



Status and Trends of Native and Nonnative Fishes in the Colorado River

David Rogowski
Lisa Winters
Robin Osterhoudt
Pilar Wolters
Kristy Manuell

Overview

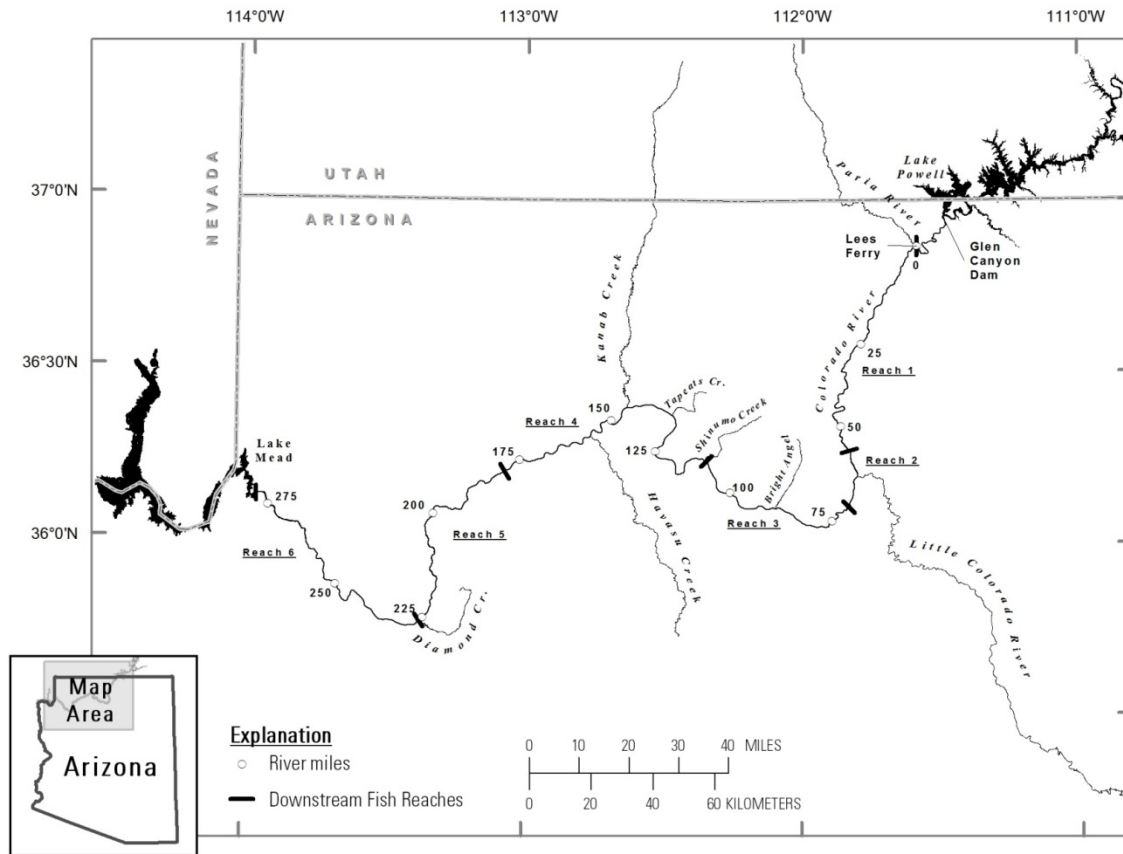
- Long term monitoring
 - Numbers summary
 - Humpback chub
 - Bright Angel Creek (RM 80-90)
 - Little Colorado River (RM 40-80)



Glen Canyon Dam



<http://www.usbr.gov/uc/water/crsp/cs/images/GCDamerial.jpg>



Lake Mead



http://media.npr.org/assets/img/2015/04/17/ap315766408047_custom-107f254056f30e3207a51808a0dd2ed1a0ec70a2-s900-c85.jpg

AGFD long term monitoring

- Goal – representative sample of the fish community in the Colorado River from Lees Ferry to Lake Mead
- Methods
 - Random stratified sampling
 - 3 trips: 2 spring/summer, 1 in fall
 - Boat Electrofishing – near shore at night



Photo by George Andrejko, AGFD



Photo by G. Andrejko

AGFD Summary

- Sampling (each site = 250 m)
 - 1-16 April = 324 sites
 - 30 April – 15 May = 334 sites
 - Fall (12-16 Oct) = 96 sites (turbidity > 4000 NTU)
- ~164.5 km shoreline sampled
 - ~18% of total shoreline sampled
- 4,175 fish captured

