

# Diel Migration of Small Bodied Stream Fishes Between Riffle and Pool Habitats

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## Introduction

Small bodied stream fishes live in both riffle and pool habitats. The diel cycle influences on these stream fishes have never been studied. This experiment is to study the effects of sunrise and sunset on the movement of stream fishes between riffle and pool habitats at four sites in Little Creek, Putnam County, Cookeville, TN (Fig. 1).

### Prediction

- Small bodied stream fishes stay in pools during the day, migrate to riffles at sunset, and then move back into the pool during sunrise.
- These fishes are also most likely to be active during the diurnal times of night to day, and of day to night.

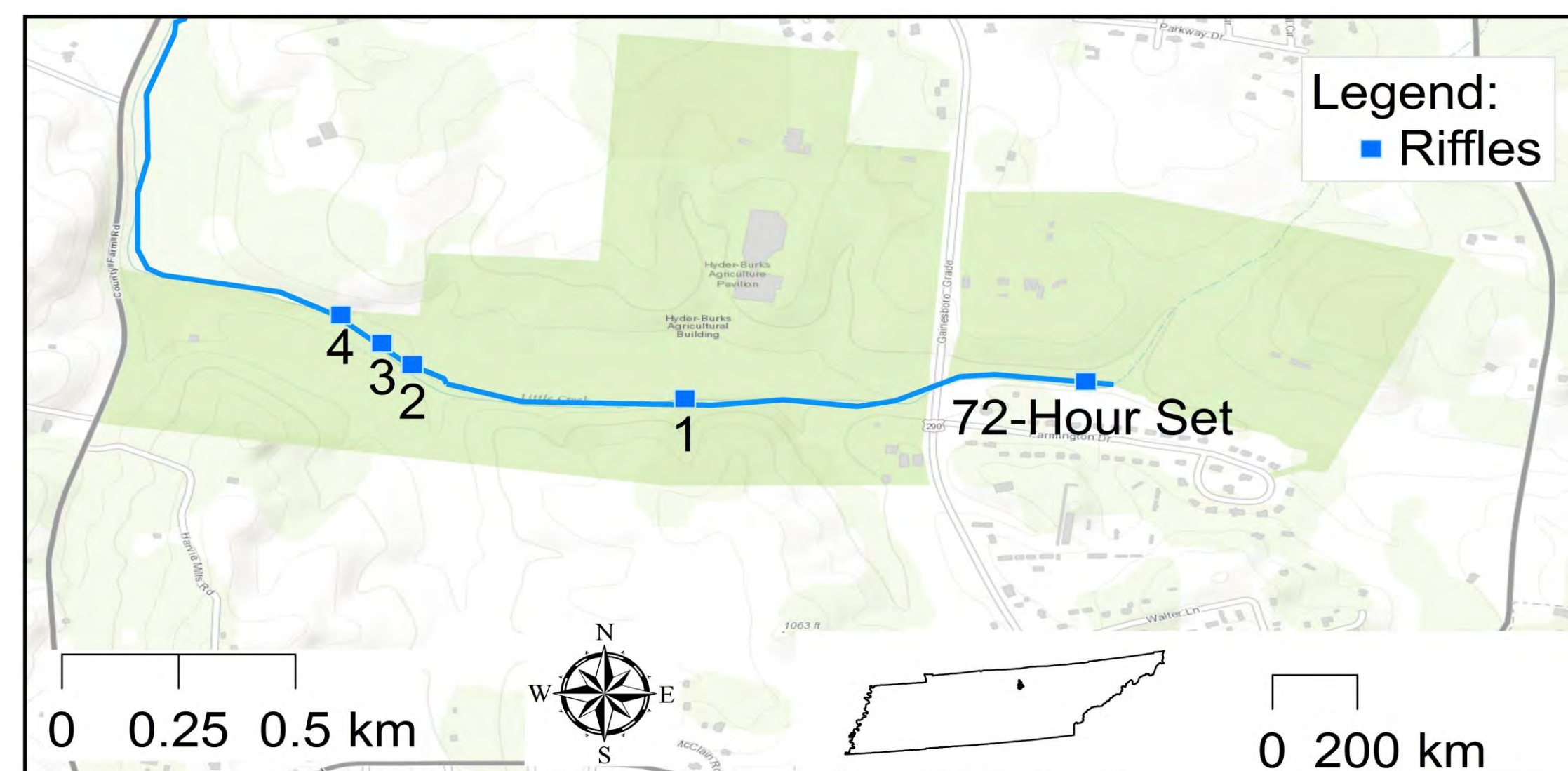


Figure 1. Map of Shipley Farm (green area) illustrating conTRAPtion riffle locations

## Methods

### Field Methods

- Weir traps (conTRAPtions; Fig. 2) were set up on either side of the riffle to block movement between pools and riffles. ConTRAPtions were set 1 hour before sunset, checked 2 hours after they were set, and removed from the wooden block. The conTRAPtions were set once more, 1 hour before the following sunrise, and checked 2 hours later.
- During the 72 hour trial, conTRAPtions were set out before sunrise and checked every 2 hours.
- For both methods, fishes were identified on site and released back into the stream in the direction that they were moving.

