EWM: Distribution and Community Interactions at Drag and Spruce Lakes

Figure 1: EWM habitat (left), EWM flower (center), and EWM foliage (right).

Background: What is Eurasian Water Milfoil (EWM)?

- **Eurasian Water Milfoil (EWM, *Myriophyllum spicatum*) is a perennial aquatic species** that has drawn the attention of lake users for years **(Figure 1).**
- It is most often **introduced to new lakes through boat movement** between waterbodies and colonizes new areas of those lakes through **prolific fragmentation**.
- This species can survive in a **wide range of environmental conditions**, giving it the **ability to displace native plant species (Figure 2)** that are not as suited to changing or disturbed lake conditions.
- The Drag and Spruce Lakes' Properties Association has discovered several locations in their lakes where EWM has established. They are concerned that the presence of EWM will **disrupt the functioning of their lake system.**

Figure 2: Various native plant species found abundantly in Drag and Spruce Lakes.

Current Research: Why this study?

- The main purpose of this study was to **learn about the current plant community** at Drag and Spruce Lakes. Without first understanding what is presently there, we cannot fully understand the effects of a new species.
- This study **identifies plant species that compete or coexist** well with EWM, **and species that are likely to be outcompeted** for resources.
- Once those species are identified, we can **begin to predict areas** that have a higher chance of EWM colonization.
- Additionally, this study begins to **identify species on other trophic levels that are incorporating EWM** into their life-cycle.
- This research will **help evaluate the level of risk associated with the presence of EWM** in Drag and Spruce Lakes.

