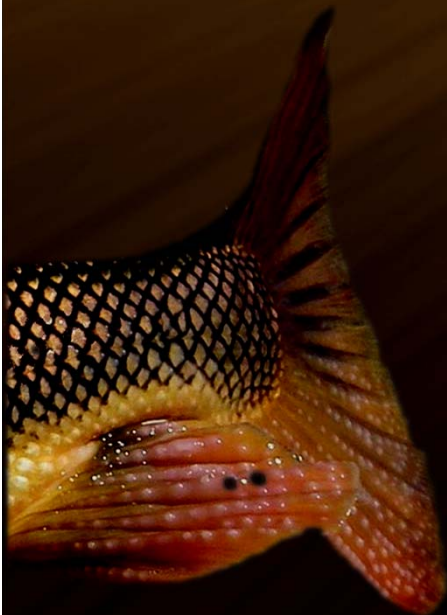


**Illuminating the depths:  
2010-2011 long-term monitoring  
studies of razorback sucker on  
Lake Mead, Nevada**

Zachary Shattuck, Brandon Albrecht,  
Ronald Rogers, and Paul Holden



# Objectives

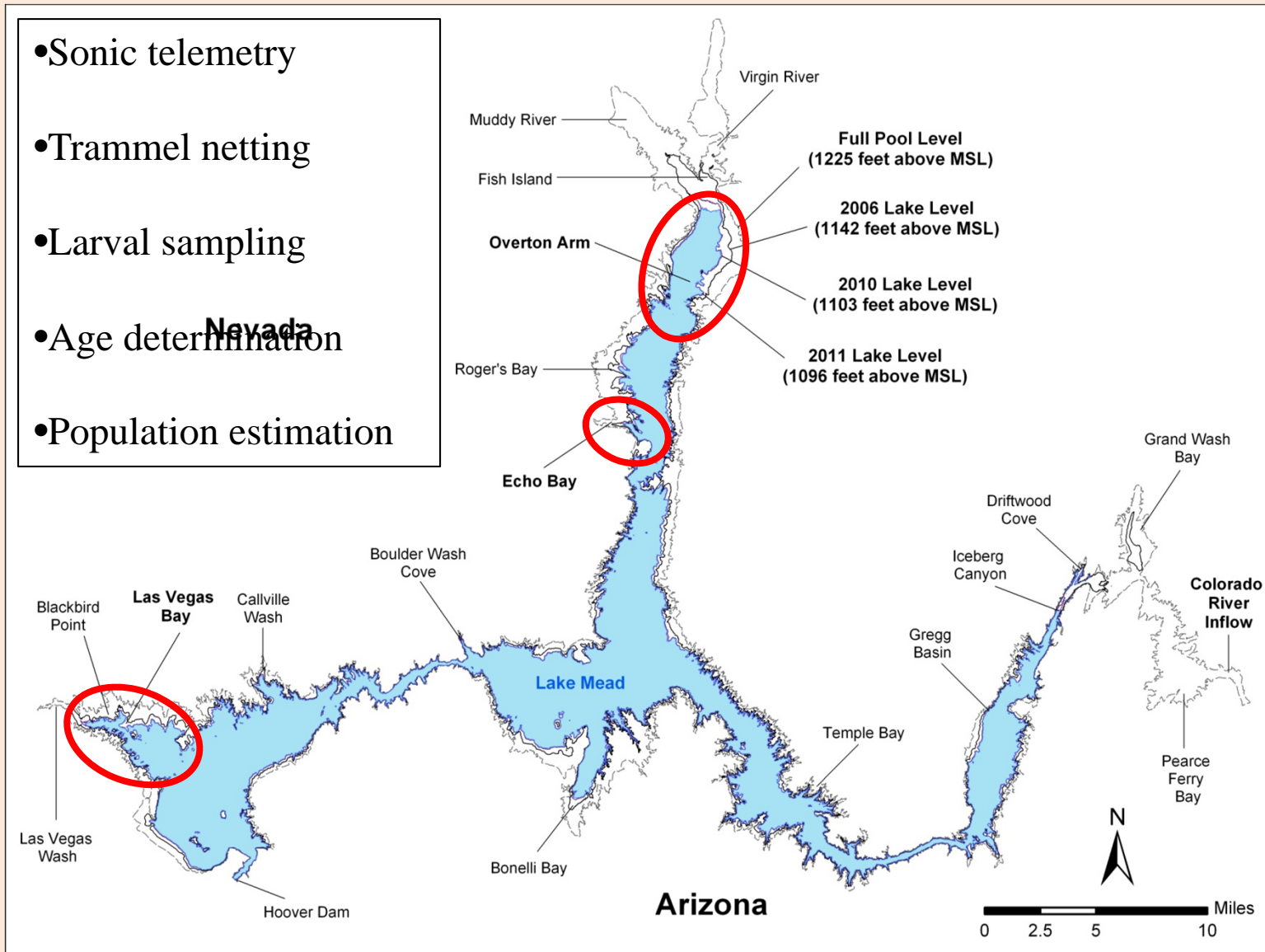
- Spatiotemporal patterns of adult razorback sucker habitat use in Lake Mead
- Life history characteristics of razorback sucker specific to Lake Mead
- Population size and age structure of razorback sucker in Lake Mead

