Wetland Management Practices Associated with Parasite Diversity

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Introduction

- Wetlands support high species diversity. This diversity includes parasites that rely on feeding interactions between other species.
- Wetland management techniques could influence parasite diversity. Therefore, parasites may serve as biological indicators of species interactions and management practices.
- Mead Wildlife Area wetlands are managed using various techniques including drawdowns, to manipulate hydrology.

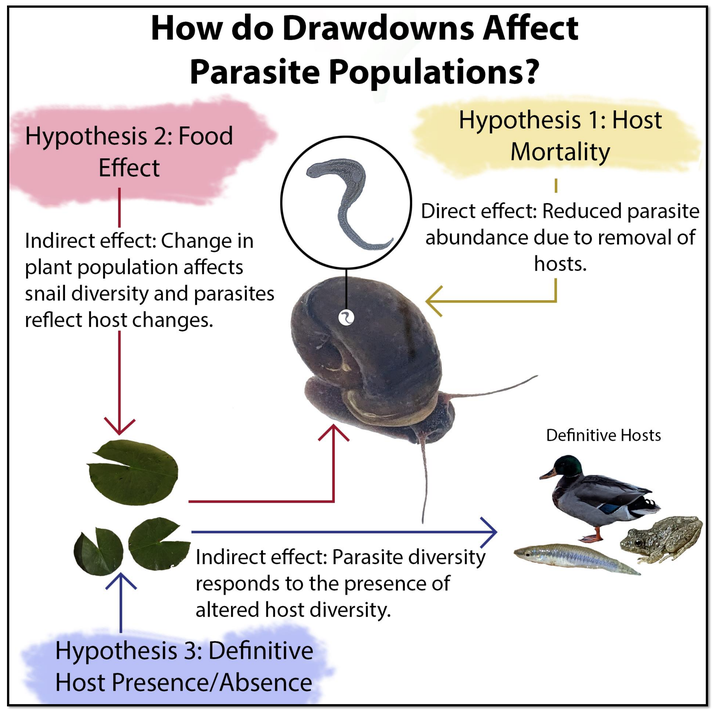

Fig. 1. Possible effects that wetland drawdowns have on parasites.

Objective

Examine how parasite communities responds to various wetland management techniques.

Methods

- **6 flowage locations were sampled (Figure 2):**
  - **3 reference sites which are large hydrologically stable wetlands (Rangeline, Teal Flowage, Smokey Hill)**
  - **3 treatment sites:**
    - **1 recently created flooded wetland (Rice Paddy)**
    - **1 wetland in full drawdown (Roundhole)**
    - **1 wetland in partial drawdown (North Townline)**
  - **Up to 50 snails were collected at each site**
  - **Each snail was individually isolated into a small container and placed under lights to encourage parasite release**
  - **Once parasites emerged, they were identified by morphology under a dissection microscope**

Results

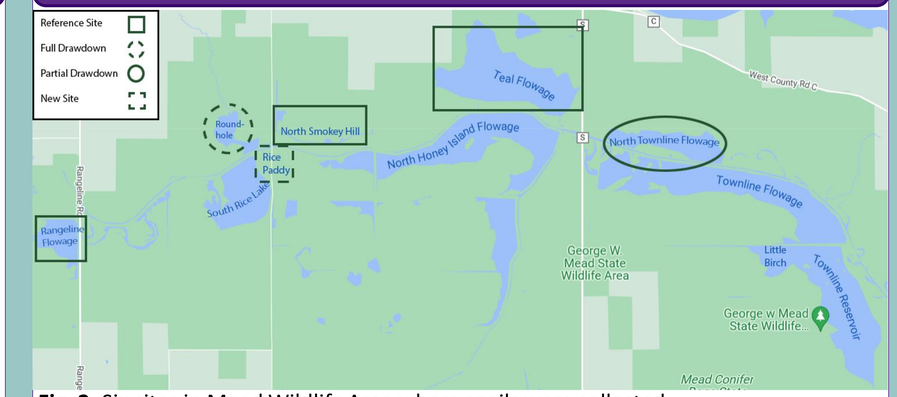

Fig. 2. Six sites in Mead Wildlife Area where snails were collected.

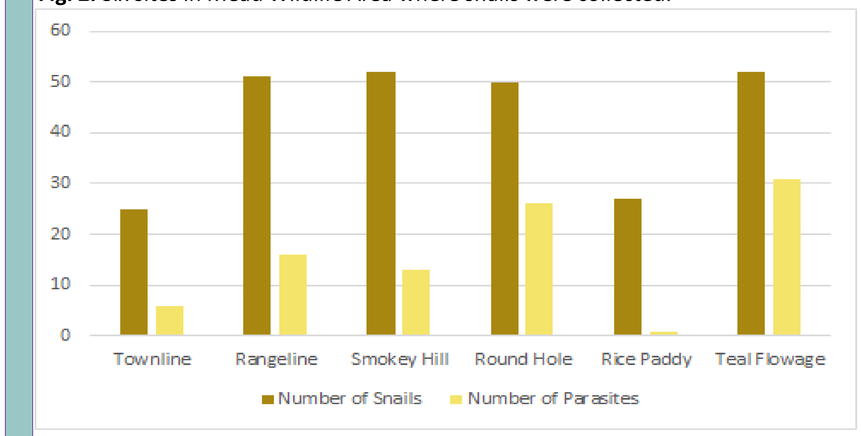

Fig. 3. Number of snails and parasite infections at each site.

