Jupiter Urban Wildlife Centre: Bryophyte Survey Report 2010

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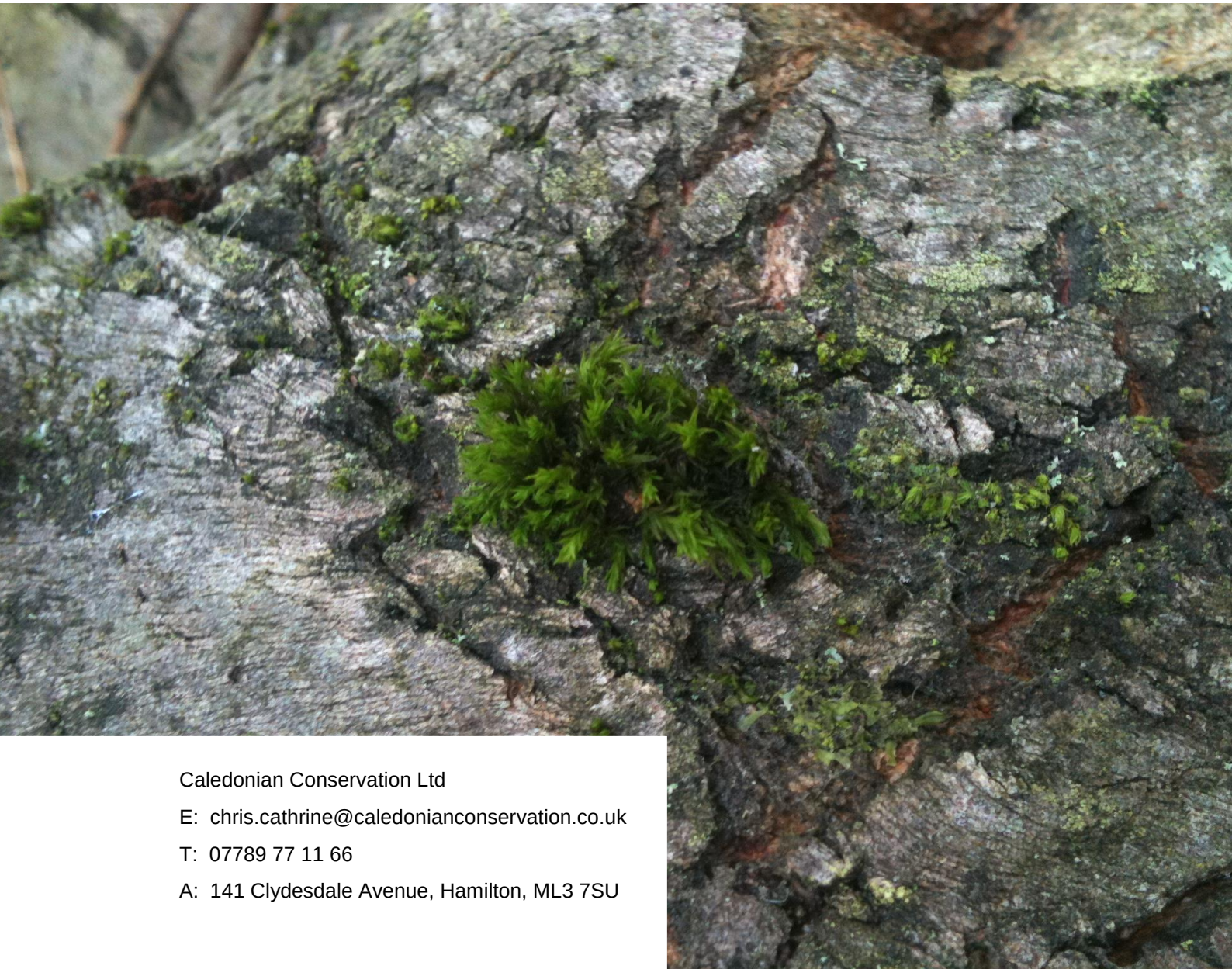

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Report prepared by Caledonian Conservation Ltd.

