

Experimental Pikeminnow Stocking in Western Grand Canyon?



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Colorado Pikeminnow were impacted by dams very early



Celebration at completion of Laguna Dam 1909



For almost 50 years Colorado Pikeminnow have been missing from the Lower Basin!



Catching Colorado pikeminnow above Hoover Dam c.1938



Last Colorado pikeminnow captured in Lake Mohave, 1962



1978 last pikeminnow caught in Grand Canyon at Havasu Creek

Colorado Pikeminnow



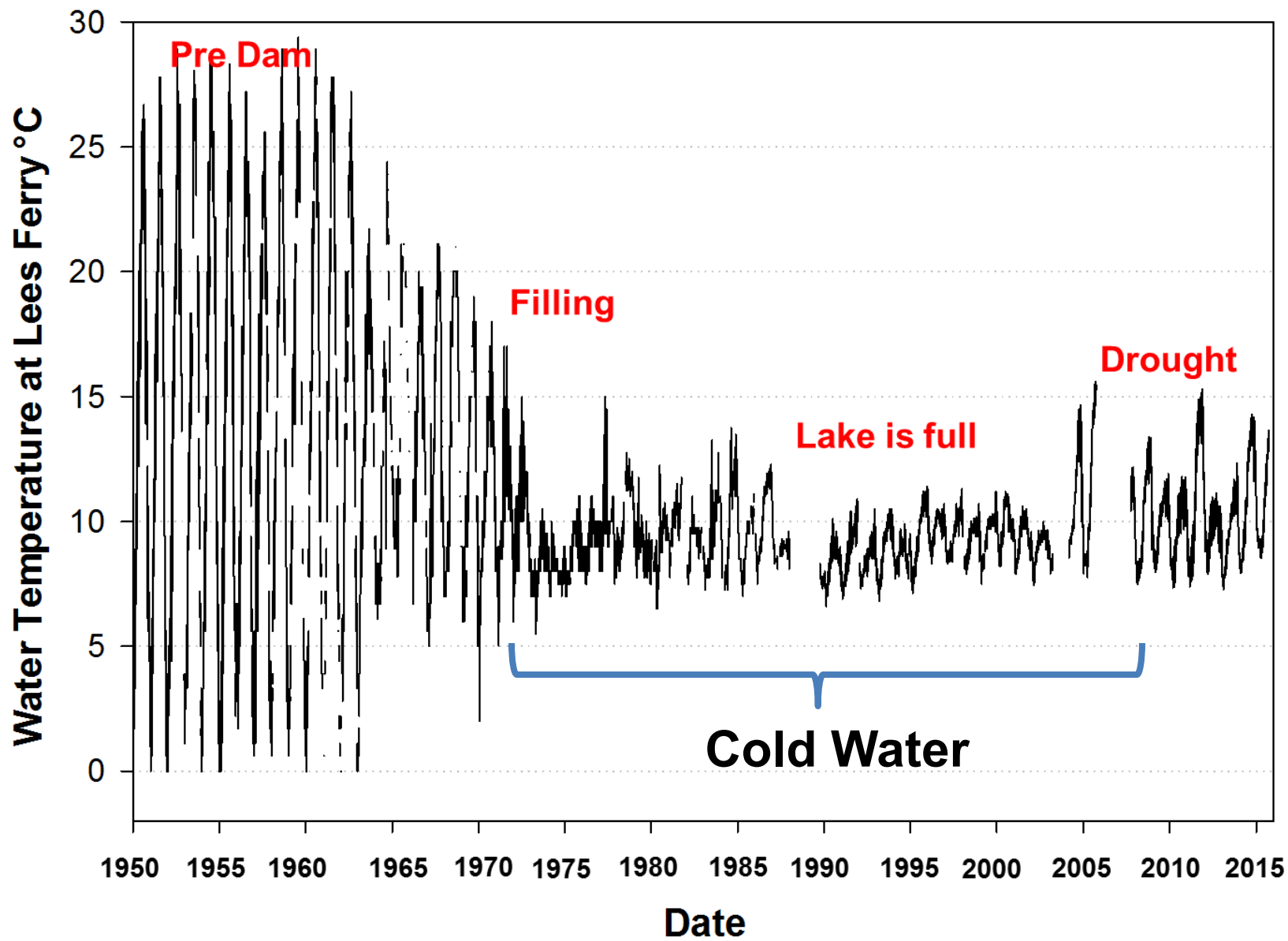


- Over 9 million Colorado Pikeminnow stocked into upper basin in last 50 years
- Average = 400,000 annually since 2002



- 0 - Mainstem Lower Colorado River

Why the large disparity in effort to reintroduce this species to its native range?



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Two Reasons



Recovery Program vs Compliance Program (Grand Canyon?)

