

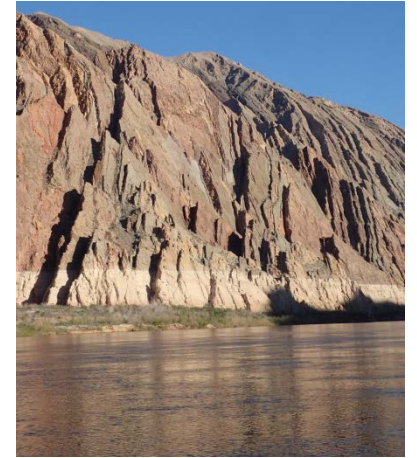
AGFD Grand Canyon Systemwide Fish Monitoring



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Objective

Describe distribution and relative abundance of fish (all species) in the Colorado River between Lees Ferry and Lake Mead



Role in GCDAMP

Goal 2: Maintain or attain viable populations of existing native fish, remove jeopardy for humpback chub and razorback sucker, and prevent adverse modification to their critical habitats

Long term, broad scale fisheries monitoring
2000 – present (no end date)

Role in GCDAMP

- Provide information on species and areas not targeted by other projects
- Data sharing with other projects
- Historical/baseline data to address future questions

Methods – boat electrofishing



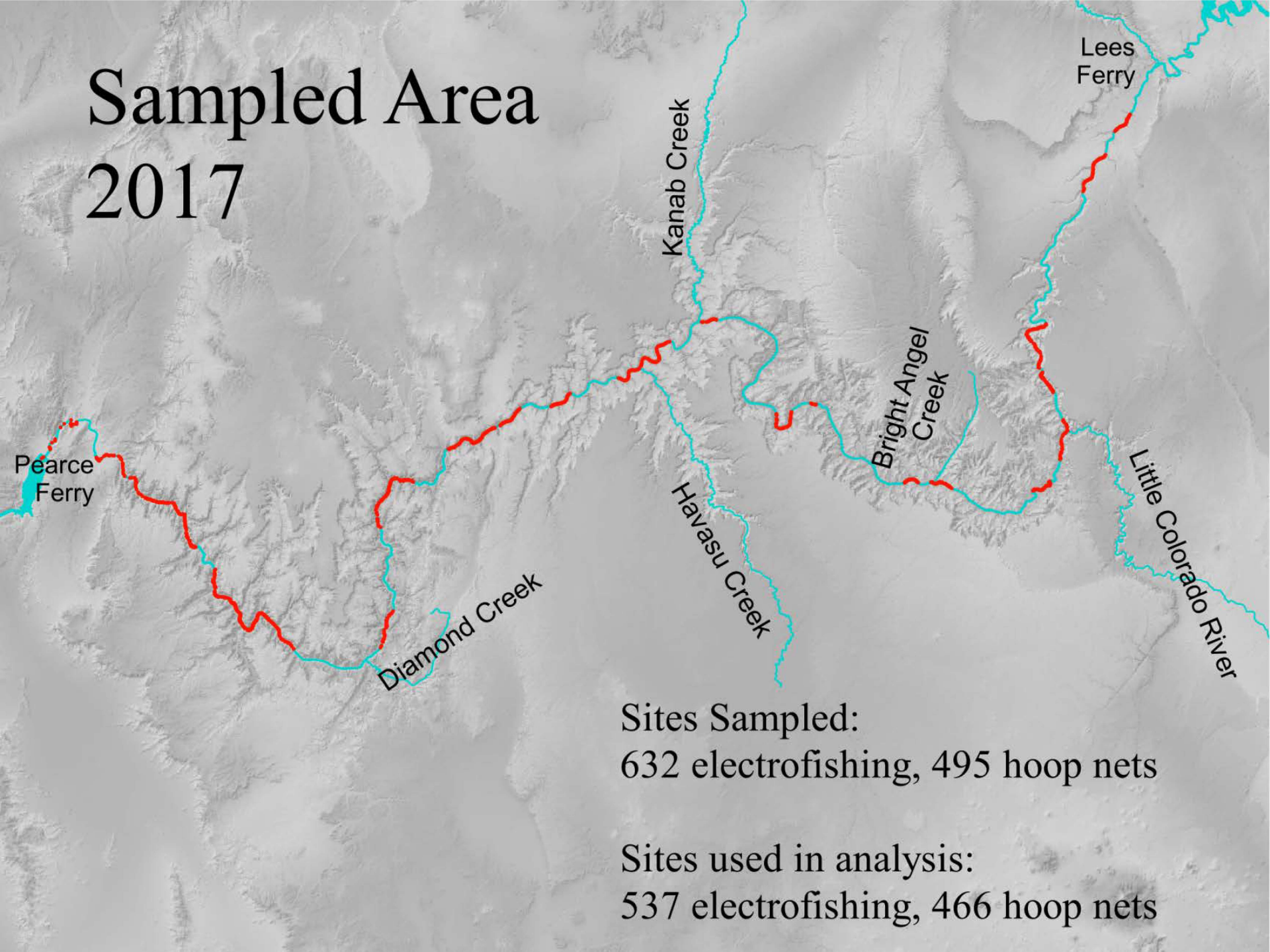
Methods – hoop netting



Methods – angling