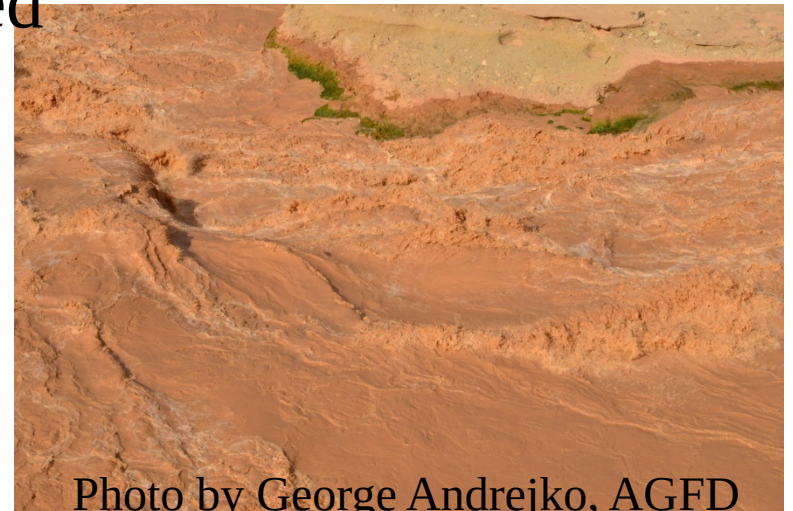
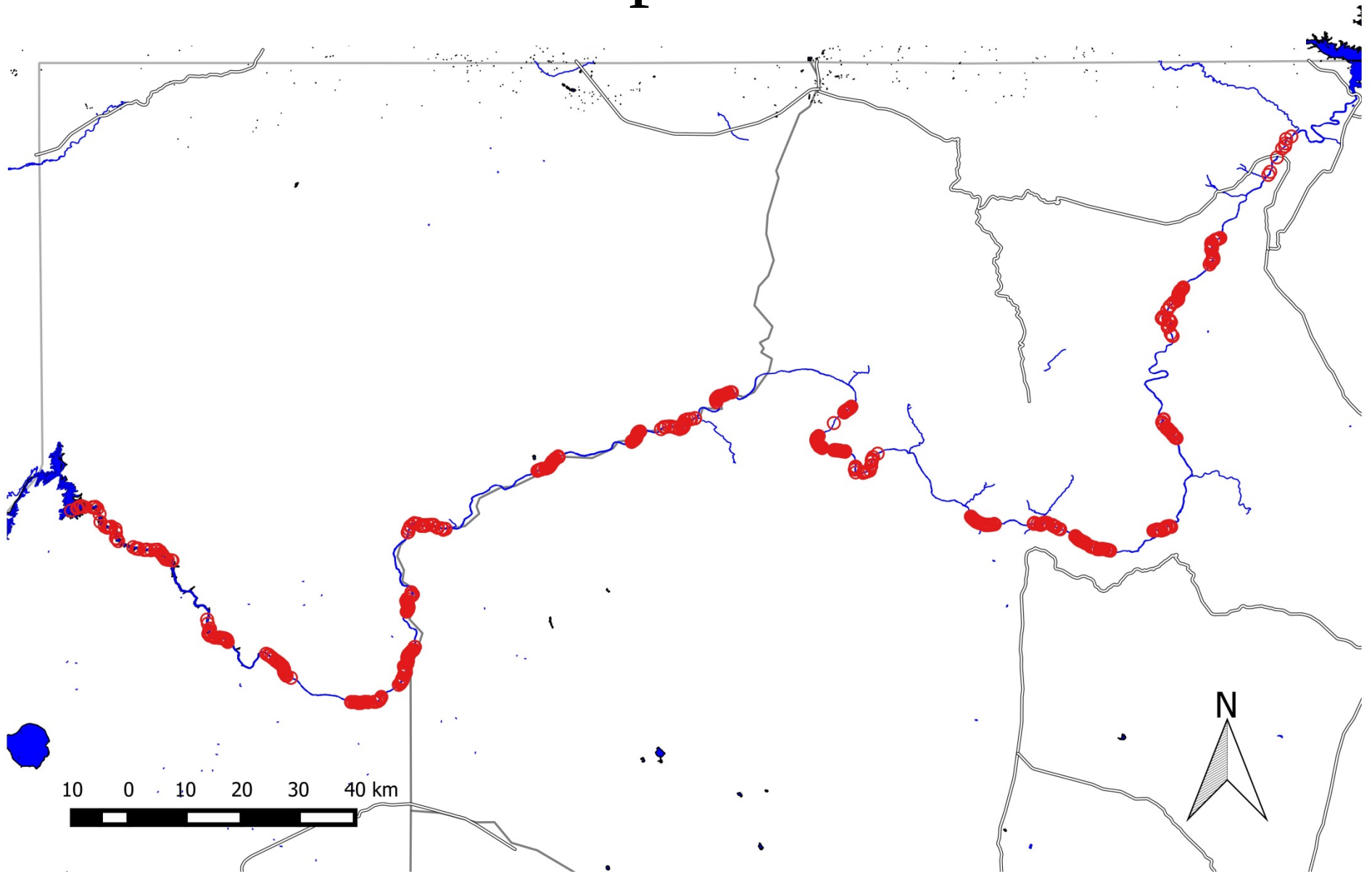
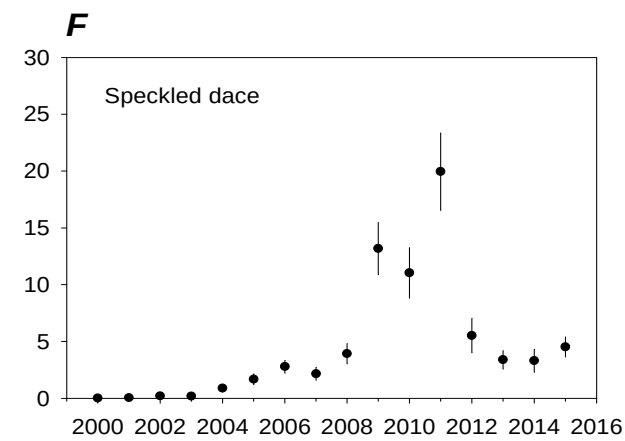
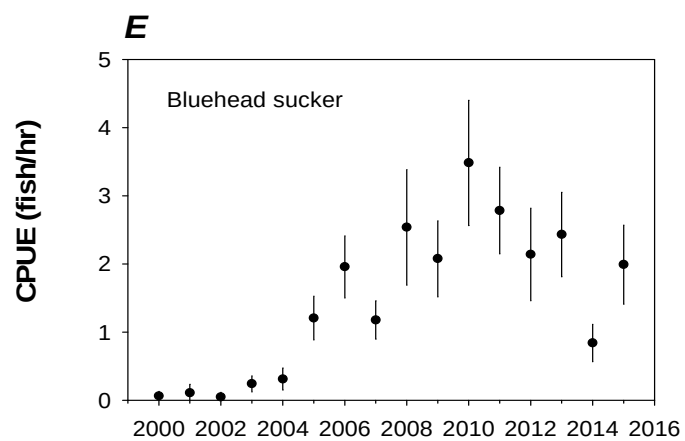
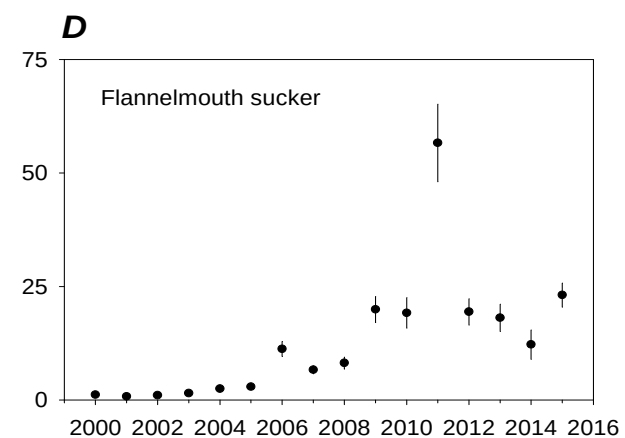
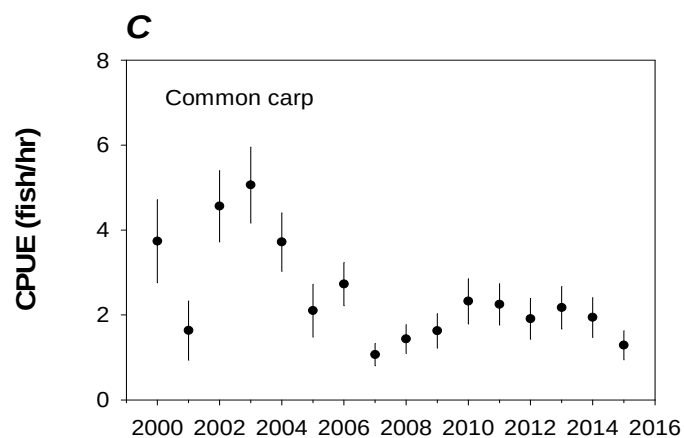
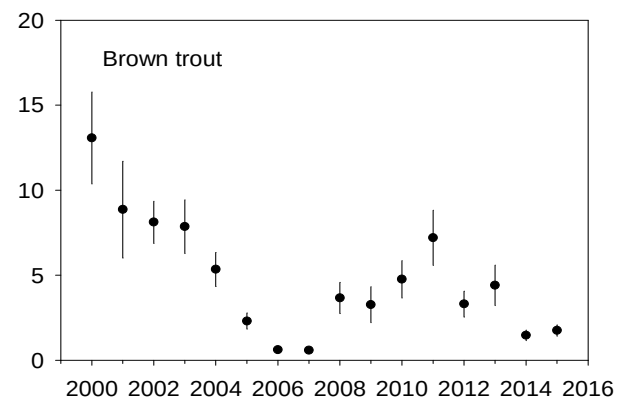
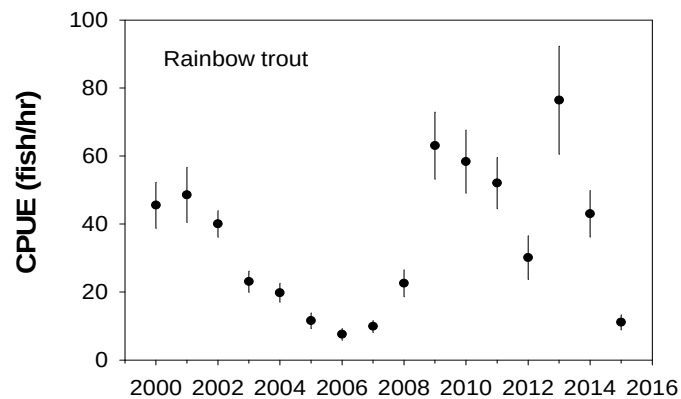


Photo by George Andrejko, AGFD

Sites sampled in 2015



Riverwide CPUE



Five Year Trends in CPUE

Species	F-value	df	P
Native			
Bluehead Sucker (BHS)	1.22	4	0.349
Flannemouth Sucker (FMS)	1.94	4	0.258
Speckled Dace (SPD)	3.72	4	0.149
Nonnative			
Brown Trout (BNT)	9.94	4	0.0511
Common Carp (CRP)	4.76	4	0.117
Rainbow Trout (RBT)	1.60	4	0.295

