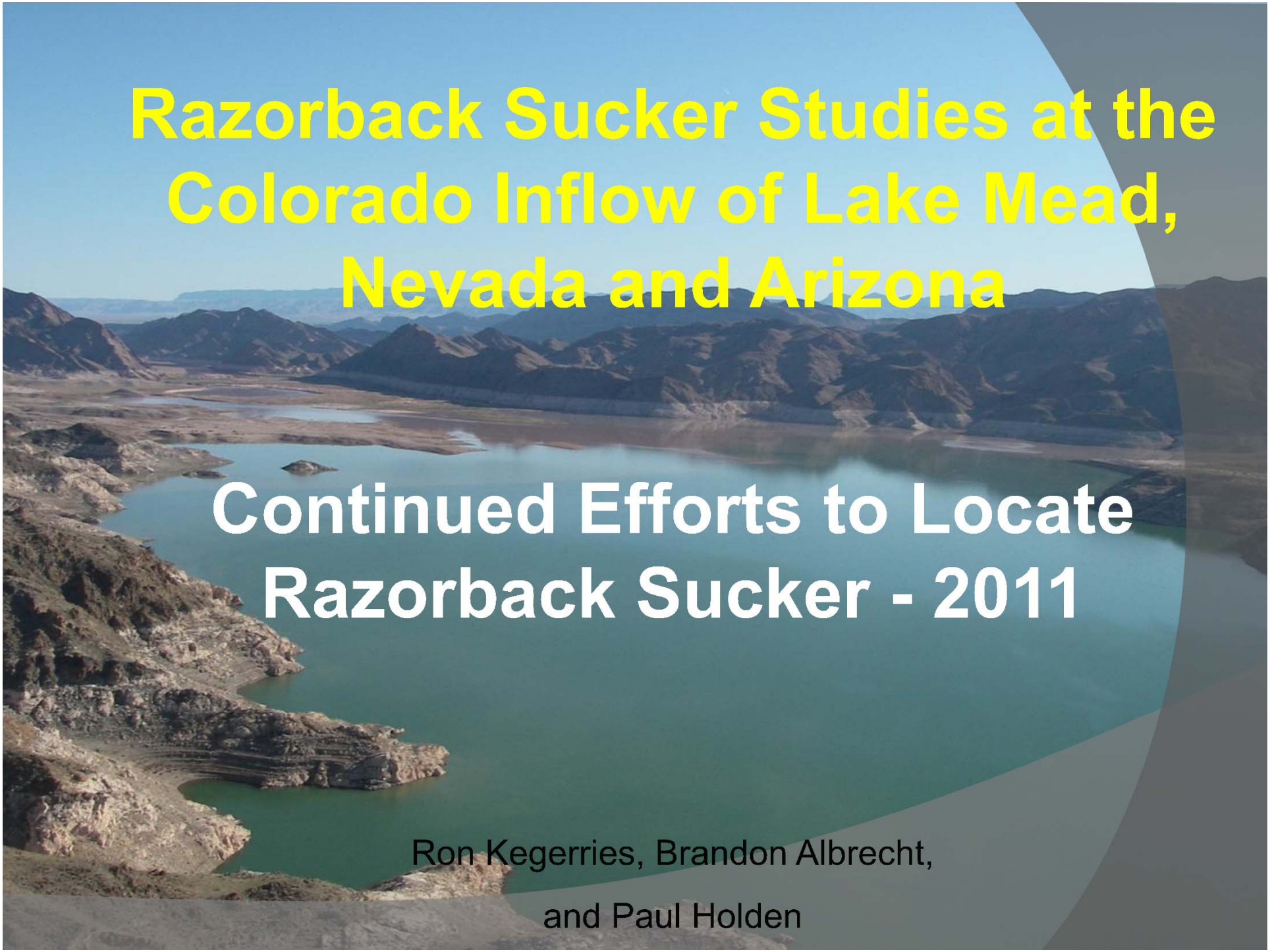


Razorback Sucker Studies at the Colorado Inflow of Lake Mead, Nevada and Arizona

Continued Efforts to Locate Razorback Sucker - 2011

Ron Kegerries, Brandon Albrecht,

and Paul Holden

Acknowledgements

- US Bureau of Reclamation (LCR MSCP, UCRB)
- Nevada Department of Wildlife
- Arizona Game and Fish
- US Fish and Wildlife Service
- US National Park Service
- Lake Mead Workgroup

2011 Objectives

- Mark captured juvenile and adult razorback suckers for individual identification using passive integrated transponder (PIT) tags.
- Use a combination of sonic-telemetry data, larval razorback sucker capture-location information, and juvenile/adult razorback sucker netting data to determine habitat use of this unique population.
- Use nonlethal aging techniques to characterize the age structure and potential recruitment patterns associated with a razorback sucker population in the CRI.
- Double the effort and manpower from 2010 to capitalize on sampling opportunity.


