

Effectiveness of Light Traps for Capturing Razorback Sucker Larvae

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Introduction

- Razorback Sucker is a federally-listed endangered fish in the Colorado River Basin, threatened by loss of floodplain connections and other habitat, and nonnative fishes
- Detection of early life stages of Razorback Sucker by light traps triggers spring flow releases for floodplain inundation crucial to their survival
- Light traps are a passive gear type commonly used to sample positively phototactic early life stages of fish in low velocity areas at night
- Little is known about how environmental factors affect capture of Razorback Suckers with light traps

Results: Figures

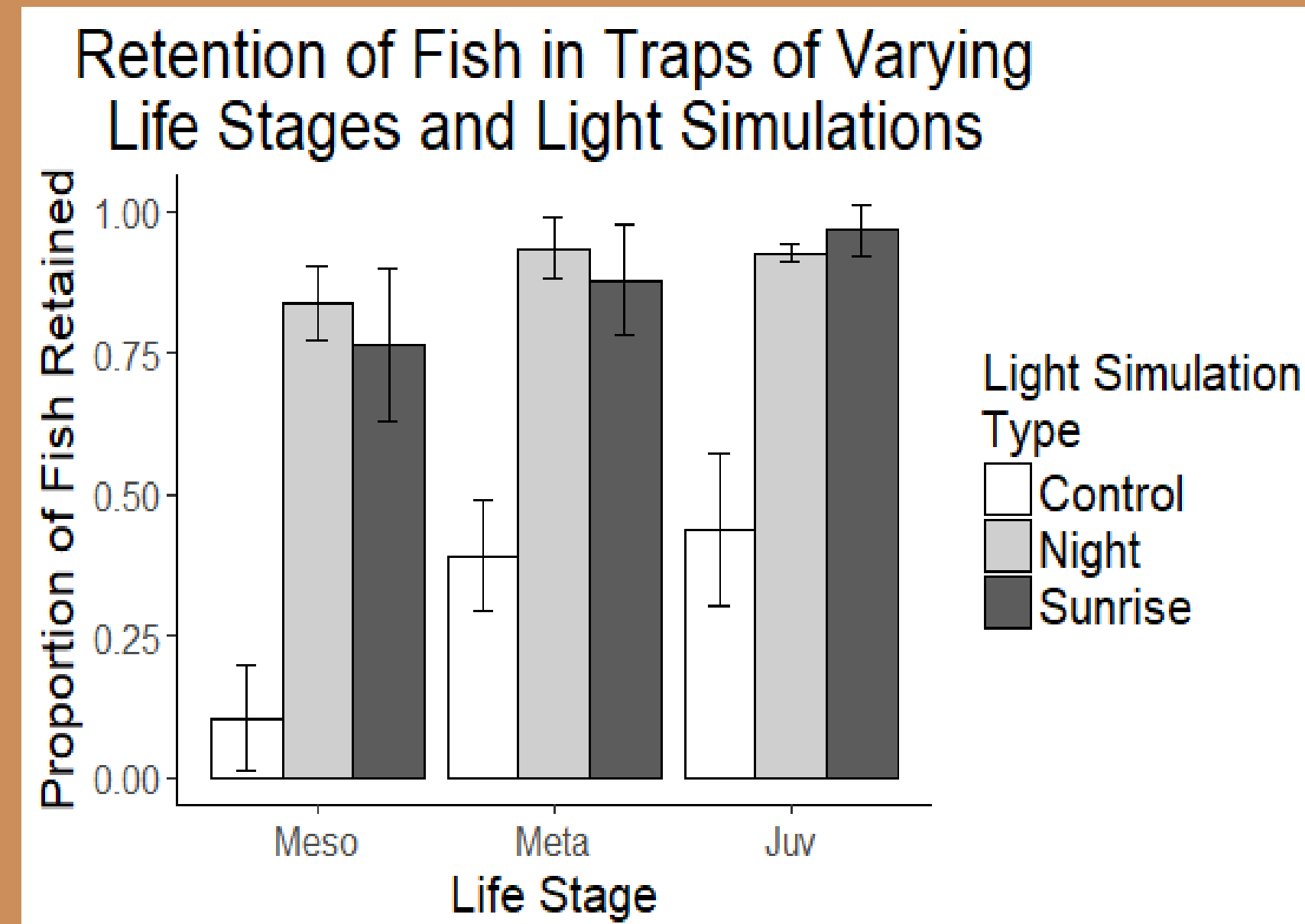


Figure 2. Retention of fish in light traps was high across all experiments and life stages except when light was absent (Control).

