

Appendix 13-6 Botanical Survey

East Reading Mass Rapid Transit Scheme

Botanical Survey

On behalf of **Reading Borough Council Highways and Transport Department**



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1 Executive Summary

- 1.1.1 This Botanical Survey Report has been prepared in respect of a planning application for a new mass rapid transit (MRT) scheme to the east of Reading, Berkshire (referred to as the 'proposed development'). An indicative area of works (referred to as the 'East MRT Site') is included on Figure 1.
- 1.1.2 A Preliminary Ecological Assessment (PEA) was completed by PBA in April 2016 including an ecological desk study and Phase 1 habitat survey of the East MRT Site.
- 1.1.3 The desk study identified the presence of a non-statutory designated site within the East MRT Site; The Coal, Kennetmouth and King's Meadow East Local Wildlife Site (LWS). The citation describes the LWS as comprising areas of woodland, mature trees and riparian vegetation. The eastern part of the LWS is also cited as being of importance to the nationally scarce vascular plant Loddon Lily *Leucojum aestivum*; also known as summer snowflake. Clumps of this species were recorded in the area during the Phase 1 habitat survey.
- 1.1.4 Due to the presence of part of a LWS within the East MRT Site, and records of nationally scarce plant species, a Phase 2 botanical survey was undertaken in summer 2016. The aim of this was to enable the current character and condition of the LWS to be compared with that described in the citation. A search for rare, notable and invasive non-native plant species was also undertaken. In addition, sampling of vegetation was completed across representative habitat areas within the remainder (i.e. non-LWS) parts of the East MRT Site in order to gather baseline information on their botanical character and to identify if any notable areas of habitat or vegetation are present.
- 1.1.5 The survey results indicate that the surveyed portion of the LWS part is still in similar condition to that described in the citation. Whilst some of the features and habitats in the LWS would be lost or otherwise affected by the proposed development (e.g. mature trees and secondary woodland in the southern part of the LWS) many of the key features, including the row of mature horse chestnuts, mature willow *Salix* sp. pollards and area identified in the Phase 1 habitat survey as containing Loddon lily, appear to be retained (based on current plans). Recommendations are made in this report to minimise impacts on the LWS such as reducing land-take, avoiding the loss of mature trees, safeguarding the area containing Loddon lily and compensation planting or management of retained areas.
- 1.1.6 The habitats across the remainder of the East MRT Site were found to largely comprise common, widespread and readily established habitats. Small areas of grassland with characteristics of an acid grassland community and ephemeral/short-perennial habitat were identified in the western extent of the East MRT Site. These contain species likely to be less common in the local area, although no notable species were recorded. Recommendations are again made in this report to limit negative impacts of habitats such as limiting habitat loss, diversification and positive management of retained habitats to maximise their biodiversity (and landscape) value.
- 1.1.7 Stands of the invasive non-native plants Virginia creeper *Parthenocissus quinquefolia* and Himalayan balsam *Impatiens glandulifera* were recorded in the survey area. Virginia creeper was recorded growing in the woodland in the surveyed portion of the LWS, with Himalayan balsam growing along the nearby riverbank. It is recommended that these species are eradicated to prevent further spread within or outside the East MRT Site.
- 1.1.8 This Executive Summary contains an overview of the key findings and conclusions. However, no reliance should be placed on any part of the executive summary until the whole of the report has been read.

2 Introduction

2.1 Overview

- 2.1.1 This Botanical Survey Report has been prepared in respect of a planning application for a new mass rapid transit (MRT) scheme to the east of Reading, Berkshire (referred to as the 'proposed development'). An indicative area of works (referred to as the 'East MRT Site') is included on Figure 1: Site Location Plan.

2.2 Project Background

Site Location

- 2.2.1 The East MRT Site is located between Thames Valley Business Park and Napier Road, Reading, to the south of the River Thames and north of the Great Western Main Line Railway, as shown on Figure 1: Site Location Plan.
- 2.2.2 The East MRT Site comprises three main land parcels:
- Land to the east of the River Kennet, which is dominated by a matrix of poor semi-improved grassland and tall ruderal habitat;
 - A central area of broadleaved woodland and riparian vegetation (i.e. vegetation along the river banks) associated with The Coal, Kennetmouth and Kings Meadow East Local Wildlife Site (LWS; see below); and
 - Land within the Tesco supermarket ownership at the western extent of the East MRT Site which is dominated by hardstanding and introduced shrub.
- 2.2.3 Other habitats across the East MRT Site include dense and scattered scrub, ephemeral/short-perennial vegetation and scattered trees.
- 2.2.4 Within a wider landscape context, the East MRT Site is located approximately 1 km north-east of Reading town centre within the county of Berkshire. South of the East MRT Site land use is dominated by residential and commercial development associated with Reading town. North of the East MRT Site lies the settlement of Caversham along with a network of lakes and other waterbodies (including a marina and rowing lakes) adjacent to the River Thames.

Proposed Development

- 2.2.5 The proposed description is described as follows:

'Construction of a segregated fast-track public transport, pedestrian and cycle bridge and viaduct, comprising concrete bridge structure with a river span of 59.5m and a land span of 316m, supported by concrete columns, steel beams and reinforced soil embankment, together with new footpath links and existing footpath alterations, replacement supermarket car parking provision, junction improvements and landscaping.'

- 2.2.6 The proposed development comprises:

- creation of a new route for public transport only, including cycle path and footway between Napier Road and the A3290 at Thames Valley Park proposed Thames Valley Park and Ride (TVP P&R);
- the erection of a new bridge over the River Kennet;

- formation of a new T-junction with Napier Road;
- connection to the proposed TVP P&R;
- development of new and improved footpath links to Tesco and the towpath; and
- associated infrastructure and landscaping.

2.2.7 The proposed development is being promoted by Reading Borough Council (RBC), working with Wokingham Borough Council (WBC), Thames Valley Berkshire Local Enterprise Partnership (TVB LEP) and Peter Brett Associates LLP (PBA). The public-sector led project has been allocated funding by TVB LEP from the Local Growth Fund.

Ecological Background

- 2.2.8 A Preliminary Ecological Assessment (PEA) was completed by PBA in April 2016 including an ecological desk study and Phase 1 habitat survey of the East MRT Site.
- 2.2.9 The desk study identified the presence of seven non-statutory designated areas within a 2 km search radius of the East MRT Site. One of these; The Coal, Kennetmouth and King's Meadow East Local Wildlife Site (LWS) (site code 77G02) is partially located within the East MRT Site. The citation for this LWS confirms that it is a combination of two areas previously notified separately (The Coal and Kennetmouth West), plus a section of land in the east of King's Meadow. The updated LWS boundary (encompassing all three areas of land) does not indicate the exact extent of the Coal, Kennetmouth or King's Meadow East sections. However, based on the descriptions of each area in the citation text, it appears that the sections falling partially within the East MRT Site (i.e. those of most relevance to this report) are The Coal and Kennetmouth, with King's Meadow East forming the remainder of the LWS outside the East MRT Site to the west.
- 2.2.10 The LWS citation describes The Coal as an area of woodland adjacent to the railway embankment growing on a former colliery spoil site. The woodland includes large poplars *Populus* sp. and horse chestnuts *Aesculus hippocastanum* with semi-mature hornbeam *Carpinus betulus* also present in places. A dense understorey of elder *Sambucus nigra*, butterfly-bush *Buddleja davidii* and hawthorn *Crataegus monogyna* occurs here; this creates shading over the woodland floor effectively precluding growth of ground flora. The Coal part of the LWS equates to the area of woodland immediately west of the River Thames/River Kennet confluence within the East MRT Site (and east of the supermarket car-park located north-west of the East MRT Site).
- 2.2.11 Kennetmouth is cited as a short section of towpath at the mouth of River Kennet where it joins the River Thames. The area within the LWS includes part of the western bank of the River Kennet and part of the south bank of the River Thames (in this immediate area). These include areas of riparian trees such as alder *Alnus glutinosa*, willows *Salix* spp. and ash *Fraxinus excelsior* and marginal vegetation with a mixture of wetland species. The Kennetmouth section of the LWS is also cited as being of importance to the nationally scarce vascular plant Loddon Lily *Leucojum aestivum*, with this species known to be present here. The Kennetmouth part of the LWS clearly relates to the area subject to proposed development within the central part of the East MRT Site (i.e. at the confluence of the rivers), with the river banks immediately west and north-west of the confluence also assumed to be included (where these fall within the LWS boundary).
- 2.2.12 Criteria for the Selection of Local Wildlife Sites in Berkshire, Buckinghamshire and Oxfordshire have been prepared by Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC) and Thames Valley Environmental Records Centre (TVERC) (BMERC and TVERC, 2009). Nine criteria are used to determine if a site is worthy of LWS notification. These include four core criteria directly related to biodiversity value/features such as naturalness (i.e.

presence of priority habitats), rare or exceptional features (e.g. presence of rare or nationally scarce species), size and diversity as well as five contextual criteria including historical or cultural associations and perceived public/educational value.