Sampled Area 2017



Lees Ferry

Kanab Creek

Bright Angel Creek

Little Colorado River

Havasu Creek

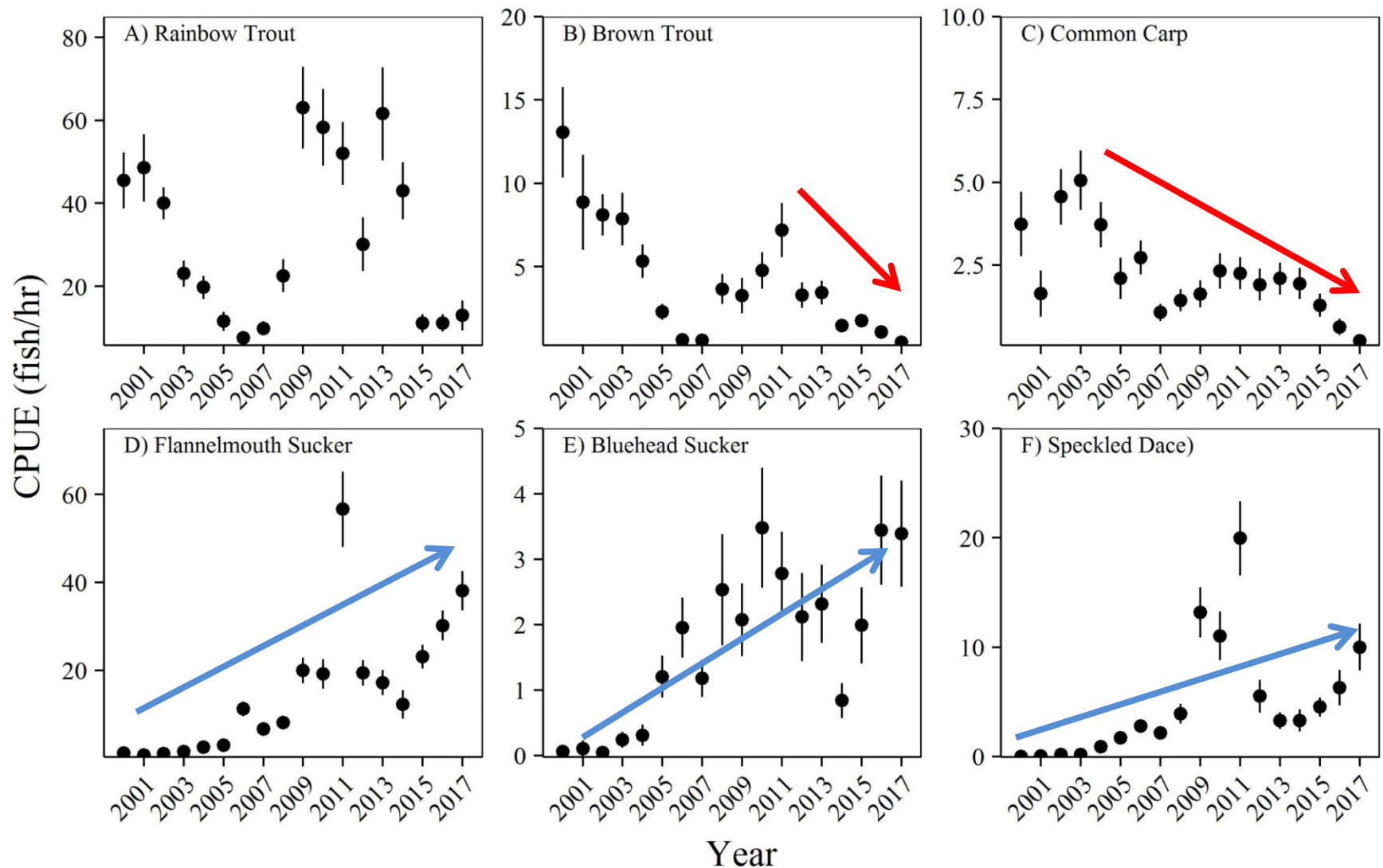
Diamond Creek

Pearce Ferry

Sites Sampled:
632 electrofishing, 495 hoop nets

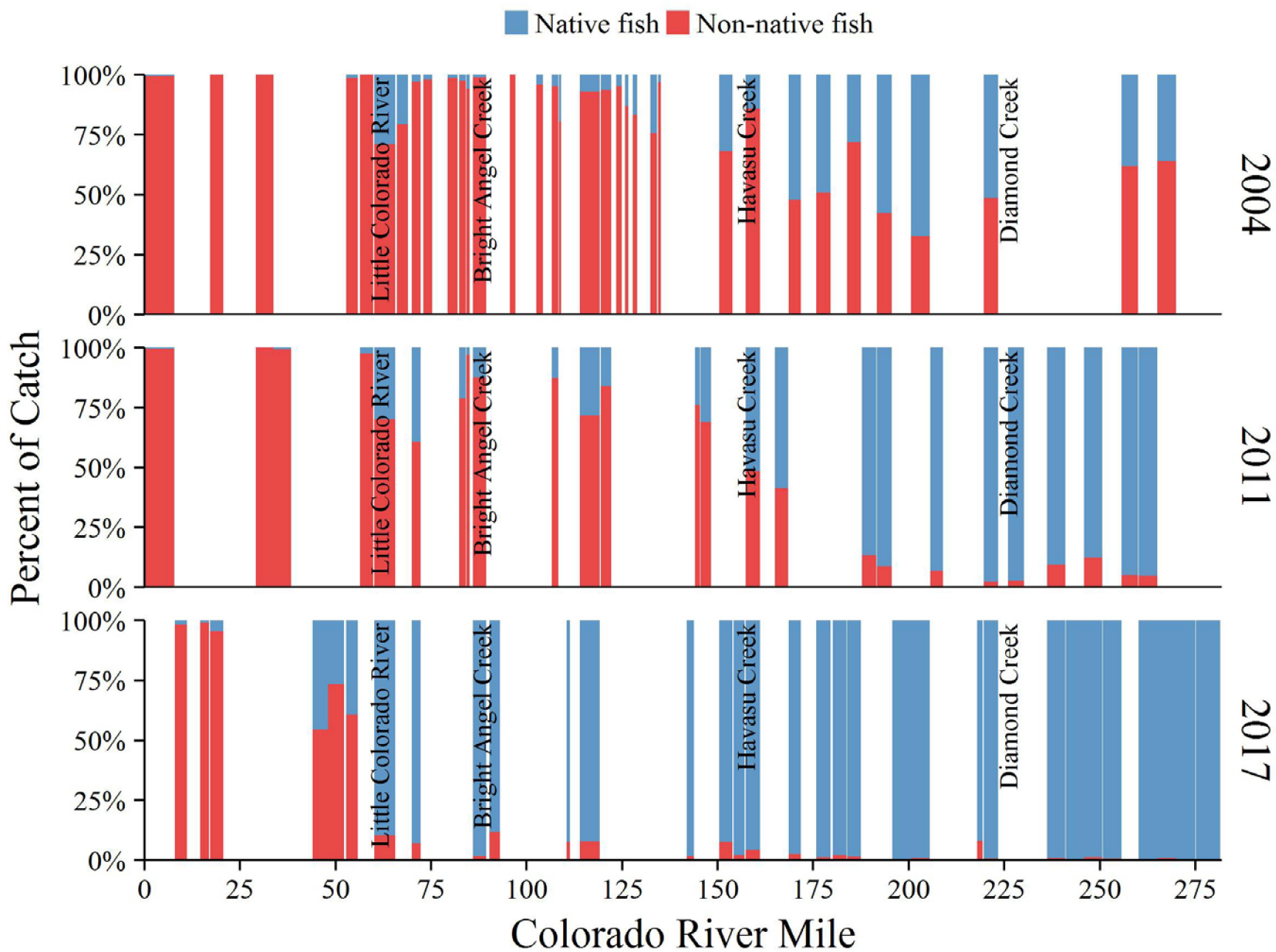
Sites used in analysis:
537 electrofishing, 466 hoop nets

Historical Electrofishing Catch (2000 – 2017)



Non-native fish: relative abundance decreasing

Native fish: relative abundance increasing



Rare non-natives

- Warmwater species
 - Monitor species already in river
 - Detect future invasions from Lake Powell, Lake Mead, Little Colorado River
- Brown Trout





Rare non-natives

Species	2017 Count
<i>Large Bodied Fish</i>	
Brown Trout	32
Common Carp	19
Channel Catfish	2
Gizzard Shad	2
Striped Bass	1
<i>Small Bodied Fish</i>	
Fathead Minnow	28
Red Shiner	19
Plains Killifish	1

