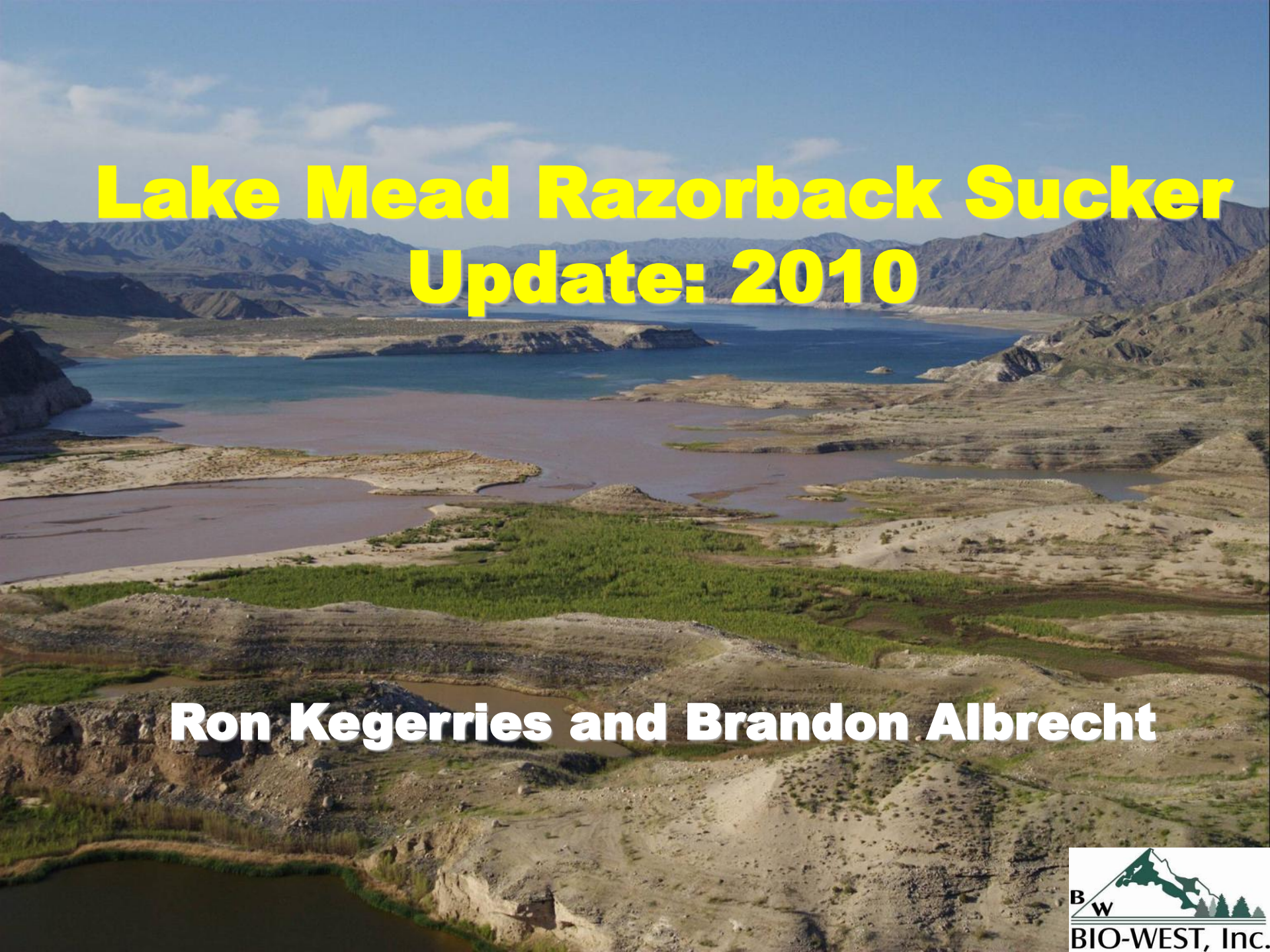


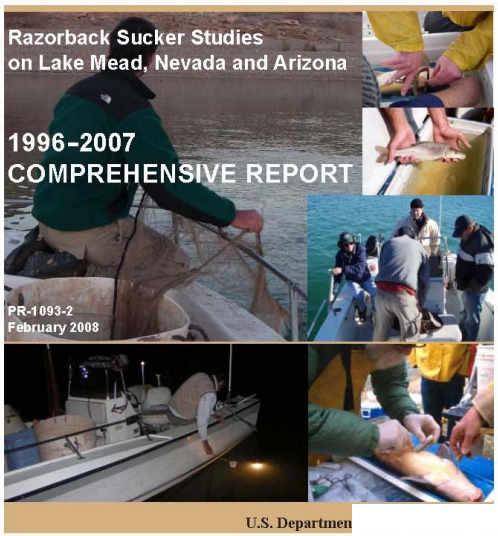
Lake Mead Razorback Sucker Update: 2010

Ron Kegerries and Brandon Albrecht

BIO-WEST, Inc.