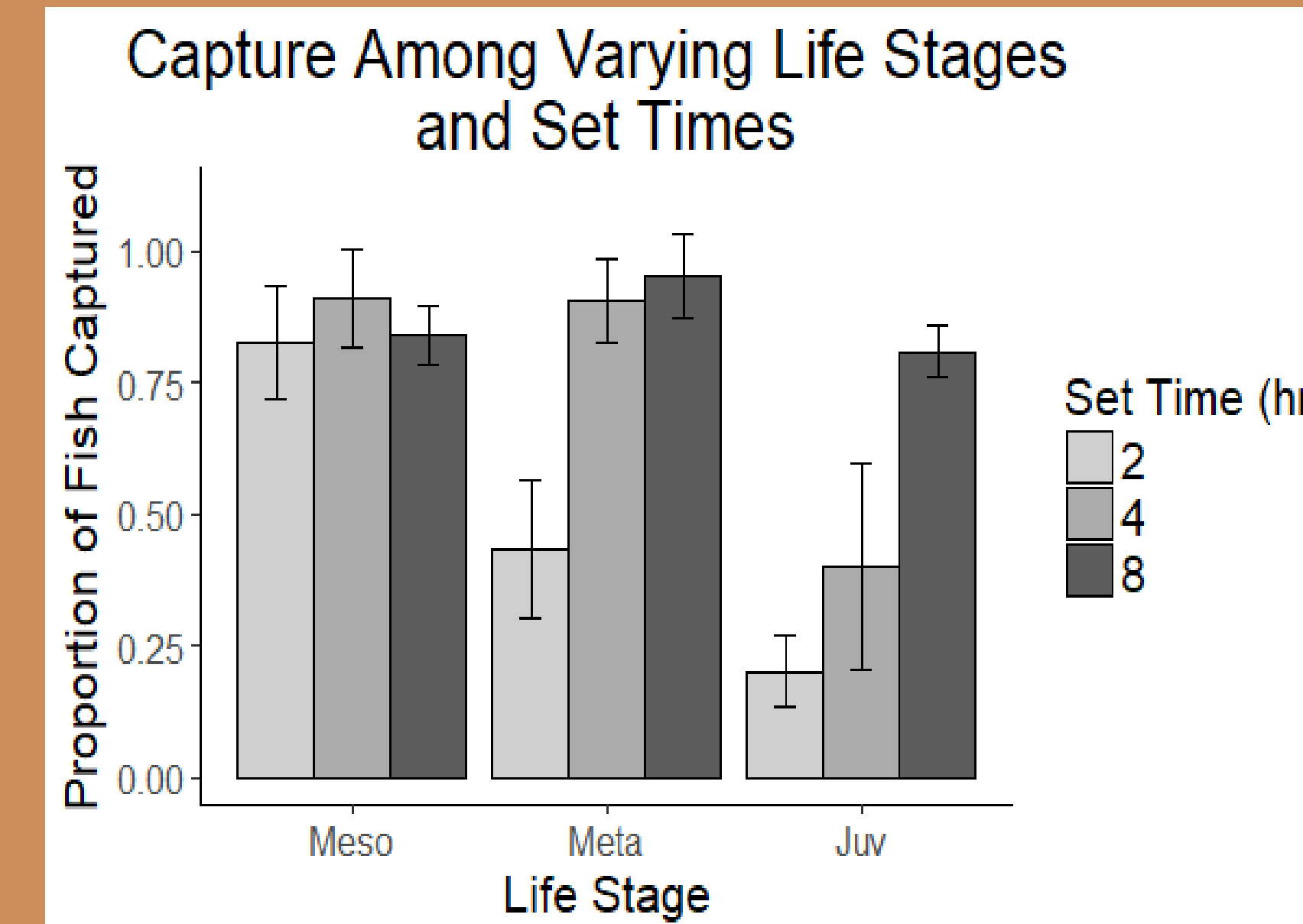


Figure 3. Capture increased with trap set time (Set Time) except for mesolarvae, which had high capture in every treatment.