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Summary

Caledonian Conservation Ltd was commissioned by Scottish Wildlife Trust (SWT) to complete a bryophyte survey of the Jupiter Urban Wildlife Centre reserve in 2010.

The reserve is 4.35ha, and located between a railway line and industrial units set within an urbanized and brownfield landscape dominated by buildings and hard standing with occasional pockets of more natural (although often landscaped) habitats.

The bryophyte survey and analysis was undertaken by Cameron MacIver on behalf of Caledonian Conservation Ltd in November 2010.

This report was completed by Cameron MacIver and Chris Cathrine.

In total, 24 species of bryophytes were recorded at Jupiter Urban Wildlife Centre.

All species previously recorded by Ben Averis in 2007 were re-recorded during this survey, with the exception of *Polytrichum juniperinum*.

No nationally rare or other species of conservation concern were recorded.

Notes to aid interpretation of the bryophyte fauna are provided for a selection of species, including cypress-leaved plait moss (*Hypnum cupressiforme*), tree-moss (*Climacium dendroides*), crescent-cup liverwort (*Lunularia cruciata*), springy turf-moss (*Rhytidiadelphus squarrosus*) and wood bristle-moss (*Orthotrichum affine*). Reference photographs for these species are also provided in Appendix 1.

Locations of bryophyte records are provided on maps in Appendix 2.

1 Introduction

Caledonian Conservation Ltd was commissioned by Scottish Wildlife Trust (SWT) to complete a bryophyte survey of the Jupiter Urban Wildlife Centre reserve in 2010.

Bryophyte survey and analysis was conducted by Cameron MacIver (Cameron Ecology Ltd) on behalf of Caledonian Conservation Ltd.

This report presents the results of this survey together with some observations on the species recorded.

This report was prepared by Cameron MacIver and Chris Cathrine (Caledonian Conservation Ltd). Mapping was undertaken using ArcGIS 10, and completed by Chris Cathrine.

As well as presenting new information, this report draws upon data provided by SWT.

2 Methodology

The bryophyte survey was undertaken at Jupiter Urban Wildlife Centre in November 2010. The survey encompassed the entire area within the site boundary, as shown in Figure 1 and Figure 2 (Appendix 2).

Winter is a good time of year to undertake bryophyte surveys as annual vascular plant vegetation dies back in late autumn, affording bryophytes greater prominence in the plant community. This results in greater detection of individual bryophytes.

The survey method employed involved two stages:

- Field visit (to collect samples and identify species *in-situ* wherever possible); and
- Laboratory analysis (to identify or confirm identification of samples).

The field visit involved an initial walkover which was undertaken on the 1st November 2010. Bryophytes were examined *in-situ* using x10 and x20 hand lenses. Although a number of bryophytes were identified during this walkover, samples of all species were placed in sealed polythene bags and taken away for confirmation. The locations of species and/or samples were recorded accurately using a handheld GPS unit.

The second stage involved confirmation or identification of the sampled species through examination of the material under both stereo and compound microscopes in the laboratory.

Reference was made to the keys and descriptions provided in the references noted at the end of this report.

3 Results

3.1 2010 Survey Results

A total of 24 species of bryophytes were recorded during the survey. Details of these species, and their location within the Jupiter Urban Wildlife Centre reserve are provided in Table 1. Locations where particular species were identified are also shown in Figure 1 and Figure 2 (Appendix 2), while reference photographs have also been taken of a handful of species (Appendix 1). Table 1 indicates which figure and photograph (if any) correspond to any given species. Note that species which are widespread throughout the survey area are not mapped on either figure.

Table 1. Bryophytes Recorded at Jupiter Urban Wildlife Centre in 2010.