Concerns about how reintroduction could adversely ongoing recovery efforts for other listed fishes

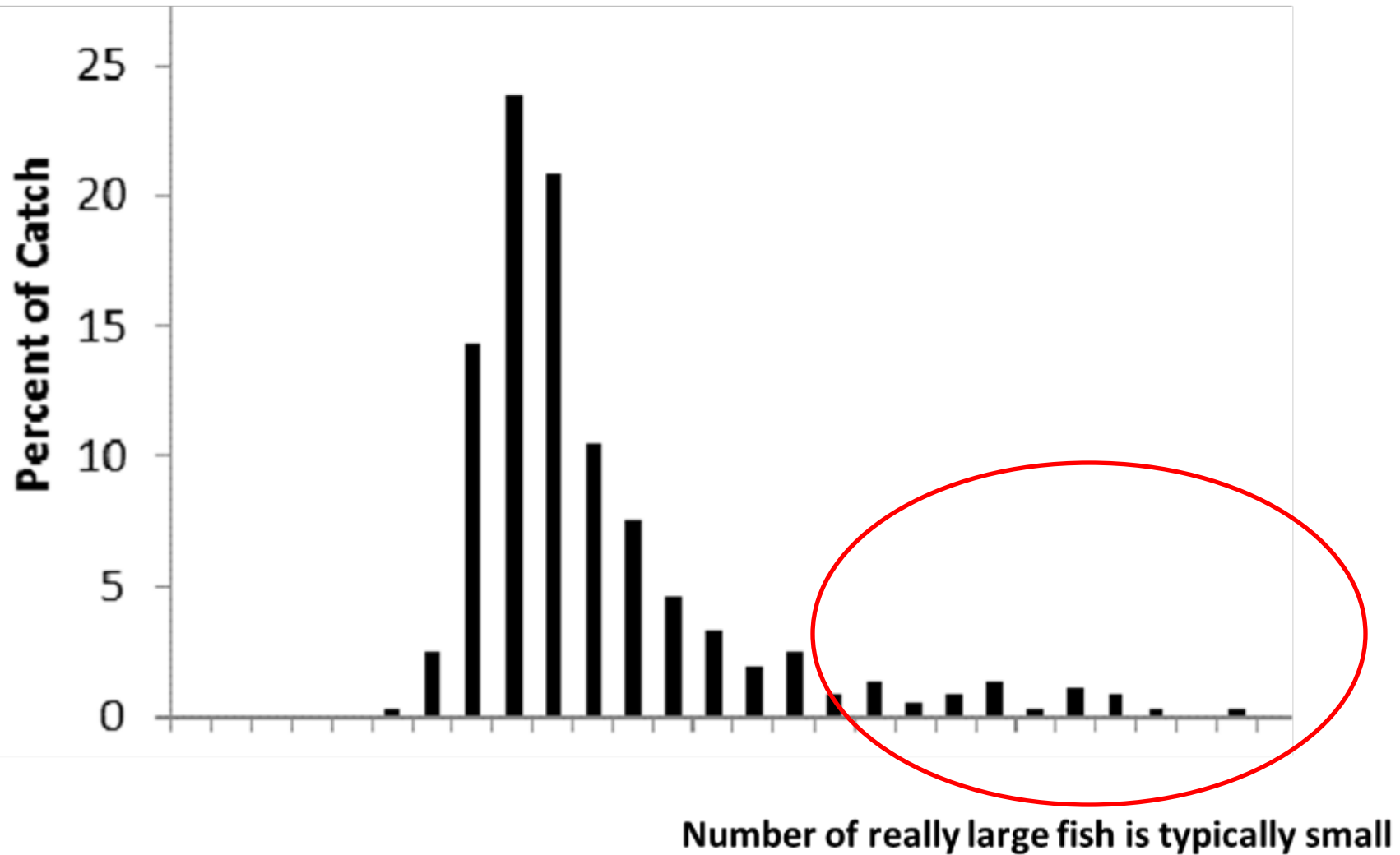


Mouths on large Colorado Pikeminnow look huge!

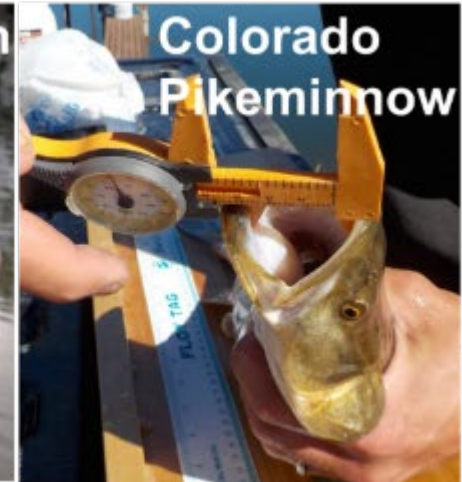
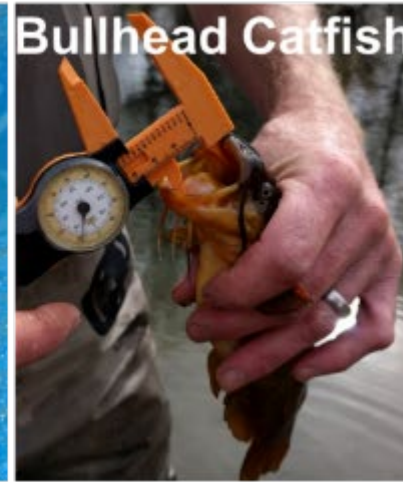