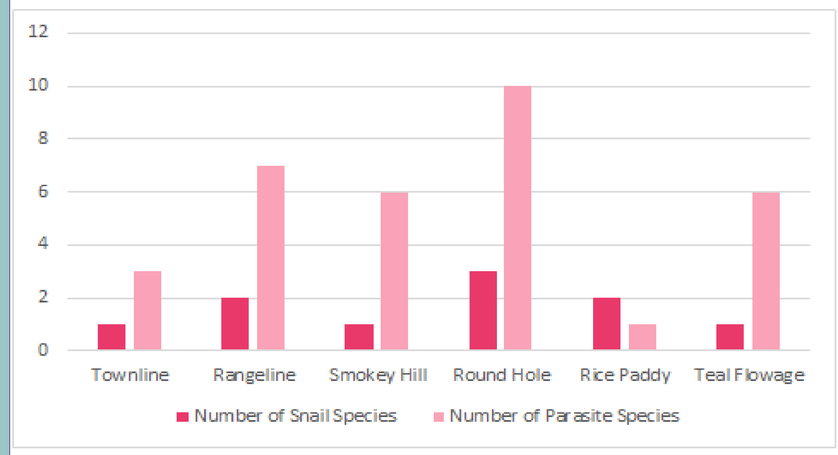

Fig. 4. Snail and parasite diversity at each site.

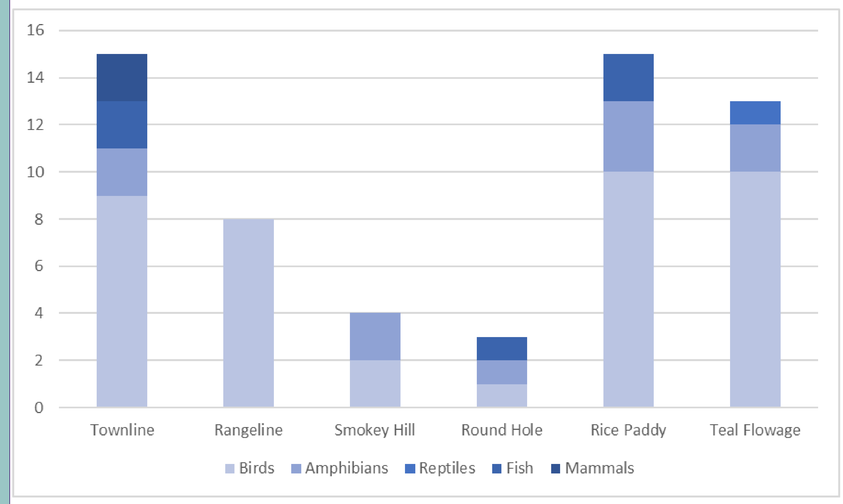

Fig. 5. Wildlife species (potential parasite hosts) by Flowage.

Discussion

- Overall, parasite diversity was consistently similar among reference sites and varied greatly among treatment sites. Parasite abundance varied among all sites.
- Teal Flowage, one of the reference sites, showed the highest parasite abundance followed by Round Hole.
- Round Hole, in full drawdown, showed the highest parasite species diversity and least wildlife diversity.
  - A limitation of this study is that the small-scale surveys of wildlife diversity were completed on a singular day in the field.
  - eBird data showed that Round Hole had the highest diversity of bird species (eBird, 2023).
- Rice Paddy, newly installed, had the lowest amount of parasite diversity and parasite abundance, but high wildlife diversity.

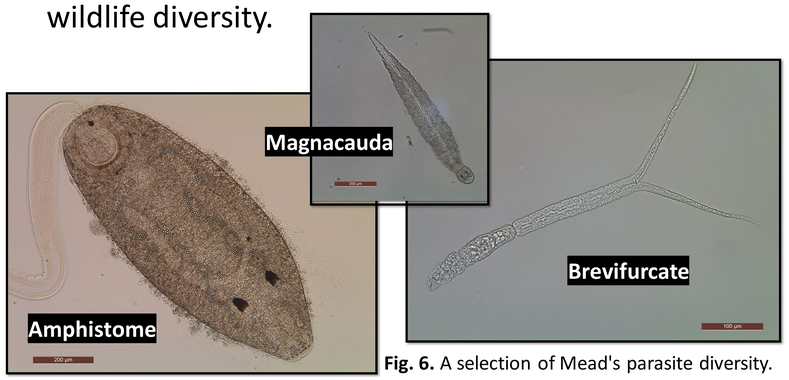

Fig. 6. A selection of Mead's parasite diversity.

The effects of landscape modifications on parasite life cycles and their hosts are poorly understood (Schotthoefer et al. 2011). This is a pilot study and future long-term research will help assess whether wetland management techniques have an influence on parasite abundance and infection. This research has potential implications for wetland restoration and wildlife management through addressing key species interactions.

References

Schotthoefer AM, Rohr JR, Cole RA, Koehler AV, Johnson CM, Johnson LB, Beasley VR. *Effects of wetland vs. landscape variables on parasite communities of Rana pipiens: links to anthropogenic factors*. Ecol Appl. 2011 Jun;21(4):1257-71. doi: 10.1890/10-0374.1. PMID: 21774428.

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