Razorback Sucker Research and Monitoring in the Colorado River Inflow Area of Lake Mead and the Lower Grand Canyon, Arizona and Nevada

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U.S. DEPARTMENT OF THE INTERIOR
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Lower Colorado River
Multi-Species Conservation Program

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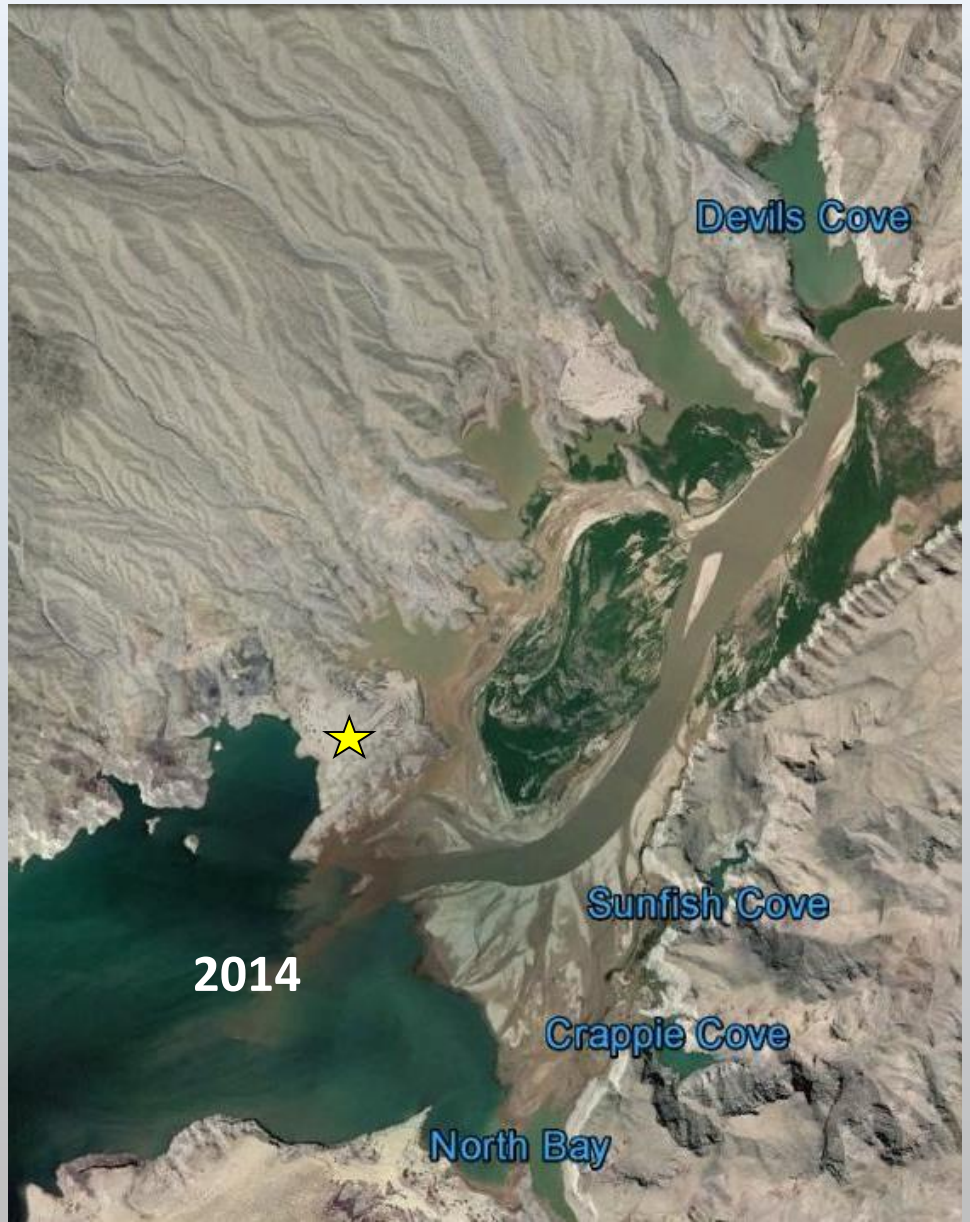
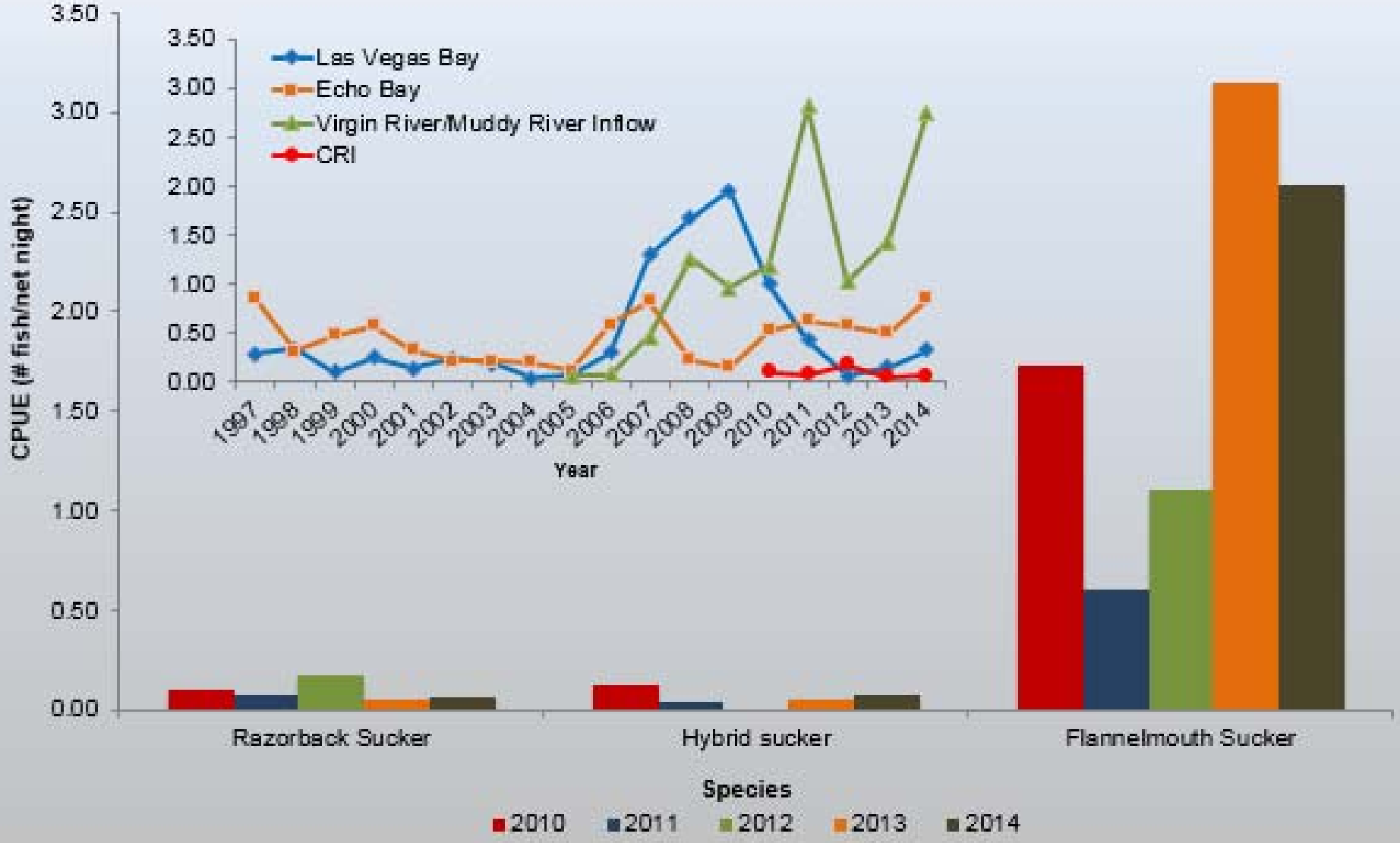
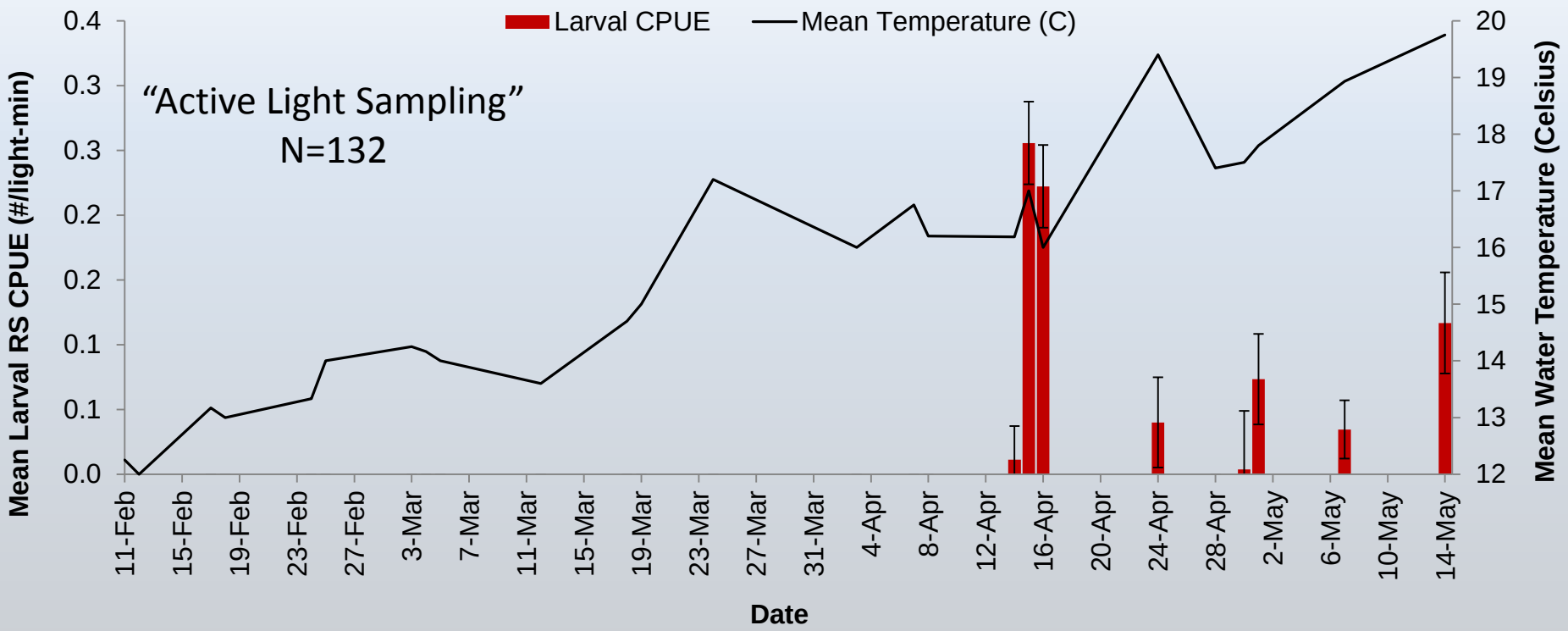
Colorado River inflow (CRI)



