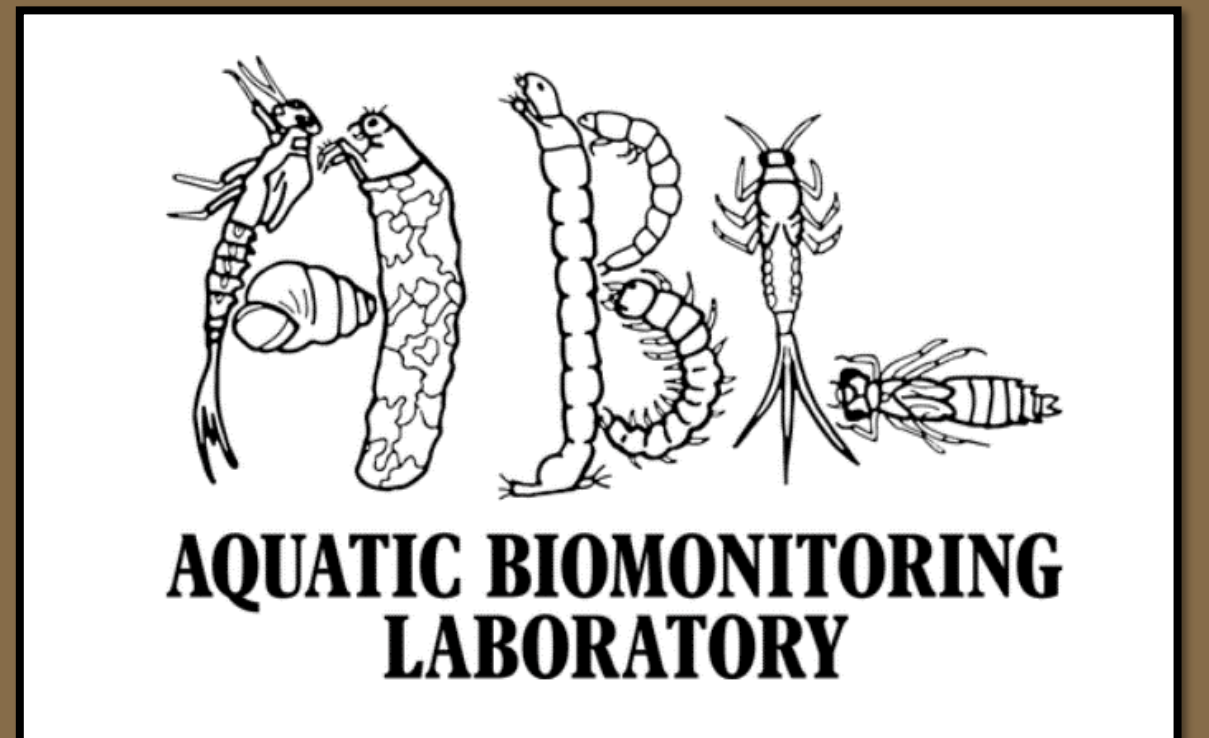




Effects of Riparian Habitat Type on Macroinvertebrate Drift in the Little Plover River, Wisconsin

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INTRODUCTION

Background: Riparian areas benefit stream ecosystems by supporting vegetation, preventing erosion, and increasing ecological productivity. Brook Trout (*Salvelinus fontinalis*) diets are significantly dependent on terrestrial macroinvertebrates that either fall into the water from these riparian zones, or are aquatic for at least a portion of their life cycle. This study focuses on Central Wisconsin's Little Plover River (LPR), which supports a successful Brook Trout population and is surrounded by forested, wetland, and agricultural riparian zones.

Objectives

- Determine the differences and involved factors when contrasting the macroinvertebrate compositions of three surrounding habitat types.
- Provide insight on how Brook Trout prey availability is affected by riparian habitats along a cold-water stream.

Hypothesis: The composition of aquatic and terrestrial macroinvertebrate communities in the Little Plover River drift will display a higher number of taxa in stream locations surrounded by the forested and restored wetland riparian areas, versus the agriculture/grassland riparian area.

Site Descriptions: Three locations chosen based on habitat types



1. Forested (near Hoover Ave): dominated by Tag Alder, nearby residential development.
2. Restored wetland (downstream from Kennedy Ave): Restoration of Little Plover River's flow/watershed, began July 2017.
3. Agricultural grassland (upstream from Kennedy Ave): grassy flat area with occasional trees, nearby agricultural fields.

METHODS

Data Collection

- 3 drift nets per location deployed in fall 2019.
- After 24 hrs, removal of nets and drift samples collected.