Lake Mead
Devil's Cove
Second Rapid
2010
Spawning Site
First Rapid
River/Lake Interface
2011
Spawning Site
Sunfish Cove
"Lunch Cove"
Crappie Cove
Powell Bay
North Bay
Sandy Point
South Bay
Colorado River
Inflow
Gregg Basin
Scanlon Bay
N
Miles
0
0.5
1
Wagon Trail Bay
Legend
Full Pool (1225 feet above MSL)
2011 Lake Level (1096 feet above MSL)
Colorado River Inflow Spawning Sites
SUR Locations
Sonic Release Site
Radio Release Site
Reef Bay
Narrows

Colorado River inflow

Colorado River Inflow Telemetry

- Efforts were initiated on: January 5, 2011
- Eight Floyd Lamb State Park razorback sucker were implanted with tags and released at the CRI
  - 4 Sonic Tags [Sonic], 4 Combination Sonic/Radio Tags [Radio]
  - Sonic fish released at the Colorado River inflow
  - Radio fish released up in the flowing portion of the river
- Deployed 2 SURs (“Narrows” and Sandy Point)

Sonic fish movement and habitat use

- 17 sonic-tagged fish were contacted more than 42,000 times (302 manual, 42,026 SUR).
- Particularly heavy use was observed at or near the interface of the Colorado River and Lake Mead.
- No sonic-tagged fish were tracked above the second rapid after February 2011.

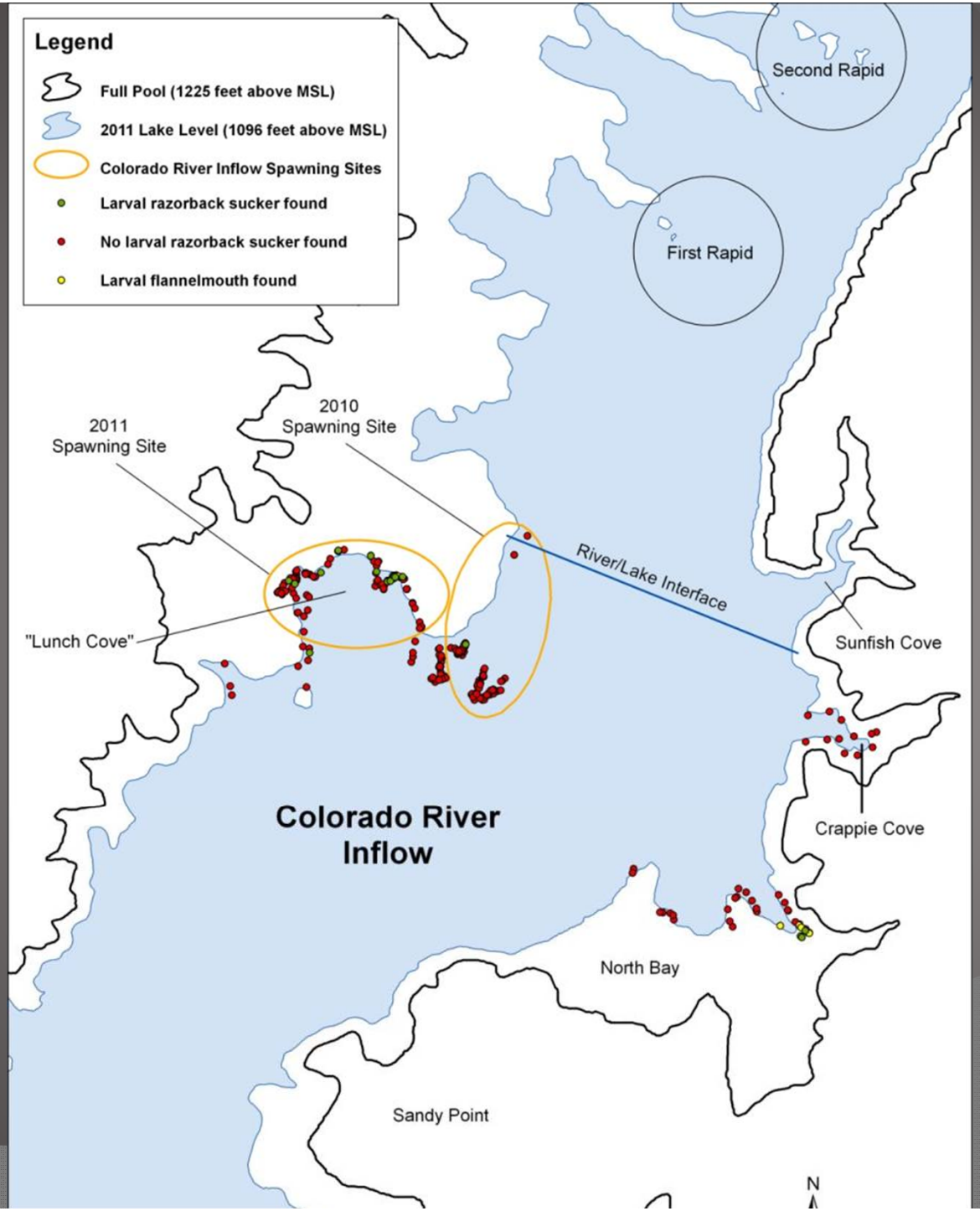
- Several sonic-tagged fish spent days to weeks occupying slackwater or eddy habitats upstream of the inflow area, immediately below the first and second rapids.
- In the course of our efforts, it became evident that sonic-tagged fish were utilizing shallower littoral habitats.
- Trammel netting and larval fishing, guided by the presence of sonic-tagged fish, resulted in the capture of both adult and larval razorback suckers.

