

Gate Burton Energy Park Environmental Statement

Volume 3, Appendix 8-C: Flora report (including hedgerows)
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1. Introduction

- 1.1.1 Gate Burton Energy Park Limited (hereafter referred to as 'the Applicant') commissioned surveys of flora and hedgerows (where Scheme impacts were known or predicted) for the Gate Burton Energy Park (hereafter referred to as the 'Scheme').
- 1.1.2 The Scheme comprises the installation of solar photovoltaic (PV) generating panels and on-site energy storage facilities across a proposed site in Lincolnshire (hereafter referred to as the 'Solar and Energy Storage Park') and grid connection infrastructure (hereafter referred to as the 'Grid Connection Corridor'). The entire Scheme, including both the Solar and Energy Storage Park and Grid Connection Corridor is referred to as the 'Site'. Further information on the Scheme is provided in **ES Volume 1, Chapter 2: The Scheme [EN010131/APP/3.1]**.
- 1.1.3 This report forms a technical appendix to the Environmental Statement (ES), specifically to accompany **ES Volume 1, Chapter 8: Ecology and Nature Conservation [EN010131/APP/3.1]**. Further information on the Scheme is included within **ES Volume 1, Chapter 2: The Scheme [EN010131/APP/3.1]**.

2. Relevant Legislation, Policy and Guidance

2.1 Flora and Habitats

2.1.1 Part 1 of the Wildlife and Countryside Act 1981 (as amended) (the WCA) (Ref 1) affords specific protection to flora listed on Schedule 8 (flora, fungi and lichens).

2.1.2 Section 13 of the WCA (Ref 1) protects plants from picking and sale of plants or parts of plants listed in Schedule 8, as follows:

- Intentional picking, uprooting or destruction (Section 13 1a);
- Selling, offering for sale, possessing or transporting for the purpose of sale (live or dead, part or derivative) (Section 13 2a);
- Advertising (any of these) for buying or selling (Section 13 2b); and
- In certain circumstances, licences can be granted to permit some actions prohibited under the WCA.

2.1.3 Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (Ref 2) includes a list of habitats and plant species of principal importance for nature conservation in England which is to be used by decision-makers to guide the implementation of their duties under Section 40 of the Act. This Section 41 list includes arable field margins habitat. Decision-makers are required to have regard to the conservation of biodiversity in England when carrying out their normal functions; consideration of the Section 41 list is integral to this. In addition, with regard to those species and habitats on the list of Species of Principal Importance listed under Section 41, the Secretary of State must:

- *“Take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or*
- *Promote the taking by others of such steps.”*

2.2 Hedgerows

2.2.1 A hedgerow is defined by Defra (Ref 3) as: *“Any boundary line of trees or shrubs over 20m long and less than 5m wide, provided that at one time the trees or shrubs were more or less continuous. It includes an earth bank or wall only where such a feature occurs in association with a line of trees or shrubs.”*

2.2.2 The Hedgerows Regulations 1997 (the Regulations) (Ref 3), made under the Environment Act 1995, were introduced in England and Wales in 1997 in order to protect this characteristic element of the countryside. The Regulations were amended by the Hedgerows (Amendment) (England) Regulations in 2002.

2.2.3 The Regulations prevent the removal of most countryside hedgerows without first submitting a hedgerow removal notice to the local planning authority. This is not required if the removal is part of a planning application, but consideration

and application of the Regulations can still be beneficial for the purposes of consistent assessment.

2.2.4 Under the Regulations, criteria are established that are to be used by the local planning authority to determine which hedgerows are 'Important'. The criteria relate to the value of the hedgerows from an archaeological, historical, landscape or ecological perspective.

2.2.5 The Regulations (Ref 3) provide a series of comprehensive assessments to identify 'Important' hedgerows. Note that a hedgerow is not protected if it's in, or marks the boundary of, a private garden. To qualify as 'Important' under the Regulations, the hedgerow must comply with the following list of criteria:

- It must have a continuous length of or exceeding 20m;
- Has a continuous length of less than 20m, but meets another hedgerow (by intersection or junction) at each end; and
- It must be more than 30 years old.

2.2.6 In addition to the above criteria, to be deemed 'Important', a hedgerow must meet one or more of the following criteria (see also Annex A):

- The hedgerow contains a species of bird, animal or plant listed on Part 1 of Schedule 1, Schedule 5 or Schedule 8 within the WCA 1981 (as amended) (Ref 1);
- The hedgerow is adjacent to a public right of way (PRoW), such as a bridleway, footpath, road used by a public path, or a byway open to all traffic, and contains at least four woody species (as defined in Schedule 3 of the Regulations, on average, in a 30m length, plus at least two Associated Features within Part II Criteria;
- The hedgerow includes one or more of the following:
 - At least seven woody species, on average, in a 30m length;
 - At least six woody species, on average, in a 30m length, plus at least three Associated Features within Part II Criteria;
 - At least six woody species including a Black Poplar *Populus nigra* subsp. *betulifolia*; Large-leaved lime *Tilia platyphyllos*, Small-leaved lime *Tilia cordata* or Wild Service Tree *Sorbus torminalis*) or
 - At least five woody species, on average, in a 30m length and at least four Associated Features within Part II Criteria.

2.3 Local Biodiversity Action Plan

2.3.1 The Site is located within two counties, Lincolnshire and Nottinghamshire. The Lincolnshire Biodiversity Action Plan (BAP) (Ref 4) and the Nottinghamshire BAP (Ref 5) provide the local nature conservation strategy for identifying threats to species within each of the counties and set out the action plans necessary to conserve them. These action plans provide context to inform identification of threatened or uncommon species within the district and, or county. The plans also identify priorities for conservation and enhancement but confers no particular legislative or policy protection to the species identified, however in some cases this is provided through related legislation and local planning policy.