# Overview

- 15<sup>th</sup> year of study (1996-2011)
- To date: 807 individuals, 323 recaptures
- To date: 360 aged, 2-36 years old
- Established reproduction in
  - Las Vegas Bay (LB)
  - Echo Bay (EB)
  - Virgin River/Muddy River inflow (OA)

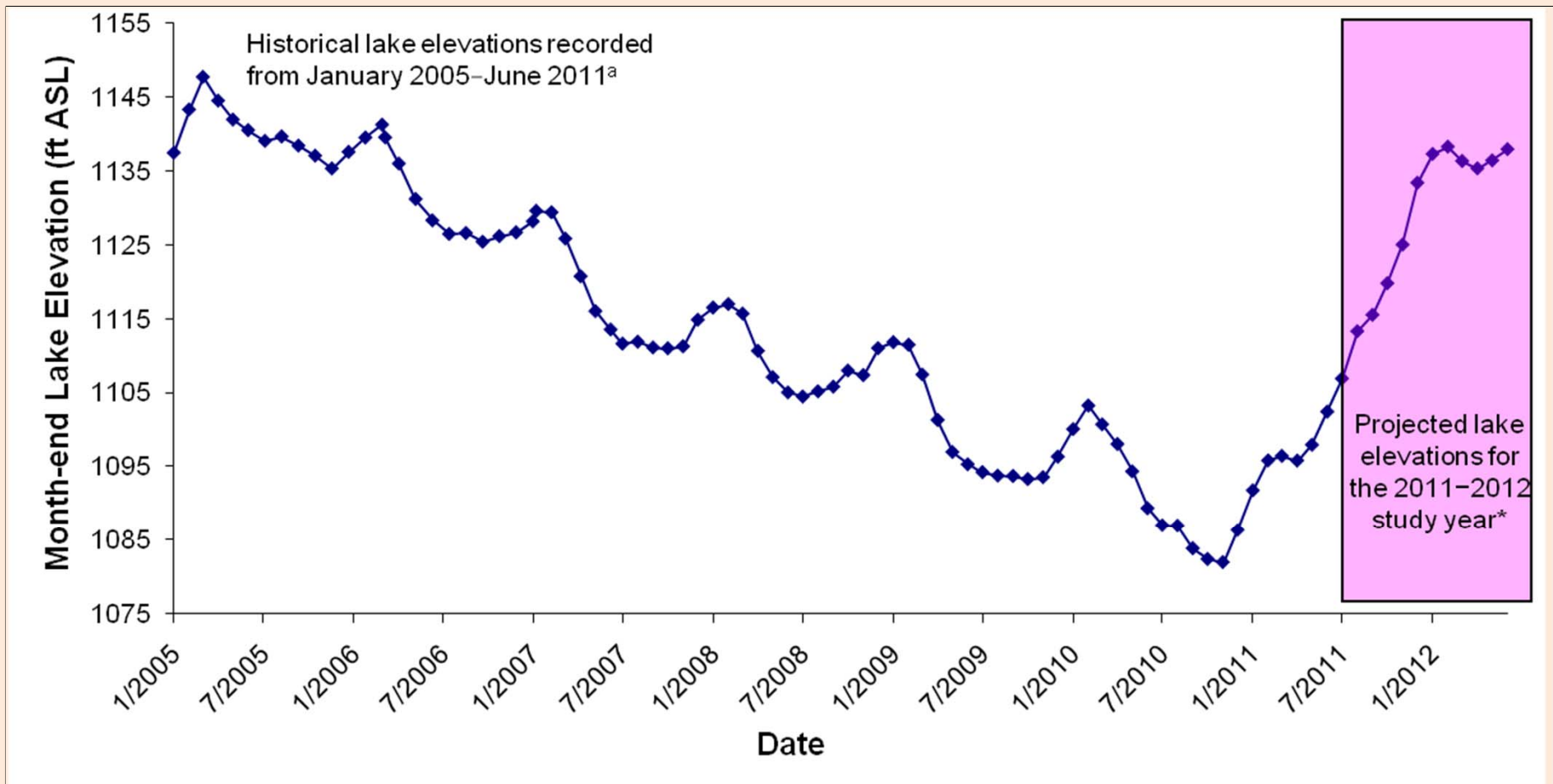
# Methods / Study Area

- Sonic telemetry
- Trammel netting
- Larval sampling
- Age determination
- Population estimation