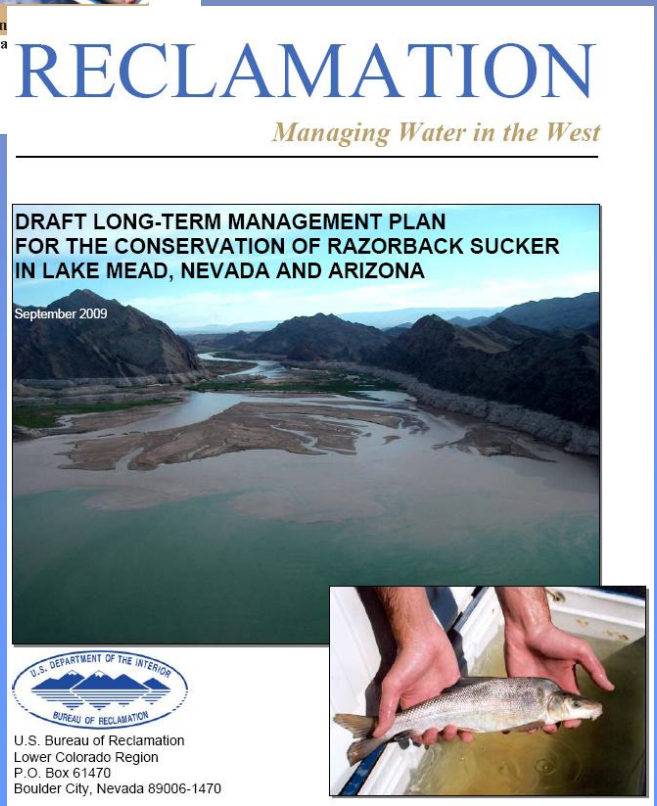
Colorado Inflow Activities

- Golden and Holden's studies on cover in Lake Mead and Lake Mohave.
- Conditions similar to that of Las Vegas Bay and the MR/VR inflow.
- Larval razorback found in the CRI area in 2000 and 2001.
- Most recently the capture of one adult razorback near the CRI in 2008.
- USFWS Biological Opinion



2008 comprehensive report

- Provides an overview of our findings since 1996
- Recommends ways of gaining further understanding of razorbacks in Lake Mead and how this population may provide recovery insights for other populations in other locations



Management Plan:

- Positive indication of management progression
- LCR MSCP funded
- Plan of attack for Lake Mead razorbacks
- Living document
- Road map for recovery


TASKS
ongoing
proposed future
Ongoing Task 1: Monitor Existing Populations
Conduct trammel netting.
Age fish.
Conduct larval surveys.
Conduct sonic telemetry.
Collect larvae.
Ongoing Task 2: Rear Razorback Sucker
NDOW LAKE MEAD HATCHERY
Rear larvae.
Study exercise impact.
Stock adults (for propagation).
Utilize adults for sonic telemetry.
FLOYD LAMB STATE PARK
Rear adults.
Stock adults.
Utilize adults for sonic telemetry.
OVERTON PONDS
Rear adults.
Stock adults.
Utilize adults for sonic telemetry.
LAKE MEAD WORKGROUP
GOAL:
Conserve razorback sucker in Lake Mead and contribute to species recovery.
Ongoing Task 3: Conduct Colorado Inflow Study
Conduct sonic telemetry.
Conduct trammel netting.
Conduct larval surveys.
Age fish.
Future Task 1: Explore Other Locations in Lake Mead for Existing Populations
Conduct sonic telemetry.
Conduct larval surveys.
Conduct trammel netting.
Age fish.
Collect larvae.
Future Task 2: Add New Populations in Lake Mead
Locate suitable areas.
Stock adults that will spawn and imprint young.
Monitor new areas.
Future Task 3: Conduct Research to Determine Reasons for Recruitment
Monitor water quality, turbidity, spawning substrate, and vegetation.
Conduct nonnative fish monitoring.
Investigate population models.
Investigate otolith chemistry.
Conduct pheromone study.

