

# Razorback Sucker research and monitoring in Lake Mead, Nevada and Arizona



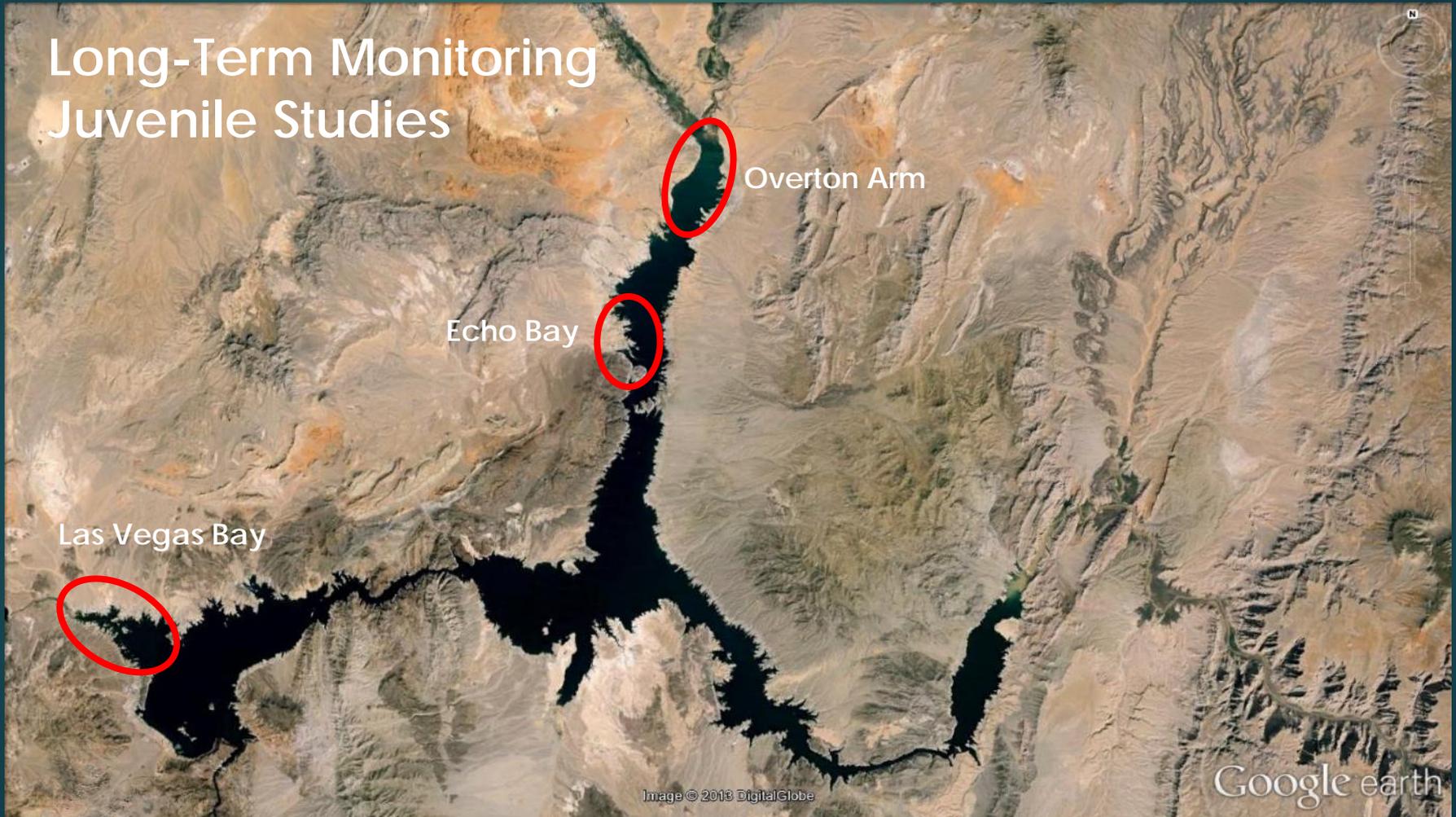
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# Introduction

- ▶ Razorback suckers
  - ▶ Fluvial – big river fish
    - ▶ Off channel habitats (backwaters, flooded wetlands, oxbows)
  - ▶ Adapted to the lacustrine environment
- ▶ Lake Mead
  - ▶ Many non-natives
  - ▶ Unique in terms of annual, natural recruitment



