



Roxhill (Junction 15) Limited

Northampton Gateway, Northampton

DESIGNATED SITES & HABITAT REPORT

May 2018

FPCR Environment and Design Ltd

Registered Office: Lockington Hall, Lockington, Derby DE74 2RH

Company No. 07128076. [T] 01509 672772 [F] 01509 674565 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

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1.0 INTRODUCTION

- 1.1 This report has been prepared by FPCR Environment and Design Ltd. on behalf of Roxhill (Junction 15) Limited and provides details of a desk study and habitat surveys at land that is located to the west of Junction 15, Northamptonshire.
- 1.2 The report has been produced to accompany an Environmental Statement of the development proposals and should be read in conjunction with that document.

Development Proposals

- 1.3 The Proposed Development comprises a Strategic Rail Freight Interchange (SRFI) (referred to herein as the 'Main Site') and associated Highway Mitigation Works (referred to collectively herein as the 'Highway Mitigation Works').
- 1.4 Full details of the Proposed Development are provided separately in Chapter 2: Application Site and Proposed Development. In brief, the Proposed Development consists of the following:
- An intermodal freight terminal including container storage and HGV parking, rail sidings to serve individual warehouses, and the provision of an aggregates facility as part of the intermodal freight terminal, with the capability to also provide a 'rapid rail freight' facility;
 - Up to 468,000 sq m (approximately 5 million sq ft) (gross internal area) of warehousing and ancillary buildings, with additional floorspace provided in the form of mezzanines;
 - A secure, dedicated, HGV parking area of approximately 120 spaces including driver welfare facilities to meet the needs of HGVs visiting the site or intermodal terminal;
 - New road infrastructure and works to the existing road network, including the provision of a new access and associated works to the A508, a new bypass to the village of Roade, improvements to Junction 15 and to J15A of the M1 motorway, the A45, other highway improvements at junctions on the local highway network and related traffic management measures;
 - Strategic landscaping and tree planting, including diverted public rights of way;
 - Earthworks and demolition of existing structures on the SRFI site. .
- 1.5 This report includes and assessment of habitats and proposals for suitable mitigation.

Site Location and Context

- 1.6 The 'Main Site' area is bound to the north by Collingtree Road, to the east by the M1, to the south by the A508 / Northampton Road and to the west by arable fields. The site itself comprises arable fields bisected by hedgerows of varying ages and structures, with areas of woodland, tree belts, grassland, ponds, wet ditches and several abandoned buildings (central grid reference SP 748 547).
- 1.7 The Bypass Corridor encompasses the majority of the Highway Mitigation Works. This area is bound to the north by arable fields and woodland, to the east by Roade and to the south and west by a mix of arable and grazed field compartments. The site itself comprises areas of grassland, a mix of arable and grazed fields bound by hedgerows and standard trees, with

scrub, grassland, running water, dry ditches. The surrounding landscape consists of arable farmland with woodland blocks, pasture and scattered urban areas.

- 1.8 Additional sections encompassed by the 'Highway Mitigation Works' are located to the north, west and south of the main site and Roade Bypass as detailed in Chapter 2 of the ES.

2.0 METHODOLOGY

Desk Study

- 2.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations in September 2017 for the purposes of this appraisal, including:
- Multi Agency Geographic Information for the Countryside (MAGIC) website¹;
 - Northamptonshire Biodiversity Records Centre (NBRC);
- 2.2 Further inspection, using colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk) was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:

- 5km around the subject site for sites of International Importance, e.g. Special Area of Conservation (SAC) & Ramsar sites
- 2km around the subject site for statutory sites of National/ Regional importance, e.g. Sites of Special Scientific Interest (SSSI)
- 1km around the subject site for non-statutory sites of County Importance, e.g. Local Wildlife Sites (LWSs) and potential LWSs (pLWSs)

Field Survey

Extended Phase 1 Survey

- 2.4 Habitats within the were surveyed on the following dates:
- Main Site – 1st August 2017 & 27th October 2016, which represent updates of survey of the whole Main Site that had previously been completed in June 2013 to July 2014
 - Bypass Corridor - Surveyed on 8th & 15th April 2016 (arable fields, road verges and byways only), on 14th & 15th November 2016 (detailed hedgerow survey) 1st September 2016 (fields 1 – 11 only; Figure 5.3c), 1st August 2017 (Roade Cutting SSSI / pLWS only)
- 2.5 The remaining minor Highway Mitigation Works were surveyed on 21st March 2018.

¹ <http://www.magic.defra.gov.uk/>

- 2.6 Habitats have been classified using the standard Phase 1 Habitat Survey methodology (JNCC, 2010). This involved a systematic walk over of the site to classify the habitat types present and marking them on a base map. Target notes were used to record features or habitats of particular interest, as well as any sightings or evidence of protected or notable species. Whilst the plant species lists obtained should not be regarded as exhaustive, sufficient information was obtained to determine broad habitat types.

Hedgerows

- 2.7 All accessible hedgerows were also surveyed using the Hedgerow Evaluation and Grading System (HEGS) (Clements and Toft 1993). The aim of the assessment is to allow the rapid recording and ecological appraisal of any given site in the UK, and to allow the grading of the individual hedges present, in order to identify those which are likely to be of greatest significance for wildlife. This method of assessment includes noting down: canopy species composition, associated ground flora and climbers; structure of the hedgerow including height, width and gaps and associated features including number and species of mature tree and the presence of banks, ditches and grass verges.
- 2.8 Using the HEGS methodology each hedgerow can then be given a grade. These grades are used to assign a nature conservation value to each hedgerow as follows:

Grade -1, 1, 1+ High to Very High Value

Grade -2, 2, 2+ Moderately High to High Value

Grade -3, 3, 3+ Moderate Value

Grade -4, 4, 4+ Low Value

- 2.9 Hedgerows graded -2 or above are suggested as being a nature conservation priority.

The hedgerows were also assessed for their potential ecological value under the Hedgerow Regulations 1997 (Statutory Instrument No: 1160). Hedgerow diversity is evaluated by determining both the average number of woody native species present per 100m and the number of hedgerow associated features. These results are compared against the nature conservation criteria of the Hedgerow Regulations to ascertain whether a hedgerow is classed as 'Important' under these regulations.

- 2.11 All hedgerows were also assessed as to whether they qualified as Habitats of Principle importance under Section 41 of the Natural Environment and Rural Communities Act 2006 habitat (i.e. they consisted of 80% or more native species), Northamptonshire Biodiversity Action Plan (BAP) priority [Five or more woody species per 30m section, fewer woody species but a rich basal flora or predate the Enclosure Acts (1720, 1870)²] or Northamptonshire Local Wildlife Site habitat.

Survey Limitations

Main Site

- 2.12 At the time of survey the hedgerows H49 – H52 were not accessible. Where possible descriptions of this hedge were made from viewing with binoculars and other available data.

² http://www.northamptonshirebiodiversity.org/default.asp_PageID=44.html

M1 Road Improvements

- 2.13 Sections of grassland verge flanking the M1 road junction were not accessible to direct survey. Descriptions were made from viewing with binoculars, inference from data collected through survey of neighbouring verges of the A508 and any available desk study data. From this sufficient information was available to provide an adequate assessment of these habitats and to provide recommendations for mitigation.
- 2.14 The hedge H35 was not accessible to direct survey due to its location on the slip road to the M1. Descriptions of this hedge were made from viewing with binoculars. Furthermore, it is relevant that this native hedge is associated with the verge of the M1 and likely to be of recent origin. Therefore, it is considered that sufficient information is available to evaluate the ecological importance of H35 and to provide recommendations for mitigation.

Bypass Corridor

Hedgerows

- 2.15 On all survey occasions the hedgerow surveys, H121, H122, H139, H142 & H143 were inaccessible to direct survey. None of these hedgerows will be directly affected by the Proposed Development and therefore the lack of access is not considered to represent a significant constraint.
- 2.16 At the time of survey it was not possible to fully evaluate hedges H140, H141 and H144 against the criteria for HEGS or the Hedgerow Regulations 1997. H144 will not be affected by the Proposed Development and therefore the lack of access to this hedge is not considered to represent a significant constraint. An initial appraisal was made of hedges H140 & H141 in April 2016. Both are regularly managed and dominated by a small number of native species (Appendix C). Therefore, the available survey information is considered sufficient to evaluate the likely ecological importance of these hedges and to provide recommendations for mitigation.

Grassland Survey

- 2.17 Phase 1 habitats surveys of the grasslands within Fields 1 – 11 (Figure 5.3c) was made during early September. Although this falls within the optimum period for botanical surveys, this date would be considered to be at the 'back end' of the optimum survey period. However, this was not considered to of sufficient significance to prevent an accurate assessment of the pasture fields which are all located south of Blisworth Road.
- 2.18 The fields to the north of Blisworth Road (Fields 1, 2 and 3) are managed as traditional hay meadows and a hay crop had been taken prior to the survey and as such species will invariably have been missed during the Phase 1 survey visit. The recorded species composition in terms of number of species present is therefore likely to be lower than what is present. Species abundances for the grasses are also likely to be inaccurate, and as a consequence, some grass species were just recorded as being present.
- 2.19 Notwithstanding the above, a separate NVC survey of Fields 1, 2 and 3 has subsequently been completed during June 2017 (refer to Appendix 5.2). This survey was completed well-within the optimal period for grassland surveys and in advance of that years hay cut when it is reasonable to anticipate that the occurrence of vascular plants would be well represented.

Therefore, overall it is considered that sufficient information is available to evaluate the ecological importance of the grasslands, including the hay meadow of Fields 1, 2 and 3.

3.0 RESULTS

Desk Study

- 3.1 The locations of designated sites discussed in the following section are illustrated in Figure 5.1 of the accompanying ES chapter.

Designated Nature Conservation Sites

Statutory Sites of International Importance

- 3.2 The Upper Nene Valley Gravel Pits SPA / Ramsar was the closest statutorily designated site of International importance, being located approximately 5km north-east of the site. The Upper Nene Valley Gravel Pits SPA / Ramsar is a discontinuous series of water bodies stretching over 35km from Clifford Hill on the edge of Northampton to the north of Thrapston. The Upper Nene Valley Gravel Pits SPA / Ramsar is designated for the population of wintering and breeding birds that it supports (refer to separate ES chapter and accompanying winter bird survey report).
- 3.3 There were no other statutorily designated nature conservation sites of international importance within the search area.

Statutory Sites of National Importance

- 3.4 Roade Cutting SSSI was the a statutorily designated geological site of national importance located approximately 800m south of the site boundary (Appendix A). There were no other statutorily designated sites of national importance within 2km of the site boundary.

Non-statutory Sites

- 3.5 The non-statutorily designated LWSs and pLWSs located within the search area are described in Table 1. The citations for these sites are provided in Appendix A.

Table 1 Description of Non-statutory Sites of Nature Conservation Interest

Name	Location	Description*
Local Wildlife Sites (LWSs)		
Collingtree Golf Course LWS	620m north of Main Site & adjacent A45 improvement works	Important freshwater habitats associated with network of ponds and streams
Roade Quarry LWS	Adjacent to south east boundary of Bypass Corridor	An old, shallow limestone quarry supporting a wide range of vegetation in various stages of succession
Potential Local Wildlife Sites (pLWSs)		
Collingtree pLWS*	400m east of Main Site	Grassland & Hedgerows*
Junction 15 Grassland pLWS	On east site boundary Main Site	2.5ha of former neutral grassland and scrub now dominated by tall ruderal vegetation due to a lack of management
Collingtree pLWS	400m east	Grassland & hedgerows*
236 / Unnamed pLWS	Within southern half of Main Site	Deciduous woodland of Highgate*

Name	Location	Description*
Roade Cutting pLWS	Bisects central area of Bypass Corridor	Area corresponding to the Roade Cutting SSSI* and a number of notable bryophyte records
234 / Unnamed pLWS	455m south east of Main Site	Woodland of Great Ground, Sarah's Spinney & Waltham Wood*
237 / Unnamed pLWS	Adjacent north east boundary of Bypass Corridor	The wood pasture and parkland of the Courteenhall Estate*
239 / Unnamed pLWS	Adjacent to east boundary of J15A improvement works	Area of woodland, scrub and grassland associated with the Grand Union Canal
Roade Field pLWS	Adjacent the Bypass Corridor	Grassland

* Description determined from Ordnance Survey maps and publically accessible aerial photography

Other Designations

- 3.6 An area of the 'Middle Nene' section of the Nene Valley Nature Improvement Area (NIA) named 'Wootton Brook' overlaps the east boundary of the Main Site. NIAs are areas that receive targeted funding for the purposes of nature conservation, in particular the maintenance and enhancement of ecological networks.
- 3.7 There are no areas listed on the Ancient Woodland Inventory located within 1km of the Site.

Invasive Plant Species

- 3.8 Japanese Knotweed *Fallopia japonica*, has been recorded previously within Roade Cutting SSSI, at a location just to the south of the site and c. 800m north of the Bypass Corridor (SP 748 531).

Field Survey - Main Site, M1 Junction 15 & A45 Improvement Works

- 3.9 The Main Site is bound to the north by Collingtree Road, to the east by the M1, to the south by the A508 / Northampton Road and to the west by arable fields. The Main Site comprises arable fields bisected by hedgerows of varying ages and structures, with areas of woodland, tree belts, grassland, ponds, wet ditches and several abandoned buildings. The surrounding landscape consists of arable farmland with woodland blocks, pasture and scattered urban areas.
- 3.10 Survey over the period 2013 – 2017 has indicated that there have been no significant alterations to the habitats of the Main Site.
- 3.11 The location of the following numbered Target Notes and each of the habitats are illustrated in Figure 5.2. A botanical species list is provided in Appendix B.

Target Notes

- 3.12 Some target notes that describe features relevant to fauna are provided here for consistency, with further discussion provided the ES chapter and accompanying technical appendices.
- 1) Churchills; a wood comprising a small area of semi-natural woodland and larger area of mixed plantation;
 - 2) Slade Springs; plantation woodland;
 - 3) Piles of rubble and debris at the edge of a woodland that are colonised by ruderal vegetation and provide potential opportunities for amphibians to shelter and hibernate;
 - 4) An old tree stump with a central hollow where splashing and pellets of a type typically associated with kestrel *Falco tinnunculus* were identified;
 - 5) Semi-improved neutral grassland and scrub associated with the Junction 15 – Grassland pLWS (Table 1 & Appendix A). This area was inaccessible to direct survey. Observation from over the fence confirmed that the area consisted of a mix of grassland, ruderal and scrub plant communities;
 - 6) A dry ditch with stands of marginal vegetation that were indicative of periodic inundation;
 - 7) Highgate; corresponds to the deciduous woodland of Unnamed pLWS. The canopy and understory were dominated by ash *Fraxinus excelsior* and bramble *Rubus fruticosus* agg., respectively; and
 - 8) The Moors; coniferous plantation woodland with poor structure and sparse ground-flora.

Woodland, Trees & Scrub

- 3.13 Roughly half of the tree cover comprised woodland belts around arable field margins and smaller stands associated with the M1 road junction. The remaining comprised compartments of mature broad-leaved and mixed plantation woodland. Each of the woodland areas is described below.

Semi-natural Broad-leaved Woodland

- 3.14 This comprised a very small compartment within the larger mixed plantation woodland of Churchills (Target note 1). Here the woodland was dominated by mature ash, with a hawthorn *Crataegus monogyna*, elder *Sambucus nigra* and bramble understory. The groundflora in this area was also comparatively species-rich, with abundant wood false-brome *Brachypodium sylvaticum* and frequent herb bennet *Geum urbanum*.

Broad-leaved Plantation Woodland

- 3.15 A compartment of young broad-leaved plantation was located immediately north of the shooting lodge (building B1). The stand was mixed and included semi-mature examples of alder *Alnus glutinosa*, ash, hybrid black poplar *Populus x canadensis* and pedunculate oak. Mature examples of silver birch *Betula pendula* were also scattered within this area. Shrub species included hazel *Corylus avellana*, field maple *Acer campestre* and hawthorn *Crataegus monogyna*. In general, the woodland groundflora was continuous with the adjacent semi-improved grassland habitats.

- 3.16 Small blocks of mature plantation woodland, including Slade Springs (Target Note 2) were located to the north of the shooting lodge and Churchills, and were linked to the hedgerows H9, H10, H11 & H25. These blocks were dominated by mature examples of pendunculate oak and ash, with occasional pine *Pinus* sp. and larch *Larix decidua*. The understory included blackthorn *Prunus spinosa* and elder, and the groundflora was dominated by ruderal species, including common nettle *Urtica dioica*, cow parsley *Anthriscus sylvestris* and hogweed *Heracleum sphondylium*.
- 3.17 The 2.8ha woodland of Highgate (Target Note 7) was located in the south-west of the survey area. The canopy was dominated locally by mature examples of ash and sycamore *Acer pseudoplatanus*, with occasional larch, pendunculate oak and Scot's pine *Pinus sylvestica*. The understory was dominated by a layer of bramble, with occasional elder and hawthorn. The groundflora consisted of locally abundant common nettle, with cow parsley *Anthriscus sylvestris*, hogweed and herb robert *Geranium robertianum*. The woodland appeared to be subject to localised and very limited management. A central ride of approximately 5m in width ran through the woodland and was heavily over-shaded by the canopy.
- 3.18 The stands of young plantation associated with the field boundaries were generally poorly stratified with no clear distinction between the canopy and shrub layers. The species included ash, elder, hawthorn, hybrid black poplar, Norway maple *Acer platanoides* and pedunculate oak. Shrub species included elder. Ground flora was limited to common and widespread species tolerant of the low light levels that persisted. These species included common nettle and ground-ivy *Glechoma hederacea*, and where more light was available grasses such as cocksfoot *Dactylis glomerata* and false oat-grass *Arrhenatherum elatius* were noted.
- Mixed Plantation Woodland
- 3.19 The majority of the woodland of Churchills, which was located centrally within the survey, had a mixed canopy that included ash, pedunculate oak, Scot's pine, silver birch. The shrub layer was poorly developed with occasional elder and locally frequent goat willow *Salix caprea*. The ground layer in the central areas of woodland was dominated by leaf litter, and on the woodland edge grasses, such as smooth meadow-grass *Poa pratensis* and rough meadow-grass *P. trivialis*, were frequent.

Coniferous Plantation Woodland

- 3.20 This was a semi-mature woodland belt with greater than 90% conifer cover dominated by Scots pine. Light levels were consistently low beneath the canopy and no defined shrub layer was noted. Bare ground predominated and the ground flora was limited to occasional bramble *Rubus fruticosus* agg.

Trees

- 3.21 The majority of standard trees were associated with hedgerows along the field boundaries. The most frequently occurring trees were mature example of ash and pedunculate oak. Other trees recorded included young and semi-mature examples of field maple, horse chestnut *Aesculus hippocastanum*, hybrid black poplar, silver birch, Norway maple and white poplar *Populus alba*.

- 3.22 Those trees that were mature did not appear to support significant areas of dead bark, dead limbs or other noteworthy features indicating advanced maturity, and were therefore not considered to represent Veteran or near-Veteran trees (see separate Arboricultural Report).

Scattered Scrub

- 3.23 Due to the heavily managed nature of habitats only very limited scrub cover was recorded. The majority of this habitat occurred along the unmanaged embankments of the railway line and the verges of the M1, particularly at the junction with the A508, and here bramble dominated. Discrete areas were also noted along arable margins and scattered within semi-improved grassland, and the species recorded here included dog rose *Rosa canina*, bramble, hawthorn and self-set hazel.

Grassland

Semi-improved Grassland

- 3.24 Some small areas of semi-improved grassland were located centrally within the site. The grasslands immediately north of the shooting lodge (building B1), appeared to be a mix of unmanaged and more regularly mown areas. Yorkshire fog *Holcus lanatus* was abundant within both swards, with occasional tussocks of false oat-grass *Arrhenatherum elatius*, red fescue *Festuca rubra* agg and timothy *Phleum pratense*. Forbs included locally abundant white clover *Trifolium repens*, with occasional broad-leaved willowherb *Epilobium montanum*. Other species noted included black medick *Medicago lupulina*, common ragwort *Senecio jacobaeae*, creeping thistle *Cirsium arvense*, smooth tare *Vicia tetrasperma* and spear thistle *Cirsium vulgare*.
- 3.25 Semi-improved grassland was also associated with the road verges of the M1, A508 and A45. The verges of the flanking the A508 appeared to be representative of this habitat type, including the M1 verges, which were inaccessible to survey. Management appeared to be limited to mowing of the verge closest to the road, with the remaining areas of grassland appearing to lack active management. The sward comprised coarse grassland that was dominated by false oat-grass. Creeping thistle was locally dominant and both creeping cinquefoil *Potentilla reptans* and bristly ox-tongue *Helminthotheca echioides* were locally abundant. Other species recorded included ribwort plantain *Plantago lanceolata*, perforate St. John's-wort *Hypericum perforatum* and black medick.
- 3.26 Species-poor, semi-improved grassland was confined to discrete arable margin habitat. These grasslands either lacked management or were subject to occasional mowing or cultivation as part of the arable field management. Species noted include cocksfoot, common bent *Agrostis stolonifera*, timothy, red fescue, false oat-grass, welshed thistle *Carduus crispus* and curled dock *Rumex crispus*.

Improved Grassland

- 3.27 A temporary rye-grass lay was present immediately north of H6 within a larger arable field. The sward was dominated by perennial rye-grass *Lolium perenne* and Italian rye-grass *Lolium multiflorum*. Other species included dandelion *Taraxacum officinale* agg., white clover, red clover *Trifolium repens* and bristly ox-tongue.

Amenity Grassland

- 3.28 Shortly mown amenity grassland was situated on the verge of the A45 in the north-east of the survey area. The sward composition was generally consistent with adjacent areas of semi-improved grassland.

Tall Ruderal

- 3.29 Discrete stands of tall ruderal were mostly restricted to the areas of the road verges that lacked management and the riparian margins of the stream RW1. Species included common nettle, cow parsley, hemlock *Conium maculatum* and hogweed. Extensive teasel *Dipsacum fullonum* dominates large parts of the J15 pLWS where it is associated with abundant false oat grass *Arrhenatherum elatius*.

Running Water

- 3.30 A stream formed the south boundary of the survey area (RW1). The banks of RW1 were generally graded at 45° and were approximately 2m in height. The depth of water within the watercourse was approximately 0.1-0.2m and supported a slow to medium flow. Although typically 1m wide, the channel narrowed centrally within the section surveyed. The channel bed was firm, comprising clay with occasional silt deposits. The margins of northern bank of the stream were generally well-vegetated, with abundant great willowherb *Epilobium hirsutum*, common nettle *Urtica dioica* and bramble *Rubus fruticosus*. Semi-improved grassland and tall ruderal became dominant higher up the banks. As a result of over-shading by the bank-side scrub and hedgerows, the presence of aquatic vegetation was localised to small patches of watercress *Rorippa nasturtium-aquaticum*, lesser water parsnip *Berula erecta* and floating sweet grass *Glyceria fluitans*.

Ditches

- 3.31 A single wet ditch (D1) was located immediately north of hedgerow H33 and on the edge of the south-bound M1 slip road from the A508. The channel was approximately 1m wide along the section surveyed, with banks approximately 2m high and averaging 45° in gradient. From the western-most extent of the ditch was dry up to a point where water entered via a culvert from north of the M1. The depth of water rarely exceeded 0.05m, although a small number of slightly deeper pools were present. The ditch supported only a very slight flow to the east, where initially the ditch supported stands of aquatic and marginal vegetation. This was dominated by great willowherb, with frequent to occasional reedmace *Typha latifolia*, hard rush *Juncus inflexus*, soft rush *Juncus effusus*, water figwort *Scrophularia auriculata*, watercress and duckweed *Lemna sp.*
- 3.32 There were a number of dry ditches within the survey area, all of which were associated with hedgerows and field boundaries. Vegetation in the ditches was generally continuous with the adjacent habitats, with no species typical of periodic inundation recorded. Bare earth also dominated where the banks were over-shaded by adjacent hedges and / or scrub.

Standing water

- 3.33 There were three ponds within the area of the Main Site; P1, P3 & P4. A fourth pond present in 2013 was subsequently drained and infilled. Water quality was extremely poor due to the tipping shotgun cartridges which appeared to have been undertaken over many years.
- 3.34 Pond P1 was a large pond of approximately 40m x 15m and unknown depth. The pond supported dense stands of reedmace *Typha latifolia* and a variegated reed species. A lily *Nymphaea sp.*, water-cress *Nasturtium officinale* and reed canary-grass *Phalaris arundinacea* were also noted. The pond supported gently sloping margins and banks that were colonised by young trees and scrub.
- 3.35 Pond P3 was a small pond of approximately 5m x 3.5m that was heavily over-shaded by surrounding woodland and scrub. Algal blooms were dominant within the central areas of the pond.
- 3.36 Pond P4 was a shallow, ephemeral pond that was located north end of a dry ditch that ran along hedge H26. No aquatic or marginal vegetation was recorded in this pond.

Hedgerows

- 3.37 There were a total of fifty three hedgerows within this area; H1 – H52 (including H46A & H46B)³. The hedgerows H49 – H52 were not accessible to direct survey. The species composition and notable features associated with the accessible hedgerows are provided in Appendix C.
- 3.38 The hedgerows H3, H4, H24 & H25 were species-rich. Hedgerows H4, H11, H24 and H25 were assessed as 'Important' according to the wildlife and landscape criteria of the Hedgerow Regulations 1997 as a result of their association with public byways, species diversity and / or associated features, such as standard trees and linkages to surrounding woodland.
- 3.39 Sixteen of the hedges were assessed as being of 'conservation priority' for wildlife according to HEGS assessment (score -2 or above), and these were generally the most structurally diverse hedgerows with greater connectivity to the surrounding hedgerow network. Twenty hedges were assessed as having 'moderate value', possessing less structural diversity and poorer connectivity. Three hedgerows were assessed as being 'low value' under HEGS for their limited connectivity, poor structure and generally lower species diversity.
- 3.40 The hedgerow H37 was ornamental and not assessed for its conservation value.

Arable

- 3.41 The large areas of heavily cultivated arable supported a variety of common and widespread herbs and few grasses including common poppy *Papaver rhoeas*, spear thistle, dove's-foot crane's-bill *Geranium molle*, cut-leaved crane's-bill *Geranium dissectum*, knotgrass *Polygonum aviculare*, autumn hawkbit *Leontodon autumnalis* and barren brome *Anisantha sterilis*.
- 3.42 Arable margins were generally 1-2m wide and supported common and widespread grasses and herbs with grasses generally more dominant. Species recorded included common couch *Elytrigia repens*, false oat-grass, Yorkshire fog, broad-leaved dock *Rumex obtusifolius*, teasel *Dipsacus fullonum* and common nettle *Urtica dioica*.

³ Please note that the numbering of hedgerows is separate to that of the Arboricultural Report

- 3.43 No rare or scarce arable weeds were recorded within the survey area.

Buildings & Hardstanding

- 3.44 There were five buildings within the boundary of the survey area; Building B1 (Rectory Farm), Barns A, B & C and Building B3. Further detailed descriptions of these buildings are provided separately in the accompanying bat survey technical appendices (Appendix 5.4).

Field Survey - Bypass Corridor

- 3.45 The land encompassed the Bypass Corridor comprises a mix of arable and grazed fields bound by hedgerows and standard trees, with dense / continuous scrub, neutral grassland, running water, dry ditches and farm buildings (central grid reference SP 746 515).

Target Notes

Bypass Corridor

- 1) Roade Cutting; area dominated by scrub that corresponds with the boundary of Roade Cutting SSSI and an Unnamed pLWS;
- 2) A disused railway cutting colonised by dense scrub; and
- 3) Road verge with small area of *Centaurea scabiosa*, *Primula veris*, *Lotus corniculatus* and *Brachypodium sylvatica*.

Trees and Scrub

Trees

- 3.46 The majority of standard trees were associated with hedgerows along the field boundaries. The most frequently occurring trees were mature example of ash and pedunculate oak. Other trees recorded included young and semi-mature examples of sycamore, field maple, alder, horse chestnut and hybrid black poplar.
- 3.47 The majority of mature trees did not appear to support significant areas of dead bark, dead limbs or other noteworthy features indicating advanced maturity and were therefore not considered to represent Veteran or near-Veteran trees. The exception to this was tree T39, a mature ash standard, which was found to meet the criteria for veteran tree status (see separate Arboricultural Report).

Dense / Continuous Scrub

- 3.48 An area of dense and continuous scrub was associated with the dismantled railway in the south of the site. This scrub included hawthorn *Crataegus monogyna*, blackthorn and elder. The groundflora associated with this area was relatively diverse, and included abundant dog's-mercury, lords-and-ladies *Arum maculatum*, red champion *Silene dioica* and moschatel *Adoxa moschatellina*.
- 3.49 Scrub was also present in association with the embankment of the active railway line intersecting the site in the north (forming Roade Cutting pLWS). Species generally included blackthorn, hawthorn, elder, crab apple *Malus sylvestris*, hazel and field maple. The area

beneath this scrub was dominated by bare earth, with only a sparse and scattered groundflora that included ivy, ground elder *Aegopodium podagraria* and wood dock *Rumex sanguineus*.

Grassland

- 3.50 The field compartments within or adjacent to the Bypass Corridor that comprised grasslands were surveyed individually. These compartments have been labelled Fields 1 to 11 and their locations are illustrated in Figure 5.3. Species lists for each field compartment are provided in Appendix D.

Fields 1, 2 & 3

- 3.51 The following describes the habitat and management of grassland associated with Fields 1 to 3 based on the phase 1 survey completed in September 2016.
- 3.52 Fields 1 and 2 correspond to the boundary of Roade Field pLWS.

Field 1

- 3.53 The grassland in this area, which is effectively the northeast corner of Field 2, has resulted via natural regeneration from a former arable field. This process took place through the former 'arable set-aside scheme', which resulted in the land being taken out of production sometime during the 1990s. Subsequent management has been extensive (e.g. without the use of fertilisers or herbicides), and within an agri-environment scheme. Management of this area, and the rest of the field (Field 2), has been as traditional hay meadow, with the hay cut after the middle of July, followed by aftermath grazing.
- 3.54 Despite the survey constraints, several herbs were clearly in abundance within this stand of neutral grassland, particularly common knapweed *Centaurea nigra*, common bird's-foot-trefoil *Lotus corniculatus*, ribwort plantain *Plantago lanceolata*, red clover *Trifolium pratense* and meadow buttercup *Ranunculus acris*. The majority of the grass component was formed by several species, all of which were either abundant or frequent within the stand; these were tall fescue *Schedonorus arundinaceus*, common bent *Agrostis capillaris*, cock's-foot *Dactylis glomerata*, crested dog's-tail *Cynosurus cristatus*, Yorkshire-fog *Holcus lanatus* and creeping bent *Agrostis stolonifera*.
- 3.55 One area, marked by local abundance of compact rush *Juncus conglomeratus*, appeared to lay damp.
- 3.56 Small quantities of seedling ash *Fraxinus excelsior*, hawthorn *Crataegus monogyna* and field rose *Rosa arvensis* were noted, indicating that in the absence of mowing scrub development would most likely occur rapidly.

Field 2

- 3.57 Whilst the management of the main part of the field has been the same as that for Field 1, the origins of the grassland are very different. The grassland here, and in the adjoining Field 3 to the west, was created in 2002 on a former arable field by sowing seed harvested from Dr. Miriam Rothschild's Sudburgh Meadow.