### Statistical Analysis

- Species data were combined into 4 groups: sunrise in, sunrise out, sunset in, sunset out.
- Data were analyzed to identify any significant difference in movement between either of the 4 groups.
- Number of fishes were averaged for 2 hour sets over a 3 day period.

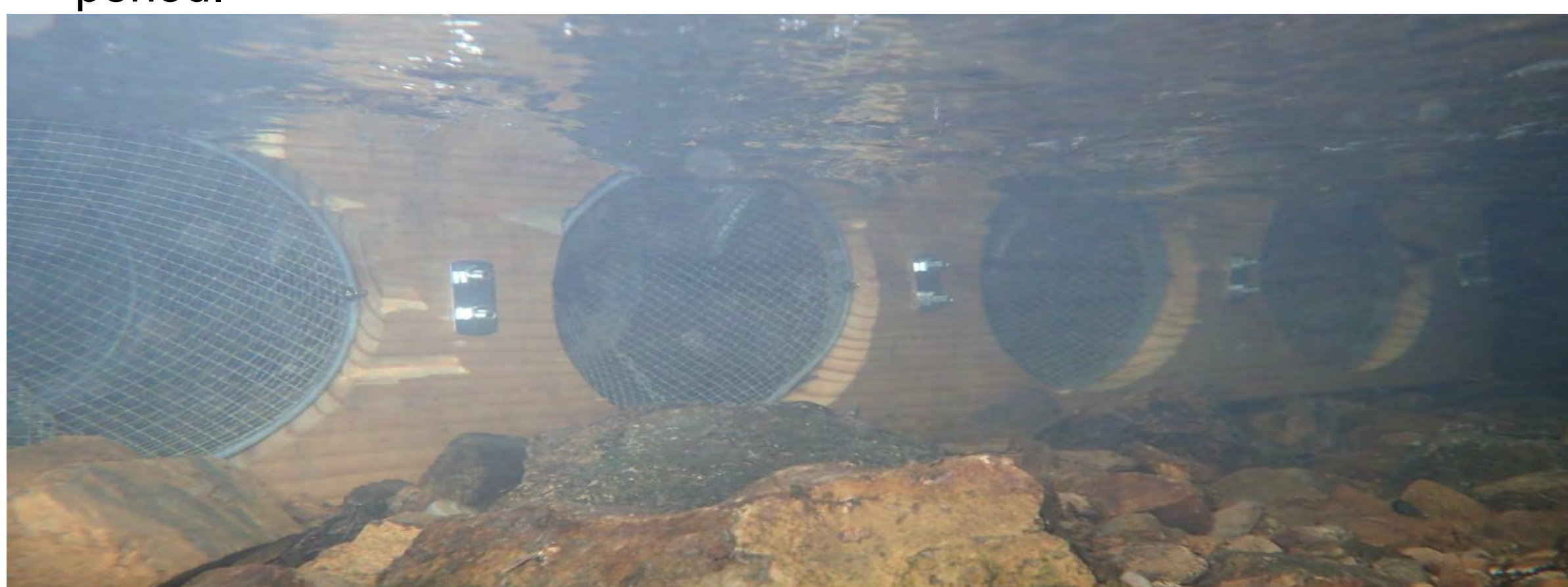


Figure 2. An underwater view of the conTRAPtions.



Figure 3. Upstream conTRAPtion set up of riffle 1



Figure 4. Downstream conTRAPtion set up of riffle 1



Figure 5. Entire habitat with both conTRAPtions.



Figure 6. Murphy with riffle conTRAPtion.