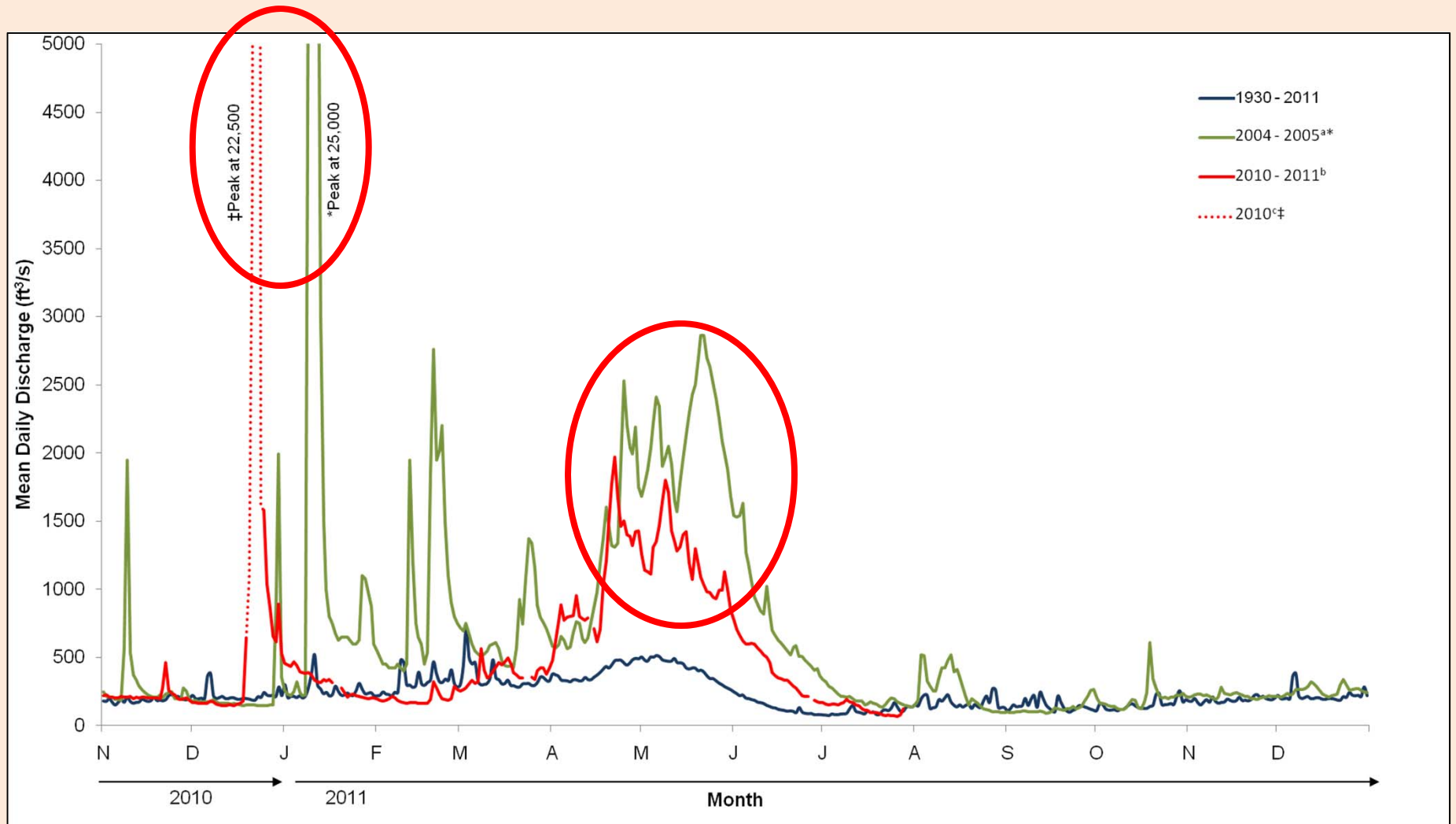


# Lake Mead Conditions

- 1,092 ft – January 2011, **1,133 ft** – January 2012



# Virgin River Conditions



# Sonic Telemetry 2010-2011

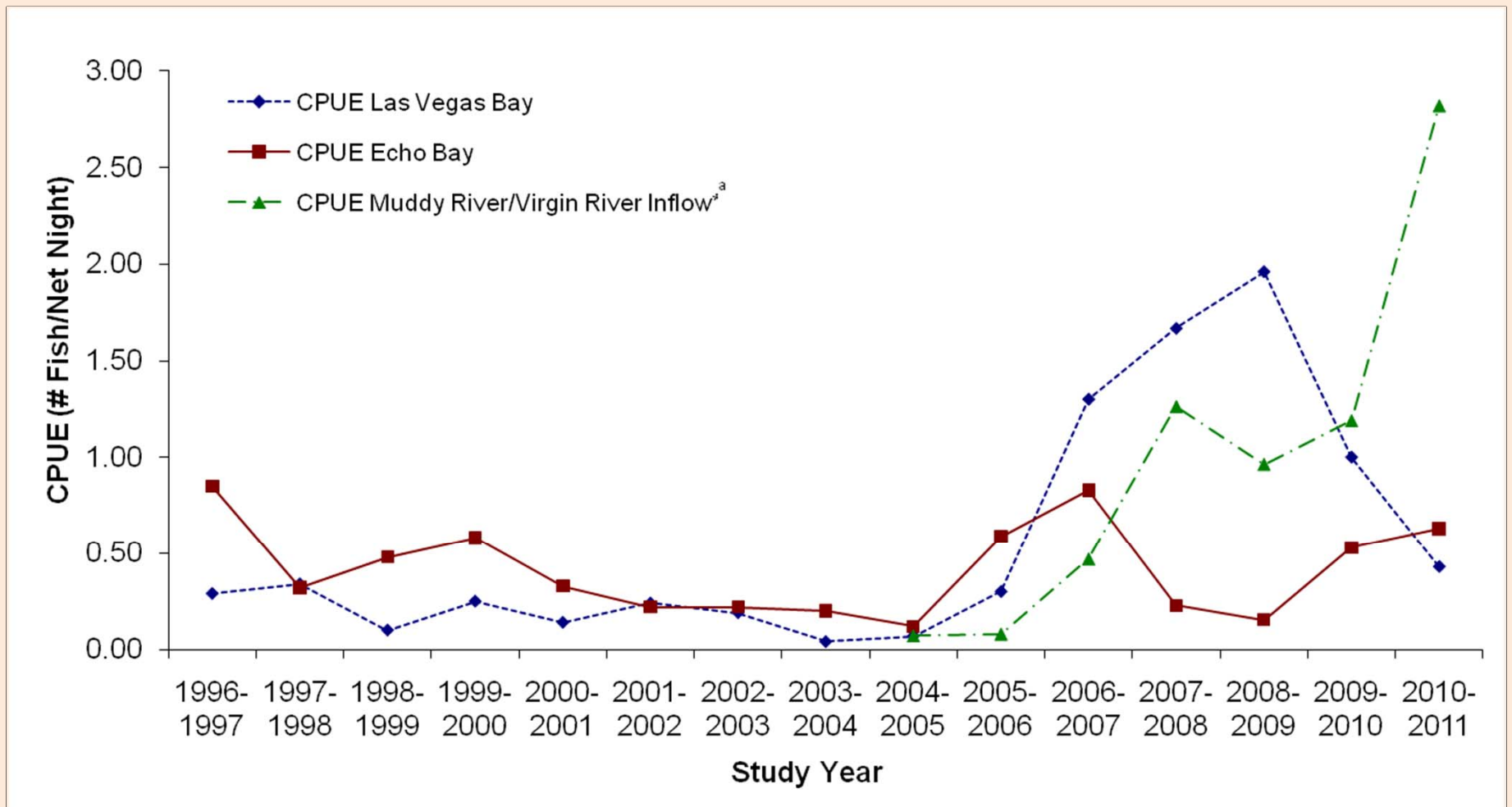
- 180 contacts
  - 8 new sonic-tagged individuals stocked 1/2011
    - 4 in LB, 4 in OA
  - 5 from 2008 individuals
- 2 additional contacts by SURs (BB, EB)
- Return of older sonic individuals in LB, EB, OA
- Difficulties with tracking inflows
  - Las Vegas Wash, Virgin River/Muddy River inflow
- Connectivity between OA and EB