- 2.3.2 There are no specific action plans for terrestrial flora species in Lincolnshire (Ref 4). However, action plans are produced for arable field margins and hedgerows.
- 2.3.3 In Lincolnshire, the action plan for arable field margins includes the following listed species:
- Night-flowering Catchfly *Silene noctiflora*;
 - Round and Sharp-leaved Fluellen *Kickxia spuria* and *K. elatine*;
 - Venus Looking-glass *Legouisa hybrida*;
 - Dwarf Spurge *Euphorbia exigua*; and
 - Small Toadflax *Chaenorhinum minus*.
- 2.3.4 Furthermore, the Lincolnshire BAP (Ref 4) lists the following threats to arable field margins in the county:
- Spray drift of pesticides into the field-edge environment;
 - Lack of cultivation;
 - Over-spreading of fertilisers into the field edge; and
 - Silt deposition.
- 2.3.5 In addition, the Lincolnshire BAP (Ref 4) lists the following threats to hedgerows in the county:
- Over-frequent, too severe and badly timed cutting;
 - Abandonment, reflecting modern high labour costs and loss of traditional skills;
 - The loss of hedgerow trees through old age, neglect and removal;
 - Hedgerow and root damage from ploughs, mechanical excavators, road improvements and the laying of service pipes;
 - Non-agricultural development. Hedges are often removed in advance of a wide range of developments;
 - Increased stocking rates particularly of sheep, leading to hedgerow damage and the need to fence fields;
 - Contamination by pesticides and fertilisers; and
 - Introduction of non-native species/cultivars.
- 2.3.6 In Nottinghamshire, the action plan for arable field margins includes the following listed species:
- Shepherd's Needle *Scandix pecten-veneris*;
 - Cornflower *Centaurea cyanus*;
 - Hairy buttercup *Ranunculus sardous*;
 - Red Hemp Nettle *Galeopsis angustifolia*; and
 - Spreading Hedge Parsley *Torilis arvensis*.
- 2.3.7 The Nottinghamshire BAP (Ref 5) lists the following threats to arable field biodiversity in the county:
- Crop density and timing of planting;
 - Reduction in mixed farming (arable / grassland);
 - Lack of field margins adequate to support birds, mammals and insects
 - Land drainage; and

- Use of herbicides and insecticides.

2.3.8 Furthermore, the Nottinghamshire BAP (Ref 5) lists the following threats to permanent grassland in the county:

- Early grass cutting;
- Over and under-grazing;
- Lack of infrastructure support for stock farming; and
- Modern worming treatments.

2.3.9 In addition, the Nottinghamshire BAP (Ref 5) lists the following threats to hedgerows in the county:

- Loss and fragmentation due to intensified farming practices, residential and industrial development, road schemes, landfill and mineral extraction;
- Lack of management (laying and trimming);
- Unsympathetic, over management through modern methods;
- Managing too frequently;
- Management at the wrong time of the year;
- Cutting hedges all at once;
- Disturbance of leaf litter;
- Chemical pollution from spray and fertiliser drift, and pesticides.
- Cultivation right up to hedge base; and
- Automatic removal of dead wood from hedgerows.

3. Methods

3.1 Desk Study

- 3.1.1 A desk study was undertaken as part of the Preliminary Ecological Appraisal (PEA) in October 2021 (see **ES Volume 3: Appendix 8-B [EN010131/APP/3.3]**). This desk study obtained records of relevant flora (including lower plant species such as mosses, ferns and fungi) within the preceding ten years and within a 2km radius of the Site from Greater Lincolnshire Nature Partnership (GLNP) and Nottinghamshire Biological and Geological Records Centre (NBGRC).
- 3.1.2 Only records up to ten years old were considered within the assessment, as any records older than ten years are unlikely to be still representative of plant communities in the local area.

3.2 Field Survey

Survey Area

- 3.2.1 The survey area for grassland and arable flora surveys comprised selected areas of unimproved / semi-improved grassland, coastal, floodplain and grazing marsh and arable margins within the Site, where impacts were known or predicted.
- 3.2.2 The survey area for hedgerows included all mature hedgerows within the Site, where impacts were known or predicted as identified through the vegetation removal plan (**ES Volume 2: Figure 10-21 [EN010131/APP/3.2]**).

Grassland Survey

- 3.2.3 The survey of grassland focussed on areas that are to be impacted upon by the Scheme, providing more detail on the species present within such areas. This was undertaken to identify any notable species and species composition of the grassland to help inform mitigation, habitat compensation and enhancement proposals (if required). Notes were also made of notable species present along tracks, set-aside grassland and other potential interesting habitats on the Site.
- 3.2.4 The survey was undertaken by an experienced botanists between June and September 2022. Notes were made on the species and abundance within each area, using the DAFOR scale (D=Dominant, A=Abundant, F=Frequent, O=Occasional, R= Rare).
- 3.2.5 The rarity of higher plants given is based on Stace (2019) (Ref 6), where;
- Uncommon – a species found in not more than 250 different 10 x 10km grid squares in the British Isles since 1987;
 - Scarce - a species found in not more than 100 different 10 x 10km grid squares since 1987; and
 - Rare – a species found in not than 15 different 10 x 10km grid squares since 1987.

Arable Flora Survey

- 3.2.6 All arable fields in the Site were assessed for their potential to support arable flora, with surveys for important arable plant species undertaken between 7th and 10th June 2022 and 28th and 29th September 2022, optimal times of year for recording such species. The distribution of scarce arable plant species in the modern agricultural landscape is largely confined to arable field margins and similar areas of less intensive management. As such, the survey involved walking field boundaries and comparable areas of marginal habitat only.
- 3.2.7 Lists of scarce arable plant species were recorded for each field surveyed. It was not the intention of the survey to record all arable plant species present, only those listed in the Great Britain (Ref 7) and England (Ref 8) Red Data Lists as Critically Endangered, Endangered, Vulnerable and Near Threatened, and those listed by Byfield & Wilson as locally, regionally or nationally scarce (Ref 9). As such, data were only collected for those fields where scarce flora was found.
- 3.2.8 The survey results were used to determine the relative notability and importance of any scarce arable plant assemblages present. Byfield and Wilson (Ref 9) set thresholds to support this and subsequent nature conservation evaluation. Thresholds have been defined based on the cumulative total of the weighted scores of species present at each discrete location (in this case per field location). The scoring system recognises that arable communities on a particular geological substrate may consistently score either more or less than equally valued communities on a different substrate.
- 3.2.9 According to data held in the Multi-Agency Geographic Information for the Countryside (MAGIC) website (Ref 10) identify that the soil classification of the study area comprises a mixture of Slowly permeable seasonally wet acid loamy and clayey soils (Soilscape Type 17), Naturally wet very acid sandy and loamy soils (Soilscape Type 15), and Saltmarsh soils (Type 1). The most appropriate substrate type for the purposes of data analysis, as presented in Table 1, of the Site is therefore “Clays”. Whilst it is acknowledged there is some sand and freely draining acidic soil influence, using the Clay category takes the precautionary approach as it has a lower threshold value for nature conservation importance.
- 3.2.10 No criteria are available for the identification of assemblages of lower value/biodiversity importance. Professional judgement has been applied to the Site, based on the nature of the species assemblage recorded. As such District importance assemblages have a species score between 10 and 19 or have the presence of a high scoring species (7+), and Local importance assemblages have a score between 1 and 9.

