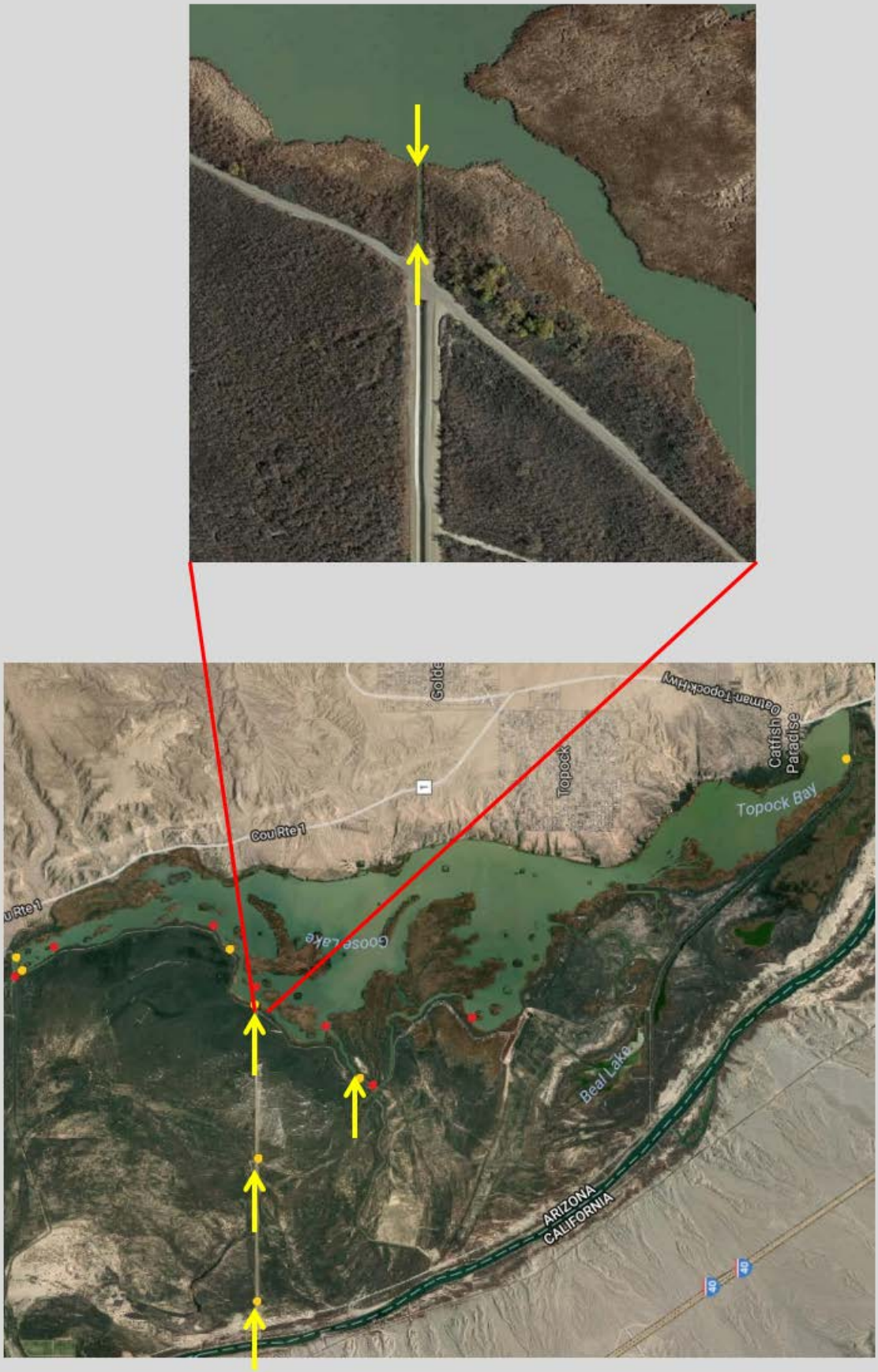
- Total of 14 deployements
  - 2 shore based deployements
  - 12 submersible deployments
- Contacted 345 individual fish
  - Only 11 of the fish were stocked outside of the Marsh
- Location Breakdown
  - 323 at the north dike
  - 30 at the firebreak Canal
  - 22 at the south dike