Humpback chub



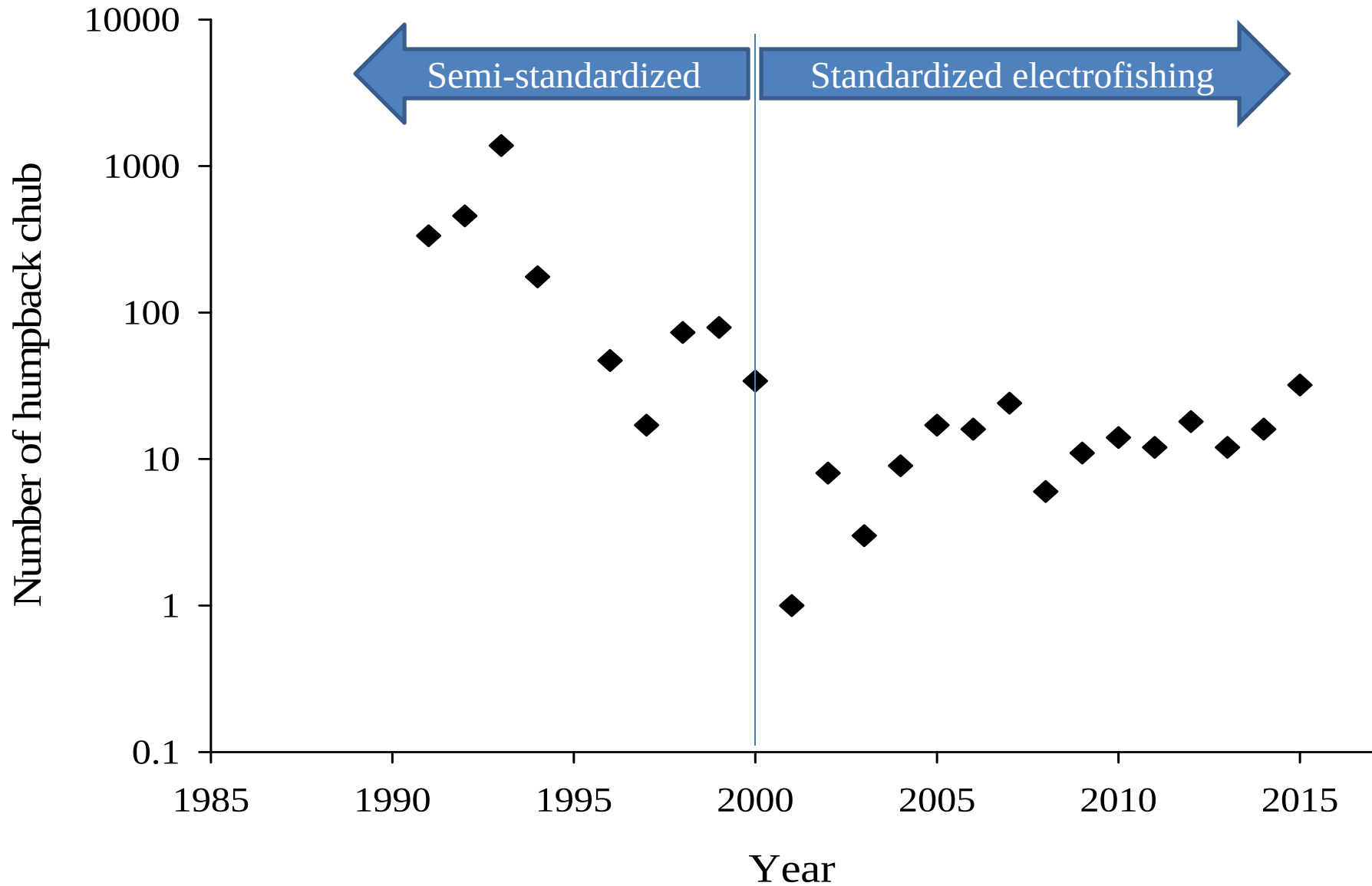
- What can long-term SWEF monitoring tell us?
 - What is their distribution?
 - Is their recent occurrence in the lower Grand Canyon something new?

AGFD long term monitoring

- Electrofishing nearshore at night
 - Somewhat standardized in 2000
 - 2014 – current: random stratified sampling which included below Diamond Creek (~RM 225)
 - Not particularly effective for HBC
 - But we catch a few