- 2.2.13 The Coal, Kennetmouth and King's Meadow East LWS citation does not confirm exactly which criteria have been met during selection of this non-statutory designated area. However, Loddon lily and the slender groundhopper *Tetrix subulata* (an invertebrate species); are both mentioned and are both nationally scarce species, thus presumably meeting the rare or exceptional features criteria. The citation also notes that parts of the site '*might be classed as open mosaic habitat on previously developed land*' which would meet the 'naturalness' criteria (as this is a priority habitat type¹). However, the citation does not confirm if this is the case nor identify where this habitat type occurs within the LWS area. Other features noted in the citation include the presence of bluebell (listed on schedule 8 of the Wildlife and Countryside Act 1981 (as amended) albeit prohibiting sale only) and cormorant *Phalacrocorax carbo*; a bird species of medium conservation concern.
- 2.2.14 The LWS portion of the East MRT Site was included in the April Phase 1 habitat survey and was found to be dominated by woodland and scrub, with mixed habitats of varying quality recorded. This included mature and semi-mature trees along the northern extent of the East MRT Site. The portion of the LWS within the East MRT Site was also found to contain a small area of riparian (riverside) habitat. Records of Loddon lily; a British Red Data Book species, were returned from this area as part of the ecological desk study, with plants of this species also noted during the Phase 1 habitat survey.
- 2.2.15 A mixture of other habitat types were recorded during the Phase 1 habitat survey across the East MRT Site. These included areas of broadleaved woodland, scrub, semi-improved and amenity grassland, tall ruderal vegetation, marginal vegetation, introduced shrub and ephemeral/short-perennial vegetation.

2.3 Aims of Study

- 2.3.1 It is understood that The Coal, Kennetmouth and King's Meadow East LWS was last surveyed by Reading Borough Council (RBC) in 2004. Given the time that has passed, a detailed botanical survey of the on-site portion of the LWS was recommended to ascertain the current botanical baseline. In addition, sampling of different habitat areas was also proposed across the wider East MRT Site in order to gather information on general botanical diversity, including the presence of rare or otherwise notable plant species.
- 2.3.2 The specific aims of this study were to:
- Gather up-to-date detailed botanical information within the on-site portion of the LWS, including mapping parcels of differing habitat type/quality within the LWS area and gathering plant species lists;
 - Complete a botanical sampling survey within broad habitat types elsewhere within the East MRT Site to gather information on species composition and overall diversity;
 - Search for and map locations of any rare, invasive non-native or otherwise notable plant species (particularly Loddon lily);
 - Compare current habitat conditions within the on-site portion of the LWS to those described within the LWS citation; and

¹ More accurately, this habitat is now included on the list of habitats of principal importance to the conservation of biodiversity in England drawn up in response to section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. This list was largely based on the list of priority habitats identified in the UK Biodiversity Action Plan. These habitats are sometimes referred to as 'section 41 habitats'.

- Provide outline recommendations for how impacts on habitats/vegetation (particularly those in the on-site portion of the LWS) associated with the proposed development can be minimised or mitigated.

3 Methods

3.1 Botanical Survey

3.1.1 A detailed Phase 2 botanical survey was undertaken on 21st June 2016. This concentrated on the portion of The Coal, Kennetmouth and King's Meadow East LWS occurring within the East MRT Site. Areas of different habitat types and evident quality (based on a visual assessment) were mapped as individual habitat 'parcels' within the LWS area. A detailed list of botanical species present within each parcel was then gathered, with relative abundance recorded using the DAFOR scale:

- D = Dominant
- A = Abundant
- F = Frequent
- O = Occasional
- R = Rare

3.1.2 In addition to the detailed botanical survey of the LWS area (as described above), botanical sampling was undertaken within broad habitat types elsewhere across the East MRT Site. Sufficient sampling locations were selected in the field by the surveyor in order to gather representative botanical species lists within each broad habitat type. At each sampling location, all evident plant species within a defined quadrat area were identified, with relative abundance again recorded using the DAFOR system. Quadrat areas of 2m x 2m were used for grassland and other open habitats (e.g. ephemeral/short-perennial vegetation), with 4m x 4m quadrats used for scrub and tall ruderal habitats. A hand-held GPS was used to record the central point of each sampling location.

3.1.3 Effort was made to search for rare or otherwise notable plant species (e.g. species of principal importance to the conservation of biodiversity in England, as listed in response to Section 41 of the NERC Act; see Appendix B); as well as invasive non-native species. The location of any such plants was recorded using a hand-held GPS. This included a search for Loddon lily, in order to supplement the results of the previous Phase 1 habitat survey.

3.1.4 The results of the botanical survey were compared to descriptions of vegetation communities in the National Vegetation Classification (NVC) in order to provide additional context. It should be noted that the survey did not constitute a full NVC survey (nor did it intend to), so the indicative communities are presented as a reasonable estimate of vegetation types only.

3.2 Survey Limitations

3.2.1 The survey was completed at an optimal time for botanical survey (mid-summer) when the majority of plant species are evident and readily identifiable. Weather conditions during the survey were good, with full access possible to the LWS portion of the East MRT Site as well as to representative areas of each broad habitat type. There were therefore no limitations to the general botanical survey methods described above.

3.2.2 It is noted that the survey was completed outside of the main flowering season of Loddon lily, which typically flowers in spring (April/May). However, vegetative parts of this species persist into the summer. In addition, a search for this species was undertaken in order to supplement the earlier Phase 1 habitat survey, which had already recorded the presence of Loddon lily in some of the riparian habitats on site. The timing of the detailed botanical survey was therefore a limitation in terms of identifying and recording this species, but as presence had already

been confirmed this is not deemed to be significant in relation to the overall ecological assessment of the East MRT Site.

- 3.2.3 Part of the East MRT Site, namely the area of grassland toward the central/eastern part of the East MRT Site had been recently strimmed at the time of survey (see Photograph 8 in Appendix B). Although it was still possible to identify many species from vegetative characteristics, this meant that the vegetation structure in this area may not have been representative and some species may not have been evident. However, it is unlikely that the species diversity in or value of this area would be significantly different to that observed during the survey.
- 3.2.4 Given that the planning application boundary for the proposed development had not been fixed at the time, the area included within the survey varied slightly from the current East MRT Site – see Figure 2 for extent. This namely affected land within the LWS, where a more extensive survey area was considered, with two wider botanical sampling locations (6 and 8) included within land to the north / east of the East MRT Site. The results within these locations provide contextual information and as such, are not considered to limit the findings of the survey.

3.3 Personnel

- 3.3.1 The botanical survey was completed by Ed Austin MCIEEM. Ed has been in continuous employment as a professional ecologist since 2004 and began his career in environmental consultancy in 2002. He has completed a large number of ecological site assessments and has extensive experience in using the extended Phase 1 habitat survey method. In addition, Ed has undertaken a wide-range of projects utilising botanical assessment techniques such as the National Vegetation Classification (NVC) as well as bespoke surveys for specific plant species.

4 Results and Interpretation

4.1 The Coal, Kennetmouth and King's Meadow East LWS

- 4.1.1 Vegetation within the LWS area was divided into six different habitat/habitat mosaic parcels based on vegetation character/structure and species present. Full botanical species lists for each parcel are provided in Appendix A with each parcel summarised below. Representative photographs are provided in Appendix B.
- 4.1.2 The part of the LWS that falls within the East MRT Site essentially comprises two areas of woodland, with a more open 'glade' of scattered scrub and tall ruderal vegetation at the eastern end and a belt of dense scrub/introduced shrub along the southern edge adjacent to the nearby railway corridor.
- 4.1.3 The woodland making up the bulk of the on-site portion of the LWS was divided into two areas north (BW1) and south (BW2) of a surfaced footpath running diagonally through the centre. The northern area (BW1; see photographs 1 to 3 in Appendix B), of which a small proportion is located within the East MRT Site boundary, is a mixed secondary woodland with frequent mature and young self-seeded sycamore *Acer pseudoplatanus* and occasional mature ash *Fraxinus excelsior*, plus a dense shrub layer of elder *Sambucus nigra*, hawthorn *Crataegus monogyna* and butterfly-bush *Buddleja davidii*. This section of woodland also has a characteristic row of mature horse chestnut *Aesculus hippocastanum* trees growing along the northern edge adjacent to the Thames path (footpath). Virginia creeper *Parthenocissus quinquefolia* was noted growing on trunks of trees and across the ground in this location.
- 4.1.4 The area of woodland to the south (BW2; see photographs 4 and 5 in Appendix B), of which the majority is located within the East MRT Site boundary, is noticeably different in character (compared to BW1) having abundant silver birch *Betula pendula*, frequent Norway maple *Acer platanoides* and a group of mature hybrid black poplar *Populus deltoides x nigra*, resulting in a more open woodland with a less dense shrub layer (although elder and young sycamore are still frequent). Ground cover in both BW1 and BW2 contains a mixture of species such as common nettle *Urtica dioica*, garlic mustard *Alliaria petiolata*, ground ivy *Glechoma hederacea*, green alkanet *Pentaglottis sempervirens* and cleavers *Galium aparine*. Due to the predominance of shrub species in the bulk of the woodland parcels, both BW1 and BW2 show more affinity to scrub community (e.g. W21 (*Crataegus monogyna* - *Hedera helix*) scrub), as opposed to 'true' woodland.
- 4.1.5 The eastern end of the portion of the LWS on-site consists of a more open 'glade' with scattered scrub and ruderal vegetation (see photograph 7 in Appendix B). The scrub component comprises a mixture of young, self-seeded sycamore and ash with frequent butterfly-bush and occasional dogwood *Cornus sanguinea*. Characteristic ground cover species here include creeping cinquefoil *Potentilla reptans* and common nettle, with other species including thyme-leaved speedwell *Veronica serpyllifolia*, wild mignonette *Reseda lutea* and wood forget-me-not *Myosotis sylvatica*. In the most open areas some grassland has established including creeping bent *Agrostis stolonifera* and red fescue *Festuca rubra*.
- 4.1.6 The southern part of the on-site portion of the LWS consists of a strip of scrub/introduced shrub between the woodland (BW2) and the adjacent railway corridor (photograph 6 in Appendix B). Dense stands of butterfly-bush are characteristic of this area, with frequent young self-seeded sycamore and patches of bramble *Rubus fruticosus* and common nettle. Where scrub is more open, a variety of ground cover species was recorded including ground ivy, green alkanet, creeping cinquefoil, common ragwort *Senecio jacobaea*, teasel *Dipsacus fullonum*, wood forget-me-not, garlic mustard, cleavers, great mullein *Verbascum thapsus* and dark mullein *Verbascum nigrum*.