Scientific Name	Common Name	Figure	Photo	Location Notes
Brachythecium rutabulum	Rough-stalked feather-moss	1	N/A	On a stone at NS 91856 81099, and in woodland at NS 91873 81118.
Brachythecium albicans	Whitish feather-moss	2	N/A	In woodland at NS 91873 81118.
Bryum capillare	Capillary thread-moss	N/A	N/A	On boardwalks throughout.
Calliergonella cuspidata	Pointed spear-moss	N/A	N/A	On grassy bank in front of office and generally common in grassland throughout site.
Ceratodon purpureus	Redshank	1	N/A	Under Bill Brackenridge boardwalk at NS 91869 81031.
Climacium dendroides	Tree-moss	1	2	NS 91719 80941.
Conocephalum sp.	A liverwort	N/A	N/A	In woodland throughout.
Didymodon insulanus	Cylindric beard-moss	N/A	N/A	Occasional on woodland floor throughout site.
Fissidens taxifolius var taxifolius	Common pocket-moss	1	N/A	On pond spoil-heap at NS 91862 81093.

Scientific Name	Common Name	Figure	Photo	Location Notes
Frullania dilatata	Dilated scalewort	2	N/A	Around tree stump near NS 91719 80941.
Funaria hygrometrica	Bonfire-moss	2	N/A	On pond spoil-heap at NS 91862 81093.
Hypnum cupressiforme	Cypress-leaved plait-moss	2	1	Common on tree bark throughout, recorded on Fraxinus at NS 91978 81139.
Kinbergia praelonga	Common feather-moss	N/A	N/A	Common in grassy areas throughout site.
Lophocolea bidentata	Bifid crestwort	1	N/A	NS 91810 80991, common throughout in grassy areas and woodland floor.
Lunularia cruciata	Crescent-cup liverwort	2	3	Under Bill Brackenridge boardwalk at NS 91869 81031.
Orthotrichum affine	Wood bristle-moss	1	5	NS 91908 81069.
Othodontium lineare	Cape thread-moss	1	N/A	On tree stump at NS 91837 81025.
Pellia endiviifolia	Endive pellia	1	N/A	NS 91856 81003.
Pellia epiphylla	Overleaf pellia	1	N/A	NS91893 81037.
Plagiomnium affine	Many-fruited thyme-moss	1	N/A	NS 91954 81136.
Plagiomnium undulatum	Hart's-tounge thyme-moss	2	N/A	NS 91954 81136, noted to be common in an number of areas.
Pseudoscleropodium purum	Neat feather-moss	N/A	N/A	Occasional in grassland throughout the site.
Rhytidiadelphus squarrosus	Springy turf-moss	N/A	4	Very common and abundant in grassland throughout the site.

Scientific Name	Common Name	Figure	Photo	Location Notes
Weissia sp.	A weissia species	2	N/A	On tree Stump at NS 91837 81025.

The majority of species recorded at Jupiter Urban Wildlife Centre are relatively widespread species. No nationally rare or other species of conservation concern were recorded.

3.2 Historical Context

A previous list of species recorded during a vegetation survey by Ben Averis in 2007 was provided by Stephen Owen (Jupiter ranger). This included a list of 10 mosses and one liverwort, as shown in Table 2 and Table 3 below.

Table 2. Mosses recorded at Jupiter Urban Wildlife Centre by Ben Averis in 2007.

Species
Brachythecium albicans
Brachythecium rutabulum
Calliergonella cuspidata
Ceratodon purpureus
Climacium dendroides
*Eurhynchium praelongum**
Hypnum cupressiforme
Plagiomnium undulatum
Polytrichum juniperinum
Rhytidiadelphus squarrosus

*Now known as *Kindbergia praelonga.*

Table 3. Liverworts recorded at Jupiter Urban Wildlife Centre by Ben Averis in 2007.