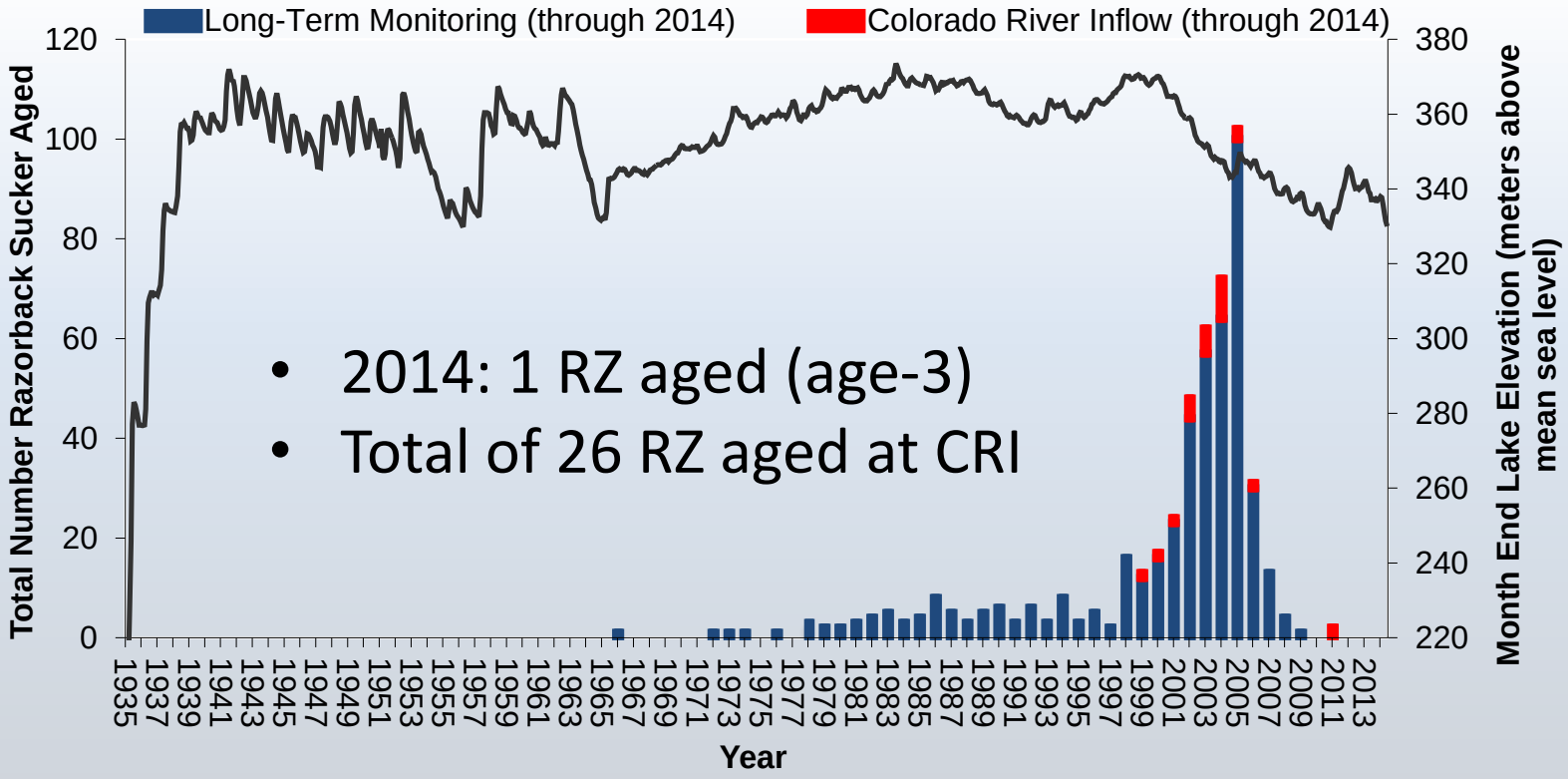
Netting Catch Rates (CRI)