- 4.1.7 Vegetation along the riverbank to the north of the woodland was also included as part of the LWS, although it is unclear exactly where the LWS boundary finishes (i.e. some or all of this area may be outside the LWS). This habitat included a strip of vegetation north of the Thames path (footpath) growing on the south bank of the River Thames. The majority of this strip was recorded as scattered broadleaved trees and tall ruderal vegetation (SBW/TR1). This consists of scattered alder *Alnus glutinosa*, ash, sycamore, silver birch and goat willow *Salix caprea* with a ground cover of largely ruderal or woodland species such as clustered dock *Rumex conglomeratus*, garlic mustard and common nettle plus some marginal species or species favouring wet conditions such as yellow iris *Iris pseudacorus*, hemlock water-dropwort *Oenanthe crocata*, water figwort *Scrophularia auriculata* and bittersweet *Solanum dulcamara*. The eastern end of this strip of vegetation was recorded as a mosaic of tall ruderal and marginal vegetation (TR/MV1) growing where there is a break in tree cover (photograph 8 in Appendix B). Characteristic species here included clumps of yellow iris on the water's edge with dense stands of Himalayan balsam *Impatiens glandulifera* on the bank along with common nettle, cleavers, creeping thistle *Cirsium arvense* and clustered dock (among others). The LWS boundary also appears to include a narrow strip of land leading up to the existing railway bridge. This area includes stands of common nettle as well as characteristic mature crack willow *Salix fragilis* pollards (photograph 9 in Appendix B).

4.2 Vegetation Sampling (Rest of East MRT Site)

- 4.2.1 Samples of the vegetation across the rest of the East MRT Site (outside the LWS area), and within the land to the north / east (sampling locations 6 and 8) were taken in representative places within each broad habitat type identified. A total of 11 sampling locations were used in areas of grassland, scrub, tall ruderal and ephemeral/short-perennial vegetation. The location of the 11 sampling points is shown on Figure 2 with full lists of botanical species provided in Appendix A. A summary of the vegetation at each sampling location together with information on broad habitat type and indicative plant community is provided in Table 1 below.

Table1: Summary of Vegetation Sampling

Sample No.	Summary Description	Broad Habitat Type	Indicative Community Type
1	Short grassland in east of East MRT Site close to footbridge. Characterised by common grasses such as perennial rye-grass <i>Lolium perenne</i> and rough meadow-grass <i>Poa trivialis</i> with low diversity of herbs such as yarrow <i>Achillea millefolium</i> and white clover <i>Trifolium repens</i> .	Amenity grassland/species-poor neutral grassland	Shows most affinity to a mesotrophic grassland - MG7 (<i>Lolium perenne</i> leys and related grasslands); specifically, MG7b (<i>Lolium perenne</i> / <i>Poa trivialis</i> sub-community). Also has elements of an open habitat community - OV23 (<i>Lolium perenne</i> - <i>Dactylis glomerata</i> community)

Sample No.	Summary Description	Broad Habitat Type	Indicative Community Type
2	Rough grassland and tall ruderal mosaic growing on sloping ground between River Thames and railway boundary. Perennial rye-grass and rough meadow-grass still present. Large component of colonising ruderal species such as common nettle, comfrey <i>Symphytum officinale</i> and docks <i>Rumex</i> spp..	Species-poor neutral grassland/tall ruderal mosaic	Shows affinity to MG11 (<i>Festuca rubra</i> - <i>Agrostis stolonifera</i> - <i>Potentilla anserina</i> grassland); specifically, the <i>Lolium perenne</i> sub-community. Also elements of an open habitat community; particularly OV24 (<i>Urtica dioica</i> - <i>Galium aparine</i> community); a tall-herb 'weed' community.
3	Area of grassland further east along slope (as S2 above). Dominated by perennial rye-grass with other coarse grasses such as cock's-foot <i>Dactylis glomerata</i> and rough meadow-grass. Less ruderal vegetation than S2 (above) but with low-growing herbs such as creeping buttercup <i>Ranunculus repens</i> .	Species-poor neutral grassland	Affinity with an open 'weedy' grassland community; OV23 (<i>Lolium perenne</i> - <i>Dactylis glomerata</i> community).
4	Grassland at eastern end of bank between river and railway boundary. Characterised by perennial rye-grass with frequent cock's-foot and perforate St John's-wort <i>Hypericum perforatum</i> with other herbs including ground ivy and white clover.	Species-poor neutral grassland	Some affinity with an open 'weedy' grassland community; OV23 (<i>Lolium perenne</i> - <i>Dactylis glomerata</i> community) but also elements of underscrub community; e.g. W24 (<i>Rubus fruticosus</i> - <i>Holcus lanatus</i> underscrub), particularly toward edges.
5	Open area of tall ruderal vegetation surrounded by scrub toward east-end of the East MRT Site. Area dominated by common nettle with spear thistle <i>Cirsium vulgare</i> also frequent.	Tall ruderal	Shows affinity to an open habitat community; particularly OV24 (<i>Urtica dioica</i> - <i>Galium aparine</i> community), a tall-herb 'weed' community.

Sample No.	Summary Description	Broad Habitat Type	Indicative Community Type
6	Mosaic of scrub and tall ruderal vegetation within land to the east of the East MRT Site close to railway boundary. Stands of bramble, dogwood and butterfly-bush with ruderal vegetation between including great willowherb <i>Epilobium hirsutum</i> , perforate St John's-wort and common nettle.	Scattered scrub/tall ruderal mosaic	Affinity with a W24 (<i>Rubus fruticosus</i> - <i>Holcus lanatus</i> underscrub) community.
7	Scrub east of grassland area toward east of the East MRT Site (surrounding S5). Abundant hawthorn with frequent regenerating English elm <i>Ulmus procera</i> and suckering blackthorn <i>Prunus spinosa</i> .	Dense scrub	Affinity to a W21 (<i>Crataegus monogyna</i> - <i>Hedera helix</i> scrub) community.
8	Scrub and introduced shrubs within land to the north of the East MRT Site. Dense stands of butterfly-bush with other species including bramble, dogwood and field maple <i>Acer campestre</i> .	Dense scrub/introduced shrub	Affinity with a W24 (<i>Rubus fruticosus</i> - <i>Holcus lanatus</i> underscrub) community.
9	Short rabbit-grazed grassland toward western end of the East MRT Site south of supermarket. Characterised by short sward of sheep's fescue <i>Festuca ovina</i> with low-growing herbs including sheep's sorrel <i>Rumex acetosella</i> and creeping cinquefoil.	Acid grassland	Shows some affinity to a U1 (<i>Festuca ovina</i> - <i>Agrostis capillaris</i> - <i>Rumex acetosella</i>) calcifugous (acid) grassland community.
10	Scrub and introduced shrubs around patches of grassland in western part of the East MRT Site. Characterised by dense stands of butterfly-bush with bramble and common nettle.	Dense scrub/introduced shrub	Affinity with a W24 (<i>Rubus fruticosus</i> - <i>Holcus lanatus</i> underscrub) community, although with dominant butterfly-bush.

Sample No.	Summary Description	Broad Habitat Type	Indicative Community Type
11	Area of low-growing self-established vegetation on dry, open ground in west of the East MRT Site. Mixture of low-growing species such as bird's-foot trefoil <i>Lotus corniculatus</i> , biting stonecrop <i>Sedum acre</i> , English stonecrop <i>Sedum anglicum</i> and wild strawberry <i>Fragaria vesca</i> with short sward of red fescue in places and taller, readily colonising species such as teasel <i>Dipsacus fullonum</i> and mulleins <i>Verbascum</i> spp..	Ephemeral/short-perennial	No clear affinity, but likely one of the open habitat (OV) communities.

- 4.2.2 In summary, the habitats across the East MRT Site (outside the LWS area), and within the land to the north / east (sampling locations 6 and 8) represent widespread and commonly occurring habitat types that are unexceptional in terms of their botanical diversity or species composition. Within the context of the East MRT Site, the small areas of grassland showing some affinity with an acid grassland community (around sample 9) and the area of ephemeral/short-perennial vegetation (sample 11) represent habitats that are less common in the local area. The NVC U1 acid grassland community type is one of the grassland communities included in the 'lowland dry acid grassland' Section 41 habitat description. However, the acid grassland areas are not good examples of this habitat type being very small in area and containing common and widespread species.
- 4.2.3 Although the ephemeral/short-perennial habitat (around sample 11) has characteristics of 'open mosaic habitat on previously developed land' it does not fit the description of this Section 41 habitat type as it is too small in area (<0.25ha) and is largely vegetated (i.e. lacking areas of bare ground).