4 trips, Lees Ferry to Lake Mead inlet

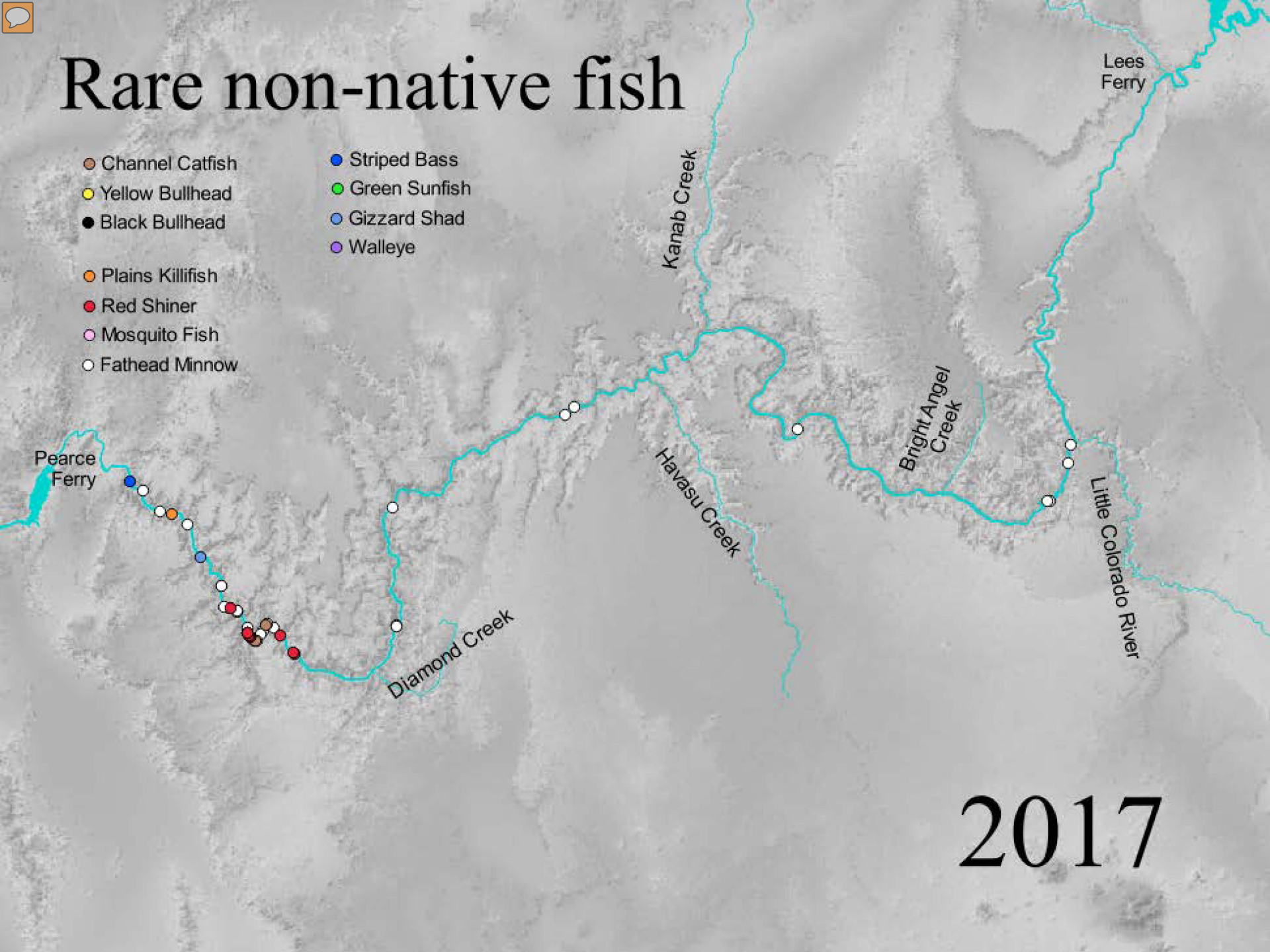
632 Electrofishing sites, 476 Baited hoop nets, 29 nights of angling

Species	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<i>Large Bodied Fish</i>										
Brown Trout	252	245	318	550	187	308	142	153	84	32
Common Carp	192	125	158	138	82	175	178	122	58	19
Channel Catfish	5	4	8	3	12	9	2	2	3	2
Gizzard Shad	1	0	0	0	2	4	5	1	0	2
Striped Bass	0	0	3	1	8	10	0	0	6	1
Walleye	0	0	0	0	0	1	0	0	0	0
Green Sunfish	0	0	2	0	1	0	0	0	0	0
Yellow Bullhead	0	0	1	0	0	0	1	0	2	0
Black Bullhead	3	1	1	0	1	3	1	0	1	0
<i>Small Bodied Fish</i>										
Fathead Minnow	48	152	206	119	61	15	31	37	53	28
Red Shiner	1	239	130	103	37	27	5	16	2	19
Plains Killifish	1	0	3	2	7	1	0	1	2	1
Mosquito Fish	0	0	0	0	9	0	5	2	1	0



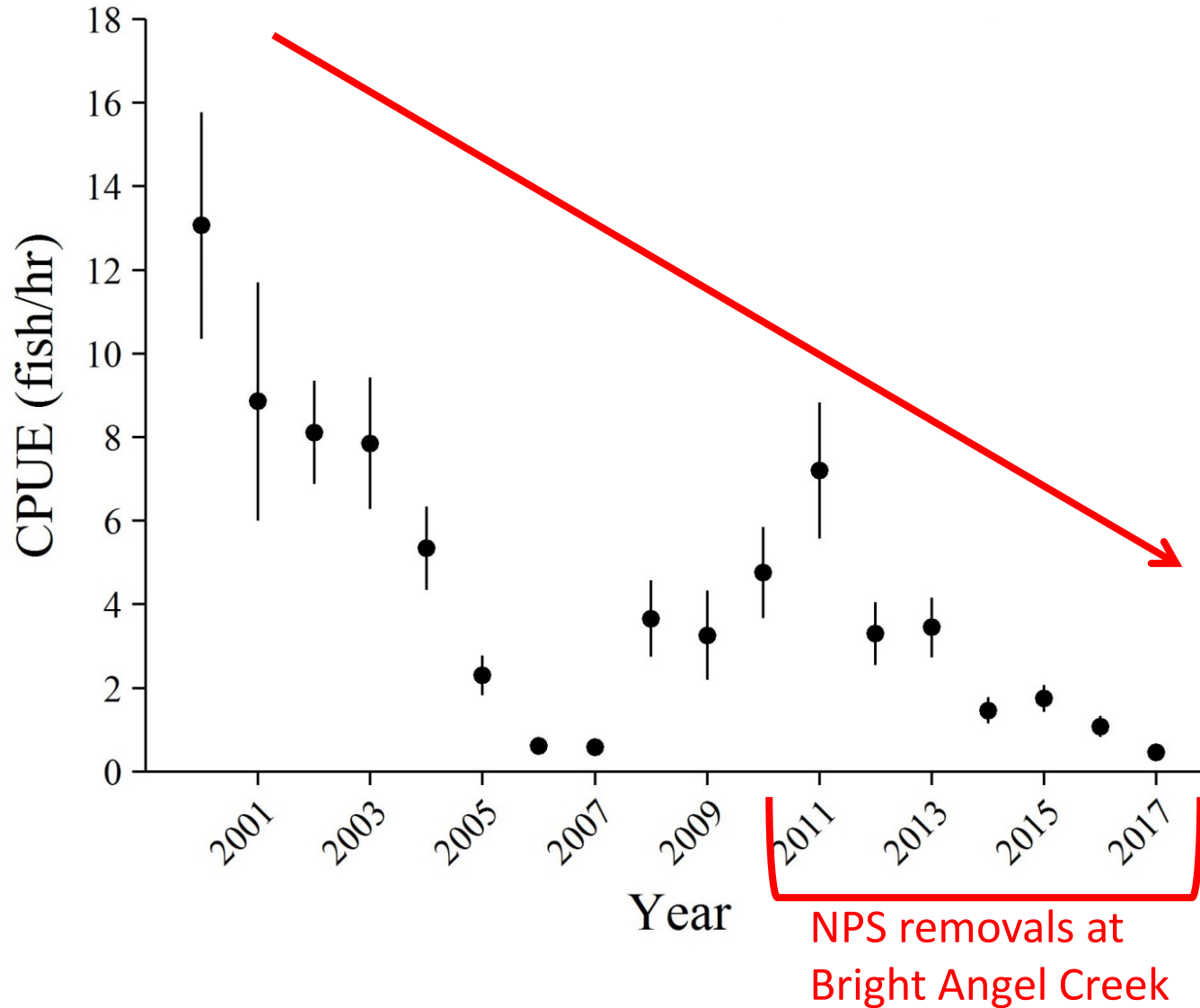
Rare non-native fish

- Channel Catfish
- Yellow Bullhead
- Black Bullhead
- Plains Killifish
- Red Shiner
- Mosquito Fish
- Fathead Minnow
- Striped Bass
- Green Sunfish
- Gizzard Shad
- Walleye