Summer Scanning

- August 1-4 scanning
  - 6 submersible deployments
  - 108 unique fish (only 4 were stocked outside of the Marsh)
  - 99 at firebreak canal Inlet
  - 8 in the middle firebreak canal
  - 8 in the west firebreak canal
  - 1 at glory hole

- August 9-11 scanning
  - 4 submersible deployments
  - 200 unique fish (only 5 were stocked outside of the Marsh)
  - 188 at entrance to the firebreak canal
  - 78 at the firebreak canal inlet
  - 2 at glory hole


Golde
Oatman Topock Hwy
Catfish Paradise
Topock
Topock Bay
Cou Rte 1
Cou Rte 1
Goose Lake
Beal Lake
ARIZONA
CALIFORNIA

Overall

- Overall there were 551 individual Razorback Sucker contacted through scanning and netting efforts
  - Only 20 of these fish were stocked outside of the Marsh.
- Spring and Summer scanning represented two distinct groups of fish as there were only 51 fish scanned during both scanning events
- Contacted 16% of the original stocked population

Conclusions

- Good survival of hatchery-sized (35 cm) Razorback Sucker on the lower River.

- High turbidity?
  - Topock Marsh is a highly turbid system
  - Some studies have suggested that higher turbidity can decrease predation by nonnatives (i.e. Ward et al. (2016) suggested that high turbidity increased survival of endangered Humpback Chub).

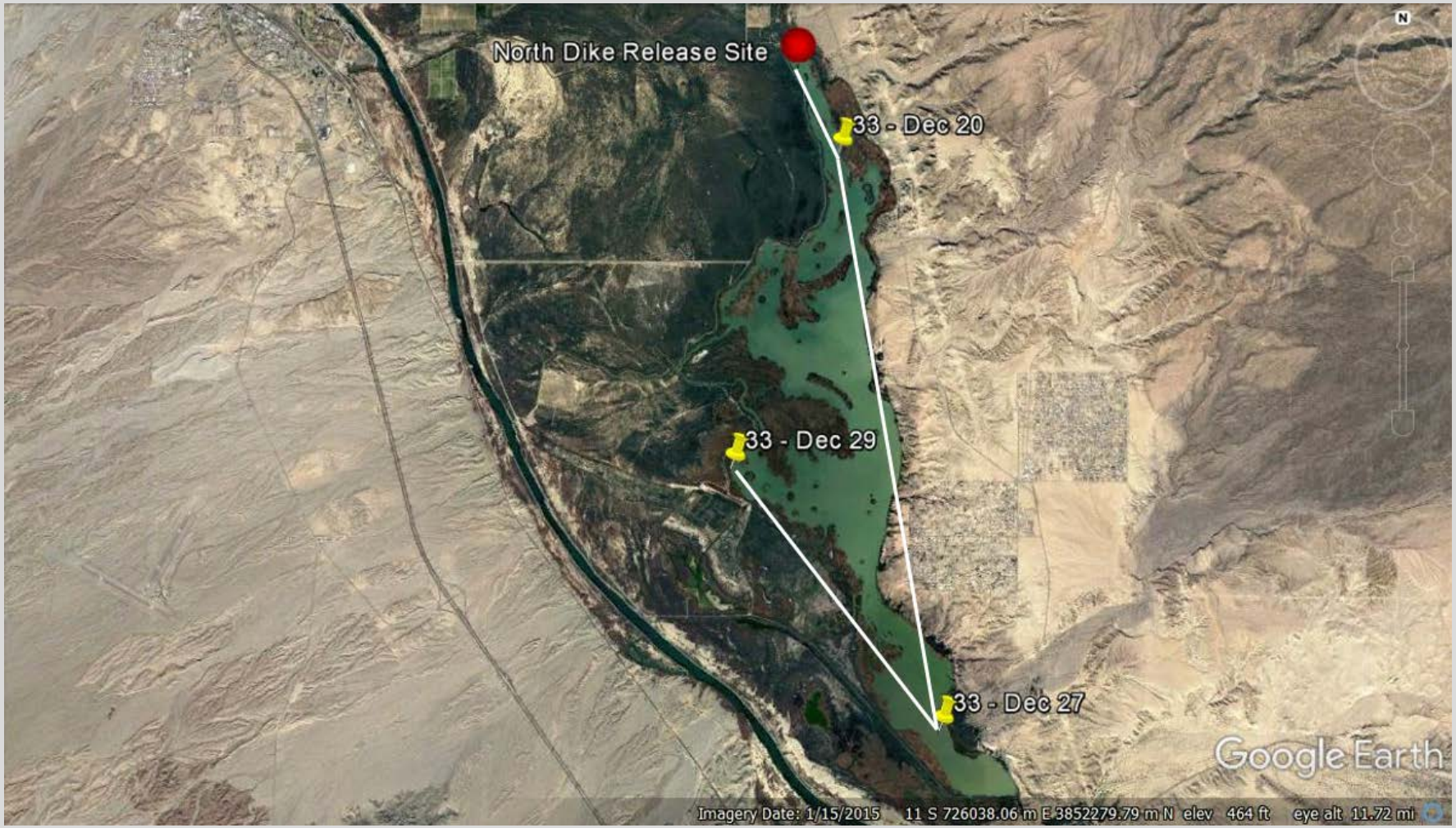
- Is there a general lack of large predators?