Methods of Investigation

Efforts were initiated on: February 23, 2010

1. Sonic telemetry
2. Larval sucker sampling
3. Trammel Netting

Methods refined over 14 years of sampling for razorback sucker and similar to those used to locate the population at the Muddy River/Virgin River Inflow area

Sonic Telemetry Highlights

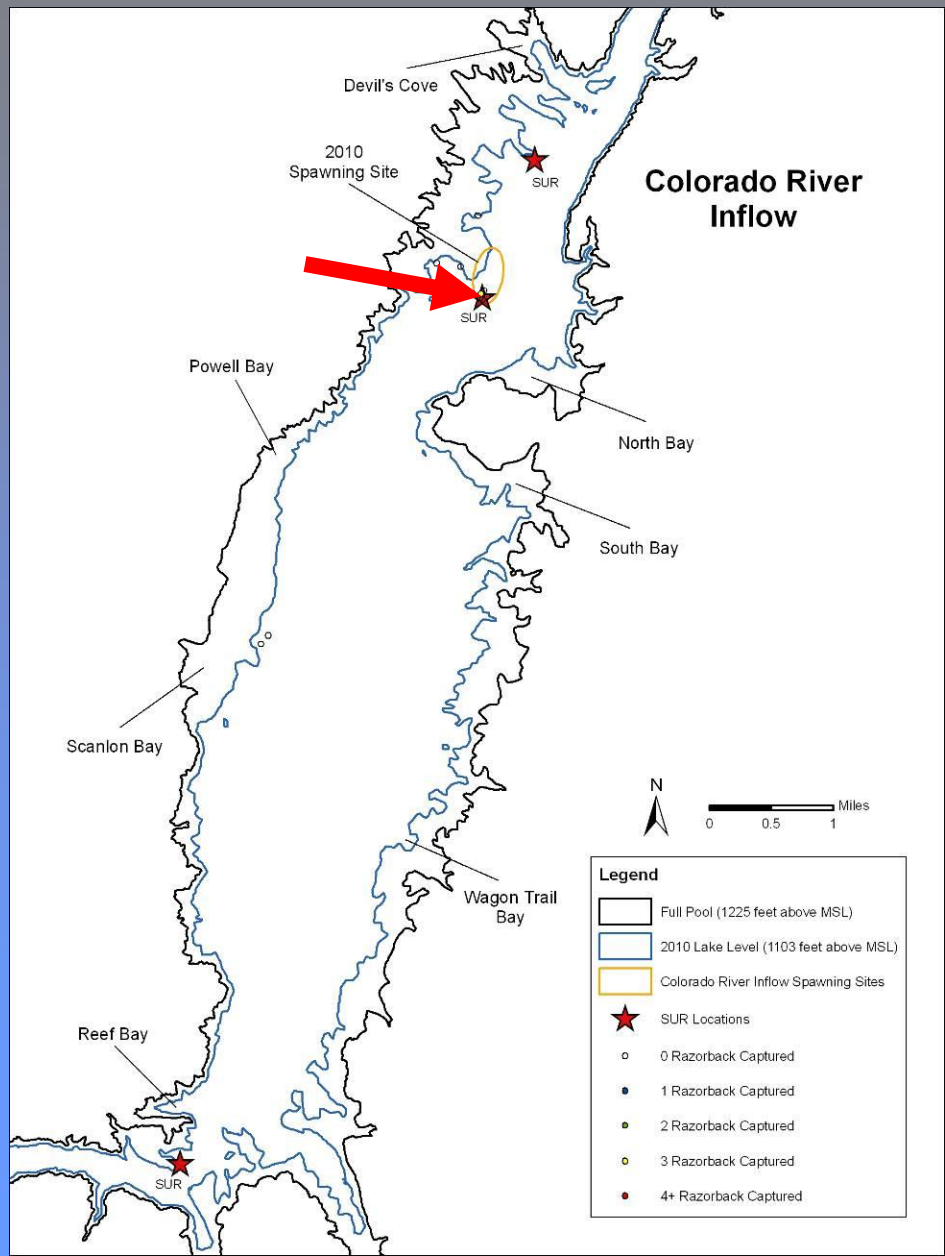
- Fish from Scanlon Bay (Gregg Basin) quickly joined the inflow fish
- Movement occurred within Gregg Basin and even up the Colorado River
- Fish were found in aggregate on a couple of occasions near the small island South of the inflow leading to adult captures.
- Two sonic fish (1-LVB, 1-MR/VR) were located within the CRI area.
- It was noted that fish utilize the deep channel when moving long distances.
- Seven active CRI still remain plus the two tagged fish from previous stockings.
- SUR data provided 9,201 detections recording data on fish movement when crews weren't on the lake.