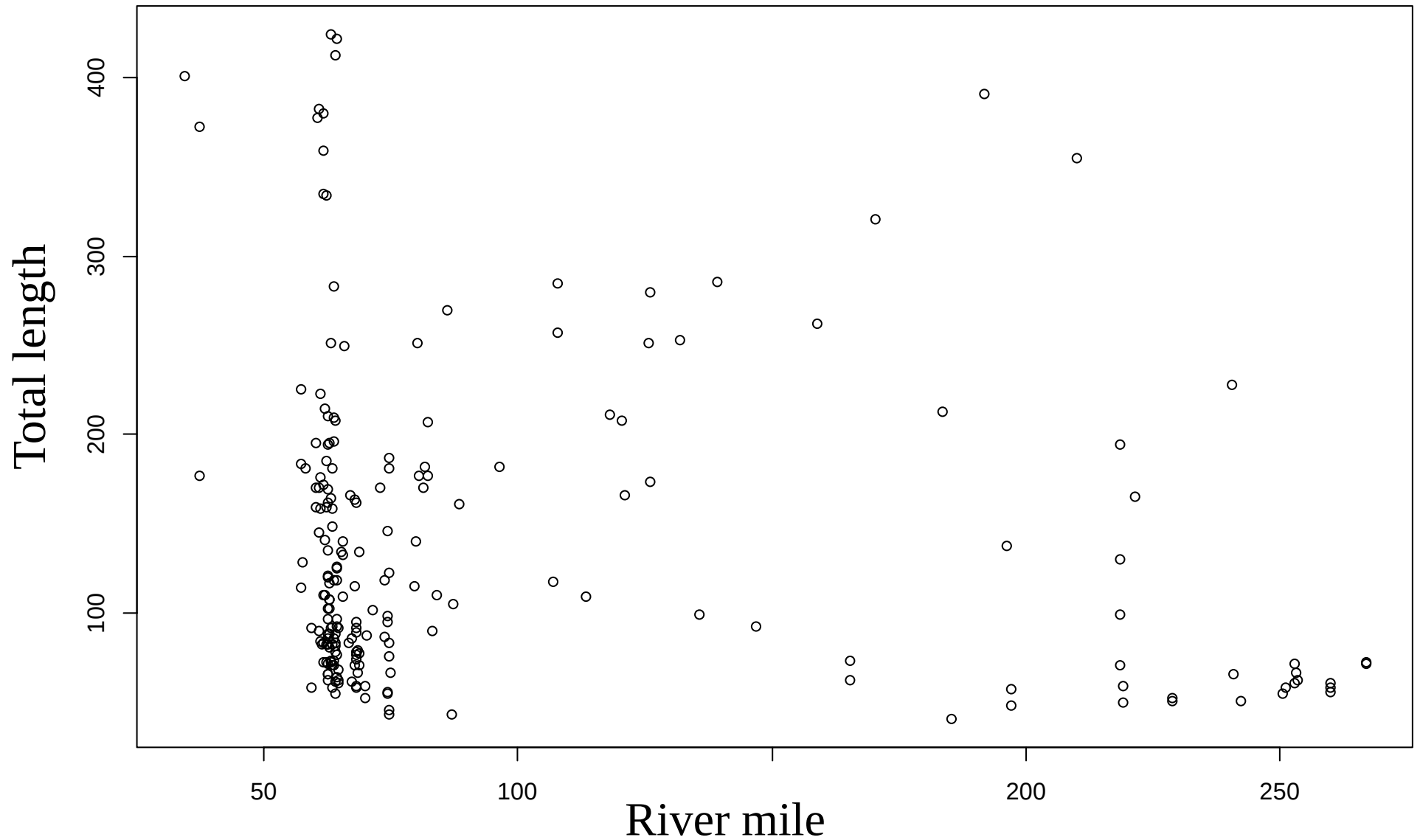


Humpback Chub numbers

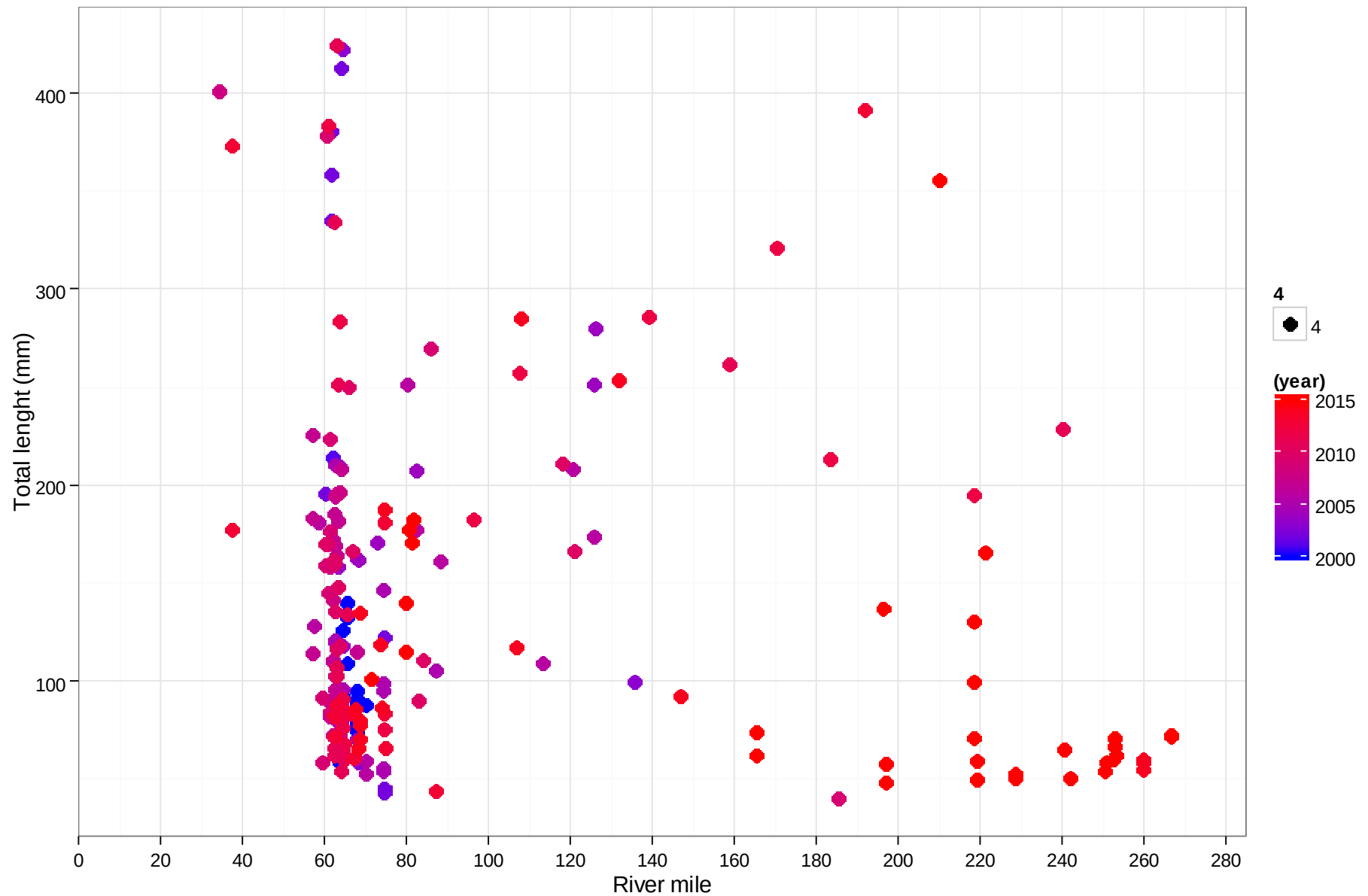


Humpback chub distribution

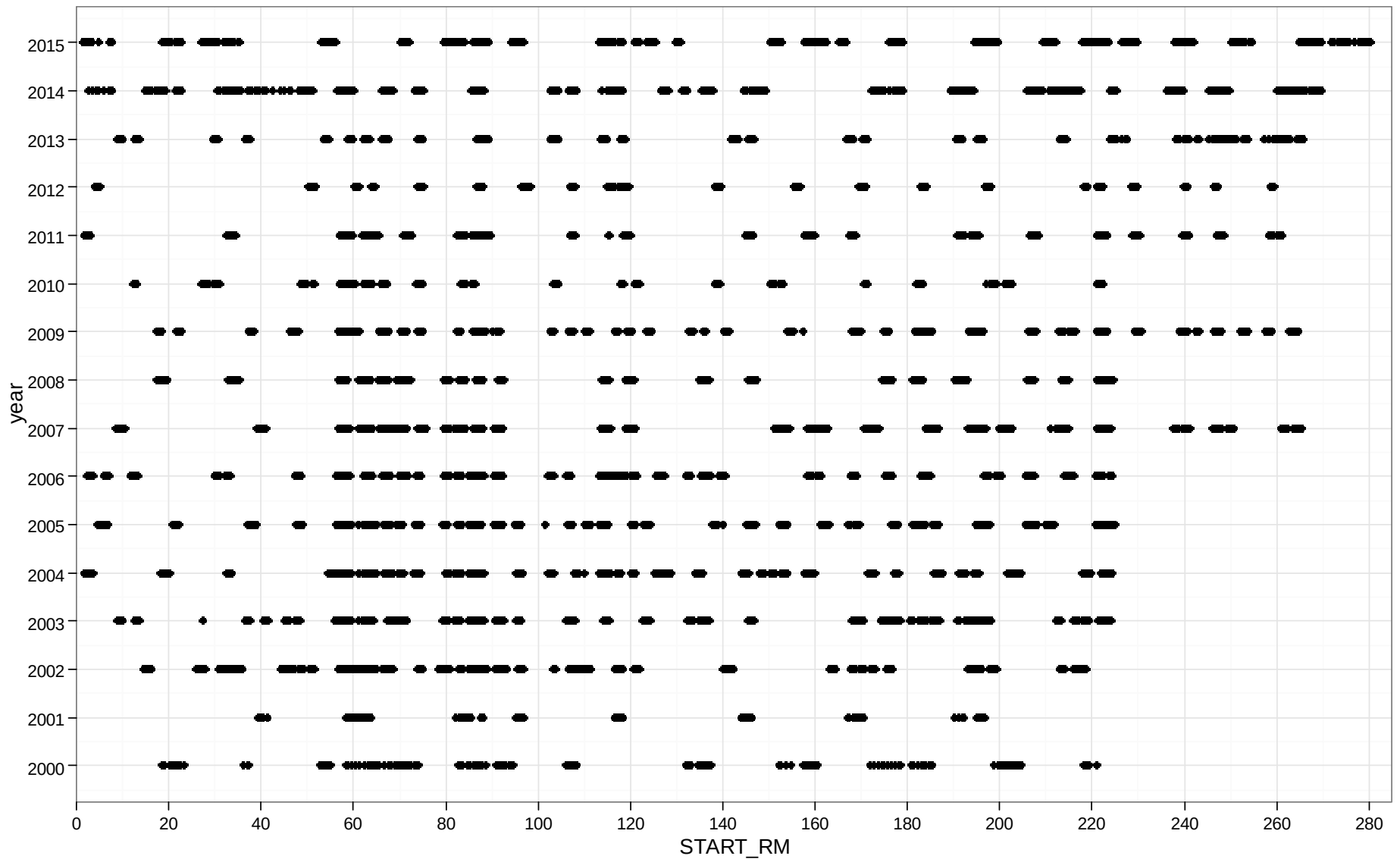
AGFD sampling 2000-2015



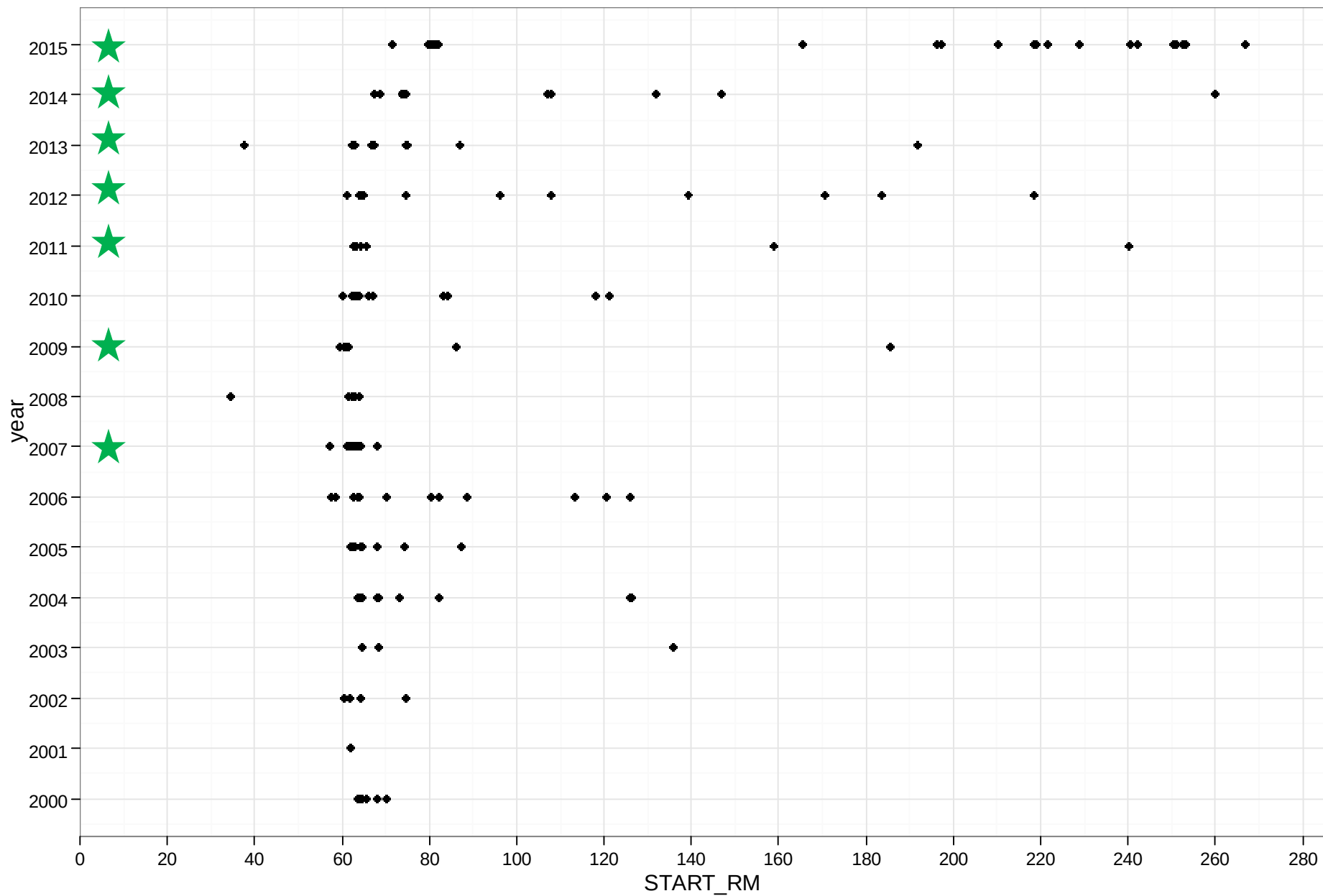
Humpback chub distribution



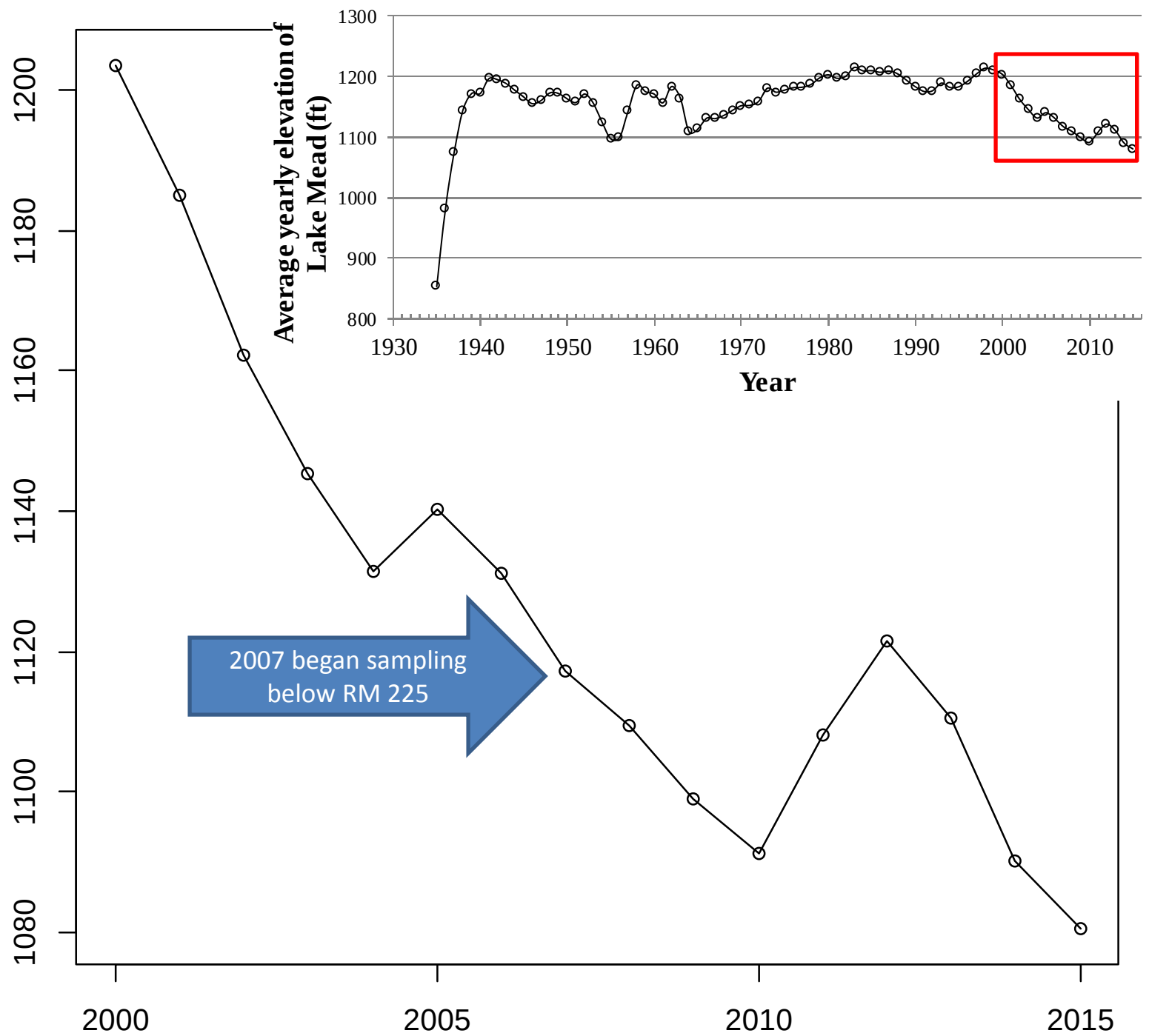
Sample site distribution