Larval Sampling (CRI)



LOCATION	2007	2008	2009	2010	2011	2012	2013	2014
Colorado River Inflow	–	–	–	0.002	0.007	0.0014	0.000	0.042
Las Vegas Bay	0.39	0.43	0.342	0.093	0.282	0.1791	0.391	0.427
Echo Bay	0.43	0.024	0.021	0.269	1.482	0.2197	0.019	0.090
Virgin River/ Muddy River Inflow	0.001	0.116	0.107	0.011	0.013	0.0036	0.205	0.265



YEAR	Total #	# NEW WILD	# RECAP	# NETS
2010	3	3	0	30
2011	15	7	8	187
2012	33	13	20	183
2013	4	1	3	70
2014	6	1	5	83*
TOTALS	**61**	**25**	**36**	**553**

Movement of tagged fish from CRI into LGC.

Overview (LGC)

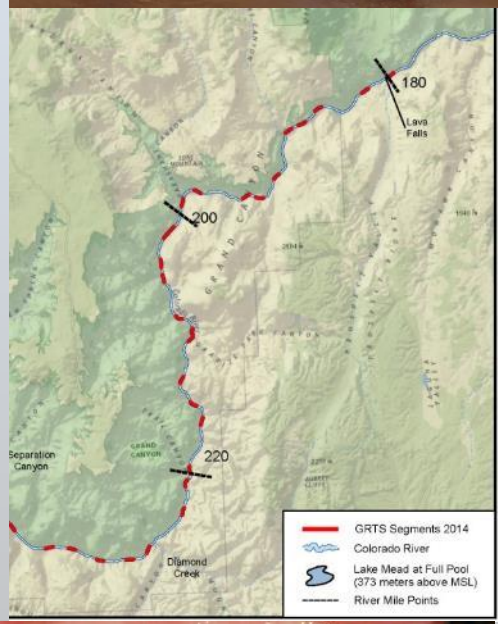
- For over 20 years, RBS thought to be extirpated from the Lower Grand Canyon (LGC)
- "…undertake an effort to examine the potential of habitat in the **lower Grand Canyon** for the species, and institute an augmentation program in collaboration with FWS, if appropriate." (USFWS 2007 BiOP)
- Determined suitable habitat by science panel
- Razorbacks captured in Canyon by AZGFD

