Biodiversity at Homerton College

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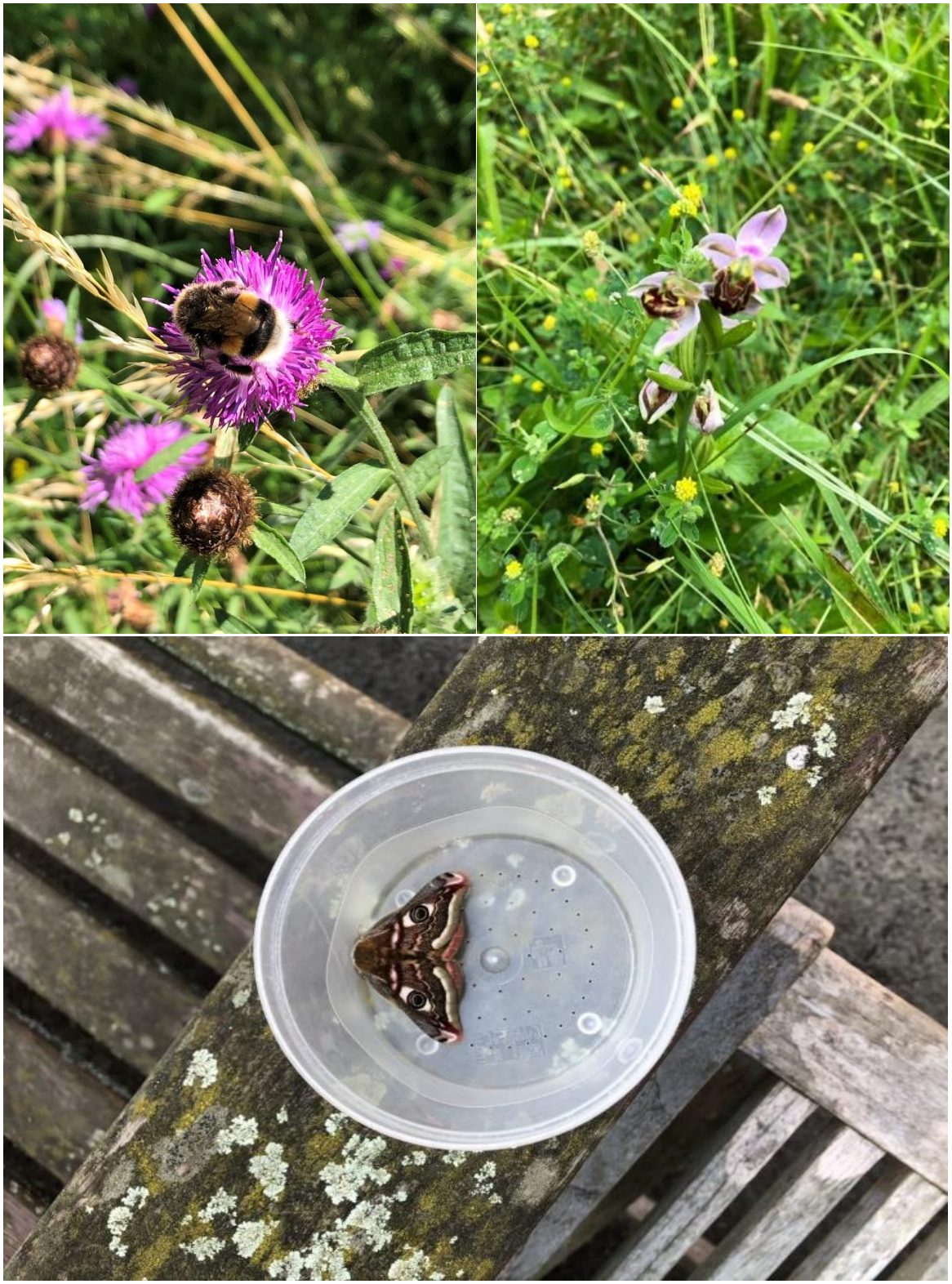

Photos (left to right): 1:Buff-tailed bumblebee (*Bombus terrestris*) collecting nectar from lesser knapweed (Centaurea nigra). 2: Bee orchid (*Ophrys apifera).* 3: Emperor moth (*Saturnia pavonia*).

1. Introduction

This report serves as an executive summary to the fieldwork undertaken this year and serves to outline the biodiversity at Homerton College. Homerton College has the luxury of a large campus with lots of green space. The biodiversity found here should be explored and celebrated. All the data collected this year will be made available to all relevant people and parties. I am very grateful to the college for generously funding the purchase of the equipment this year to get started on the survey work, and I hope the support for the project continues for the future.

The next major step is to develop a Biodiversity Action Plan, giving clear direction on biodiversity targets, and how they will be achieved. I have given some suggestions for future survey work that could provide valuable data, along with outlining what I already have planned. Surveys should be done over many years, to provide data clearly outlining the changes in biodiversity as time goes on, and there is a change in habitat management. The key groups to track here would be the plant communities and butterflies, as these are indicative of biodiversity and management changes.