4.3 Notable and Invasive Non-native Plant Species

Notable Plant Species

- 4.3.1 Despite being present during the earlier Phase 1 habitat survey; no evidence of Loddon lily was found in the LWS subject to survey or anywhere else in the survey area. However, given that the survey was completed outside the peak flowering season of Loddon lily and given the subsequent dense growth of other species (particularly Himalayan balsam), there is no reason to assume this species is not still present.
- 4.3.2 Loddon lily (or summer snowflake as it is also known) is included in the Vascular Plant Red Data List for Great Britain (Cheffings *et al.*, 2005) as 'nationally scarce' (i.e. found in between 16 and 100 hectads in the Ordnance Survey National Grid).

Invasive Non-native Plant Species

- 4.3.3 Both Himalayan balsam and Virginia creeper (recorded in the survey area) are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to plant or other cause to grow in the wild any plant included on Schedule 9. Note that the Department for Environment Food and Rural Affairs (DEFRA) do not consider planting of Schedule 9 species

in private gardens, estates and amenity planting as 'planting in the wild' so long as reasonable measures are taken to confine them to the cultivated area (i.e. to prevent spread into the wild).

- 4.3.4 Virginia creeper was recorded growing on the ground and on trees in part of the LWS toward the north (adjacent to the Thames Path); see Figure 2. Dense stands of Himalayan balsam were recorded on the bank of the River Thames in the north-east part of the LWS (or immediately adjacent to it); see Figure 2.

5 Discussion and Outline Recommendations

5.1 The Coal, Kennetmouth and King's Meadow East LWS

- 5.1.1 The citation for The Coal, Kennetmouth and King's Meadow East LWS only provides a brief overview of the habitat types, structure and plant species present in the LWS area. However, the results of the botanical survey undertaken in summer 2016 indicate that conditions in the surveyed portion of the LWS are broadly the same as those indicated in the citation. Key features cited for The Coal section of the LWS include mature poplar and horse chestnut trees with a dense understorey of shrubs dominated by elder, butterfly-bush and hawthorn. These features/species were all recorded during the botanical survey. The Kennetmouth section of the LWS is cited as including riparian trees and marginal vegetation as well as Loddon lily. The habitat types cited were all confirmed to still be present during the 2016 botanical survey. Whilst no evidence of Loddon lily was found at this time, clumps of this plant had been recorded in this area during the earlier Phase 1 habitat survey.
- 5.1.2 The 2016 botanical survey results therefore indicate the LWS is still in a similar condition to when it was notified. There is no evidence of significant change to the habitats/botanical species present such that the cited features/value of the LWS would have also significantly changed.
- 5.1.3 With reference to the LWS selection criteria, key botanical/habitat features associated with the surveyed portion of the LWS include the presence of Loddon lily (a nationally scarce species). Although not recorded during this botanical survey, the presence of Loddon lily was confirmed on site during the earlier Phase 1 habitat survey (undertaken during the flowering period for this species). Plants were recorded on the river banks adjacent to the River Thames/River Kennet confluence in an area understood to fall within the Kennetmouth section of the LWS. Although the citation suggests that open mosaic habitat on previously developed land (a Section 41 habitat; see introduction) may occur within the LWS, no habitats meeting this description were recorded in 2016 in the surveyed part of the LWS. However, due to the description of the Section 41 habitat 'lowland mixed deciduous woodland' being very broad and encompassing a great variety of woodland types, parts of the woodland areas in the LWS are also likely to represent this habitat type. The surveyed areas of woodland in the LWS are not good examples due to their small size and general lack of mature tree cover.
- 5.1.4 With reference to the LWS citation and based on the results of the 2016 field survey, key features (i.e. those of the greatest biodiversity or cultural/landscape value) within the surveyed portion of the LWS only include:
- The presence of Loddon lily;
 - The row of mature horse chestnut trees along the northern edge of BW1;
 - The mature poplar trees located in BW2; and
 - The mature crack willow trees on the western bank of the River Kennet
- 5.1.5 The current plans indicate that only part of the surveyed portion of the LWS is likely to be directly affected by works, with impacts mainly associated with land-take for the construction of the proposed development and associated raising of ground levels. This will affect the south-eastern end of the LWS only, including parts of BW1 and BW2 as well as the area of shrubs and ruderal vegetation (SS/TR1) and scrub adjacent to the railway corridor (DS/IS1). These areas are characterised by dense shrubs and secondary woodland. At present, it appears that the majority of the riparian trees and vegetation (including the crack willow pollards further south) associated with the Kennetmouth part of the LWS will not be affected aside from the area immediately beneath the new bridge itself. Importantly, this indicates that

the riparian habitat at the confluence of the River Thames and River Kennet where Loddon lily was recorded in the Phase 1 habitat survey will not be directly affected. In addition, the majority if not all of the line of mature horse chestnuts also fall outside this area. However, it appears likely that the mature poplar trees in BW2 will be removed to facilitate the raising of ground levels in this area.

- 5.1.6 Based on the above, outline recommendations to avoid, minimise or mitigate/compensate potential impacts of the proposals on the surveyed portion of the LWS are provided below. It should be noted that these measures are not intended to be final or prescriptive. A full assessment of impacts and associated measures for mitigation/compensation will be developed once final project plans have been confirmed.
- Limiting the footprint of the works area to minimise the amount of the LWS that is directly affected by works.
 - Restricting development works to avoid the area containing Loddon lily. This may require the use of temporary fencing to demarcate an area within which no storage of materials or access by contractors can occur.
 - Avoiding the removal of mature/semi-mature trees wherever possible (in particular the mature horse chestnuts along the northern edge of the LWS) with replacement planting of native tree specimens to compensate any losses as far as is practicable.
- 5.1.7 In terms of compensation or enhancement of the LWS post-development, the following options could be considered:
- Management of the LWS woodland post-development to increase its biodiversity value. This could include selective removal of the shrub layer (particularly non-native species such as butterfly-bush) to increase light levels and promote the growth of a more diverse ground flora.
 - Additional planting of native tree species to add diversity to the woodland and provide additional screening of the proposed development from the existing towpath.

5.2 Other Habitats

- 5.2.1 The proposed development will affect other areas of habitat on site. The majority of these represent widespread and commonly occurring habitats of limited intrinsic ecological value. However, they do provide supporting habitat for other species (e.g. nesting birds and/or reptiles) which should be taken into account during works. In addition, some habitats, particularly the open grassland in the central/eastern part of the site (around samples 1 to 4) although not of high intrinsic ecological value, provide open greenspace that is likely to have landscape or amenity value. Current plans indicate that much of this area would be lost as part of the development.
- 5.2.2 Although small areas of grassland with affinity to acid grassland (a Section 41 habitat) were identified in the western part of the East MRT Site, these are very small in area and do not represent good quality examples of this habitat type. Despite this, measures to limit, mitigate or compensate for loss of these areas (and other habitats) should be taken. This could include:
- Recreation of new areas of species-rich grassland outside the works area. This could include new areas of acid grassland, if ground/soil conditions allow in the west of the East MRT Site, and/or the diversification of the remaining grassland area in the central/eastern part of the East MRT Site. Establishment of species-rich grassland would help to compensate for the reduction in grassland area by increasing overall species diversity

and the ecological value of remaining grassland. This could also create an aesthetically desirable area in this part of the East MRT Site.

- Limiting the loss of tree cover (particularly native trees) along the proposed development route as far as is practicable, with compensating planting (of native and preferably locally sourced stock) for any removed.
- Management of remaining scrub habitats to remove non-native species (such as butterfly-bush) and replace (or promote regeneration of) native species such as hawthorn. This could be used to provide screening in some areas (if required) and would provide additional habitat for species such as nesting birds and other fauna.

5.3 Invasive Non-native Plants

- 5.3.1 It is recommended that steps are taken to eradicate (or at least limit the spread of) both Virginia creeper and Himalayan balsam from the East MRT Site and the immediate surroundings. Removal of Himalayan balsam from the river bank adjacent to the LWS will open up this habitat allowing native wetland vegetation to recolonise, potentially encouraging the spread of Loddon lily. Removal of Virginia creeper from the woodland will prevent it from spreading further as well as potentially encouraging growth of native ground flora (particularly in combination with woodland management; see above).
- 5.3.2 Advice from specialist contractors is likely to be required to enable an effective strategy for the eradication of invasive plants to be implemented.

6 Conclusion

- 6.1.1 The botanical survey undertaken in 2016 confirmed that the portion of The Coal, Kennetmouth and King's Meadow East LWS on or immediately adjacent to the East MRT Site is still in similar condition to that described in the LWS citation, with identified features still present. Although the proposed development will affect part of the LWS area, current plans suggest that many of the key features (Loddon lily and rows of mature horse chestnut and crack willow trees) will be unaffected. Some removal of trees will be required along with areas of scrub and secondary woodland habitat.
- 6.1.2 Although much of this habitat (aside from mature trees) is of limited ecological value in its own right (particularly areas of non-native shrubs), steps could be taken to minimise habitat loss or to compensate for required losses via new tree planting/habitat management elsewhere within retained areas.
- 6.1.3 In relation to other vegetation in the wider (i.e. non-LWS) East MRT Site, the majority of habitats are common, widespread and readily established. Small areas of habitat of increased value (in the context of the East MRT Site) such as grassland with characteristics of acid communities and ephemeral/short-perennial habitat containing species not found elsewhere on site were located, particularly to the western extent. Although loss of habitat should be minimised where possible, some of these areas will inevitably be removed as the project goes ahead. However, options are available to maximise the ecological value of retained areas through habitat diversification and/or appropriate management.