Species
Pellia epiphylla

All of the above species were re-found during the 2010 survey with the exception of *Polytrichum juniperinum.* Note that *Eurhynchium praelongum* is now accepted as *Kindbergia praelonga.* This name change has been adopted since the 2007 survey.

3.3 Survey Limitations

Although every effort was made to detect bryophytes and collect samples, many bryophytes are extremely small and some species may have been overlooked. However, the risk of overlooking species is lower during the winter due to reduced vegetative growth from other plants which may obscure bryophytes at other times of the year.

4 Discussion and Recommendations

The survey detected 24 species of bryophytes within the Jupiter Urban Wildlife Centre reserve. All species of bryophytes recorded during a 2007 survey (undertaken by Ben Averis) were re-recorded with the exception of *Polytrichum juniperinum*. The 2010 bryophyte survey has therefore significantly expanded the list of bryophyte species known to occur at Jupiter Urban Wildlife Centre from 11 to 25. The majority of species recorded are relatively widespread species, and none are known to be nationally rare or of conservation concern.

Notes to aid interpretation of the bryophyte fauna are provided below for a selection of species. Habitat management recommendations are also provided, so as to maintain and enhance the bryophyte community at Jupiter Urban Wildlife Centre.

4.1 Interpretation Notes for Selected Species

The following notes are provided as an aid to interpretation of the bryophyte fauna found at Jupiter Urban Wildlife Centre. These notes focus on a selection of interesting species, and reference photos are provided for each in Appendix 1. Notes detailing interesting facts and features of selected species are provided below:

- Cypress-leaved plait-moss (*Hypnum cupressiforme*) (Photo 1) is an attractive moss with a silvery sheen to the leaves that can be found at Jupiter growing over both wood and stones.
- Tree-moss (*Climacium dendroides*) (Photo 2) is another attractive moss. 'Dendroides' means 'like a tree', and the moss looks almost like a miniature palm tree. It grows in the woodland at Jupiter.
- Under the Bill Brackenridge boardwalk there is an impressive colony of crescent-cup liverwort (*Lunularia cruciata*) (Photo 3). The first part of the name 'Lunularia' refers to the moon (as in lunar), because the reproductive structures of this plant are crescent shaped, like little new moons. These structures can be seen throughout the year. This is a 'thallose liverwort', meaning it is one of our simplest plants; it lacks even differentiated leaves and stems. Yet its reproductive biology is fascinating, providing a rare example of motility in the plant kingdom. The crescent-shaped receptacles collect reproductive cells which 'swim' into them like microscopic tadpoles.

  NOTE: Crescent-cup liverwort (*Lunularia cruciata*) can easily be differentiated from redshank (*Ceratodon purpureus*) which is found at the same location, even in absence of reproductive structures. Redshank is a very common and typical moss, often found growing on roofs and walls. Crescent-cup liverwort, on the other hand, is 'thallose', and so is leafless and flat.
- Springy turf-moss (*Rhytidiadelphus squarrosus*) (Photo 4) is probably the most abundant moss in the UK and is considered by some to be a weed of lawns. It is found throughout the grassy areas at Jupiter. Despite being considered as a weed by some, it is also an attractive moss in its own right. It has red stems and leaves that curl back on themselves, and when viewed end-on the stems are star-shaped. 'Squarrose' is a Latin term meaning 'curved back'.

- Wood bristle-moss (*Orthotruchum affine*) (Photo 5) was the only species of *Orthotrichum* recorded. These are tiny mosses that grow on the bark of trees. The presence of these plants is taken as an indicator of relatively good air quality. In the past, atmospheric pollution restricted the range and diversity of *Orthotrichum* species in the UK, but with improving air quality an increased diversity of *Orthotrichum* species is being recorded throughout the country.