Objectives

- Determine RBS presence and habitat use in LGC
  - Larval and small-bodied fish community sampling within the LGC
    - Assess reproduction, spawning, and distribution
  - Sonic telemetry
- Explore linkages between Lake Mead and LGC

LGC Small-bodied Sampling

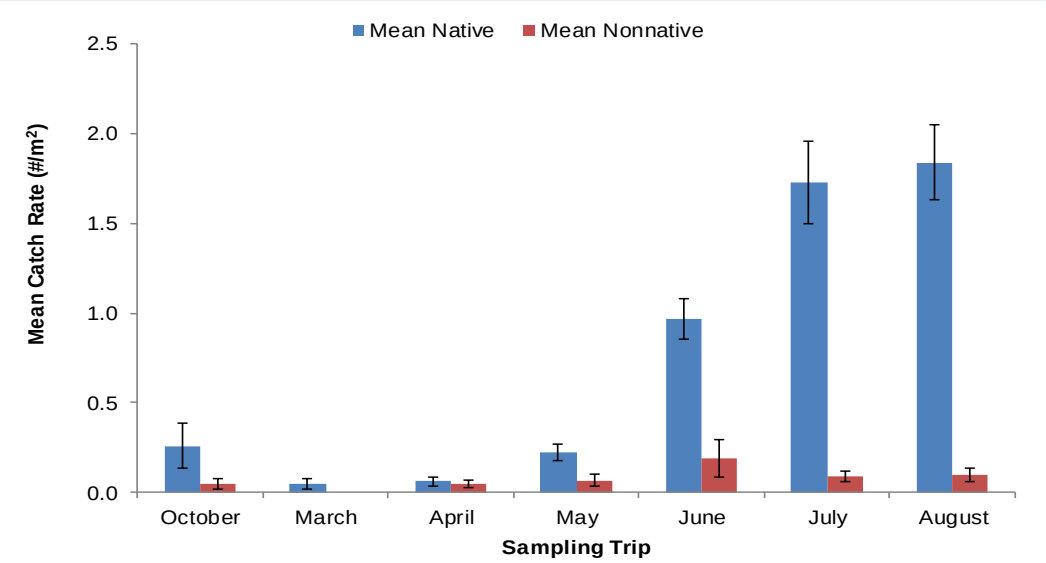
- 7 sampling trips per year
  - October, March-August 2014
  - Lava Falls to Pearce Ferry (RM 179-280)
- Sonic Telemetry
  - 9 RBS released near Lava Falls
  - SURs deployed every 5 miles
  - Active Listening
- Seining
- Generalized Random Tessellation Stratified (GRTS)
- Opportunistic Sampling



GRTS Sampling Design

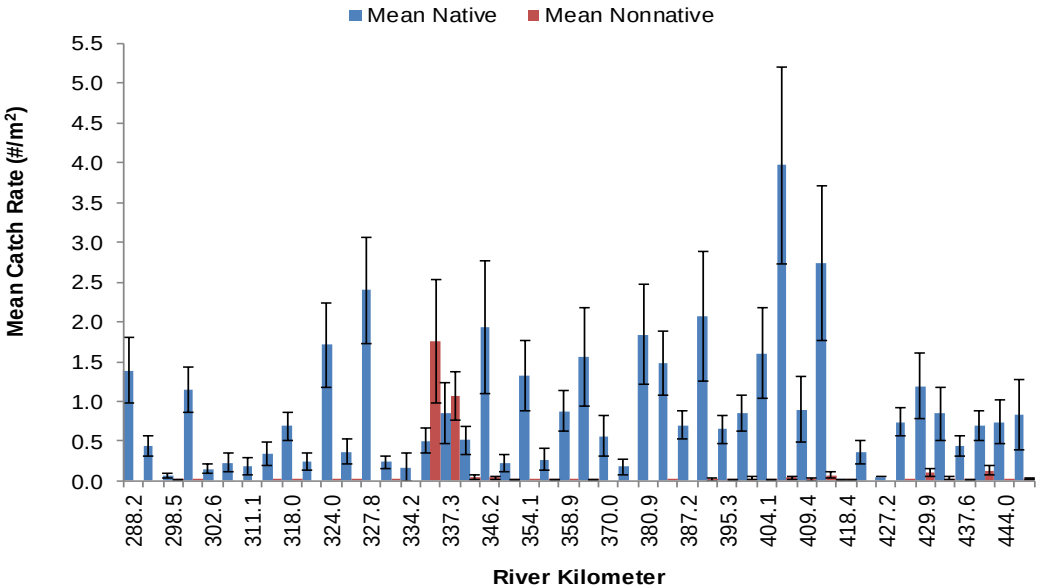
- Well established and used by NPS
- Ensures spatially balanced, random sampling while reducing sampler bias
- 100 RM reach was divided into 800 m segments
- S-Draw selected 40, spatially balanced, segments with an additional 10 replacements
- Sampling can occur anywhere within the segment
- Repeated sampling in each of the 40 segments each trip