# Adult Sampling 2010-2011

- 67 net-nights = **86 total captures** (14 recaptures)
- Las Vegas Bay (24 net-nights, 9 captures [1 recapture])
  - 50% F, 50% M, **5 subadults**
  - 2011 CPUE = 0.43 fish/net-night
- Echo Bay (24 net-nights, 15 captures [6 recaptures])
  - 26.67% F, 73.33% M
  - 2011 CPUE = 0.63 fish/net-night
- Overton Arm (21 net-nights, **62 captures** [7 recaptures])
  - 53.23% F, 46.77% M
  - 2011 CPUE = 2.82 fish/net-night, **record high CPUE**
- 2 flannelmouth suckers (\*LB, OA)



# Adult Sampling 2010-2011



# Adult Sampling 2010-2011

- Growth
  - 14 recaptures, only 6 available for use in growth
    - 365 days since last capture
  - Lake-wide mean annual growth = 24.7 mm/year
  - Wild fish mean annual growth = 19.3 mm/year
  - Stocked fish mean annual growth = 35.5 mm/year

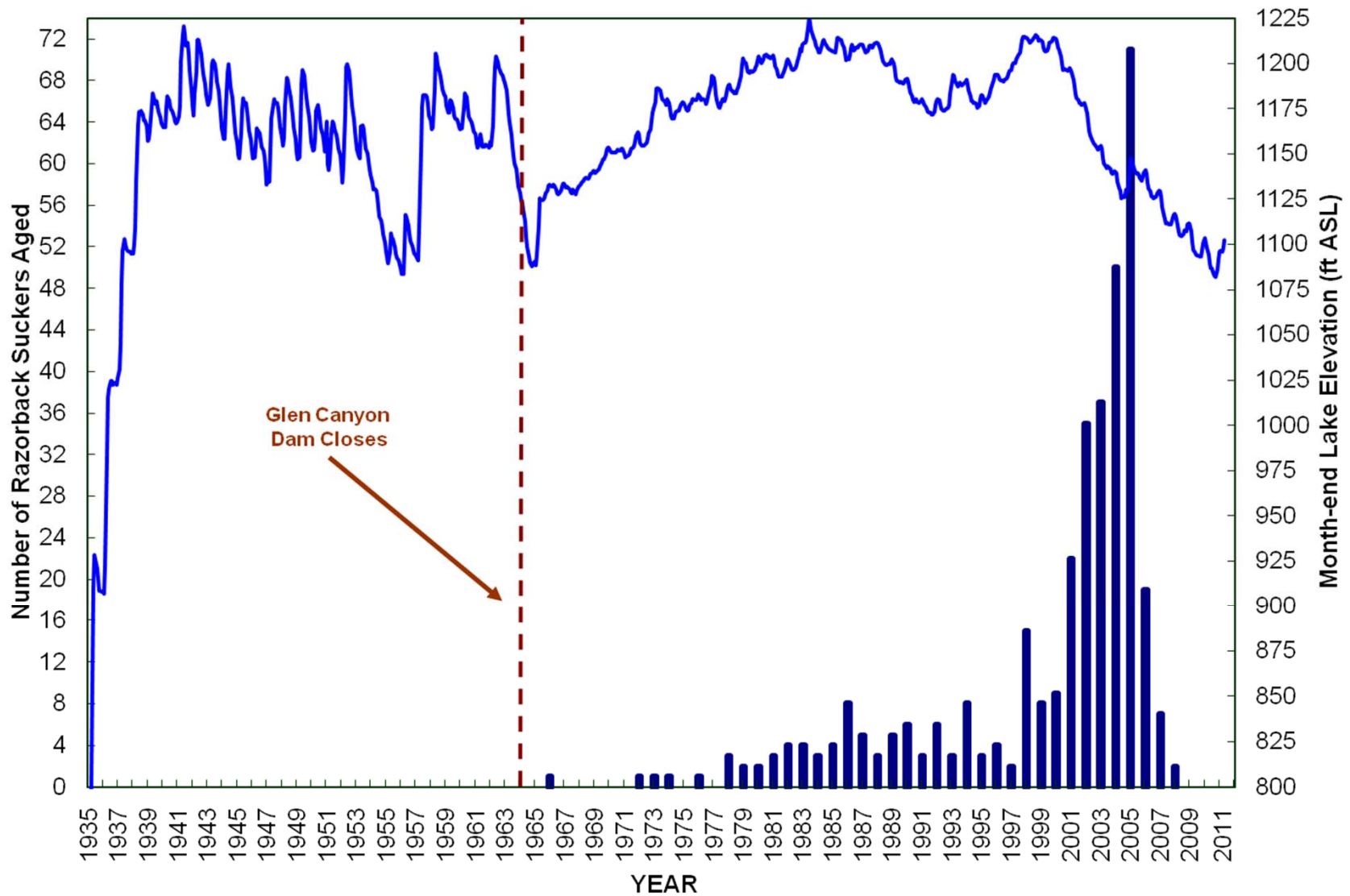
# Larval Sampling 2010-2011

- 4,288 collected from combined sites
- Las Vegas Bay (449 collected in 1,590 min)
  - CPM = 0.282,
  - majority on S shore (2/24 – 4/12 at 15-21°C)
- Echo Bay (3,818 collected in 2,577 min)
  - CPM = 1.482,
  - majority on N shore (3/1 – 4/26 at 12-19°C)
- Overton Arm (21 collected in 1,596 min)
  - CPM = 0.013,