2. Biodiversity at Homerton:

2.1 Plants

Species lists have been made for all of the wilder areas around college. These species lists are included in the data collected this year. The flower beds have not been included, as they are primarily for aesthetic purposes, and the gardening department have strong records of what is in them already.

The wilder areas around college are very species rich, hosting many beautiful wildflower species. Outside South Court, there is an area where wildflower seed has been sown. This area is rich in wildflowers such as common sainfoin (*Onobrychis viciifolia*), common comfrey (*Symphytum officinale*), cornflower (*Centaurea cyanus*), corn poppy (*Papaver rhoeas*), oxeye daisies (*Leucanthemum vulgare*), wild carrot (*Daucus carota*) and rattlebox (*Rhinanthus minor)*. The area around the pond also hosts an interesting stand of vegetation due to the wetter soil here. Hogweed (*Heracleum sphondylium*) and lesser knapweed (*Centaurea nigra*) are the dominant plant here, with a high abundance of meadowsweet (*Filipendula ulmaria*), yellow flag iris (*Iris pseudacorus*) and Bird's foot trefoil (*Lotus corniculatus*), with the former two preferring wetter habitats.

Common herbaceous species throughout the entire area are ragwort (*Senecio jacobaea*), lesser knapweed (*Centaurea nigra*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), ribwort plantain (*Plantago lanceolata*), yarrow (*Achillea millefolium*), cow's parsley (*Anthriscus sylvestris*) and hogweed (*Heracleum sphondylium*). These all provide a valuable source of nectar for pollinators, with the exception of ribwort plantain, which is wind pollinated.

Four orchid species are found in the Conservation area which are common-spotted orchids (*Dactylorhiza fuchsii*), bee orchids *(Ophyrs apifera),* pyramidal orchids (*Anacamptis pyramidalis*) and twayblade (*Neottia ovata*). The common-spotted is found at a particularly high abundance.

2.2 Mammals

4 species of mammal have been recorded on the college grounds during this study.

- Grey Squirrel (*Sciurus carolinensis*)
- Red Fox (*Vulpes vulpes*)
- Rabbit (*Oryctolagus cuniculus*)
- Reeves' Muntjac Deer (*Muntiacus reevesi*)

Photographs from the camera trap show clearly the Muntjac and the Foxes using the Conservation Area. There are no photos of the rabbits directly in the conservation area, but there are photos of rabbits at the back of Homerton by the trainline. This shows that the foxes and muntjac do use the college grounds as a corridor to get to the entire grounds, rather than just coming in and staying by the back of college. Muntjac deer were also recorded in the hedgerow bordering the principal's lawn. In the near future, a bat survey and a hedgehog survey will be undertaken (see section 4.3).

2.3 Invertebrates

2.3.1 Butterflies

The following 15 butterfly species were recorded ad-hoc whilst carrying out the habitat surveying (months of April and July). These species are as follows: Brimstone, Gatekeeper, Green-Veined, Large White, Marbled White, Meadow Brown, Orange Tip, Painted Lady, Peacock, Red Admiral, Ringlet, Small Skipper, Small Tortoiseshell, Small White, and Speckled Wood.

An absence of species from this list does not necessarily mean they are not present, but instead could be due to a limited sampling effort. A butterfly transect could be set up in the future to track the number of butterflies in college (see section 4.2). Butterflies would be a good choice of indicator taxon to include in the habitat monitoring programme. Butterflies are easy to identify and monitor and are considered to be representative of invertebrate populations generally. They are good indicators of long-term biodiversity change, including in response to management and climate change.

2.3.2 Moths

A moth trap was set up on the 23rd of March and is run weekly. The location is outside of West House, in the wild area outside the Griffin Bar. 29 species of macro-moths have been caught in the trap since it was set up. This is not as high as it could be. Several limiting factors include the light pollution from the lamps outside West House, as well as the light from West House. The unpredictable weather of the last year has also made it tough for moths. Next year, I hope to find a more suitable location away from the lights. This would require the purchase of an external power source such as a generator.

As well as night flying moths, day flying moths have also been recorded. Cinnabar moth caterpillars (*Tyria jacobaeae*) were found on much of the ragwort (*Senecio jacobaea*). Six-Spotted Burnet Moths (*Zygaena filipendulae*) were also a common pollinator in the Conservation Area, whose larvae feed on bird's foot trefoil (*Lotus corniculatus*) predominantly. Christopher Thurgood has been running pheromone traps throughout the last few months with successful lures being made for Red-tipped clearwings (*Synanthedon formicaeformis*), orange-tailed clearwings (*Synanthedon andrenaeformis*), lunar hornet moth (*Sesia bembeciformis*), red-belted clearwing (*Synathedon myopaeformis*), and emperor moths (*Saturnia pavonia*). Red-tipped clearwing and lunar hornet moth caterpillars feed on willows, so are well suited to the area around the pond, which has a crack willow (*Salix fragilis*) and a white willow (*Salix alba*). Red-belted clearwing caterpillars feed on apple trees, so a lot of these would be expected to be seen in the orchard.