LGC Small-Bodied Sampling



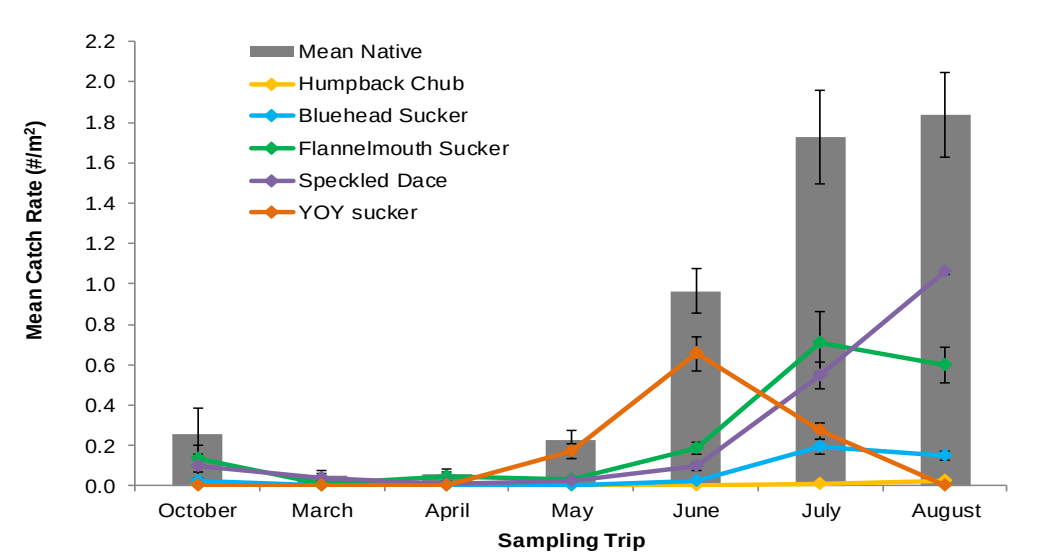
- No Razorback Sucker
- 4-native species
- Native dominance (*P*=0.0000)

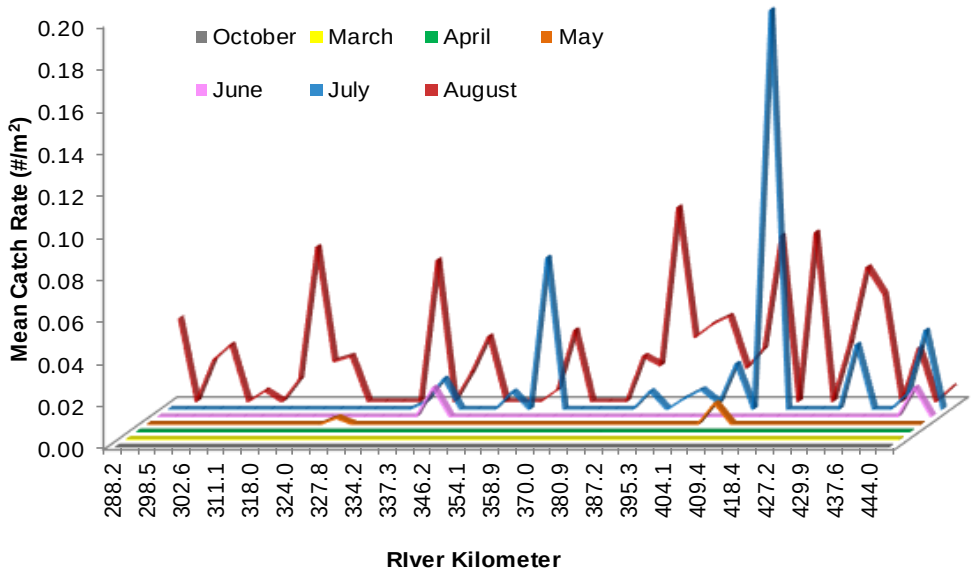
- Native abundance increase Jun.-Aug.
- Native fish present throughout
- Native dominance at nearly all segments