# Overview: Study Sites



# LTM Methods

## Field

- ▶ Sonic telemetry
- ▶ Trammel netting
- ▶ Larval sampling

## Laboratory

- ▶ Age determination
- ▶ Survival estimation
- ▶ Population estimation



# Sonic Telemetry

- ▶ 20/25 sonic fish contacted (from 2011, 2012, and 2014 tagging events)
- ▶ 105 active contacts (key for field crews)
- ▶ 27,829 passive contacts (important for large-scale, and constant tracking)
- ▶ Lake wide movement patterns: CRI to OA to LVB



# Adult Sampling

- ▶ 22 captures: 12 recaptures (54.5%)
- ▶ 42% female, 58 % male

## Las Vegas Bay

- ▶ 2 new females, 12 net-nights

## Echo Bay

- ▶ 1 recaptured female, 14 net-nights
- ▶ 2 Flannelmouth Suckers

## Overton Arm

- ▶ 19 cap (8 new, 11 recap), 12 net-nights
- ▶ 9 females, 9 males and one juvenile (221 mm TL)
- ▶ 2 Flannelmouth Suckers



# Larval Sampling

## Las Vegas Bay

- ▶ 104 larval fish
- ▶ 2/2/15 1st capture (18°C)
- ▶ CPM: 2015 = 0.217 (18-22 °C)

## Echo Bay

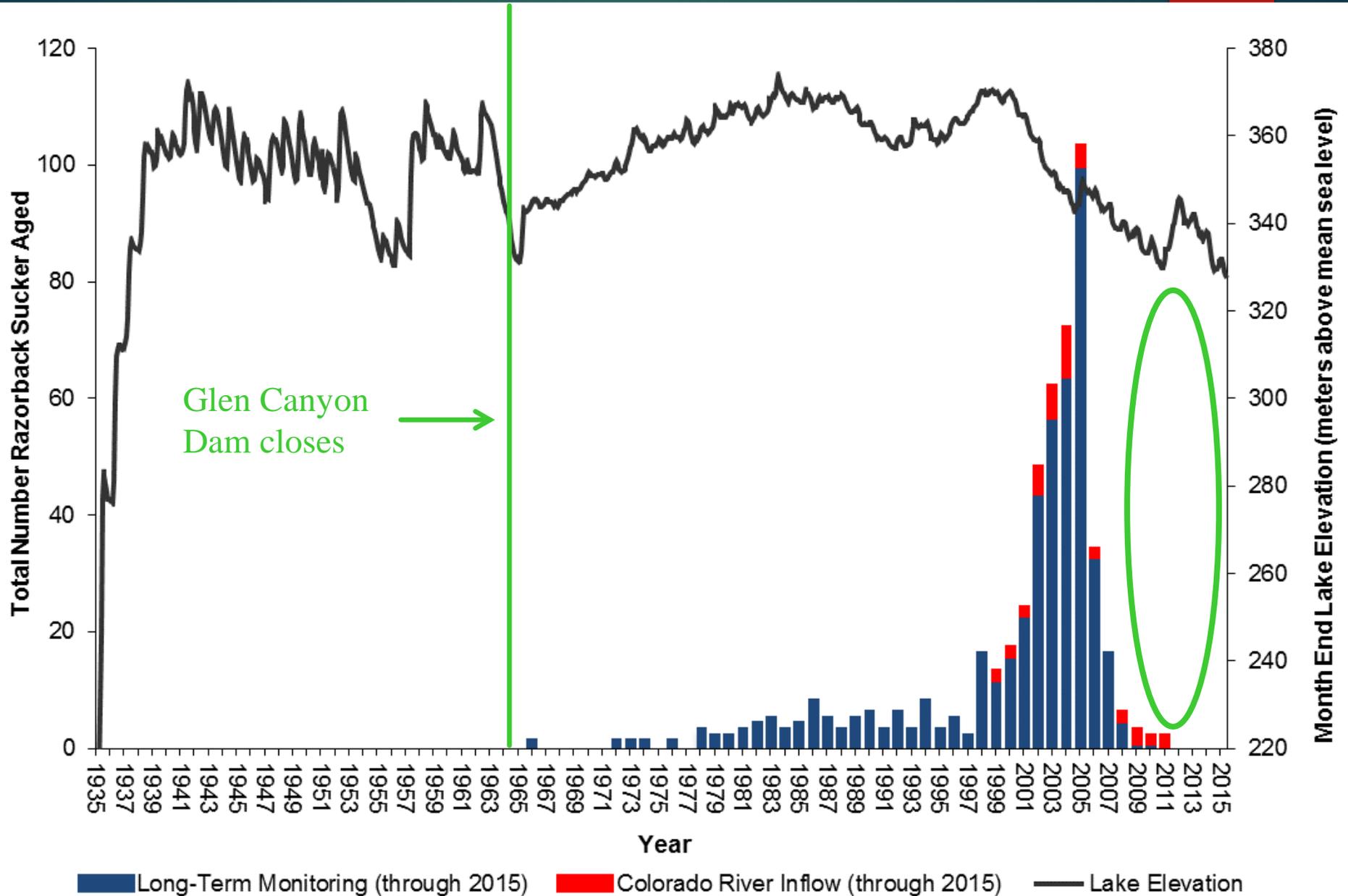
- ▶ 137 larval fish
- ▶ 2/18/15 1st capture (15 °C)
- ▶ CPM: 2015 = 0.193 (14-21 °C)