Humpback Chub - distribution

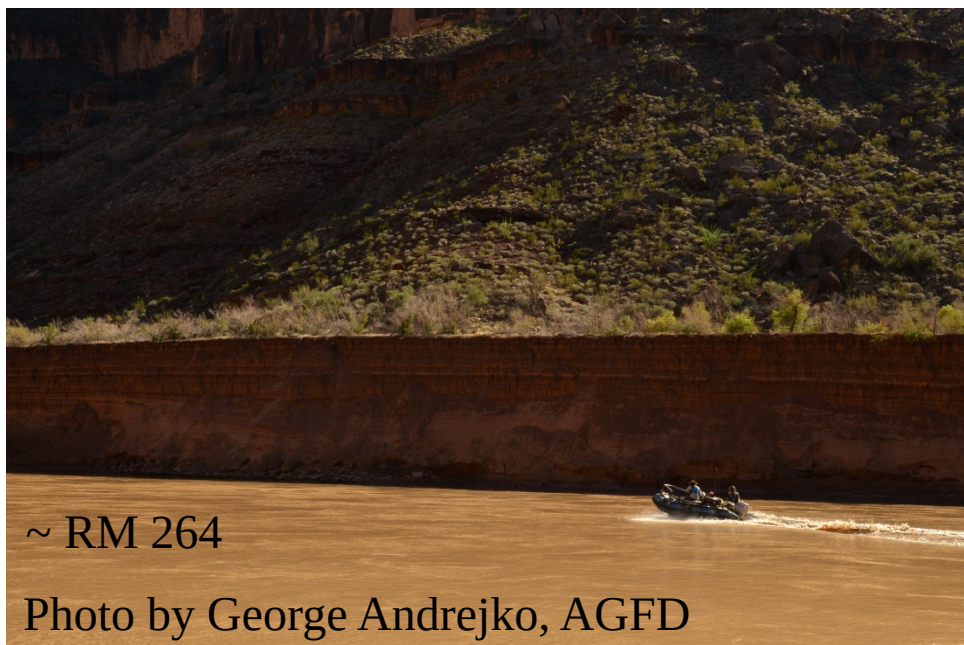


Average elevation of Lake Mead (ft)



Humpback Chub

- Occur throughout Colorado River presently
 - Occurrence below RM 225 (Diamond Creek)
 - Not sure if this is new or not?
 - No longer a lake
 - Temperatures are warmer
 - Not adequately sampled