7 References

Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC) and Thames Valley Environmental Records Centre (TVERC) (2009). Criteria for the Selection of Local Wildlife Sites in Berkshire, Buckinghamshire and Oxfordshire. Available at <http://www.tverc.org/cms/sites/tverc/files/LWS%20criteria%20Nov%2009.pdf> (accessed 23/09/16).

Cheffings, C.M. & Farrell, L. (Eds), Dines, T.D., Jones, R.A., Leach, S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J., Taylor, I. (2005). The Vascular Plant Red Data List for Great Britain. Species Status 7: 1-116. Joint Nature Conservation Committee, Peterborough.

Figures

Figure 1: Site Location

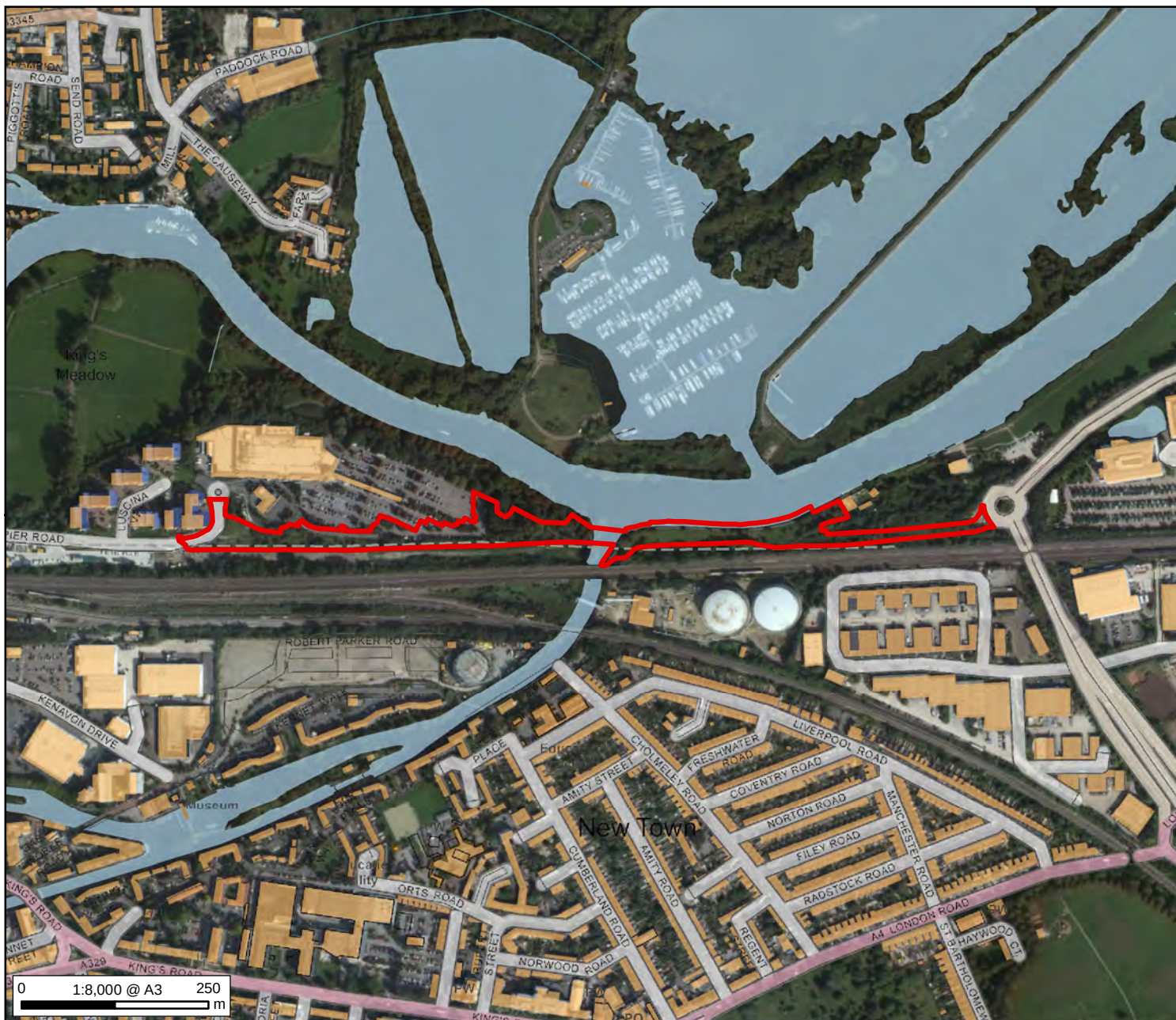
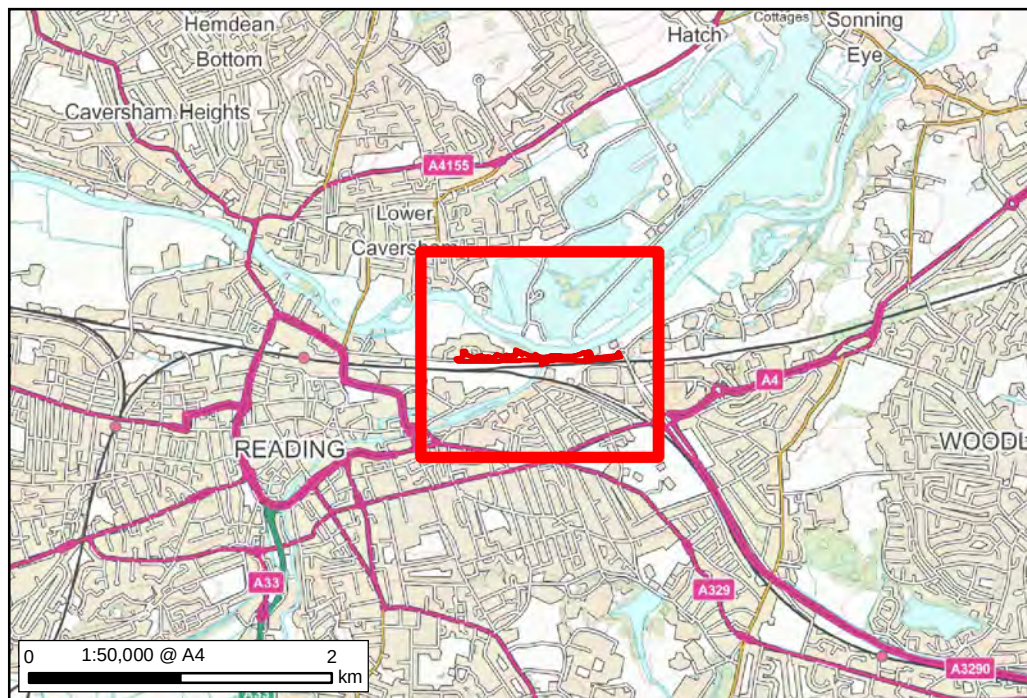
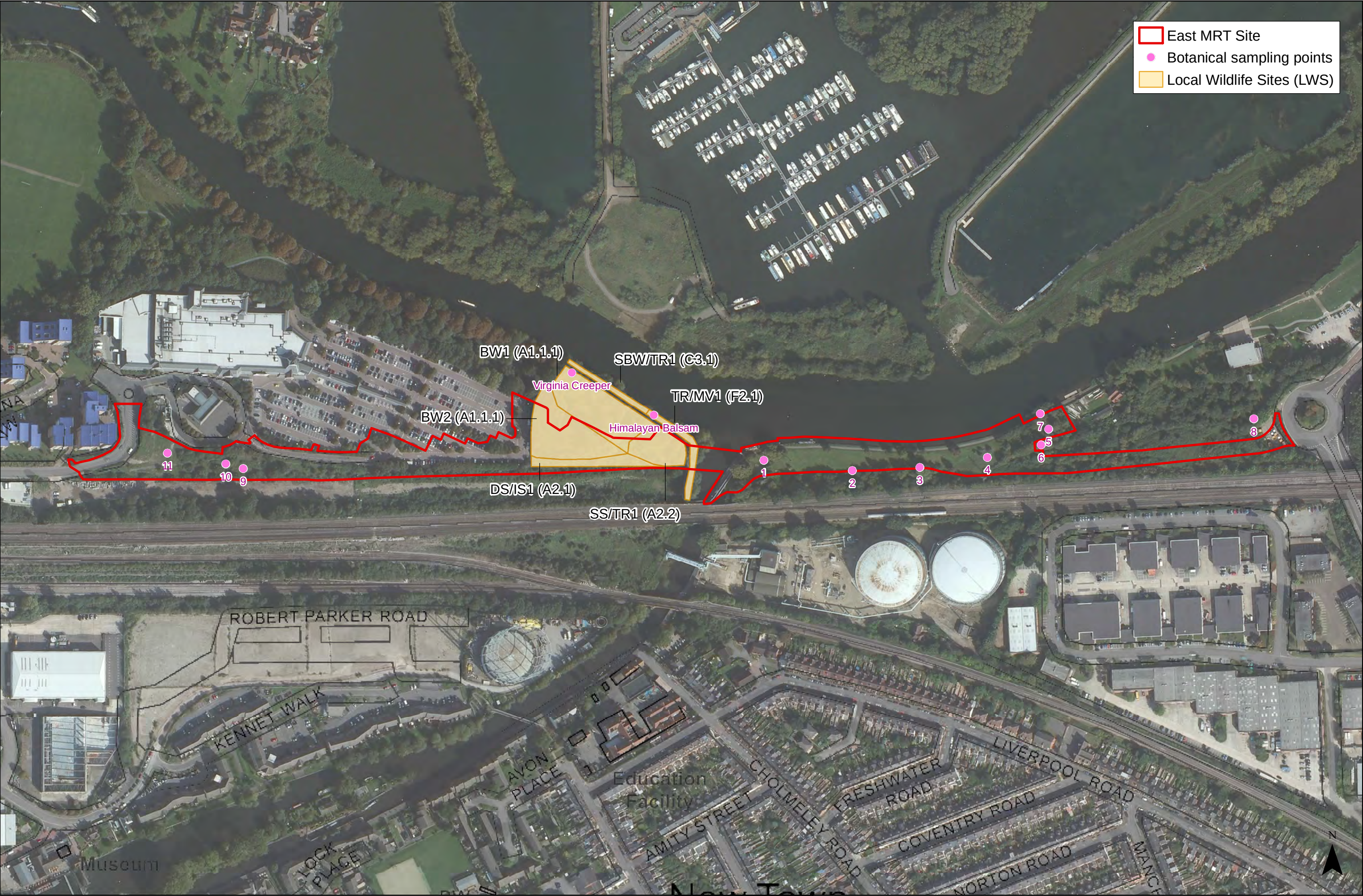