Table 1 Threshold scores for assessing the nature conservation importance of arable plant assemblages with reference to prevailing soil type (taken from Byfield and Wilson)

Geographic scale of nature conservation importance	Chalk and limestone derived soils (excluding clay)	Clays	Sand and freely draining acidic soils
European	90+	70+	70+
National	45-89	30-69	35-69
County	30-44	20-29	20-34

Hedgerow Survey

- 3.2.11 Hedgerow surveys were carried out between July and September 2022 by an experienced ecologist, in accordance with the wildlife and landscape criteria described in the Regulations and the methods within the Hedgerow Survey Handbook (Ref 11).
- 3.2.12 Each hedgerow was assigned a unique identifier number and the relevant hedgerows (*i.e.* those where impacts were identified) were surveyed and assessed against the Wildlife and Landscape Criteria, detailed in the Regulations (Ref 3). The identified hedgerows were not assessed against the history and archaeology criteria of the Regulations as these criteria are not within the professional remit of an ecologist.
- 3.2.13 Any hedgerows that are not included within this report were scoped out of requiring any further assessment.
- 3.2.14 Where the age of hedgerows was not known, a precautionary approach was taken based on professional judgement. All well-established mature hedgerows were assumed to be at least 30 years unless there was evidence or knowledge that would cast doubt on this.
- 3.2.15 Where non-native lookalikes (species and races of non-British origin) had been planted or had self-sown in hedgerows these were not recorded. An example is the non-native Southern Dogwood *Cornus sanguinea* subspecies *australis* which can be readily mistaken for native Dogwood *Cornus sanguinea* subspecies *sanguinea* and is widely planted and increasingly bird sown. Southern Dogwood is native to Eastern Europe and the Caucasus, so to include it in species totals for the purposes of applying the Regulations would undermine the process of identifying important hedgerows based on the diversity of native tree and shrub species present.
- 3.2.16 Whilst the primary aim of the survey work undertaken was to determine the presence and distribution of all 'Important' hedgerows, the survey data collected can also be used to evaluate hedgerows as being species-rich or species-poor.
- 3.2.17 Species-rich hedgerows are those that have an average of five or more woody species per 30m survey section. Therefore, all hedgerows that can be determined as 'Important' are by definition species-rich (but the converse is not true, species rich hedgerows are not automatically 'Important'). Species-

poor hedgerows are those with an average of four or less woody species per 30m survey section. For these thresholds to be usable in practice, the results of the Hedgerow survey need to be rounded to the nearest whole number.

3.2.18 Each 30m sections were sampled in accordance with Schedule 1 Part II Wildlife and Landscape 7(3) of the Regulations (Ref 3):

- where the length of the hedgerow does not exceed 30m, count the number of woody species present in the hedgerow;
- where the length of the hedgerow exceeds 30m, but does not exceed 100m, count the number of woody species present in the central stretch of 30m;
- where the length of the hedgerow exceeds 100m, but does not exceed 200m, count the number of woody species present in the central stretch of 30m within each half of the hedgerow and divide the aggregate by two; or
- where the length of the hedgerow exceeds 200m, count the number of woody species present in the central stretch of 30m within each third of the hedgerow and divide the aggregate by three.

Invasive Plant Species and Other Records of Protected or Notable plants

3.2.19 During the Phase 1 habitat survey (see **ES Volume 3: Appendix 8-B [EN010131/APP/3.3]**) and surveys of habitats reported within this document, the Site was surveyed for the presence of invasive non-native plant species listed on Schedule 9 of the WCA (Ref 1) including Japanese Knotweed *Reynoutria japonica*, Giant Hogweed *Heracleum mantegazzianum* and Himalayan Balsam *Impatiens glandulifera*.

3.3 Biodiversity Evaluation

3.3.1 An evaluation of the relative biodiversity importance of the identified ecological features has been developed with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) (Ref 12). This gives guidance on scoping and carrying out environmental assessments and places appraisal in the context of relevant policies. Data received through consultation, desk-based studies and field-based surveys are used to allow ecological features of biodiversity importance or potential importance to be identified, and the main factors contributing to their importance described and related to available guidance.

3.3.2 Habitats and their component plant species can be of biodiversity importance for a variety of reasons, and their relative importance should always be determined on a case-by-case basis. Importance may relate, for example, to the uniqueness of the assemblage, or to the extent to which species are threatened throughout their range, or to their rate of decline.

3.3.3 The importance of the habitats and plant species addressed in this document has been defined with reference to the geographical level at which the feature being assessed is considered to matter. Relevant published national and local guidance and criteria can be used, where available, to inform the assessment of biodiversity importance and to assist consistency in evaluation.

- 3.3.4 The identified guidance and criteria are not definitive and other criteria have been applied when relevant and appropriate, e.g. see the method for Important Arable Plant Areas referenced above in Section 3.2.1. In the case of assessing the value of county important habitats such as hedgerows and grassland guidance in Local Wildlife Site Selection Criteria has been followed for Lincolnshire (Ref 13) and Nottinghamshire (Ref 14).

3.4 Assumptions and Limitations

- 3.4.1 Survey areas were chosen to provide a representative sample of the Site, based on the best quality in terms of potential species diversity and potential for protected or notable flora species which could be impacted as a result of the Scheme.
- 3.4.2 Invasive plant species were recorded where present within the terrestrial habitats surveyed. It should be noted that a survey of aquatic invasive non-native species within the Site has not been undertaken in this report, incidental records of note have been included, but these species are included (where present) in the Aquatic Ecology Report (see **ES Volume 3: Appendix 8-E [EN010131/APP/3.3]**).

4. Results

4.1 Desk Study

- 4.1.1 The data search through NBGRC returned four records of four species of notable flora, recorded within 2km of the Site and within the last ten years.
- 4.1.2 The data search, through GLNP, returned over 300 records of ‘flowering plant’ from within 2km of the Site and within the last ten years.
- 4.1.3 None of the data search records were from within the Site.
- 4.1.4 The data search returned a large number of records of invasive terrestrial plants including: New Zealand Pigmyweed *Crassula helmsii*, Japanese Knotweed, Giant Hogweed, Spanish Bluebell *Hyacinthoides hispanica* and Indian Balsam. None of these species were recorded within the Site.