LGC Small-Bodied Sampling

- YOY suckers dominated early
- YOY Humpback Chub present May-Aug. (N=144)

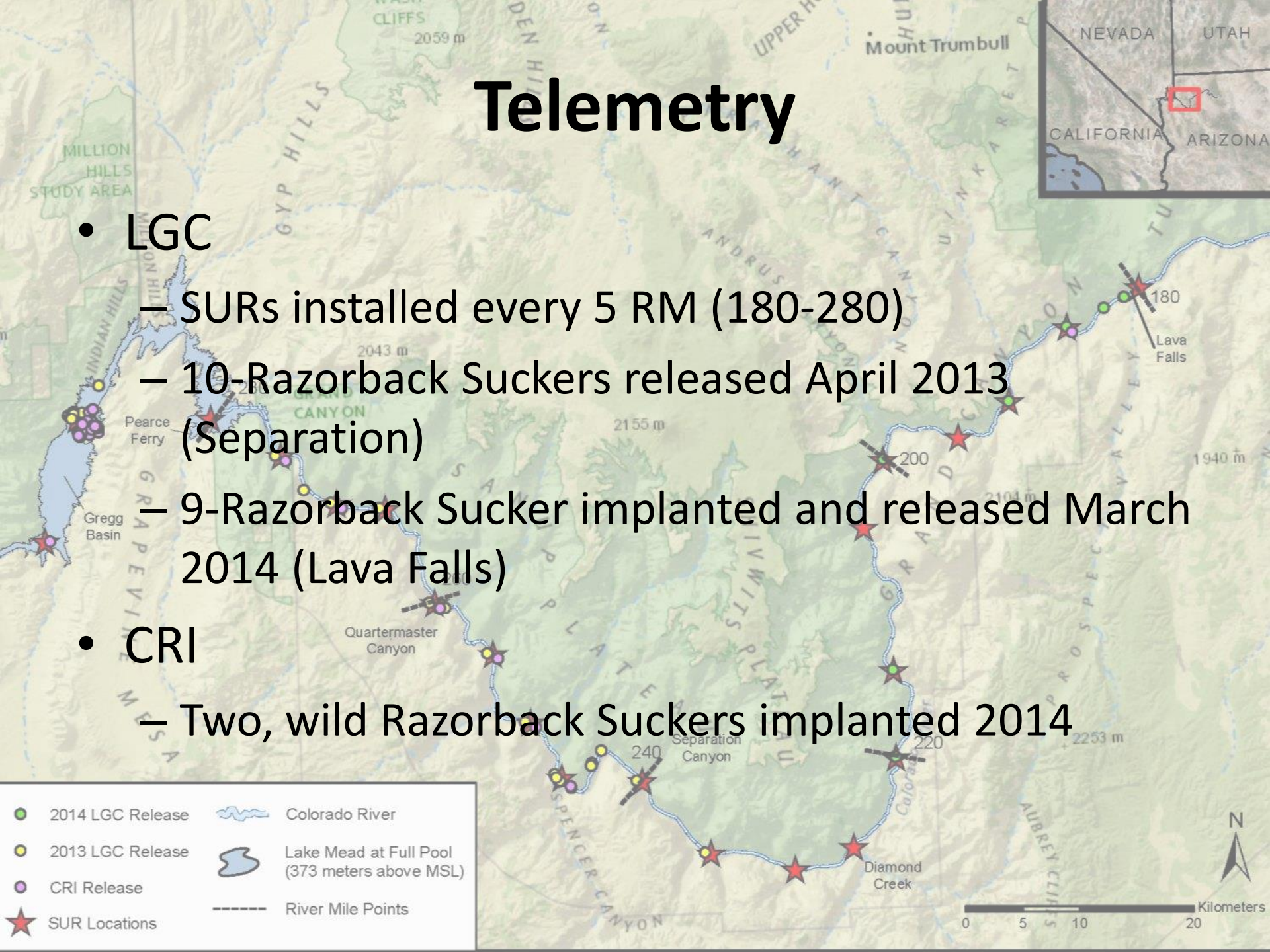




- HC abundance increased throughout the summer
- Relatively even distribution by Aug.