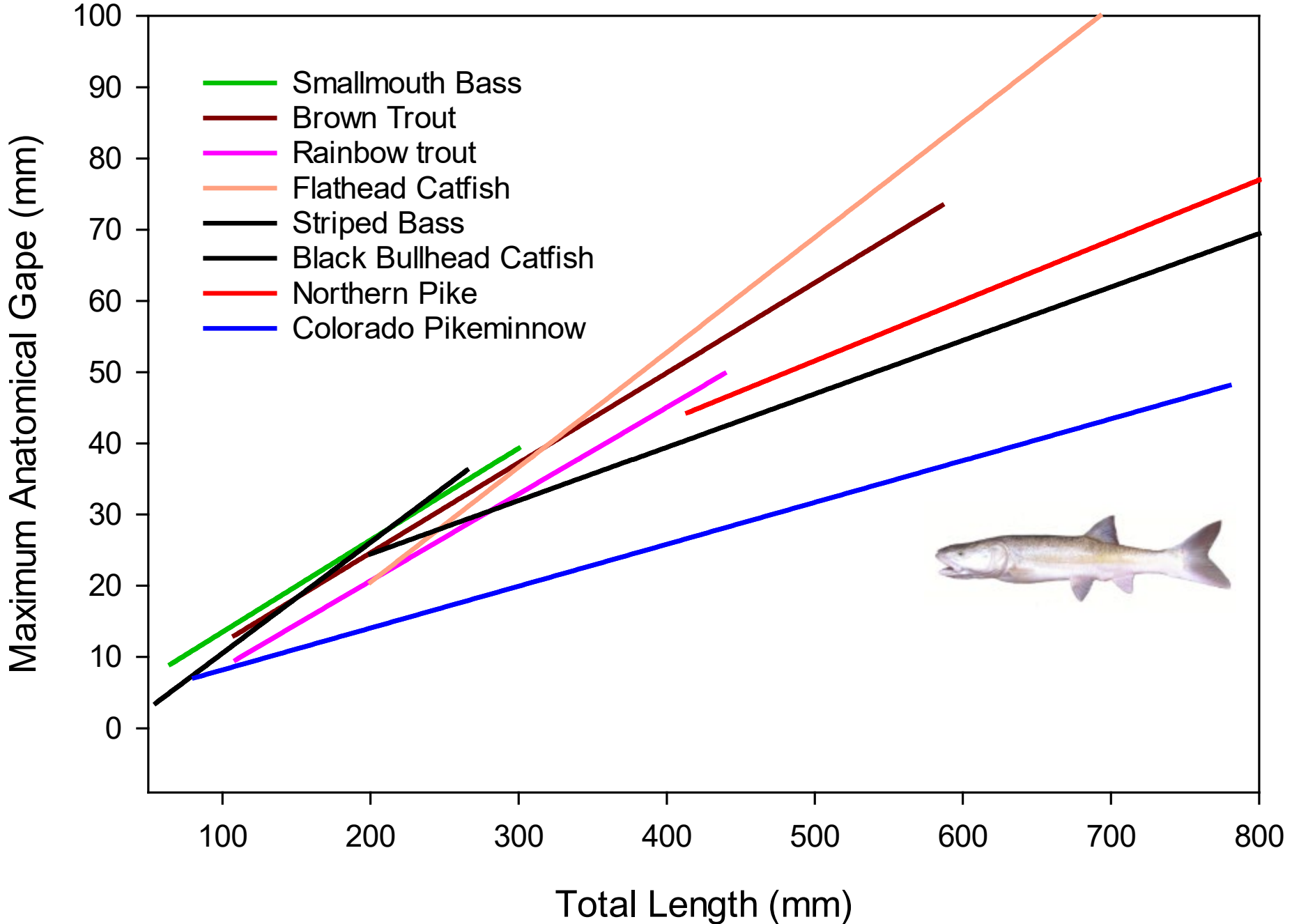
But are they really that big compared to other piscivorous fish?
And how many really large fish would exist in a normal population?