4.2 Habitat Management Recommendations

The current management regime is already benefiting bryophytes at Jupiter Urban Wildlife Centre, and there are few further recommendations that can be made. The bryophytes present at the site can be subdivided into three sub-communities based upon their habitats:

- Woodland bryophytes / General epiphytes
- Grassland bryophytes; and
- Urban / Suburban bryophytes

These categorisations are useful when designing habitat management plans so as to ensure complimentary action is taken that is appropriate to the different bryophyte communities on site.

The current site management appears to be ideal for both the Grassland and Urban / Suburban bryophyte communities, and no additional recommendations can be made.

While the woodland management also appears to be well designed so as to be favourable for the Woodland bryophyte community, it is important to ensure that the regime considers particular habitat niches important to bryophytes. The greatest variety of woodland species would be encouraged by providing a mix of old trees, different deadwood habitat (fallen, standing, and of various ages and species), areas of undisturbed woodland floor as well as areas of woodland floor that are subject to occasional disturbance. Based upon observations at the site, it is likely that Jupiter Urban Wildlife Centre's habitat management plan is already designed to promote these elements, and any future revisions should ensure that these features remain integral to the overall regime.

5 References

Atherton, I., Bosanquet, S. and Lawley, M. (Eds) 2010. *Mosses and Liverworts of Britain and Ireland: A field guide.* British Bryological Society, Edinburgh.

Bosanquet, S. 2009. *Orthotrichum* – Britain's bristle-mosses. *British Wildlife* 20(3) 187 – 194.

Crawford, C.L. 2002. *Bryophytes of Native Woods: A Field Guide to Common Mosses and Liverworts of Britain and Ireland's Woodlands, 3rd edition.* Natural Resource Consultancy/Native Woodlands Discussion Group Lower Plants Section, Ayr.

Frey, W., Frahm, J.-P., Fischer, E., and Lobin, W. 2006. *The Liverworts, Mosses and Ferns of Europe*. Harley, Colchester.

Phillips, R. 1980. *Grasses, Ferns Mosses and Lichens of Great Britain and Ireland*. MacMillan, London.

Smith, A.J.E. 1996. *The Liverworts of Britain and Ireland.* Cambridge University Press, Cambridge.

Smith, A.J.E. 2004. *The Moss Flora of Britain and Ireland Second Edition*. Cambridge University Press, Cambridge.

APPENDIX 1: Photographs

Photo 1. Typical habitat of cypress-leaved plait-moss (*Hypnum cupressiforme*).