## Results

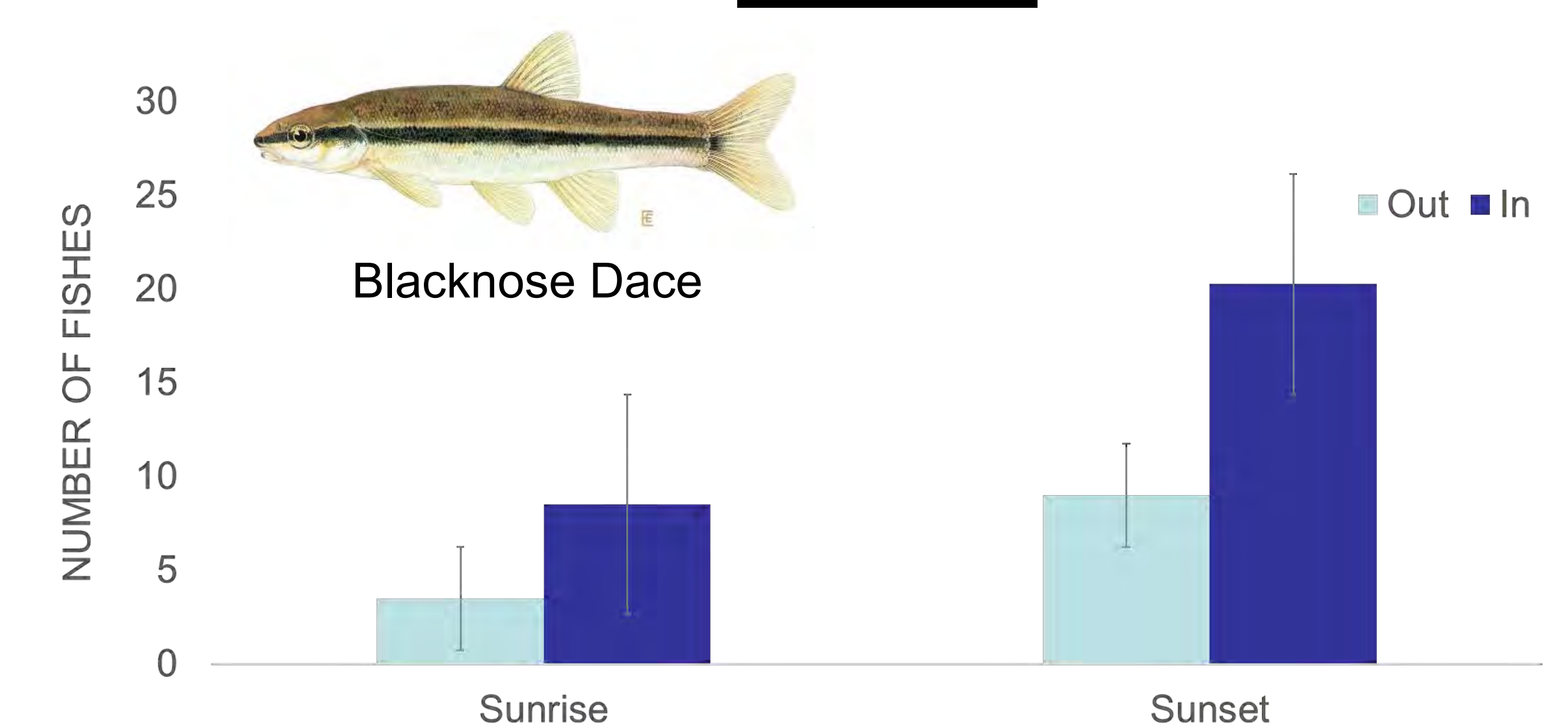


Figure 7. Number of fishes caught at sunrise and sunset moving into and out of the riffles.