4.2 Field Survey

Grassland

- 4.2.1 Grasslands surveyed within the Site comprised two areas of permanent grassland (G1 and G2, see Figure 8C-1, Annex C) and 8 areas (G3 to G7, see Figure 8C-1, Annex C) within the Grid Connection Corridor. A description of these areas is presented in Table 2.

Table 2 Grassland Survey Results

Survey Area (see Figure 8C-1)	Location	Description
G1	Solar and Energy Storage Park	Set-aside semi-improved grassland with small areas of marshy grassland present in the southern section. Dominated by Yorkshire Fog and Crested Dogs-tail with frequent Meadow Fescue, Cocksfoot, Creeping Thistle, Rough Meadow-grass and Red Fescue, occasional Creeping Buttercup, Common Vetch, Ox-eye Daisy, Perennial Ryegrass and Meadow Buttercup. Areas of marshy grassland had frequent Creeping Buttercup, Hard Rush, Meadow Fescue and Yorkshire Fog, with occasional Common Club-rush, Compact Rush, Creeping Bent and Selfheal and rare False Fox Sedge, Glaucous Sedge, Great Willowherb, Greater Pond Sedge, Jointed Rush and Tufted Hairgrass.
G2	Solar and Energy Storage Park	Area of set-aside improved grassland immediately south of G1 with a similar plant composition, but with less diversity of forbs.
G3	Grid Connection Corridor	Area of semi-improved grassland, with extensive areas of encroaching Hawthorn, Blackthorn, Ash and Dogrose scrub. Grassland dominated by Yorkshire Fog, Meadow Fescue and Cocksfoot, with frequent Creeping Thistle and occasional Mugwort, Rosebay Willowherb, Great Willowherb, Smooth Sowthistle and Ribwort Plantain.
G4	Grid Connection Corridor	Area of improved grassland for grazing.

Survey Area (see Figure 8C-1)	Location	Description
G5	Grid Connection Corridor	Area of semi-improved grassland, with similar composition to G3, but with fewer scrubby species.
G6	Grid Connection Corridor	Areas of improved grassland either side of the River Trent. These areas are identified as coastal floodplain grazing marsh but are heavily grazed. The diversity of grass and plant species is relatively low, with dominant grass species including Creeping Bent, Perennial rye-grass and Yorkshire Fog. This is likely to have resulted from agricultural improvement and extensive grazing of cattle and sheep.
G7	Grid Connection Corridor	Area of improved grassland for grazing.
G8	Grid Connection Corridor	Area of improved grassland pasture.
G9	Grid Connection Corridor	Area of semi-improved neutral grassland within the power station.
G10	Grid Connection Corridor	Area of semi-improved acid grassland within the power station

Arable Flora

4.2.2 The margins of all arable fields within the Site were subject to an initial walkover assessment for species of important arable plants. Four arable fields, marked as 1, 3, 5 and 8 as presented on Figure 8C-1, were noted to contain scarce arable flora and were surveyed further. A summary of the results is presented in Table 3. All other fields within the Site were either not in cultivation (e.g., improved grassland), or had no potential or visible arable plants, (e.g., sown field margins that are not included in the method), or sprayed margins.

Table 3 Arable Flora Results

Field Number (see Figure 8C-1)	Soil type	Crop	Score and Geographic Importance	Species present with DAFOR* abundance rating and score
1	Clay	Wheat	Local	Dwarf Spurge – R – Score 7
3	Sands and freely draining acidic soils	Maize	Local	Corn Spurrey (<i>Spergula arvensis</i>) – O -Score 7
5	Clay	Wheat	Local	Dwarf Spurge – R – Score 7
8	Clay	Wheat	Local	Dwarf Spurge – R – Score 7

4.2.3 Additionally, a single Dwarf Spurge plant was recorded on the verge along Clay Lane (see Figure 8C-1, Annex C).

4.2.4 No other notable arable flora was recorded on the Site.

Hedgerows

- 4.2.5 Hedgerows across the Site are generally species-poor, comprising mostly Common Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa*. Many contain standard trees, including mature, veteran or ancient Oak *Quercus robur*, Ash *Fraxinus excelsior* and occasional Field Maple *Acer campestre*.
- 4.2.6 None of the hedgerows on Site are classified as 'Important' in terms of landscape and wildlife criteria under the Hedgerow Regulations (Ref 3).
- 4.2.7 A summary of the hedgerow survey results, is presented in Table 4. Full results of the hedgerow survey are presented in Annex B with the locations of hedgerows presented in Figure 8C-2, Annex C.

Table 4 Summary of Hedgerow Survey Results

Hedgerow Reference (see Figure 8C-2)	Length (metres)	Average Number of woody species per 30 m section	Number of associated features	Public Right of Way running parallel?	Species-rich / Species-poor?	Hedgerow classified as 'Important' under the Regulations
3	225	1.7	1	No	Species-poor	No
5	220	1.3	1	No	Species-poor	No
10	225	2.5	3	No	Species-poor	No
16	130	2.0	1	No	Species-poor	No
20	580	3.7	1	No	Species-poor	No
23	305	2.7	2	No	Species-poor	No
27	108	4.0	0	No	Species-poor	No
29	320	2.0	1	No	Species-poor	No
32	470	3.3	2	No	Species-poor	No
35	180	1.5	1	No	Species-poor	No
44	295	3.3	2	No	Species-poor	No
46	470	2.3	2	No	Species-poor	No
48	245	3.7	2	No	Species-poor	No
51	235	3.0	1	No	Species-poor	No
52	475	3.0	1	No	Species-poor	No
57	325	2.7	1	No	Species-poor	No
62	250	2.3	1	No	Species-poor	No
64	630	4.0	5	No	Species-poor	No
72	200	2.5	1	No	Species-poor	No
73	265	2.3	3	No	Species-poor	No
77	250	3.3	1	No	Species-poor	No
78	120	3.0	3	No	Species-poor	No

