



The impact of temperature on shredding rates of the invasive Narrow-clawed crayfish and Signal crayfish

Amarni Newman¹ & Dr. Josie South¹

¹ School of Biology, Faculty of Biological Sciences, University of Leeds, Leeds LS2 9JT, UK



Narrow-clawed crayfish

1. Introduction

- Invasive freshwater crayfish are large-bodied shredders.
- Shredding disrupts nutrient cycling.
- There is a need for research on data deficient species, such as Narrow-clawed crayfish.
- Investigations into shredding rate and temperature interactions are needed to determine the effect of climate change.

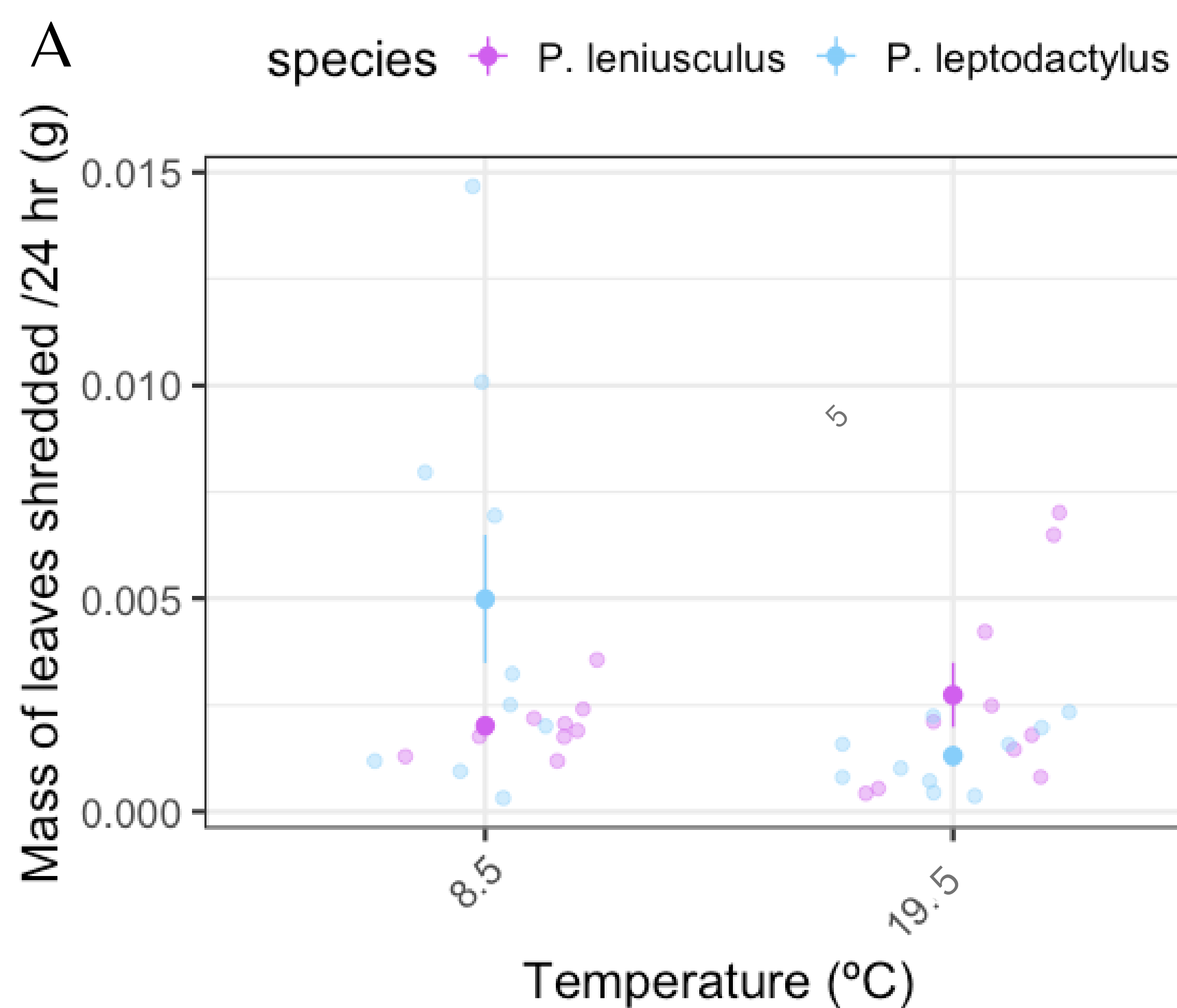
2. Aims

Determine differences in shredding rates between species, and whether there is an interaction with temperature.