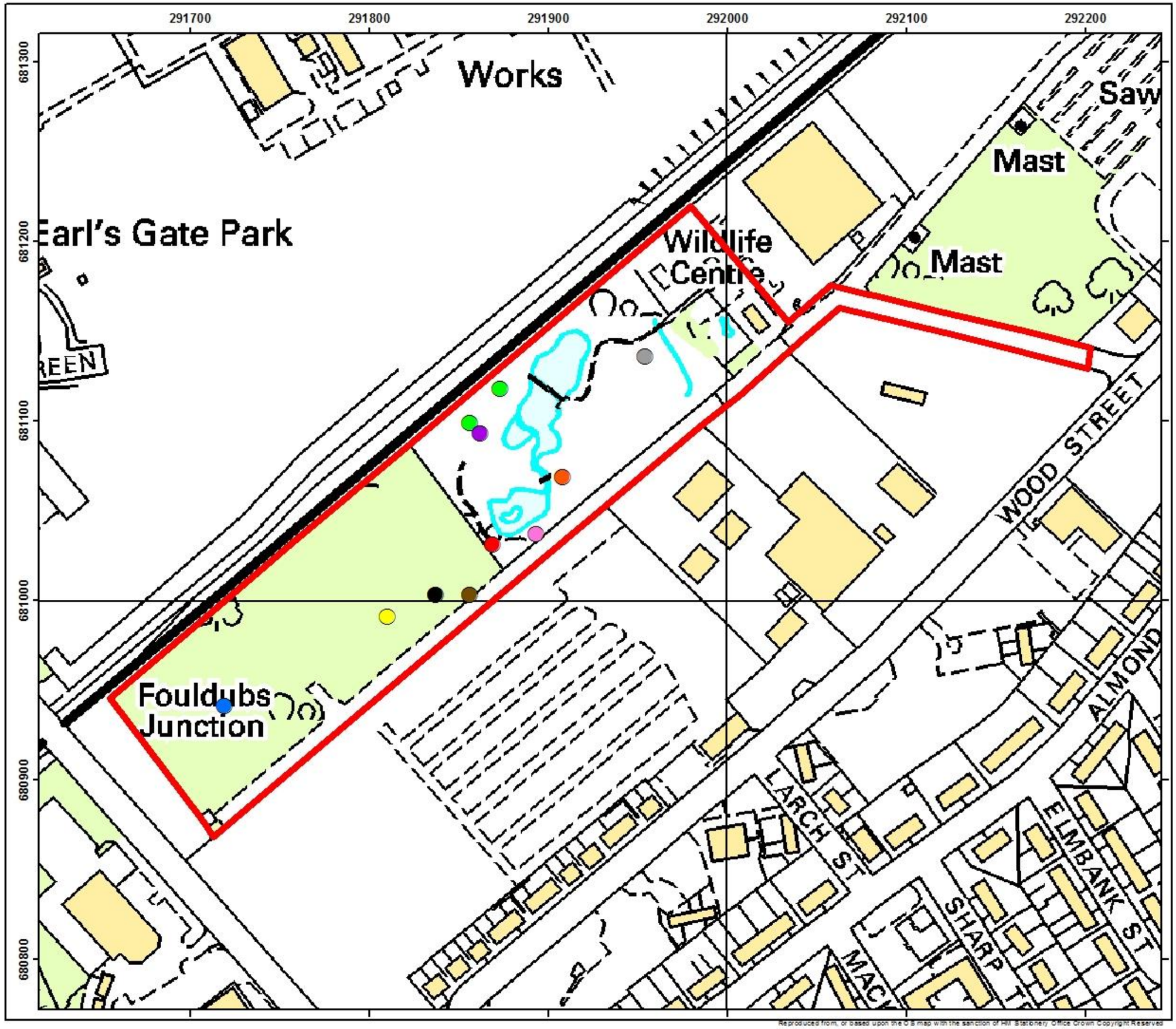
Photo 2. Shoot of tree-moss (*Climacium dendroides*), a moss which looks like a miniature palm-tree.

Photo 3. Liverworts growing under the Bill Brackenridge boardwalk, including crescent-cup liverwort (*Lunularia cruciata*).

Photo 4. Springy turf-moss (*Rhytidiadelphus squarrosus*), one of the most abundant mosses in Great Britain.

Photo 5. Wood bristle-moss (*Orthotrichum affine*).

APPENDIX 2: Figures



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Key

- *Brachythecium rutabulum*
- *Ceratodon purpureus*
- *Climacium dendroides*
- *Fissidens taxifolius var taxifolius*
- *Lophocolea bidentata*
- *Orthotrichum affine*
- *Othodontium lineare*
- *Pellia endiviifolia*
- *Pellia epiphylla*
- *Plagiomnium affine*
- Site boundary