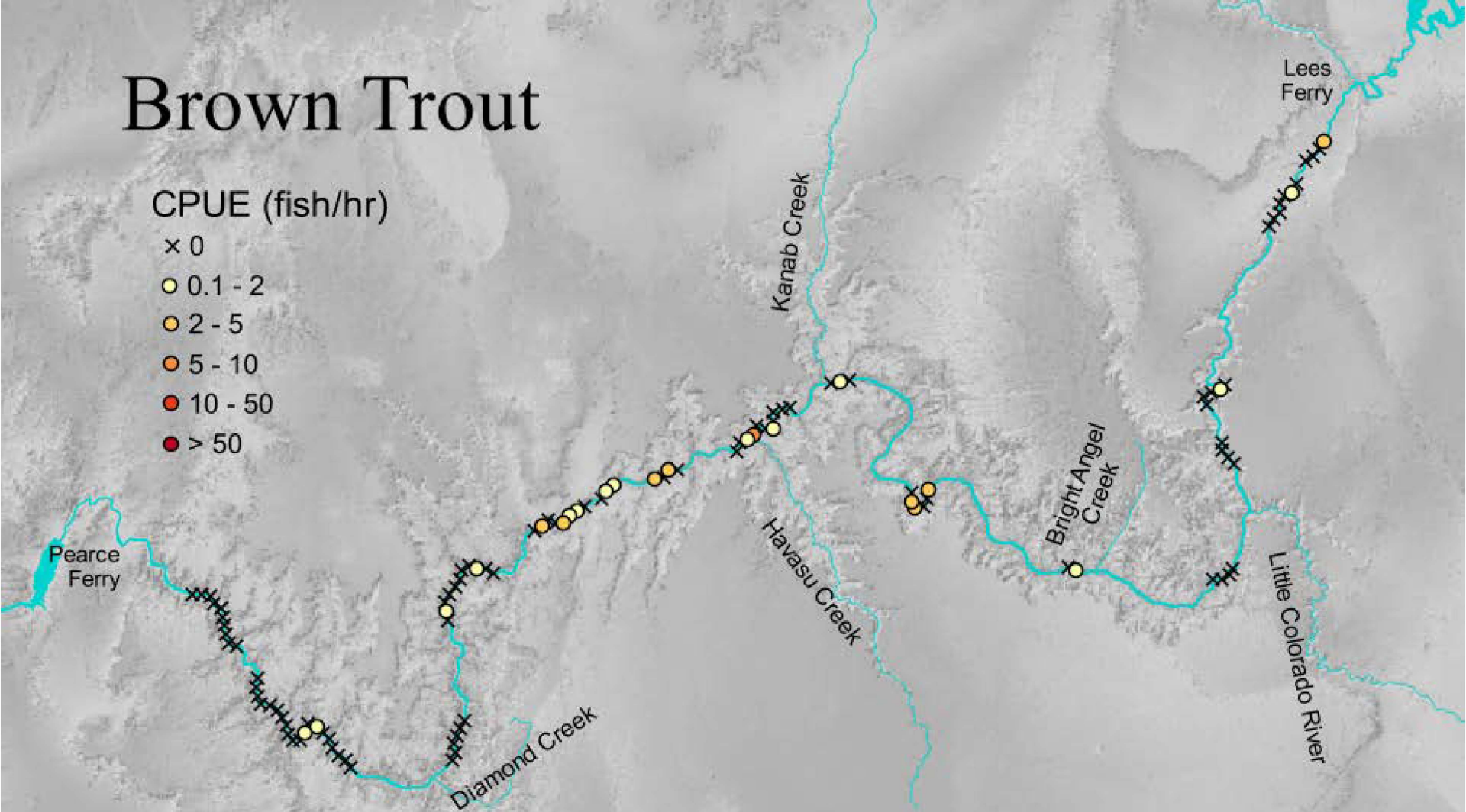


2017

Brown Trout electrofishing CPUE

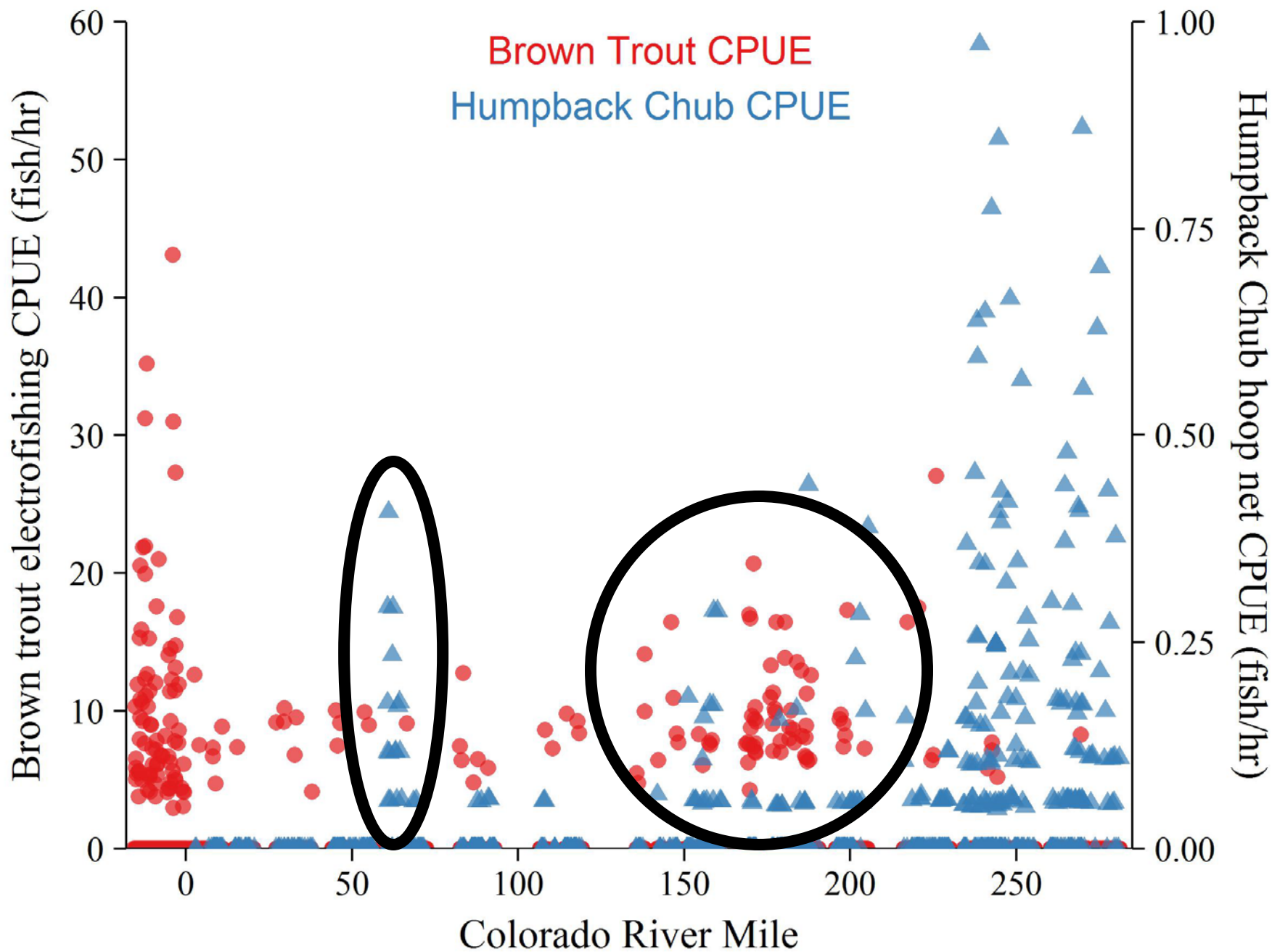


Brown Trout



2017

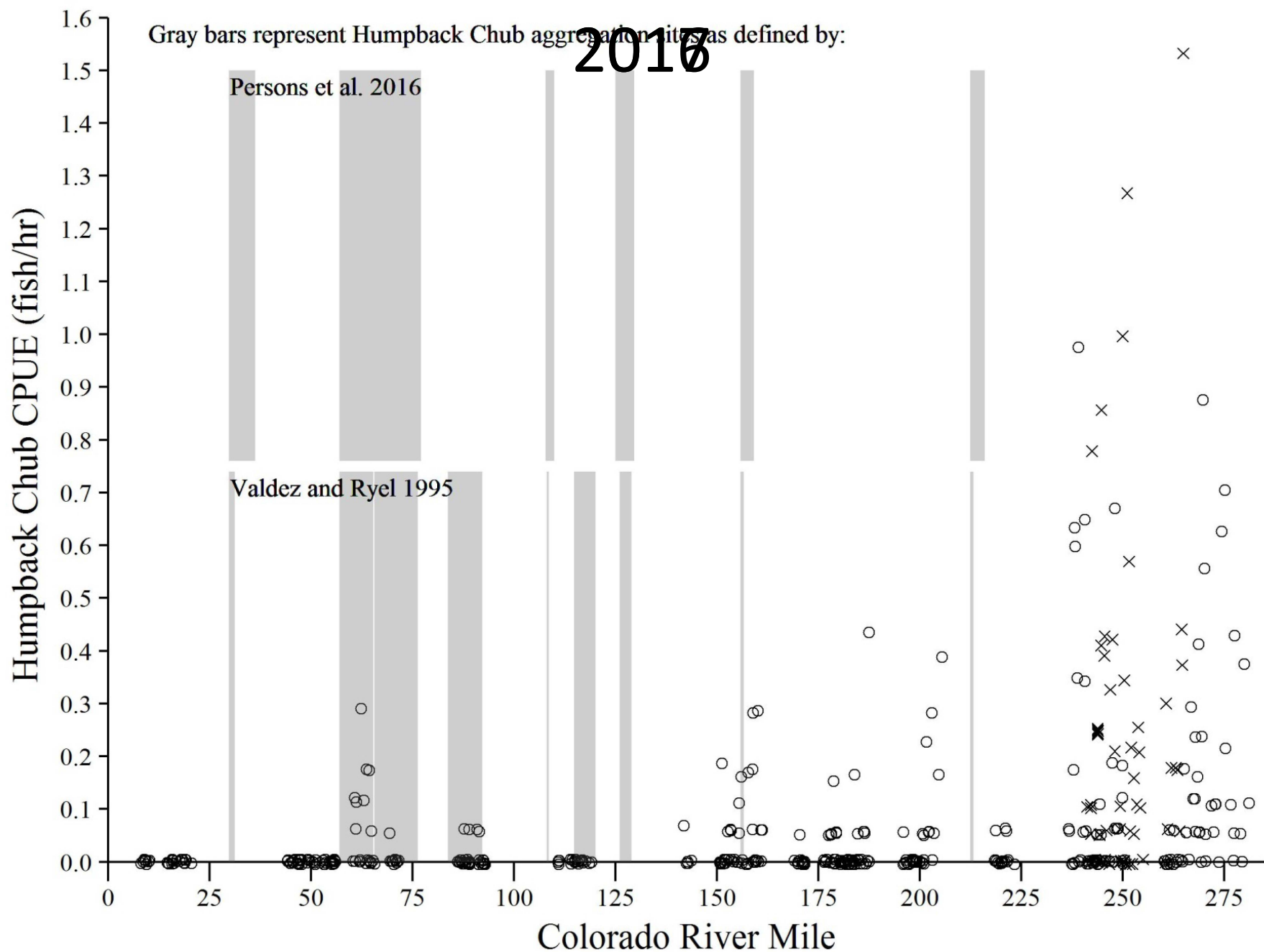
Electrofishing CPUE (fish/hr) by river mile



Humpback Chub

- 2016 – Hoop nets added to sampling, caught high numbers of humpback chub in Western Grand Canyon
- 2017 - similar patterns in HBC catch