Hedgerow Reference (see Figure 8C-2)	Length (metres)	Average Number of woody species per 30 m section	Number of associated features	Public Right of Way running parallel?	Species-rich / Species-poor?	Hedgerow classified as 'Important' under the Regulations
80	230	3.0	3	No	Species-poor	No
84	120	1.5	1	No	Species-poor	No
87	210	3.3	2	No	Species-poor	No
98	230	2.3	1	No	Species-poor	No
99	200	2.5	1	No	Species-poor	No
108	190	3.0	2	No	Species-poor	No
114	520	4.0	3	No	Species-poor	No
115	700	4.7	3	No	Species-poor	No
148	180	4.0	1	No	Species-poor	No
152	110	2.5	1	No	Species-poor	No
156	180	3.0	1	No	Species-poor	No
168	380	3.0	2	Yes	Species-poor	No
169	90	2.5	3	Yes	Species-poor	No
170	240	3.7	1	No	Species-poor	No
171	90	3.0	3	Yes	Species-poor	No
174	350	3.0	2	No	Species-poor	No
187	380	3.0	0	No	Species-poor	No
188	545	2.7	2	No	Species-poor	No

5. Discussion and Evaluation

5.1 Nature Conservation Evaluation

5.1.1 An evaluation of the biodiversity importance of flora and habitats in relation to the Scheme is presented below.

Grassland

5.1.2 No notable or protected species were found during the grassland survey and all grasslands present within the Solar and Battery site had an affinity to a ubiquitous and widespread grassland community type MG1 *Arrhenatherum elatius* grassland (Ref 15). The set-aside grasslands fields, whilst providing a valuable resource for biodiversity (such as invertebrates and foraging birds) are of limited biodiversity importance due their recent or sown origin and can be readily re-created if required. These are assessed as of Site importance.

5.1.3 All other grassland within the Order limits was either improved grazed or species poor and assessed of site importance.

Arable Flora

5.1.4 Four arable fields (1, 3, 5 and 8) supported important arable plant assemblages of Local importance based on established criteria. These assemblages enrich the habitat resource and are of value within the Local context (*i.e.* within 2km of the Site). All other arable fields are of less than Local (Site) importance for important arable plant assemblages due to the absence of notable arable species.

Hedgerows

5.1.5 All of the other hedgerows surveyed are of Local importance and are examples of the Priority Habitat under S41 of the NERC Act (Ref 2), which encompasses all predominantly (greater than 80%) native hedgerows regardless of their “importance” or species-richness. Together the hedgerows within and adjacent to the Site form a network that helps link other wooded habitats in the surrounding landscape. Each hedgerow contributes to an ecological network of greater biodiversity importance than its individual component hedgerows. Regardless of their importance under the Hedgerow Regulations (Ref 3), they are only likely to be of greater than district importance if they are an integral part of valuable ecological networks or are critical for the survival of populations of flora or fauna that are themselves of above district value.

5.1.6 Although only specific hedgerows within the Site have been surveyed (*i.e.* those subject to known or potential impacts), those surveyed are typical of the hedgerows within the wider Site. As such, it is considered that the hedgerow network present within the Site, is likely to be of up to County importance. This evaluation takes into account the number of hedges covering a large area of landscape, the hedgerow species composition, richness and associated features (*e.g.* the presence of mature trees and protected species within these

hedgerows, e.g. including potential bat roosts and Barn Owl *Tyto alba* presence), and an assessment against priority habitat criteria.

6. References

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- Ref 3. HMSO. (1997). Hedgerow Regulations 1997.
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- Ref 5. Nottinghamshire Biodiversity Action Group (2008) Local Biodiversity Action Plan.
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- Ref 8. Stroh, P.A., Leach, S.J., August, T.A., Walker, K.J., Pearman, D.A., Rumsey, F.J., Harrower, C.A., Fay, M.F., Martin, J.P., Pankhurst, T., Preston, C.D. & Taylor, I. 2014. A Vascular Plant Red List for England. Botanical Society of Britain and Ireland, Bristol.
- Ref 9. Byfield, A.J. & Wilson, P. J. 2005. Important Arable Plant Areas: identifying priority sites for arable plant conservation in the United Kingdom. Plantlife International, Salisbury, UK
- Ref 10. Defra, Multi-Agency geographical information for the countryside (MAGIC) map. Available at: <https://magic.defra.gov.uk/MagicMap.aspx>
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- Ref 13. Greater Lincolnshire Nature Partnership (GLNP) (2013). Local Wildlife Site Guidelines for Greater Lincolnshire, 3rd Edition.
- Ref 14. Crouch, N.C. (2018) Nottinghamshire LWS Handbook – Guidelines for the selection of Local Wildlife Sites in Nottinghamshire. Part 1 – An overview of Local Wildlife Sites in Nottinghamshire. 2nd Edition. Nottinghamshire Biological and Geological Records Centre, Nottingham.
- Ref 15. Rodwell, J.S., 1992. British Plant Communities, Volume 3. Grasslands and montane communities. Cambridge University Press

7. Annexes

Annex A: Hedgerow Regulations and Schedules

'The Hedgerow Regulations (1997) apply to any hedgerow growing in, or adjacent to, any common land, protected land, or land used for agriculture, forestry or the breeding or keeping of horses, ponies or donkeys, if—

- (a) it has a continuous length of, or exceeding, 20 metres; or
- (b) it has a continuous length of less than 20 metres and, at each end, meets (whether by intersection or junction) another hedgerow.

For the purposes of section 97 (hedgerows) of the Environment Act 1995 and these Regulations, a hedgerow is "important" if it, or the hedgerow of which it is a stretch, —

- (a) has existed for 30 years or more; and
- (b) satisfies at least one of the criteria listed in Part II of Schedule 1.'

Schedule 1 Part 11 Criteria: Wildlife and landscape

'6. (1) The hedgerow—

- (a) contains species listed or categorised as mentioned in sub-paragraph (3); or
- (b) is referred to in a record held immediately before the relevant date by a biological record centre maintained by, or on behalf of, a local authority within the meaning of the Local Government Act 1972(10), and in a form recognised by the Nature Conservancy Council for England, the Countryside Council for Wales(11) or the Joint Nature Conservation Committee(12), as having contained any such species—

(i) in the case of animals and birds, subject to sub-paragraph (2), within the period of five years immediately before the relevant date.

(ii) in the case of plants, subject to sub-paragraph (2), within the period of ten years immediately before the relevant date;

(2) Where more than one record referable to the period of five or, as the case may be, ten years before the relevant date is held by a particular biological record centre, and the more (or most) recent record does not satisfy the criterion specified in sub-paragraph (1)(b), the criterion is not satisfied (notwithstanding that an earlier record satisfies it).