Telemetry

- LGC
  - SURs installed every 5 RM (180-280)
  - 10-Razorback Suckers released April 2013 (Separation)
  - 9-Razorback Sucker implanted and released March 2014 (Lava Falls)
- CRI
  - Two, wild Razorback Suckers implanted 2014



Telemetry

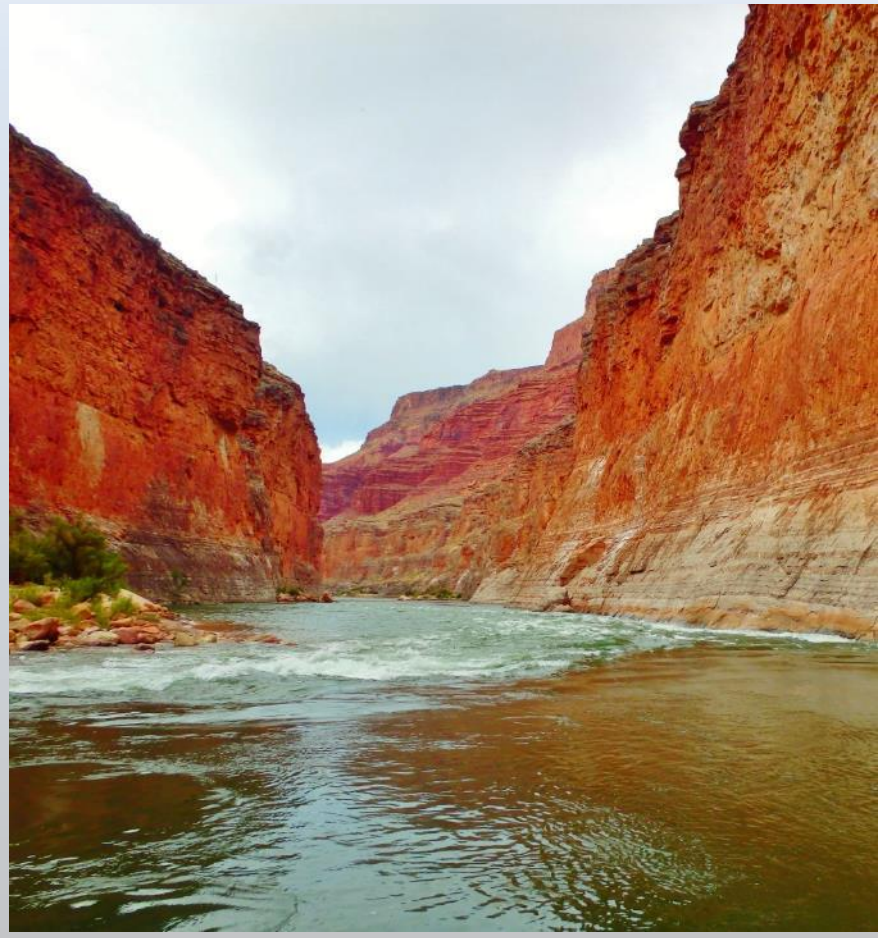
- 25 fish, 22,100 contacts
  - 8 CRI released
  - 17 LGC released
- 3 fish from CRI to LGC
  - (2) Spencer (1) 5 miles below Lava
  - (1) LGC-CRI-LGC
- 1 wild fish from CRI to OA
- 2 fish from LCG to CRI
  - (1) LGC-CRI-LGC-CRI-LGC (Spencer)
  - (1) LGC-CRI (Iceberg)
- Additional movement upstream and downstream within the LGC

Conclusions and Considerations

- Razorback Sucker were found at the CRI for the 5th year
  - Relatively young (<11 years)
- No Razorback Suckers captured during LGC small-bodied sampling in 2014
  - Age-0 juveniles in iceberg canyon
- Likely that movement occurring above Lava Falls
  - Most sonic activity from Spencer to Columbine
- GRTS sampling yielded similar species composition with higher native catch rates
- Razorback and other sucker habitat likely overlaps within the CRI and LGC with movement between the two
- Capture of other small sucker species lends hope for capturing small, wild Razorback Suckers in the future

What's Next?

- Continued CRI sampling
- LGC: 7 trips in 2015
  - March-Sept
  - Continued telemetry
  - Continued small-bodied seining
  - Opportunistic adult sampling
- Explore linkages between Lake Mead and LGC



Thank You

Questions??