Laboratory and Analysis

- In the Aquatic Biomonitoring Lab, 50% of each drift sample sorted because of large volume of debris.
- Collected invertebrates preserved and identified to family.
- Data entered onto Excel to compare habitats, based on each location's percent occurrence of aquatic or terrestrial taxa, percent occurrence of most common taxa, and average number of species.

RESULTS

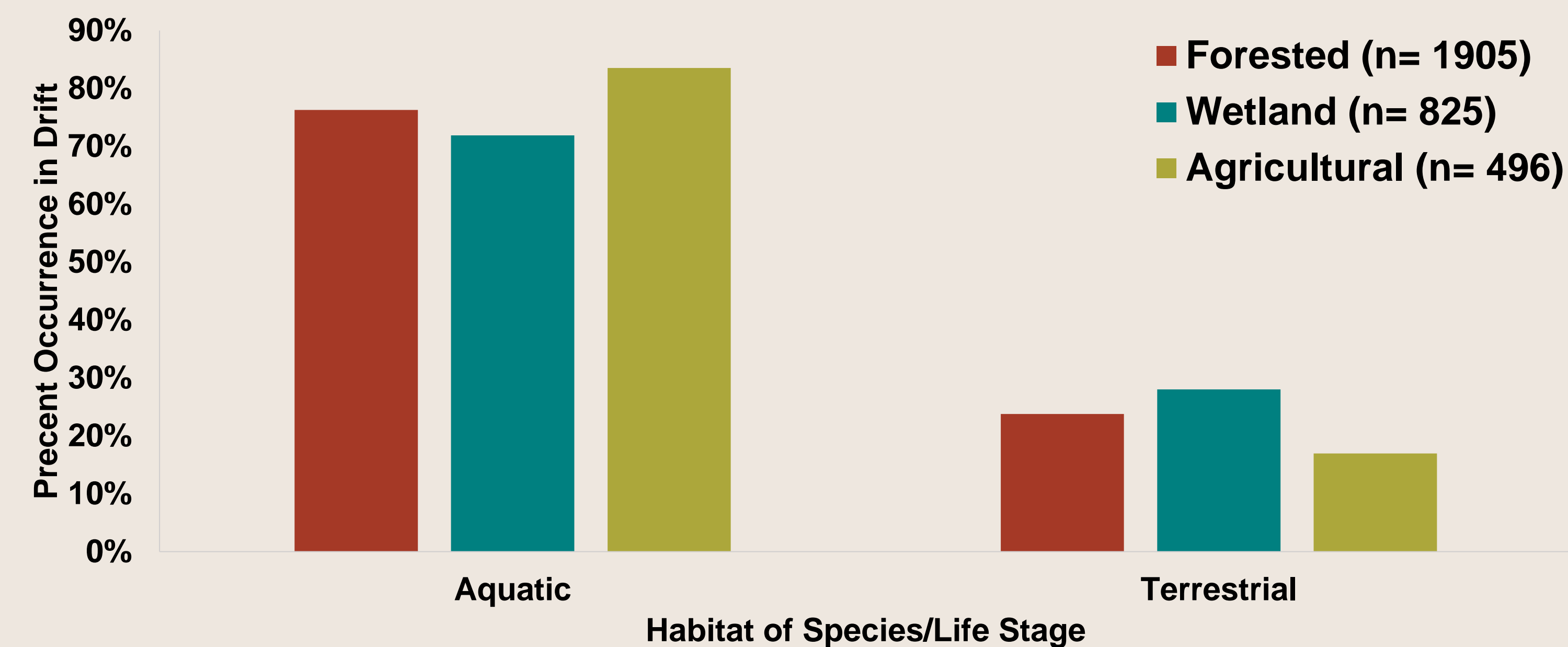


FIGURE 1. Percent occurrence of aquatic or terrestrial taxa in the macroinvertebrate drift between riparian habitats. *Not shown: <2.00% of overall taxa with unknown habitat.