- What is the future of the Marsh as a native fish habitat?
  - Despite the high survival there was no evidence of recruitment
  - Stock more to determine if this was an anomaly

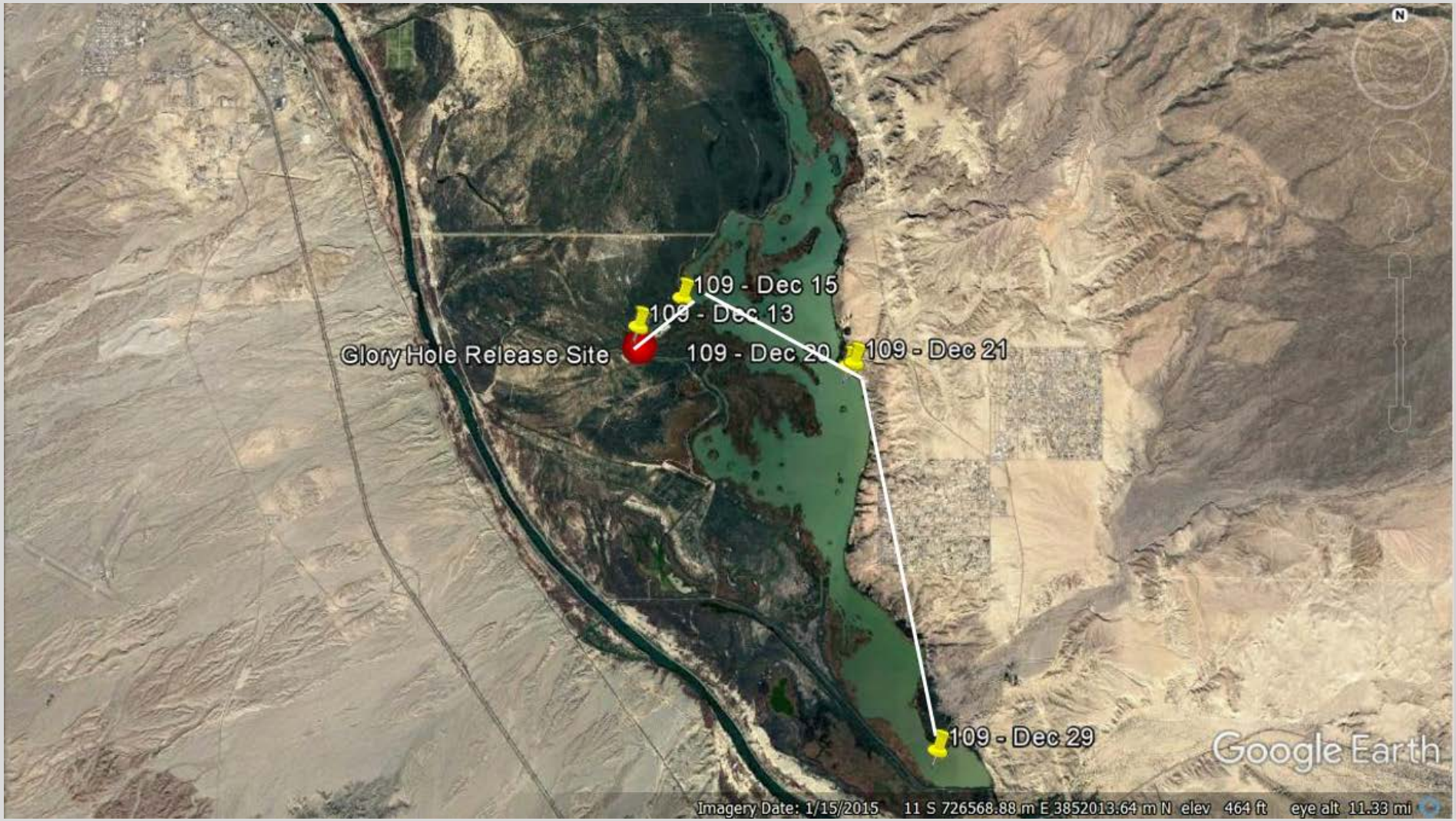
Telemetry Project

- Recently stocked 40 telemetry fish into the Marsh
  - 20 hatchery fish (mean length of 402 mm) were stocked with IBT tags on December 12
  - 20 wild fish (mean length of 560 mm) were collected from Topock Marsh, implanted with Combination Acoustic and Radio tags on December 14
  - An additional 275 PIT tagged fish were released into the Marsh on December 9
- The purpose of this project is to observe movements and habitat use over the next year so as to develop an effective monitoring program for Razorback Sucker in Topock Marsh
- Preliminary data is limited
  - Both hatchery and wild fish have dispersed throughout the Marsh
  - Early indication is that the radio component of the ART tags will have limited functionality in the Marsh

Wild Fish


North Dike Release Site
33 - Dec 20
33 - Dec 29
33 - Dec 27
Google Earth
Imagery Date: 1/15/2015 11 S 726038.06 m E 3852279.79 m N elev 464 ft eye alt 11.72 mi