A Healthy fish population size distribution

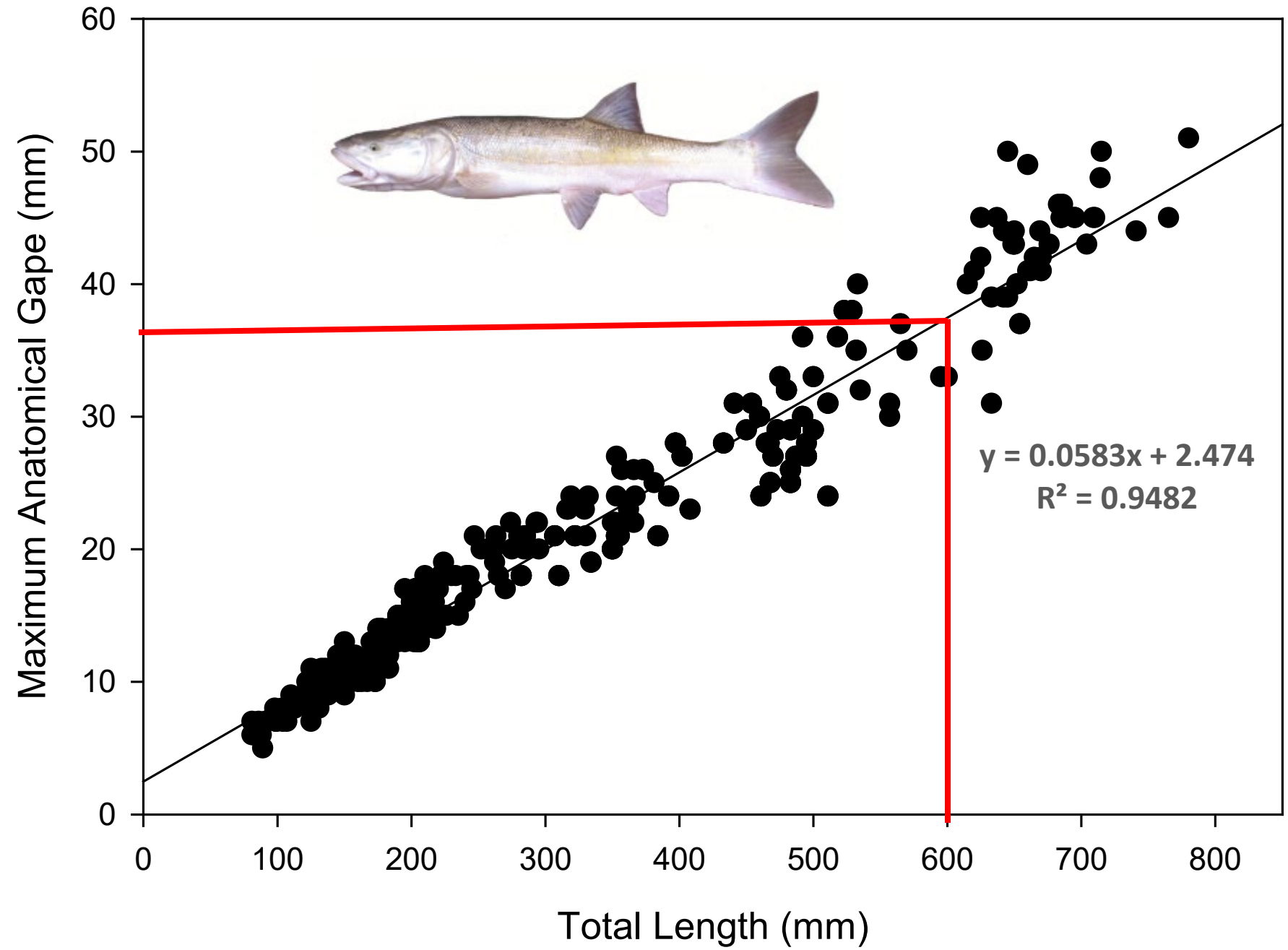


Predator Gapes

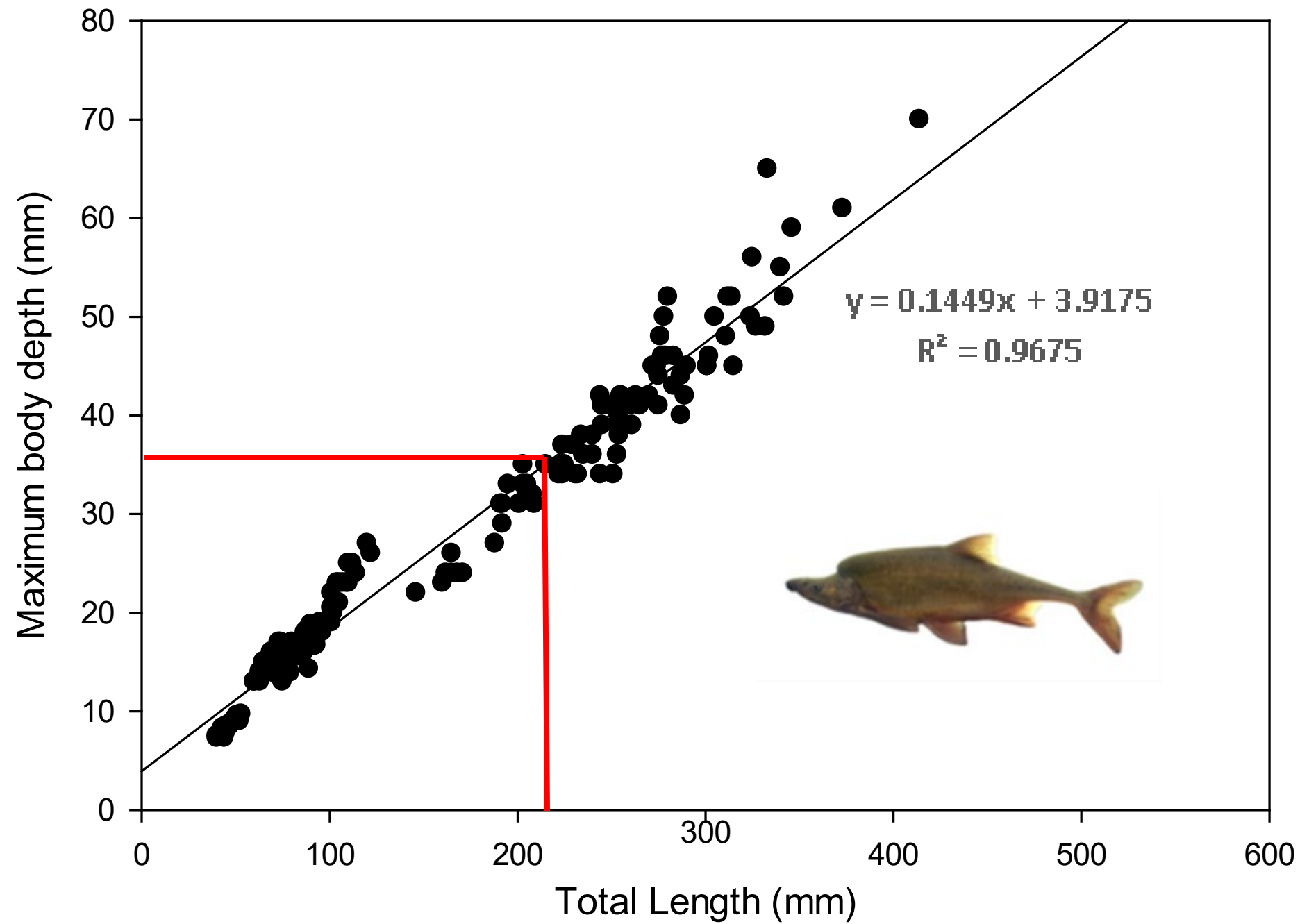