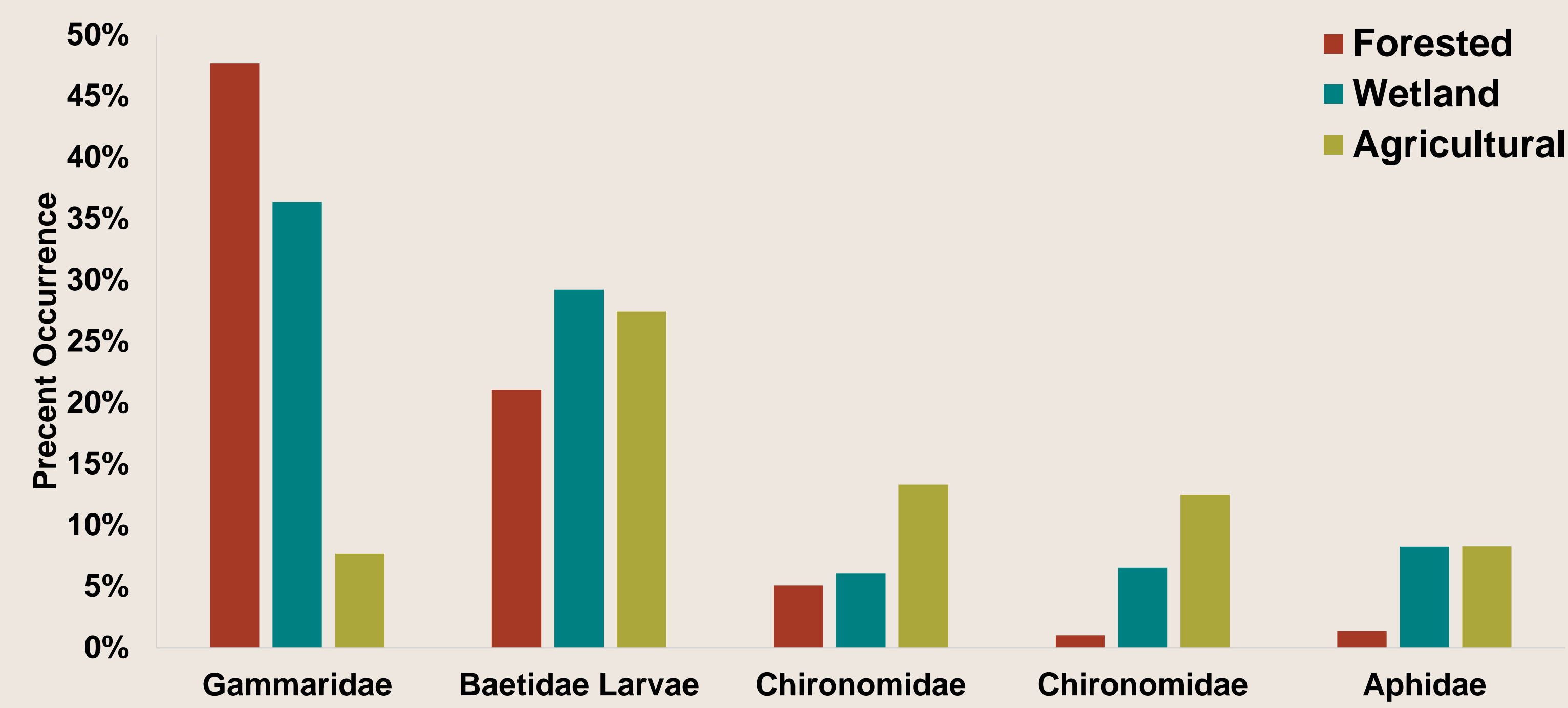


FIGURE 2. Percent occurrence of invertebrate families with the highest individual counts in all drift samples. (photo of specimen below each name)