- 3.58 With perhaps the exception of the most westerly end, the species composition appeared to be uniform across the field with only some slight variations that are always present in any stand of vegetation across a large area.
- 3.59 With an abundance of common knapweed, common bird's-foot-trefoil, ribwort plantain, meadow buttercup and red clover, aspects of the sward had strong similarities with Field 1. However, the presence of several forbs which were not noted in Field 1 gave the impression of a more species-rich sward, despite the total number of species recorded in this field being lower. Examples of these additional species are; lady's bedstraw *Galium verum*, cat's-ear *Hypochaeris radicata* and rough hawkbit *Leontodon hispidus*.
- 3.60 A shorter sward than in Field 1 meant that abundances were not determined for several of the grass species.

Field 3 (Neutral Grassland)

- 3.61 The origins and management of this field are the same as those for Field 2.
- 3.62 Despite sharing the same origins, and having received the same management, the impression gained during the survey was that the overall species abundance and frequency was lower than in Field 2.
- 3.63 The data from NVC surveys of Fields 1 to 3 completed in June 2017 is also provided in Appendix 5.2.

Fields 4 to 11

Field 4 & 4a

- 3.64
- 3.64 Field 4 comprises improved neutral grassland and was formed by a perennial rye-grass *Lolium perenne* ley.
- 3.65 The southern boundary of Field 4 was formed by a ditch with a fenced off margin alongside; this formed part of the agri-environment scheme on the farm. Whilst the species composition of the grass margin varied little from the adjacent field, many sections of the ditch (DD1) supported a luxuriant growth of emergent/marginal aquatic plants. Local abundances of water mint *Mentha aquatica* and Fool's-water-cress *Apium nodiflorum* were of particular note. Some scattered scrub was present along the length of the ditch & margin.

Field 5

- 3.66 This field supported a stand of improved neutral grassland with perennial rye-grass and white clover *Trifolium repens* forming a significant proportion of the sward. There were few forbs present and creeping thistle *Cirsium arvense* was locally frequent.

Field 6

- 3.67 This field was not accessible but from the western boundary this appeared to be sheep-grazed, species-poor semi-improved neutral, or improved, grassland similar to Fields 4 & 5.

Field 7

- 3.68 This field represented part of the continuum of species-poor pasture south of Blisworth Road with the species-poor improved sward formed by abundant perennial rye-grass and Yorkshire-fog, but was set apart from the other fields by the presence of frequent to abundant yellow oat-grass *Trisetum flavescens*.

Field 8

- 3.69 Whilst this field probably had its origins as a sown ley, as evidenced by an abundance of perennial rye-grass and white clover, the presence of abundant crested dog's-tail and occasional meadow buttercup, and more rarely common knapweed, common mouse-ear *Cerastium fontanum* and common bird's-foot-trefoil suggested that this might have been a long time ago, and this was now permanent pasture. Irrespective of this, the sward was species poor, and indicative of species-poor semi-improved neutral grassland.

Field 9

- 3.70 This was formed by a fenced off margin adjacent to a ditch (DD1); and represented part of the agri-environment scheme associated with Hyde Farm. The ditch is apparently dry for most of the time [owner pers. com.] and contained no flora of interest.
- 3.71 The neutral grassland was more diverse than the adjoining fields, with locally frequent field scabious *Knautia arvensis*. However, the presence of frequent perennial rye-grass and abundant white clover indicated that the margin had not been sown but simply fenced off from the rest of the field. Despite the additional diversity, the grassland margin was still indicative of species-poor semi-improved neutral grassland.

Field 10

- 3.72 This was improved neutral grassland, formed by a perennial rye-grass ley, similar in its species composition to Field 4.

Field 11

- 3.73 This field had been sub-divided to form a series of fenced horse paddocks. Although there were slight variations in the species composition and species abundance between individual paddocks, all were formed by species-poor semi-improved neutral grassland and as such, the paddocks were surveyed as a single unit. Management at the time of the survey was horse grazing, with un-grazed paddocks regularly mown to maintain a short-sward. Due to the shortness of the sward it was not possible to give a reliable assessment of abundance for some of the recorded grass species, so these were just noted as being present.

Other Grassland Areas

Road Verges & Arable Field Margins

- 3.74 Semi-improved grassland was associated with the arable field margins (to between 1-6m in width) and the verges bordering the A508 (Stratford Road). Management appeared to be limited to mowing of the road verges and some localised rabbit grazing, with a general lack of active management in the remaining areas. The species-poor sward was dominated by red fescue, false oat-grass, cock's-foot and Yorkshire-fog. The herb assemblage at field margins

varied comprised tall growing species such as oxeye daisy, common knapweed, common sorrel, cow parsley and hogweed, whilst low-growing herbs were characterised by ribwort plantain, field speedwell, red clover and bird's-foot trefoil. Where disturbed the herb species were characterised by creeping buttercup *Ranunculus repens* and greater plantain *Plantago major*.

- 3.75 The only exception to the species poor nature of road verges occurred at the Rookery Lane/Ashton Road junction where a small area supported abundant greater knapweed *Centuarea scabiosa* with cowslip *Primula veris*, common bird's-foot trefoil *Lotus corniculatus* wood false brome *Brachypodium sylvatica* was noted, which is reflective of the base rich nature of soils. The area is however of very limited extent and at best of only local significance.

Road Cutting (Railway Embankments)

- 3.76 Areas of unmanaged grassland along the embankments within the boundary of Roade Cutting SSSI / pLWS were distributed in patches between areas of dense scrub. Grasses were sparse and included occasional false oat-grass and quaking grass *Briza media*. In the main the sward consisted of herb species, with salad burnet *Sanguisorba minor* and common bird's-foot trefoil being abundant, and black knapweed, perforate st John's wort and ox-eye daisy *Leucanthemum vulgare* all occurring frequently. The presence of locally frequent woolly thistle *Cirsium eriophorum* and occasional ploughman's spikenard *Inula conyzae* also indicated the grassland's calcareous nature.

Running Water

A stream formed the south-east boundary of the survey area (RW2). The stream was culverted under the farm tracks, the dismantled railway and where it passed under the A508. The depth of water within the watercourse was approximately 5-20cm and supported a slow flow. The channel bed was firm, comprising stone and shingle with silt deposits, the banks to 0.5m high. The margins of the stream were generally well-vegetated, with common nettle, hogweed, dog's-mercury *Mercurialis perennis* and great horsetail *Equisetum telmateia* which was also present in the channel itself.

Standing water

- 3.77 There was a single pond within the boundary of the Bypass Corridor; P16. Pond P16 was a circular pond over shaded by dense trees and scrub making it generally inaccessible. The pond has moderately steep sloping margins, with no marginal or aquatic vegetation recorded.

Hedgerows

- 3.78 There was a total of forty four hedgerows within and in the vicinity of the Bypass Corridor; H101 – H144⁴. The species composition and notable features associated with the hedgerows are provided in Appendix D.
- 3.79 On the basis of length, diversity, anticipated age and presence of notable floral species, five of the hedges are considered likely to qualify as LWS habitat; H101, H104, H125, H127 & H135.

⁴ Please note that the numbering of hedgerows is separate to that of the Arboricultural Report

- 3.80 The hedgerows H103, H104, H111, H127, H129, H131 and H135 were species-rich. Hedgerows H103, H104, H109, H127 to H131 and H135 were also assessed as 'Important' according to the wildlife and landscape criteria of the Hedgerow Regulations 1997 as a result of their association with public byways, species diversity and / or associated features, such as standard trees and linkages to surrounding woodland
- 3.81 Thirty-three of the hedges were assessed as being of 'conservation priority' for wildlife according to HEGS assessment (score -2 or above), and these were generally the most structurally diverse hedgerows with greater connectivity to the surrounding hedgerow network each comprising a number of tree standards. Two hedges were assessed as having 'moderate value', possessing less structural diversity and poorer connectivity.

Arable

- 3.82 The Bypass Corridor included a number of heavily cultivated arable field compartments. These were broadly similar in nature to those found within the Main Site and characterised by field margins varying in width and with a species composition as per the above descriptions.

4.0 DISCUSSION AND RECOMMENDATIONS

- 4.1 The following section provides an evaluation of the existing habitats within and adjacent to the survey area. A summary of recommendations for mitigation is also provided.
- 4.2 The full assessment of impacts to sites of nature conservation interest and habitats is detailed separately in the accompanying ES chapter. The evaluation has been made in the context of relevant statutory and policy protection.

Designated Nature Conservation Sites

Statutory Sites

- 4.3 Refer to the ES chapter and accompanying winter bird survey report for an assessment of the impacts of the Proposed Development upon statutory sites of nature conservation interest.

Non-statutory Sites

- 4.4 As a result of its very limited extent this semi-natural woodland associated with Highgate is considered to be of limited ecological importance. Overall canopy associated with Highgate woodland is not typical of any particular NVC community and therefore unlikely to qualify as Habitat of Principal Importance, Northamptonshire BAP Priority Habitat or LWS habitats.
- 4.5 The grassland area of the Junction 15 – Grassland pLWS has clearly declined due to a lack of management since it was surveyed in 2006 where it was reported to support a reasonably diverse sward that did not meet criteria for LWS selection (Appendix A). A lack of management has allowed the development of abundant teasle to occur, which now dominates extensive areas. Some grassland does still occur but it is generally species poor and dominated by coarse species, most notably false oat grass.
- 4.6 An assessment of the status of the Roade Field pLWS is provided in the following section.

- 4.7 The calcareous grassland associated with Roade Cutting pLWS is likely to meet the criteria for selection as a LWS. Therefore, this grassland and the associated scrub habitat (which forms part of the same management unit) is considered to be of County importance.
- 4.8 The assessment of impacts upon non-statutory sites of nature conservation interest is provided in the accompanying ES chapter. In brief, the key findings of the assessment of impacts to non-statutory sites and the relevant mitigation measures are as follows:
- There will be a direct loss of some habitat from each of 236 / Unnamed pLWS (Highgate), Junction 15 – Grassland pLWS, Roade Field pLWS and Roade Cutting pLWS. Although these losses are considered unlikely to affect the conservation status of each pLWS, where necessary the loss will be mitigated through either the translocation of grassland or the creation of new grassland areas within the sites green infrastructure;
 - Potential indirect impacts to some sensitive habitats may also occur as a result of habitat disturbance (i.e. physical damage), hydrological change, accidental pollution and increases in dust deposition. Adequate mitigation for these potential impacts will involve the adoption of best practice measures.

Habitat

- 4.9 The following provides an assessment of those habitats that, except where indicated otherwise, fall outside the boundary of designated sites of nature conservation interest
- 4.10 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:
- Inclusion within specific policy (e.g. veteran trees, ancient woodland and linear habitats in NPPF, or non-statutory site designation),
 - Identification as a habitat of principal importance for biodiversity under Natural Environment and Rural Communities Act (NERC) 2006 and consequently identification as a Priority Habitat in England or Local Biodiversity Action Plan (LBAP).

Woodland, Trees & Scrub

- 4.11 Churchills in the central area of the Main Site comprises a small area of semi-natural woodland and a larger area of mixed plantation. This wood has a poorly developed understory and ground layer, and therefore is considered to be, at most, of moderate (local) ecological interest.
- 4.12 The remaining blocks of mixed plantation woodland, including Slade Springs (Target Note 2) associated with some of the field boundaries are either limited in extent or comprised a mix of species of similar age with poorly developed ground-flora. Coniferous plantation on the east and south (The Moors; Target Note 8) boundaries of the Main Site also have poorly developed understories and ground-flora. As common and widespread habitat types that have a poorly developed structure these woodlands are considered to be of relatively limited ecological interest.
- 4.13 The veteran tree T222 is considered to be of moderate (local) ecological importance. The remaining individual mature trees, which were typical of similar habitat in the surrounding landscape.

- 4.14 This scrub represents a widespread and species-poor habitat type and is therefore considered to be of limited ecological interest. As detailed above the scrub associated with the railway embankments within the Roade Cutting pLWS contributes to the mosaic of habitats of that non-statutory site and is therefore considered to be of County importance.

Grassland

Main Site

- 4.15 Semi-improved grassland is also located centrally within the Main Site and on the road verges of the M1, A45 & A508, and these grasslands include a reasonable diversity of forbs that are typical of neutral grasslands. None of the plant communities associated with the verges are considered to be of sufficient diversity to qualify as Habitat of Principal Importance, BAP Priority Habitat or LWS habitat, and it is likely that similar communities are also associated with the road verges in the surrounding area. Given the reasonable floral diversity associated with this habitat, the semi-improved grassland is considered to be of no more than moderate (local) importance.
- 4.16 Poor semi-improved grassland typical of unmanaged, mesotrophic swards and areas of more improved grassland are associated with the margins of the arable fields and a temporary ley. These represent species-poor habitat types that are likely to be common in the surrounding landscape and are therefore of limited ecological interest.

Fields 1, 2 & 3, including Roade Field pLWS

- 4.17 Fields 1, 2 & 3 were distinctively different from the other grasslands within the Proposed Development, and supported a wider range of species indicative of neutral grasslands. Following initial appraisal in September 2016 the constancy and abundance of common knapweed and common bird's-foot-trefoil, and the frequency and abundance of other plants such as ribwort plantain and crested dog's-tail, suggested that the swards of Fields 1 & 2 could potentially have some affinity with the National Vegetation Classification (NVC) MG5 *Cynosurus cristatus-Centaurea nigra* type grassland.
- 4.18 Assessment of fields 1, 2 & 3 has been possible using the Wildlife Site Selection Criteria for Northamptonshire⁶.
- 4.19 The Neutral Grassland criteria are formed by four sections. Two of these are concerned with the presence of NVC communities, the others involve the presence of grassland indicator species and threshold values, which if met would automatically qualify a site for the non-statutory Wildlife Site designation as indicated in Figure 1 of the guidelines:
- c) *Neutral grassland sites of more than 0.1 ha supporting populations of either:*
 - i) *Three or more strong neutral grassland indicator species.*
 - ii) *Eight or more neutral grassland indicator species in total.*
 - d) *Sites supporting populations of more than 50 grassland species.*

⁶ Northamptonshire Biodiversity Partnership Local Wildlife Sites Panel. (2014). *Wildlife Site Selection Criteria – Northamptonshire 2007 – Last updated 05/02/2014*. [online]. Available at: http://www.wildlifebcn.org/sites/default/files/wildlife_site_selection_criteria_northants_2014.pdf [Accessed 18/11/2016].

- 4.20 How these three fields should be considered in terms of the selection guidelines is problematic for a third party assessment. This arises from the fact that although Fields 1 and 2 are effectively a single management unit, they are very different in terms of their origins; however, as there is no physical division between these areas, for the purpose of this assessment it is considered that they should be considered as a single unit. Whilst Fields 2 & 3 are of the same origin, and currently receive the same management, they are separated by a relatively young hedgerow (presumably planted as part of the agri-environment agreement). Therefore, for this assessment Field 3 has been considered as a separate unit.
- 4.21 Fields 1 & 2 collectively support nine of the neutral grassland indicator species listed within the guidelines, two of which are strong indicators. Consequently, as a single unit they exceed the threshold of eight indicator species. If Field 2 is considered in isolation it supports eight indicator species and would therefore meet the threshold. If Field 1 were considered in isolation it would not meet the threshold as it only supports five indicator species. Although exact interpretation of the selection guidelines falls within the remit of the organisations running the Wildlife Site system, and ultimately the Local Wildlife Sites Panel, it is likely that Fields 1 and 2 would be considered as an ecological unit. It is therefore considered that Fields 1 & 2 collectively meet the criteria.
- 4.22 Field 3 only supports 4 indicator species. As this only represents 50% of the threshold, it falls considerably short of qualifying as a Wildlife Site.
- 4.23 In conclusion the assessment has therefore concluded that Fields 1 & 2 should be considered as a single ecological unit, and this qualifies as a Local Wildlife Site. It is therefore of at least County value.

Other Grasslands of Bypass Corridor

- 4.24 The remaining grassland fields within or adjacent to the Bypass Corridor all supported improved or species-poor semi-improved neutral grassland and were therefore considered to be of low to negligible conservation value. Whilst the fenced off agri-environment scheme margin (Field 9) was more diverse than the adjacent pasture fields, the grassland was still representative of species-poor semi-improved neutral grassland and therefore still of limited ecological importance.

Running Water & Ditches

- 4.25 Despite their low diversity, the ecological interest of RW1 and RW2 were increased by the fact that they both formed separate connections with surrounding river catchments. Therefore, although these features do not represent Section 41, BAP or CWS habitat, it is considered to be of moderate (local) ecological importance.
- 4.26 A section of dry ditch DD1 that is connected to RW2 (via the off-site pond P108) bisects the central areas of the Bypass Corridor. Although it is a feature that has been modified for agricultural purposes, it has some importance as it is connected to habitats in the surrounding landscape. The remaining dry agricultural ditches that are associated with the field boundaries, and are generally over-shaded by adjacent hedgerows and of limited diversity, are of limited ecological interest.

Ponds

- 4.27 All ponds qualify as Northamptonshire BAP Priority Habitat. None of the ponds are of sufficient floral diversity to meet the criteria for selection as a LWS⁷. Based on its size and the maturity of its aquatic and marginal habitats the pond P1 is considered to be of moderate importance. As a result of their low floral diversity the remaining ponds P2, P3 & P101 are of more limited ecological interest.

Arable Fields

- 4.28 The majority of the arable fields within the Proposed Development are typical of similar species-poor and intensively managed habitats in the surrounding area. A small number of field margins associated with the Main Site and the Bypass Corridor consisted of permanent grassland strips over 5m in width and subject to low intensity management. On this basis these margins are likely to represent Habitat of Principal Importance under Section 41 of the NERC Act 2006. None of the flora or features associated with the remainder of the arable fields were sufficient for this habitat to qualify as LWS habitat, Habitat of Principal Importance or Northamptonshire BAP habitat. Therefore, on this basis the arable fields are considered to be of limited ecological interest.

Hedgerows

- 4.29 With the exception of H37, all hedgerows within the Main Site are Habitats of Principal Importance under the NERC Act 2006 (native species dominant). None of the hedgerows within the survey area are of sufficient diversity to qualify as Northamptonshire LWS habitat. Hedgerows H4, H11, H24 & H25 were assessed as being 'Important' under the Hedgerow Regulations 1997⁸. Hedgerows H3, H4, H24 & H25 are considered to be of Northamptonshire BAP quality due to their species richness.
- 4.30 All hedgerows within the Bypass Corridor represent Habitats of Principal Importance under the NERC Act 2006. Hedgerows H103, H104, H109, H127 to H131 and H135 were assessed as being 'Important' under the Hedgerow Regulations 1997. Hedgerows H103, H104, H111, H127, H129, H131 and H135 are considered to be of Northamptonshire BAP quality due to their species richness.
- 4.31 All of the remaining native hedgerows, including those of comparatively low diversity and poor structure (as determined by HEGS assessment), were considered to be of comparatively limited ecological interest

Other Habitats

- 4.32 The remaining habitats, including the tall ruderal, grassland and hardstanding and buildings were widespread and species-poor habitat types that were considered to be of no more than Site level interest.

⁷ Due to the presence of great crested newts *Triturus cristatus* the pond P1 qualifies as Habitat of Principal Importance under Section 41 of the NERC Act 2006 (refer Volume 1, Chapter 6 & Volume 2, Appendix 6.6)

⁸ Under the Hedgerow Regulations 1997 Important hedgerows may only be removed under specific circumstances, such as during an emergency, with a hedgerow removal notice issued by the LPA or as part of an existing planning permission

Mitigation/Recommendations

- 4.33 All retained hedgerows and trees afforded suitable protection during construction activities. Clear delineation and appropriate fencing of the working area / buffer strips should be adopted to prevent inadvertent damage / disturbance of all retained habitats.
- 4.34 The maintenance of tree root protection areas throughout the lifetime of the proposed development will also ensure that trees are adequately protected. The protection measures should include consideration of *BS5837 Trees in Relation to Construction – Recommendations: 2012 for trees and hedges*, which also applies to hedgerows with trees present (see separate Arboriculture report).
- 4.35 The adoption of a Construction Environmental Management Plan (CEMP), or similar is recommended to ensure best working practices in order to minimise the risk of any potential impacts from pollution events during the construction and operational phases. This will include the control of airborne particles during construction and preventing accidental spillages entering local watercourses and appropriate design of site drainage systems according to current best practice. This should include measures that will ensure that silt generated by construction activities is not released to any of the existing systems.
- 4.36 The proposed compensation and enhancement measures that will be implemented to off-set impacts and achieve gains for biodiversity are described separately in the accompanying ES chapter.

APPENDIX A: Site Citations

Sites of wildlife and geological importance in Northamptonshire

Statutory Sites:

Special Protected Area (SPA)

SPAs are strictly protected sites classified in accordance with Article 4 of the EC Directive on the conservation of wild birds (79/409/EEC), the Birds Directive.

Site of Special Scientific Interest (SSSI)

The SSSI series provide statutory protection for the best examples of the natural environment. SSSI were originally notified under the National Parks and Access to the Countryside Act 1949 and they were renotified under the Wildlife and Countryside Act 1981. Improved provisions for their protection and management were introduced in the Countryside and Rights of Way Act 2000.

National Nature Reserve (NNR)

NNRs are declared by the statutory country conservation agency (English Nature) under the National Parks and Access to the Countryside Act 1949. NNR contain the most important examples of natural and semi-natural ecosystems within Great Britain. NNR conserve the habitats within them and offer opportunities for research.

Local Nature Reserve (LNR)

LNRs are declared under the National Parks and Access to the Countryside Act 1949 by local authorities. LNR are declared and managed for nature conservation, education and research or opportunities for public access to nature.

Non-statutory sites:

Nature Improvement Area (NIA)

Following the Natural Environment White Paper (2011), twelve NIAs were designated and granted government funding in February 2012. They should aim to achieve significant and demonstrable enhancements of the ecological network over large areas by undertaking the actions prioritised in the review:

- Improving the management of existing wildlife sites
- Increasing the size of existing wildlife sites
- Increasing the number of wildlife sites
- Improving connectivity between sites
- Creating wildlife corridors

Local Wildlife Site (LWS)

Local Wildlife Sites are areas of land which are rich in wildlife and are the equivalent to Sites of Importance for Nature Conservation. Criteria for selection take in threats and declines in certain species, national priorities and local distinctiveness. The LWS system is managed, in partnership, by The Wildlife Trust, local authorities, statutory nature conservation agencies, local naturalists and landowners. Local Wildlife Sites were previously known as County Wildlife Site (CWS) in the past.

Protected Wildflower Verge (PWV)

Protected Wildflower Verges are roadside verges rich in wildlife and are crucial to the success of the local Biodiversity Action Plan. Criteria for selection take in threats and declines in certain species, national priorities and local distinctiveness. The PWV system is managed, in partnership, by The Wildlife Trust, local authorities, statutory nature conservation agencies, local naturalists and landowners.

Pocket Park

The Pocket Park vision is to develop easy public access to the countryside, bringing the countryside to the people and providing opportunities for enjoyment and understanding of 'Countryside on the Doorstep'. Over the past 18 years, the county council has worked in partnership with many organisations and other local authorities to help create 80 Pocket Parks. For more information on this scheme please refer to the website at www.pocketparks.com.

Local Geological Site (LGS)

Local Geological Sites (LGS) are the most important places for geology and geomorphology outside the statutory SSSI. The sites are designated using locally developed criteria and are assessed by the local geological group.

Potential Local Geological Site (PLGS)

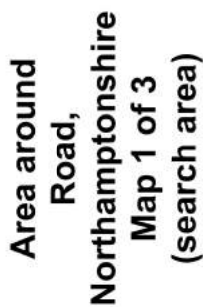
Potential Local Geological Sites (PLGS) are sites that were identified and considered to be important geological exposures. These sites have not yet been formally notified as Local Geological Sites by the local geological group. Currently these sites can only be located by a grid reference, as they do not have a formal site boundary and there is no descriptive survey information.
















Potential Wildlife Site (PWS)

Potential Wildlife Sites (PWS) are sites that are either known or thought to be of higher biodiversity value than the average countryside but have not been confirmed to be of Local Wildlife Site (LWS) standard.

PWS can belong to one of three categories: 1. Sites never fully surveyed and assessed against LWS criteria. 2. Sites surveyed and assessed against the LWS criteria but not currently reaching the standard. 3. Sites previously recognised as LWS but not currently meeting the latest LWS criteria.

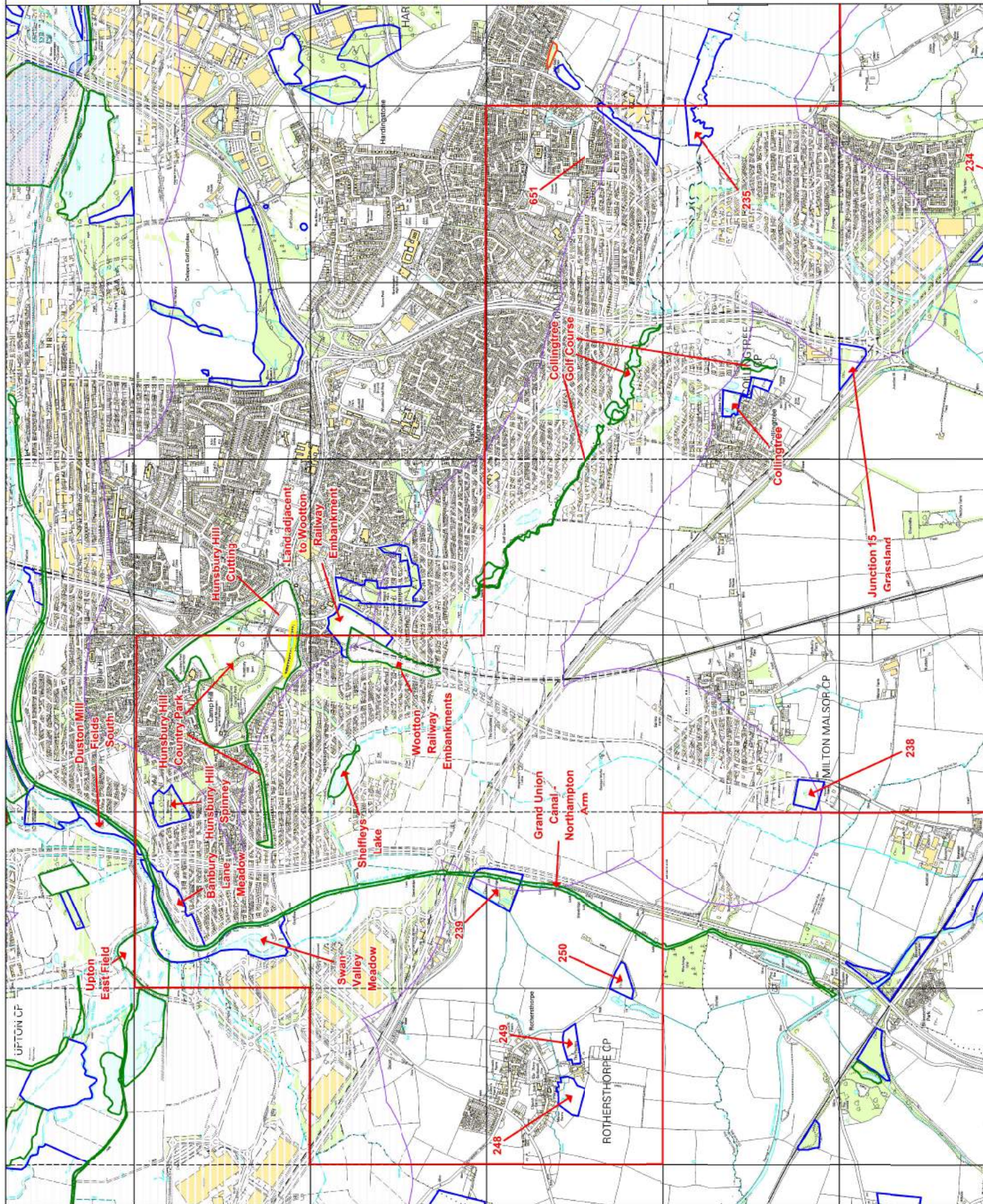
PWS were originally outlined using a combination of local knowledge and looking at aerial photographs for evidence of biodiverse habitats. All PWS are likely to be important for the County's biodiversity, either in their own right, or through buffering and linking current LWS and contributing to Green Infrastructure. Many of these sites could potentially be of LWS standard once surveyed.



- | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Local Geological Site | Local Geological Site | Country Park | County Boundary | Site of Special Scientific Interest | National Nature Reserve | Local Nature Reserve | Protected Wildflower Verges | Pocket Park | Special Protection Area | Nature Improvement Area | Wildlife Trust Reserve | Potential Local Geological Site | Local Wildlife Site | Potential Wildlife Site |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



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Area around Road, Northamptonshire Map 2 of 3 (search area)

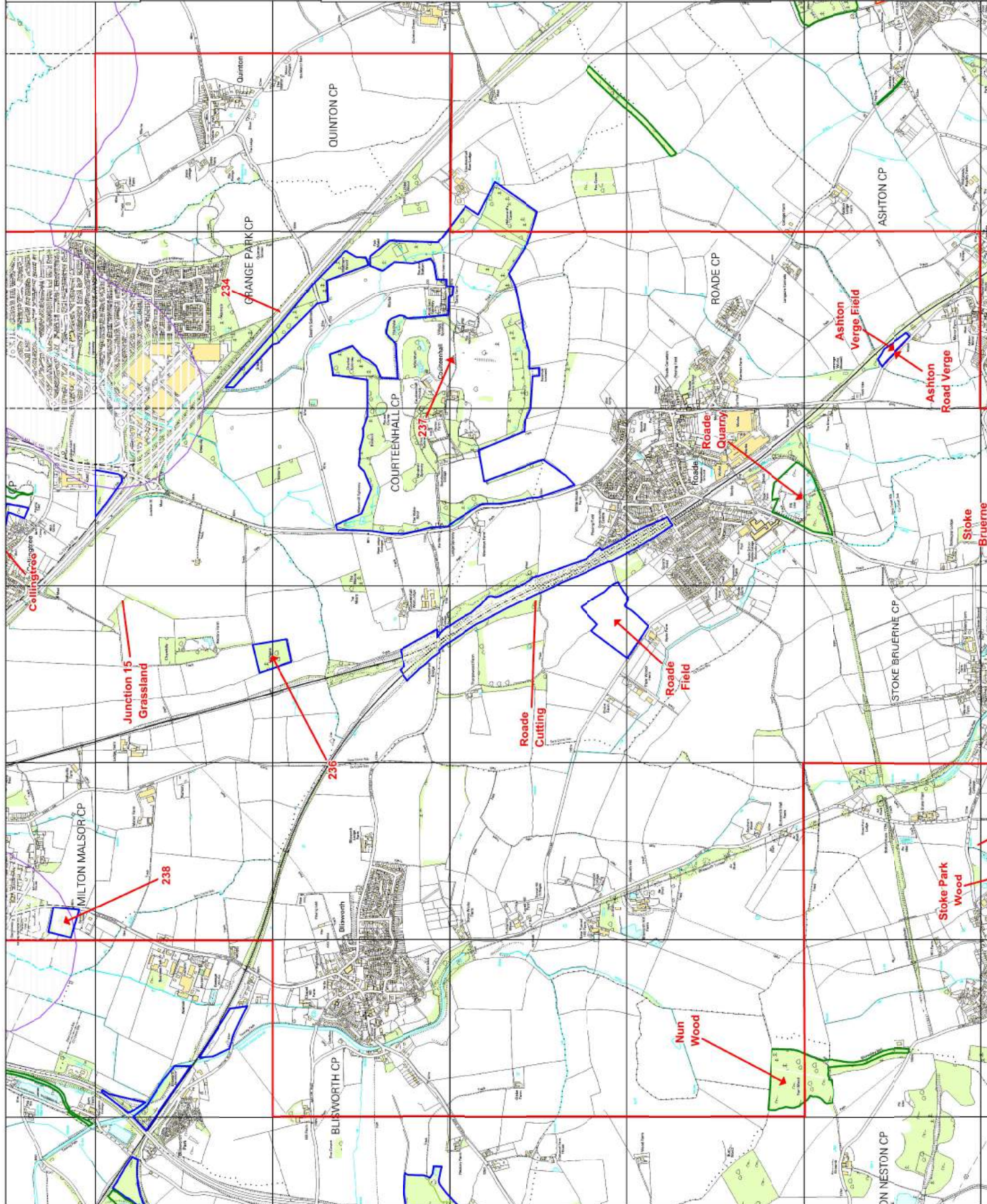
- ★ Local Geological Site
- Local Geological Site
- Country Park
- County Boundary
- Site of Special Scientific Interest
- National Nature Reserve
- Local Nature Reserve
- Protected Wildflower Verges
- Pocket Park
- Special Protection Area
- Nature Improvement Area
- Wildlife Trust Reserve
- Potential Local Geological Site
- Local Wildlife Site
- Potential Wildlife Site

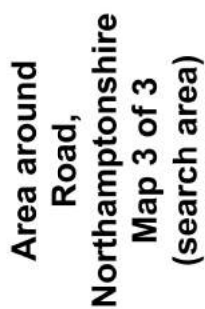


1km



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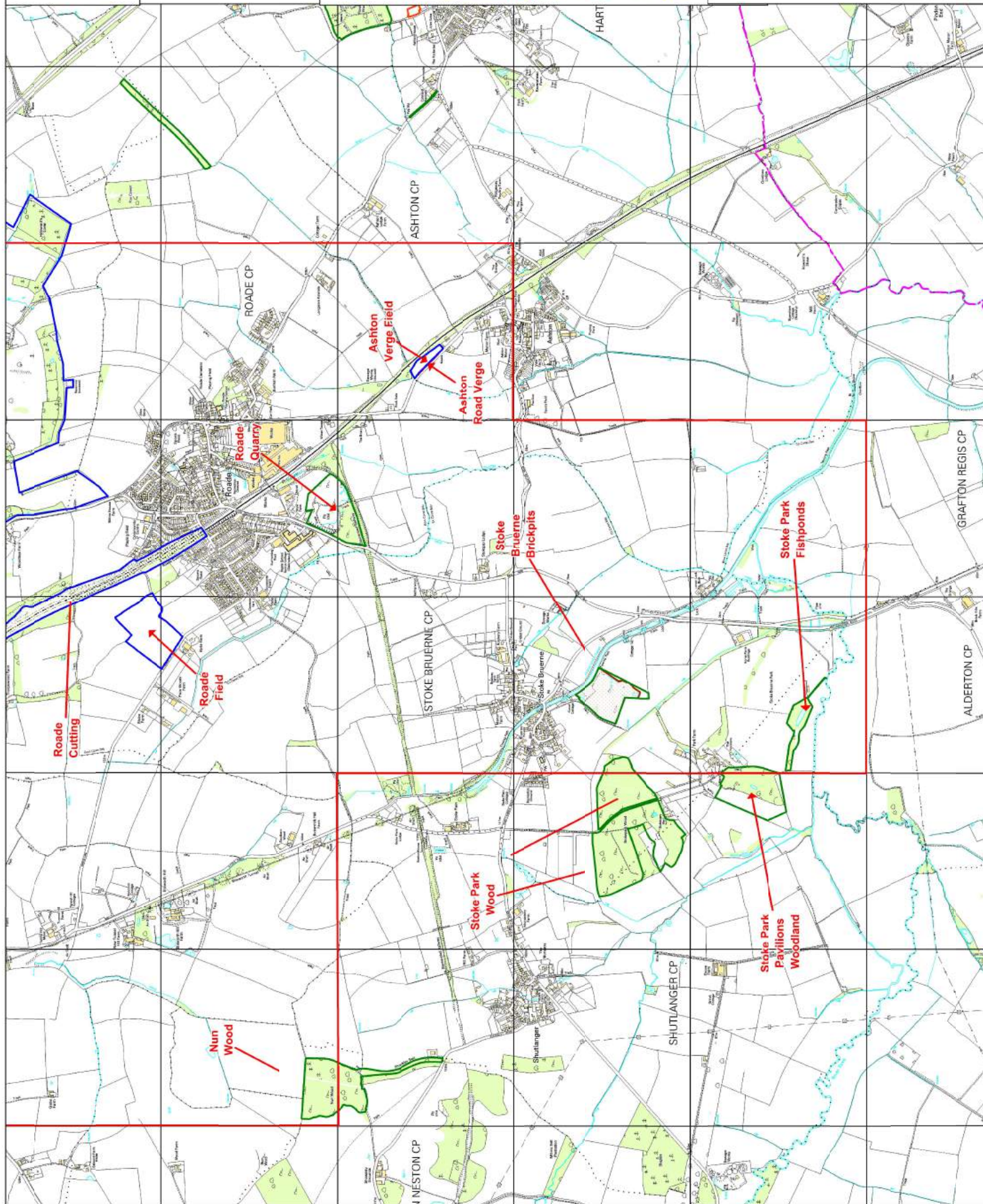
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Site Name: Ashton Road Verge

Site Code: S1349

Status: No Status

Other Designations: Protected Wildflower Verge

Grid Reference: SP763504

Area (ha): 0.076

District: South Northamptonshire

Site History:

13/05/2010 No Status

14/12/2016 No Status

Habitats present

Broad Habitat: Grassland

BAP Habitat: Lowland Meadow

Reason for Designation:

A short section of Protected Wildflower Verge that had been cut at the time of survey. Five neutral grassland indicator species were recorded and the site has been retained as a PWV but does not qualify as a Wildlife Site.

Site Description:

07/06/2016

A short section of PWV alongside the east side of the road the runs north from Ashton village. The verge is separated from the railway by a small field. The verge had recently been mown hampering survey efforts. Amongst the taller vegetation alongside the hedgerow were species such as bladder campion, toadflax, meadow vetchling and greater knapweed, suggesting this is still a species rich verge. A further survey would be worthwhile.

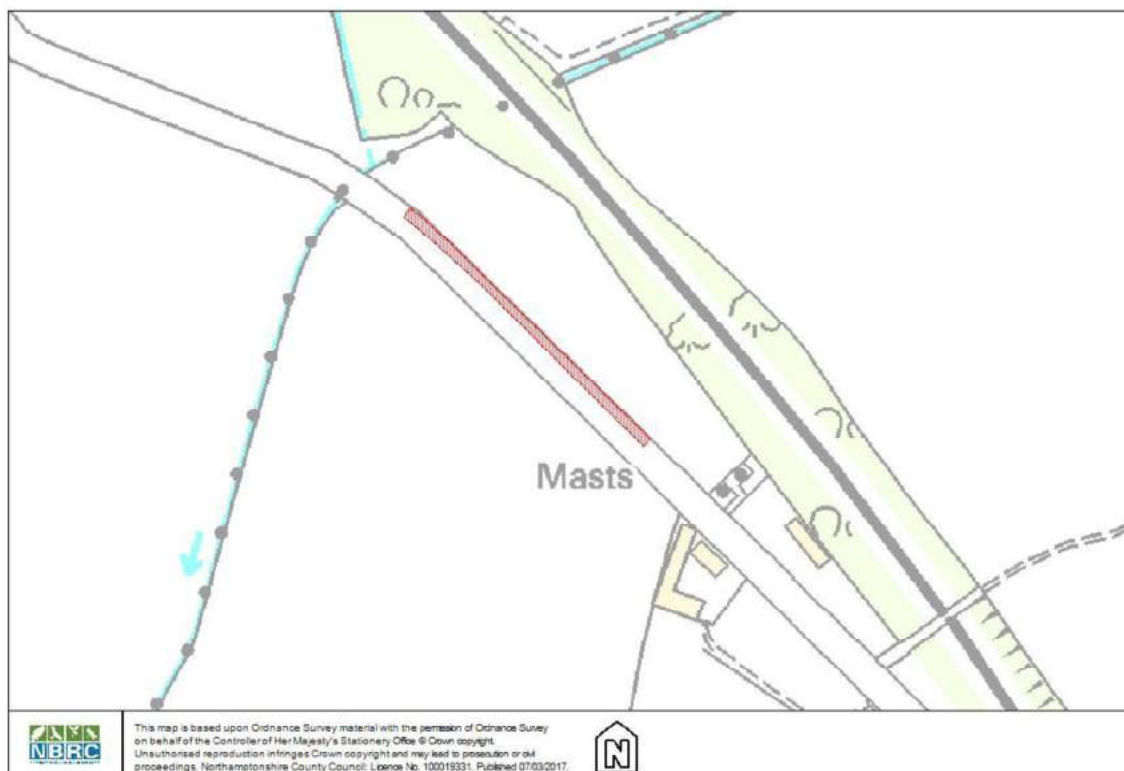
The field next to this site looked quite interesting with potentially some of the same species as the verge. It looked fairly herb rich with scattered scrub and was a reptile refugia mitigation area in relation to a nearby planning application.

It should be made a PWS and survey.

01/06/2006

These areas of wildflower verge look very good with a nice assortment of flower species and probably butterflies as well.

Map:



Site Name: Ashton Verge Field

Site Code: S1547

Status: PWS

Other Designations:

Grid Reference: SP763504

Area (ha): 1

District: South Northamptonshire

Site History:
14/12/2016 PWS

Habitats present
Broad Habitat:

Reason for Designation:

An unsurveyed grassland that looks to have interest both for flora and reptiles and has therefore been made a PWS.

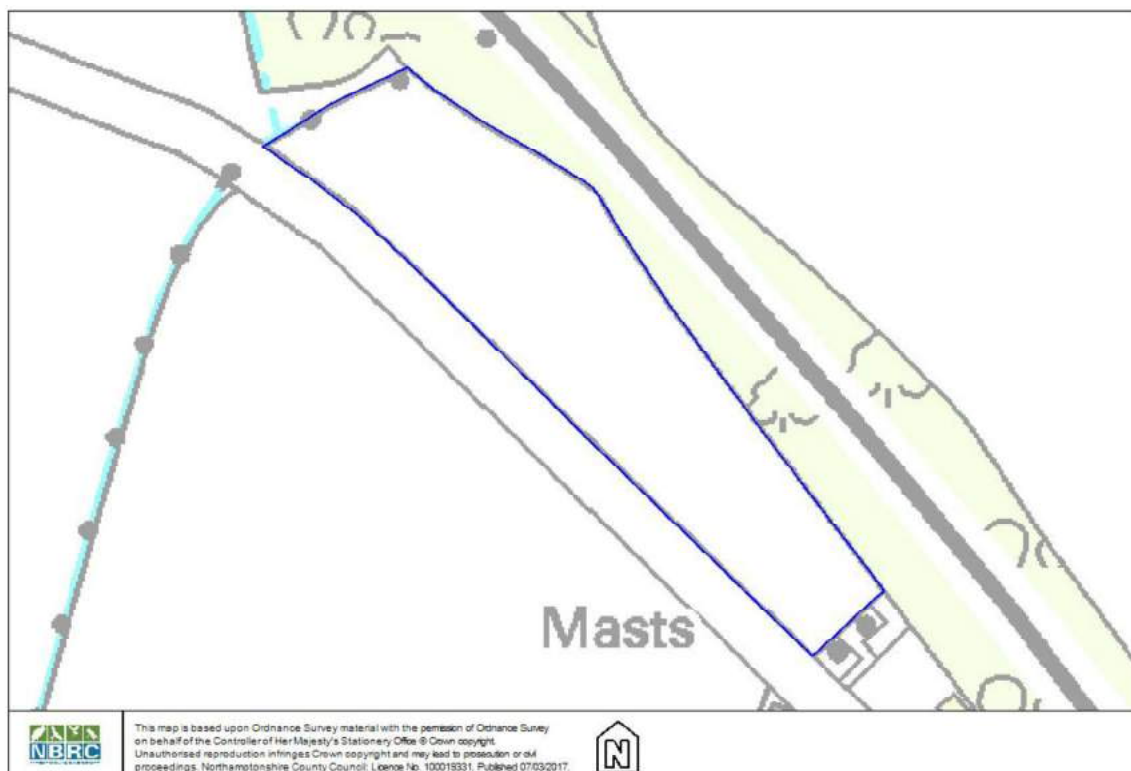
Site Description:

21/06/2016

This site has not been surveyed.

The site was observed when surveying the adjacent road verge. As a reptile mitigation area for a nearby development it has developed an interesting flora and should have a good herpetofauna.

Map:



Banbury Lane Meadow

Administrative areas: Northampton(E District (74-))

Status(es): PWS

Centroid: SP724587 (Site Centroid)

Site type: Site

File code: N1226

Site/Subsite hierarchy: **Banbury Lane Meadow**

Description: 2005: A long narrow field sloping down to the Grand Union canal. The field was fenced but was crossed by several informal footpaths leading to the canal. This was largely species poor MG1 *Arrhenatherum elatius* grassland, less than 1 metre tall, but there was also one large spoil heap, some disturbed ground and a small, fenced, young willow plantation.

Total number of records: 23

Total number of species: 23

Site Name: Collingtree Golf Course

Site Code: N808

Status: LWS

Other Designations: Nene Valley NIA

Grid Reference: SP749564

Area (ha): 5.22

District: Northampton

Site History:

18/08/1992 LWS

09/07/2007 LWS

21/08/2014 LWS

Habitats present

Broad Habitat: Wetland

BAP Habitat: Eutrophic Standing Waters, Rivers

Reason for Designation:

A stream and series of lakes and ponds through Collingtree Golf Course which provide a useful wildlife corridor and good wetland habitat. From the original survey lakes 1, 3-7 and 9 have been included in the Wildlife Site. The complex qualifies as a Wildlife Site as 15 wetland indicator species were recorded alongside further aquatic and emergent species and areas of A11 plant communities.

Site Description:

17/07/2014

On the site were nine large ponds or small lakes. Following the survey Lake 2 and Lake 8 were removed from the Wildlife Site boundary as these two small lakes did not meet the LWS criteria. All had sequences of aquatic vegetation, through swamp in standing water, to fen/mire and/or rush-pasture on the terrestrial side, then leading on to drier grassland.

However, the steep edges of most lakes meant that this sequence was very compressed and only rarely reached a metre wide, which made it difficult to draw a line where one habitat type ended and another began. Because this was a golf course rather than agricultural land, the band of vegetation was not disturbed by grazing stock and the lakes were small enough to prevent significant wave erosion of the banks, meaning the swamp fringe was more or less continuous. Fragments of the drier grassland at the edges of the lakes had missed the frequent mowing of most adjacent ground but were mainly rather species-poor.

Lakes 3 and 7 differed from the other lakes in being smaller and having less steeply sloping banks, at least in places, allowing for a few larger areas of swamp vegetation. The lakes were generally with a very open aspect, with shrubs and trees mostly rather small. However, Lakes 3-5 were with frequent tall trees on their south-western edge, most of these being in private gardens.

The brook here flowed from south-east to north-west and passed through Lakes 3 to 7 before continuing its journey over a series of small weirs. For the purposes of this survey, the Brook begins at the north-western tip of Lake 7 and ends just beyond Lake 9.

In the south the brook ran alongside private gardens to the south-west, on its left bank, with only scrappy aquatic and swamp vegetation. Further to the north the golf course continued on the north-eastern side of the Brook, while on the south-western side was agricultural land: arable followed by hay meadow. The brook was connected to Lake 9 by two narrow channels. In the vicinity of Lake 8, the brook widened out to produce some small bays where swamp vegetation was locally abundant.

Lakes 4-6 were all of similar character and connected to one another by narrow channels and were surveyed as one unit, the Brook and other lakes each have their own species lists.

The Lakes

These had a lot of natural vegetation, but plantings included Horse Chestnut *Aesculus hippocastanum* and Olive Willow *Salix elaeagnos*. Weeping Willows *Salix x sepulcralis* were also quite frequent.

The most abundant species in the swamp strip of Lakes 1 and 2 was Yellow Iris *Iris pseudacorus*, often joined, or occasionally partially replaced, by Common Reedmace *Typha latifolia* or Reed Sweet-grass *Glyceria maxima*. Reed Sweet-grass, Branched Bur-reed *Sparganium erectum* and Bulrush were most frequent in the brook and in the lakes connected to the brook. Much rarer were small areas of Common Spike-rush *Eleocharis palustris* swamp at Lakes 1 and 8.

On the drier edges of the swamp were occasional tall-herb fen species such as Reed Canary-grass *Phalaris arundinacea* and Greater Willowherb *Epilobium hirsutum*, but more frequent was Meadowsweet *Filipendula ulmaria* mire or abundant Juncus species, mostly Hard Rush *Juncus inflexus* and Soft Rush *Juncus effusus*, with very locally frequent Jointed Rush *Juncus articulatus*. Among the Meadowsweet and rushes were frequent to locally abundant Gypsywort *Lycopus europaeus*, Water Mint *Mentha aquatica*, Water Forget-me-not *Myosotis scorpioides*. Less frequent was False Fox-sedge *Carex otrubae*, while Square-stalked St. John's *Hypericum tetrapetrum* Wort and Lesser Water-parsnip *Berula erecta* were rather rare.

Drier grassland near the lake edges that had occasionally escaped mowing had grasses such as Common Bent *Agrostis capillaris* and Crested Dog's-tail *Cynosorus cristatus* but was generally species-poor. There were some areas of drier grassland however, that were mown much less frequently and these were dominated by False Oat-grass *Arrhenatherum elatius* with locally abundant Cocks-foot *Dactylis glomerata*. In these patches of taller grassland, plants such as Spiked Sedge *Carex spicata* and Perforate St John's-wort *Hypericum perforatum* were occasional. There was also a ruderal element to the drier grassland in places, presumably related to the excavation of the lakes, with locally frequent Bristly Oxtongue *Picris echioides* and Colt's-foot *Tussilago farfara*.

Lake 1 (SP75525550)

This was the best lake for aquatic species, which included abundant Spiked Water-milfoil *Myriophyllum spicatum* and Fennel Pondweed *Potamogeton pectinatus*, with smaller amounts of Rigid Hornwort *Ceratophyllum demersum*, Duckweed *Lemna minor*, Ivy-leaved Duckweed *Lemna trisulca*, Yellow Water-lily *Nuphar lutea* and Amphibious Bistort *Persicaria amphibia*. Yellow Flag was particularly abundant in the swamp fringe, with smaller amounts of Bulrush. Also present was a small amount of Common Spike-rush *Eleocharis palustris*. The lake has a considerable area of NVC plant community A11: the Fennel-leaved Pondweed-Spiked Water-milfoil community. Since 2005 some plants of the swamp/mire understorey, especially Water Forget-me-not, have increased in numbers

Near the south-eastern corner there was a little wet grassland where there were at least 30 flowering spikes of Common Spotted-orchid *Dactylorhiza fuchsii* but Bee Orchid *Ophrys apifera*, found in good numbers in the adjacent drier grassland in 2005 was not seen this time.

Lake 2 (SP75415561)

Did not meet the Wildlife Site criteria and has been removed from the LWS.

Lake 3 (SP75695610)

This lake differed from most others in having a more gently sloping edge on the north-eastern side, and in also being the only lake where rafts of wetland vegetation extended out over the water. The lake was quite heavily overshadowed by tall trees on the south-western side.

This lake had a large amount of Yellow Water-lily, below which the only submerged aquatic plant recorded in quantity was Nuttall's Pondweed, together with occasional Fennel Pondweed *Potamogeton pectinatus*. Also out on the water were some floating rafts of Reed Sweet-grass, Water-

cress *Rorippa nasturtium-aquaticum* and Fool's Water-cress *Apium nodiflorum*, as well as occasional Unbranched Bur-reed *Sparganium emersum*. Yellow Flag was again abundant at the lake edges, but was often replaced by Reed Sweet-grass, Branched Bur-reeds or Common Reedmace, with much smaller amounts of Lesser Pond-sedge *Carex acutiformis*. Backing the swamp here was a wider strip of Meadowsweet mire, with plants present including Wild Angelica *Angelica sylvestris*, Greater Bird's-foot-trefoil *Lotus uliginosus*, Gypsywort *Lycopus europaeus*, Water Figwort *Scrophularia auriculata*, Marsh Woundwort *Stachys palustris*, Tufted Vetch *Vicia cracca* and others,.

Drier grassland on the north-eastern edge was only occasionally mown and was MG1a in character. Found here were plants such as Hedge Bedstraw *Galium mollugo*, Meadow Vetchling *Lathyrus pratensis*, Black Medick *Medicago lupulina* and Germander Speedwell *Veronica chamaedrys*.

Lakes 4-6 (Lake 4; SP75565616), (Lake 5; SP75155635), (Lake 6; SP75275628)

These lakes were all similar in having mature tall trees and private gardens on the south-western side, and in having a much more open character to the north-east. They were connected to each other, and to Lakes 3 and 7, by narrow channels crossed by bridges. With Lake 6 though, a swamp edge was occasionally missing.

The only submerged aquatic plant found in these lakes was Nuttall's Pondweed. Yellow Water-lily was locally frequent on the water, and there were some large accumulations of Duckweed in sheltered bays.

There was a similar narrow swamp/mire edge to these lakes as that of Lakes 1 and 2, but here Common Fleabane *Pulicaria dysenterica*, Square-stalked St John's-wort *Hypericum tetrapterum* and Tufted Vetch *Vicia cracca* joined the other typical plants on the swamps terrestrial edge, along with small patches of Blue Water-speedwell *Veronica anagallis-aquatica*. Lesser Pond-sedge *Carex acutiformis* was occasional in the swamp fringe, and Branched Bur-reed *Sparganium erectum* was much more abundant than in Lakes 1 or 2.

Drier grassland with False Oat-grass *Arrhenatherum elatius* dominant was most abundant in the northern corner of Lake 6. Here the tall grassland included Wild Angelica, Spiked Sedge *Carex spicata*, Hedge Bedstraw, Meadow Vetchling, Hoary Ragwort *Senecio erucifolius* and others. Also present were ruderal species such as Teasel *Dipsacus fullonum*, Bristly Oxtongue *Picris echioides* and Colt's-foot *Tussilago farfara*.

In a few places, in the shade from the taller trees, were plants such as Nipplewort *Lapsana communis* and Herb Robert *Geranium robertianum*.

Lake 7 (SP75155635)

This small lake, as well as being connected to Lake 6 by a channel beneath the adjacent road, had a small stream joining from the north. There was a block of swamp vegetation in the bay where the stream joined. Most abundant here were Common Reedmace and Branched Bur-reed, with less frequent Yellow Iris. Around the swamp edges were plants such as Wild Angelica, Greater Willowherb, Meadowsweet, Gypsywort and Marsh Woundwort. Water Cress was locally abundant, and there were lesser amounts of False Fox-sedge and Marsh Horsetail *Equisetum palustre*.

The inflowing stream had quite a fast flow, and was partly occupied by Water Cress and locally abundant Fool's Water Cress. On its fairly steep banks were Hemlock Conium *maculatum*, Greater Willowherb, Meadowsweet and Reed Canary-grass *Phalaris arundinacea*, along with rare Pendulous Sedge *Carex pendula*.

Otherwise, the lake was shaded by trees, and/or close-mown to the edges in the south-west, with only fragments of swamp vegetation. Small amounts of water-margin vegetation were present though, the main species being Water Forget-me-not, Celery-leaved Buttercup *Ranunculus sceleratus*, Blue Water-speedwell and Brooklime *Veronica beccabunga*.

Lake 8 (SP 74665676)

Did not meet the Wildlife Site criteria and has been removed from the LWS.

Lake 9 (SP74355698)

This was similar to the majority of lakes here in having a narrow swamp fringe backed by mire/fen and rush-pasture. Here though, Reed Sweet-grass, Branched Bur-reed and Common Reedmace were more abundant, and Yellow Flag much scarcer. On the drier edge of the swamp vegetation, in mire and rush-pasture, Gypsywort, Greater Bird's-foot-trefoil, Marsh Woundwort and Water Forget-me-not were still frequent, and they were joined by locally frequent Skullcap *Scutellaria galericulata* and patches of Marsh Marigold *Caltha palustris*.

The only submerged aquatic recorded from this lake was Nuttall's Pondweed.

Drier grassland at the lake edges had frequent Perennial Ryegrass *Lolium perenne* and locally frequent Crested Dog's-tail *Cynosorus cristatus*, along with Smooth Hawk's-beard *Crepis capillaris*, Perforate St John's-wort *Hypericum perforatum*, Hoary Ragwort, Red Clover *Trifolium pratense*, White Clover *Trifolium repens*.

There were a few taller trees toward each end of the lake, including Weeping Willow and Alder *Alnus glutinosa*, while smaller shrubs and small trees were occasional around the perimeter. At the south-eastern end of the lake there seemed to be a strip of a *Rosa* species planted immediately alongside the lake and a metre or so tall.

The Brook

In the south there were houses and gardens on the south-western side and there were plantings of alien species such as shrubs of Olive Willow *Salix elaeagnos*.

Only fragments of swamp vegetation were present, mostly as small stands of Branched Bur-reed and just occasional Water-plantain *Alisma plantago-aquatica*. The only submerged aquatic plant recorded was Common Water-starwort *Callitriche stagnalis*, while Unbranched Bur-reed *Sparganium emersum* was occasional. There was a scattering of water-margin plants present though: Fool's Water Cress, Square-stalked St. John's-wort, Water Forget-me-not, Water Figwort and Brooklime. Marsh Marigold was evenly spaced along the brook and there were small patches of Wild Angelica and Meadowsweet.

Higher on the bank, on the north-eastern side, were grassland and ruderal species ranging from False Oat-grass and Red Fescue *Festuca rubra* to Hemlock, Bristly Oxtongue and Teasel. These were confined to the north-eastern side but were often mown down to the edge of the stream. Also on this right bank of the brook were single trees and small groups of tall trees. Many were willow species, mostly White Willow *Salix alba*, but also present was Common Alder, as well as occasional Dogwood *Cornus sanguinea*, Hazel *Corylus avellana* and Hawthorn *Crataegus monogyna*. Grey willow *Salix cinerea* and Osier *Salix viminalis* were occasional on the lower banks, as were occasional seedlings/saplings of Alder.

Further to the north-west, the houses on the left bank ended, firstly with an area of amenity grassland, but then followed by arable fields and hay meadow, with the golf course continuing on the right bank only. In the area of the amenity grassland, the Brook had some silty areas where Common Reedmace was quite frequent, growing over Celery-leaved Buttercup and Brooklime and Blue Water-speedwell. Also in these areas were Wild Angelica, Fool's Water-cress, Square-stalked St. John's-wort, Redshank *Persicaria maculosa*, Water Figwort and more Marsh Marigold. Trees and shrubs on the banks here included seedlings/saplings of Sycamore *Acer pseudoplatanus*, Ash *Fraxinus excelsior*, Wild Cherry *Prunus avium*, Grey Willow, Osier and others.

From here to the north-west, swamp, particularly Branched Bur-reed swamp, became more frequent, and occasionally occupied the whole channel toward the north-western end of this site. Branched Bur-reed was occasionally replaced by locally dominant Reed Sweet-grass. At the same time, Nettle became more abundant higher on the banks.

In the vicinity of Lake 8, the brook widened out somewhat for a short way as a meandering course, producing areas of swamp vegetation on the western side and areas of wet silt on the eastern side. The western side was inaccessible, but species in the swamp included Reed Sweet-grass and Common Reedmace, with Reed Canary-grass on the edges. Silty areas on the right bank were with typical plants of the site, as well as varying amounts of Toad Rush *Juncus bufonius*, Redshank and Water Chickweed *Myosoton aquaticum*. Growing on wet mud beside the brook here were small patches of Lesser Water-parsnip *Berula erecta* and Common Water-starwort, while Marsh Marigold and Blue Water-speedwell continued to be locally frequent, with Celery-leaved Buttercup being particularly abundant. A small amount of Various-leaved Water-starwort *Callitriche platycarpa* was found in another part of the Brook, and Yellow Water-lily was occasional to the north-west.

Groups of trees close to the Brook often suppressed any wetland vegetation and there were shade species below these, such as Hedge Garlic *Alliaria petiolata* and Nipplewort *Lapsana communis*, together with ruderal plants including Watted Thistle *Carduus crispus*, Teasel and Bristly Oxtongue. Spear Thistle *Cirsium vulgare* was locally abundant higher on the banks, also locally frequent Hemlock.

A short way downstream from Lake 9, the golf course ended at the site of an old lane, now largely occupied by abundant Nettle. Past here were areas of close-mown amenity grassland with lines of young trees. Osier and Grey Willow were frequent alongside the Brook, mainly growing over abundant Nettle with occasional Russian Comfrey *Symphytum x uplandicum*.

The Hedgerow (SP74925627)

Did not meet the Wildlife Site criteria and has been removed from the LWS.

Non-botanical interest

Families of Moorhen were present on all lakes, with Coots breeding on the larger lakes. The weirs in the Brook provided feeding, if not breeding, habitat for Grey Wagtails, and there were small cliffs suitable for Kingfishers in the north-west.

Remnants of a crayfish with large red claws (Signal Crayfish?) were found on a rock in the brook.

There were at least three pairs of Green Woodpecker on the site. Occasional Grass Snakes were seen basking on the lake banks.

29/06/2005

This site was extended in 2005 to include the lakes in the east (former TT58 from SP752562 to SP757560), which have been included in this survey.

Site summary

The main interest for wildlife within the Golf Course are the lakes and brook and it is these that are included in the Local Wildlife Site boundaries. The lakes have been labelled 1 - 9 (from SE to NW) for the purpose of the survey and the centroid grid reference of each lake is listed below for the purposes of identification;

Lake 1; SP75535550, Lake 2; SP75425561, Lake 3; SP75705610, Lake 4; SP75575616, Lake 5; SP75425621, Lake 6; SP75265627, Lake 7; SP75145636, Lake 8; SP74675676, Lake 9; SP74355700

Quite a lot of exotic trees and shrubs had been planted along the brook, and the way Marsh Marigold *Caltha palustris* was regularly spaced along the brook and around the edge of the lakes suggests that this may have been planted too, perhaps along with some of the less expected plants such as Wood Clubrush *Scirpus sylvaticus*.

Lakes 3 to 7 were all directly connected and surveyed as one unit, the stream as another unit, and the other four lakes individually.

The line of tall trees along a drain, mentioned in the 1992 report, could not be identified.

The lakes were all similar in having quite steeply sloping edges below water-level, leaving space for only a narrow fringe of swamp and wetland vegetation in a sharply contracted transition from open water to dry grassland. This produced a very mixed vegetation with fragments of several swamp, mire and rush-pasture communities growing together, the main ones being S5 *Glyceria maxima* swamp, S12 *Typha latifolia* swamp, S14 *Sparganium erectum* swamp, S18 *Carex otrubae* swamp, S28 *Phalaris arundinacea* tall-herb fen, OV26 *Epilobium hirsutum* vegetation, M27 *Filipendula ulmaria*-*Angelica sylvestris* mire and MG10 *Holcus lanatus* - *Juncus effusus* rush-pasture.