(3) The species referred to in sub-paragraph (1) are those—

- (a) listed in Part I (protection at all times) of Schedule 1 (birds which are protected by special penalties), Schedule 5 (animals which are protected) or Schedule 8 (plants which are protected) to the Wildlife and Countryside Act 1981(13);
- (b) categorised as a declining breeder (category 3) in "Red Data Birds in Britain" Batten LA, Bibby CJ, Clement P, Elliott GD and Porter RF (Eds.), published in 1990 for the Nature Conservancy Council and the Royal Society for the Protection of Birds (ISBN 0 85661 056 9); or
- (c) categorised as "endangered", "extinct", "rare" or "vulnerable" in Britain in a document mentioned in sub-paragraph (4).

(4) The documents referred to in sub-paragraph (3)(c) are—

- a) of the books known as the British Red Data Books:
1. "Vascular Plants" Perring FH and Farrell L, 2nd Edition, published in 1983 for the Royal Society for Nature Conservation (ISBN 0 902484 04 4);
 2. "Insects" Shirt DB (Ed.), published in 1987 for the Nature Conservancy Council (ISBN 0 86139 380 5); and
 3. "Invertebrates other than insects" Bratton JH (Ed.), published in 1991 for the Joint Nature Conservation Committee (ISBN 1 873701 00 4); and
 4. "Stoneworts" Stewart NF and Church JM, published in 1992 for the Joint Nature Conservation Committee (ISBN 1 873701 24 1).
7. (1) Subject to sub-paragraph (2), the hedgerow includes—
- (a) at least 7 woody species;
 - (b) at least 6 woody species, and has associated with it at least 3 of the features specified in sub-paragraph (4);
 - (c) at least 6 woody species, including one of the following:
 - black-poplar tree (*Populus nigra ssp betulifolia*);
 - large-leaved lime (*Tilia platyphyllos*);
 - small-leaved lime (*Tilia cordata*);
 - wild service-tree (*Sorbus torminalis*); or
 - (d) at least 5 woody species, and has associated with it at least 4 of the features specified in sub-paragraph (4), and the number of woody species in a hedgerow shall be ascertained in accordance with sub-paragraph (3).
- (2) Where the hedgerow in question is situated wholly or partly in the county (as constituted on 1st April 1997) of the City of Kingston upon Hull, Cumbria, Darlington, Durham, East Riding of Yorkshire, Hartlepool, Lancashire, Middlesbrough, North East Lincolnshire, North Lincolnshire, Northumberland, North Yorkshire, Redcar and Cleveland, Stockton-on-Tees, Tyne and Wear, West Yorkshire or York(14), the number of woody species mentioned in paragraphs (a) to (d) of sub-paragraph (1) is to be treated as reduced by one.
- (3) For the purposes of sub-paragraph (1) (and those of paragraph 8(b))—
- (a) where the length of the hedgerow does not exceed 30 metres, count the number of woody species present in the hedgerow;
 - (b) where the length of the hedgerow exceeds 30 metres, but does not exceed 100 metres, count the number of woody species present in the central stretch of 30 metres;
 - (c) where the length of the hedgerow exceeds 100 metres, but does not exceed 200 metres, count the number of woody species present in the central stretch of 30 metres within each half of the hedgerow and divide the aggregate by two;
 - (d) where the length of the hedgerow exceeds 200 metres, count the number of woody species present in the central stretch of 30 metres within each third of the hedgerow and divide the aggregate by three.
- (4) The features referred to in sub-paragraph (1)(b) and (d) (which include those referred to in paragraph 8(b)) are—
- (a) a bank or wall which supports the hedgerow along at least one half of its length;
 - (b) gaps which in aggregate do not exceed 10% of the length of the hedgerow;

- (c) where the length of the hedgerow does not exceed 50 metres, at least one standard tree;
 - (d) where the length of the hedgerow exceeds 50 metres but does not exceed 100 metres, at least 2 standard trees;
 - (e) where the length of the hedgerow exceeds 100 metres, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50 metres;
 - (f) at least 3 woodland species within one metre, in any direction, of the outermost edges of the hedgerow;
 - (g) a ditch along at least one half of the length of the hedgerow;
 - (h) connections scoring 4 points or more in accordance with sub-paragraph (5);
 - (i) a parallel hedge within 15 metres of the hedgerow.
- (5) For the purposes of sub-paragraph (4)(h) a connection with another hedgerow scores one point and a connection with a pond or a woodland in which the majority of trees are broad-leaved trees scores 2 points; and a hedgerow is connected with something not only if it meets it but also if it has a point within 10 metres of it and would meet it if the line of the hedgerow continued.

8. The hedgerow—

- (a) is adjacent to a bridleway or footpath, within the meaning of the Highways Act 1980(15), a road used as a public path, within the meaning of section 54 (duty to reclassify roads used as public paths) of the Wildlife and Countryside Act 1981(16), or a byway open to all traffic, within the meaning of Part III of the Wildlife and Countryside Act 1981(17), and
- (b) includes at least 4 woody species, ascertained in accordance with paragraph 7(3) and at least 2 of the features specified in paragraph 7(4)(a) to (g).'

Schedule 3 Woody Species

Alder (*Alnus glutinosa*)

Apple, crab (*Malus sylvestris*)

Ash (*Fraxinus excelsior*)

Aspen (*Populus tremula*)

Beech (*Fagus sylvatica*)

Birch, downy (*Betula pubescens*)

Birch, silver (*Betula pendula*)

Black-poplar (*Populus nigra* sub-species *betulifolia*)

Blackthorn (*Prunus spinosa*)

Box (*Buxus sempervirens*)

Broom (*Cytisus scoparius*)

Buckthorn (*Rhamnus cathartica*)

Buckthorn, alder (*Frangula alnus*)

Butcher's-broom (*Ruscus aculeatus*)

Cherry, bird (*Prunus padus*)
Cherry, wild (*Prunus avium*)
Cotoneaster, wild (*Cotoneaster integerrimus*)
Currant, downy (*Ribes spicatum*)
Currant, mountain (*Ribes alpinum*)
Dogwood (*Cornus sanguinea*)
Elder (*Sambucus nigra*)
Elm (*Ulmus species*)
Gooseberry (*Ribes uva-crispa*)
Gorse (*Ulex europaeus*)
Gorse, dwarf (*Ulex minor*)
Gorse, western (*Ulex gallii*)
Guelder rose (*Viburnum opulus*)
Hawthorn (*Crataegus monogyna*)
Hawthorn, midland (*Crataegus laevigata*)
Hazel (*Corylus avellana*)
Holly (*Ilex aquifolium*)
Hornbeam (*Carpinus betulus*)
Juniper, common (*Juniperus communis*)
Lime, large-leaved (*Tilia platyphyllos*)
Lime, small-leaved (*Tilia cordata*)
Maple, field (*Acer campestre*)
Mezereon (*Daphne mezereum*)
Oak, pedunculate (*Quercus robur*)
Oak, sessile (*Quercus petraea*)
Osier (*Salix viminalis*)
Pear, Plymouth (*Pyrus cordata*)
Pear, wild (*Pyrus pyraster*)
Poplar, grey (*Populus x canescens*)
Poplar, white (*Populus alba*)
Privet, wild (*Ligustrum vulgare*)
Rose (*Rosa species*)
Rowan (*Sorbus aucuparia*)
Sea-buckthorn (*Hippophae rhamnoides*)