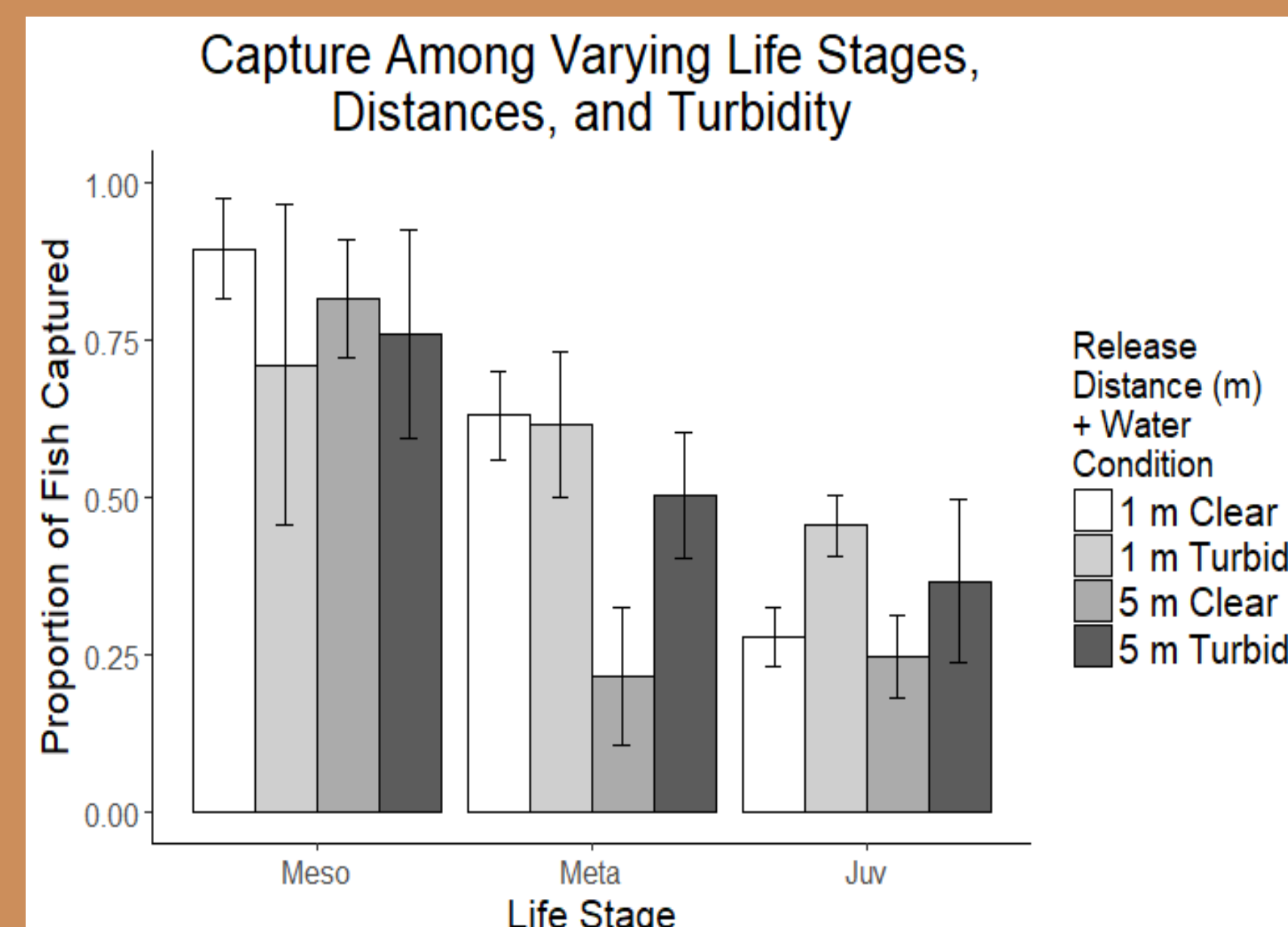


Figure 4. Turbid water significantly increased capture for metalarvae at 5 m and for juveniles at 1 m.