The adjacent grassland was often tightly mown to the edges of the lakes, while the areas of rough were largely a species poor sward of abundant Perennial Rye-grass *Lolium perenne*, Red Fescue *Festuca rubra*, Yorkshire Fog *Holcus lanatus*, Smooth-stalked Meadow-grass *Poa pratensis* and Common Bent *Agrostis capillaris* about half a metre tall, although towards the edges of the lakes the grassland frequently held a scattering of herb species such as Meadow Vetchling *Lathyrus pratensis*, Lesser Stitchwort *Stellaria graminea* and Greater Bird's-foot Trefoil *Lotus uliginosus*.

Lake One

Lake one is in the extreme south of the golf course and fed from a nearby spring. This lake was very open with rare small Weeping Willows *Salix x sepulcralis* at the edge. Aquatics found here included a small area of All Potamogeton *pectinatus*-*Myriophyllum spicatum* vegetation.

The swamp fringe was up to one metre wide and almost continuous. Most abundant here were Great Willowherb *Epilobium hirsutum*, Yellow Iris *Iris pseudacorus* and Bulrush *Typha latifolia* with Water Mint *Mentha aquatica* being particularly abundant below, along with rarer plants of species such as Jointed Rush *Juncus articulatus*, Water Forget-me-not *Myosotis scorpioides* and Water Plantain *Alisma plantago-aquatica*. In the rough grassland on the eastern edge of the lake, there was locally abundant Bee Orchid *Ophrys apifera*.

Lake Two

A slightly smaller but otherwise similar lake with occasional shading from small White Willow *Salix alba*. Aquatics here included quite large areas of the A11 community and the A8 Nuphar *lutea* community. Lesser Bulrush *Typha angustifolia* was a little more frequent, while Water Mint was less so.

Lakes Three to Seven

These lakes were all directly connected to each other, with the brook running through them from south east to north west, the water being heavily coloured at the time of survey after rain. Lake three was heavily shaded on its southern edge by overhanging trees and tall shrubs but open to the north and east. Yellow Water-lily *Nuphar lutea* was locally abundant, along with Fennel-leaved Pondweed *Potamogeton pectinatus* and Unbranched Bur-reed *Sparganium emersum*. The swamp and wetland fringe on the open edges was between one and two metres wide, much narrower or absent in shade. Reed Sweet-grass *Glyceria maxima*, Bulrush and Meadowsweet *Filipendula ulmaria* were abundant, together with less abundant Square-stalked St John's-wort *Hypericum tetrapterum*, Water Figwort *Scrophularia auriculata* and Lesser Water-parsnip *Berula erecta* and rare Wood Club-rush *Scirpus sylvaticus*. Growing among the wetland vegetation were probable weed remnants from the lake excavation such as Bristly Ox-tongue *Picris echioides* and Wild Teasel *Dipsacus fullonum*. Species in the adjacent grassland included locally frequent Cat's-ear *Hypochoeris radicata*, Hedge Bedstraw *Galium mollugo* and Germander Speedwell *Veronica chamaedrys*.

Lakes four and five were similarly overhung by trees and shrubs to the south, where gardens ran down to the lake shore. Rigid Hornwort *Ceratophyllum demersum* was locally abundant in the water here, while the swamp fringe held locally abundant Yellow Iris, Meadowsweet, and *Angelica* *Angelica sylvestris* along the open northern edges, along with Water Figwort, Marsh Woundwort *Stachys palustris* and Gypsywort *Lycopus europaeus*.

Lake six was more open with steeper banks and frequent disturbed ground. The lake held an island, edged by continuous wooden piling, on which there was a golf green; and a new building was being constructed near the southern edge. This lake held locally abundant Yellow Water-lily and Amphibious Bistort *Persicaria amphibia*, but swamp plants were more scattered here, with more

species from the swamp understorey/water-margin vegetation such as Lesser Water-parsnip, Water Mint, Brooklime *Veronica beccabunga*, Fool's Water-cress *Apium nodiflorum*, Wavy Bittercress *Cardamine flexuosa* and Marsh Horsetail *Equisetum palustre*. Spiked Sedge *Carex spicata* was locally abundant in the less heavily managed grassland near the north-west corner of the lake.

Lake seven occurred on the western side of Winding Brook Lane and was used by a fishing club. The lake represented a narrowing from lake into brook. Unbranched Bur-reed and Branched Bur-reed *Sparganium erectum* occurred out in the water, while the swamp fringe varied from 0 to 3 metres in width and held the same selection of species found in this series of lakes.

These lakes were used by feeding Common Terns *Stirna hirundo*, while Mandarin Ducks *Aix galericulata* used the adjacent tall trees.

Lake 8

This lake had no connection to the brook and was very open with just occasional small trees of White Willow. Yellow Water-lily and White Water-lily *Nymphaea alba* were locally abundant on the water, together with some exotic lilies. The narrow swamp fringe here was more open than at other lakes, the taller species being less abundant and the smaller plants of the understorey or other swamp types more prominent. The banks were also less steep and water-level was often close to ground-level.

Marsh Marigold was again regularly spaced around the lake. There was locally frequent Lesser Bulrush, Hard Rush *Juncus inflexus*, Soft Rush *J. effusus* and Jointed Rush *J. articulatus* along with the usual mixture of smaller species such as Lesser Water-parsnip, Gypsywort and Square-stalked St. John's-wort. There were also bur-reed plants here that matched *S. erectum* in every way except that they were quite tiny. Unique to this lake were small areas of Spike-rush *Eleocharis palustris* and larger patches of abundant New Zealand Pygmyweed *Crassula helmsii*. The lake was often very low, particularly on the western edge where there were patches of sodden grassland with locally abundant Floating Sweet-grass *Glyceria fluitans*, Marsh Foxtail *Alopecurus geniculatus* and Creeping Bent *Agrostis stolonifera* similar to the MG13 *Agrostis stolonifera*-*Alopecurus geniculatus* grassland.

Lake 9

This lake was connected to the brook by a by-pass channel. It was very open with just rare shrubs at the edge.

The swamp fringe was about one metre wide with abundant Reed Canary-grass *Phalaris arundinacea*, Yellow Iris and Reed Sweet-grass. Marsh Marigold was regularly spaced around the lake and there was frequent Water Mint, Greater Bird's-foot Trefoil *Lotus uliginosus*, Square-stalked St. John's-wort, Gypsywort, Marsh Woundwort and others in the understorey. The adjacent grassland held Meadow Vetchling, Hoary Ragwort *Senecio erucifolius*, Red Clover *Trifolium pratense* and Ox-eye Daisy *Leucanthemum vulgare*.

The Brook

This covers the brook from where it leaves Lake 9, downstream to the north-west corner of the site. The brook was mainly 2-3 metres wide and ran down a series of weirs that resulted in slow and faster flowing sections. The weirs had largely become softened by swamp vegetation and occasionally could not even be seen.

The stream was in spate at the time of survey and no aquatics were seen. The main emergent vegetation was *Glyceria maxima* swamp, although there was also some Branched Bur-reed, Bulrush, Reed Canary-grass, and there was also a similar mix of understorey and water-margin vegetation as that found around the lakes. Marsh Marigold was regularly spaced along the edge and there was locally frequent Water Figwort and many others.

In the south there were formal gardens on the western side of the stream, while on the eastern side there were frequent tall, dense shrubs of the alien willow species Olive Willow *Salix eleagnos*, which often, and maybe deliberately, shaded out some of the swamp vegetation. The swamp in the stream here, which included the only stand of Greater Pond-sedge *Carex riparia* found during the survey, has to be sprayed out from time to time because it is thought to contribute to flooding of the adjacent gardens.

Further downstream, to the north of the gardens, and some tall shading Crack Willow *Salix fragilis*, the brook was more open, with more abundant swamp vegetation. The swamp was now becoming more colourful as Purple Loosestrife *Lythrum salicaria* and Marsh Woundwort became more abundant. Near Lake 8, the stream came to form the western boundary of the golf course and widened out for a short distance to produce a pool before dropping down a weir. To the west there was first a large arable field, followed by pasture land, and the brook now had a much more rural feel. The banks were now becoming rather higher and steeper, with occasional almost bare soil where liverworts were locally abundant. On the more formal golf course side there were occasional stands of tall trees, including Alder *Alnus glutinosa*, Italian Alder *Alnus cordata* and willows *Salix* species, as well as occasional Gorse bushes *Ulex europaeus*.

18/08/1992

A very large area of golf course with some existing features of interest and a series of created lakes which have some added species (not all of them native) and some semi-natural colonization. The Wootton brook runs through the site and has good water quality for most of this length. Species in and alongside the water include *Caltha palustris*, large patches of *Sparganium erectum*, *Alisma plantago-aquatica*, *Iris pseudoacorus*, *Scrophularia auriculata*, *Rorippa nasturtium-aquaticum*, *Phalaris arundinacea*, *Polygonum amphibium*, *Veronica beccabunga*, *Mentha aquatica*, *Juncus articulatus* and *J. effusus*. There are areas of brook which have been landscaped into steps and riffles, and these have probably had species added (these have not been counted in the above list). Whilst gross, the landscaping probably has the effect of increasing the oxygen level of the brook. The banks of the brook are largely open, with dotted *Salix* spp. and hawthorns which may have been planted.

As the course of the brook turns to cross the golf course the watercourse widens and is subject to a lot more landscaping. On the rocks of the man-made borders to this stretch the vegetation is a somewhat bizarre mix of natural colonizing species and garden varieties. Of these it appears that *Cirsium palustre*, *Ranunculus sceleratus*, *Veronica beccabunga*, *Lythrum salicaria*, *Myosotis scorpioides*, *Lycopus europaea*, *Scrophularia auriculata*, *Conyza canadensis*, *Chamaerion angustifolium* and possibly a single plant of the rare *Verbascum lychnitis* (on the rocks at the edge of the water - undoubtedly a casual) appear to have arrived through natural means.

The lakes at the northwest end of the golf course seem to be better established than the very new lakes at the south end. As well as a variety of incongruous garden species the lakes have colonized with *Typha latifolia*, *Juncus inflexus*, *Salix fragilis*, *Lythrum salicaria*, *Lycopus europaea* and *Ranunculus repens*.

All the water areas attract a large number of damselflies and dragonflies and could repay an earlier survey to ascertain their numbers and identity more exactly.

To the south of the road to the club house the lakes are so new that they have very little vegetation and cannot yet be considered good enough habitat for a Prime Site even in this urban area.

The hedge at the centre of the northwest end of the site joins onto another, probably of the same origin, leading to the club house. Both are alongside the public footpath and have a good diversity of woody species including oak, ash, field maple, blackthorn, cherry, wych elm, buckthorn, hornbeam, horse chestnut, field rose, midland hawthorn, hawthorn, crab apple and a small amount of planting eg of Oregon grape at the southern end near the Club House.

One other corridor crosses the course and is included as it links the brook and the hedge. This is the line of tall, mature trees along a drain which bounds waste ground near the centre of the site. The brook has dense emergent species and Odonata activity, and is relatively undisturbed compared to the rest of the area, so provides a valuable habitat for wildlife.

These habitats are all worth monitoring as they could well improve with time, especially the lakes - provided the golf course management do not oust the native colonizing species in favour of more garden and amenity plants.

Boundary Changes

23/07/2010 This site was extended in 2005 to include the lakes to the east (former TT58 from SP752562 to SP757560), which were all included in the 2005 survey
02/05/2013 Original site centroid changed from SP750565 to SP749564
02/12/2014 Removed two ponds (pond 2 SP75425561 and 8 SP74675676) and hedgerow (SP74925627) as didn't meet LWS standard. Also removed furthest west section of stream which is beyond the golf course.

Map:



Duston Mill Fields South

Administrative areas: Northampton(E District (74-))

Status(es): PWS

Centroid: SP729591 (Site Centroid)

Site type: Site

File code: N1219

Site/Subsite hierarchy: **Duston Mill Fields South**

Description: 2005 Survey

This field is part of one of the fields in Duston Mill Fields. This part of the field is lower-lying and wetter. The drain is species-rich with the following species: *Angelica sylvestris*, *Apium nodiflorum*, *Carex riparia*, *Carex riparia*, *Filipendula ulmaria*, *Glyceria maxima*, *Juncus effuses*, *Juncus inflexus*, *Lythrum salicaria*, *Mentha aquatica*, *Phalaris arundinacea*, *Scrophularia auriculata*, *Sparganium erectum*, *Sonchus arvensis* and *Typha latifolia*.

The species diversity gradually decreases moving north-wards along the drain.

The grassland between the drain and the canal bank is marshy and was flooded at the time of the site visit. The following species were recorded in a brief look: *Carex hirta*, *Epilobium hirsutum*, *Lotus pedunculatus*, *Potentilla anserina* and *Rumex acetosa*.

Further survey is required to confirm whether this site qualifies as a CWS for both the drain and the marshy grassland.

Total number of records: 29

Total number of species: 29

Site Name: Grand Union Canal - Northampton Arm

Site Code: S561

Status: LWS

Other Designations: Nene Valley NIA

Grid Reference: SP724581

Area (ha): 12.7

District: South Northamptonshire

Site History:

06/09/1991 LWS

06/07/2007 LWS

Habitats present

Broad Habitat: Wetland

BAP Habitat: Rivers

Reason for Designation:

A good section of canal for wildlife with good marginal vegetation and some interest in the grassland. The site qualifies as a LWS with 16 wetland and 18 neutral grassland indicator species recorded in the swamp and grassland vegetation. In addition stonewort species and several counties rarities were also recorded (Narrow-leaved water-plantain (*Alisma lanceolatum*), hemlock water-dropwort (*Oenanthe crocata*), long-stalked pondweed (*Potamogeton praelongus*), knotted pearlwort (*Sagina nodosa*)).

Site Description:

22/06/2005

This branch of the canal was surveyed from the canal towpath, part of a long-distance public footpath.

This arm of the canal runs from the main canal near Gayton to join the river Nene near the centre of Northampton. It is less heavily used than the main canal, but a steady stream of boats was passing along it during the survey. A large selection of aquatic, swamp and grassland plants was found, the most notable being the county rarities Hemlock Water-dropwort *Oenanthe crocata* and Long-stalked Pondweed *Potamogeton praelongus*; the county occasionals Fan-leaved Water-crowfoot *Ranunculus circinatus* and Grass-wrack Pondweed *Potamogeton compressus*.

Gayton marina lies at the southern end of the site, while the Northampton end was being redeveloped at the time of the survey with blocks of flats springing up immediately adjacent to the canal. The towpath is on the eastern side of the canal and was well used by fishermen during the survey, pedestrians and cyclists, while on the much less accessible western side occurs undisturbed swamp that was being used by breeding birds such as Sedge Warblers *Acrocephalus schoenobaenus*. Shrubs, mainly Hawthorn *Crataegus monogyna*, frequently overhang the canal, and this habitat has been shown to be important for nesting and roosting birds.

Immediately north of the Gayton marina a narrow strip of swamp vegetation frequently flanks either side of the canal, this occasionally broadens out to wider areas of swamp in places such as passing bays in the lock flight; but with swamp occasionally being absent where the bank had been strengthened. The swamp vegetation is very mixed with sedges *Carex* spp., Reed Sweet-grass *Glyceria maxima*, Common Bulrush *Typha latifolia* and Bur-reeds *Sparganium erectum* Branched Bur-reed and *S. emersum* Unbranched Bur-reed forming a canopy beneath which plants such as Meadow Vetchling *Lathyrus pratensis* and Water Forget-me-not *Myosotis scorpioides* grew. Often the gradation from path to swamp is so narrow that weed, grassland and even woodland species such as Hedge Woundwort *Stachys sylvatica* grew among the swamp plants. Towards Northampton, some

taller swamp in the form of quite large patches of Common Reed *Phragmites australis* and smaller areas of Common Clubrush *Schoenoplectus lacustris* occur.

The water is quite turbid at both ends with few aquatics to be seen, although there are occasional patches of locally abundant Arrowhead *Sagittaria sagittifolia* and emergent Water Horsetail *Equisetum fluviatile*. In the lower parts of the lock flight though, and perhaps due to the constant flushing as water pours down the overflow channels bypassing the locks, there is much clearer water where it was possible to see Stoneworts growing on the canal bottom. Also growing here were locally frequent Fennel Pondweed *Potamogeton pectinatus*, along with rarer but locally abundant plants of Grass-wrack Pondweed and Long-stalked Pondweed. The fast flowing overflow channels attracted feeding Grey Wagtails.

The well-trodden canal towpath was mainly close mown, occasionally made up of hardcore or metalled. Where mowing had been less frequent, a form of MG6 grassland with frequent Crested Dog's-tail *Cynosurus cristatus* and Perennial Ryegrass *Lolium perenne* occurred, or this had succeeded to MG1 grassland with abundant False Oat-grass *Arrhenatherum elatius* and Cock's foot *Dactylis glomerata*. In the area of the lock flight, the wider areas of grassland had been tightly mown but taller and flowering plants of many grassland herbs were present at the very edges of the canal. These included several associated with neutral to calcareous grassland such as Bird's-foot Trefoil *Lotus corniculatus*, Fairy Flax *Linum catharticum*, Rough Hawkbit *Leontodon hispidus*, Greater Knapweed *Centaurea scabiosa*, Meadow Oat-grass *Helictotrichon pratense*, Sheep's Fescue *Festuca ovina*, Lady's Bedstraw *Galium verum* and Glaucous Sedge *Carex flacca*.

The brickwork of the locks provided a niche for Wall-rue *Asplenium ruta-muraria* and Black Spleenwort *Asplenium adiantum-nigrum*, as well as some less expected plants such as Lesser Water-parsnip *Berula erecta* and Hairy Sedge *Carex hirta*. Abundant dragonflies and damselflies were seen during the survey.

Other notable species found: Fan-leaved Water-crowfoot and Grass-wrack Pondweed which is described in *Aquatic Plants in Britain and Ireland* (Preston and Croft 1997) as one of the most threatened pondweeds, in need of positive conservation measures to prevent extreme rarity or extinction. The identity of Grass-wrack Pondweed was confirmed by Alex Lockton. At this site the plant was growing in a situation similar to one of its typical habitats in the Montgomery arm of the Shropshire Grand Union Canal, as described in *Aquatic Plants in Britain and Ireland*: "growing in clear, moderately deep water, often in aqueducts or other places where the flow is accelerated".

06/09/1991

This narrow arm of the Grand Union connects the main Grand Union Canal with the River Nene via Northampton City. Despite its usefulness as a throughfare the locks are neglected and frequently stopped and the waterway at the city end has litter hazards and rampant aquatic vegetation; on the whole it seems the waterway is not used. The Milton Malsor/Gayton end is much better maintained. NB, 17 locks drop this canal from 100m to 61m; the Nene end is 60m. From south to north:

1. A marina at Gayton is the start of the arm. After the main mooring areas the canal is well hedged up to the Milton Malsor lock house. All the mooring areas along this part seem to have caused less loss of emergent vegetation than might have been expected.
2. Milton Malsor locks (a short flight) have mown paths, tended by the lock-keeper. A broad strip of emergent vegetation on the east side contains *Lythrum salicaria*, *Carex riparia*, *Mentha aquatica*, *Sparganium ramosum*, *Impatiens capensis*, *Stachys palustris* and most of the species commonly found in emergent canal habitats. The structure of Glyceria maxima swamp - *Carex riparia* - *Iris* and *Sparganium* - shorter herbs - meadow species is one of the best examples of canalside vegetation forming a distinctive, consistent habitat of graded vegetation. Coots, moorhens, common frogs, common newts and a variety of Odonata were using this habitat during the time of the survey. The west side of the canal has a patchy hawthorn hedge and tall emergent herbage, providing a variety of habitats in combination with the east bank.
3. This staircase/series of locks leads down to the bridge over the M1 where the short wooded section of western bank gives way to fields. Here both edges of the canal have a 2-3m strip of emergent

vegetation. The west is mostly dominated by *Carex riparia*, *Sparganium* sp. or *Glyceria maxima*. East banks have more variety including frequent *Rumex hydrolapathum*. The east (towpath) side has a tall hedge for part of the stretch.

4. From the lock south of the A45 (Hunsbury roundabout) and Rothersthorpe Road bridge, the canal narrows slightly. The hedges are taller, the emergent vegetation slightly narrower but more varied. The west edge borders a strip of rough pasture. The thick fringes of emergent vegetation are dominated by *Typha angustifolia*, *Carex acutiformis*, *Glyceria maxima* (east bank) and *Sparganium* and *Glyceria* (west bank). This area is heavily fished, the path gravelled for easier access.

5. The canal on either side of the A45 bridge is more or less the most varied for both Odonata and plants. *Aeshna mixta* and *A. grandis* both breeding, both very common here. Emergent and submerged vegetation includes *Valeriana officinalis*, abundant *Sagittaria sagittifolia*, *Nuphar lutea* (occasional along most of the arm), *Alisma lanceolata* (county rarity), *A. plantago-aquatica*, *Impatiens capensis* and all the species mentioned above. The lack of boat traffic and necessarily low speed of passing craft have probably greatly benefitted the submerged vegetation and emergent fringe respectively.

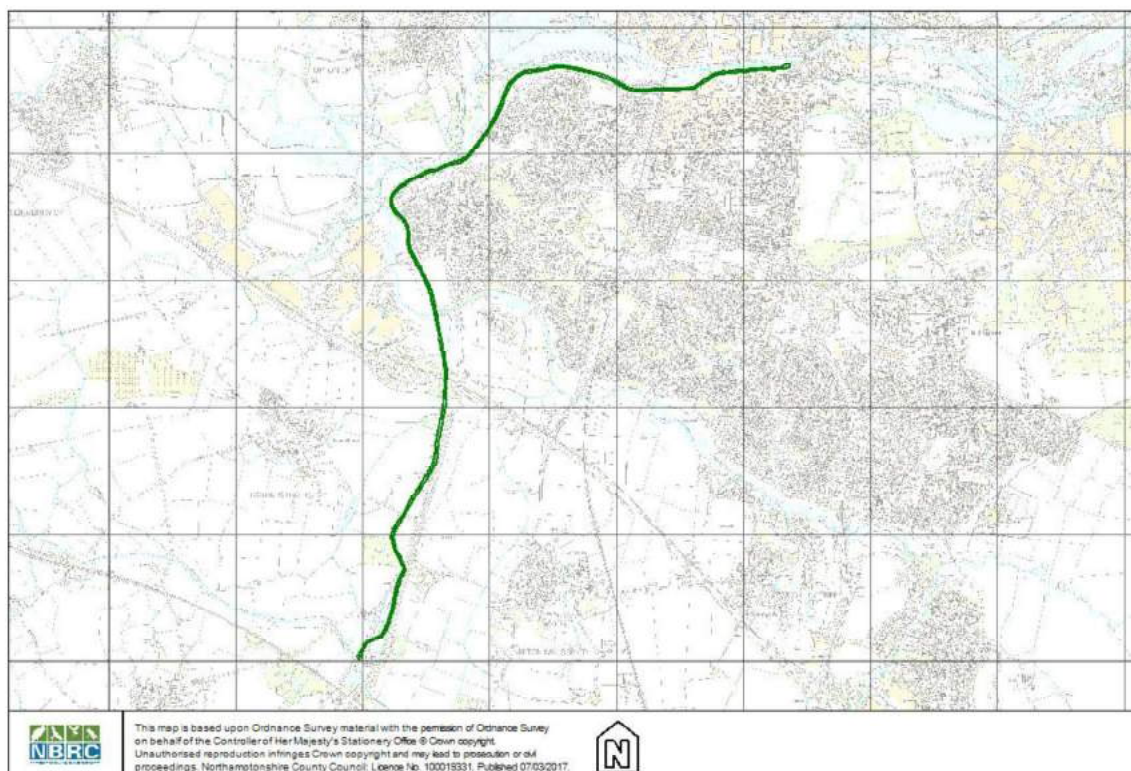
6. Blackwood Hodge works - Cotton End. Most of the vegetation is good, but litter and pollution are a problem especially by the factories leading up to Cotton End. A broad 'bay' of *Glyceria maxima* fringes the end of the canal just before the river.

This arm of the Grand Union Canal has the best diversity of common aquatic and submerged species of all the canals in Northants - although it lacks the one-off rarities of the Crick stretch. One county rarity, *Alisma lanceolata*, is present although in small numbers. Increased boat traffic is likely in a year or so, following which the flora may be adversely affected. Until then the present level of management seems to suit the site although the mowing around locks is too heavy to encourage meadow species. Partially dredged 1994-95.

Boundary Changes

18/11/2015 Site extends from SP720550 to SP754596. Site centroid changed to SP724581.

Map:



Site Name: Hunsbury Hill Country Park

Site Code: N810

Status: LWS

Other Designations: Local Geological Site, Nene Valley NIA

Grid Reference: SP737582

Area (ha): 38.5

District: Northampton

Site History:

31/08/2007 LWS

18/10/2011 LWS

Habitats present

Broad Habitat: Grassland, Woodland

BAP Habitat: Lowland Dry Acid Grassland, Lowland Meadow

Reason for Designation:

The site originally qualified as an LWS under the woodland criteria. The grasslands were the focus of this survey and provide a useful habitat alongside the woodland. The site should therefore be retained as a LWS until it is next fully surveyed.

Site Description:

13/07/2011

A country park on the outskirts of Northampton, the site contains a mixture of grassland and woodland habitats and is well used by the local public. Much of the grassland is species poor amenity grassland. This survey focussed on the grassland areas of interest as identified in previous surveys.

Meadow 1 (SP736585)

A species poor unmanaged meadow, which was very dry at the time of the survey with few herbs recorded, with the exception of frequent ribwort plantain *Plantago lanceolata*, yarrow *Achillea millefolium* and upright hedge parsley *Torilis japonica*. The grass sward is dominated by cocks-foot *Dactylis glomerata*, false oat-grass *Arrhenatherum elatius* and creeping bent *Agrostis stolonifera* and there are frequent hawthorn *Crataegus monogyna* saplings across the site. Overall the grassland is tussocky with a build-up of thatch below.

To the centre of the site there is abundant creeping cinquefoil *Potentilla reptans*, common vetch *Vicia sativa* and hairy tare *Vicia hirsuta* as well as frequent hawthorn scrub. There is increased rabbit grazing along the east and south boundaries causing a much shorter and species rich sward. Within this was abundant sheep's sorrel *Rumex acetosella* and mouse-ear hawkweed *Pilosella officinarum*, suggesting the overall site could increase in diversity should appropriate management be introduced.

Tall ruderal vegetation was frequent around most of the boundary including rosebay willowherb *Chamerion angustifolium* and nettle *Urtica dioica*.

To the east of the field ragwort *Senecio jacobaea* and yarrow *Achillea millefolium* becomes much more abundant.

The site is bounded by the railway line on all sides, between which is a (non-stockproof) post and wire fence. There is plenty of birdsong from the surrounding trees which line the railway line, predominantly oak *Quercus robur* and hawthorn.

A large number of grasshoppers, crickets, spiders, butterflies and moths were recorded across the field as well as common blue damselflies *Enallagma cyathigerum*. A large number of small skippers

Thymelicus sylvestris and meadow browns *Maniola jurtina* were recorded, as well as a hawk dragonfly.

Meadow 2 (SP739585)

This grassland has a little more interest than the surrounding amenity grassland, with rabbit grazing providing a variety of shorter and longer grassland areas. There were fairly frequent herbs including creeping buttercup *Ranunculus repens*, common mouse-ear *Cerastium fontanum*, lesser stitchwort *Stellaria graminea*, white clover *Trifolium repens* and germander speedwell *Veronica chamaedrys*. Dock *Rumex obtusifolius* and ragwort *Senecio jacobaea* were occasional. The areas of longer grassland were very species poor, with frequent false-oat grass *Arrhenatherum elatius*.

Fort grassland (SP738584)

This is a short rabbit grazed grassland, with frequent herbs including creeping buttercup, white clover and selfheal *Prunella vulgaris*. Slender speedwell *Veronica filiformis* and thyme-leaved speedwell *Veronica serpyllifolia* are also fairly frequent across the site alongside common mouse-ear and lesser stitchwort. There were occasional patches of ragwort and spear thistle *Cirsium vulgare* but the grassland was generally controlled by rabbit grazing. The grassland is surrounded by steep embankments with developing woodland, predominantly oak, ash and hawthorn with bare ground beneath. The grassland margins have a thin boundary of tall ruderal vegetation. There are anthills to the eastern side of the grassland.

Woodland

The main woodland area is planted woodland with dense lines of sycamore, norway maple and silver birch, with little growing beneath. There is more natural woodland along the path edges and scattered across the site, with frequent large oak, and ash with typical hedgerow species below.

28/05/2009

The park is currently recognised as a Local Wildlife Site. This means that it has been identified as being of county importance for biodiversity. The park was last surveyed in detail in 2005 by a Wildlife Trust surveyor.

The walkover survey carried out on 28th May sought to update the previous survey information and to identify any opportunities for improved management of the park for biodiversity. A full species list was not produced.

The key habitats on the park are acid grassland, lowland meadow and woodland. All of these are UK and Northamptonshire Biodiversity Action Plan habitats. The most significant of these is acid grassland as this habitat has a restricted range in Northamptonshire. The acid grasslands on the site appeared to be the most botanically diverse from a quick glance. The true value of each of these habitats should be identified through detailed botanical surveying.

The combination of woodland and grassland habitats makes the site good for birds, but as yet this value is un-quantified. It will be of benefit for a bird survey to be carried out on the park in order to help inform the ecological management plan.

Short mown and rabbit grazed grasslands:

The grasslands to the south and south-east of the fort, and on the fort itself appeared to have formed on acidic sandy soils, which overlay ironstone rock. Some of these areas are being mown and others are being grazed heavily by rabbits. The turf is short and a number of plant species are evident such as germander speedwell, lesser stitchwort and small leaved crane's-bill(?).

The habitat provided in these areas is of county significance, and is currently being fairly well maintained by the rabbits. Ideally the intensive mowing of some areas should be stopped or reduced to allow more plant species to flower and reproduce.

Scrub and ragwort may need controlling periodically on these areas of grassland to prevent loss of the diverse open habitat.

Lowland meadow habitat:

Areas of meadow-like habitat occur to the east of the fort and within the circular railway track.

The grassland within the railway track appears to have developed on sandy soil but the vegetation has been allowed to grow taller, resembling a meadow. This area of grassland is fairly diverse, and on the day of the walk over was full of butterflies and damselflies. This area would benefit from being managed as a meadow or from being grazed over winter. There is currently a layer of dead plant material on the ground beneath this year's growth which should be removed by grazing or cutting and raking. More detailed survey work is required to determine the most appropriate method of management of this area.

To the east of the fort the grassland appears more nutrient rich and is dominated by rye grass and creeping buttercup. The botanical diversity of this area is currently lower than other grasslands on the site. Long term management of this area as a hay meadow would encourage more wild flower species to colonise and grow here. In the long term the area could be seeded with wildflower seeds to increase the diversity artificially. The management of this area could be combined with development into an area of traditional parkland, with native trees such as oak planted in it.

Tall ruderal:

The area of tall vegetation around the school would mainly be classed as tall ruderal, with some pockets of grassland. This area has obviously remained uncut and ungrazed for many years. Although the area is dominated by common 'weed' species such as thistle, bramble, nettle and rosebay willowherb, it will still be providing food for insects and birds. The long term management of this area will take some thought.

Depending on the hydrology of this area it may be a good candidate for creation of a pond/s. Open water is fairly scarce on the site, so adding a new water feature will be of benefit to the diversity. Guidelines on pond creation should be taken from Pond Conservation.