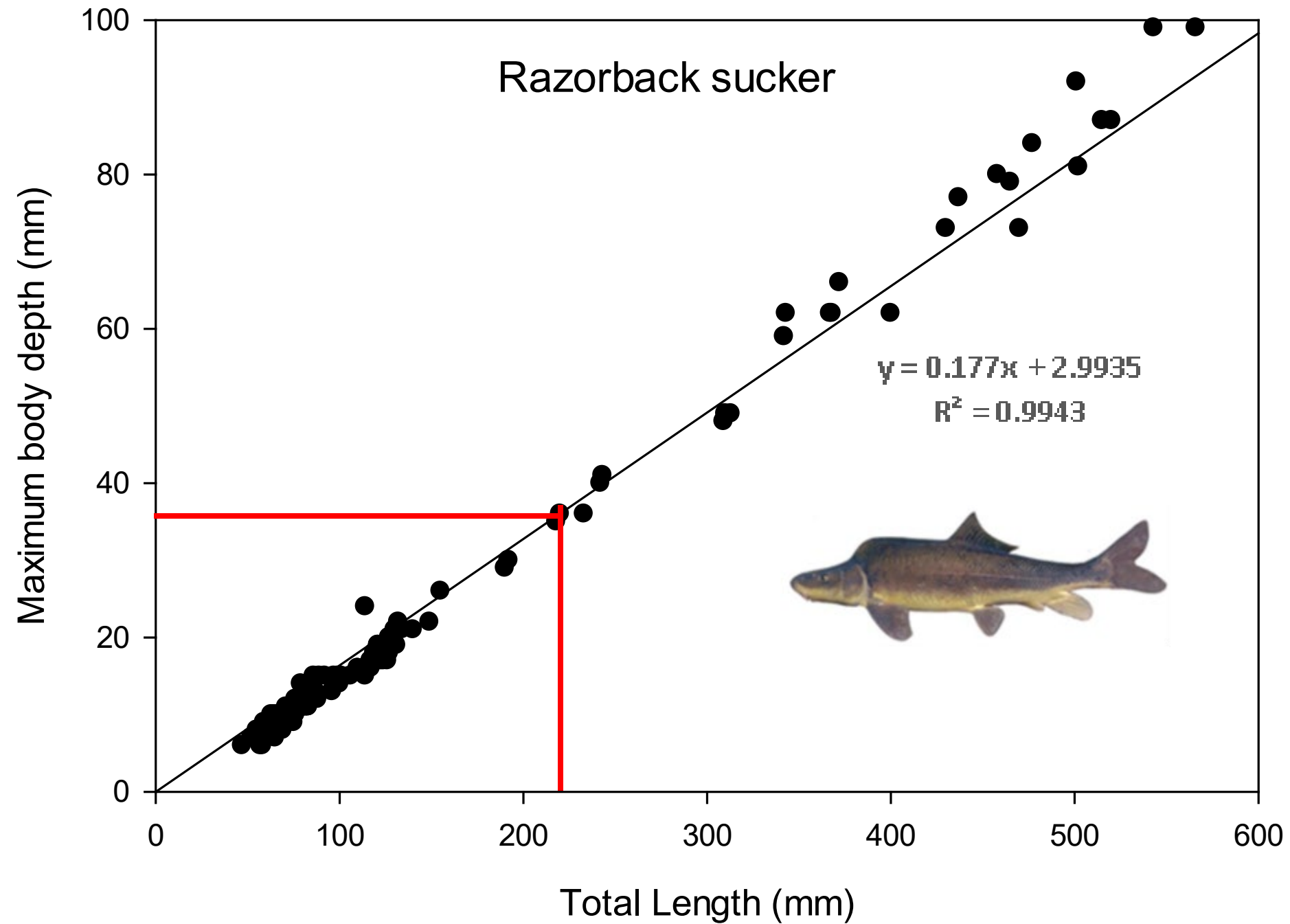


Colorado pikeminnow



Humpback chub





Adult Density



7 fish/river mile