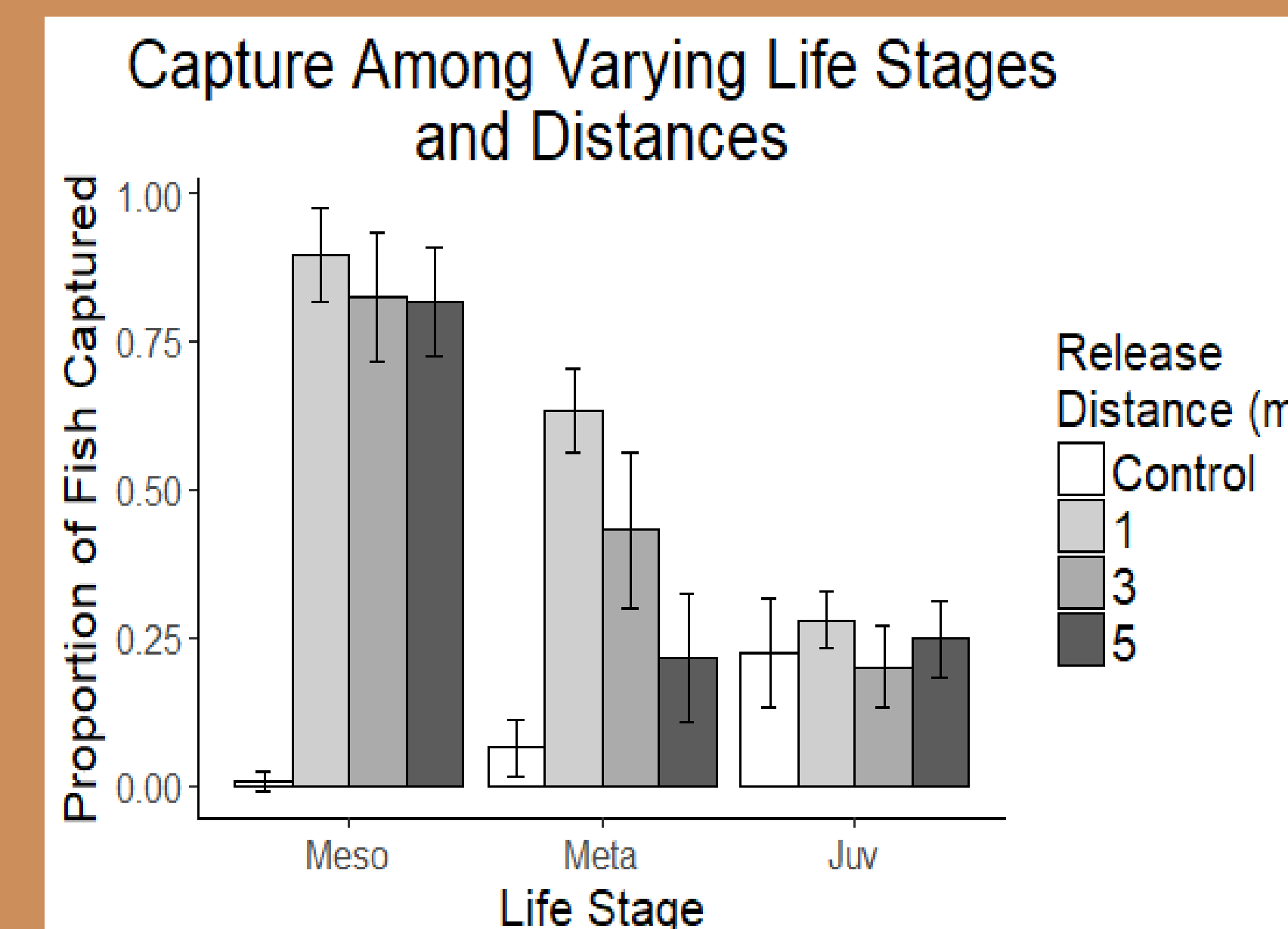


Figure 5. Capture decreased as fish size increased, metalarvae capture decreased with increasing release distance, and capture was lower when light was absent (Control), except for juveniles.

*Error bars represent 95% confidence intervals

Results: Description

- Retention of fish in light traps was high in both night and sunrise conditions and across all life stages
- Retention increased with fish age and size, though not significant.
- Captures increased with set time for the two older and larger life stages; metalarvae and juveniles. Capture of youngest and smallest larvae did not differ among set times
- As release distance increased, capture of metalarvae declined. Capture did not differ with distance for mesolarvae or juveniles.
- When a light source was present capture increased for mesolarvae and metalarvae
- Turbidity significantly increased capture at 5 m for metalarvae and at 1 m for juveniles

Conclusion

- Light traps were effective at capturing Razorback Sucker larvae
- Captures declined with fish age and size
- Light presence was the most important factor affecting capture and retention
- Capture increased with increased set time
- Release distance from the light trap was important only for metalarvae
- Maybe due to interactions with set time which were not addressed
- Turbid water sometimes increased fish captures
- Possibly due to increased activity levels

Methods

- Razorback Sucker larvae were obtained from Ouray National Fish Hatchery, Grand Valley Unit, Grand Junction, CO.
- Experiments were conducted on three developmental life stages of various lengths:
 - Mesolarvae (11-17mm) - Meso
 - Metalarvae (18-26 mm) - Meta
 - Juveniles (27-50 mm) - Juv
- Treatments tested on batches of 25 fish included:
 - Ambient light conditions on retention (sunrise and night)
 - Light source presence on retention and capture
 - Set time on capture (2-,4-,and 8-hrs)
 - Release distance on capture (1,3, and 5 m)
 - Turbidity on capture (turbid and clear water)