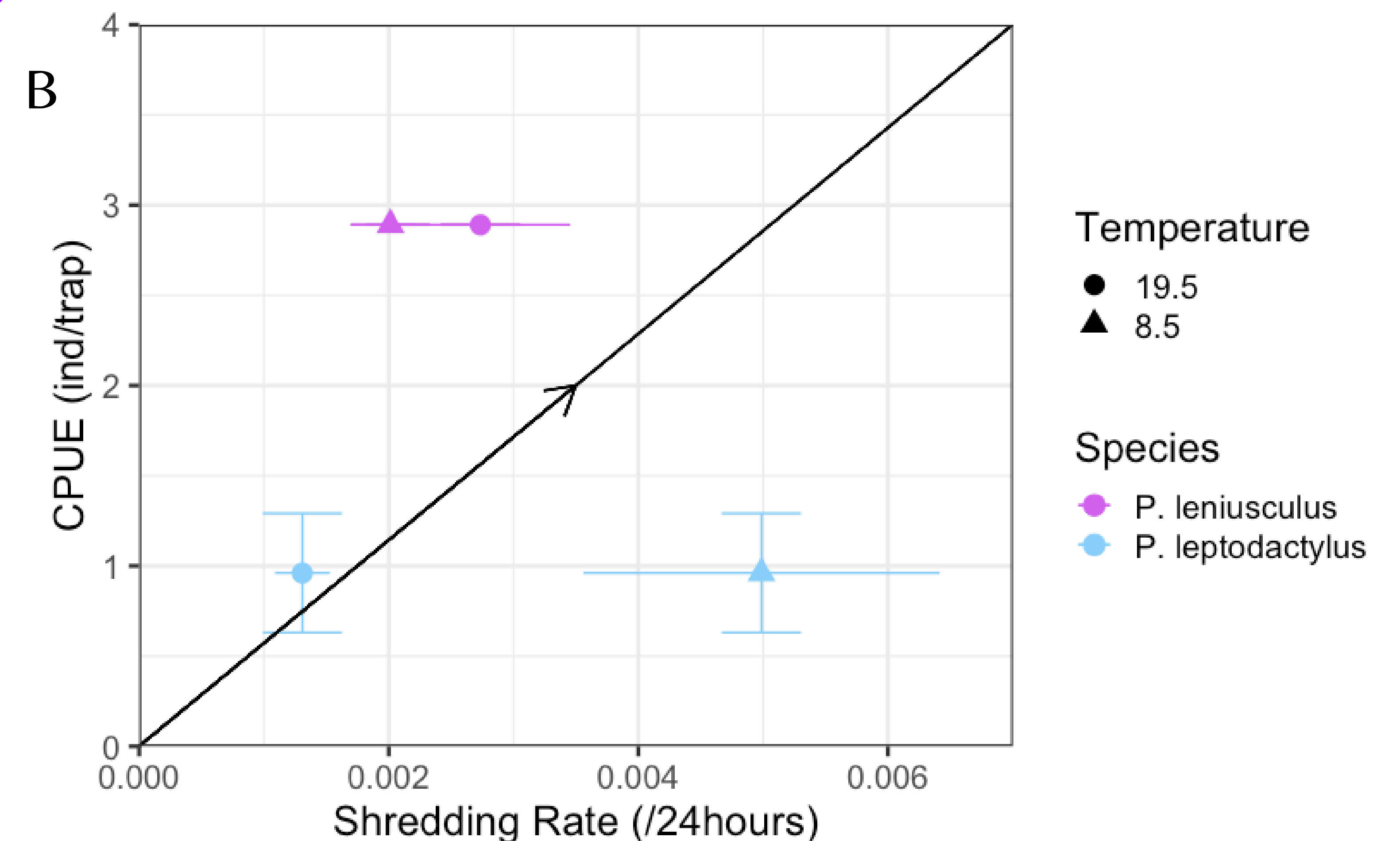
3. Research methodology

- Individual specimens were placed in experimental tanks for 24 hours to standardise hunger.
- Sycamore leaves (*Acer pseudoplatanus*) were conditioned in water for 24 hours prior to experiment.
- A standardised mass of conditioned leaves (30 g) was placed into experimental tanks with crayfish for 24 hours.
- Leaves remaining in tanks were collected, excess water removed, and weighed.
- A dry weight was taken of the collected leaves after drying in an oven over a 24 hour period at 60°C.
- 10 reps were done per species, per temperature condition.
- Data was SQRT transformed, and ANOVA testing was used to determine whether there was an interaction between species and temperature on amount of leaf shredding. Tukey HSD was used to determine differences post-hoc.
- CPUE data was obtained from monthly monitoring project.

4. Results



A: Mean \pm SE leaves shredded /24 (g) by narrow clawed and signal crayfish at 8.5 and 19.5°C, smaller points indicate raw data



B: Biplot of relative impact of the two species at both temperatures, impact increases along the arrow

There was a significant interaction between species and temperature ($F_{1,36} = 5.51, p < 0.05$), but there were no main effects, where higher temperatures significantly decreased narrow clawed crayfish shredding rates ($p < 0.05$). There was no effect of temperature on signal crayfish shredding rates, and there were no interspecific differences in shredding rates.

5. Conclusion

- Narrow-clawed crayfish should be treated with equal concern as Signal crayfish.
- Increases in temperatures alter shredding rates and thus nutrient cycling processes.
- Preventative management could reduce further invasion.