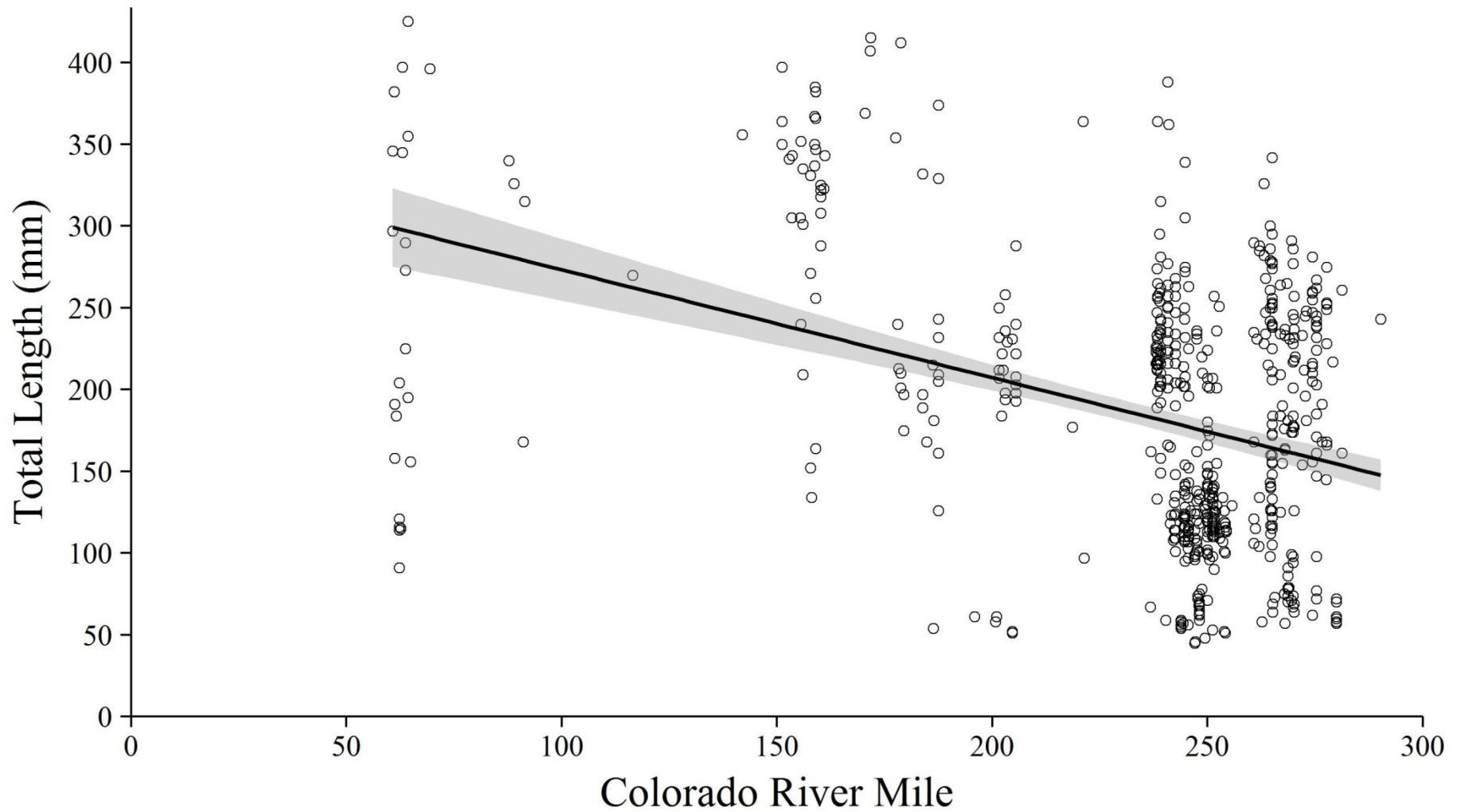


Lees Ferry



Little Colorado River

Mean Humpback Chub Total Length decreases moving downstream





Below Diamond Creek

- 536 unique Humpback Chub $\geq 80\text{mm}$
- 29 recaptured fish (3 in fall 2016, 26 in 2017)
 - All tagged below Diamond (9 by AGFD and 18 by USFWS) (except 2 unaccounted for)



What about below Pearce Ferry?