Woodlands:

There are no true areas of semi-natural woodland on the site. However, there are areas of dense sycamore and silver birch plantation, narrow strips of non-native tree plantation, and sections such as the green lane which may have historic origins of woodland, but are now very narrow linear features containing mature trees, remnant hedgerows and scrub.

The existing 'woodland' areas of the park do not have a typical woodland structure and contain very limited ground flora, although over the entire area of the park 45 woodland species were recorded in 2005.

There is potential to restore a more natural structure and species composition to the plantations between the fort and the circular railway. This could be achieved by significantly thinning the plantations and then planting native shrubs and trees in some of the cleared areas. The aim should be for a W10 woodland (National Vegetation Classification), of pedunculate oak, silver birch, and hazel, with small amounts of holly, wild cherry and crab apple. Bramble, bracken, honey suckle, wood anemone and bluebell are all typical species that might naturally recolonise. A felling license is probably required for this work due to the significant amount of timber to be removed. The work may also be applicable for a grant through the English Woodland Grant Scheme administered by the Forestry Commission.

Work on the tree belts and other areas of woodland should be informed by the bird survey.

Ironstone Gullet:

The Ironstone gullet is part of the Wildlife Site and also a Regionally Important Geological Site. The management of this should take place in consultation with the Northamptonshire RIGS group. Initial suggestions for the management of this area for wildlife would be to thin some of the bramble that is covering the rock face and to improve the ponds.

The ponds are heavily shaded and full of leaf matter and rubbish. Clearing out the litter and leaves should expose more open water. In order to maintain the open water the overhanging trees should be thinned to reduce shading.

Annual cutting back of the nettles along the base of the gullet will open up access and encourage less vigorous plant species to grow.

Green Lane:

The green lane shows remnants of old hedgerows including some mature ash and oak trees. In between the hedgerows are areas of scrub, tall grasses and ruderal vegetation, and short mown grass strips along the path. Garden plant species have spread into some sections of the green lane.

Removal of the non-native garden plants will be beneficial as these can have a tendency to dominate over native vegetation.

In the 2005 survey changing forget-me-not, which is uncommon in Northamptonshire, was found at the eastern end of the green lane past the fort. This plant likes dry, open grassland on sandy soils, which occur in and around the fort and on some of the grasslands in the park.

The hedges bordering the green lane would benefit from being properly identified, gaps replanted with appropriate species, and then sections layed each year. Laying the hedges will prolong their lives and will maintain a more bushy growth which benefits bird and mammal species.

There has been concern that older trees are being felled but no provision is being made for their replacement in time. Young saplings of certainly ash were present along the green lane, and oak may also be present. Some of these saplings should be protected from cutting so that they can grow to become the next generation of mature trees. A selection of young trees of various ages should be selected so that they mature at different stages.

Less frequent cutting of the grass along the path will benefit wildflowers as it will give them more opportunity to flower and this will provide food for insects.

Boundary Changes

04/05/2016 This site was formed following the 2005 survey by merging four LWS: Hunsbury Green Lane, Hunsbury Hill Country Park subsite, Hunsbury Ironstone Gullet and Hunsbury Ironstone Railway.

Related Site Information

Hunsbury Hill Country Park subsite, Historical
Hunsbury Ironstone Railway, Historical
Hunsbury Ironstone Gullet, Historical
Hunsbury Green Lane, Historical

Hunsbury Hill Country Park subsite (SP737584)
18/08/1992

A large and mixed area, with the main wildlife habitats concentrated in the areas of woodland and the old mineral railway line cutting (see Site 182 details). The open spaces of the park are mown grassland, around which there are various clumps of trees and patches of more established woodland. Species in the woodland include ash, English oak, common lime, field maple, Scots pine, cherry, sycamore, horse chestnut, hawthorn and midland hawthorn, grey and white poplars, holly, field and dog rose, Norway maple and frequent birch. Some of the clumps of trees have plainly been planted but the larger areas have a semi-natural rather than plantation appearance, and may be a combination of the two. Small paths run in between the denser areas of trees and as a whole the parts in between are very undisturbed, although susceptible to occasional dog disturbance. Groundflora in the woods varies from quite rank to bare litter with scattered species such as *Geum urbanum*, *Alliaria petiolata*, *Rubus* agg. and *Glechoma hederacea*. The main value of the areas is for

birds, of which there seems to be a good diversity, with lots of nests in the trees and scrub. Most of these are likely to be common species which have few other habitats in the surrounding built-up area. Thrush, blackbird, green woodpecker, stock dove, wren, hedge sparrow, magpie, chaffinch and coal tit were identified at the time of survey. A site which would not normally be notified unless of prime habitat importance within an urban area. The area is heavily used but has a good level of cover, particularly for birds. Management is already carried out but the habitat value would probably benefit from some thought for the wildlife as well as the amenity value.

01/08/2005

Hunsbury Hill Country Park is largely land that was landscaped after being quarried for ironstone and its main feature was areas of closely mown grassland enclosed by plantations of tall young trees and shrubs, beneath which there was often little vegetation. The mown areas were also grazed by quite large numbers of rabbits. A relatively small area of undulating ground had escaped landscaping and had once been fenced off, and this showed a natural colonisation by shrubs and young trees, mainly Common Hawthorn *Crataegus monogyna* and Ash *Fraxinus excelsior*. The park also included an iron-age hillfort, most of the centre of which had been lowered by past quarrying, but which retained a still quite impressive outer bank and ditch. The ditch held very little vegetation, the ground being disturbed by cyclists and rabbits and the banks being undermined by the roots of abundant trees and shrubs.

Not all the grassland was close mown though. The field enclosed by the circuit of the ironstone railway had a sward about 0.75 metres tall with abundant Perennial Rye-grass *Lolium perenne*, together with plants such as Ribwort Plantain *Plantago lanceolata*, Lesser Trefoil *Trifolium dubium*, and Cat's-ear *Hypochoeris radicata*. The other main grasses are Yorkshire Fog *Holcus lanatus*, Common Bent *Agrostis capillaris* and Timothy *Phleum pratense*. To the east of this, land around the school was largely much coarser MG1 Arrhenatherum *elatus* grassland up to two metres tall. Common Nettle *Urtica dioica*, Rosebay Willowherb *Chamerion angustifolium*, Creeping Thistle *Cirsium arvense* and Cow Parsley *Anthriscus sylvestris* were all locally abundant, and there were also patches of Tansy *Tanacetum vulgare* and Wood Small-reed *Calamagrostis epigejos*. Parts of this area were being colonised by Bramble *Rubus fruticosus* agg., Common Hawthorn and Grey Willow *Salix caprea*.

The plantation woodlands were largely in the range 10 to 15 metres tall, mostly with bare ground below but also with locally abundant Wood Avens *Geum urbanum*, Garlic Mustard *Alliaria petiolata* and Cow Parsley. Tree species were a rich mix of native and exotic species and included False Acacia *Robinia pseudo-acacia*, Turkey Oak *Quercus cerris* and Caucasian Lime *Tilia x euchlora*. Some of the plantations were being colonised by a shrub layer of locally frequent Elder *Sambucus nigra* and there were at least two active Sparrowhawk *Accipiter nisus* nests at the time of survey. There were occasional seedlings of Pedunculate Oak *Quercus robur* in less intensely managed grassland.

Hunsbury Ironstone Railway (SP736582)

18/08/1992

A long, curved railway cutting which used to be the Hunsbury mineral railway line, then lay unused for years, and now is being reinstated as a railway line for enthusiasts. The track has been replaced, and is on loose clinker which does not seem to have had much vegetation on it. The rocky sides of the cutting however are well-vegetated with a wide variety of tree and scrub species. Further to the east the line has grassier vegetation with ruderal, meadow and rock colonizing species on either side of the track. At the country park end the species include *Rosa* sp., *Acer pseudoplatanus*, *Tilia europaea*, *Fraxinus excelsior*, *Quercus robur*, *Aesculus hippocastanum*, *Salix* spp., frequent *Betula pendula* and patches of *Rubus fruticosus*. The south and east of the site has a dense hawthorn hedge along each side with additional species such as *Rosa arvensis*, *R. rugosa*, *Sambucus nigra*, *Crataegus laevigata*, *Acer campestre* and *Prunus spinosa*. Below the hedges on the banks of the cutting the vegetation is a mixture of tall grasses and colonizing species, with some meadow herbs starting to appear. These include *Centaurea nigra*, *Solidago canadensis*, *Leucanthemum vulgare*, *Chamaerion angustifolium*, *Arrhenatherum elatius*, *Anthriscus sylvestris*, *Erigeron acer*, *Lotus corniculatus* and a mixture of other species not often found growing together. Because of the large amount of flowers in bloom this end of the line attracts insects including beetles, hoverflies and peacock, red admiral, large white, orange tip, large skipper and small tortoiseshell butterflies. A site that is changing and will follow a fairly rapid

succession (not necessarily for the worse) if left unmanaged. It would probably benefit wildlife if some effort was made to keep the grassier areas open for the benefit of butterflies and other insects.

01/08/2005

This site was a part of the Hunsbury Hill Country Park complex and comprised a single track railway, with rolling stock, workshops etc protected within a secure area near the car park. There was a small circuit with a much longer extension to the south-east, where there was a short stretch of double track that could be used as a passing place. Much of the track had older, rusting rails on rotting wooden sleepers, while parts were being replaced by new rails on wooden or concrete sleepers. Newer parts of the track had been cleared recently and had few plants, while older parts were a little more interesting. The track was often in a shallow cutting that had open parts and occasional rock exposures, and which also ran through woodland and between overhanging trees and shrubs.

The most interesting part of the site botanically was the wider and more open eastern end of the track. Here there were coarse areas with locally abundant Rosebay Willowherb *Chamerion angustifolium*, Common Nettle *Urtica dioica* and Creeping Thistle *Cirsium arvense*, but there was also locally abundant Toadflax *Linaria vulgaris*, White Campion *Silene latifolia* alba, Hare's-foot Clover *Trifolium arvense* and Black Medick *Medicago lupulina* and there was abundant insect activity here.

Hunsbury Ironstone Gullet (SP739581)

18/08/1992

A deep gullet running parallel to the south of the now-reinstated Hunsbury mineral railway. Much of the sides of the gullet have exposed rock with occasional trees growing out of the rock and a liana effect from roots and climbing species. This results in shaded stretches with more scrub but less overall diversity. The central track is mostly bare and used as a public footpath and by children for games. There is also a small amount of tipping, mostly of larger items. On the grassier slopes the plants include *Achillea millefolium*, *Pilosella officinalis*, *Leucanthemum vulgare* and *Hypericum perforatum*. *Pteridium aquilinum* is occasional along the site. The central section of the gullet is flooded and supports a fair diversity of emergent species, especially considering the heavy use of the area and the prevalence of litter. Species include *Lemna minor*, *Solanum dulcamara*, *Typha latifolia*, *Juncus effusus*, *Equisetum palustre*, *Epilobium hirsutum* and *Salix* spp. The pool attracts Odonata; Aeshna mixta dragonflies were seen at the time of survey. This site now acts as the main habitat corridor through a now completely built-up area. Seems to be surviving the large amount of disturbance without too much cost to the wildlife. It is only the pool which is likely to benefit greatly from any management in the near future.

01/08/2005

This site was a part of the Hunsbury Hill Country Park complex and was a long narrow strip of much lower ground with a steep cliff-face on the northern side and a mainly less severe slope to the south. The gullet was shallowest in the west, becoming deeper to the east, and much of it was occupied by trees and shrubs, these including some quite large Pedunculate Oak *Quercus robur* and Ash *Fraxinus excelsior*, some of which grew as multiple-stemmed re-growth from large coppice stools. Male Fern *Dryopteris filix-mas* was frequent in these shaded areas, along with a selection of commoner woodland species and very locally abundant Polypody *Polypodium vulgare*. Less heavily shaded areas held locally abundant Common Nettle *Urtica dioica* and Cleavers *Galium aparine*.

The rock exposure of the cliff-face was often obscured by sprawling Bramble *Rubus fruticosus* agg. and Ivy *Hedera helix*, but more open parts held some tiny plants such species as Ribwort Plantain *Plantago lanceolata* and Nipplewort *Lapsana communis*, along with locally frequent mosses and a few plants of a Hawkweed *Hieracium* agg..

The eastern third of the gullet was flooded at the time of survey as a strip of water 2 to 4 metres wide. This was often shaded by shrubs, mainly Grey Willow *Salix cinerea*, but there was locally abundant Common Duckweed *Lemna minor*, as well as some Bulrush *Typha latifolia*, Bittersweet *Solanum dulcamara*, Creeping Bent *Agrostis stolonifera* and Great Willowherb *Epilobium hirsutum*.

An informal footpath ran through the gullet, and this continued to the north as a 'sunken lane' that followed the course of the railway track to the main country park carpark. This was overhung by tall shrubs and small trees beneath which there was often bare ground or a carpet of Ivy. A scattering of

shade species included Foxglove *Digitalis purpurea*, Lords-and-Ladies *Arum maculatum*, Hedge Woundwort *Stachys sylvatica*, Ground Ivy *Glechoma hederacea* and others.

Hunsbury Green Lane (SP734583)

18/08/1992

A very long stretch of green lane running through the now-built up area of Hunsbury, south of the country park. There is a tall, mature hedgerow for all of the length of the lane, with additional planting, mostly of native species, along the way. The track is now a public footpath and is rarely used by vehicles. Some areas are bare track with hedge on either side, but there are also broad grassy verges and a broader strip of grassland at the east end of the lane. The hedgerow species are very varied and include mature oak, ash, wych elm, field maple, English elm, dogrose and crab apple. Scrub species are at a variety of ages and include hawthorn, blackthorn, hazel, goat willow, elder and a large patch of wild raspberry for a short stretch of the lane. Planted trees include ash, rowan, cherry, oak, field maple, beech and some ornamental *Eucalyptus* sp. Part of the west end of the lane has escaped Russian vine. The broad grassland at the east end of the lane is quite short but has a greater diversity of herb species than might be expected, including *Hypochoeris radicata*, *Bellis perennis*, *Taraxacum* agg., *Centaurea nigra* and *Prunella vulgaris*. This area was covered with feeding rabbits despite it being midday, and appears to be virtually undisturbed despite not being particularly secluded. A very valuable corridor for wildlife which has had some recent management and seems to be well cared for. The verges of the lane, where they are grassy, would benefit from a different cutting regime to encourage a wider diversity of plants.

25/07/2005

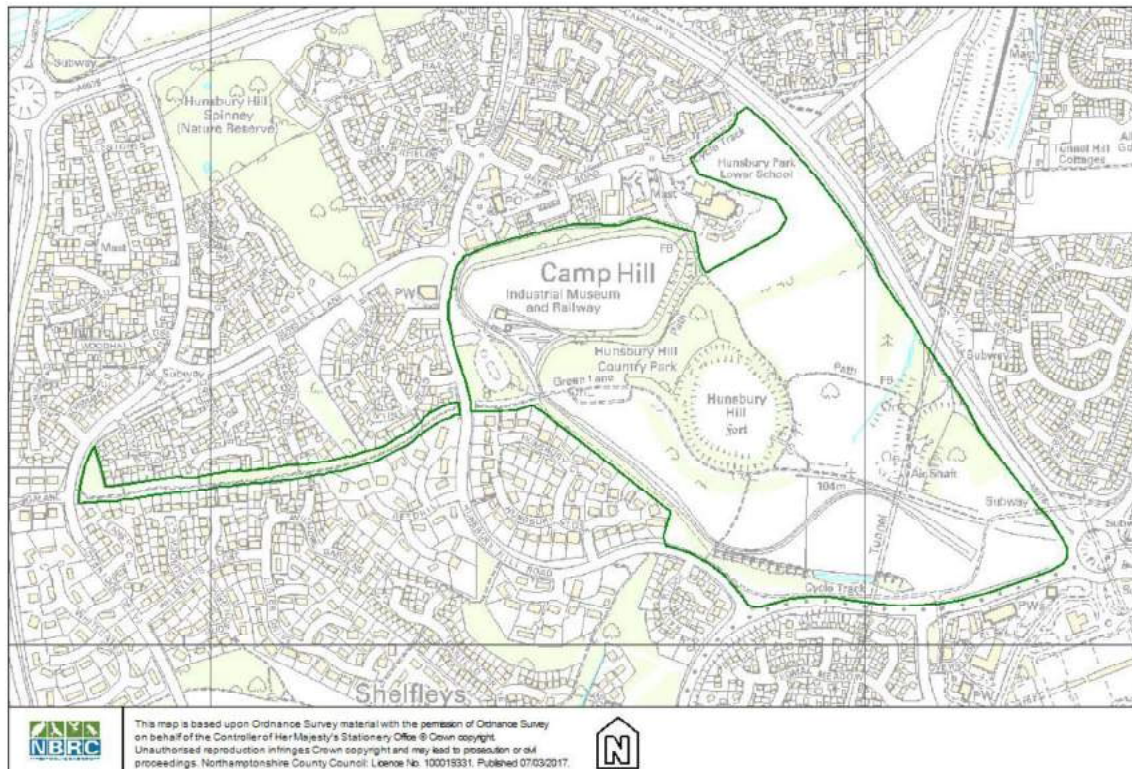
A stretch of old green lane a little over 1 kilometre long, now used as a public footpath and with no sign of recent use by vehicles. The lane stretched east/west across the southern edge of Hunsbury Hill and was once (ca 1860) part of a road from Rothersthorpe to Hardingstone, but it is now isolated by new roads and housing. The lane varied from about 10 to 20 metres in width with a hardcore path 1 to 2 metres wide and was bordered by tall, rambling hedgerows with occasional large trees of Pedunculate Oak *Quercus robur* and rarer Ash *Fraxinus excelsior*. Field Maple *Acer campestre* was locally abundant in the hedgerows, occasionally growing from large coppice stools and occasionally making small trees, otherwise the most abundant shrubs were Common Hawthorn *Crataegus monogyna* and Blackthorn *Prunus spinosa* with locally frequent suckering English Elm *Ulmus procera* and rarer Wych Elm *U. glabra*. There was also a probable *Ulmus* hybrid with characteristics of *Ulmus minor*. Hazel *Corylus avellana* was rare and there was a variety of exotic shrubs.

Parts were rather formal with wide strips of close-mown grassland to either side of the path while more often the hedgerows had spread out to form narrow woodland strips where the most abundant ground vegetation was Ivy *Hedera helix*. Where more open parts were unmown, then there was locally abundant Common Nettle *Urtica dioica* or MG1 *Arrhenatherum elatius* grassland. Also present was rare disturbed ground where plants such as Broad-leaved Dock *Rumex obtusifolius* and Greater Plantain *Plantago major* were locally abundant.

With the Danes Camp car-park at the approximate centre of the lane, the western part sloped gently downward with housing and gardens to either side. There was frequent garden rubbish dumped here, including some old fencing with nails that could be a danger to the public. Garden escapes and exotic shrubs were most abundant in this part of the site. A triangular area of land at the western end of the lane was partly occupied by a plantation of small Field Maple and Ash trees and partly by rather coarse grassland where Yorkshire Fog *Holcus lanatus* was abundant and Meadow Vetchling *Lathyrus pratensis* locally frequent.

The eastern part of the lane ran through the Hunsbury Hill Country Park and skirted the hillfort. At first this was on slightly rising ground and higher than the adjacent land, where the ground surface has been lowered by past quarrying activities, but past the hillfort, the lane began to slope downward to the east. The most interesting plant found here was rare Changing Forget-me-not *Myosotis discolor*, uncommon in the county.

Map:



Historical Background / Significance / Former use of site

Ironstone quarrying here by 1897. Tramway cutting made 1912, to Wootton. This remaining ironstone face is important not only geologically (a rare exposure) but as a relic of industrial archaeological history.

Conservation and remedial work needed or desirable

Yes. There is much unnecessary vegetation (brambles etc) hanging over the face.

Summary of site significance

An important site for Northampton and the County.

Scientific value *
Educational value **
Historical value **
Aesthetic value **

Submitted to RIGS Group by D.B. Sutherland Date 20 March 2001

Considered by Rigs Group on 29.9.98

Approved / Not Approved as a RIGS Site

Signed on behalf of the RIGS Group by _____



Northamptonshire RIGS Group: Site Evaluation Form

n5
10 24

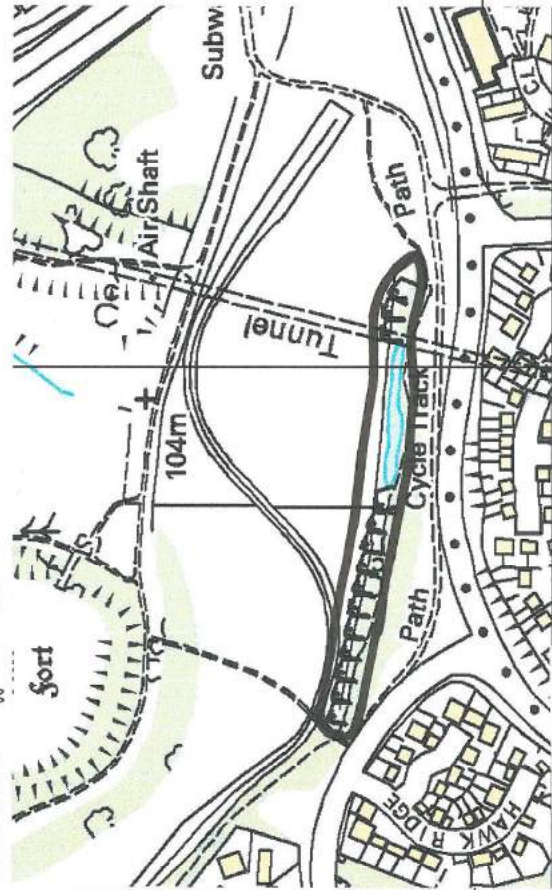
Site name	n5	Grid Ref	Local Authority
HUNSBURY HILL CUTTING	SP 73 905815	NORTHAMPTON BOROUGH	
Geographical Location			
Hunsbury Hill Country Park, south side			
Former site use	Present site use		
Cutting for ironstone railway to quarries	country park		
Ownership details and address			
Northamptonshire County Council Countywide Department, Environment Directorate, P.O. Box 163, County Hall, Northampton NN1 1AX			

Photo? ☒ Location 28.8.

Stratigraphical position / Geological context (summary)

Northampton Sand Formation; Ironstone division and basal Variable Beds (Middle Jurassic)

Map / Diagram of Location and Boundaries, with dimensions of site
Rock face approximately 250m long; north side of former railway cutting; also small bluff south side at SP739581



SCIENTIFIC DETAILS

Sketch / Section

Geological Features and/or geomorphological / industrial economic features

a rock face of 3-4 metres high runs for some 250 metres, the remains of a cutting for the tramway leading to the ironstone quarries at Wootton Hill and Wootton Grange. The tramway went under the (then) Towcester road in 1912, and a further section of rock face can still be seen by this brick bridge at SP742578.

The rock face provides the only accessible section of the Northampton Sand Ironstone and the overlying basal sandstones of the 'Variable Beds' in the Northampton area.

The oolitic ironstone shows good box-stone weathering with seams of dense limonite. The Variable Beds are ferruginous sandstones with limonitic matrix; the whole formation is ^{basal} weathered, being at outcrop and long exposed in the cutting.

Beds are apparently horizontal, between two faults figured by Hollingworth & Taylor, 1951, p.35.

Educational value

Excellent

- Specialist ☐
- Higher educational ☒
- Secondary school ☒
- Primary school ☐

Physical Means of Access

Excellent. This is a public footpath in a country park.

- Permission required ☐
- Public access ☒
- See footnote

Specimen collection potential

Small samples would not be detrimental.
Not likely to be fossiliferous.

- Hammering by permission ☐
- Hammering forbidden ☐

Site facilities (e.g. parking, toilets?)

Public carpark within 1/4 mile

References, (published / unpublished) relating to the site

Hollingworth, S.E. and Taylor, G.H., 1951. Memoir of G.E.S. gives details of the geology at Humberly pp188-189; figures important camber and dip-and-fault structures here. Fig 3 p 35.
Tonks, E., 1989. The ironstone quarries of the Midlands. Part III Northampton area. pp 106-121; map p 107.

Regional context

Unique in Northampton Borough.

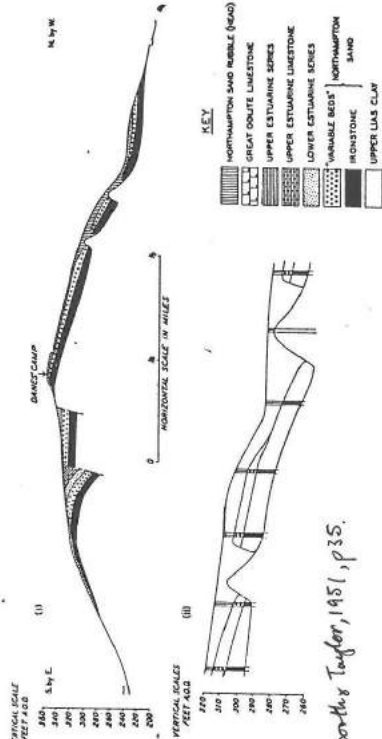
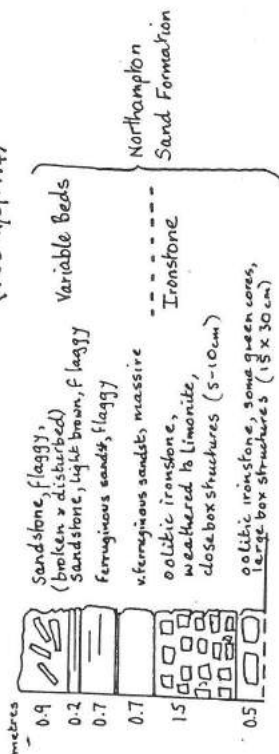
Few such exposures remain in County - with junction ironstone and Variable Beds

- Unique ☒
- Rare ☐

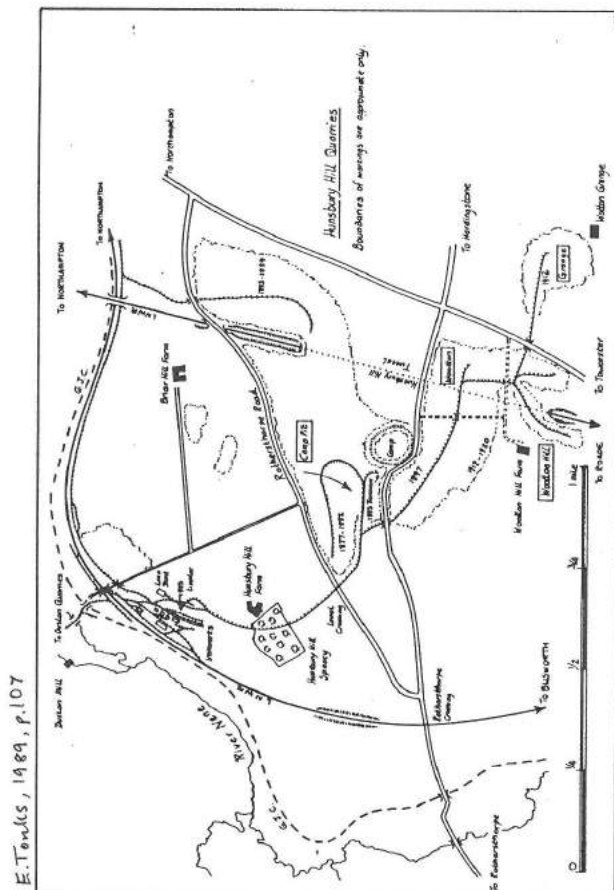
Unless on an official RIGS Group site visit, people visiting a site are responsible for their own Health and Safety. Unofficial visits are not covered by the Wildlife Trust's Liability Insurance.

section near [SP 739582]

(RIGS 11/6/1994)



Hollingsworth Taylor, 1951, p. 35.



Site Name: Hunsbury Hill Spinney

Site Code: N1049

Status: PWS

Other Designations: Nene Valley NIA

Grid Reference: SP730588

Area (ha): 3.2

District: Northampton

Site History:

18/08/1992 LWS

30/08/2007 PWS

17/09/2013 PWS

Habitats present

Broad Habitat: Woodland

BAP Habitat: Lowland Mixed Deciduous Woodland

Reason for Designation:

A small broadleaved spinney on the outskirts of Northampton, likely replanted and doesn't contain an ancient woodland flora. Retained as a PWS, is on the first OS map, and is to start being managed by ACRE.

Site Description:

14/05/2013

A predominantly sycamore *Acer pseudoplatanus* and ash *Fraxinus excelsior* woodland, with occasional mature oaks *Quercus robur* and an understorey of hawthorn *Crataegus monogyna* and abundant elder *Sambucus nigra*. The ground flora suggests enrichment with abundant nettles *Urtica dioica*, cleavers *Galium aparine* and frequent red campion *Silene dioica* alongside areas of bare ground and dead wood. The boundary has signs of an old hedgerow, with some mature beeches *Fagus sylvatica*. To the south is a young deciduous plantation. Towards the southwest corner the woodland is much more open with a carpet of nettles, red campion and ground ivy *Glechoma hederacea* below mature ash trees.

The pond is almost entirely dried out, with a small patch of muddy water and yellow iris *Iris pseudacorus*, whilst the rest of it is ruderal vegetation surrounded by thick bramble *Rubus fruticosus* agg. The ivy *Hedera helix* present on many of the trees provides a useful cover for bats, and there is a large bank of hedge garlic *Alliaria petiolata* on the western side. Alongside the dual carriageway is a young plantation of ash and beech. A deep dry ditch crosses the eastern portion of the site, running N-S. Above the ditch are more mature trees, below in the centre the vegetation is fairly dense, and predominantly elder but opens up towards the west. Two possible rides cross the site N-S and E-W, forming informal footpaths. A second pond is also dry and silted.

18/08/2005

This is a deciduous woodland on a west facing slope dominated by mature Ash *Fraxinus excelsior* and Sycamore *Acer pseudoplatanus* with Pedunculate Oak *Quercus robur* more frequent on the lower slopes; many of the mature trees support scrambling Ivy *Hedera helix* which provides valuable summer roosting sites for species of bat. The canopy is dense, casting heavy shade and thus the field-layer is sparse. A steep-sided ditch runs through the woodland to a shaded, shallow, silty pond - again, vegetation is sparse here but it provides a very successful breeding site for Common Frogs *Rana temporaria*; at the time of the survey young frogs carpetted the ground around the pond. Another low-lying area, probably a dried pond, occurs in the south of the site - Yellow iris *Iris pseudacorus* grows here but it is dominated by Common Nettle *Urtica dioica* and Bramble *Rubus*

fruticosus agg.. This habitat holds good numbers of large, old mature Ash and Pedunculate Oak, and some very large old coppice stools of Ash and Sycamore.

The north-east of the site is more recently planted woodland (probably planted sometime in the 1980s, and possibly in association with construction of the adjacent dual carriageway). An old boundary bank with large old stools of Common Hawthorn *Crataegus monogyna* and Ash separates this from the mature woodland; this bank continues along the west and part of the south-east boundaries of the site.

Particular features of wildlife value:

Old deciduous trees - these can support a high diversity of native invertebrates; cracks and hollows in the trees, together with associated scrambling ivy, can provide bat-roosting sites.

The woodland pond provides an additional valuable habitat; in addition to providing the excellent frog breeding site it could provide refuge for various aquatic invertebrates.

Linkages to other features of wildlife value:

The Grand Union Canal County Wildlife Site lies 200 metres to the north of the site and the Hunsbury Country Park County Wildlife Site lies about 300 metres to the south-east.