Service-tree, wild (*Sorbus torminalis*)

Spindle (*Euonymus europaeus*)

Spurge-laurel (*Daphne laureola*)

Walnut (*Juglans regia*)

Wayfaring-tree (*Viburnum lantana*)

Whitebeam (*Sorbus* species)

Willow (*Salix* species)

Yew (*Taxus baccata*)

Annex B: Hedgerow Survey Results

Table B - 1 Hedgerow Survey Results

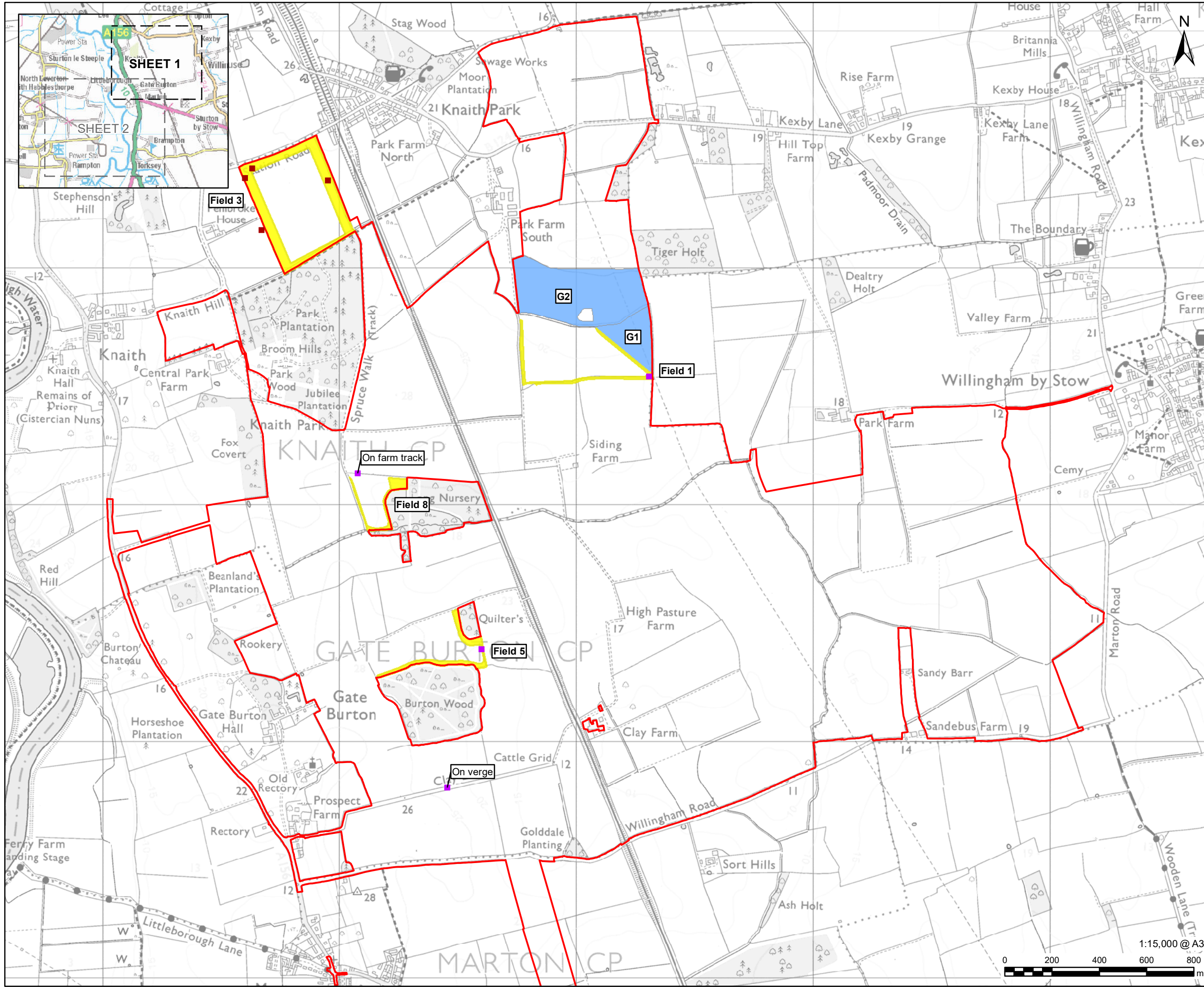
Hedgerow Reference (see Figure 8C-2)	Length (metres)	>30 years old?	Mean number of qualifying species	Standard tree for every 50m?	3 woodland herbs within 1m of hedge margin?	Gaps <10% of hedge?	Bank or wall along at least half of the hedge?	Ditch at least half the length?	Connections scoring 4 or more points?	Parallel hedge within 15m?	Protected species (as defined by the Regs?)	PRoW running parallel?	Species-rich?	Important hedgerow?
3	225	Yes	1.7	No	No	Yes	No	No	No	No	No	No	No	No
5	220	Yes	1.3	No	No	Yes	No	No	No	No	No	No	No	No
10	225	Yes	2.5	No	No	Yes	No	Yes	Yes	No	No	No	No	No
16	130	Yes	2.0	No	No	Yes	No	No	No	No	No		No	No
20	580	Yes	3.7	No	No	Yes	No	No	No	No	No		No	No
23	305	Yes	2.7	No	No	Yes	No	No	Yes	No	No		No	No
27	108	Yes	4.0	No	No	No	No	No	No	No	No		No	No
29	320	Yes	2.0	No	No	Yes	No	No	No	No	No		No	No
32	470	Yes	3.3	Yes	No	Yes	No	No	No	No	No		No	No
35	180	Yes	1.5	No	No	Yes	No	No	No	No	No		No	No
44	295	Yes	3.3	No	No	Yes	No	Yes	No	No	No		No	No
46	470	Yes	2.3	No	No	Yes	No	Yes	No	No	No		No	No
48	245	Yes	3.7	Yes	No	Yes	No	No	No	No	No		No	No
51	235	Yes	3.0	No	No	Yes	No	No	No	No	No	No	No	No
52	475	Yes	3.0	No	No	Yes	No	No	No	No	No	No	No	No