Lake Mead
Inlet

Humpback Chub below Pearce Ferry

Pearce
Ferry

- ✕ No Humpback Chub caught
- < 0.05 fish/hr
- 0.05 - 0.15
- 0.15 - 0.30
- > 0.30

Total: 8 Humpback Chub
(54 hoop nets, 1 trammel net capture)

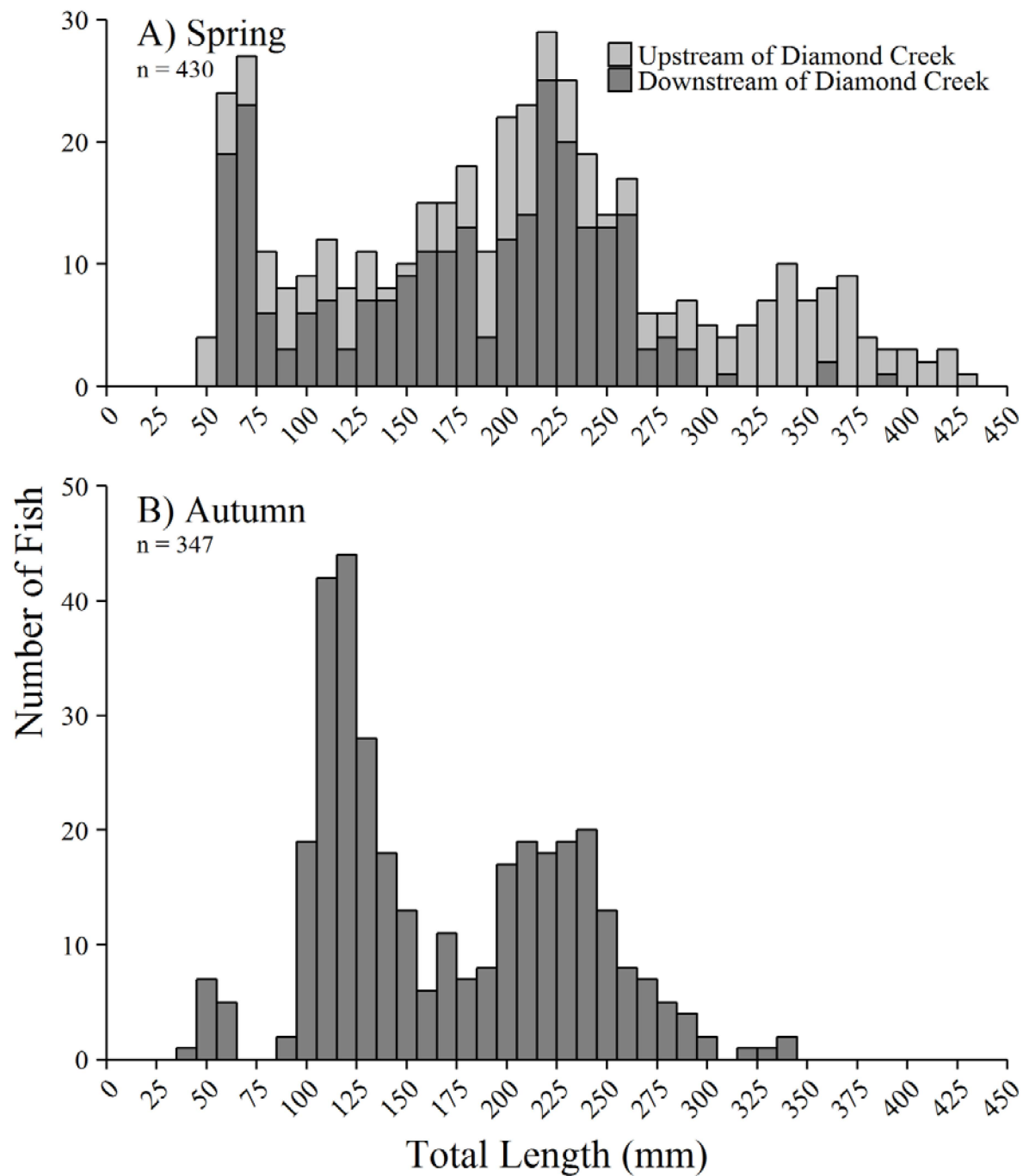
Conclusions

- Native fish
 - Flannelmouth sucker most abundant species captured in Grand Canyon
 - Relatively high numbers of Humpback Chub below Diamond Creek
- Non-native fish
 - In Grand Canyon, Brown Trout at historically low numbers (especially few in Marble Canyon)
 - No new warmwater nonnative species detected

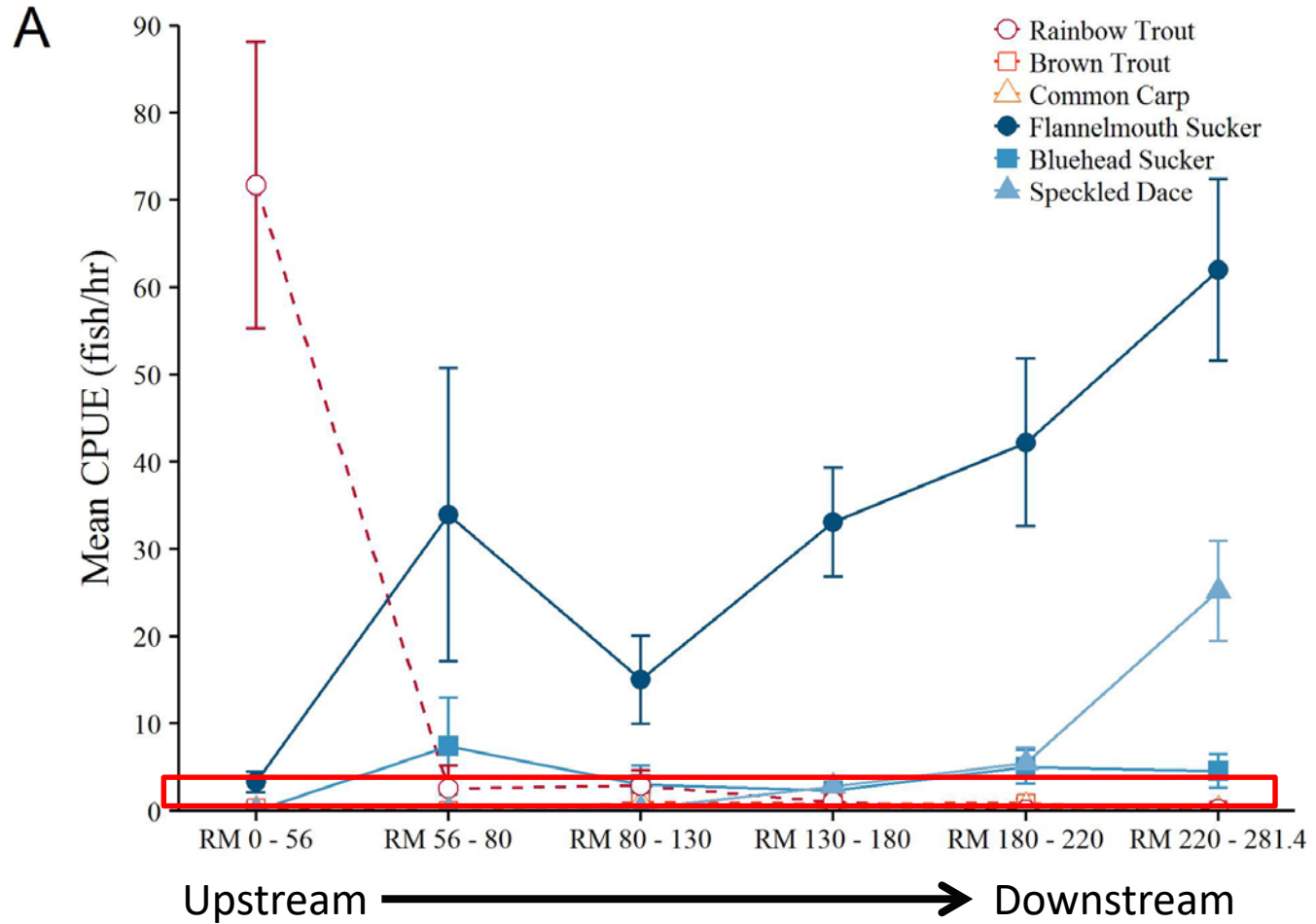
Acknowledgements

- GCMRC
- St. Judes LLC boatmen
- Volunteers & past AGFD employees
- Photos: AGFD, Susan Allen, Katherine Halama
- Cooperators
- Bio-WEST for additional data below Pearce Ferry