>100 fish/river mile



>300 fish/river mile

Predation Methods



x 4

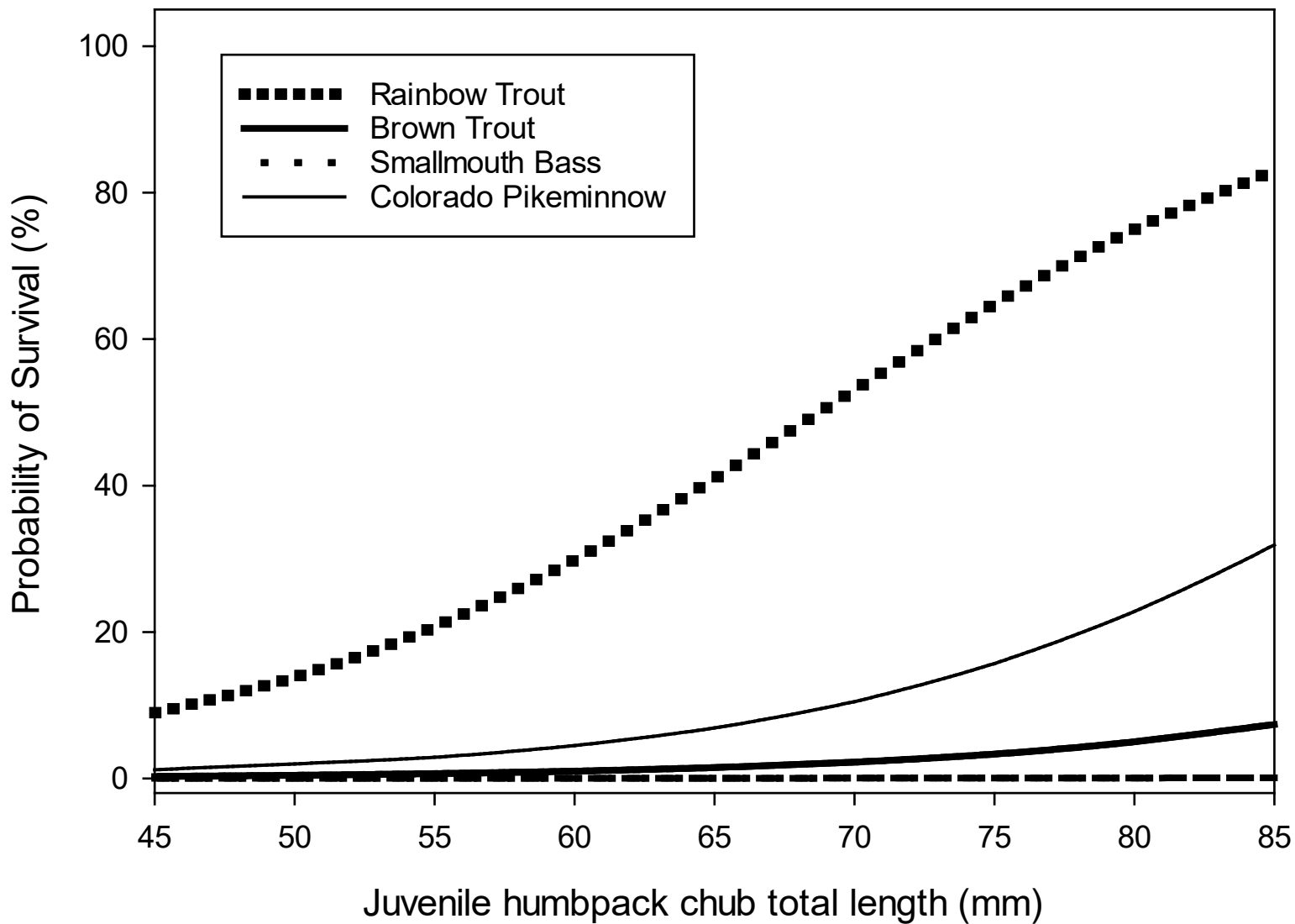


x 12



24 H

n TL)