  - majority on NW point of Meadows area (3/22 – 4/27 at 14-20°C)

# Aging & Recruitment

- 360 individuals aged to date, 73 aged in 2011
- 72.6% ( $n = 53$ ) were 7 years or younger
- Remaining ( $n = 20$ ) were aged 8-12 years
- Oldest individual (12 years), TL = 574mm
- Youngest individuals (3 years), TL = 383 mm
- Strong year-class for 2005

# Aging & Recruitment



# Discussion

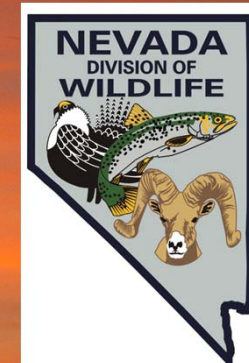
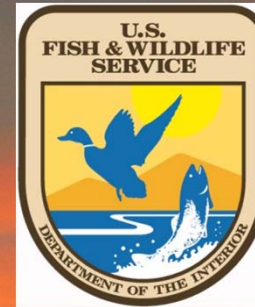
- 2011 was exceptional
  - Record adult catch rates in OA
  - return to past larval catch rates in EB
- Unique population at Lake Mead
  - young, recruiting, and resilient
- 2011 population estimate increasing
  - EB & OA: 737-1568
  - LB: 107-167
  - Lake-wide: 733-1038

# Discussion

- Recruitment occurs at a variety of lake levels
  - Presence of new, wild individuals near annually
- Opportunity with subadults
  - With potential for increased recruits, it could be an advantageous time to study this life stage
- 2005 year-class
  - Ideal conditions for strong recruitment in 2005, 2011?
  - Exponential increase in numbers of potential recruits for 2016-2017?



# Acknowledgements



Lake Mead Workgroup