Telemetry Summary

- Maintained contact with fish from the January 2011 and February 2010 tagging events, as well as with one fish tagged during the 2008 long-term studies.
- Pond-reared fish were successful in locating new, wild individuals exceeding our expectations for the first 2 years of this study.
- Sonic-tagged fish greatly enhancing our ability to capture wild razorback suckers at the CRI.
- Telemetry data helped identify the 2011 spawning area.
- Limited upstream movement - fish stocked upstream returned to the lake.
- Radio technology was a nice addition to river tracking, but became irrelevant when all four radio-tagged fish began using lake habitats.
- Combining active and passive tracking methods increased efficiency.

Colorado Inflow Larval sampling

- Total of 265 sampling events for a total of 146 light hours.
- First larval razorback sucker collected (Feb 14, 2011; Temp 11.5 C).
- Total catch of 65 larval razorback suckers.
- Catch per minute (CPM) value for razorback sucker larvae of 0.0074.
- Captured 11 flannelmouth larvae for a CPM of 0.0013.


Legend
Full Pool (1225 feet above MSL)
2011 Lake Level (1096 feet above MSL)
Colorado River Inflow Spawning Sites
Larval razorback sucker found
No larval razorback sucker found
Larval flannelmouth found
Second Rapid
First Rapid
2011
Spawning Site
2010
Spawning Site
River/Lake Interface
"Lunch Cove"
Sunfish Cove
Crappie Cove
Colorado River
Inflow
North Bay
Sandy Point
N

Larval Sampling Summary

- Confirmed successful spawning of razorback sucker.
- Catch rates of CRI larval razorback sucker similar to first two seasons of larval sampling in the Muddy River/Virgin River inflow area.
- Larval razorback sucker catch rates increased by 350% from 2010.
- The majority of larval razorback sucker captures during 2011 occurred during a relatively compressed 2-week period (April 14–27) within a single cove.
- Larval data suggests the importance of the CRI as a spawning area for razorback sucker and flannelmouth sucker.

Colorado Inflow Adult Sampling

Total of 187 net nights (600% increase from 2010.

Total of 15 Razorbacks (8 recap; 7 new wild fish).