Larval Sampling

- Initiated on March 9, 2010
- Both systematic, basin-wide sampling and targeted sampling
- 7 razorback sucker larvae collected on April 13, 2010
- 1 flannelmouth and 4 suspected hybrids
- Water temp. 14-16˚C
- CPM 0.002 for RZ

Trammel Netting

- Netting efforts initiated on March 24, 2010
- Efforts focused on sonic fish and/or larval fish presence
- 3 wild razorback sucker captured (2-6 years old, 1-11 years old)
- 4 hybrid razorback/flannelmouth sucker captured
- 52 flannelmouth sucker captured
- All razorback sucker captured April 20, 2010
- Hybrid sucker captured April 7-20, 2010
- Flannelmouth sucker captured April 8-May 25, 2010



Summary items and highlights from CRI, 2010

- **Identified the presence of wild, ripe razorback sucker at the Colorado Inflow area of Lake Mead!**
- Captured 3 adult razorback sucker
- Captured 7 larval razorback sucker
- Documented wild, adult razorback sucker in spawning condition
- Successfully stocked and tracked 8 sonic tagged fish leading us to wild razorback sucker
- Documented movement and the use of the Colorado River by stocked razorbacks
- Documented hybridization and the presence of flannelmouth within the Colorado Inflow area
- Confirmed that current methodologies for finding new populations of razorback sucker within Lake Mead are feasible and effective.

What effect will these fish have on the overall population size?

How many razorbacks use the CRI area and what is the population size?

How important is the CRI to flannelmouth?

Can razorbacks be found continually at the CRI?

Are recruitment patterns similar to those of other areas of Lake Mead?

Extent of hybridization?

Does the CRI produce larval fish annually?

Are there juvenile razorbacks present?

Can we obtain enough aging data to assess the age structure of this population?

Can enough individuals be collected and marked to estimate population size?

Do these razorback sucker utilize similar habitats to the other Lake Mead razorbacks?

Can what we have learned be applied throughout the Colorado River basin?

Colorado Inflow Recommended Work Plan

- Increase efforts (time and manpower) at the CRI.
  - Anticipate nearly doubling the effort spent tracking, larval sampling, and netting.
  - An effort to indentify spawning in 2011 (can we repeat or better results from 2010?).
  - Understand razorback sucker habitat use within the CRI.
  - Identify other spawning sites within or adjacent to the CRI.
  - Track fish within the river and better understand movement and habitat use throughout the river/lake interface.
  - Begin to start answering these new questions and prioritize or focus future studies.
- Search for avenues to investigate physicochemical and biological factors that allow for razorback sucker recruitment in Lake Mead (i.e., why).

Long Term Monitoring Highlights

To date:

102 wild, young, sexually immature (subadult) razorback sucker collected at Lake Mead.

The trend:

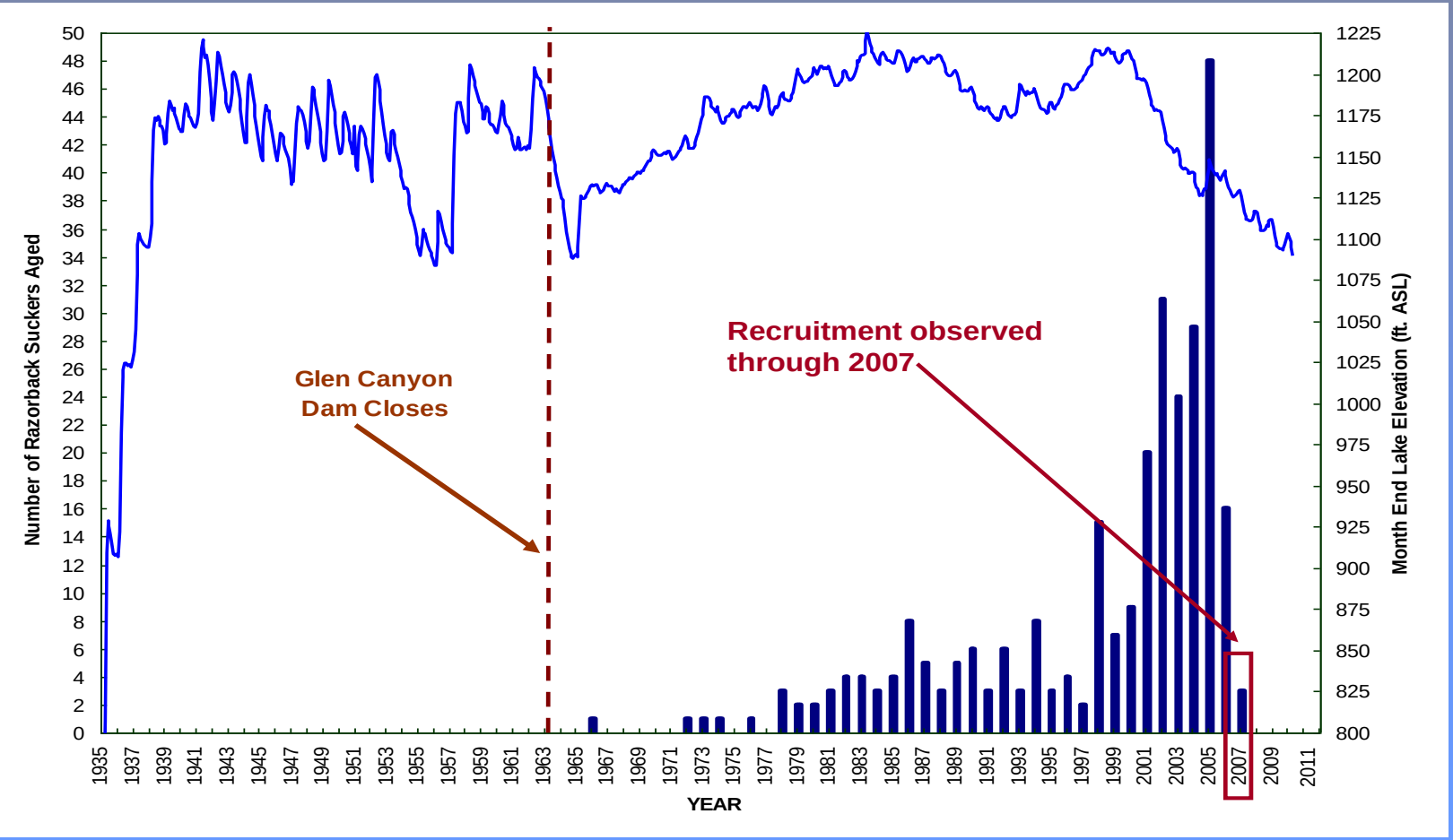
1996-1997 (2 yrs) = 4 subadults

1998-2005 (8 yrs) = 17 subadults

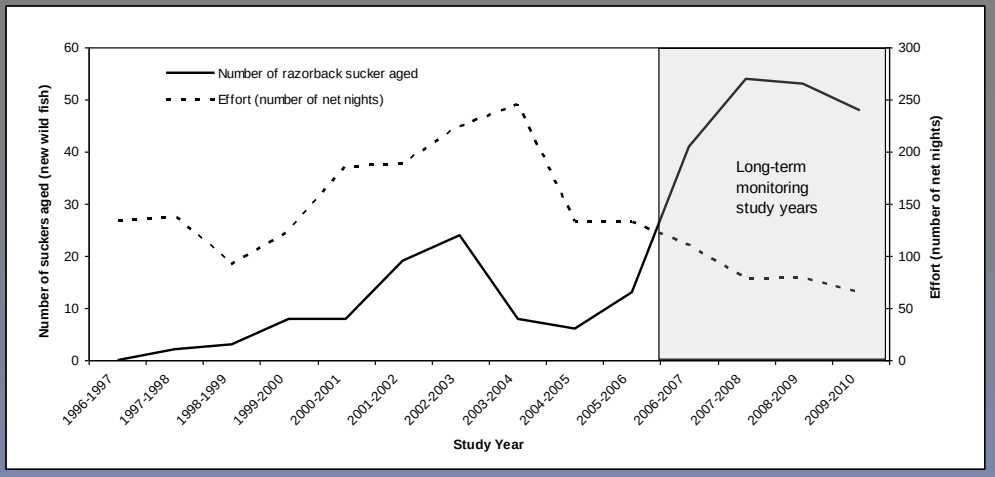
2006-2010 (5 yrs) = 81 subadults

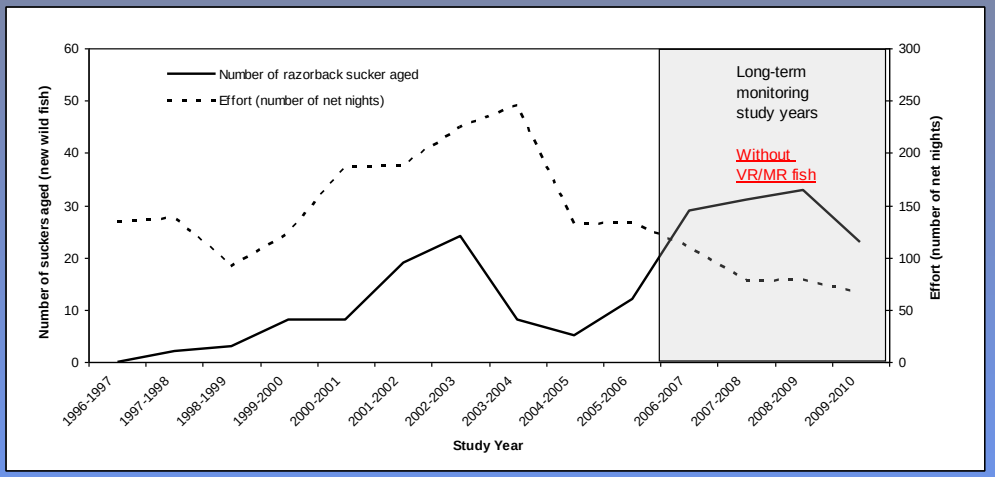
Razorback Sucker Age Structure: Long Term Monitoring

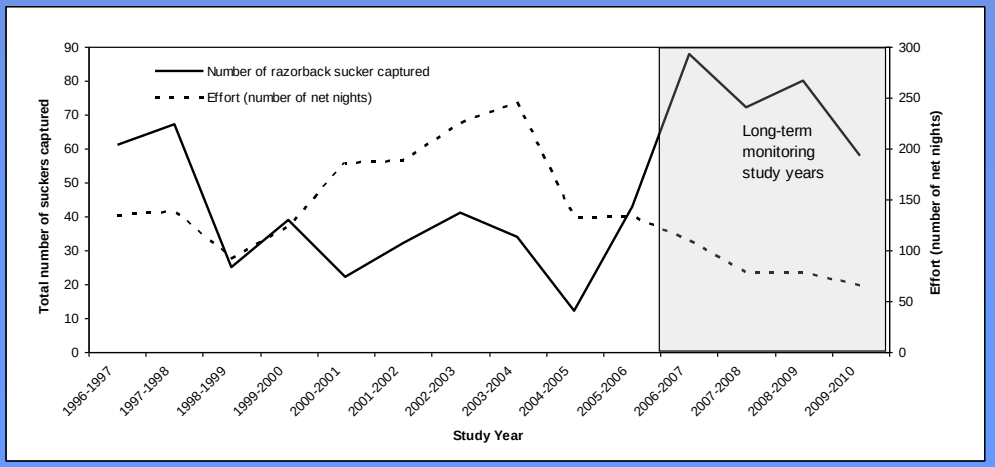
- Lake Mead hydrograph with number of aged razorback sucker spawned per year <u>lakewide</u>



Long Term Monitoring Cont.







Catch and effort comparisons:

1. New, young, aged fish
2. New, young, aged fish minus MR/VR (i.e., the magic is not just happing at the MR/VR inflow)
3. Total razorback sucker captures

The Bottom line…

increasing catch rates despite reduced effort associated with switch to “long-term” monitoring

THANK YOU!

- Lake Mead Work Group
- US Bureau of Reclamation (MSCP)
- Southern Nevada Water Authority
- Nevada Department of Wildlife
- Arizona Game and Fish
- US Fish and Wildlife Service
- US National Park Service

Questions?