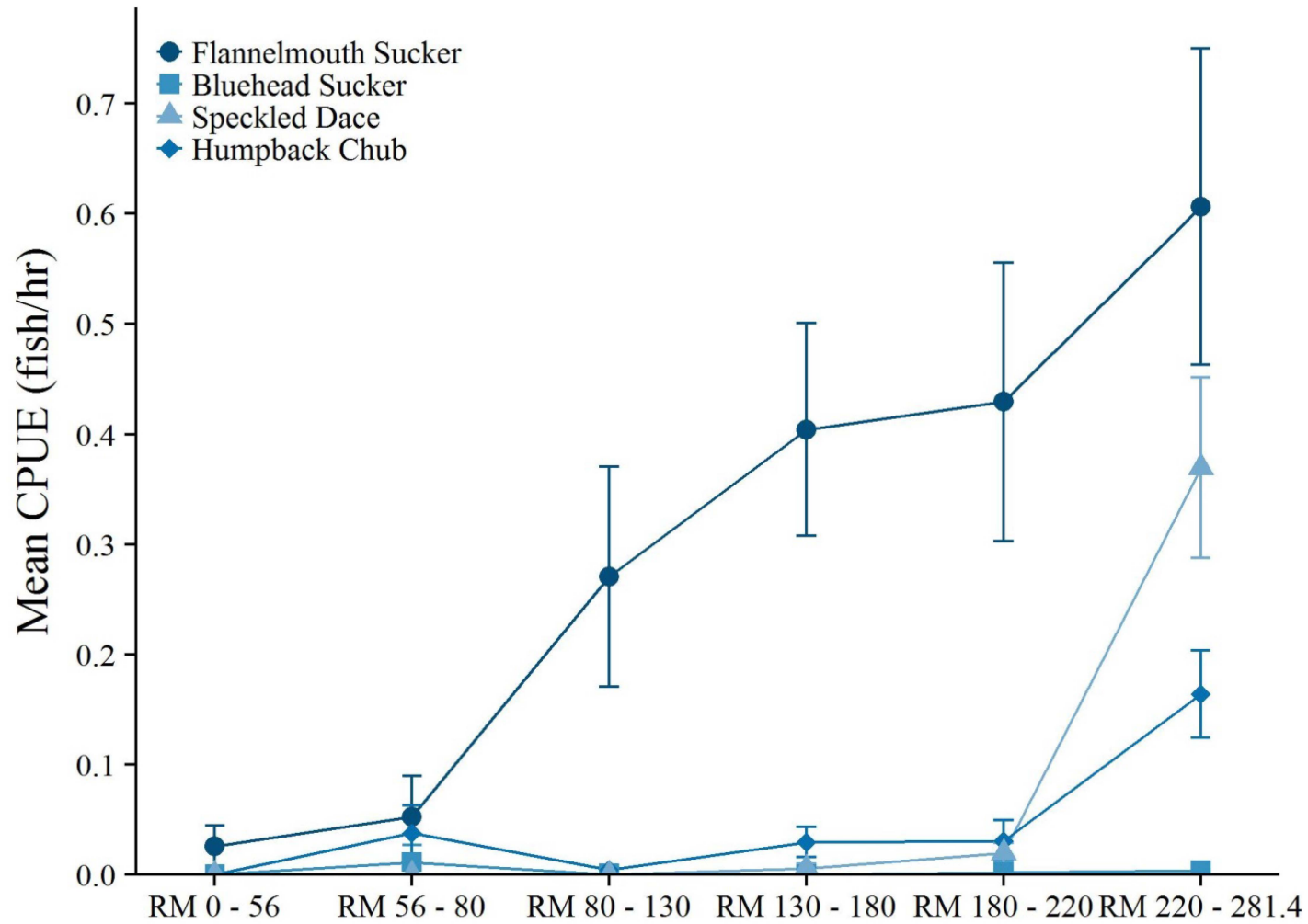
Supplemental Figures



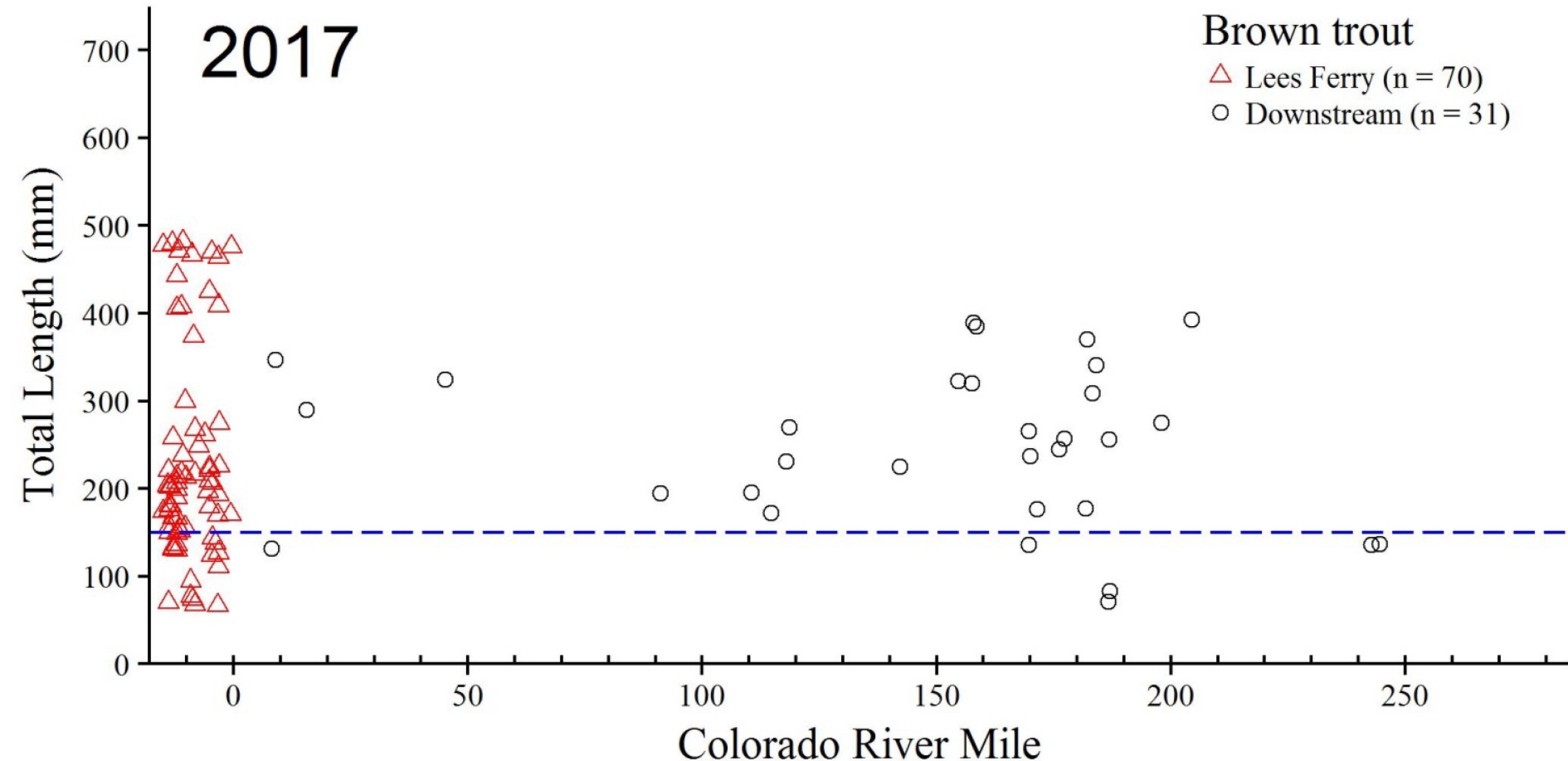
Electrofishing Catch



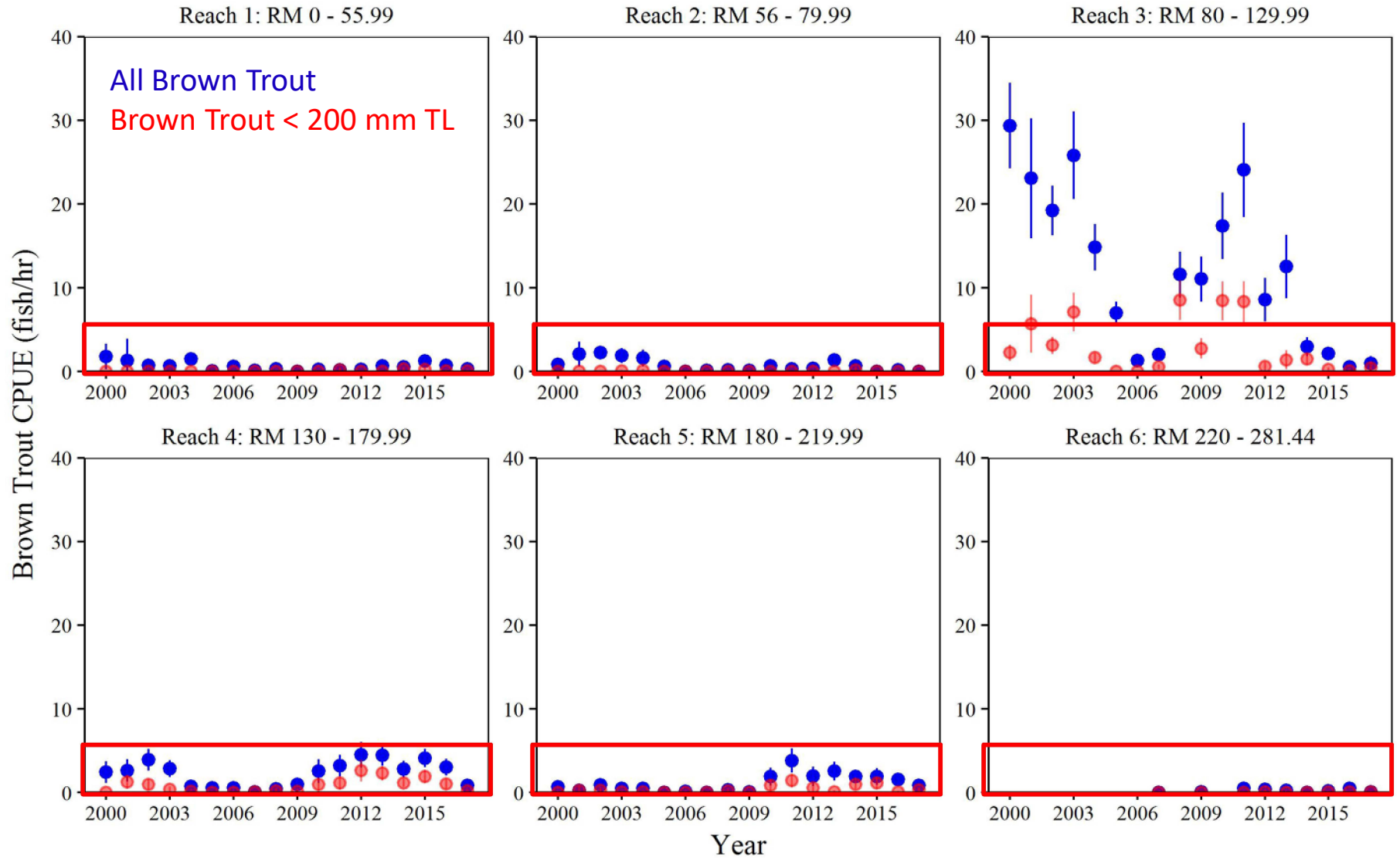