Woodland north-east of the Hunsbury Centre buildings is separated from Hunsbury Hill Spinney by a row of trees and nettle beds.

This site visit was not carried out at the best time of year for a woodland survey (which is late spring), therefore it is likely that some species will not have been recorded that may have earlier in the year but it is nevertheless unlikely that the site would qualify as a CWS for its woodland flora. However, the high numbers of mature trees is a very valuable feature and during the CWS review it will be proposed that this site be designated as a potential CWS with the view that there is potential for the site.

18/08/1992

A spinney dominated by mature oaks and ash, possibly on an ancient woodland site. There is also a small area of more recently planted oak to the south of the site. NB. The pond on the north side of the wood is written up separately as a subsite. The structure of this spinney is quite varied and consists of a more or less bare litter layer with scattered groundflora, a patchy scrub layer of old hawthorns, privet and field maple, and mature oak and ash standards with a few other tree species such as beech, holly, crab apple and sycamore. Groundflora species include *Silene latifolia*, *Moehringia trinerva*, *Dryopteris filix-mas*, occasional *Pteridium aquilinum*, *Brachypodium sylvaticum* and frequent patches of *Mnium hornum*. NB the small pond to the south of the site is now quite dry and mostly covered with moss, with a clump of hawthorn in the centre. In the very centre of the wood there are signs of badger activity and it may be that there is a newer sett in this wood that was overlooked - or that the disappearance of the surrounding grassland has meant the badgers no longer favour the site. This appears to be a neglected wood although it is not too overgrown. The groundflora is sparse but not particularly rank, and might not improve if the canopy was opened up, so it may be that this valuable undisturbed habitat should be left without management for longer. The pond might however need some attention.

Boundary Changes

10/04/2014 Historical boundary information: Following the 2005 survey the original boundary area increased from 2.64ha to 3.21ha. Site was extended to the NW and SW and now includes Hunsbury Hill Spinney Pond

Related Site Information

Hunsbury Hill Spinney Pond, Historical

Hunsbury Hill Spinney Pond (SP72995885)

18/08/1992

A small pond in the Hunsbury Hill Spinney. Despite quite heavy shading this has a fairly dense, although not yet choking, vegetation. Species include *Solanum dulcamara*, *Callitriche stagnalis*, *Veronica beccabunga*, *Lemna minor*, *Iris purpurea*, *Ranunculus lingua* and a population of newts, apparently both great crested and smooth (this needs confirming). A dragonfly was seen and it seems likely that the invertebrate fauna here is good. A very nice woodland pond with apparently a good amphibian population - likely to have a good invertebrate fauna as well. It may be that this pond will need clearing at some point to stop it from choking up though.

Map:



Junction 15 Grassland

Administrative areas:	Northamptonshire(E County (74-)) Northampton(E District (74-)) Collingtree(Civil Parish)
Status(es):	PWS
Centroid:	SP755549 (Site Centroid)
Site type:	Site
File code:	N1216
Site/Subsite hierarchy:	Junction 15 Grassland
Description:	<p>2005: This site is immediately to the north of the motorway exit ramp. It comprises two distinct habitats:</p> <p>An area of open coarse, occasionally undulating grassland with occasional scrub that had recently been used for motorcycle scrambling and appears to have informal open access. Tall oat-grass (<i>Arrhenatherum elatius</i>), cock's-foot (<i>Dactylis glomerata</i>), nettle (<i>Urtica dioica</i>), creeping thistle (<i>Cirsium arvense</i>) and common ragwort (<i>Senecio jacobaea</i>) are abundant but there is also some finer grassland maintained by rabbit grazing. Locally or very locally abundant were hoary ragwort (<i>Senecio erucifolius</i>), hairy St.John's-wort (<i>Hypericum hirsutum</i>), perforate St.John's-wort (<i>H. perforatum</i>), black knapweed (<i>Centaurea nigra</i>), red fescue (<i>Festuca rubra</i>), ribwort plantain (<i>Plantago lanceolata</i>), redshank (<i>Persicaria maculosa</i>), red bartsia (<i>Odontites verna</i>), hairy sedge (<i>Carex hirta</i>), tufted hair-grass (<i>Deschampsia cespitosa</i>) and creeping buttercup (<i>Ranunculus repens</i>).</p> <p>Immediately to the north of the open area, and separated from it by a mainly hawthorn hedge, was an area of scrub with native and exotic trees, which included a cypress species, lilac, walnut, crab apple, ash, oak and English elm. Ivy and Russian Vine occasionally scrambled over the shrubs. The northern boundary of this area was formed by a strip of closely spaced tall young beech trees, probably derived from an old hedge, and to the west these led to another small area of open grassland as they were replaced by a line of Lombardy poplars. Much of this grassland was rather coarse, but parts were maintained as a short sward by rabbits and the main interest here was scattered plants of lady's mantle (<i>Alchemilla vulgaris</i>).</p> <p>This site holds four indicators from the neutral grassland indicators list; although a reasonable number this is not enough to qualify as a CWS. However, with appropriate management the quality of the grassland habitat may improve sufficiently to meet the CWS selection criteria.</p>
Total number of records:	43
Total number of species:	43

Land adjacent to Wootton Railway Embankment

Administrative areas:**Status(es):** PWS**Centroid:** SP740577 (Site Centroid)**Site type:** Site**File code:****Site/Subsite hierarchy:** Land adjacent to Wootton Railway Embankment**Description:**

2005: This area of land is above the railway cutting; although not on a steep slope there are a number of hills and hollows in the south of the site formed by contractors working on land around the car park to the south. This is abandoned pasture, not as acidic as further west, not yet succeeded to scrub or nettles / thistles. Botanically it comes close to meeting the CWS criteria though a more detailed survey is required to fully assess the site against the criteria. A marshy area had abundant dead orchid spikes (some leaves still present, look like southern marsh orchid).

Survey next summer is likely to bring to light more species, including the identity of the orchid species - it will probably be a strong indicator of a habitat, just need specific identification to know which. So the site may meet the criteria on a number of counts and it needs to be assessed for these early next summer:

A grassland habitat - probably neutral but there are also areas of marshy and other grassland so these also need to be assessed.

In the brief visit to the site, 44 grassland species from the grassland record sheet were recorded. A criterion under which a site can be selected is the presence of 50 grassland species - however, the definition of grassland species has not been qualified. From such a brief survey, the presence of 44 grassland species indicates that it is highly unlikely that a more detailed survey will not result in more than 50 grassland species being recorded, particularly as grasses were not looked at during the visit.

This site could also be considered as a Green Infrastructure site. Although it is currently not open access, it appears to not be used by the owners and is fenced off from the railway so safety issues are not a major worry. The site may also be worth surveying for its invertebrate interest.

Management will be required to prevent the site succeeding to scrub and woodland.

Total number of records: 88**Total number of species:** 88

Site Name: Nun Wood

Site Code: S579

Status: LWS

Other Designations: Ancient semi-natural woodland, Plantation on ancient woodland site

Grid Reference: SP722510

Area (ha): 10.8

District: South Northamptonshire

Site History:
22/08/1994 LWS

Habitats present

Broad Habitat: Woodland

BAP Habitat: Lowland Mixed Deciduous Woodland

Reason for Designation:

An area of ancient woodland that has retained semi-natural cover. Some areas have been replanted, but overall the site has a diverse canopy, scrub layer and ground flora. A shelter belt to the south provides additional habitat and connectivity.

Site Description:

22/08/1994

This area of ancient woodland is now isolated from other woodlands, except for a long tree belt virtually adjacent to the south side of the wood. The belt is dominated by young sycamore with older ash and oak. There is a sparse scrub layer of field maple, hawthorn and Midland hawthorn with locally frequent elder. The groundflora is not the diverse ancient woodland groundflora of the main wood, but contains *Geum urbanum*, *Geranium robertianum*, *Brachypodium sylvaticum* and *Glechoma hederacea*, with large areas dominated by *Mercurialis perennis*.

The main woodland has much more diverse scrub, including wayfaring tree, blackthorn, young sycamore and frequent hazel in addition to the scrub species in the belt. The canopy is also more diverse, with aspen, beech, rare Scots pine and occasional Turkey oak in addition to the oak, ash and sycamore. There are some fine mature oak, ash and beeches, but most standards are of medium age. The groundflora is mostly dominated by *Mercurialis perennis*, with abundant *Hyacinthoides non-scriptus*. Other species present at the time of survey include *Glechoma hederacea*, *Circaea lutetiana*, *Carex sylvatica*, *Urtica dioica* and *Arctium* agg. A cleared area under some thinned oaks was dominated by *Deschampsia cespitosa*. The rides are not very diverse, being dominated by *Holcus lanatus* and *Agrostis stolonifera*. *Trifolium* spp, *Prunella vulgaris* and *Vicia sativa* were all frequent on the rides. A few wet areas had abundant *Filipendula ulmaria*. There is a strong possibility that these rides could have more species of interest and, like the groundflora, would benefit from a survey earlier in the year. The diversity of the groundflora in this wood appears to have suffered somewhat as a result of straw-laying for pheasants.

Map:

Road Cutting SSSI

Administrative areas:	Northamptonshire(E County (74-)) Courteenhall(Civil Parish)
Status(es):	PWS Geological SSSI
Centroid:	SP750525 (Site Centroid)
Site type:	Site
File code:	S/S
Site/Subsite hierarchy:	Road Cutting SSSI
Description:	<p>A nationally important geological SSSI, identified in the Geological Conservation Review. A virtually complete Middle Jurassic Limestone section is present, exhibiting complete Rutland Formation and White Limestone sections, plus the Blisworth Clay underneath. The site is therefore of great value for the study of the formation and deposition that occurred to create the relationship between the layers visible. See SSSI sheet for full details. Possibly the most important geological SSSI in the county.</p>
Total number of records:	0
Total number of species:	0

Site Name: Roade Quarry

Site Code: S1306

Status: LWS

Other Designations:

Grid Reference: SP755510

Area (ha): 7.95

District: South Northamptonshire

Site History:

26/10/2009 PWS

10/12/2010 LWS

Habitats present

Broad Habitat: Grassland, Wetland, Woodland

BAP Habitat: Lowland Calcareous Grassland, Open Mosaic Habitats on Previously Developed Land

Reason for Designation:

An ex-quarry with an open mosaic habitat at various stages of succession and including patches of calcareous grassland. It qualifies as a LWS under the open mosaics habitat criteria.

Site Description:

01/07/2009

This was a rather shallow old limestone quarry, bought for infilling with factory waste. This has been done in the northern part but, no longer needed for this purpose, companies have shown an interest in acquiring it for infilling with other waste products.

There was a wide range of vegetation here in various stages of succession, ranging from bare rock, through mosses/lichens, ruderal vegetation and grassland to scrub and young woodland.

The accompanying map gives a rough guide to the distribution of these. It would have been possible to map the site more accurately but that would have been very time consuming and of limited value. Abundant rabbit grazing had broken the succession in many places, producing a tight sward of tiny plants. The rabbits themselves were being taken in turn by Buzzards. The most botanically interesting areas here were where calcareous grassland had been prevented from succeeding to coarser vegetation by that rabbit grazing. These were of limited size, occurring in an area with a small "hills and hollows" landscape and on a slightly raised area.

The main plants of the calcareous grassland were Perforate St John's-wort *Hypericum perforatum*, Bird's-foot Trefoil *Lotus corniculatus*, Fairyflax *Linum catharticum* and Mouse-ear Hawkweed *Pilosella officinarum*. Some of these were taller than average for the overall vegetation in these areas and, presumably, they represented plants that the rabbits least liked to eat. These areas are shown on the map in dark-green (SP75475097, SP75565097 and SP75595105).

Some small, damp hollows on the site held locally dominant Wood Small-reed *Calamagrostis epigejos*. One of these, between the two best areas of calcareous grassland, also had quite abundant Common Spotted Orchid *Dactylorhiza fuchsii* and locally frequent Hard Rush *Juncus inflexus*. These are shown on the map in mustard green (SP75505112, SP75525111 and SP75575101).

The remnants of a ditch system ran more or less parallel with the south-east boundary and was dry at the time of survey. In the eastern corner of the site (SP75685103) this was partially shaded and held locally dominant Giant Horsetail *Equisetum telmateia*. To the west of Gate 2 (southeast SP75545090) the remaining short stretches of ditch there were heavily shaded and supported locally frequent Dog's

Mercury *Mercurialis perennis* and Lesser Burdock *Arctium minus*. A little way to the east of Gate 2 there was a small, unshaded hollow, which was just damp at the time of this survey (SP75605094). Plants here included plants such as Celery-leaved Buttercup *Ranunculus sceleratus* and Tufted Forget-me-not *Myosotis laxa*. Common spotted-orchid *Dactylorhiza fuchsii* was occasional around the edges here and alongside a short length of ditch that ran north from this wetland area.

In the main open parts of the quarry, the most obvious vegetation were stands of tall Rosebay *Chamerion angustifolium* and Nettle *Urtica dioica*. The main areas for these are also shown on the map. There were also small stands of MG1 grassland where False Oat-grass *Arrhenatherum elatius*, Cock's-foot *Dactylis glomerata*, Red Fescue *Festuca rubra* and Yorkshire Fog *Holcus lanatus* were locally abundant. Over most of the rest of the open ground there was a mixture of abundant bare soil and rock, locally abundant mosses and *Cladonia* species of lichen, and a scattering of ruderal/pioneer species and neutral grassland plants in developing plant communities.

Species found here included Procumbent Pearlwort *Sagina procumbens*, Field Forget-me-not *Myosotis arvensis*, Selfheal *Prunella vulgaris*, White Clover *Trifolium repens*, White Dead-nettle *Lamium album*, Bristly Oxtongue *Picris echioides*, Teasel *Dipsacus fullonum*, Great Mullein *Verbascum thapsus* and others. There were also a few surprises here in very locally abundant Dog's Mercury *Mercurialis perennis* and Primrose *Primula vulgaris* well out in the open. Concrete stands and blocks of concrete in this part of the quarry held locally abundant Biting Stonecrop *Sedum acre*. Although the best areas of species-richness were quite small, there was a considerable overlap between them and the more open vegetation in the quarry bottom, particularly in a scattering of Fairyflax *Linum catharticum*, Bird's-foot Trefoil *Lotus corniculatus* and Common Centaury *Centaureum erythraea*.

There was a low limestone cliff along much of the western edge to the north of Gate 1 (SP75355103), along the top of which ran a Hawthorn hedge. The cliff was often obscured by locally frequent Blackthorn *Prunus spinosa* and small Ash *Fraxinus excelsior*. Smaller plants on the cliff included Hedge Bindweed *Calystegia sepium*, White Campion *Silene alba*, Hogweed *Heracleum sphondylium* and Cuckoo Pint *Arum maculatum*. Rosebay was locally abundant at the bottom of the cliff as shown on the map.

Moving toward the house and garden to the north, the ground rose over a low earth escarpment onto the area already infilled, which stretched across the northern part of the site. In the north-west corner here there was also Elder *Sambucus nigra* and Wild Privet *Ligustrum vulgare* on the cliff face, below which was locally frequent Germander Speedwell *Veronica chamaedrys*. There was a low, defunct hedge secured by a barbed wire fence along the north/north-eastern edge of the site, and Blackthorn from this was occasionally suckering out into the quarry. In this area the infilling had brought the level back up to that of the adjacent land, a pasture field. The grassland here was a mostly very short turf, largely species-poor but with locally frequent Perforate St John's-wort. There was some taller vegetation here as well, with small stands of Nettle and Wood Small-reed. Also more abundant here than elsewhere on the site were Ragwort *Senecio jacobaea*, Teasel *Dipsacus fullonum*, Creeping Thistle *Cirsium arvense*, Prickly Oxtongue *Picris echioides* and Hemlock *Conium maculatum*. On the leading edge of the infill, where it sloped down to the main quarry area, there was occasional Musk Thistle *Carduus nutans* and Weld *Reseda luteola*.

Succession to woodland was most advanced in the south-west corner of the site where tall and large Ash trees were frequent over abundant Rosebay. Out into the quarry from here an area of scrub and young trees covered almost half of the site. This was often on undulating ground and the scrub was occasionally very dense. Beside Ash, the main species were Hawthorn *Crataegus monogyna*, Goat Willow *Salix caprea*, Elder *Sambucus nigra* and Dogwood *Cornus sanguinea*, with locally frequent Bramble *Rubus fruticosus*. The ground below the scrub and trees was occasionally bare or with very locally abundant Dog's Mercury *Mercurialis perennis*, Ground Ivy *Glechoma hederacea* and Male Fern *Dryopteris filix-mas*. A little less frequent was Primrose *Primula vulgaris*. Mostly though, the scrub was less dense giving only partial shade, which allowed Nettle *Urtica dioica* to be abundant. Occasional clearings had a short but largely species-poor turf with plants such as Ragwort and Teasel. In one larger clearing there was locally abundant Garden Lady's-mantle *Alchemilla mollis*.

Land level was variable along the southern edge in the west. The track of the adjacent dismantled railway line ran in a fairly deep cutting, but in places the level of the quarry was equally deep so that

there was a narrow strip of higher ground between the railway and the quarry. Ivy *Hedera helix* climbed some of the taller trees here.

Scrub was dense enough in the eastern corner of the site to have mostly bare ground below, but was tall enough for it to be easy to walk below. It was composed largely of Hawthorn with occasional Elder. The only vegetation on the ground was occasional Chickweed *Stellaria media* and Rough Meadow-grass *Poa trivialis*.

Moderately tall and rambling Hawthorn hedges ran along the western edge of the site, with a low and defunct hedge with fence separating the quarry from pasture to the north-east. On the long south-eastern boundary the hedgerow of this site was mixed up with hedgerows and scrub at the edges of the old railway track.

Indicator species

In the areas of calcareous grassland, nine neutral and neutral to calcareous indicators were recorded, including the strong indicators Glaucous Sedge *Carex flacca*, Rough Hawkbit *Leontodon hispidus*, Fairyflax *Linum catharticum* and Mouse-ear Hawkweed *Pilosella officinarum*.

Included within damp, neutral grassland was the strong neutral to calcareous indicator Common Spotted-orchid *Dactylorhiza fuchsii* and a scattering of plants from the calcareous areas, Common Centaury *Centaurea erythraea*, Perforate St John's-wort *Hypericum perforatum*, Bird's-foot Trefoil *Lotus corniculatus* and the strong indicator Fairyflax *Linum catharticum*.

Adjacent land

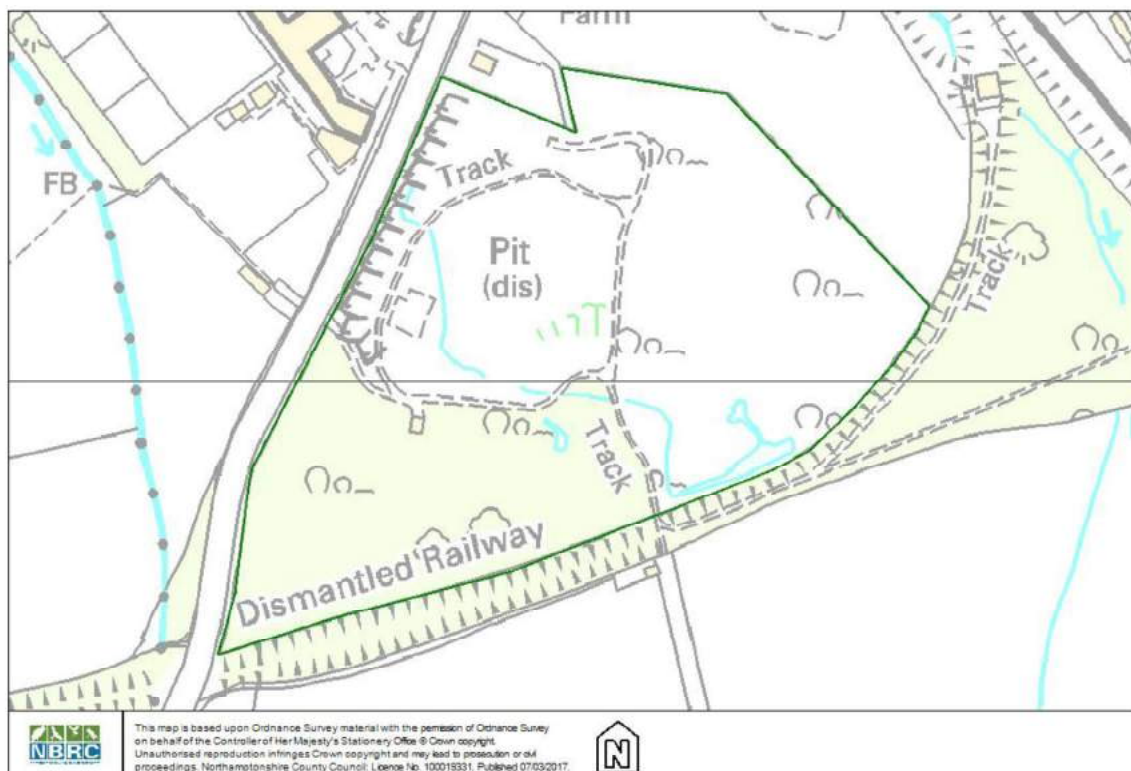
A dismantled railway followed the south-eastern edge of the site. The vegetation here was often similar to that in the central part of the quarry, including the scattering of Fairyflax, Bird's-foot Trefoil and Common Centaury.

At the main entrance, Gate 1, and just outside the site fence, there was locally abundant Greater Knapweed *Centaurea scabiosa* and Bladder Campion *Silene vulgaris*, as well as a little Red Valerian *Centranthus ruber*.

A feature of this site that made it of interest was the presence of many different stages of plant succession in a relatively small area. The most species-rich parts were very small, however, this habitat is scarce in this part of the county, the plant communities were young and developing, and the intense rabbit grazing may have masked other important plants. Perhaps in a couple of hundred years it will be as nice as Collyweston quarry. The scrub and young woodland here enhance the site but would probably destroy the best grasslands in time if left unmanaged, or if the rabbit population crashed.

Buzzards were hunting here, a Green Woodpecker was feeding on the ground and Turtle Doves were breeding in the scrub. Several Marbled White Butterflies were feeding in the calcareous grassland areas.

Map:



Site Name: Shelfleys Lake

Site Code: N695

Status: LWS

Other Designations: Nene Valley NIA

Grid Reference: SP731578

Area (ha): 1.8

District: Northampton

Site History:

19/08/1992 LWS

09/07/2007 LWS

29/10/2014 LWS

Habitats present

Broad Habitat: Grassland, Wetland

Reason for Designation:

A lake on the edge of Northampton with a wide marginal fringe of wetland vegetation. This site qualifies as a Wildlife Site with 11 wetland indicators recorded and supports a range of invertebrates.

Site Description:

23/07/2014

The previous description still stands, although the water quality is perhaps slightly improved. The wide marginal fringe around nearly all of the lake holds a nice range of wetland plants. Some parts of the dry grassland, particularly in the south-west where the soil is thinner and more gravelly, hold some wild flowers as well.

The small river channel that feeds the lake has very steep banks which are eroding. There are many holes in the banks, most likely from signal crayfish. Young fish were seen in the river at the time of the survey. Small fish were also seen in the lake. The lake is obviously well used by waterfowl, and people were visiting to feed them.

21/07/2005

This is a popular site in a town park. The banks are mostly gently sloping; unshaded sections (the majority of the west bank and parts of the north and south banks) support wide bands of wetland vegetation. Above the banks is mown improved grassland.

The submerged aquatic flora, however, is very poor; this could be due to eutrophication by waterfowl faeces - waterfowl numbers are quite high and probably artificially so due to the levels of duck-feeding by the general public. The increase in eutrophication by waterfowl species results in reduced water oxygen levels and increased turbidity, thus aquatic invertebrates cannot breathe and aquatic plants cannot photosynthesise and the lake loses the ability to support aquatic species.

19/08/1992

A lake at the north end of the Wootton Brook Park at East Hunsbury, separated by a road into a pond and a larger lake to the north (although they are in fact joined under the road). The large lake has a fringe of vegetation including *Glyceria maxima*, *Typha latifolia*, *Lycopus europaea*, *Filipendula ulmaria*, *Angelica sylvestris*, *Stachys palustris*, *Carex riparia*, *Mentha aquatica* and *Salix* spp. This fringe is 3-5m broad in places, and crisscrossed with orb-spider webs, of which there are an enormous number. Other invertebrates also flourish, particularly damselflies. There seems to be a fish

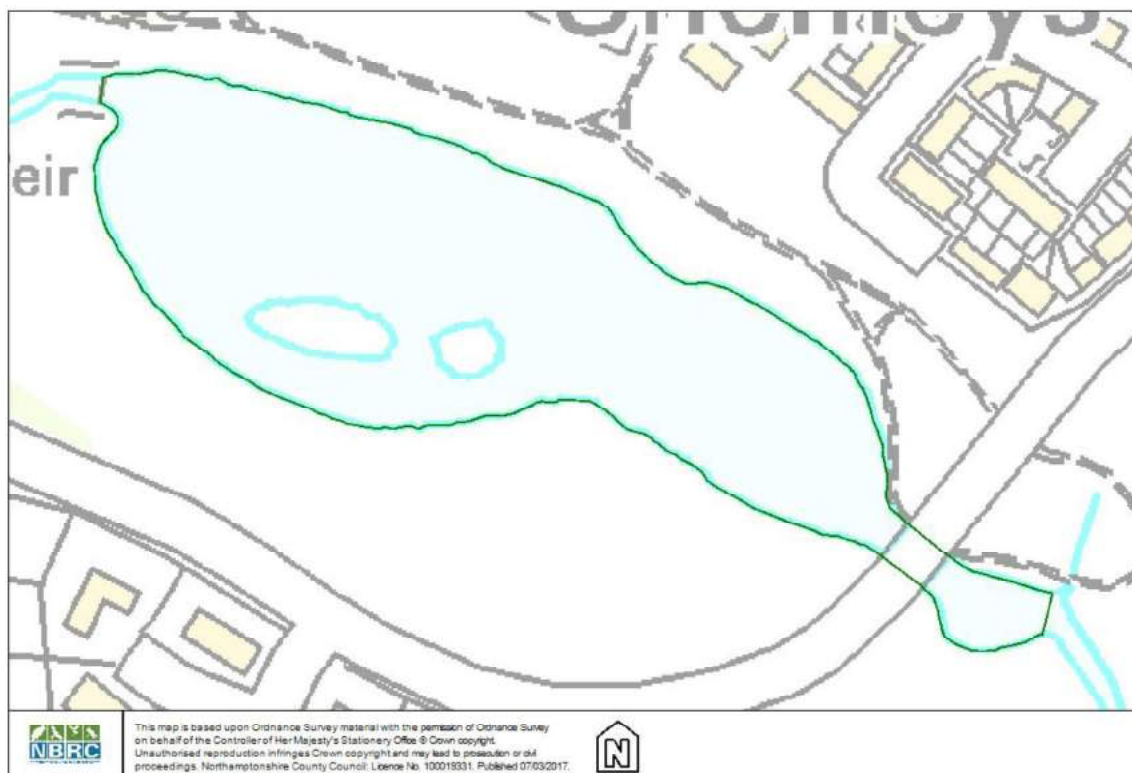
population in the lake large enough to warrant angling, although it is unlikely to have been stocked. Both frogs and a toad were seen amongst the fringing vegetation at the time of survey.

The main island has tall white and crack willows and a small amount of scrub, and is used by waterfowl including mallard, coot and mute swan. The smaller pond to the south of the road is joined to the lake, under the road, and is essentially the same habitat. It has a thick fringe of *Glyceria maxima*, *Typha latifolia*, *Sparganium erectum* and *Salix* spp. and like the bigger lake attracts damselflies. This site is likely to improve with time and does not seem to need any extra management at the moment. The grassland around the lake however is not currently being managed for its wildlife habitat potential and it would greatly improve the interest of the site if this were to change.

Boundary Changes

23/05/2013 Grid ref changed from SP735576 to SP731578 as was not near the site

Map:



Stoke Bruerne Brickpits

Administrative areas:	Northamptonshire(E County (74-)) Stoke Bruerne(Civil Parish)
Status(es):	Wildlife Trust Reserve County Wildlife Site
Centroid:	SP746494 (Site Centroid)
Site type:	Site
File code:	(S/TR/1988) S401
Site/Subsite hierarchy:	Stoke Bruerne Brickpits
Description:	<p>An area of disused brickpits that now contains grassland, marsh, reedbed and pools. The drier areas of grassland contain species such as <i>Galium verum</i>, <i>Lotus corniculatus</i>, <i>Dactylorhiza fuchsii</i>, <i>Cardamine pratensis</i>, <i>Ophioglossum vulgare</i> and <i>Primula veris</i>, with frequent anthills. Emergent species in the marshy areas and around the pools include <i>Lycopus europaeus</i>, <i>Lychnis flos-cuculi</i>, <i>Lythrum salicaria</i> and <i>Phragmites australis</i>. The surrounding hedges and scrub contain mostly <i>Acer campestre</i> and <i>Crataegus monogyna</i>. Birds on the site include barn owl, kingfisher, reed bunting, sedge and reed warbler, heron, green woodpecker, kestrel and snipe. See NWT leaflet for further details. A site which could well increase in diversity with further management.</p>
Total number of records:	1058
Total number of species:	474

Site Name: Stoke Park Fishponds

Site Code: S537

Status: LWS

Other Designations:

Grid Reference: SP743483

Area (ha): 2.4

District: South Northamptonshire

Site History:

04/06/1996 LWS

Habitats present

Broad Habitat: Wetland, Woodland

Reason for Designation:

Two ponds within Stoke Bruerne Park surrounded by scrub and mature trees with a variety of wetland and woodland vegetation beneath. This is an attractive and diverse site likely to be of importance for invertebrates.

Site Description:

04/06/1996

The old carp pond of Stoke Bruerne Park now has a narrower pond to the east, added recently. A small drain from the east end of the larger pond (which is dammed with a wooden paddle) leads into the adjacent River Tove.

The scrub and mature trees surrounding these ponds have shaded them, but not so heavily that there is no aquatic vegetation. The tree cover around the water includes old oak and ash, occasional lime and some large mature hornbeams. Elder is locally frequent, otherwise the scrub layer (also mature) consists mainly of occasional hawthorns and frequent field maple.

The groundflora varies from tall, grassy/ruderal species in the well-lit areas, which are mostly at the west end of the site, to abundant *Mercurialis perennis*, *Glechoma hederacea* and other woodland species under the old trees. This vegetation grades into the tall marshy fringes around the ponds, which includes *Epilobium hirsutum*, *Scrophularia auriculata*, *Carex remota*, *Cirsium palustre*, *Stachys sylvestris*, *S. palustris*, *Phalaris arundinacea* and *Juncus effusus*.