2.3.3 Other Pollinators

10 flower-insect timed (FIT) counts were done within the Conservation Area. The mean number of pollinators was 13.6, which sits comfortably near the country-wide mean of 14/15 for the month of July (UKPoMS.org.uk, 2021). The most common pollinators were western honeybee (*Apis mellifera*), buff-tailed bumblebee (*Bombus terrestris*), common banded hoverfly (*Syrphus ribesii*), and common red soldier beetle (*Rhagonycha fulva*).

2.4 Birds

Homerton is home to many common garden bird species. These include chiffchaffs, long-tailed tits, chaffinches, song thrushes, pied wagtails, and Eurasian jays. Green woodpeckers and greater-spotted woodpeckers are also frequent visitors to the grounds and could potentially be nesting here.

3. Suggestions to improve biodiversity

3.1 Develop a Biodiversity Action Plan.

The next crucial step for Homerton, is to develop a biodiversity action plan, much like the one recently developed for the University. This would help give direction, and create specific goals, and ways to achieve them. This would need to be an effort taken by many departments in college. The survey work done this summer has provided a baseline for assessing the biological information of the campus grounds. The next step would be to fill any gaps in our data, and then determining areas and species of particular interest. Targets for improving/preserving the biodiversity on site should be made, which can include the restoring or creation of habitat. Budgets and timelines to achieve goals are both crucial parts of a biodiversity action plan.

3.2 Wildlife Corridor

Whilst there is currently no data on small mammals such as hedgehogs and mice, it is highly likely that the habitat is suitable for them. We do have data on foxes and muntjac deer, which are shown to use the Conservation Area. It is currently thought that these mammals gain entry to the college via the train line at the back of college, with it acting as a wildlife corridor. Hedgehogs do not travel over open spaces, but instead travel along margins. A wildlife corridor could be continued through college, connecting the conservation area with the train line at the back. This will allow small mammals to travel safely through the college grounds. I do not currently have the data for whether this is necessary, but it could be a project to explore next year. The wildlife corridor could be a 3-metre-wide unmown strip on the far edge of the football field (next to the wall), with the taller grass providing shelter for many animals. This could connect to the orchard.

3.3 Hedgehog Friendly Campus.

This is an accreditation given to university campuses by the British Hedgehog Preservation Society. Fitzwilliam College is currently the only Cambridge College who has been granted an award, and they achieved a silver accreditation (2020-2021). The full list of university campuses signed up to this scheme can be found here: https://www.britishhedgehogs.org.uk/hedgehog-friendly-campus-awards-announced/.

To find out more information, and to sign up, an email will need to be sent to: info@hedgehogfriendlycampus.co.uk.

4. Future survey work.

4.1 Projection for the future

As mentioned in the introduction, we believe this project should be ongoing, and undertaken by future Homertonians for many years to come. Once a biodiversity action plan is implemented, the changes in biodiversity on campus should be monitored and recorded, providing data over a clear time series. This should be a joint effort from many different departments around college and should actively involve the students. The Environmental Society can provide a basis for getting students involved. The tracking of the biodiversity could be done by students like myself, providing them will valuable experience doing practical ecology, whilst also producing data for Homerton that can have tangible benefits for the biodiversity onsite. The botanical surveys and moth trapping should be continued for many years, to track biodiversity changes.

4.2 Future survey work:

There are several projects that would provide incredibly useful data for assessing the biodiversity at Homerton.

- **Continuation of botanical and moth surveys.** A more in-depth analysis should be conducted in areas such as the Lime Walk, as well as recurring surveys in the Conservation Area.
- **Setting up a butterfly transect**. The UK Butterfly Monitoring Scheme allows for people and organisations to set up a transect which is walked once a week during the months of April-September. Butterflies are easy to identify and monitor and are considered to be representative of invertebrate populations generally. They are good indicators of long-term biodiversity change, including in response to management and climate change.
- **Assessing more specific plant communities.** The report done this year on the conservation area has highlighted how heterogeneous the vegetation community is in this area. A further analysis into each of these stands of vegetation will provide the data necessary to determine if any particular attention should be paid to a specific area.
- **Determining species of trees in the orchard.** I am aware that the species of apple trees are not known by anyone on the college site. It could be of interest to determine exactly which apple variants are present. There is a county expert on apple trees who could be contacted.

4.3 Survey Work already planned:

Currently there are few surveys that have been planned, but not currently undertaken.

- **Hedgehog survey.** Hedgehog tunnels are placed in various areas around the college campus, over the course of five days, the footprints are checked. The hedgehog tunnels will be kindly provided by the Cambridge Botanical Gardens.
- **Bat Survey.** The Botanical Gardens also possess automatic bat detectors that are left up a tree for a week, and they automatically record the bats that fly past. They will then kindly help analyse the data.
- **Recording data on iRecord.** I am planning on exploring the possibility of recording our records to iRecord, in order to be used as part of a university-wide Biodiversity Assessment. Upload findings to iRecord for University Records.