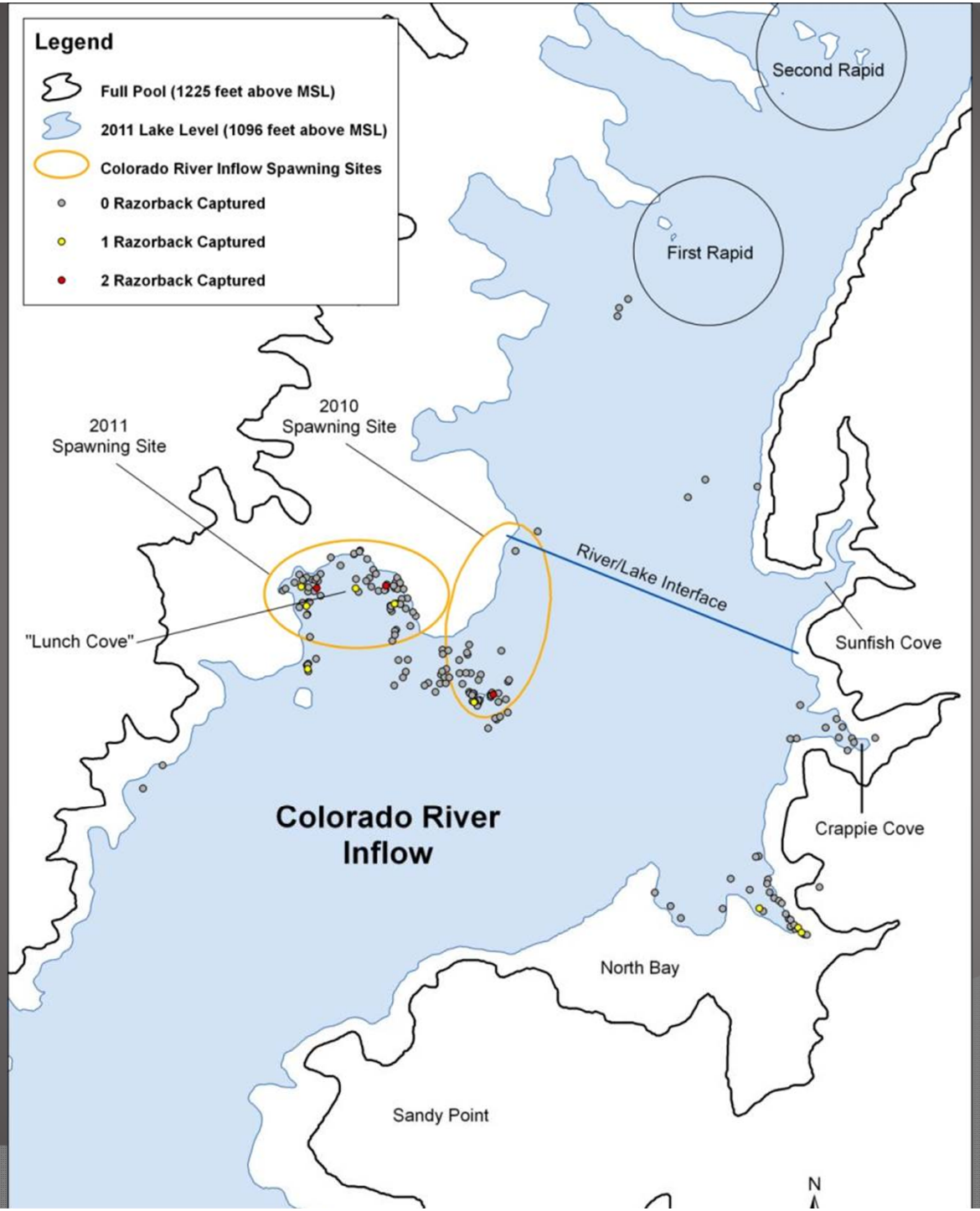
Total of 7 Hybrids [razorback x flannelmouth] (1 recap; 6 new wild fish).

Total of 112 flannelmouth (39 recap; 73 new wild fish).

0.08 razorback/net night (0.04 new, wild fish/net night).