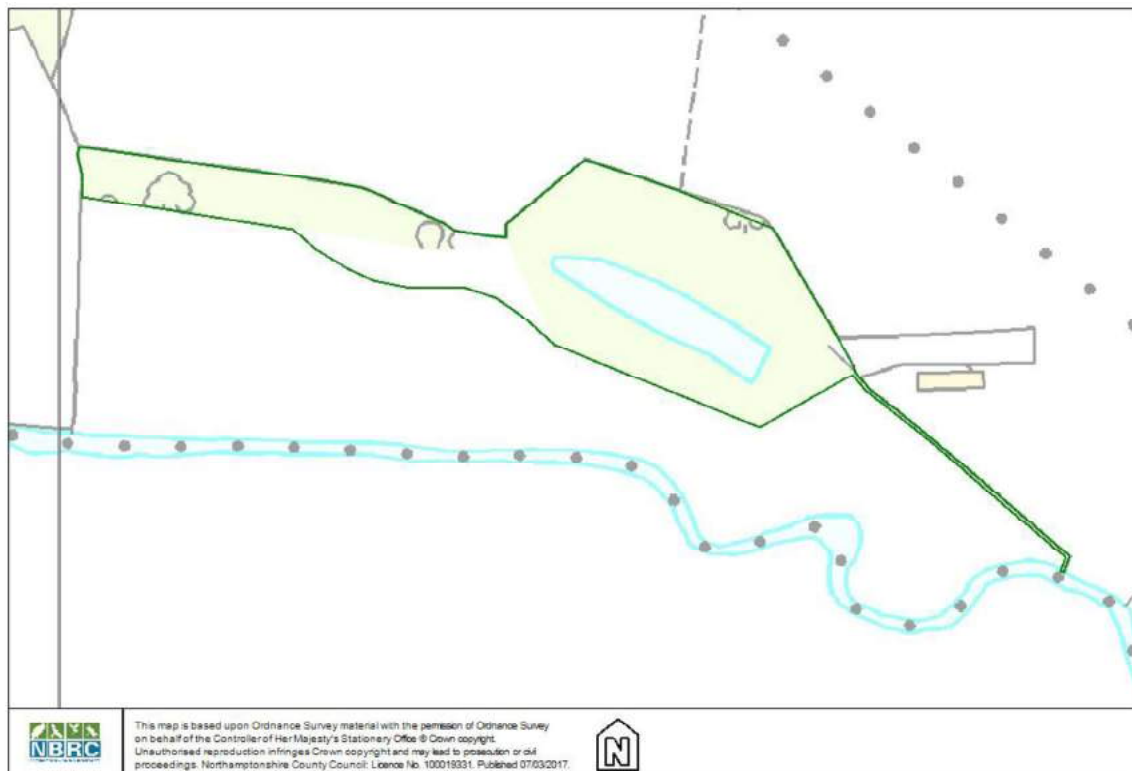
The water contains abundant aquatic species, limited to *Callitriche stagnalis*, *Mentha aquatica* and *Veronica beccabunga* in the shallowest (most recent) pond, but with *Caltha palustris*, *Alisma plantago-aquatica*, *Potamogeton natans* and other larger pond species in the older, deeper east pond. At the time of survey there were thousands of tadpoles and small fry in the ponds, and hundreds of damselflies. Water-beetles, pond skaters and whirligig beetles were also present. A heron regularly fishes here, and kingfishers are reported by the owner to breed here each year.

A very attractive and diverse site, with only a small amount of damage from the disturbance of creating the newer ponds. As they settle the invertebrate and plant diversity is likely to increase. These ponds are probably a good newt site.

Boundary Changes

20/08/2015 Original site centroid SP743494 was incorrect and so was changed to SP743483.

Map:



Site Name: Stoke Park Pavilions Woodland

Site Code: S586

Status: LWS

Other Designations:

Grid Reference: SP739487

Area (ha): 8.7

District: South Northamptonshire

Site History:

01/01/1980 LWS

Habitats present

Broad Habitat: Wetland, Woodland

BAP Habitat: Lowland Mixed Deciduous Woodland, Traditional Orchards

Reason for Designation:

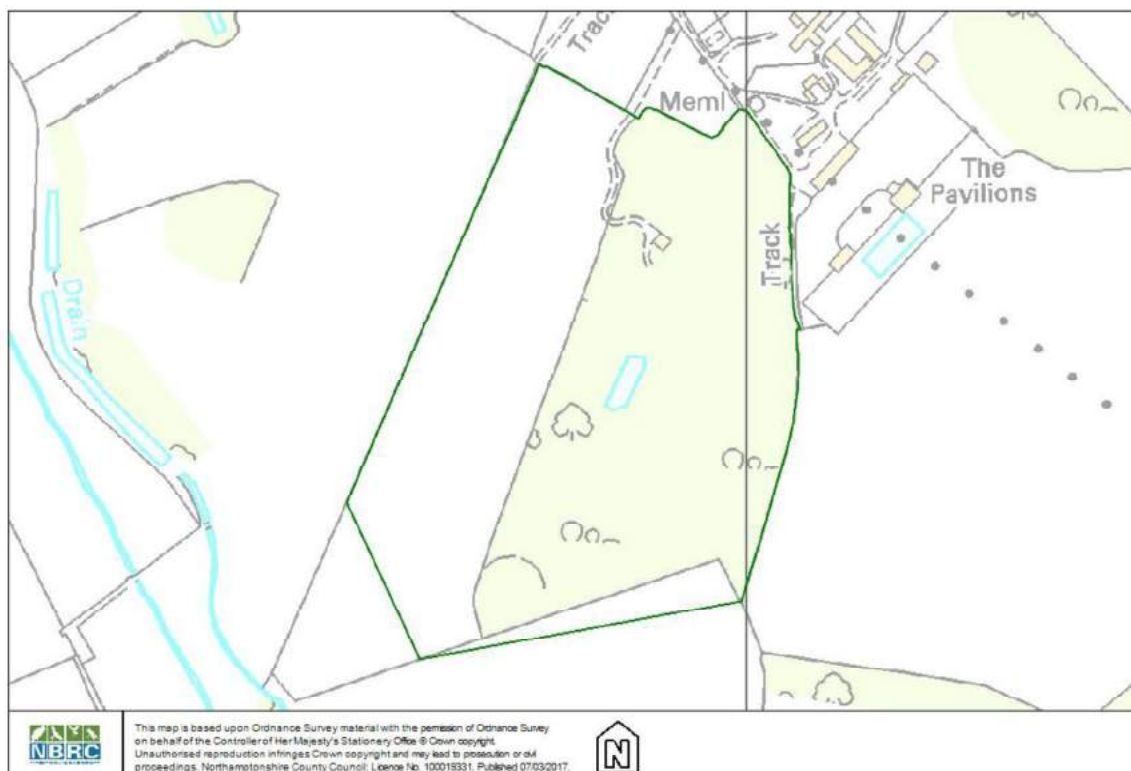
A park woodland with well-spaced trees to the north and a long-disused orchard to the south. An unusual site which offers a potentially interesting invertebrate habitat due to the old fruit trees which have been left to go overmature.

Site Description:

01/01/1980

A park woodland with well-spaced trees to the north and a long-disused orchard to the south. The understorey at the time of the last survey was very overgrown, with the woodland fenced against cattle and apparently otherwise unmanaged. Trees include old apples and mulberries, plus lime, poplar, hornbeam, laurel which all may have been planted. The main tree cover at the north end of the woodland is oak, with occasional ash and sycamore, and abundant elder in the understorey. Despite the limited scrub layer in this part of the wood, it is a well-established park woodland with groundflora species such as *Campanula trachelium*, *Circaea lutetiana*, *Carex remota*, *Mercurialis perennis* and *Brachypodium sylvaticum*. At the time of the last survey the small pond near the centre of the wood still held water, and a good variety of emergent species including *Hypericum tetrapterum*, *Filipendula ulmaria*, *Juncus inflexus*, *J. effusus* and *J. conglomeratus*, *Glyceria fluitans*, *Rorippa nasturtium-aquaticum*, *Myosotis scorpioides*, *Veronica beccabunga*, *Sparganium erectum* and *Salix capraea*. It is not known whether this pond is still wet, or if it has dried out like several other ponds in the area. An unusual site which offers a potentially interesting invertebrate habitat due to the old fruit trees which have been left to go overmature.

Map:



Site Name: **Stoke Park Wood**

Site Code: S588

Status: LWS

Other Designations: Ancient semi-natural woodland

Grid Reference: SP737493

Area (ha): 22.8

District: South Northamptonshire

Site History:
04/06/1996 LWS

Habitats present

Broad Habitat: Woodland

BAP Habitat: Lowland Mixed Deciduous Woodland

Reason for Designation:

A large semi-natural ancient woodland consisting of ash, oak and derelict hazel coppice with frequent field maple and suckering elm. There is a varied scrub layer and good ancient woodland ground flora.

Site Description:

04/06/1996

A large area of ancient woodland, very little of which has been cleared and replanted.

The wood is bisected by the narrow road to Park Farm (although the canopy on either side remains very close), and has one chunk taken out of the west side. The missing area has been converted to sheep pasture, with a few standard trees left to form parkland and a small strip at the far end reserved for maize (pheasant cover). A small strip of woodland opposite this has been re-coppiced, with both hazel and wych elm apparently cut back. Here the groundflora is ruderal and rather compacted, presumably due to the disturbance of extraction following the work. The remaining canopy consists of ash, oak and derelict hazel coppice with frequent field maple and suckering elm (some of which has also been coppiced).

Other scrub species are patchy throughout, including blackthorn, hawthorn, Midland hawthorn and elder. Much of the ride edges and some small clearings in the wood (mostly next to the rides) have tall, ruderal vegetation with few ancient woodland species present. Many of these areas have thistles and nettles in abundance, with occasional *Myosotis arvensis*, *Glechoma hederacea*, *Vicia sepia* and *Silene dioica*.

Most of the groundflora however (including a pheasant-pen area in the centre) has a good variety of typical species including large areas dominated by *Mercurialis* (darker areas), *Hyacinthoides* (lighter areas), *Primula vulgaris*, *Anemone nemorosa*, *Geum urbanum*, *Circaea lutetiana*, *Glechoma hederacea*, *Deschampsia cespitosa*, *Ajuga reptans*, *Veronica chamaedrys*, *Viola odorata* and *Arum maculatum*.

NB later this month (June 96) the owner of the wood found one *Orchis mascula* plant by one of the rides; apparently spotted orchids have also been found here.

The woodland on the east side of the road tends to have more of a typical old coppice structure, and the groundflora there is more diverse, with the majority of *Anemone* and *Primula* patches and frequent *Lamium galeobdolon* and *Conopodium majus* in addition to the above. There are also fewer signs of disturbance and correspondingly less weedy vegetation. Many birds and signs of mammals were found in the wood, which was thought to be a potential dormouse site. Unfortunately no dormouse-

chewed nutshells could be found, but this should really be surveyed again at a more suitable time, because it is eminently suitable.

The only area with limited groundflora and tree diversity was on the southwest side, where there has been some clearance and subsequent regeneration. A small pond area on the opposite of the track next to this compartment was found to be dry and overgrown with elder and other scrub.

Signs of mole, fox, badger, woodmouse, muntjac and rabbit were found, and a large jack hare was grazing the groundflora at the time of survey. Orange-tip, red admiral, large white and speckled wood butterflies all appear to breed here. Perhaps because of the small-mammal-rich sloping pastures around the edges of the wood, it is particularly attractive to birds of prey. Tawny owl, kestrel and, most significantly, a buzzard were seen at the time of survey. A varied woodland much-used by wildlife.

The owner is keen to manage it sympathetically, including coppicing small areas at a time.

Map:



Swan Valley Meadow

Administrative areas: Northampton(E District (74-))

Status(es): PWS

Centroid: SP722587 (Site Centroid)

Site type: Site

File code: N1203

Site/Subsite hierarchy: Swan Valley Meadow

Description: 2005: Viewed from a public bridle path, this was a site belonging to Swan Valley and comprised several quite different habitats.

In the south of the site there was a quite large lake with an island, through which flowed the same brook as that which flows through some of the lakes of Collingtree golf course. The rest of the site was situated between this brook and the Northampton arm of the Grand Union canal.

A brief view of the lake produced 9 species from the Fen, Swamp and Marsh indicator species list. The presence of locally abundant galingale beside the lake does make the origin of some other species rather suspect, though many other swamp and wetland species could also be seen, including branched bur-reed (*Sparganium erectum*), marsh yellow-cress (*Rorippa amphibian*), water chickweed (*Myosoton aquaticum*) and others. The immediate edges of the lake also held grassland and wet grassland species such as wild carrot (*Daucus carota*), meadow vetchling (*Lathyrus pratensis*) and tufted vetch (*Vicia cracca*).

Land between the lake and the bridle path in the south was neatly maintained. The path was regularly mown, and there was an area of recently mown grassland punctuated by small enclosures of young trees such as white willow (*Salix alba*) and crack willow (*S. fragilis*). There were also occasional individual planted trees with memorial plaques. This grassland held locally abundant black knapweed (*Centaurea nigra*) as well as ribwort plantain (*Plantago lanceolata*), yarrow (*Achillea millefolium*), hard rush (*Juncus inflexus*), ox-eye daisy (*Leucanthemum vulgare*), selfheal (*Prunella vulgaris*) and bedstraws (*Galium* species). In this area, and to the east of the bridle path, there was land gently rising to the higher level of the canal, and this grassland was species poor.

Towards the northern end of the lake there was taller, unmanaged vegetation between the path and lake, including abundant angelica (*Angelica sylvestris*) and water figwort (*Scrophularia auriculata*) growing among nettle (*Urtica dioica*), orange balsam (*Impatiens capensis*), spear thistle (*Cirsium vulgare*) and great willowherb (*Epilobium hirsutum*). There were also inaccessible patches of swamp here, which included a horsetail (*Equisetum* sp.), water chickweed and sedges (*Carex* spp.).

To the north of the lake the path crossed the brook to leave the site to the west. North of here the remainder of the site comprised a large area of unmanaged vegetation 2 metres or more tall where a mixture of plants grew. Great willowherb, angelica, hogweed (*Heracleum sphondylium*) and cow parsley (*Anthriscus sylvestris*) were abundant, along with occasional greater burdock (*Arctium lappa*), and through this struggled patches of marsh woundwort (*Stachys palustris*) and water chickweed.

At least some of this site is of County Wildlife Site quality, and permission should be obtained for a more thorough survey.

Total number of records: 52

Total number of species: 52

Site Name: Upton East Field

Site Code: N1472

Status: LWS

Other Designations: Nene Valley NIA

Grid Reference: SP721589

Area (ha): 6.6

District: Northampton

Site History:

12/06/2012 PWS

19/11/2012 LWS

Habitats present

Broad Habitat: Grassland

BAP Habitat: Floodplain Grazing Marsh

Reason for Designation:

A wet grassland with wide ditches on the banks of the River Nene. The site had a good scattering of wetland plants and is popular with grass snakes. It qualifies as a LWS with 10 wetland indicators recorded, including 1 strong.

Site Description:

12/06/2012

Low lying ground with the river Nene and a wide drainage channel on the eastern side. With a green-lane with abundant shrubs and trees on the western edge. The site, which was crossed by three narrow drains, was immediately to the east of Upton Mill South Lake. It gave the impression of being rarely disturbed.

A lot of this site was under water at the time of this survey, some parts being really quite deep.

The three drains held deep water at the time of survey, with the flooding making it rather difficult to see the drains in places. Present in the drains in small numbers were *Carex riparia* Greater Pond-sedge, *Glyceria maxima* Reed Sweet-grass, *Lemna minor* Lesser Duckweed and *Typha latifolia* Reedmace. Locally frequent *Salix cinerea* Grey Willow and small *Salix alba* White Willow were inhibiting swamp growth in some places.

The edge of the most southerly drain had a gappy rush-pasture edge with *Juncus effusus* Soft Rush and more frequent *J. inflexus* Hard Rush present. *Persicaria amphibia* Amphibious Bistort was quite frequent. Away from the rush-pasture there were small stands of *Iris pseudacorus* Yellow Flag as well as *Epilobium parviflorum* Hoary Willowherb, *Lythrum salicaria* Purple Loosestrife and *Lycopus europaeus* Gipsywort. Among these were lesser amounts of *Cardamine pratensis* Cuckoo Flower, *Galium palustre* Marsh Bedstraw and others. There was a little *Glyceria fluitans* Floating Sweet-grass in the deepest part of this drain.

The central drain had larger areas of *Glyceria maxima* Reed Sweet-grass swamp associated with it, in one place stretching a few metres out into the grassland, as well as a tiny amount of *Carex acuta* Slender Tufted Sedge. Where the central and northern drains converged in the east, there was a patch of *Phalaris arundinacea* Reed Canary-grass. With this, Purple Loosestrife was locally very abundant. The northern drain also had sizeable stands of Reed Sweet-grass associated with it, as well as much smaller stands of Reed Canary-grass.

There was a pond in the eastern corner of this site. Here were some larger stands of Greater Pond-sedge swamp, which in places was being invaded by *Cirsium arvense* Creeping Thistle, *Galium*

aparine Cleavers and *Urtica dioica* Nettle. The pond edges had Grey Willow and *S. viminalis* Osier. On the open water of the pond was a little *Nuphar lutea* Yellow Water-lily. Reed Sweet-grass was present as a narrow strip along the south-eastern edge of the pond and around a small island and there was also a small amount of *Schoenoplectus lacustris* Bulrush.

The grassland between the drains had locally abundant *Alopecurus pratensis* Meadow Foxtail, *Poa trivialis* Rough Meadow-grass, *Elytrigia repens* Couch Grass, *Holcus lanatus* Yorkshire Fog and less frequent *Lycopus europaeus* Gipsywort. The grassland had occasional wetland plants such as *Angelica sylvestris* Wild Angelica, *Lythrum salicaria* Purple Loosestrife, *Scrophularia auriculata* Water Figwort and *Stachys palustris* Marsh Woundwort growing well away from the drains. Among this were occasional to locally frequent *Angelica sylvestris* Angelica, *Persicaria amphibia* Amphibious Bistort, *Ranunculus acris* Meadow Buttercup and *R. repens* Creeping Buttercup. *Agrostis stolonifera* Creeping Bent was more abundant in the north.

Areas without vegetation may have been flooded for a long period, but not enough for swamp communities to develop. At the edges here were plants such as *Alopecurus geniculatus* Marsh Foxtail, *Agrostis stolonifera* Creeping Bent, *Persicaria maculosa* Redshank, *Potentilla anserina* Silverweed and *Rumex crispus* Curled Dock.

Along the western edge of the site, *Urtica dioica* Nettle was often abundant, with frequent scrambling *Galium aparine* Cleavers. In the shade of the overhanging trees and shrubs beside the green lane though, there were also a few shade plants such as Red Campion *Silene dioica* and rare *Ranunculus auricomus* Goldilocks Buttercup. *Prunus spinosa* Blackthorn was occasionally suckering out from the hedge line.

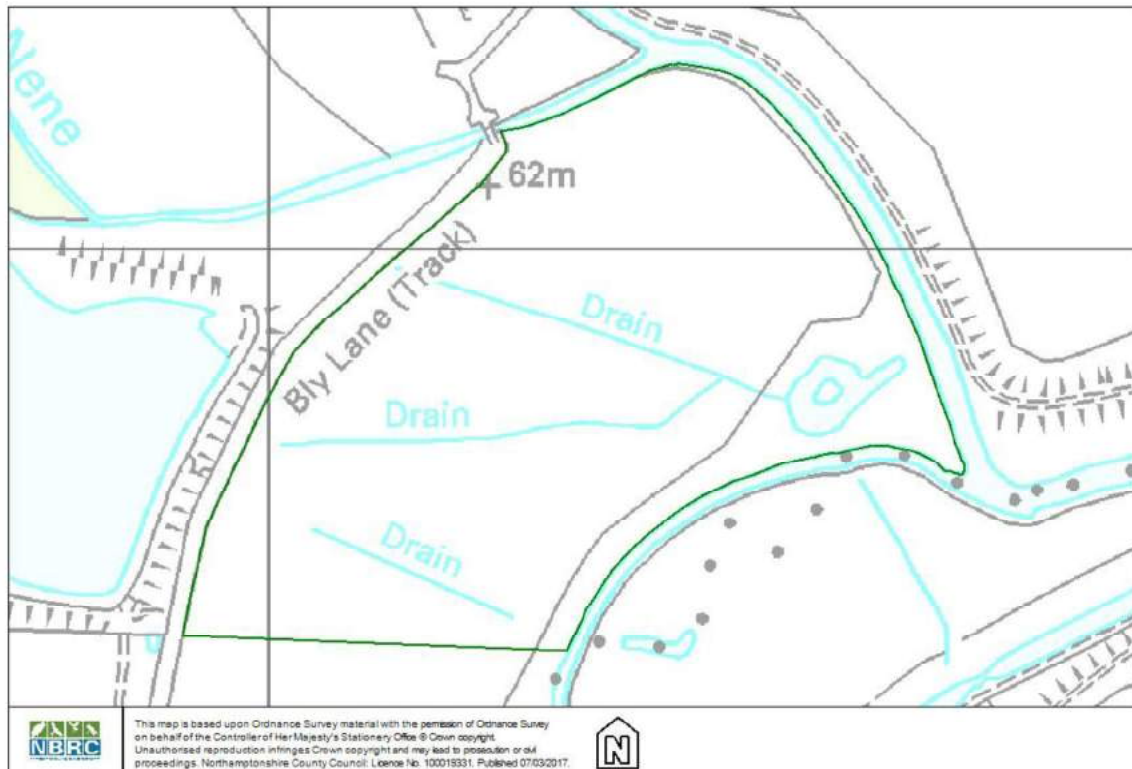
To the south of a wooden fence across the site, there was disturbed ground with abundant *Elytrigia repens* Couch Grass, *Rumex obtusifolius* Broad-leaved Dock. There was also a small amount of *Carex riparia* Greater Pond-sedge growing on this disturbed ground also.

However, close to a footpath at the south-east edge, there was a narrow strip of grassland with locally frequent *Centaurea nigra* Knapweed, *Galium mollugo* Hedge Bedstraw and *Leucanthemum vulgare* Oxeye Daisy in what may be a seeded area. The strip was recently mown, with the cuttings removed.

A strip of higher ground along the edge of the drain in the east grew locally abundant *Conium maculatum* Hemlock and *Epilobium hirsutum* Greater Willowherb, along with less frequent *Arctium minus* Lesser Burdock, *Cirsium arvense* Creeping Thistle and nettle. *Barbarea vulgaris* Wintercress was also locally frequent. The slightly higher ground alongside the main river in the east had plants such as *Dipsacus fullonum* Teasel, *Epilobium hirsutum* Greater Willowherb and *Heracleum sphondylium* Hogweed.

Grass snakes were frequent at this site. Reed Buntings and Sedge Warblers were breeding here. Birds using the flooded areas included Black-headed Gull, Canada Goose, Mallard.

Map:



Wootton Railway Embankments

Administrative areas: Northamptonshire(E County (74-))
Wootton(Civil Parish)

Status(es): County Wildlife Site

Centroid: SP740579 (Site Centroid)

Site type: Site

File code: N/18.8.92

Site/Subsite hierarchy: **Wootton Railway Embankments**

Description:

The west side of this high embankment is now beginning to scrub over, but there is still a fair area of grassland present, especially in the central part of the site. This is an unusual grassland for the area as it appears to be on a slightly acid, Northampton Sand substrate. Young scrub on the site includes *Cytisus scoparius*, *Rubus* agg. and *Ulex europaea*, with frequent regenerating *Quercus robur*. A close survey was not possible as the line is in use, but some of the grassland species were noted, including frequent *Daucus carota*, *Lathyrus pratensis*, *Arrhenatherum elatius*, *Festuca rubra*, *Agrostis tenuis*, *Aira* sp., *Vulpia* sp. and *Senecio jacobaea*. NB. the east side of the embankment has much more rank vegetation and is covered with *Calystegia sepium*, so is not included in the Prime Site. There is a possibility that this site could be a reptile site for one or more species, but a sufficiently close survey was not possible. A priority site for a full survey - although this may be difficult as BR have not been responsive. The grassland is well worth managing as it will probably be lost to encroachment fairly soon.

2003: Access still not possible to the whole site. Atkins consulted NCC on management works, and brief survey carried out by us - site retains considerable interest, with lichen-rich very low turf - BE to supply lichen list. Also possible record of Sweet Briar, to be confirmed. Impact of management works (seeding slope, removing rabbits, redirecting drainage) may be minimised and suggestions have been passed to Atkins.

2005 update

The east side of the embankment was covered in netting about a year ago, possibly seeded with various species of grass, which currently dominate this part of the site (Linda recorded this bank as being mostly hedge bindweed). Above the steep bank is open tall ruderal vegetation over bare ground (contractors were working around this area recently). North of this on a short steep bank up to the top of the bridge from the railway line and above the bridge itself is an acidic community; this is grassland but very sparse due to very high levels of rabbit grazing (less than 50% vegetated) - this is the area of main interest, it extends across the top of the bridge but is replaced by dense bracken in the west corner and down the west bank adjacent to the bridge together with locally abundant perforate St. John's wort (*Hypericum perforatum*).

The area of interest is predominantly red fescue (*Festuca rubra*), common bent (*Agrostis capillaris*) and sheep sorrel (*Rumex acetosella*) with frequent lichens (samples collected and given to Brian Eversham, mostly small ground-level specimens). Also scattered here are carline thistle (*Carlina vulgaris*), ragwort (*Senecio jacobaea*), field pansy (*Viola arvensis*), spear thistle (*Cirsium vulgare*), a parsley piert species (*Aphanes* sp. - only bottom young leaves, not identifiable to species), basal leaves of greater mullein (*Verbascum thapsus*) and bramble (*Rubus fruticosus* agg.). More frequent are ox-eye daisy (*Leucanthemum vulgare*), bird's-foot trefoil (*Lotus corniculatus*), teasel (*Dipsacus fullonum*) and rosebay willowherb (*Chamerion angustifolium*), germander speedwell (*Veronica chamaedrys*). Also recorded rarely were broom (*Cytisus scoparius*), smooth sow-thistle (*Sonchus oleraceus*), square-stalked willowherb (*Epilobium tetragonum*) and dog rose (*Rosa canina*). Buzzard and magpie flew over. Large piles of ironstone rocks lie at the bottom of the slope.

A hawkweed *Hieracium vulgatum* was present either above the railway or on the west bank.

The west bank was described as of interest in the survey in 1992, at which time it was said to be beginning to scrub over and had frequent regenerating pedunculate oak (*Quercus robur*) - this has now resulted in loss of the majority of the grassland (the oak is mostly planted rather than regeneration). However, the north half of the west bank does still support interesting patches within the young woodland - these areas are also heavily rabbit grazed and often almost exclusively sheep sorrel, but small leaves of a species of wood-rush (*Luzula* sp.) are also scattered together with common bent. There are also patches of a *Polytrichum* moss with lichens, red fescue and common mouse-ear (*Cerastium fontanum*) also in the same community.

Along the bottom of the bank adjacent to the railway are areas of damp neutral grassland (these are regularly sprayed with herbicide from the track but nevertheless have managed to retain some diversity with occasional perforate St. John's wort, bird's-foot trefoil, nettle (*Urtica dioica*), tufted hair-grass (*Deschampsia cespitosa*), dove's-foot crane's-bill (*Geranium molle*), selfheal (*Prunella vulgaris*) and smooth hawk's-beard (*Crepis capillaris*). More frequent are black medick (*Medicago lupulina*), hairy sedge (*Carex hirta*), creeping thistle (*Cirsium arvense*), tall oat-grass (*Arrhenatherum elatius*) and creeping bent (*Agrostis stolonifera*).

Further south the open areas are generally less rabbit-grazed and dominated by tall ruderal vegetation, predominantly nettle and rosebay willowherb with bramble.

This site qualifies as a CWS because it contains a lichen listed in the Northamptonshire Red Data Book as a Northamptonshire Scarce Species. The acid grassland is currently too degraded to qualify as CWS. It is under serious threat and will be lost entirely unless management is altered soon.