Predation Trials

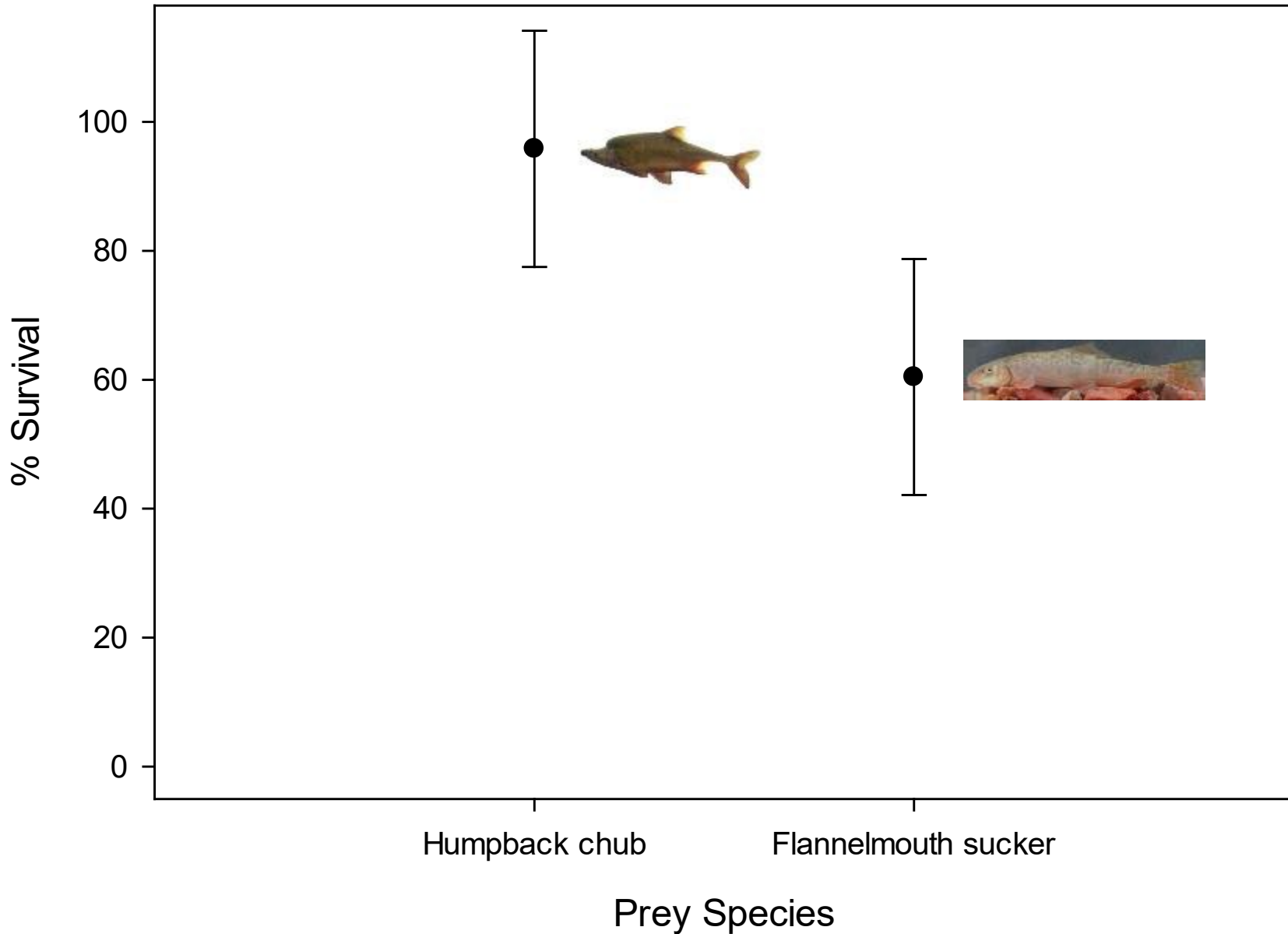
2 prey types



Chubs are 28 - 36% less
vulnerable to predation than suckers

Tank Trials - 8 Replicates

Difference in Predation Vulnerability



Pond Trials

10



626-765 mm
TL

25



25

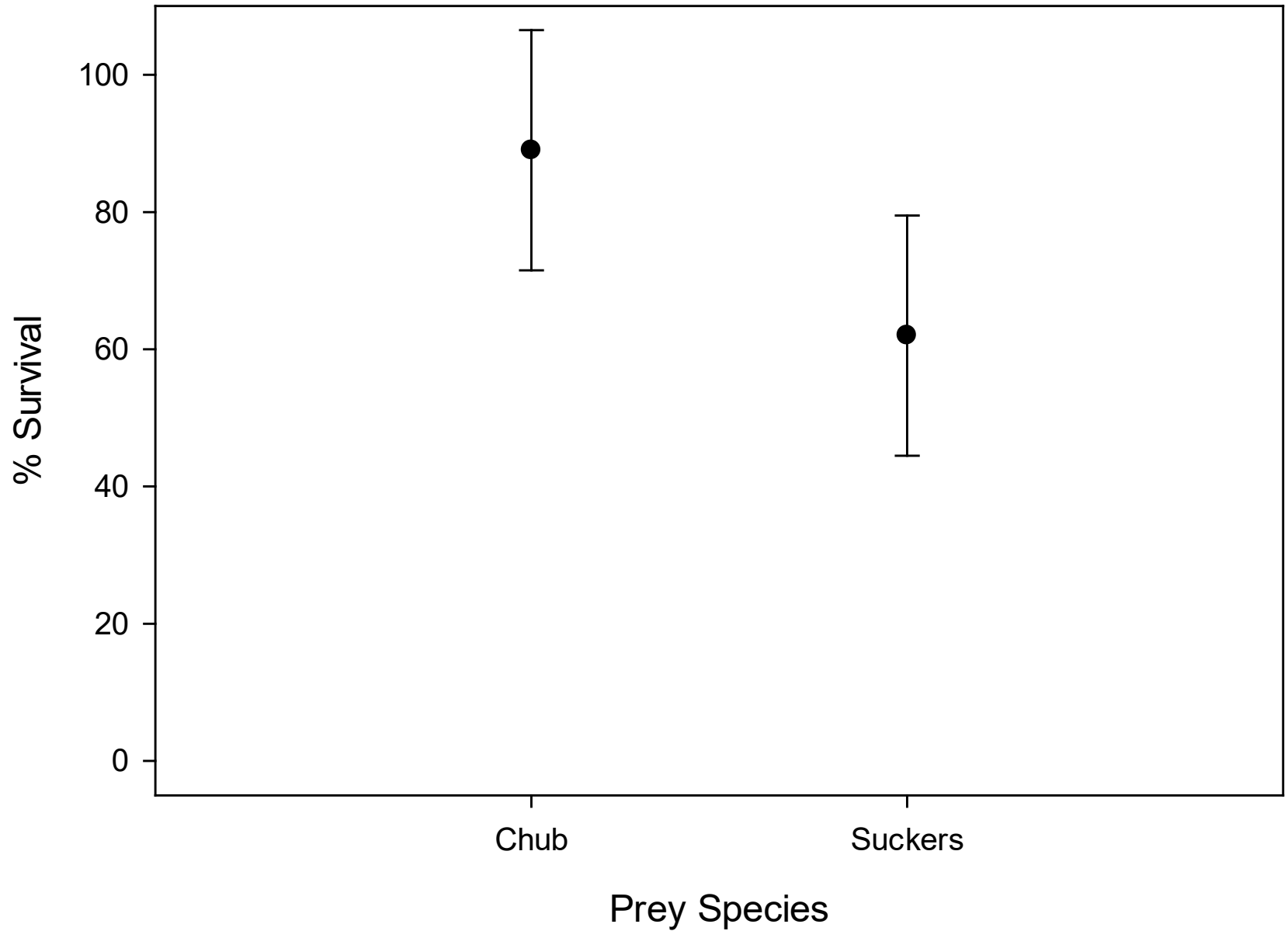


2 Replicates

2 Replicates



Pond Trials



Razorback sucker Behavior in the face of a Threat

Remain motionless to avoid detection



How did Razorback sucker persist?

