The impact of lowland raised peatbog fragment size and micro-habitats on Coleoptera communities.

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Introduction:

- Lowland raised peat bogs were once a quintessential part of the Northwest of England's habitat matrix (Bellis *et al* 2019).
- With land use change this globally rare environment has become fragmentated and remnant patches isolated, reducing diversity (Assandri and Bazzi 2022; Grzybowski and Glińska-Lewczuk 2020).
- The carbon storage potential of this environment has become apparent and the remaining fragments have been restored to try and re-create this ability, whilst providing for the specialist species that where once abundant in the landscapes.
- The size and micro-habitats of these landscapes affect their capabilities to provide for a high diversity of species (Lehmitz *et al* 2020; Phillips *et al* 2018).
- In this study a highly diverse but declining Invertebrate group (Coleoptera) will be used to assess the effect of three micro-habitats found in restored lowland raised peatbogs (Edge, Bund and Centre) (Fig 1) and fragment size in six restored lowland raised peatbogs in the North West of England (Fig 2).

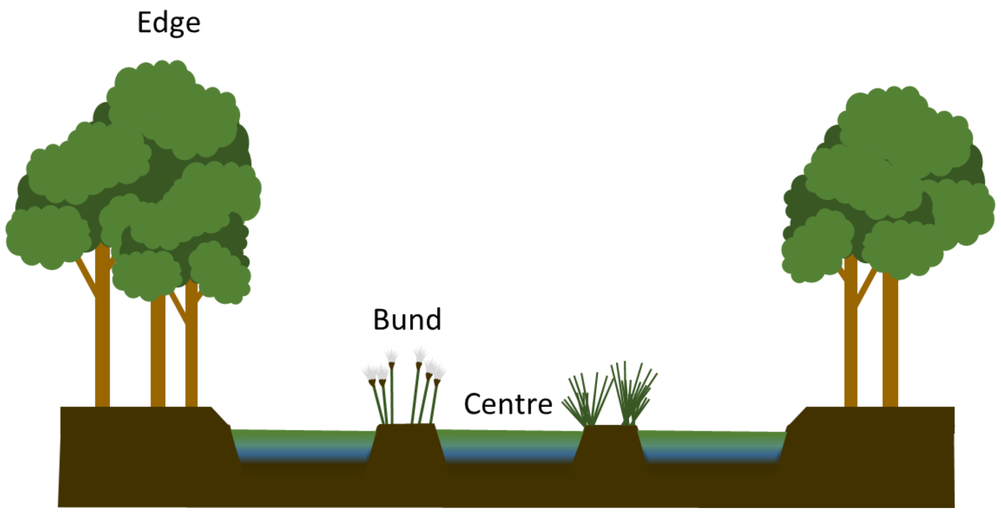

Fig 1. Micro-habitats found in lowland raised peatbogs that have undergone restoration. Each differs in vegetation communities due to water table depth..

Study sites:

Fig2. The six peatlands selected for use in this study, managed by The Lancashire, Manchester and Merseyside Wildlife Trust. The three large sites: Astley and Bedford Moss (**SSSI**) 40ha (SJ 692 975), Little Woolden Moss 107ha (SJ692 951), and Winmarleigh Moss (**SSSI**) 120ha (SD 446 479) where placed in this category as it was defined by being over 20ha. The smaller sites: Cadishead Moss 7ha (SJ698 951), Highfield Moss (**SSSI**) 8ha (SJ609961), and Holiday Moss 3.2ha (SD488010) where placed in the small category, all being less than 10ha.

(Google Maps (2023))

Research Questions:

- Are there differences in the diversity and species traits of Coleoptera between Large and small fragments of restored lowland raised peatbog?
- Are there differences in the diversity and species traits of Coleoptera in different micro-habitats within a restoration lowland raised peatbog?
- Are there differences between micro-habitat Coleoptera communities in large and small fragments within restored lowland raised peatbog?
- Are there lowland raised peatbog associated Coleoptera species in the restored lowland raised peat bogs being studied?

Aims:

Assess the diversity and species traits of Coleoptera communities in large and small restored fragments of lowland raised peatlands, with a focus on the impacts of the microhabitats created during restoration.

Lowland raised peatbog associated Coleoptera species:

Acilius canaliculatus

Onthophagus fracticornis

Bembidion humerale

Carabus intricatus

Hydrochara caraboides

Photos by Borowiec, L.

Methods:

<u>Coleoptera sampling</u>

- Pitfall trapping method.
- Filled with a mixture of propylene glycol and washing detergent.
- Sampling will take place across 2-week periods from April to August 2023. Four traps will be placed in a 2x2m^2 plot.
- Two plots per micro-habitat, placed in the most suitable representation of the habitat. Spaced 50m+ from each other.
- Overall, 144 traps will be placed per month, 24 in each site.

<u>Traits to be assessed (Ng *et al* 2018):</u>

Trait	Reasoning
Wing occurrence	Dispersal
Head width and length	Feeding and foraging
Pronotum width, length and depth.	Microhabitat choice
Rear femur length	Dispersal and foraging
Mandible protrusion	Diet preferences (Micro-habitat)
Body length	Dispersal tolerance

<u>Vegetation sampling</u>

- Taken between June and July in each site.
- Three 1x1m^2 plots will be established in each micro-habitat.
- Percentage cover of the different plant species in each layer will be recorded.
- The layers will consist of tree, shrubs, herbaceous, Sphagnum and non-sphagnum bryophytes groups.
- The area cover of each layer will also be recorded.

References:

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