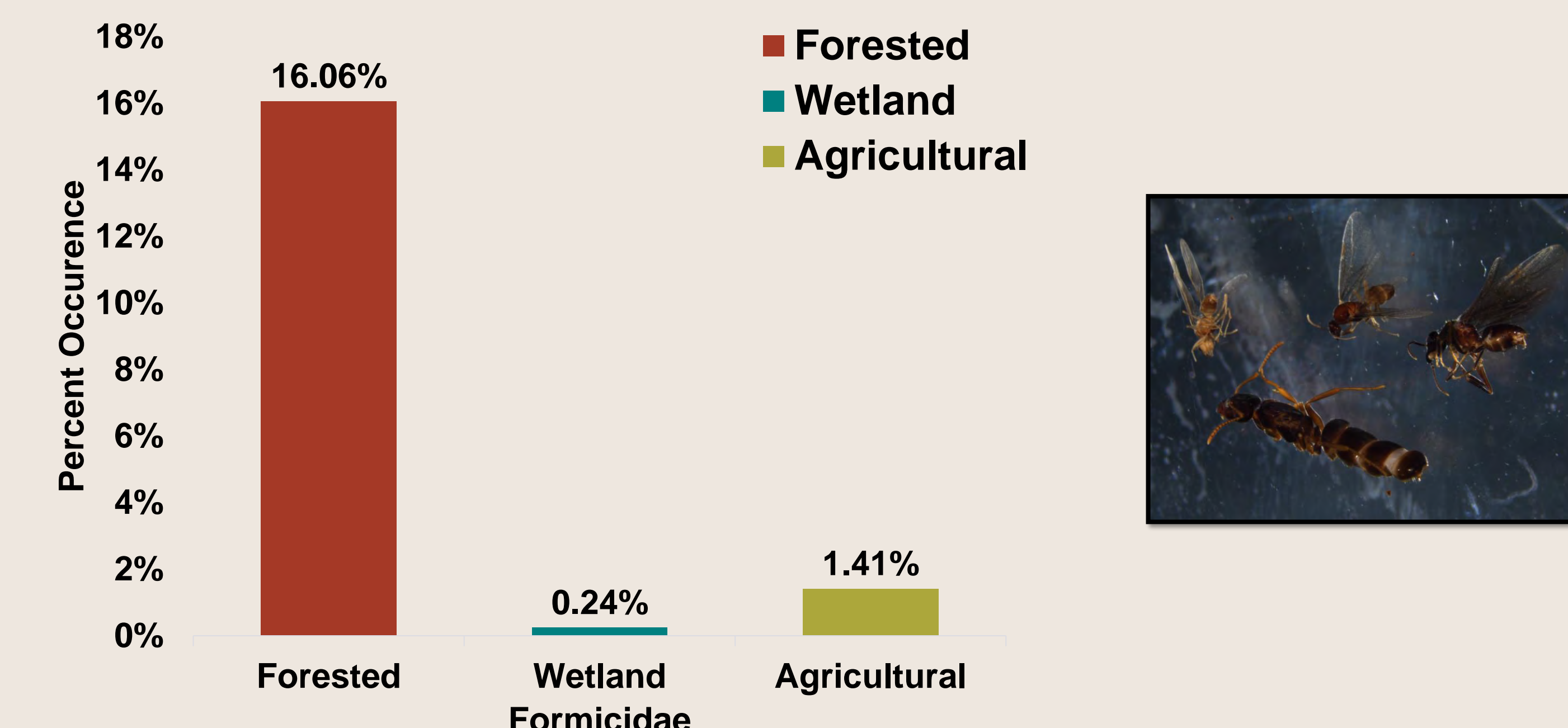


FIGURE 3. Percent occurrence of *Hymenoptera Formicidae* in all drift samples to show high amount of this specimen in the forested area, versus the wetland and agriculture areas. (pictured above)

DISCUSSION

- All three macroinvertebrate drifts showed a higher proportion of aquatic versus terrestrial taxa, which was expected based on the nets being placed in the river and the changing fall season (Fig. 1).
 - The wetland restoration site displayed the highest occurrence of terrestrials (28.02% of wetland drift), suggesting riparian disturbance increases the amount of terrestrial invertebrates into the LPR drift.
 - Gammaridae, Baetidae Larvae, and Chironomidae Larvae were the highest occurring aquatic taxa in the total macroinvertebrate drift (Fig. 2).
 - Agricultural pollution may act as a factor is the decrease of non-tolerant specimens in the macroinvertebrate drift (such as Gammaridae and Baetidae Larvae), which would influence aquatic invertebrate occurrence in the Agricultural drift sample.
 - High numbers of Formicidae in the forest habitat drift may be from location where net was placed, decreased water levels, or increased erosion along the bank of trees and Alder.
 - Results exhibit the highest amount of invertebrates in the forested macroinvertebrate drift and the lowest amount in the agricultural macroinvertebrate drift, which supports the hypothesis.
- *more data needs to be collected to further investigate mechanisms mentioned.

FUTURE RESEARCH

- Similarly repeat with this study process in fall 2021 for additional data and a stronger conclusion or correlation.
- Measure the stream flow, water temperature, acidity(pH) for each location drift nets are placed.
- Correlate macroinvertebrate drift results with Brook Trout diets, obtained through gastric lavage.
- Further analysis of tolerance values for taxa of each riparian habitat overall.

ACKNOWLEDGEMENTS

We would like to thank Sam Lamarche and involved volunteers for the chosen GPS coordinates and collected macroinvertebrate drift samples, Jeff Dimick for assistance with aquatic invertebrate identification, guidance of analyses, editing/reviewing study, and allowing use of the Aquatic Biomonitoring Lab, Joshua Raabe for data collection, editing/reviewing study, and poster design, Jered Studinski for identification of terrestrial invertebrates, formulation of analyses, and editing/reviewing study. Thank you to UW-Stevens Point for offering this opportunity.

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