Figure 2: Botanical Survey Locations



- East MRT Site
- Botanical sampling points
- Local Wildlife Sites (LWS)

Appendix A Botanical Survey Results

The Coal, Kennetmouth and King's Meadow East LWS Area

Table 1: Broadleaved Woodland (BW1)

Common Name	Species Name	Relative Abundance (DAFOR)
Ash	<i>Fraxinus excelsior</i>	O
Buckthorn	<i>Rhamnus cathartica</i>	R
Butterfly-bush	<i>Buddleja davidii</i>	F
Cleavers	<i>Galium aparine</i>	O
Common nettle	<i>Urtica dioica</i>	A
Common ragwort	<i>Senecio jacobaea</i>	O
Creeping buttercup	<i>Ranunculus repens</i>	R
Elder	<i>Sambucus nigra</i>	A
Garlic mustard	<i>Alliaria petiolata</i>	F
Greater burdock	<i>Arctium lappa</i>	R
Green alkanet	<i>Pentaglottis sempervirens</i>	O
Ground ivy	<i>Glechoma hederacea</i>	O
Hawthorn	<i>Crataegus monogyna</i>	A
Hop	<i>Humulus lupulus</i>	R
Hornbeam	<i>Carpinus betulus</i>	R
Horse chestnut	<i>Aesculus hippocastanum</i>	O
Silver birch	<i>Betula pendula</i>	O
Sycamore	<i>Acer pseudoplatanus</i>	F
Virginia-creeper	<i>Parthenocissus quinquefolia</i>	O
Wood avens	<i>Geum urbanum</i>	R

Table 2: Broadleaved Woodland (BW2)

Common Name	Species Name	Relative Abundance (DAFOR)
Dark mullein	<i>Verbascum nigrum</i>	O
Bracken	<i>Pteridium aquilinum</i>	O
Bramble	<i>Rubus fruticosus</i>	O
Butterfly-bush	<i>Buddleja davidii</i>	O
Cleavers	<i>Galium aparine</i>	O
Common figwort	<i>Scrophularia nodosa</i>	R
Common lime	<i>Tilia cordata x platyphyllos</i>	O
Common nettle	<i>Urtica dioica</i>	A
Common ragwort	<i>Senecio jacobaea</i>	R
Crack willow	<i>Salix fragilis</i>	R
Creeping bent	<i>Agrostis stolonifera</i>	O
Creeping thistle	<i>Cirsium arvense</i>	R
Elder	<i>Sambucus nigra</i>	F
Garlic mustard	<i>Alliaria petiolata</i>	F

Common Name	Species Name	Relative Abundance (DAFOR)
Greater burdock	<i>Arctium lappa</i>	R
Green alkanet	<i>Pentaglottis sempervirens</i>	O
Ground ivy	<i>Glechoma hederacea</i>	F
Hornbeam	<i>Carpinus betulus</i>	R
Hybrid black poplar	<i>Populus deltoides x nigra</i>	F
Norway maple	<i>Acer platanoides</i>	F
Perforate St John's-wort	<i>Hypericum perforatum</i>	R
Silver birch	<i>Betula pendula</i>	A
Spear thistle	<i>Cirsium vulgare</i>	R
Sycamore	<i>Acer pseudoplatanus</i>	F
Teasel	<i>Dipsacus fullonum</i>	R
Wood forget-me-not	<i>Myosotis sylvatica</i>	R

Table 3: Dense scrub/introduced shrub mosaic (DS/IS1)

Common Name	Species Name	Relative Abundance (DAFOR)
Barren brome	<i>Anisantha sterilis</i>	R
Bramble	<i>Rubus fruticosus</i>	F
Butterfly bush	<i>Buddleja davidii</i>	D
Cleavers	<i>Galium aparine</i>	O
Comfrey	<i>Symphytum officinale</i>	R
Common figwort	<i>Scrophularia nodosa</i>	R
Common nettle	<i>Urtica dioica</i>	F
Common ragwort	<i>Senecio jacobaea</i>	O
Creeping bent	<i>Agrostis stolonifera</i>	O
Creeping cinquefoil	<i>Potentilla reptans</i>	F
Cut-leaved cranesbill	<i>Geranium dissectum</i>	R
Dark mullein	<i>Verbascum nigrum</i>	O
Dog rose	<i>Rosa canina</i>	R
Elder	<i>Sambucus nigra</i>	O
Garlic mustard	<i>Alliaria petiolata</i>	O
Great mullein	<i>Verbascum thapsus</i>	O
Greater burdock	<i>Arctium lappa</i>	R
Green alkanet	<i>Pentaglottis sempervirens</i>	O
Ground ivy	<i>Glechoma hederacea</i>	F
Hedge mustard	<i>Sisymbrium officinale</i>	R
Hemp-agrimony	<i>Eupatorium cannabinum</i>	R
Hogweed	<i>Heracleum sphondylium</i>	R
Hop	<i>Humulus lupulus</i>	R
Perforate St John's-wort	<i>Hypericum perforatum</i>	R
Rosebay willowherb	<i>Chamerion angustifolium</i>	R

Common Name	Species Name	Relative Abundance (DAFOR)
Rough sow-thistle	<i>Sonchus asper</i>	R
Scarlet pimpernel	<i>Anagallis arvensis</i>	O
Selfheal	<i>Prunella vulgaris</i>	R
Silver birch	<i>Betula pendula</i>	O
Sycamore	<i>Acer pseudoplatanus</i>	F
Teasel	<i>Dipsacus fullonum</i>	O
Thyme-leaved speedwell	<i>Veronica serpyllifolia</i>	O
Weld	<i>Reseda luteola</i>	R
White dead nettle	<i>Lamium album</i>	R
Wild mignonette	<i>Reseda lutea</i>	R
Wood forget-me-not	<i>Myosotis sylvatica</i>	O
Yorkshire fog	<i>Holcus lanatus</i>	R

Table 4: Scattered Scrub/Tall Ruderal Mosaic (SS/TR1)

Common Name	Species Name	Relative Abundance (DAFOR)
Ash	<i>Fraxinus excelsior</i>	O
Bramble	<i>Rubus fruticosus</i>	O
Butterfly-bush	<i>Buddleja davidii</i>	F
Common nettle	<i>Urtica dioica</i>	F
Common stork's-bill	<i>Erodium cicutarium</i> agg.	R
Creeping bent	<i>Agrostis stolonifera</i>	O
Creeping cinquefoil	<i>Potentilla reptans</i>	A
Cut-leaved cranesbill	<i>Geranium dissectum</i>	R
Dogwood	<i>Cornus sanguinea</i>	O
Great mullein	<i>Verbascum thapsus</i>	R
Hawthorn	<i>Crataegus monogyna</i>	O
Red fescue	<i>Festuca rubra</i>	R
Scarlet pimpernel	<i>Anagallis arvensis</i>	R
Selfheal	<i>Prunella vulgaris</i>	O
Sycamore	<i>Acer pseudoplatanus</i>	F
Thyme-leaved speedwell	<i>Veronica serpyllifolia</i>	O
Wild mignonette	<i>Reseda lutea</i>	O
Wood forget-me-not	<i>Myosotis sylvatica</i>	O

Table 5: Scattered Broadleaved Trees/Tall Ruderal Mosaic (SBW/TR1)

Common Name	Species Name	Relative Abundance (DAFOR)
Alder	<i>Alnus glutinosa</i>	F
Angelica	<i>Angelica sylvestris</i>	R
Ash	<i>Fraxinus excelsior</i>	O
Bittersweet	<i>Solanum dulcamara</i>	R
Clustered dock	<i>Rumex conglomeratus</i>	O
Common nettle	<i>Urtica dioica</i>	O
Crack willow	<i>Salix fragilis</i>	O