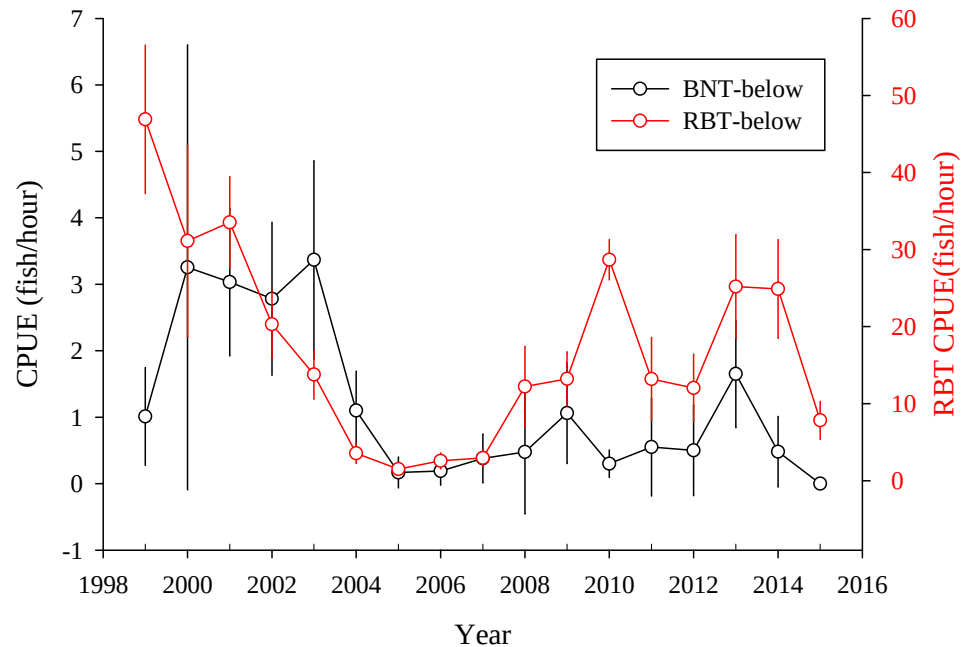
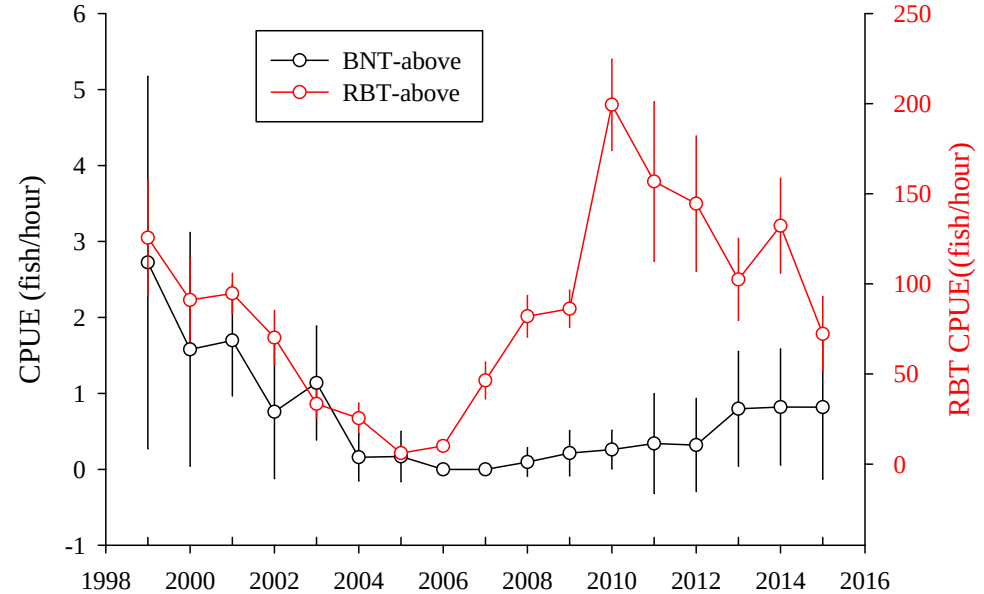
Trout and long term monitoring

- Tributaries
 - Little Colorado River
 - Bright Angel Creek



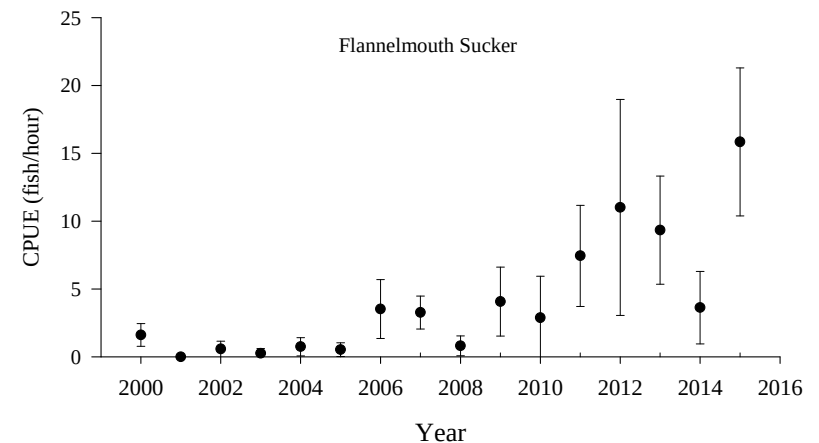
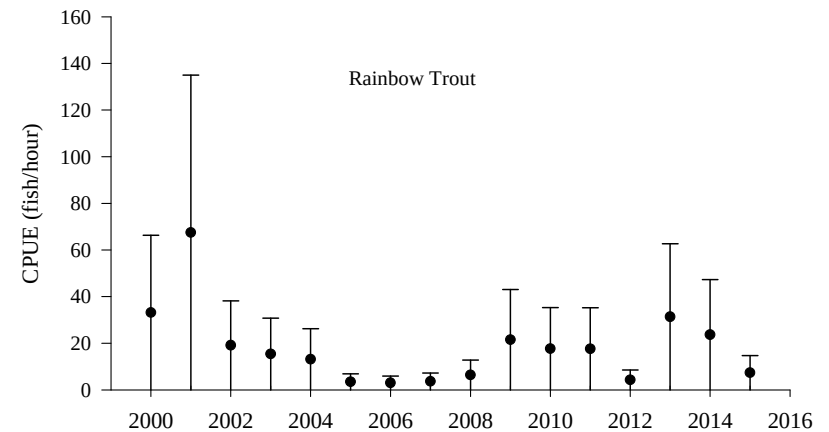
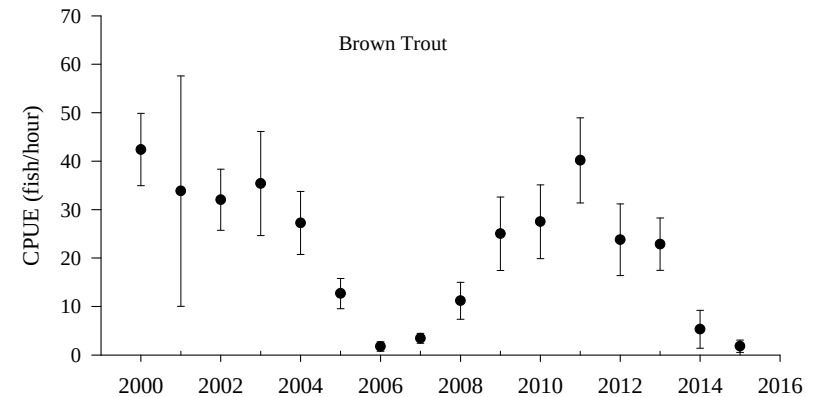
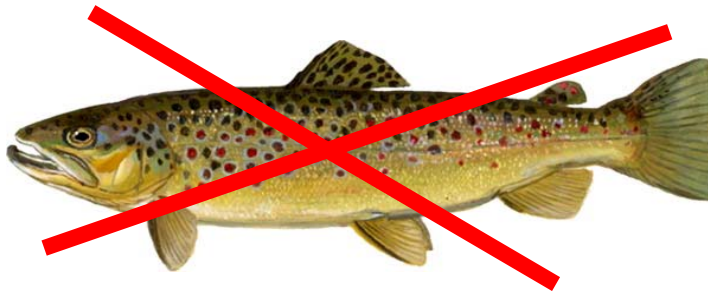
Little Colorado River inflow