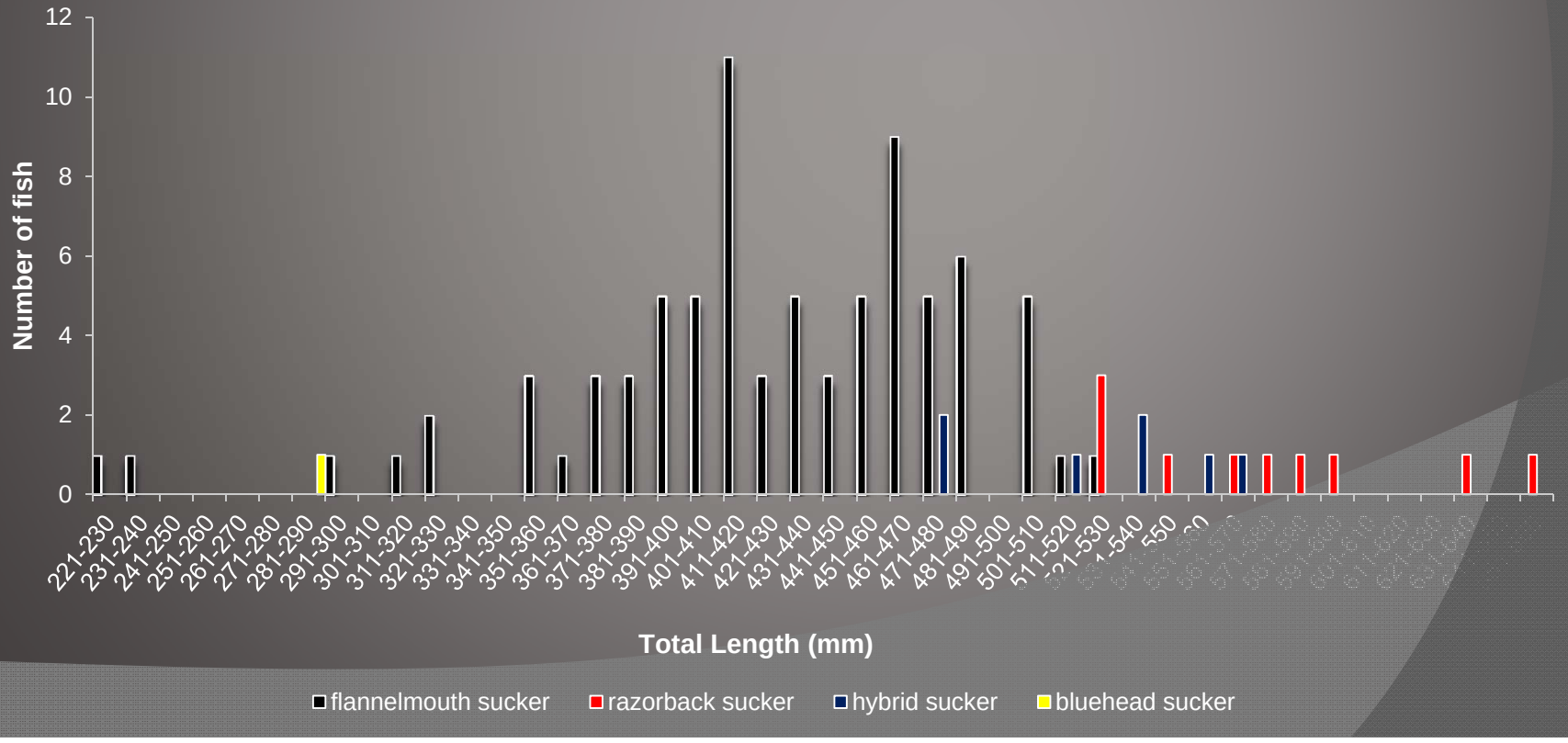
A single bluehead sucker also captured.

Efforts expended in the river using a variety of methods to capture razorbacks have been unsuccessful.


Legend
Full Pool (1225 feet above MSL)
2011 Lake Level (1096 feet above MSL)
Colorado River Inflow Spawning Sites
0 Razorback Captured
1 Razorback Captured
2 Razorback Captured
Second Rapid
First Rapid
2011
Spawning Site
2010
Spawning Site
River/Lake Interface
"Lunch Cove"
Sunfish Cove
Crappie Cove
Colorado River
Inflow
North Bay
Sandy Point
N

Length and Growth

- Mean annual growth – 4 razorback sucker (1 wild).
- 33.4 mm/yr (24.7 mm/yr LTM); 12.4 mm/yr wild.
- RZ- 527-659 mm (TL); Hyb- 476-562 mm; FM- 230-510 mm.
- 1 bluehead sucker 282 mm.