## Overton Arm

- ▶ 98 larval fish
- ▶ 3/17/15 1st capture (20 °C)
- ▶ CPM: 2015 = 0.218 (20-23 °C)



# Aging and Recruitment



# Summary



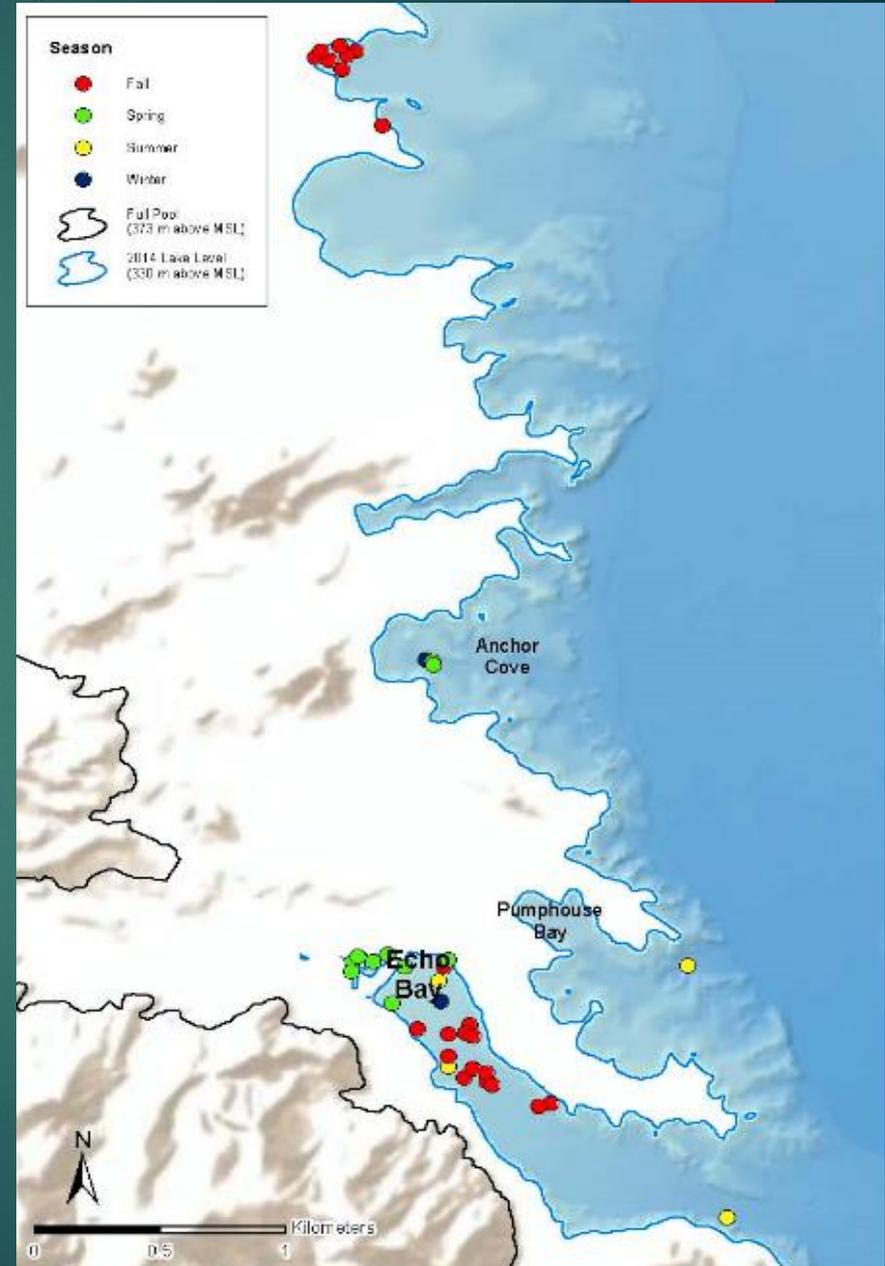
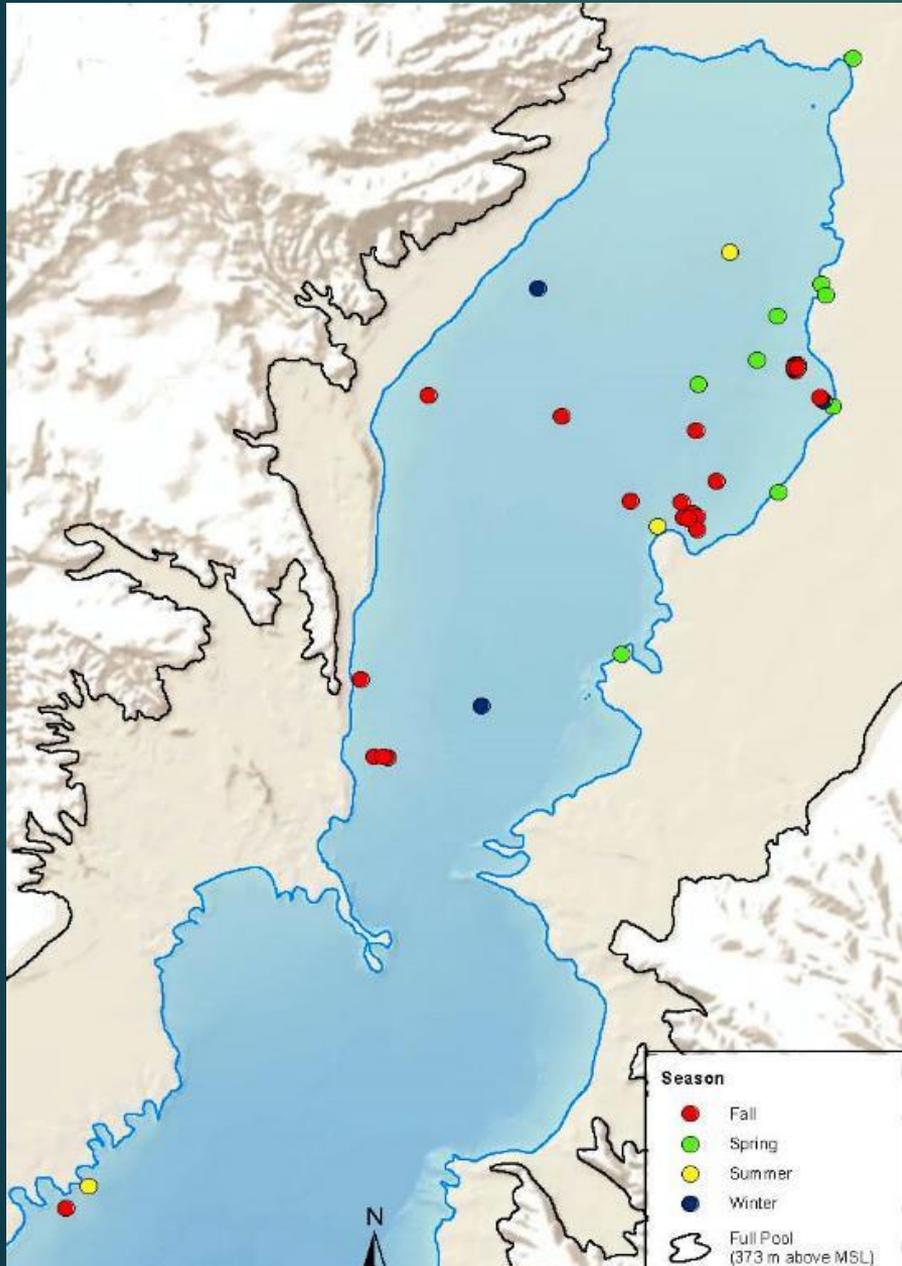
- ▶ 19<sup>th</sup> year of study (1996-2015)
- ▶ 93 sonic-tagged individuals in LTM
- ▶ 1,118 total captures of 665 unique individuals in LTM
- ▶ 478 individuals aged, 2-35+ years old in LTM
- ▶ Known, established reproduction in Las Vegas Bay (LB), Echo Bay (EB), and the Muddy River/Virgin River inflow area (OA)
- ▶ Annual, natural recruitment