- CPUE of trout
20 mi above
and below the
LCR



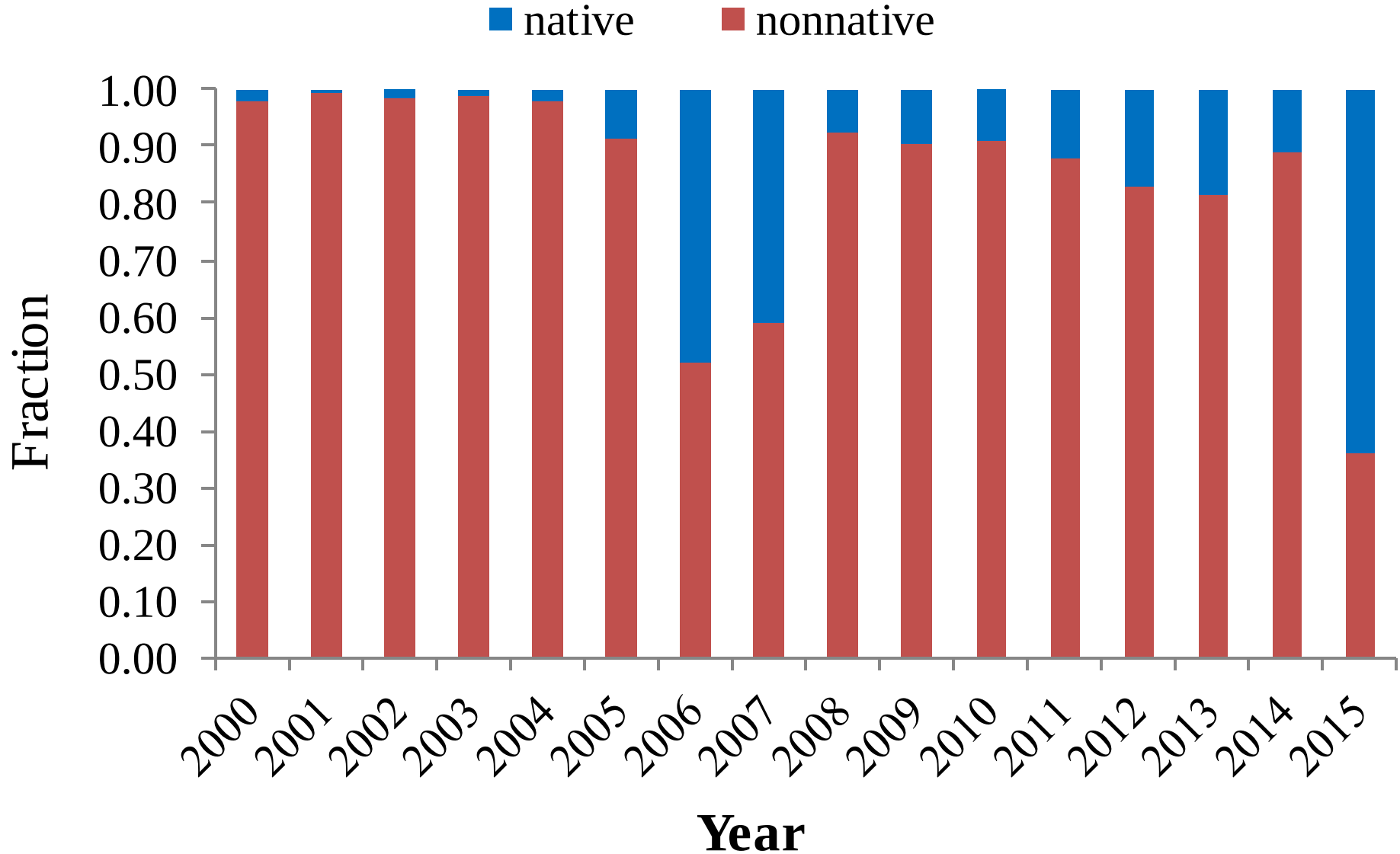
Bright Angel Creek Inflow (RM 80-90)

- Nonnative trout removal in a tributary stream: does it benefit native fish in the mainstem Colorado River?