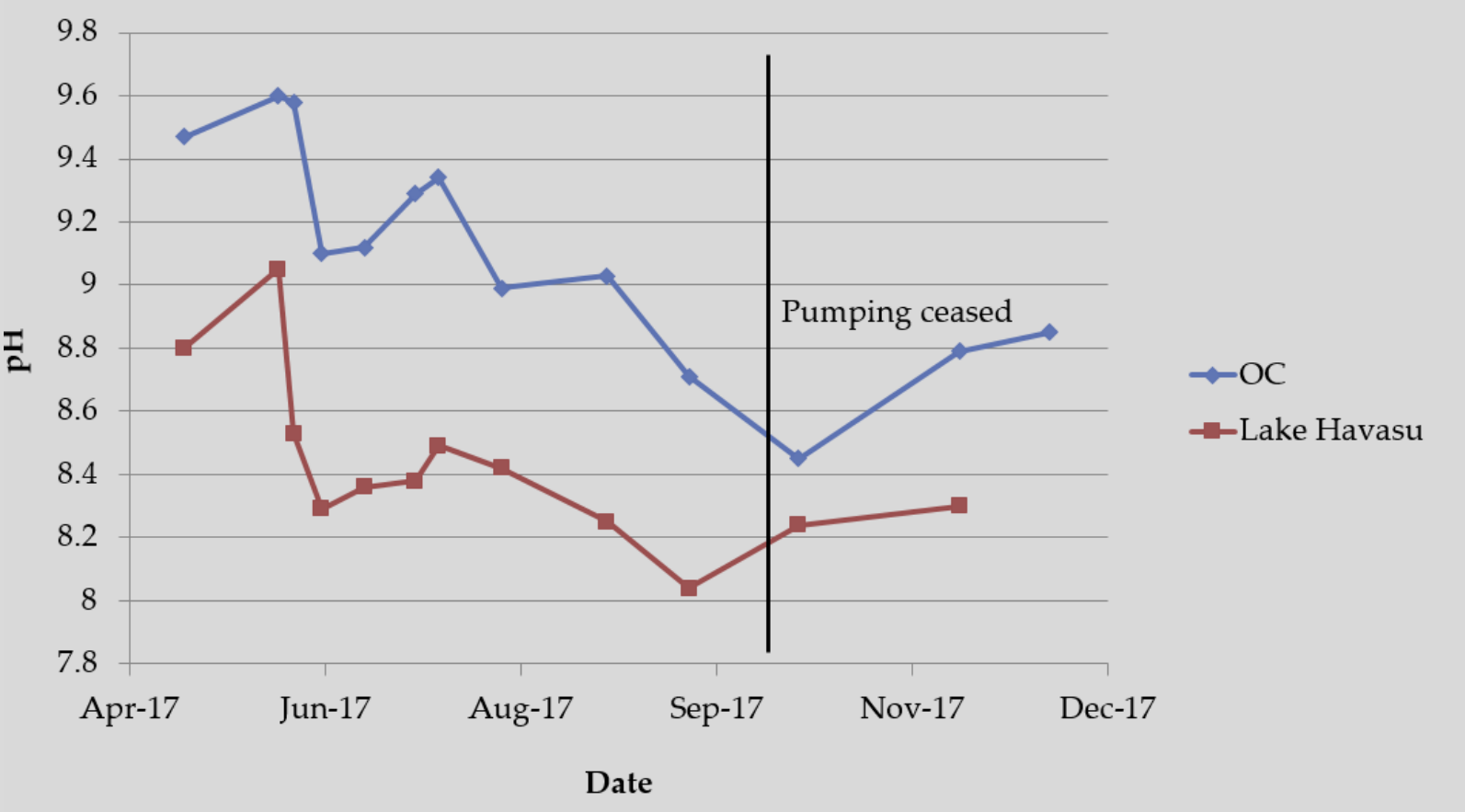
Hatchery Fish



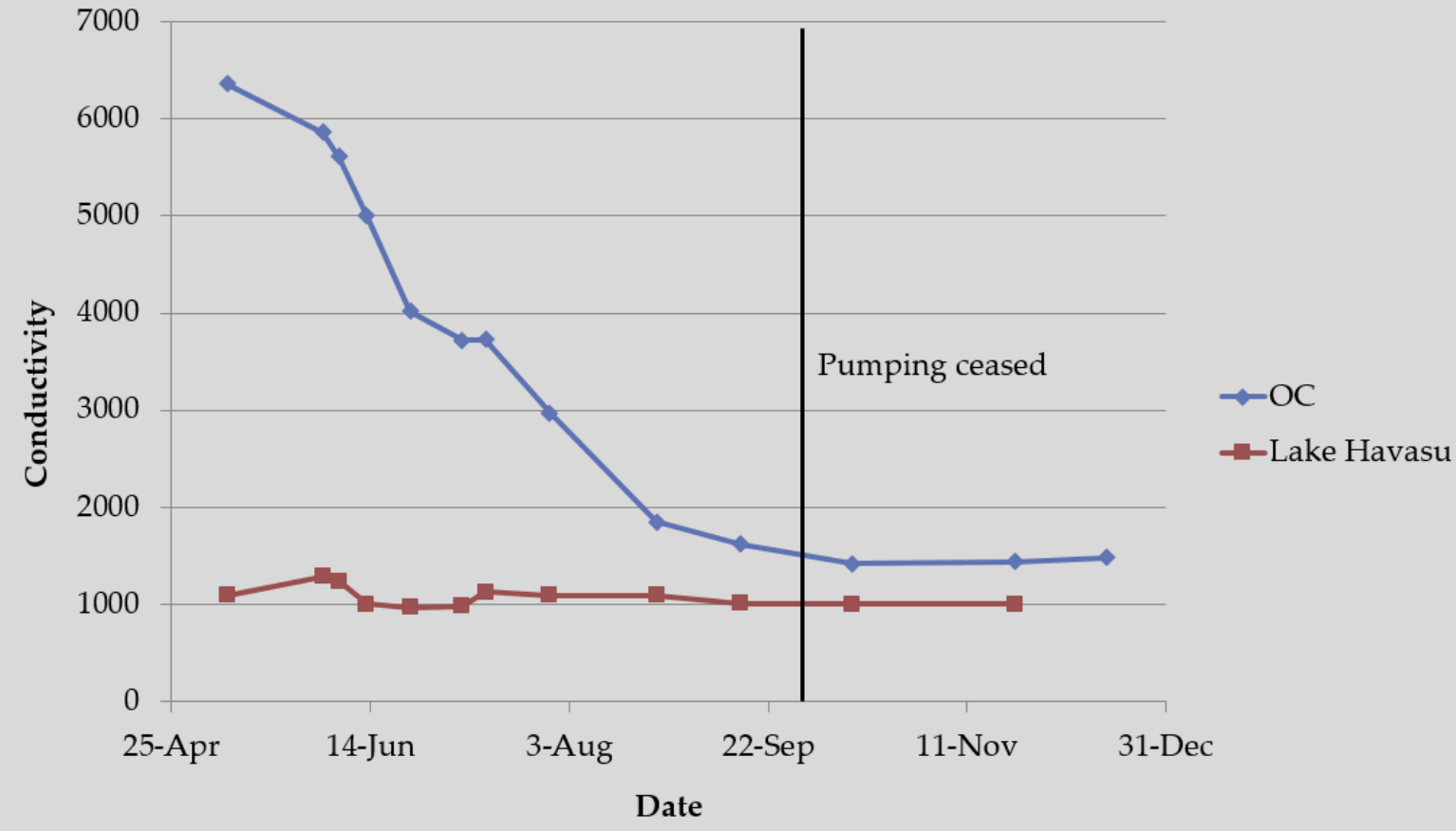
Office cove pumping

- 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

Mean pH


9.8
9.6
9.4
9.2
9
8.8
8.6
8.4
8.2
8
7.8
pH
Pumping ceased
Apr-17
Jun-17
Aug-17
Sep-17
Nov-17
Dec-17
Date
OC
Lake Havasu

Conductivity



Cibola High Levee

- Three sampling trips in 2016
  - April 2016
    - 54 Bonytaill – 48-291 mm
    - 7 Razorback Sucker – 331-379 mm
  - October 2016
    - 423 Bonytail – 95-487 mm
    - 18 Razorback Sucker – 412-586 mm
  - Novemeber 2016
    - 114 Bonytail – 66-425 mm
    - 32 Razorback Sucker – 421-600mm

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- Remote PIT scanning
  - Five trips with six submersible PIT scanner deployments per trip.
  - A total of 2719 hours of scanning and 196 individual fish
  - The majority of fish (179) were Razorback Sucker and 17 were Bonytail

Acknowledgements

- John Naugle
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