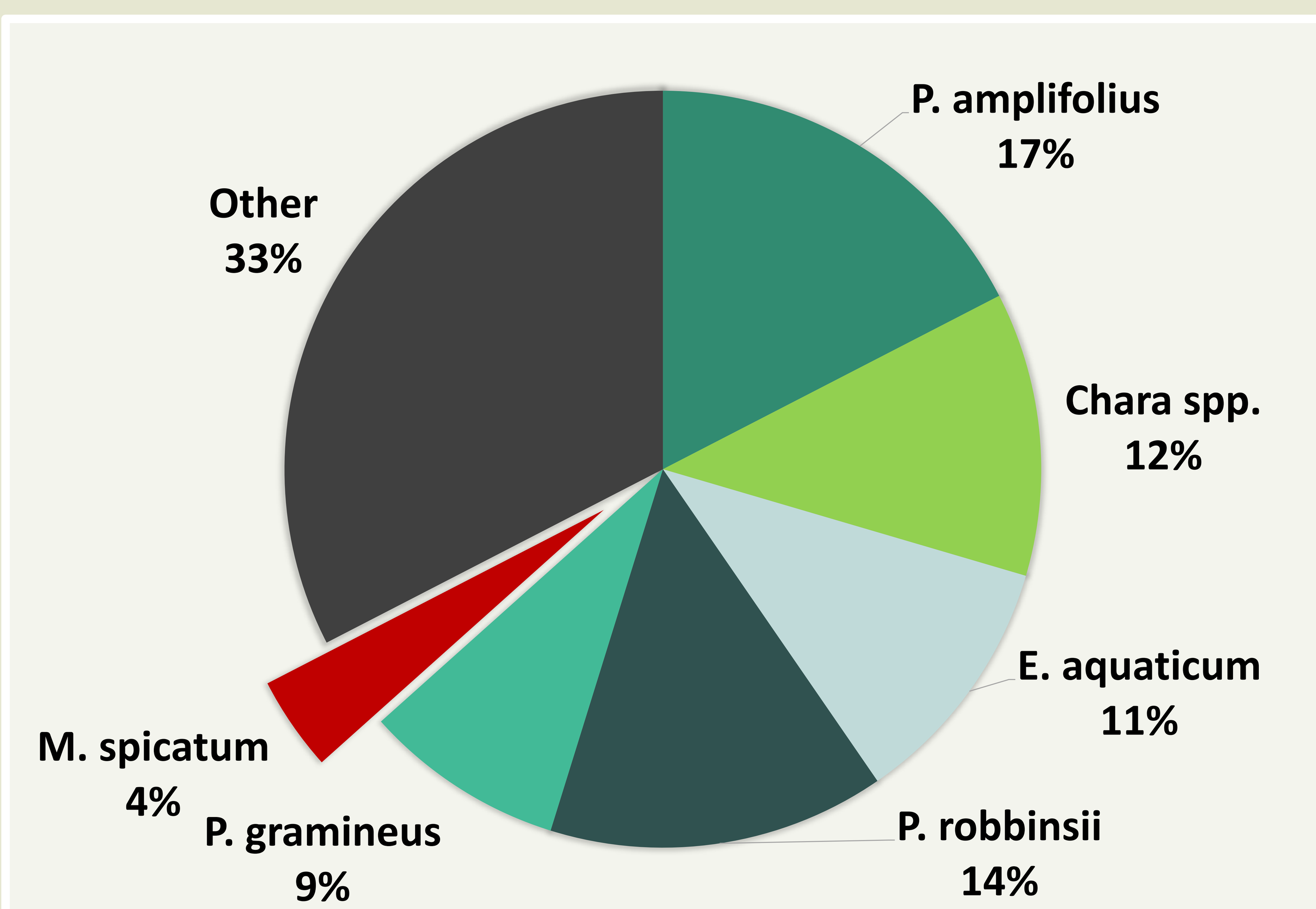

Figure 3: Proportions of biomass for dominant species in the aquatic plant community of Drag and Spruce Lakes. EWM is ranked 9th in estimated biomass.