# Methods: Juvenile Studies

- ▶ Sonic-tagged, stocked juveniles
  - ▶ Detail seasonal movements
  - ▶ Habitat associations
    - ▶ Vegetation, turbidity, substrate, depth, etc.
  - ▶ Local community assemblage
    - ▶ Netting, electrofishing, and trapping efforts
  - ▶ Determine factors that likely benefit recruitment.



# Sonic Telemetry: Juvenile



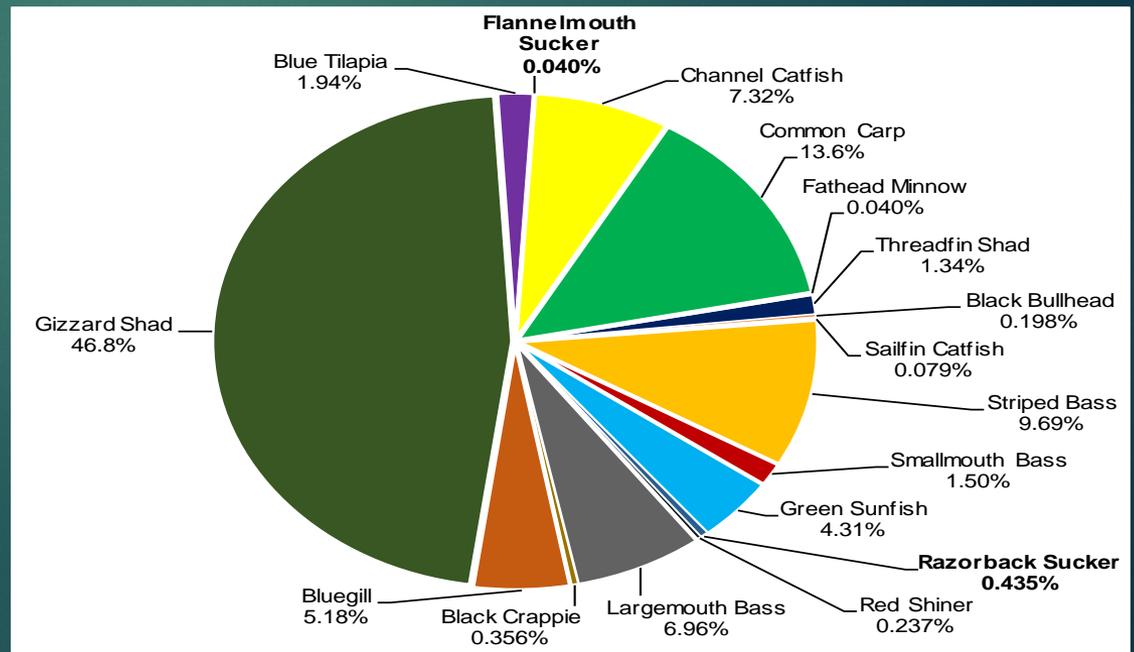
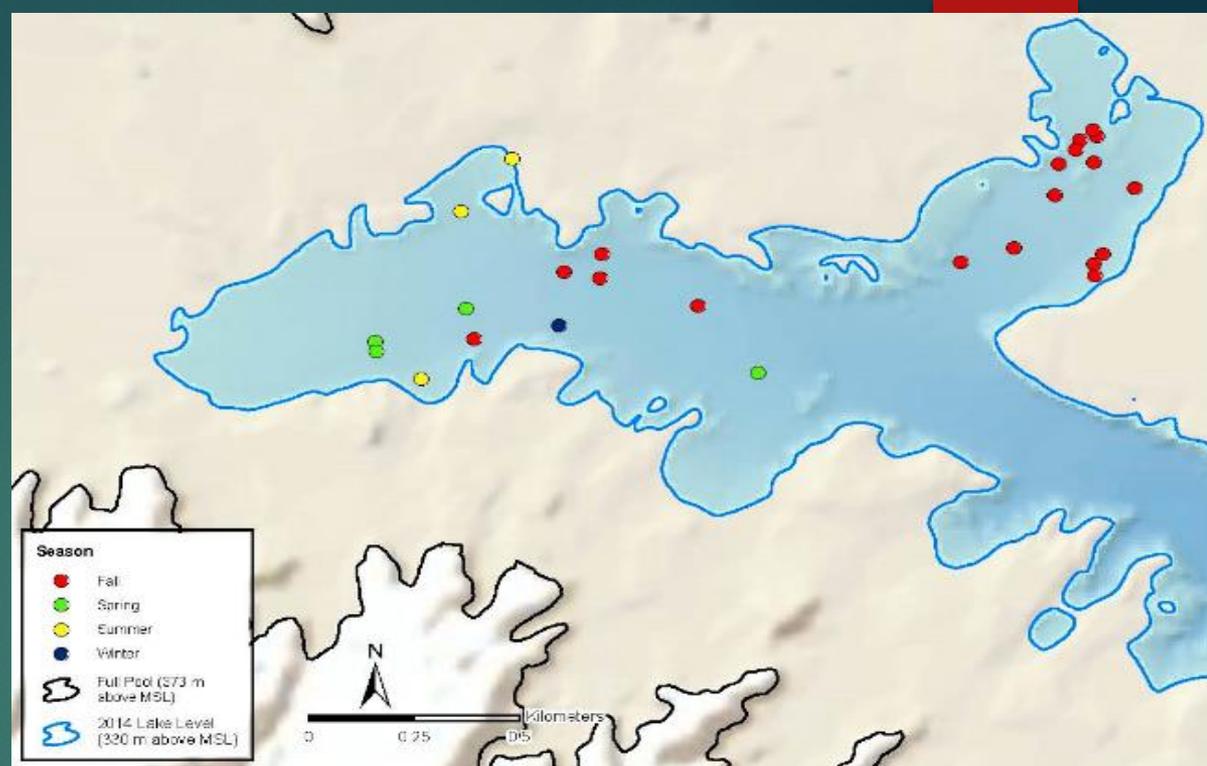
# Sonic Telemetry and Fish Community Assemblage

## ▶ Habitat Associations

- ▶ All juveniles remained in highly turbid areas
- ▶ Short-distance seasonal movements (temperature)
- ▶ Silt bottom, vegetation

## ▶ Fish Community

- ▶ High % of non-predatory
  - ▶ Competitors
- ▶ Lower % of predatory



# Fish Community

- ▶ Predation certainly occurs
- ▶ Set nets on fish 3065
  - ▶ Among the usual assemblage, two 18 inch smallmouth
- ▶ Tag recovered
- ▶ First documented case of predation
  - ▶ Aging data confirms recruitment
  - ▶ Some years are better than others
    - ▶ Currently looking into factors that may be benefitting recruitment during some years.



# Continuing efforts



- ▶ Long-term monitoring will commence next week
  - ▶ Trammel Netting
  - ▶ Sonic Tracking
  - ▶ Larval sampling
- ▶ Juvenile
  - ▶ Winter is last round of intensive community sampling under current plan
  - ▶ Implanted/released 7 juveniles in December
    - ▶ Sonic tracking
      - ▶ Habitat variables
    - ▶ Netting in close proximity
      - ▶ Catch wild juveniles

# Questions?



**Lake Mead Workgroup**