Total number of records:	103
Total number of species:	97

APPENDIX B: Botanical Species List

Common Name	Scientific Name
Annual Meadow-grass	<i>Poa annua</i>
Ash	<i>Fraxinus excelsior</i>
Autumnal Hawkbit	<i>Leontodon autumnalis</i>
Barren Brome	<i>Anisantha sterilis</i>
Black Bindweed	<i>Fallopia convolvulus</i>
Black Medick	<i>Medicago lupulina</i>
Blackthorn	<i>Prunus spinosa</i>
Bramble	<i>Rubus fruticosus agg.</i>
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Broad-leaved Willowherb	<i>Epilobium montanum</i>
Cleavers	<i>Galium aparine</i>
Cock's-foot	<i>Dactylis glomerata</i>
Common Couch	<i>Elytrigia repens</i>
Common Knapweed	<i>Centaurea nigra</i>
Common mouse-ear	<i>Cerastium fontanum ssp. vulgare</i>
Common Nettle	<i>Urtica dioica</i>
Common Poppy	<i>Papaver rhoeas</i>
Common Ragwort	<i>Senecio jacobaea</i>
Common Sorrel	<i>Rumex acetosa</i>
Cow Parsley	<i>Anthriscus sylvestris</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Creeping Cinquefoil	<i>Potentilla reptans</i>
Creeping Thistle	<i>Cirsium arvense</i>
Curled dock	<i>Rumex crispus ssp. littoreus</i>
Cut-leaved Crane's-bill	<i>Geranium dissectum</i>
Dandelion	<i>Taraxacum officinale agg.</i>
Dog Rose	<i>Rosa canina agg.</i>
Dove's-foot Crane's-bill	<i>Geranium molle</i>
False Oat-grass	<i>Arrhenatherum elatius</i>
Field Bindweed	<i>Convolvulus arvensis</i>
Field Forget-me-not	<i>Myosotis arvensis</i>
Field Maple	<i>Acer campestre</i>
Forget-me-not	<i>Myosotis sp.</i>
Greater Plantain	<i>Plantago major</i>
Guelder-rose	<i>Viburnum opulus</i>
Hawthorn	<i>Crataegus monogyna</i>
Hazel	<i>Corylus avellana</i>
Hedge Bindweed	<i>Calystegia sepium</i>
Hedge Mustard	<i>Sisymbrium officinale</i>
Herb bennet	<i>Geum urbanum</i>
Hogweed	<i>Heracleum sphondylium</i>
Horsetail	<i>Equisetum sp.</i>

Knotgrass	<i>Polygonum sp.</i>
Lesser Hawkbit	<i>Leontodon saxatilis</i>
Oak	<i>Quercus sp.</i>
Oxeye Daisy	<i>Leucanthemum vulgare</i>
Perennial Rye-grass	<i>Lolium perenne</i>
Primrose	<i>Primula vulgaris</i>
Red Fescue	<i>Festuca rubra agg.</i>
Redshank	<i>Persicaria maculosa</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Rough Meadow-grass	<i>Poa trivialis</i>
Rowan	<i>Sorbus aucuparia</i>
Selfheal	<i>Prunella vulgaris</i>
Sessile Oak	<i>Quercus petraea</i>
Sheep's Fescue [agg.]	<i>Festuca ovina agg.</i>
Silver Birch	<i>Betula pendula</i>
Smaller Cat's-tail	<i>Phleum bertolonii</i>
Smooth Meadow-grass	<i>Poa pratensis sens.lat.</i>
Smooth Tare	<i>Vicia tetrasperma</i>
Sow-thistle	<i>Sonchus sp.</i>
Spear Thistle	<i>Cirsium vulgare</i>
Timothy	<i>Phleum pratense sens.lat.</i>
Tufted Hair-grass	<i>Deschampsia caespitosa</i>
Wall Barley	<i>Hordeum murinum</i>
Wavy Hair-grass	<i>Deschampsia flexuosa</i>
Wetted Thistle	<i>Carduus crispus</i>
White Clover	<i>Trifolium repens</i>
White Dead-nettle	<i>Lamium album</i>
Wild Cherry	<i>Prunus avium</i>
Wild Teasel	<i>Dipsacus fullonum</i>
Yarrow	<i>Achillea millefolium</i>
Yorkshire-fog	<i>Holcus lanatus</i>

APPENDIX C: Hedgerow Survey Results

Main Site

Table

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H1	Hawthorn, Prunus sp, field rose, blackthorn, apple, dog rose, elm	100	4	No	>4m high Outgrown/ not managed Dry ditch	2	Moderate-high	NO
H2	Elm, hawthorn, blackthorn, prunus sp, apple, elder, dog rose	400	3	No	3-4m high Occasional (10-30%) gaps Dry ditch	-2	Moderate-high	NO
H3	Wild cherry, hawthorn, elm, ash, blackthorn, elder, white poplar, dog rose, crab apple, Norway maple	350	5	Yes	3-4m high Abundant semi-mature standard trees	2+	Moderate-high	NO
H4	Elm, hawthorn, white poplar, field maple, norway maple, field rose, ash, blackthorn, cherry, common lime, hybrid black poplar.	150	5	Yes	3-4m high and 2-3m wide Associated with byway Several semi-mature standard trees	2	Moderate-high	YES
H5	Elm, hawthorn, ash, Norway maple, downy birch, English oak, sycamore	250	4	No	Dry ditch with abundant vegetation.	2	Moderate-high	NO
H6	Blackthorn, elm, ash, hawthorn, white poplar, Norway maple, wild cherry, horse chestnut, dog rose	200	4	No	2-3m high and 2-3m wide Several trees within the hedge and dry ditch.	2	Moderate-high	NO

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H7	Hawthorn, hybrid black poplar, dog rose, backthorn, ash	220	3	No	>4m high	3	Moderate	NO
H8	Hawthorn, blackthorn, dog rose, apple, elder, English oak, hybrid black poplar, ash	300	4	No	Adjacent to woodland	-2	Moderate-high	NO
H9	Ash, hawthorn, blackthorn, apple, elder, field maple	190	4	No	>4m high	-2	Moderate-high	NO
H10	Elder, hawthorn, p.oak	170	2	No	>4m high.	3	Moderate	NO
H11	Blackthorn, hawthorn, elder, Norway maple, dog rose, elm, pedunculate oak, white poplar	280	4	No	Associated with byway Ditch	-2	Moderate-high	YES
H12	Blackthorn, hawthorn, elm, sycamore, elder, horse chestnut, white poplar, common lime, dog rose	140	4	No	Defunct hedgerow	3+	Moderate	NO
H13	Blackthorn, ash, elder, hawthorn, prunus sp., elm	280	3	No	Short, managed hedgerow with many gaps.	4	Low	NO

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H14	Hawthorn, elder, field maple	270	2	No	n/a	4+	Low	NO
H15	Pedunculate oak, elm, hawthorn, dog rose, elder, ash, blackthorn, apple	300	4	No	n/a	2	Moderate-high	NO
H16	Hawthorn, hybrid black poplar, dog rose, blackthorn, ash, apple, elm	180	3	No	Number of standard trees.	-2	Moderate-high	NO
H17	Hawthorn, dog rose, pedunculate oak, ash, blackthorn, field maple	150	2	No	Connected to woodland	3	Moderate	NO
H18	Blackthorn, hawthorn, dog rose, elder, field maple, ash, elm	400	3	No	Associated with ditch Abundant gaps (20 – 30%)	3	Moderate	NO
H19	Blackthorn, elm, hawthorn, dog rose, ash	150	3	No	Ditch & grass verge on one side.	4+	Low	NO
H20	Blackthorn, elm, elder, ash, hawthorn	250	4	No	n/a.	-3	Moderate	NO
H21	Ash, blackthorn, hawthorn, dog rose, pedunculate oak, apple	500	4	No	Abundant standard trees	-2	Moderate-high	NO

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H22	Ash, blackthorn, elder, dog rose, apple, elm	330	3	No	Defunct hedgerow (>30% gaps)	3	Moderate	NO
H23	Apple, hawthorn, ash, dog rose, elm, pedunculate oak, blackthorn, elder	290	3	No	Abundant tree standards	3+	Moderate	NO
H24	pedunculate oak, hawthorn, horse chestnut, apple, blackthorn, white poplar, ash, field maple, dog rose, Norway maple, elder	700	6	Yes	Vegetated ditch Small (~0.5m) hedgebank.	1	High	YES
H25	Ash, blackthorn, hawthorn, dog rose, pedunculate oak, apple	420	5	Yes	Vegetated ditch and grass verge	-2	Moderate-high	YES
H26	Elder, hawthorn, blackthorn, apple, ash	220	4	No	Vegetated ditch.	3+	Moderate	NO
H27	Hawthorn, sycamore, dog rose	130	1	No	n/a	3+	Moderate	NO
H28	Hawthorn, dog rose, ash	120	1	No	n/a	3+	Moderate	NO
H29	Ash, hawthorn	260	1	No	n/a	3+	Moderate	NO

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H30	Hawthorn, elder, blackthorn, apple	100	2	No	n/a	3+	Moderate	NO
H31	Hawthorn, dog rose, hybrid black poplar, blackthorn, pedunculate oak, elm, ash	150	3	No	Standard trees Dry ditch	3	Moderate	NO
H32	Hawthorn, bramble, common ash, wych elm, elder, field maple, blackthorn	500	4	No	Standard trees Dry ditch	-2	Moderate - high	NO
H33	Hawthorn, bramble, common ash, field maple, blackthorn, Lombardy poplar	260	4		Standard trees	2+	Moderately high-high	NO
H34	Hawthorn, common ash	180	2		Dry ditch	-3	Moderate	
H35	Not accessible	-	-		-	-	-	-
H36	Hawthorn, blackthorn, elder	30	3		n/a	3	Moderate	NO
H37	Dogwood, Berberis	-	-	No	Ornamental hedge	-	-	-
H38	Cherry species, pedunculate oak	90	3	No	Semi-mature standard trees	3	Moderate	NO
H39	Cherry species, pedunculate oak	90	3	No	Semi-mature standard trees	3	Moderate	NO

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H40	Blackthorn, crack willow, elder, hawthorn	170m	2	No	Linked to woodland	3	Moderate	NO
H41	Blackthorn, elder, hawthorn	380m	2	No	n/a	3	Moderate	NO
H42	Blackthorn, elder, hawthorn English elm	500m	2	No	>10% gaps	-3	Moderate	NO
H43	Hawthorn, English elm	130m	2	No	Connections, linked to woodland	4	Low	No
H44	Hawthorn, bramble, elder, dog rose, English elm, white poplar, ash, aspen, horse chestnut, hybrid black poplar	400m	3	No	<10% gaps, grass verge, ditch	3+	Moderate	NO
H45	Blackthorn, hawthorn, elder, dog rose, English elm, hybrid black poplar	200m	3	No	Connections	3+	Moderate	NO
H46A	Hawthorn, elder, crack willow, hybrid black poplar	75m	2	No	<10% gaps	-3	Moderate	NO
H46B	Hawthorn, elder, ash, sycamore	120m	2	No	<10% gaps, grass verge	3	Moderate	NO
H47	Blackthorn, hawthorn, hazel, whitebeam, dogwood, ash	250m	n/a	n/a	Recently planted	n/a	n/a	N/A

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H48	Hawthorn, elder, dog rose, bramble, ash	45m	3	No	<10% gaps	3	Moderate	NO

¹ Species-rich hedgerows with 5 or more per 30m section (based on sampling 30m sections according to the Hedgerow Regulations 1997)

² Hedgerows that meet the wildlife & landscape criteria of the Hedgerow regulations 1997. These hedgerows are also highlighted in bold throughout

Highway Mitigation Works – Roade Bypass and minor highway worksareas

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H101	Willow sp., Spindle, Field maple, Blackthorn, Elm, Elder, Sycamore, Hawthorn	300	4	No	<4m high 0-10% gaps Ditch	-1	High-Very High	Not important
H102	Elm, Hawthorn, Elder	115	2.5	No	2-4m high 0-10% gaps No ditch	-2	Moderate High-High	Not important
H103	Privet, S.L Lime, Poplar, Hazel, Hawthorn, Wayfaring, Spindle, Ash, Field maple, Dogwood, Blackthorn	240	6	Yes	2-4m high 0-10% gaps Ditch	1	High-Very High	Important
H104	White poplar, Dogwood, Hazel, Field maple, Elm, Blackthorn, Elder, Spindle, Hawthorn, Ash, Oak	350	5.7	Yes	2-4m high No gaps Ditch	1	High-Very High	Important

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H105	Dogwood, Wayfaring, Ash, Field maple, Elder, Hazel, Blackthorn, Hawthorn	320	4	No	2-4m high 0-10% gaps Ditch	-1	High-Very High	Not important
H106	Sycamore, Elm, Elder, Blackthorn	60	3	No	<4m high 0-10% gaps Ditch	-2	Moderate High-High	Not important
H107	Elder, Hazel, Dogwood, Blackthorn, Spindle, Field maple, Hawthorn, Wayfaring	340	4.6	No	<4m high	-1	High-Very High	Not important
H108	Hawthorn, Elder	60	2	No	2-4m high No gaps No ditch	-2	Moderate High-High	Not important
H109	Field maple, Hawthorn, Ash, Dogwood, Elder, Elm	160	4	No	2-4m high No gaps Ditch	-1	High-Very High	Important
H110	Spindle, Ash, Sycamore, Hawthorne, Elm, Field maple, Blackthorn, Oak	150	3	No	2-4m high 0-10% gaps Ditch	2+	Moderate High-High	Not important
H111	Goat willow, Field maple, Hawthorn, Blackthorn, Spindle, Hazel, Ash, Elm	360	5	Yes	<4m high No gaps Ditch	-1	High-Very High	Important

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H112	Elm, Blackthorn, Elder	50	3	No	<4m high No gaps No ditch	3+	Moderate	Not important
H113	Goat willow, Elm, Oak, Blackthorn, Hawthorn	133	4.5	No	2-4m high No gaps Ditch	-1	High-Very High	Not important
H114	Hawthorn, Blackthorn, Oak, Elm, Field maple	230	2.7	No	<4m high No gaps Ditch	2+	Moderate High-High	Not important
H115	Hazel, Sycamore, Ash, Hawthorn, Blackthorn, Field maple	120	3	No	<4m high No gaps No ditch	-1	High-Very High	Not important
H116	Hazel, Elder, Hawthorn, Blackthorn	90	3	No	<4m high No gaps Ditch	-1	High-Very High	Not important
H117	Blackthorn, Hawthorn, Elder, Elm, Ash	230	2.7	No	<4m high 0-10% gaps No ditch	2+	Moderate High-High	Not important
H118	Spindle, Hawthorn, Ash, Field maple, Blackthorn	220	3	No	<4m high No gaps Ditch (centre)	2+	Moderate High-High	Not important

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H119	Hawthorn, Field maple, Blackthorn, Elm	230	2.5	No	2-4m high No gaps No ditch	-2	Moderate High-High	Not important
H120*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
H121*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
H122	Blackthorn, Hawthorn	150	1.5	No	2-4m high 0-10% gaps Ditch	-2	Moderate High-High	Not important
H123	Field maple, Hawthorn, Blackthorn	130	2.5	No	2-4m high No gaps Ditch	-2	Moderate High-High	Not important
H124	Hawthorn, Field maple, Dogwood, Blackthorn	100	2	No	<4m high No gaps Ditch	2+	Moderate High-High	Not important
H125	Wayfaring, Dogwood, Hawthorn, Hazel, Blackthorn, Spindle, Field maple, Elm	550	4	No	<4m high No gaps Ditch	-1	High-Very High	Not important

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H126	Sycamore, Hawthorn, Dogwood, Field maple	130	3	No	2-4m high No gaps No ditch	-2	Moderate High-High	Not important
H127	Field maple, Hawthorn, Dogwood, Ash, Hazel, Elder, Elm, Blackthorn	130	5	Yes	<4m high No gaps No ditch	-1	High-Very High	Important
H128	Hawthorn, Field maple, Elder, Blackthorn	65	4	No	2-4m high No gaps Ditch	2+	Moderate High-High	Important
H129	Wayfaring, Hazel, Spindle, Ash, Elm, Dogwood, Blackthorn, Field maple, Hazel	270	5	Yes	2-4m high No gaps Ditch	-1	High-Very High	Important
H130	Dogwood, Hazel, Hawthorn, Field maple, Buckthorn, Wayfaring, Blackthorn, Elder	380	4.3	No	2-4m high No gaps Ditch	-1	High-Very High	Important
H131	Field maple, Blackthorn, Ash, Elder, Hawthorn	100	5	Yes	<4m high 0-10% gaps No ditch	3+	Moderate	Important
H132	Blackthorn, Hawthorn, Ash, Elder	100	3	No	<4m high No gaps No ditch	2+	Moderate High-High	Not important

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H133	Elder, Hawthorn, Blackthorn	50	4	No	<4m high No gaps No ditch	2+	Moderate High-High	Not important
H134	Hawthorn, Elder, Blackthorn, Field maple	50	4	No	2-4m high No gaps No ditch	2+	Moderate High-High	Not important
H135	Wayfaring, Dogwood, Malus sp., Spindle, Hazel, Field maple, Ash, Elm, Hawthorn, Elder, Blackthorn	350	5	Yes	<4m high 0-10% gaps No ditch	1	High-Very High	Important
H136	E.El原因, Blackthorn, Hawthorn, Elder	240	2.7	No	2-4m high 0-10% gaps Ditch	2+	Moderate High-High	Not important
H137	Ash, Hawthorn, Elder, E.El原因	230	2.3	No	2-4m high No gaps Ditch	-2	Moderate High-High	Not important
H138*	N/A	100m	N/A	N/A	N/A	N/A	N/A	N/A
H139*	N/A	130m	N/A	N/A	N/A	N/A	N/A	N/A
H140**	Hawthorn, elder	220m	N/A	N/A	<10% gaps	N/A	N/A	N/A
H141**	Hawthorn, elder	285m	N/A	N/A	N/A	N/A	N/A	N/A
H142*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
H143*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Hedge	Species	Approximate Length / m	Average species per 30m section	Species-rich ¹	Features & Comments	HEGS Assessment		Regs ²
						Grade	Value	
H144**	Hawthorn, elder	215m	N/A	N/A	<10% gaps	N/A	N/A	N/A
H201	Ash, English elm, elder, blackthorn, hawthorn	200m	2	No		4	Low	Not important
H202	Ash, English elm, elder, hawthorn	315m	3	No		4	Low	Not important
H203	Ash, English elm, elder, hawthorn	300m	2	No		4	Low	Not important
H204	Ash, English elm, elder, hawthorn, beech	145m	3	No	Ditch	3	Moderate	Not important
H205	Not used	N/A	N/A	N/A	N/A	N/A	N/A	N/A
H206	Ash, English elm, elder, hawthorn	260m	3	No		4	Low	Not important
H207	English elm, elder, ash, blackthorn, sycamore	310m	3		Standard trees, bank/lynchet	3	Moderate	Not important
H208	Hawthorn, elder, English elm, Field maple, blackthorn, English oak, ash, dogwood	400m	4	No	Standard trees, bank/lynchet	-2	Moderate High-High	Not important
H209	Ash, English elm, elder, blackthorn, hawthorn	380m	3	No	Bank/Lynchet	4	Low	Not important
H210	Elder, ash, hawthorn	75m	2	No		4	Low	Not important

¹ Species-rich hedgerows with 5 or more per 30m section (based on sampling 30m sections according to the Hedgerow Regulations 1997)

² Hedgerows that meet the wildlife & landscape criteria of the Hedgerow regulations 1997. These hedgerows are also highlighted in bold throughout

* Hedgerow inaccessible to direct survey

** No assessment against criteria of HEGS & Hedgerow Regulations 1997 made due to access restrictions

Appendix D – Bypass Corridor - Grassland Survey Results

Insert Figure 5.3c

Species Lists (September 2017)

Table 2: Field 1 Species List (September 2016)

Taxon	Common Name	Abundance / Comment
<i>Centaurea nigra</i>	Common Knapweed	Abundant
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	Abundant
<i>Plantago lanceolata</i>	Ribwort Plantain	Abundant
<i>Ranunculus acris</i>	Meadow Buttercup	Abundant
<i>Schedonorus arundinaceus</i>	Tall Fescue	Abundant
<i>Senecio erucifolius</i>	Hoary Ragwort	Abundant
<i>Trifolium pratense</i>	Red Clover	Abundant
<i>Agrostis capillaris</i>	Common Bent	Frequent
<i>Dactylis glomerata</i>	Cock's-foot	Frequent
<i>Cynosurus cristatus</i>	Crested Dog's-tail	Frequent to abundant
<i>Holcus lanatus</i>	Yorkshire-fog	Frequent to abundant
<i>Agrostis stolonifera</i>	Creeping Bent	Frequent to locally abundant
<i>Juncus conglomeratus</i>	Compact Rush	Locally abundant
<i>Equisetum arvense</i>	Field Horsetail	Locally frequent
<i>Trifolium repens</i>	White Clover	Locally frequent
<i>Cirsium arvense</i>	Creeping Thistle	Occasional
<i>Heracleum sphondylium</i>	Hogweed	Occasional
<i>Juncus effusus</i>	Soft-rush	Occasional
<i>Phleum pratense</i>	Timothy	Occasional
<i>Lolium perenne</i>	Perennial Rye-grass	Occasional to locally frequent
<i>Ranunculus repens</i>	Creeping Buttercup	Occasional to locally frequent
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Present
<i>Agrimonia eupatoria</i>	Agrimony	Rare
<i>Cerastium fontanum</i>	Common Mouse-ear	Rare
<i>Juncus inflexus</i>	Hard Rush	Rare
<i>Lathyrus pratensis</i>	Meadow Vetchling	Rare
<i>Leucanthemum vulgare</i>	Oxeye Daisy	Rare
<i>Rumex crispus</i>	Curled Dock	Rare
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Rare
<i>Senecio jacobaea</i>	Common Ragwort	Rare
<i>Vicia cracca</i>	Tufted vetch	Rare
<i>Crataegus monogyna</i>	Hawthorn	Rare/seedlings
<i>Fraxinus excelsior</i>	Ash	Rare/seedlings
<i>Rosa arvensis</i>	Field-rose	Rare/seedlings

Table 3: Field 2 Species List

Taxon	Common Name	Abundance / Comment
<i>Centaurea nigra</i>	Common Knapweed	Abundant
<i>Holcus lanatus</i>	Yorkshire-fog	Abundant
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	Abundant
<i>Plantago lanceolata</i>	Ribwort Plantain	Abundant
<i>Ranunculus acris</i>	Meadow Buttercup	Abundant
<i>Trifolium pratense</i>	Red Clover	Abundant

Taxon	Common Name	Abundance / Comment
<i>Agrostis capillaris</i>	Common Bent	Frequent
<i>Agrostis stolonifera</i>	Creeping Bent	Frequent
<i>Scorzoneroide autumnalis</i>	Autumn Hawkbit	Frequent
<i>Trifolium repens</i>	White Clover	Locally frequent
<i>Galium verum</i>	Lady's Bedstraw	Locally frequent to abundant
<i>Cirsium arvense</i>	Creeping Thistle	Occasional
<i>Hypochaeris radicata</i>	Cat's-ear	Occasional
<i>Lathyrus pratensis</i>	Meadow Vetchling	Occasional
<i>Leontodon hispidus</i>	Rough Hawkbit	Occasional
<i>Leucanthemum vulgare</i>	Oxeye Daisy	Occasional
<i>Prunella vulgaris</i>	Selfheal	Occasional
<i>Dactylis glomerata</i>	Cock's-foot	Occasional to locally frequent
<i>Schedonorus arundinaceus</i>	Tall Fescue	Occasional to locally frequent
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Present
<i>Cynosurus cristatus</i>	Crested Dog's-tail	Present
<i>Festuca rubra</i> agg.	Red Fescue	Present
<i>Lolium perenne</i>	Perennial Rye-grass	Present
<i>Phleum pratense</i>	Timothy	Present
<i>Rhinanthus minor</i>	Yellow Rattle	Present
<i>Cerastium fontanum</i>	Common Mouse-ear	Rare
<i>Rumex acetosa</i>	Common Sorrel	Rare

Table 4: Field 3 Species List

Taxon	Common Name	Abundance / Comment
<i>Centaurea nigra</i>	Common Knapweed	Abundant
<i>Cynosurus cristatus</i>	Crested Dog's-tail	Abundant
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	Abundant
<i>Ranunculus acris</i>	Meadow Buttercup	Abundant
<i>Agrostis capillaris</i>	Common Bent	Frequent to abundant
<i>Holcus lanatus</i>	Yorkshire-fog	Frequent to abundant
<i>Trifolium pratense</i>	Red Clover	Abundant
<i>Trifolium repens</i>	White Clover	Abundant
<i>Lathyrus pratensis</i>	Meadow Vetchling	Frequent
<i>Lolium perenne</i>	Perennial Rye-grass	Frequent
<i>Galium verum</i>	Lady's Bedstraw	Locally frequent
<i>Schedonorus arundinaceus</i>	Tall Fescue	Locally frequent
<i>Trifolium dubium</i>	Lesser Trefoil	Locally frequent
<i>Plantago lanceolata</i>	Ribwort Plantain	Occasional to locally frequent
<i>Agrostis stolonifera</i>	Creeping Bent	Occasional
<i>Cirsium arvense</i>	Creeping Thistle	Occasional
<i>Dactylis glomerata</i>	Cock's-foot	Occasional
<i>Ranunculus repens</i>	Creeping Buttercup	Occasional
<i>Scorzoneroide autumnalis</i>	Autumn Hawkbit	Occasional
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Present
<i>Cirsium vulgare</i>	Spear Thistle	Rare
<i>Festuca rubra</i> agg.	Red Fescue	Rare

Taxon	Common Name	Abundance / Comment
<i>Hypochaeris radicata</i>	Cat's-ear	Rare
<i>Pimpinella saxifraga</i>	Burnet-saxifrage	Rare
<i>Prunella vulgaris</i>	Selfheal	Rare

Table 5: Field 4 Species List

Taxon	Common Name	Abundance / Comment
<i>Dactylis glomerata</i>	Cock's-foot	Occasional
<i>Holcus lanatus</i>	Yorkshire-fog	Occasional to locally frequent
<i>Lolium perenne</i>	Perennial Rye-grass	Abundant to dominant
<i>Trifolium pratense</i>	Red Clover	Locally frequent to abundant

Table 6: 4a Species List

Taxon	Common Name	Abundance / Comment
<i>Epilobium hirsutum</i>	Great Willowherb	Frequent to locally abundant
<i>Mentha aquatica</i>	Water Mint	Frequent to locally abundant
<i>Rubus fruticosus agg.</i>	Bramble	Locally frequent to abundant
<i>Arrhenatherum elatius</i>	False Oat-grass	Locally frequent
<i>Solanum dulcamara</i>	Bittersweet	Locally frequent
<i>Apium nodiflorum</i>	Fool's-water-cress	Occasional to locally frequent
<i>Filipendula ulmaria</i>	Meadowsweet	Occasional to locally frequent
<i>Scorzonoides autumnalis</i>	Autumn Hawkbit	Occasional to locally frequent
<i>Urtica dioica</i>	Common Nettle	Occasional to locally frequent
<i>Rumex conglomeratus</i>	Clustered Dock	Occasional
<i>Stachys sylvatica</i>	Hedge Woundwort	Occasional
<i>Calamagrostis epigejos</i>	Wood Small-reed	Rare
<i>Carduus crispus</i>	Wetted Thistle	Rare
<i>Crataegus monogyna</i>	Hawthorn	Rare
<i>Juncus inflexus</i>	Hard Rush	Rare
<i>Lathyrus pratensis</i>	Meadow Vetchling	Rare
<i>Prunus spinosa</i>	Blackthorn	Rare
<i>Rosa canina agg.</i>	Dog-rose	Rare

Table 7: Field 5 Species List

Taxon	Common / Name	Abundance / Comment
<i>Lolium perenne</i>	Perennial Rye-grass	Abundant to locally dominant
<i>Trifolium repens</i>	White Clover	Abundant
<i>Holcus lanatus</i>	Yorkshire-fog	Frequent
<i>Taraxacum officinale agg.</i>	Dandelion	Frequent
<i>Cirsium arvense</i>	Creeping Thistle	Locally frequent
<i>Agrostis stolonifera</i>	Creeping Bent	Occasional to locally frequent
<i>Agrostis capillaris</i>	Common Bent	Occasional
<i>Cynosurus cristatus</i>	Crested Dog's-tail	Occasional
<i>Ranunculus acris</i>	Meadow Buttercup	Occasional
<i>Trifolium pratense</i>	Red Clover	Occasional

Taxon	Common / Name	Abundance / Comment
<i>Cirsium vulgare</i>	Spear Thistle	Rare
<i>Geranium dissectum</i>	Cut-leaved Crane's-bill	Rare
<i>Rumex crispus</i>	Curled Dock	Rare

Table 8: Field 7 Species List

Taxon	Common Name	Abundance / Comment
<i>Holcus lanatus</i>	Yorkshire-fog	Abundant
<i>Lolium perenne</i>	Perennial Rye-grass	Abundant
<i>Trisetum flavescens</i>	Yellow Oat-grass	Frequent to abundant
<i>Agrostis stolonifera</i>	Creeping Bent	Frequent
<i>Cirsium arvense</i>	Creeping Thistle	Locally frequent
<i>Cerastium fontanum</i>	Common Mouse-ear	Occasional
<i>Rumex crispus</i>	Curled Dock	Occasional
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Occasional
<i>Taraxacum officinale</i> agg.	Dandelion	Occasional

Table 7: Field 8 Species List

Taxon	Common Name	Abundant / Comment
<i>Cynosurus cristatus</i>	Crested Dog's-tail	Abundant
<i>Holcus lanatus</i>	Yorkshire-fog	Abundant
<i>Lolium perenne</i>	Perennial Rye-grass	Abundant
<i>Taraxacum officinale</i> agg.	Dandelion	Abundant
<i>Trifolium repens</i>	White Clover	Abundant
<i>Phleum pratense</i>	Timothy	Frequent to abundant
<i>Agrostis stolonifera</i>	Creeping Bent	Occasional to locally frequent
<i>Heracleum sphondylium</i>	Hogweed	Occasional to locally frequent
<i>Cirsium vulgare</i>	Spear Thistle	Frequent
<i>Rumex crispus</i>	Curled Dock	Frequent
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Frequent
<i>Poa annua</i>	Annual Meadow-grass	Occasional
<i>Ranunculus acris</i>	Meadow Buttercup	Occasional
<i>Trifolium pratense</i>	Red Clover	Occasional
<i>Centaurea nigra</i>	Common Knapweed	Rare
<i>Cerastium fontanum</i>	Common Mouse-ear	Rare
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	Rare
<i>Prunella vulgaris</i>	Selfheal	Rare

Table 10: Field 9 Species List

Taxon	Common Name	Abundance / Comment
<i>Holcus lanatus</i>	Yorkshire-fog	Abundant
<i>Trifolium repens</i>	White Clover	Abundant
<i>Crepis capillaris</i>	Smooth Hawk's-beard	Locally abundant
<i>Agrostis capillaris</i>	Common Bent	Frequent
<i>Arrhenatherum elatius</i>	False Oat-grass	Frequent
<i>Heracleum sphondylium</i>	Hogweed	Frequent
<i>Lolium perenne</i>	Perennial Rye-grass	Frequent

Taxon	Common Name	Abundance / Comment
<i>Bromus hordeaceus</i>	Soft-brome	Locally frequent
<i>Cirsium arvense</i>	Creeping Thistle	Locally frequent
<i>Festuca rubra</i>	Red Fescue	Locally frequent
<i>Knautia arvensis</i>	Field Scabious	Locally frequent
<i>Odontites vernus sens. lat.</i>	Red Bartsia	Locally frequent
<i>Prunus spinosa</i>	Blackthorn	Locally frequent
<i>Urtica dioica</i>	Common Nettle	Locally frequent
<i>Agrostis stolonifera</i>	Creeping Bent	Occasional to locally frequent
<i>Achillea millefolium</i>	Yarrow	Occasional
<i>Cynosurus cristatus</i>	Crested Dog's-tail	Occasional
<i>Dactylis glomerata</i>	Cock's-foot	Occasional
<i>Lapsana communis</i>	Nipplewort	Occasional
<i>Potentilla reptans</i>	Creeping Cinquefoil	Occasional
<i>Trifolium dubium</i>	Lesser Trefoil	Occasional
<i>Trisetum flavescens</i>	Yellow Oat-grass	Occasional
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Present
<i>Cirsium vulgare</i>	Spear Thistle	Rare
<i>Phleum bertolonii</i>	Smaller Cat's-tail	Rare
<i>Scorzonoides autumnalis</i>	Autumn Hawkbit	Rare
<i>Senecio erucifolius</i>	Hoary Ragwort	Rare
<i>Sonchus asper</i>	Prickly Sow-thistle	Rare
<i>Torilis japonica</i>	Upright Hedge-parsley	Rare
<i>Tragopogon pratensis ssp minor</i>	Goat's-beard	Rare
<i>Vicia cracca</i>	Tufted vetch	Rare
<i>Vicia sepium</i>	Bush Vetch	Rare

Table 11: Field 10 Species List

Taxon	Common Name	Abundance / Comment
<i>Cirsium arvense</i>	Creeping Thistle	Locally frequent
<i>Cirsium vulgare</i>	Spear Thistle	Occasional
<i>Cynosurus cristatus</i>	Crested Dog's-tail	Occasional
<i>Holcus lanatus</i>	Yorkshire-fog	Frequent to abundant
<i>Lolium perenne</i>	Perennial Rye-grass	Abundant to locally dominant
<i>Trifolium repens</i>	White Clover	Abundant to locally dominant

Table 12: Field 11 Species List

Taxon	Common Name	Abundance / Comment
<i>Trifolium repens</i>	White Clover	Abundant
<i>Ranunculus acris</i>	Meadow Buttercup	Frequent
<i>Trifolium pratense</i>	Red Clover	Frequent
<i>Holcus lanatus</i>	Yorkshire-fog	Frequent to locally abundant
<i>Lolium perenne</i>	Perennial Rye-grass	Frequent to locally abundant
<i>Plantago lanceolata</i>	Ribwort Plantain	Frequent to locally abundant
<i>Plantago major</i>	Greater Plantain	Frequent to locally abundant
<i>Taraxacum officinale agg.</i>	Dandelion	Frequent to locally abundant
<i>Festuca rubra</i>	Red Fescue	Locally frequent to abundant
<i>Ranunculus repens</i>	Creeping Buttercup	Locally frequent

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Taxon	Common Name	Abundance / Comment
<i>Agrostis capillaris</i>	Common Bent	Occasional to locally frequent
<i>Agrostis stolonifera</i>	Creeping Bent	Occasional
<i>Cerastium fontanum</i>	Common Mouse-ear	Occasional
<i>Dactylis glomerata</i>	Cock's-foot	Occasional
<i>Odontites vernus sens. lat</i>	Red Bartsia	Occasional
<i>Poa annua</i>	Annual Meadow-grass	Occasional
<i>Polygonum aviculare agg.</i>	Knotgrass	Occasional
<i>Cerastium glomeratum</i>	Sticky Mouse-ear	Rare
<i>Cirsium vulgare</i>	Spear Thistle	Rare
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Rare
<i>Scorzoneroide autumnalis</i>	Autumn Hawkbit	Rare
<i>Urtica dioica</i>	Common Nettle	Rare
<i>Prunella vulgaris</i>	Selfheal	Rare (but locally frequent in one area)
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Present
<i>Arrhenatherum elatius</i>	False Oat-grass	Present
<i>Phleum pratense</i>	Timothy	Present