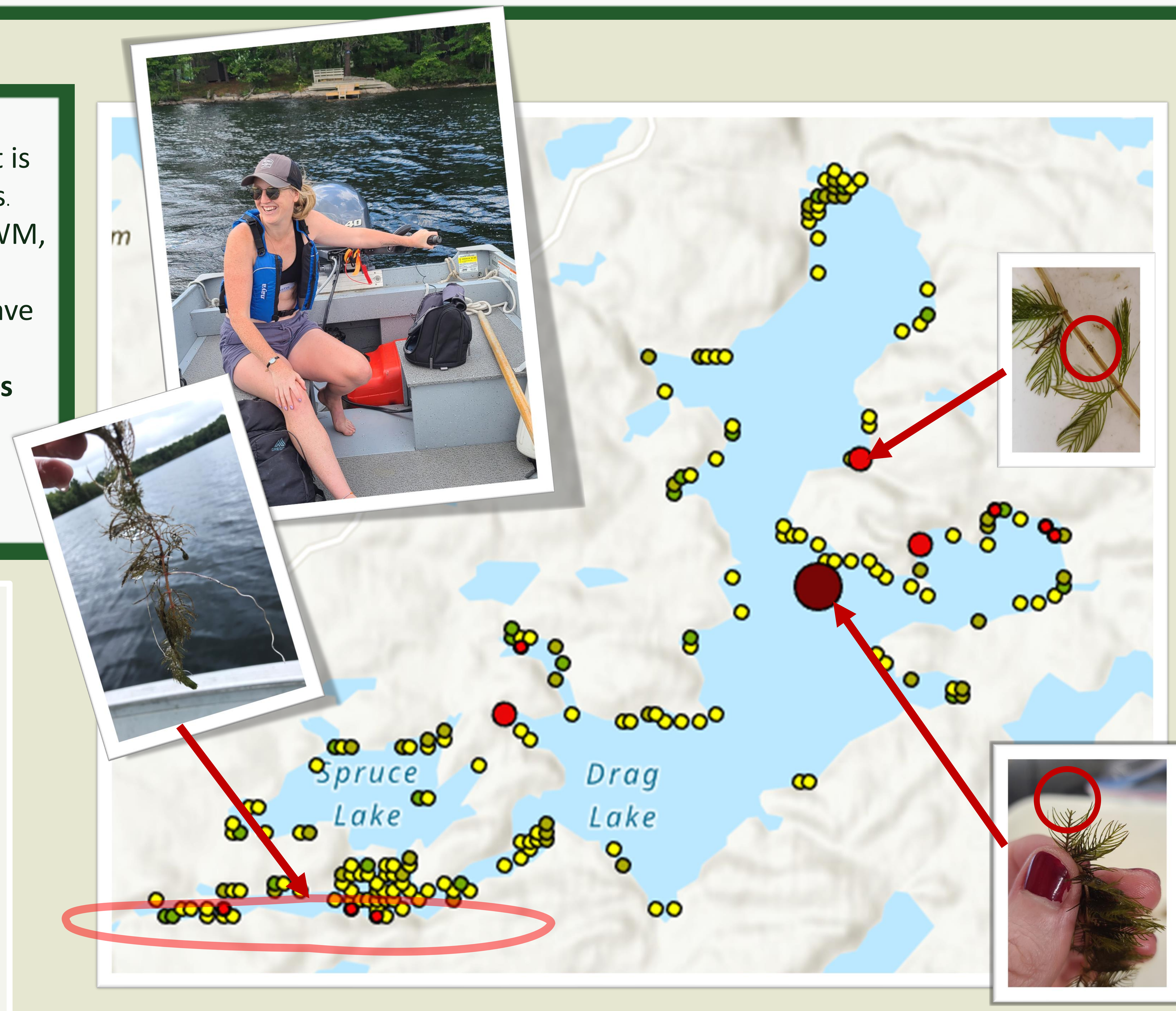

Figure 4: Macrophyte community distribution in Drag and Spruce Lakes. Locations with native plants are depicted by yellow-green dots. Yellow dots signify locations with one species and dark green dots have five or more native species. Locations with EWM are depicted by red dots. The size of the red dots demonstrate the proportional biomass found at that location.

Results: How is EWM interacting with the lake?

- **The aquatic plant community is not dominated by EWM.** There was no EWM found in Spruce Lake, and although there were several locations where EWM was documented in Drag Lake, most **often it was co-occurring with other species**. Overall, EWM ranked 9th in estimated biomass.
- The community was **dominated by Pondweed species**, with large leaf pond weed being the most commonly occurring species **(Figure 2, Figure 3)**.This is a species that tend to occupy a similar habitat as EWM, so it could be that EWM spread is being buffered by the established community currently occupying the preferred niche.

- There were two locations **where evidence of macroinvertebrate herbivory** was discovered **(Figure 4)**.
- Markings on EWM samples pointed towards the presence of the **milfoil weevil (Figure 4, upper right)** and the **milfoil moth (Figure 4, lower right**).
- These species are known to occur with the native species, **Northern Water Milfoil (NWM, *M.sibiricum*)**. As there were several occurrences of NWM in both lakes, it is unsurprising that these insects have **adapted their life strategy to include use of the new milfoil** relative now present in this system.

- It is theorised that **future colonization on the south-east shorelines of Drag and Spruce Lakes** are more likely to receive fragments of EWM from established patches **(Figure 4)**.
- However, if there is already a rich plant community established in those locations, it is less likely that there will be enough resources to support this EWM dispersal process.
- It is therefore the areas of **high disturbance**, where there is a less diverse plant community that are the most likely to become colonized.

Trent Community Research Centre

Drag and Spruce Lakes Property Owners Association

TRENT UNIVERSITY

Kaleigh Mooney – BSc Restoration Ecology

Host Organization: Drag and Spruce Lakes' Properties Association
Host Supervisors: Rick Wesselman and Jim Miners
U-links Coordinator: Sadie Fischer

Faculty Supervisors: Dr. Eric Sager and Dr. Brendan Hickie
Course Code: ERSC 4830Y
2022-2023

U-LINKS CENTRE FOR COMMUNITY-BASED RESEARCH