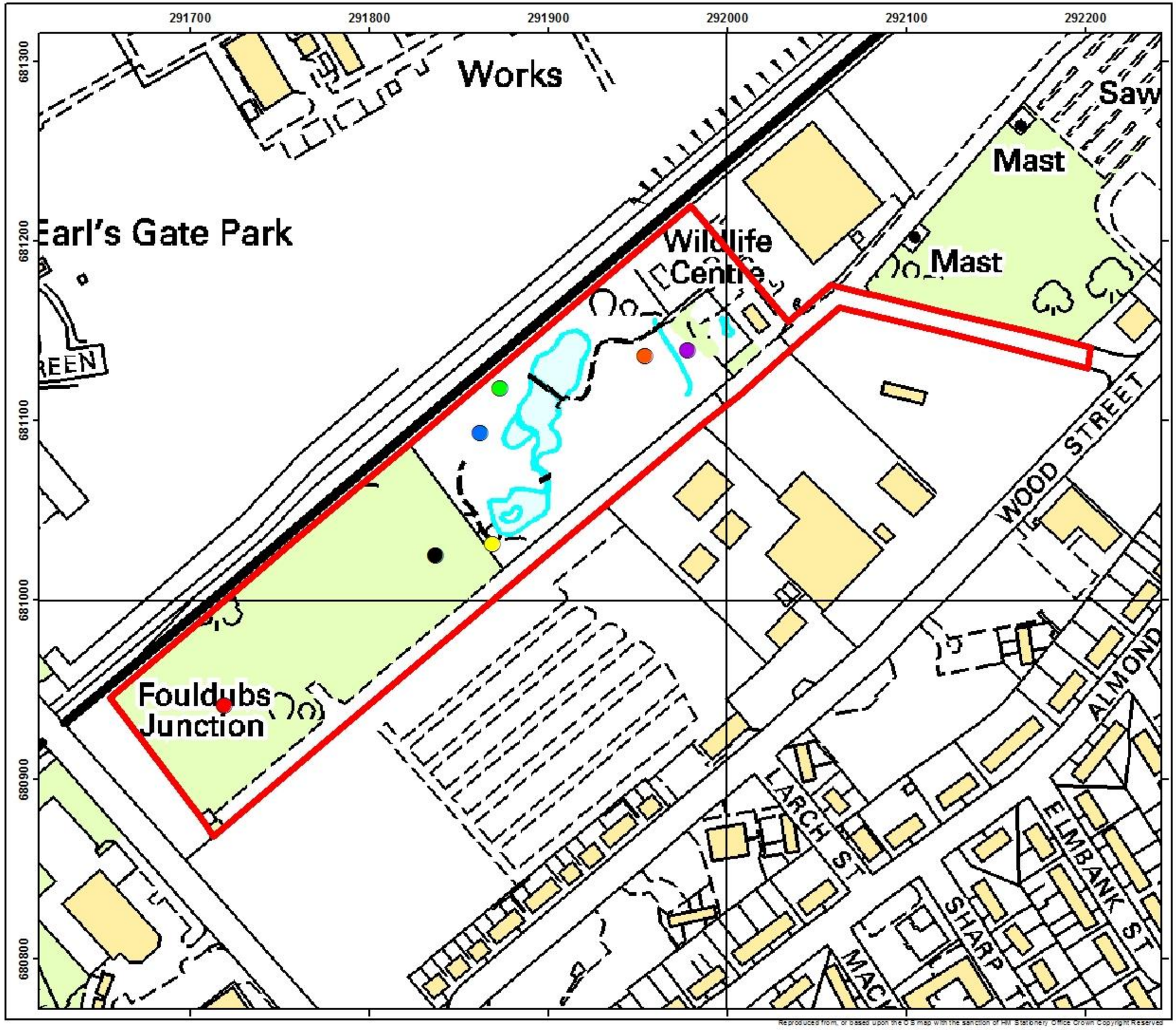
Scale 1:2,000 @ A3

0 20 40 80 m

N

Figure 1
Bryophyte Locations 1

Jupiter Urban Wildlife Centre
Bryophyte Survey Report



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Key

- *Brachythecium albicans*
- *Frullania dilatata*
- *Funaria hygrometrica*
- *Hypnum cupressiforme*
- *Lunularia cruciata*
- *Plagiomnium undulatum*
- *Weissia sp*
- Site boundary

Scale 1:2,000 @ A3

0 20 40 80 m

N

Figure 2
Bryophyte Locations 2

Jupiter Urban Wildlife Centre
Bryophyte Survey Report