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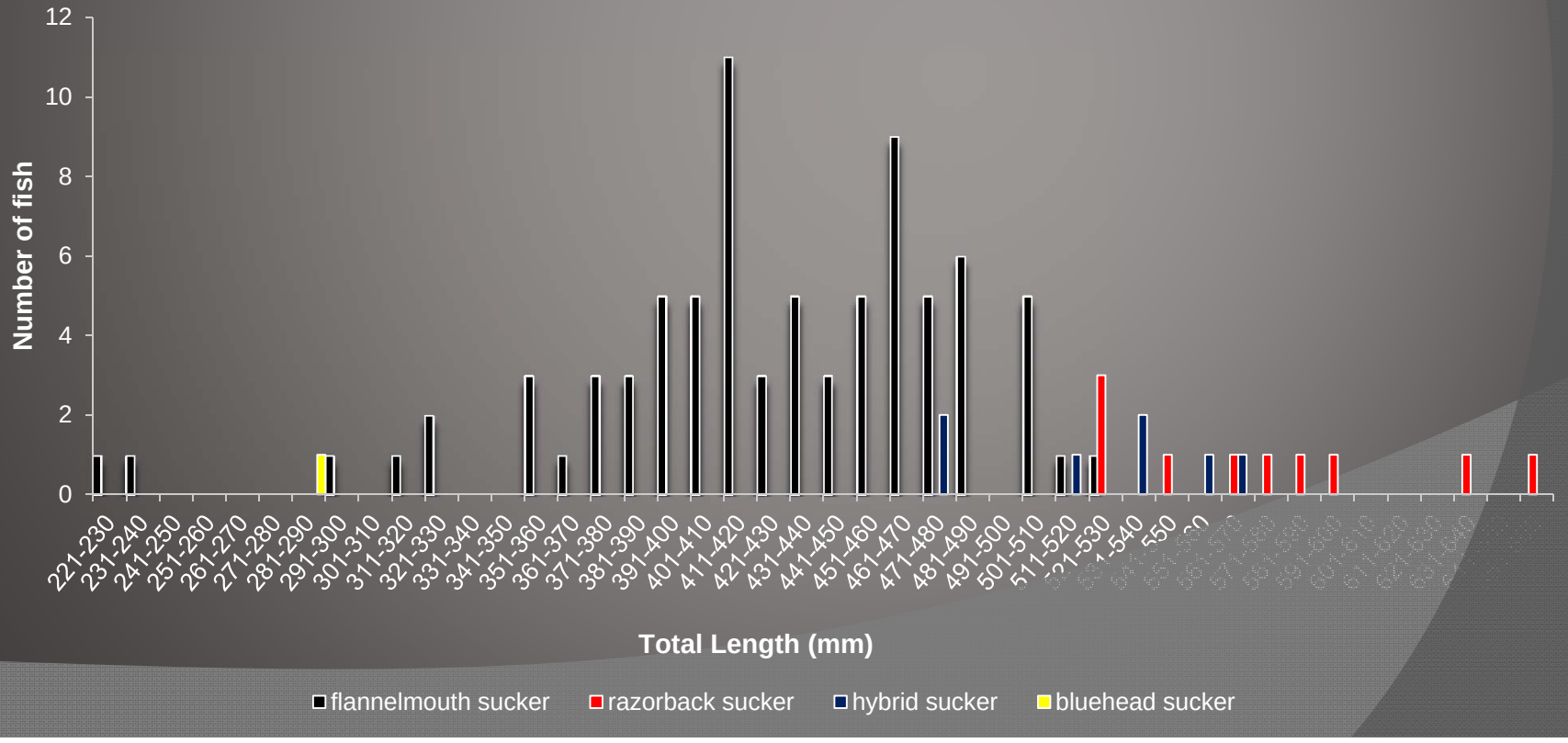
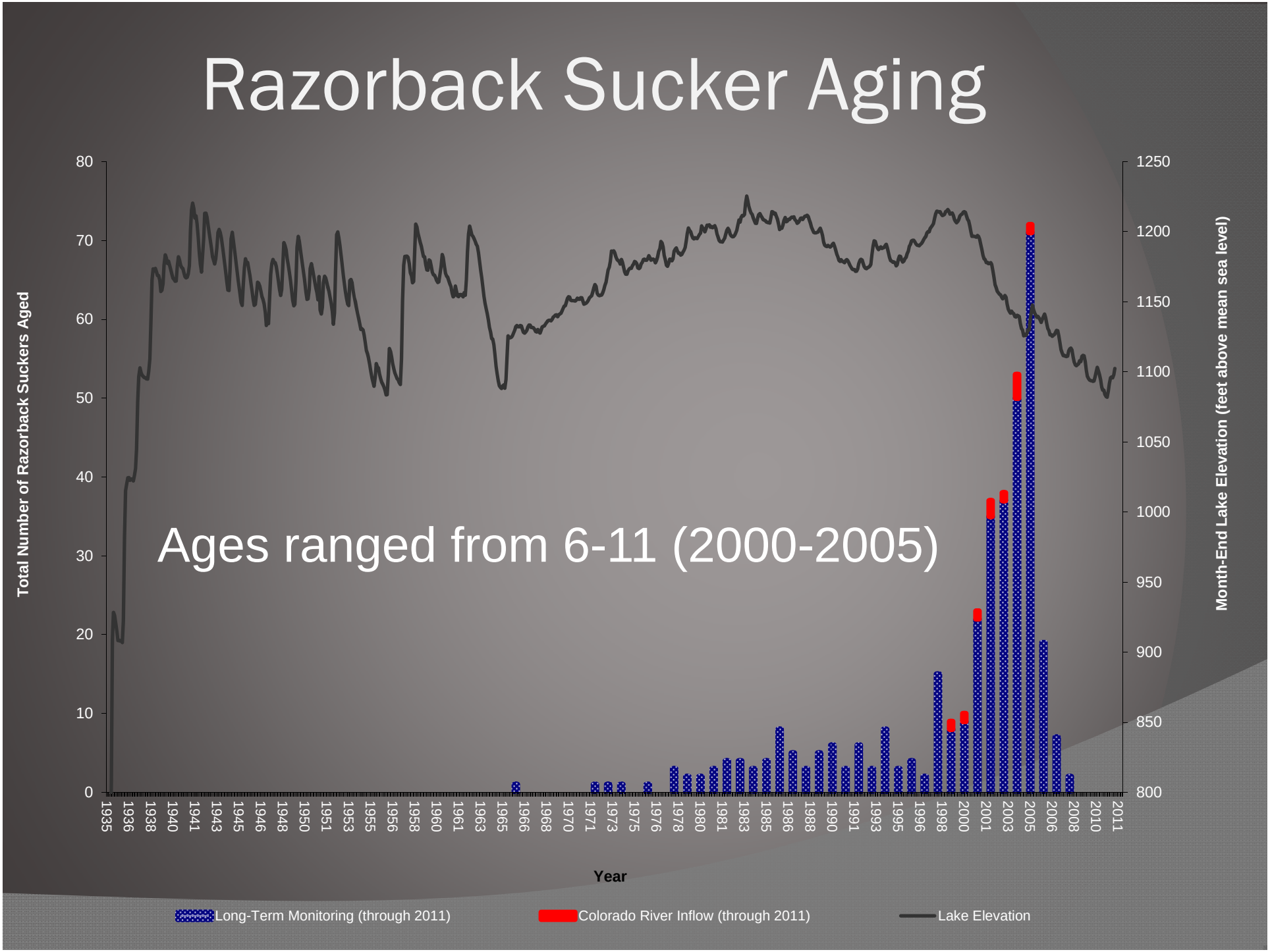


