Manor Woods Valley Executive Summary

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Project aim

Research on the Manor Woods Valley was carried out with the intention of investigating:

1. Whether the wildflower meadow could be extended onto the amenity grassland
2. The history of the site, specifically of the landfill, and how it has impacted the top soil and vegetation today

Methodology

1. In order to investigate whether it is possible to extend the Wildflower Meadow, a comparison of the soil characteristics between the two adjacent areas was conducted along a transect (Figure 1).

   Field sampling:
   - Coring
   - Soil Moisture

   Laboratory analysis:
   - pH
   - Nutrients: phosphate and nitrogen
   - Organic carbon
   - Heavy metals
   - Calcium Carbonate
   - Grain size

   Other studies of wildflower meadows, and the study of the neighbouring orchard, were used to as secondary data to place the results in context.

2. To study the history of the site and its impact on the top soil that is present today, the top soil was cored and analysed for heavy metal content. This would help us understand if the historical landfill had an effect on the soil.

   Field: the top soil was cored

   Lab analysis: the soil samples were analysed for concentrations of the cadmium, copper, iron, nickel and zinc

   Secondary Data: The environment agency website gave basic information on the historical landfill including its opening date, December 1945, and its use, household waste. There was however, no closing date for the landfill.

Findings

A t-test statistical analysis to a 95% confidence level was used to see whether there was a significant difference between the wildflower meadow and the amenity grassland for each soil property. With the data we collected and statistically analysed we found:

1. The wildflower meadow and the adjacent amenity grassland have very similar soils
   - There is no statistically significant difference between the two areas with regards to soil organic carbon, calcium carbonate, nitrogen, phosphate and metal content
   - Although there were statistical differences in the amounts of silt and sand, the meadow and the grassland still have the same textural soil type
   - There was a statistically significant difference between soil moisture and pH. However, pH is not a limiting factor to wildflower growth
   - The soil moisture displayed an unusual trend with higher moisture levels at the top of the wildflower meadow, and lower levels in the dip in the amenity grassland. This could suggest soil compaction or uneven drainage

2. Conflicting information was found resulting in an inconclusive historical account of the site.
    - According to the environment agency the Manor Woods Valley became a Landfill Site storing household waste in 1945
    - Historical maps show the site used to be a playing fields at the same time period where the environment agency claim the site to be a landfill
    - Local residents support the historical maps in that the site was not used for waste disposal and the added height of the land is due to the deposition of debris when the Malago Valley intercept was created after the 1968 floods
    - The heavy metal content in the Manor Woods Valley topsoil was very minute compared to other heavy metal concentrations surrounding landfill. This suggests that whatever is under the topsoil has no effect on the topsoil in terms of metals

Advice for Malago Valley Conservation Group

The wildflower meadow and the grassland are very similar, which means the meadow could be extended. This would be beneficial to the local environment and community, as wildflower meadows increase the biodiversity, can preserve local species of plants and look aesthetically pleasing. They also require less intensive maintenance than the cultivated grassland that is there currently, as both the time and the cost of frequent mowing are spared.

Suggestions for future work

Studies investigating the drainage and soil moisture of the site:

- Having established soil moisture increases up slope, further surveys of the site should be undertaken with a focus of how and why the site drains the way it does. This could be due to the way different species of vegetation take up water.

Further investigation into the history of the site:

- Access the Bristol City Council records to solve the conflicting information and carry out deep soil coring which was not undertaken due to safety reasons.

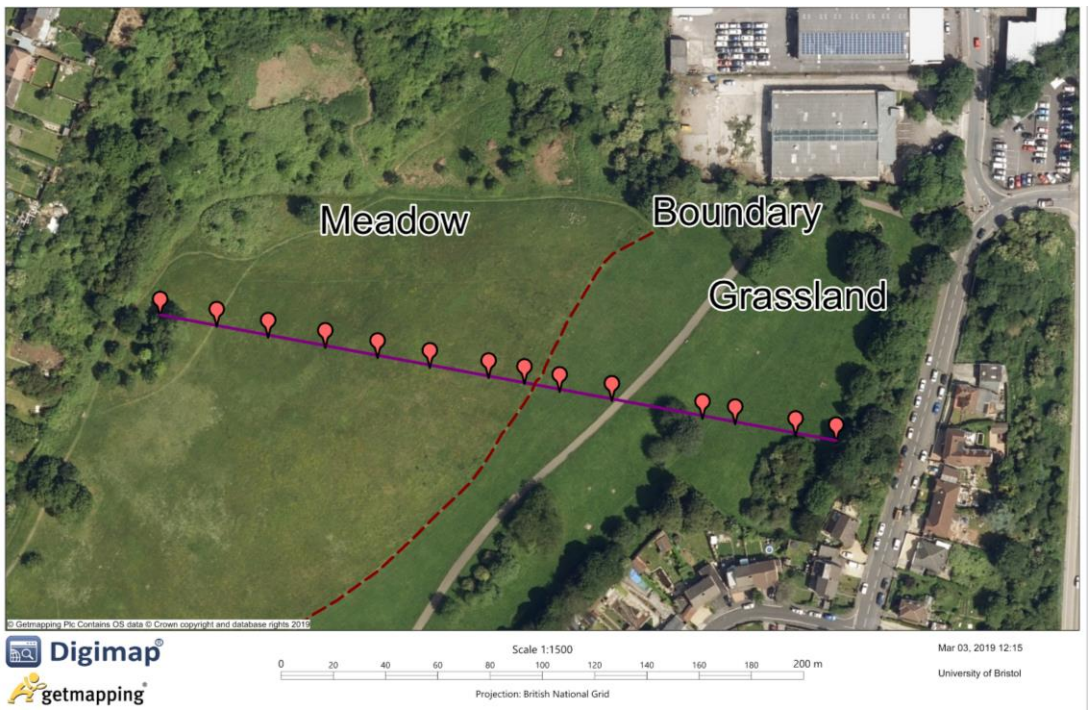

Figure 1: An aerial image of the transect along which the samples were taken from. At sites 3, 8 and 14, three samples were taken.