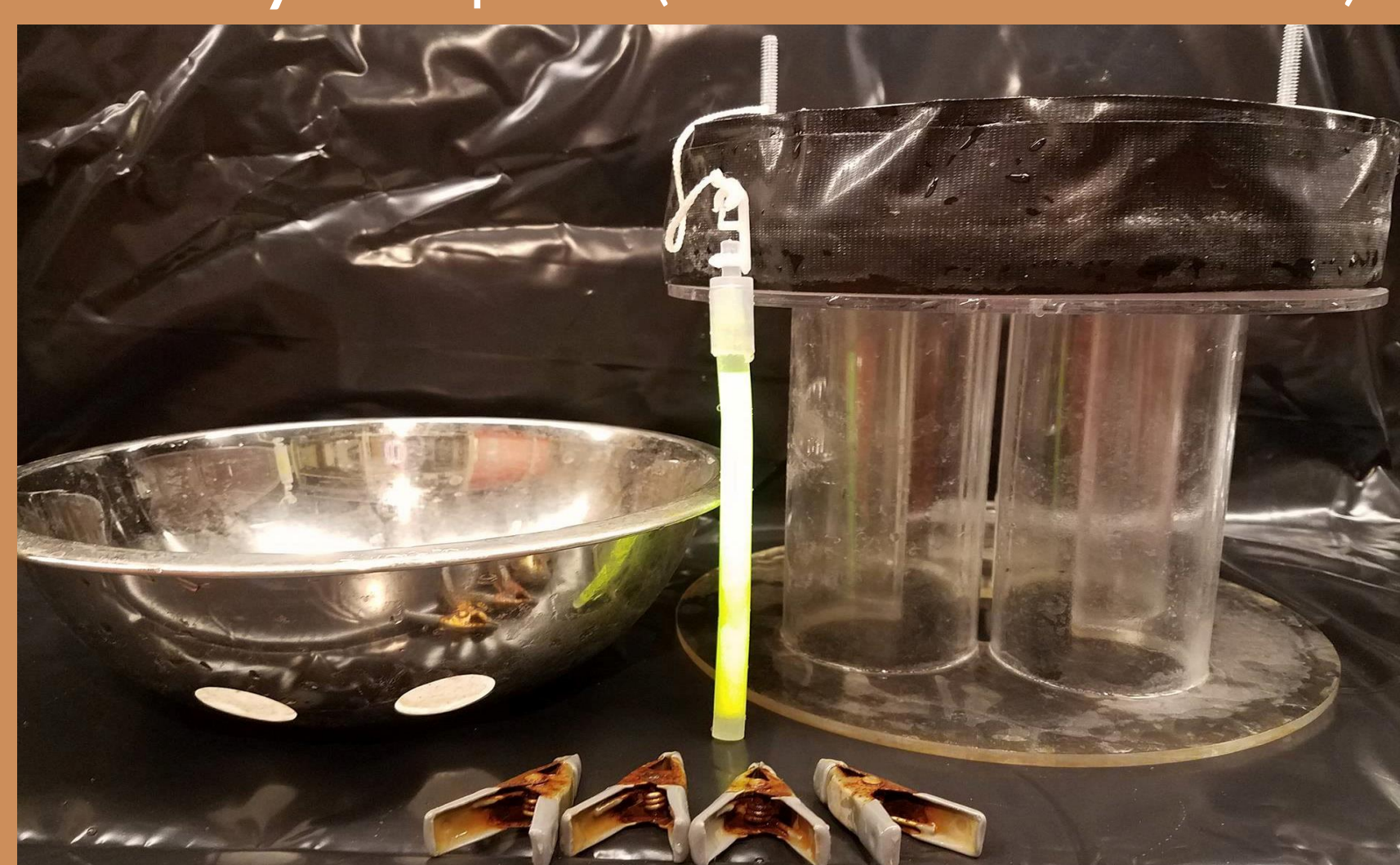


Figure 1. A disassembled light trap and chemical light source are shown. The catch basin (bowl) is clipped to the trap bottom and a light inserted at the top.

Implications

- Light traps are effective for sampling Razorback Sucker, and most effective for younger and smaller life stages
- As long as a light source is present, high retention of Razorback Sucker should result even if traps are retrieved after sunrise

Future Directions

- Field Testing
- Define the relationship between set time and distance on capture

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