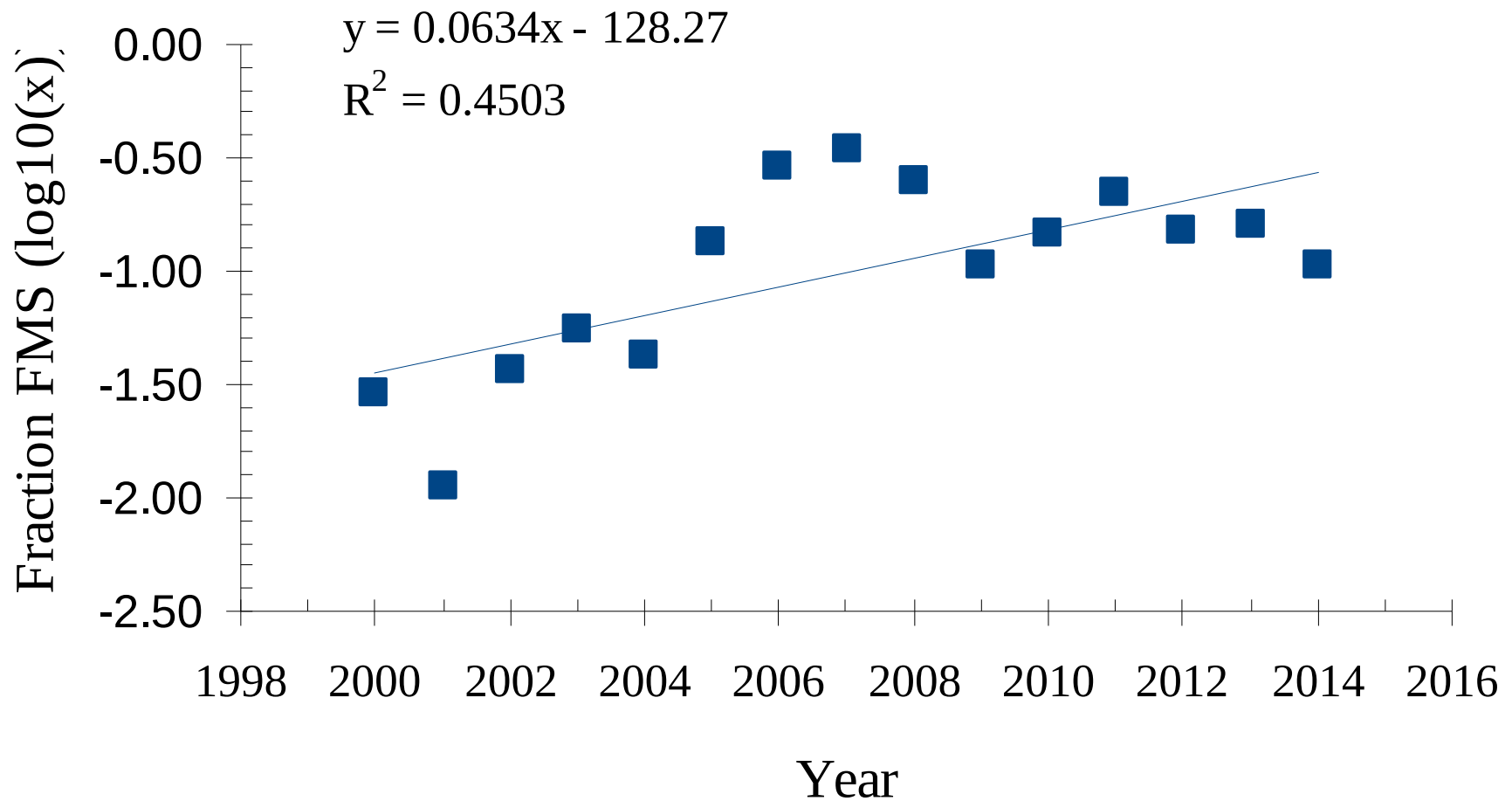


Fish community at RM 80-90

Bright Angel Creek inflow reach

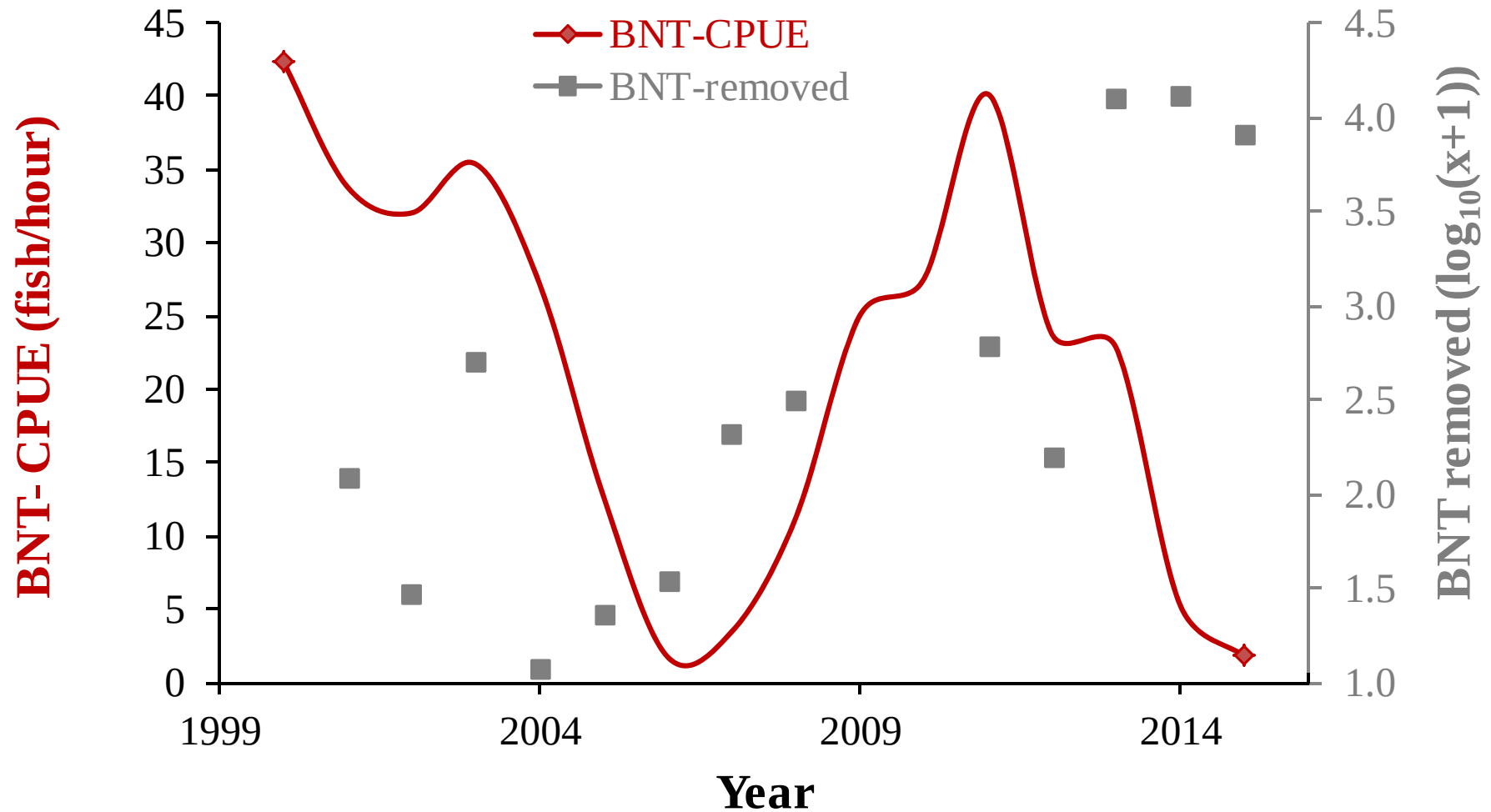


Percent FMS downstream Bright Angel Creek (RM 90-140)





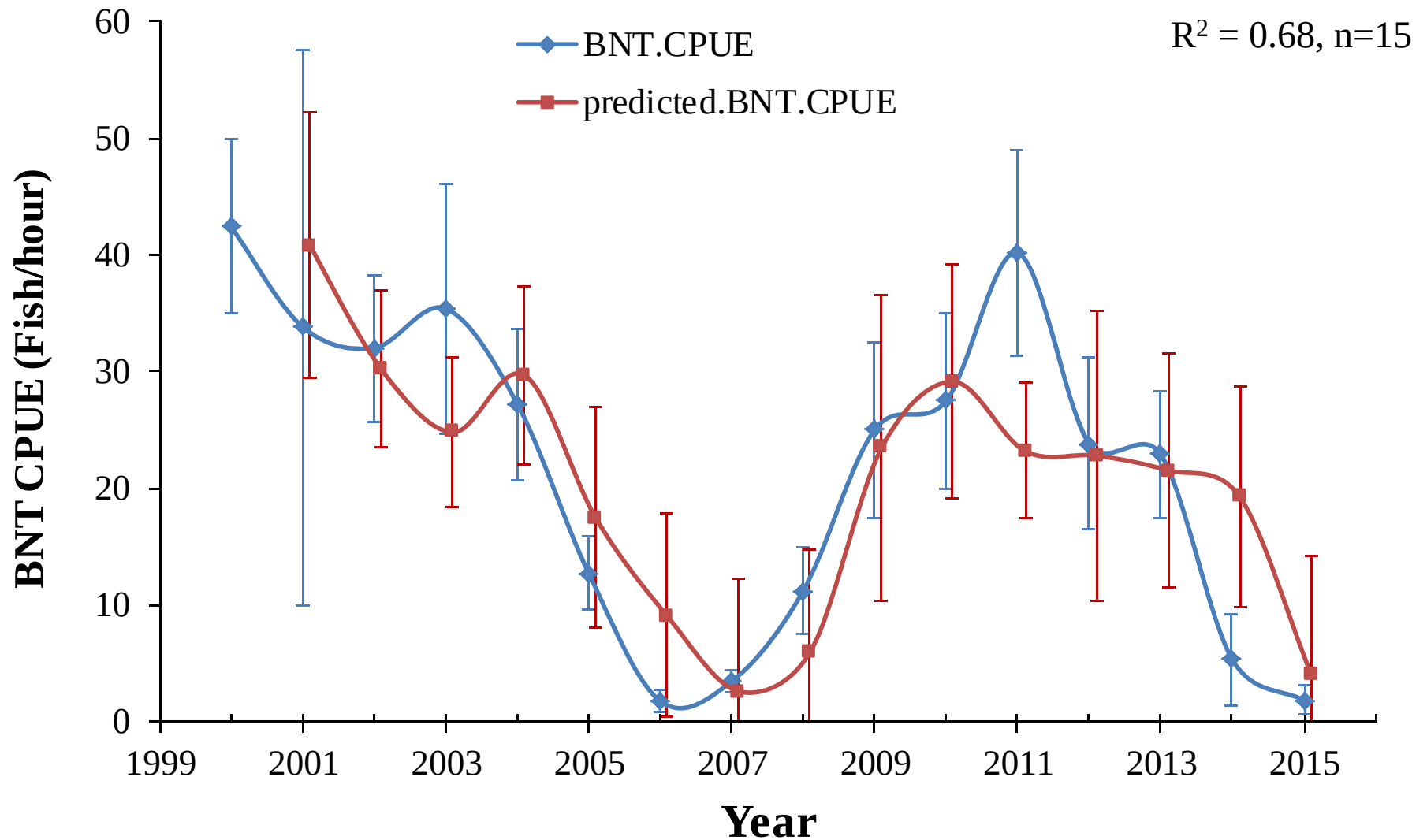
BNT removal and CPUE in mainstem



Predicting BNT CPUE



$$\text{BNT.CPUE} = \text{RBT.CPUE} + \text{BNT.CPUE-1yr} - \text{BNT.removed}$$



Bright Angel Creek trout removal and Colorado River effects

- We can model trout metrics and removal is an important component of those models
 - Fish community changed - Due to removal?
 - Reduction in BNT CPUE
 - Length distribution of BNT has increased
 - Reduction in RBT CPUE



Summary

- Representative sample: 18% of the shoreline
- HBC are throughout the river (RM 0-280)
 - Don't know if this is new or not?
- We can detect an effect of the NPS Bright Angel trout removal project in the mainstem





Acknowledgements



Humphrey Summit & Saint Judes Ltd.
- boatmen

All of the volunteers,
Past & present agency personnel