Hoop net Catch



Brown Trout – size and location



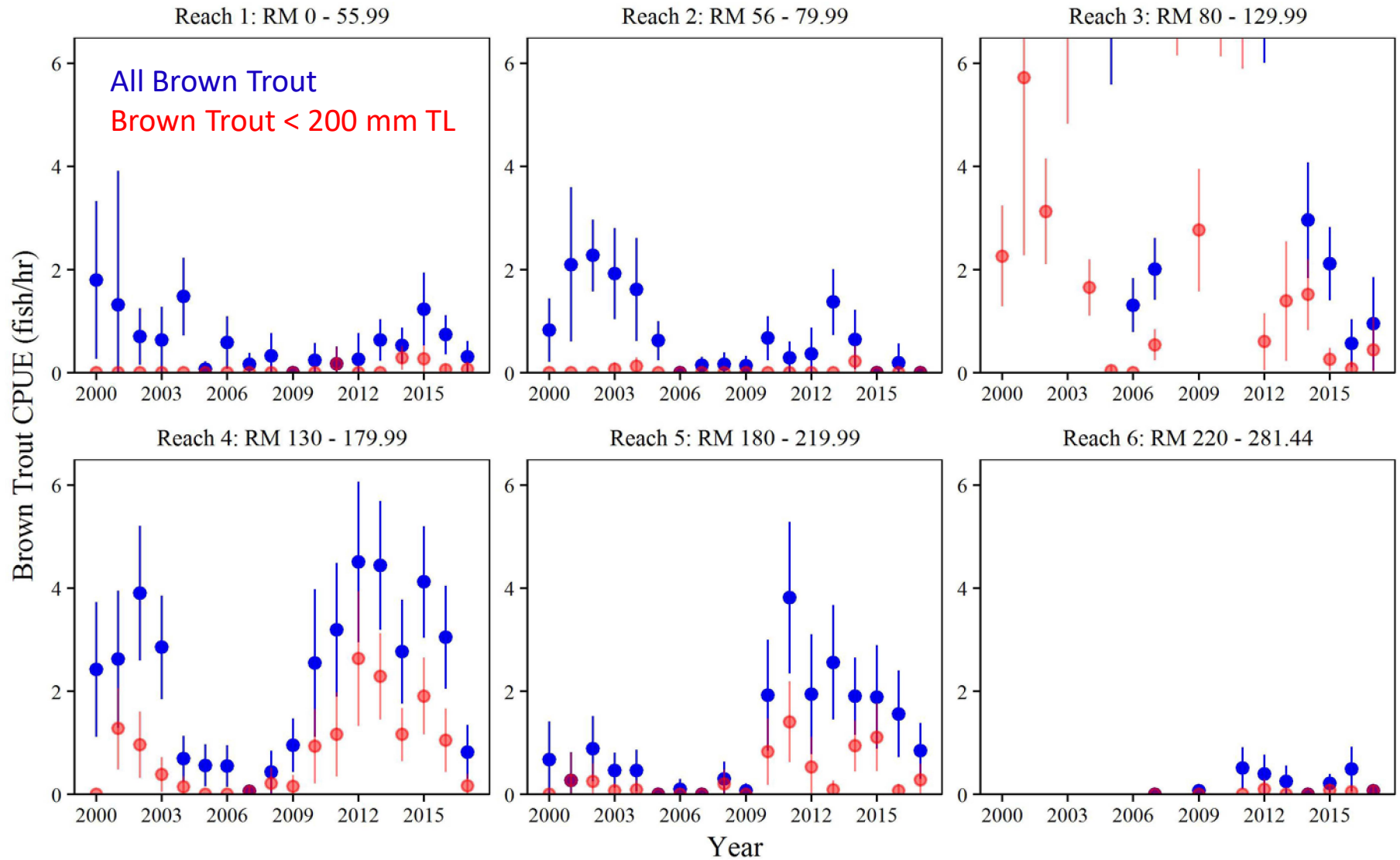
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