Common Name	Species Name	Relative Abundance (DAFOR)
Creeping bent	<i>Agrostis stolonifera</i>	O
Creeping thistle	<i>Cirsium arvense</i>	R
Garlic mustard	<i>Alliaria petiolata</i>	O
Goat willow	<i>Salix caprea</i>	O
Greater burdock	<i>Arctium lappa</i>	R
Grey willow	<i>Salix cinerea</i>	O
Hemlock water dropwort	<i>Oenanthe crocata</i>	R
Nipplewort	<i>Lapsana communis</i>	R
Silver birch	<i>Betula pendula</i>	O
Spear thistle	<i>Cirsium vulgare</i>	R
Sycamore	<i>Acer pseudoplatanus</i>	O
Water figwort	<i>Scrophularia auriculata</i>	R
Yellow-flag iris	<i>Iris pseudacorus</i>	O

Table 6: Tall Ruderal/Marginal Vegetation (TR/MV1)

Common Name	Species Name	Relative Abundance (DAFOR)
Annual meadow-grass	<i>Poa annua</i>	O
Brooklime	<i>Veronica beccabunga</i>	R
Cleavers	<i>Galium aparine</i>	F
Clustered dock	<i>Rumex conglomeratus</i>	F
Comfrey	<i>Symphytum officinale</i>	R
Common nettle	<i>Urtica dioica</i>	F
Common ragwort	<i>Senecio jacobaea</i>	R
Crack willow	<i>Salix fragilis</i>	O
Creeping bent	<i>Agrostis stolonifera</i>	O
Creeping thistle	<i>Cirsium arvense</i>	F
Curled dock	<i>Rumex crispus</i>	R
Greater burdock	<i>Arctium lappa</i>	O
Greater reed-mace	<i>Typha latifolia</i>	R
Hedge bindweed	<i>Calystegia sepium</i>	O
Hemlock water dropwort	<i>Oenanthe crocata</i>	O
Himalayan balsam	<i>Impatiens glandulifera</i>	F
Meadowsweet	<i>Filipendula ulmaria</i>	O
Mugwort	<i>Artemisia vulgaris</i>	R
Procumbent pearlwort	<i>Sagina procumbens</i>	R
Reed sweet-grass	<i>Glyceria maxima</i>	R
Silverweed	<i>Potentilla anserina</i>	O
Spear thistle	<i>Cirsium vulgare</i>	R
Toad rush	<i>Juncus bufonius</i>	O
Water figwort	<i>Scrophularia auriculata</i>	O
Water mint	<i>Mentha aquatica</i>	R
Water pepper	<i>Persicaria hydropiper</i>	R
Yellow-flag iris	<i>Iris pseudacorus</i>	F
Yorkshire fog	<i>Holcus lanatus</i>	R

Vegetation Sampling (Rest of Site)

Table 7: Sample 1 (S1) - Grassland

Common Name	Species Name	Relative Abundance (DAFOR)
Cock's-foot	<i>Dactylis glomerata</i>	O
Common bent	<i>Agrostis capillaris</i>	O
Perennial rye-grass	<i>Lolium perenne</i>	F
Ribwort plantain	<i>Plantago lanceolata</i>	O
Rough meadow-grass	<i>Poa trivialis</i>	F
White clover	<i>Trifolium repens</i>	F
Yarrow	<i>Achillea millefolium</i>	F

Table 8: Sample 2 (S2) - Grassland/tall ruderal

Common Name	Species Name	Relative Abundance (DAFOR)
Broad-leaved dock	<i>Rumex obtusifolius</i>	O
Clustered dock	<i>Rumex conglomeratus</i>	O
Comfrey	<i>Symphytum officinale</i>	F
Common nettle	<i>Urtica dioica</i>	A
Creeping bent	<i>Agrostis stolonifera</i>	O
Creeping buttercup	<i>Ranunculus repens</i>	O
Hogweed	<i>Heracleum sphondylium</i>	O
Perennial rye-grass	<i>Lolium perenne</i>	F
Rough meadow-grass	<i>Poa trivialis</i>	O
Teasel	<i>Dipsacus fullonum</i>	R

Table 9: Sample 3 (S3) - Grassland

Common Name	Species Name	Relative Abundance (DAFOR)
Cock's-foot	<i>Dactylis glomerata</i>	F
Common nettle	<i>Urtica dioica</i>	R
Creeping buttercup	<i>Ranunculus repens</i>	F
Creeping thistle	<i>Cirsium arvense</i>	R
Dandelion	<i>Taraxacum officinale</i>	O
Greater plantain	<i>Plantago major</i>	R
Perennial rye-grass	<i>Lolium perenne</i>	D
Ribwort plantain	<i>Plantago lanceolata</i>	O
Rough meadow-grass	<i>Poa trivialis</i>	F

Table 10: Sample 4 (S4) - Grassland

Common Name	Species Name	Relative Abundance (DAFOR)
Bramble	<i>Rubus fruticosus</i>	R
Cock's-foot	<i>Dactylis glomerata</i>	F

Common Name	Species Name	Relative Abundance (DAFOR)
Common nettle	<i>Urtica dioica</i>	R
Creeping thistle	<i>Cirsium arvense</i>	R
Ground ivy	<i>Glechoma hederacea</i>	F
Hogweed	<i>Heracleum sphondylium</i>	R
Perennial rye-grass	<i>Lolium perenne</i>	A
Perforate St John's-wort	<i>Hypericum perforatum</i>	F
Rough meadow-grass	<i>Poa trivialis</i>	O
White clover	<i>Trifolium repens</i>	F

Table 11: Sample 5 (S5) - Open tall ruderal area (between scrub)

Common Name	Species Name	Relative Abundance (DAFOR)
Bristly oxtongue	<i>Helminthotheca echinoides</i>	R
Cleavers	<i>Galium aparine</i>	R
Common nettle	<i>Urtica dioica</i>	D
Great willowherb	<i>Epilobium hirsutum</i>	R
Rough sow-thistle	<i>Sonchus asper</i>	R
Spear thistle	<i>Cirsium vulgare</i>	F
White bryony	<i>Bryonia dioica</i>	R
White dead-nettle	<i>Lamium album</i>	O
Wood forget-me-not	<i>Myosotis sylvatica</i>	O

Table 12: Sample 6 (S6) - Scrub and tall ruderal

Common Name	Species Name	Relative Abundance (DAFOR)
Bramble	<i>Rubus fruticosus</i>	A
Broad-leaved willowherb	<i>Epilobium montanum</i>	O
Butterfly-bush	<i>Buddleja davidii</i>	F
Cleavers	<i>Galium aparine</i>	O
Common nettle	<i>Urtica dioica</i>	F
Dogwood	<i>Cornus sanguinea</i>	F
Great willowherb	<i>Epilobium hirsutum</i>	F
Hawthorn	<i>Crataegus monogyna</i>	O
Hogweed	<i>Heracleum sphondylium</i>	O
Lombardy poplar (seedling)	<i>Populus nigra (fastigiata cultivar)</i>	O
Mugwort	<i>Artemisia vulgaris</i>	R
Perforate St John's-wort	<i>Hypericum perforatum</i>	F
Rough sow-thistle	<i>Sonchus asper</i>	R
Walnut (seedling)	<i>Juglans regia</i>	R
Weld	<i>Reseda luteola</i>	O

Common Name	Species Name	Relative Abundance (DAFOR)
Wood forget-me-not	<i>Myosotis sylvatica</i>	R

Table 13: Sample 7 (S7) - Scrub

Common Name	Species Name	Relative Abundance (DAFOR)
Blackthorn	<i>Prunus spinosa</i>	F
Common nettle	<i>Urtica dioica</i>	F
Dogwood	<i>Cornus sanguinea</i>	O
Elder	<i>Sambucus nigra</i>	O
English elm	<i>Ulmus glabra</i>	F
Hawthorn	<i>Crataegus monogyna</i>	A
Ivy	<i>Hedera helix</i>	F
Lilac	<i>Syringa vulgaris</i>	R

Table 14: Sample 8 (S8) - Scrub

Common Name	Species Name	Relative Abundance (DAFOR)
Bramble	<i>Rubus fruticosus</i>	F
Butterfly-bush	<i>Buddleja davidii</i>	D
Common nettle	<i>Urtica dioica</i>	O
Dog rose	<i>Rosa canina</i>	O
Dogwood	<i>Cornus sanguinea</i>	O
Field maple	<i>Acer campestre</i>	O
Silver birch	<i>Betula pendula</i>	O

Table 15: Sample 9 (S9) - Short grassland (rabbit grazed)

Common Name	Species Name	Relative Abundance (DAFOR)
Biting stonecrop	<i>Sedum acre</i>	O
Bramble	<i>Rubus fruticosus</i>	O
Common mouse-ear	<i>Cerastium fontanum</i>	R
Common ragwort	<i>Senecio jacobaea</i>	O
Common stork's-bill	<i>Erodium cicutarium</i> agg.	O
Creeping cinquefoil	<i>Potentilla reptans</i>	F
Dove's-foot cranesbill	<i>Geranium molle</i>	O
Early forget-me-not	<i>Myosotis ramosissima</i>	O
Evening primrose	<i>Oenothera sp.</i>	R
Eyebright	<i>Euphrasia officinalis</i> agg.	R
Germander speedwell	<i>Veronica chamaedrys</i>	R
Hemlock	<i>Conium maculatum</i>	R
Perennial rye-grass	<i>Lolium perenne</i>	O