- Behavior

- » Remain motionless to avoid detection



- Morphology/Physiology

- » Deep body with bony keel

- » Fast growth early in life

- Interaction with Environment

- » Vulnerable life history stages in oxbows and off-channel backwaters

How did Humpback chub persist?

- **Behavior**

- » Largely nocturnal

- **Morphology/Physiology**

- » Nuchal hump

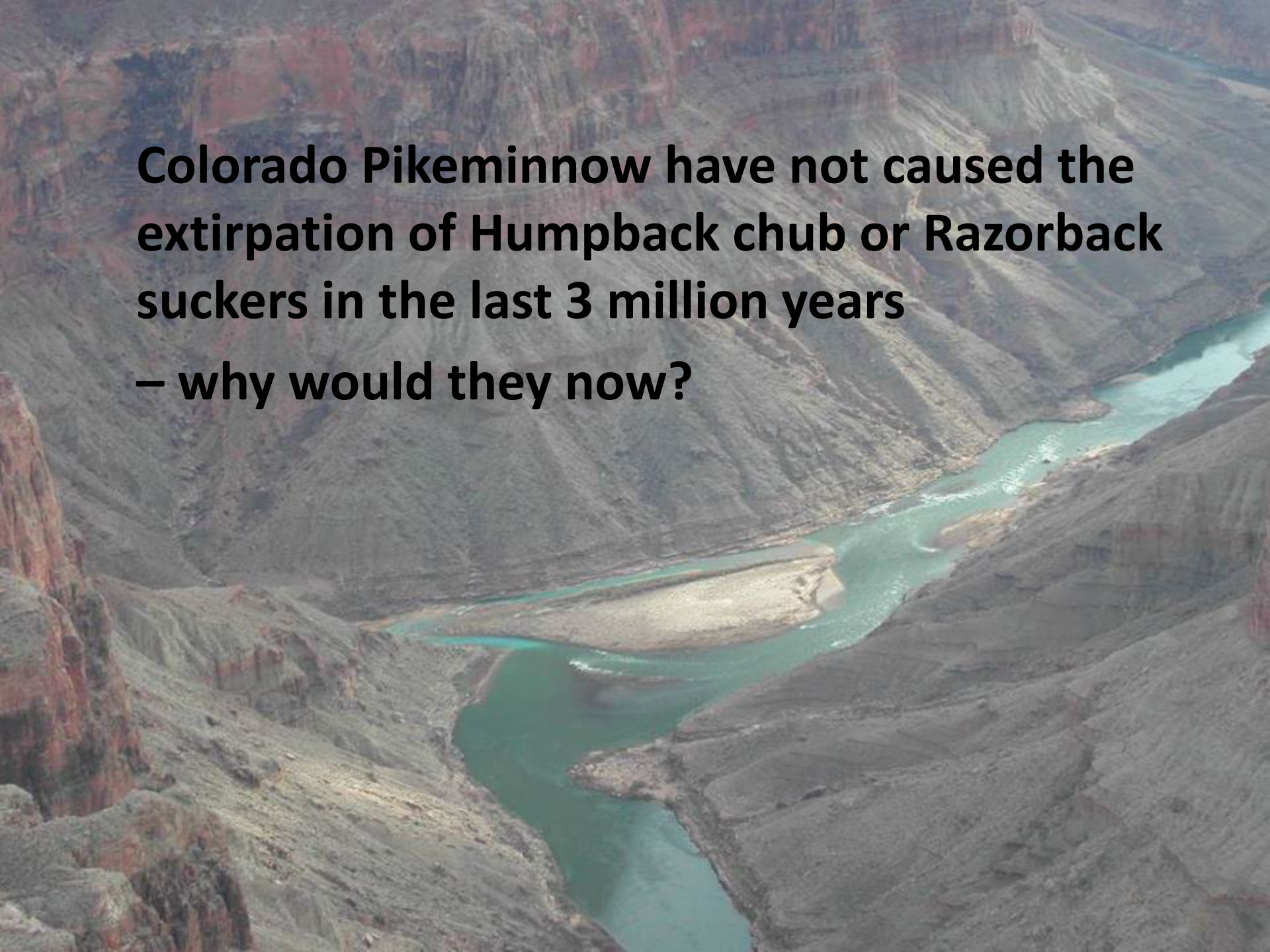


- **Interaction with Environment**

- » Tightly linked to tributaries

- » Remain in tributaries during early life stages

**Colorado Pikeminnow have not caused the
extirpation of Humpback chub or Razorback
suckers in the last 3 million years
– why would they now?**



Potential Experimental Pikeminnow Stocking in Western GC?



- **Risks are relatively low – these are co-evolved species**
 - **The risks can be quantified**
 - **Stock somewhere with lots of juvenile**



Western North American Naturalist, Colorado Pikeminnow: Missing Predator of the Lower Colorado River. *In Review*

Up to 60 female fish with sonic tags