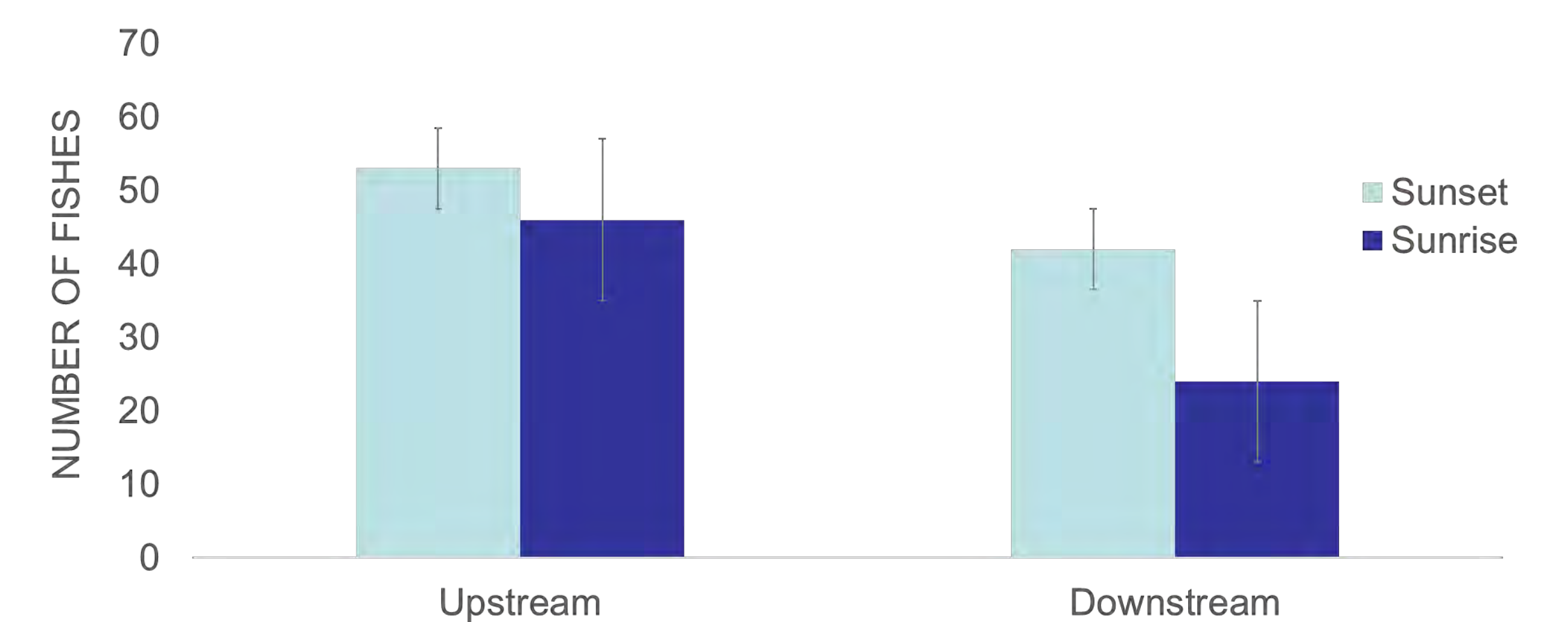


Figure 8. Number of fishes caught moving upstream and downstream during sunset and sunrise.

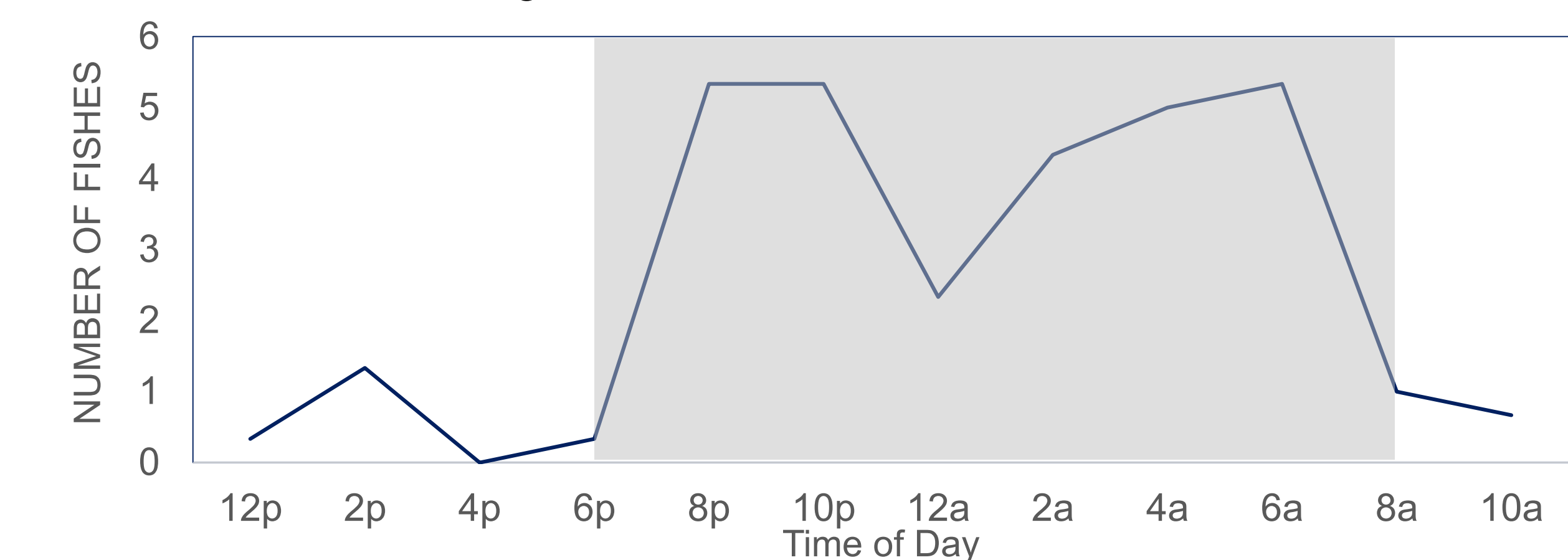


Figure 9. Line chart of the average amount of fishes caught during a 72 hour period.

## Conclusions

- Caught 263 stream fishes during June-July 2016 using conTRAPtions.
- The highest number of small bodied stream fishes moved upstream into the riffle at sunset than any other direction and time.
- A higher number of small bodied stream fishes moved upstream at sunset.
- The most movement was between these fishes were from the hours of 8:00pm and 6:00am.

## Acknowledgements

We would like to thank the Tennessee Technological University Biology Department and Shipley Farm for allowing us access to Little Creek.