Common Name	Species Name	Relative Abundance (DAFOR)
Perforate St John's-wort	<i>Hypericum perforatum</i>	O
Selfheal	<i>Prunella vulgaris</i>	O
Sheep's fescue	<i>Festuca ovina</i>	A
Sheep's sorrel	<i>Rumex acetosella</i>	F
Smooth meadow-grass	<i>Poa pratensis</i>	O

Table 16: Sample 10 (S10) - Scrub

Common Name	Species Name	Relative Abundance (DAFOR)
Bramble	<i>Rubus fruticosus</i>	F
Butterfly-bush	<i>Buddleja davidii</i>	D
Common nettle	<i>Urtica dioica</i>	F
Common ragwort	<i>Senecio jacobaea</i>	R
Creeping cinquefoil	<i>Potentilla reptans</i>	R
Wild strawberry	<i>Fragaria vesca</i>	O
Wood forget-me-not	<i>Myosotis sylvatica</i>	R

Table 17: Sample 11 (S11) - Ephemeral/short-perennial

Common Name	Species Name	Relative Abundance (DAFOR)
Bird's-foot trefoil	<i>Lotus corniculatus</i>	A
Biting stonecrop	<i>Sedum acre</i>	F
Bramble	<i>Rubus fruticosus</i>	R
Broad-leaved willowherb	<i>Epilobium montanum</i>	R
Common ragwort	<i>Senecio jacobaea</i>	R
Common stork's-bill	<i>Erodium cicutarium</i> agg.	O
Creeping bent	<i>Agrostis stolonifera</i>	O
Dark mullein	<i>Verbascum nigrum</i>	O
Dove's-foot cranesbill	<i>Geranium molle</i>	R
Early forget-me-not	<i>Myosotis ramosissima</i>	O
English stonecrop	<i>Sedum anglicum</i>	F
Eyebright	<i>Euphrasia officinalis</i> agg.	R
Great mullein	<i>Verbascum thapsus</i>	R
Hedge mustard	<i>Sisymbrium officinale</i>	O
Hoary mustard	<i>Hirschfeldia incana</i>	R
Perforate St John's-wort	<i>Hypericum perforatum</i>	F
Red fescue	<i>Festuca rubra</i>	F
Selfheal	<i>Prunella vulgaris</i>	F
Teasel	<i>Dipsacus fullonum</i>	F
Wild strawberry	<i>Fragaria vesca</i>	F
Wood forget-me-not	<i>Myosotis sylvatica</i>	R

Appendix B Photographs

Photograph 1: Character of LWS woodland (BW1) showing mature horse chestnut and limited ground flora



Photograph 2: Virginia creeper on ground and on trees in BW1



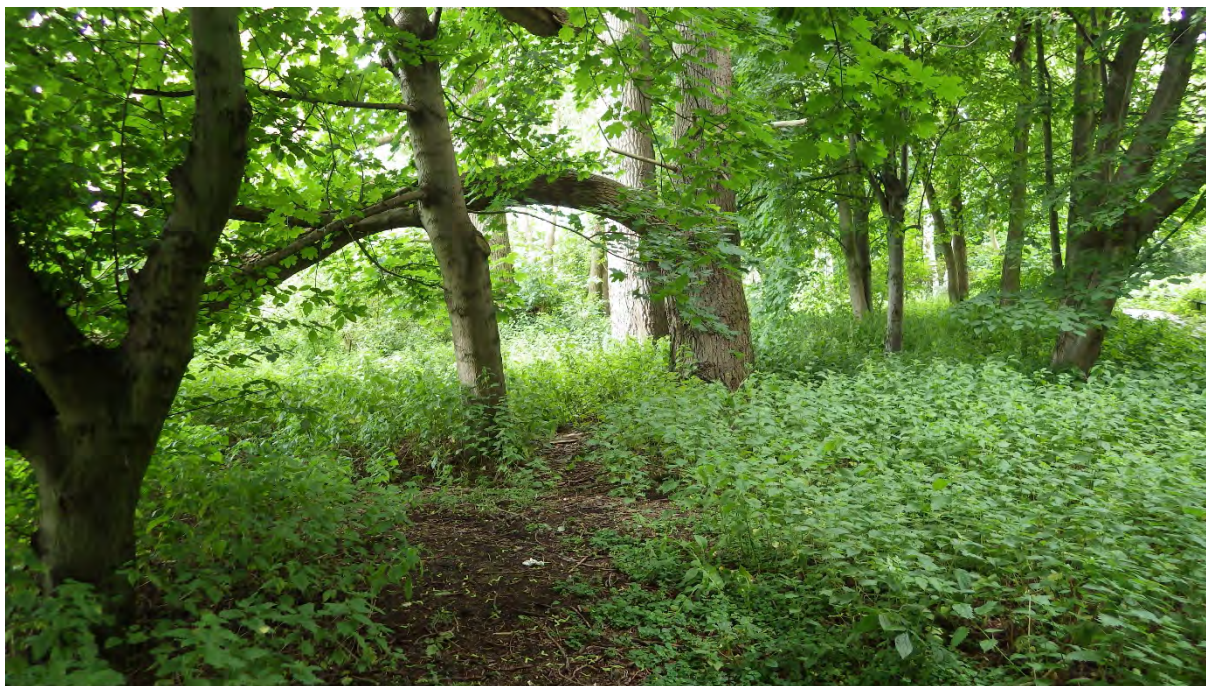
Photograph 3: Interior of LWS (BW1) showing dense shrub layer



Photograph 4: Southern part of LWS (BW2) showing open, secondary birch woodland



Photograph 5: Character of LWS woodland to south (BW2) showing mature poplars in centre



Photograph 6: Scrub along boundary with railway land (DS/IS1)



Photograph 7: Open area in eastern part of LWS (SS/TR1) showing lack of mature tree cover



Photograph 8: Riparian vegetation along River Thames north of LWS showing Himalayan balsam



Photograph 9: Riparian vegetation of west bank of River Kennet showing willows to side and close to existing footbridge



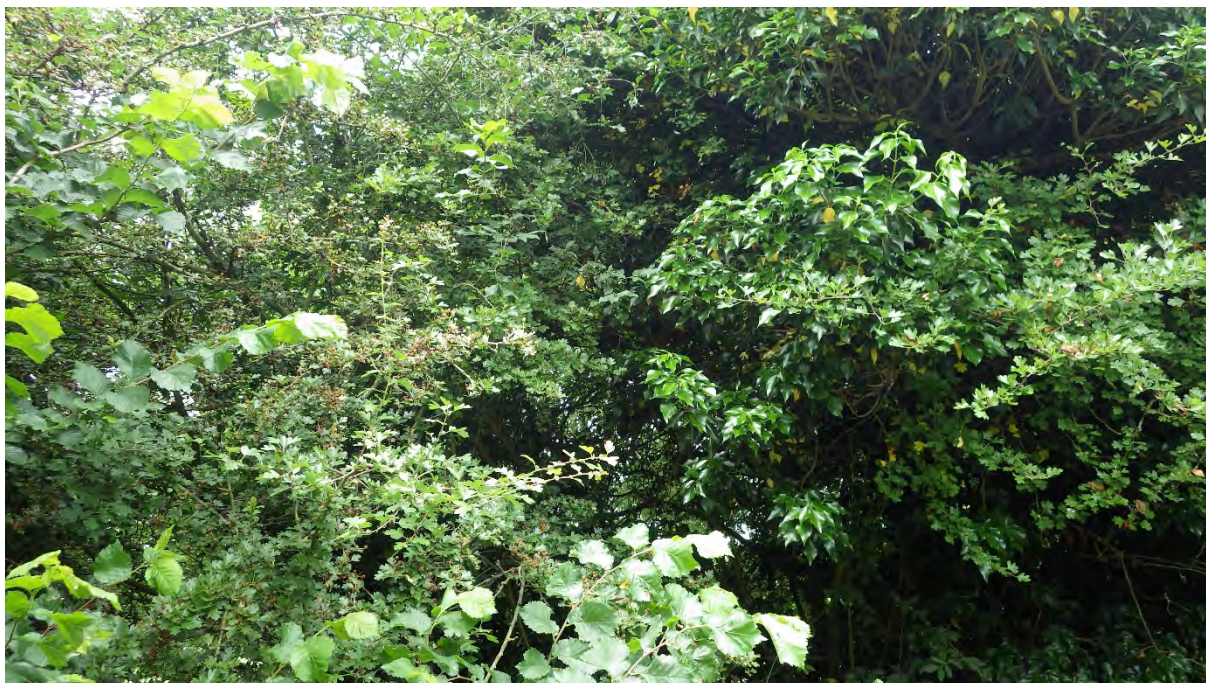
Photograph 10: Recently cut grassland toward central/eastern part of the East MRT Site (around sample 1 and 2)



Photograph 11: Tall ruderal vegetation within scrub at eastern end of the East MRT Site (sample 5)



Photograph 12: Scrub toward eastern end of the East MRT Site (sample 7)



Photograph 13: Short grassland with characteristics of an acid community toward western end of the East MRT Site (sample 9)



Photograph 14: Ephemeral/short-perennial vegetation in western part of the East MRT Site (sample 11)