Razorback Sucker Aging



Adult Sampling Summary

- Razorback suckers successfully spawned at the CRI in 2011.
- Adult razorback sucker captures increased by 500% compared to 2010 (increased effort).
- Capture of more razorback sucker x flannelmouth sucker hybrid adults and a single bluehead sucker (increased effort).
- Growth rates for razorback suckers captured in the CRI follow the relatively high growth-rates observed in razorback suckers collected throughout Lake Mead.
- All seven year classes found at the CRI correlate with strong year classes across Lake Mead.

Conclusions and Considerations

- Successful spawning has been documented and confirmed for the past two field seasons.
  - The number of razorback suckers at the CRI is undetermined, and the timing of spawning appears to be more variable than at other known spawning areas in Lake Mead.
- Wild, ripe razorback suckers were captured at different locations for two consecutive field seasons in the CRI.
  - There is potential for unknown aggregates of razorback suckers to exist at other locations in Lake Mead.

Conclusions and Considerations

- Sonic-telemetry techniques can be used as an effective tool to help document razorback sucker habitat use in understudied areas of Lake Mead.
  - The technique should be continued.
- Hybridization of native sucker species has been documented.
  - The potential effects of hybridization to the Lake Mead razorback sucker population is unknown.

THANK YOU!

Questions?