Hedgerow Reference (see Figure 8C-2)	Length (metres)	>30 years old?	Mean number of qualifying species	Standard tree for every 50m?	3 woodland herbs within 1m of hedge margin?	Gaps <10% of hedge?	Bank or wall along at least half of the hedge?	Ditch at least half the length?	Connections scoring 4 or more points?	Parallel hedge within 15m?	Protected species (as defined by the Regs?)	PRoW running parallel?	Species-rich?	Important hedgerow?
57	325	Yes	2.7	No	No	Yes	No	No	No	No	No		No	No
62	250	Yes	2.3	No	No	Yes	No	No	No	No	No		No	No
64	630	Yes	4.0	Yes	No	Yes	No	Yes	Yes	No	No		No	No
72	200	Yes	2.5	No	No	Yes	No	No	No	No	No		No	No
73	265	Yes	2.3	No	No	Yes	No	Yes	Yes	No	No		No	No
77	250	Yes	3.3	No	No	No	No	Yes	No	No	No		No	No
78	120	Yes	3.0	Yes	No	Yes	No	Yes	No	No	No		No	No
80	230	Yes	3.0	No	No	Yes	No	Yes	Yes	No	No		No	No
84	120	Yes	1.5	No	No	No	No	Yes	No	No	No		No	No
87	210	Yes	3.3	Yes	No	Yes	No	No	No	No	No		No	No
98	230	Yes	2.3	No	No	Yes	No	No	No	No			No	No
99	200	Yes	2.5	No	No	Yes	No	No	No	No			No	No
108	190	Yes	3.0	No	No	Yes	No	Yes	No	No	No		No	No
114	520	Yes	4.0	Yes	No	Yes	No	No	No	Yes	No		No	No
115	700	Yes	4.7	Yes	No	Yes	No	No	No	Yes	No		No	No
148	180	Yes	4.0	No	No	Yes	No	No	No	No	No	No	No	No
152	110	Yes	2.5	No	No	Yes	No	No	No	No	No	No	No	No
156	180	Yes	3.0	No	No	Yes	No	No	No	No	No	No	No	No
168	380	Yes	3.0	No	No	Yes	No	No	No	No	No	Yes	No	No

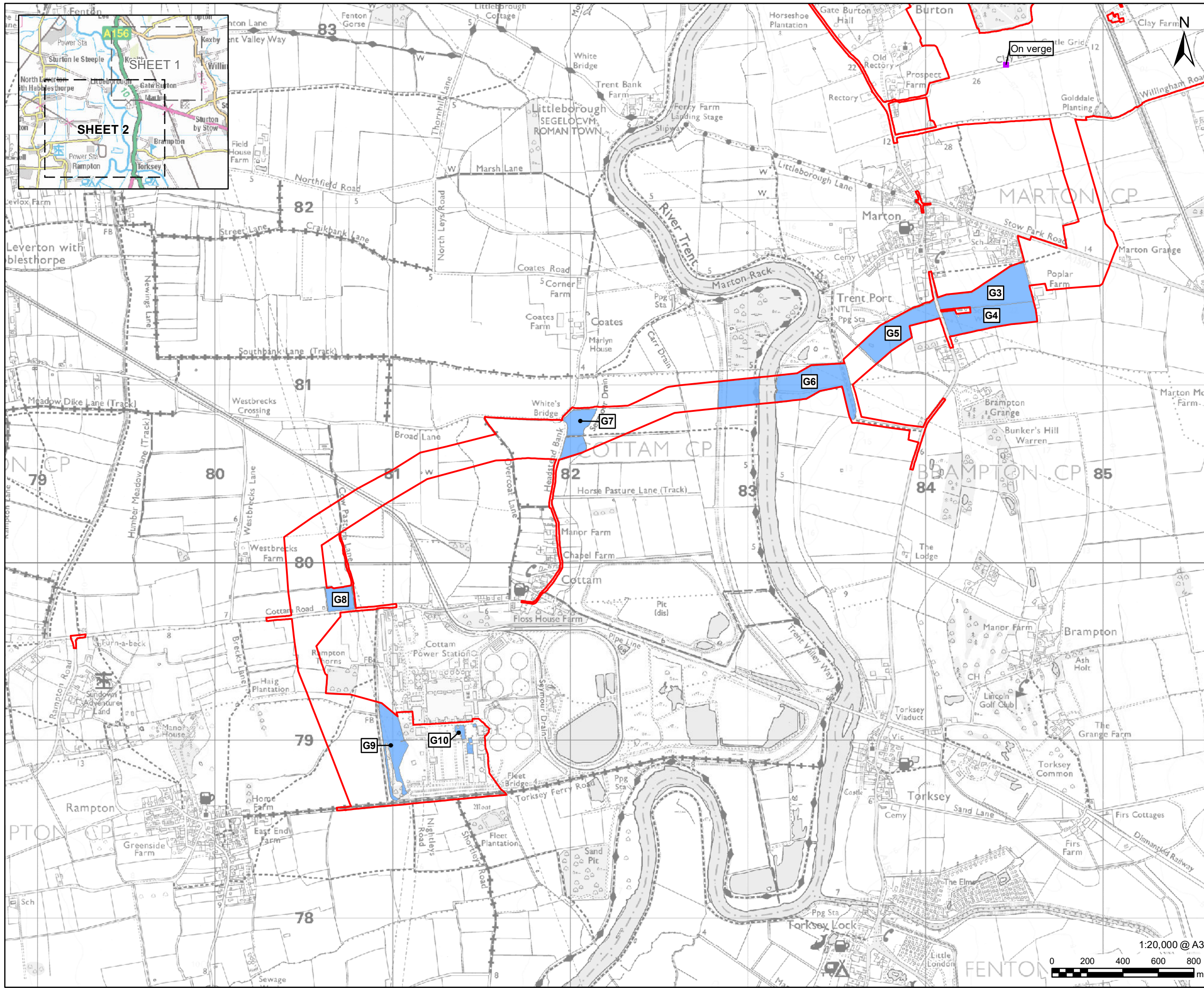
Hedgerow Reference (see Figure 8C-2)	Length (metres)	>30 years old?	Mean number of qualifying species	Standard tree for every 50m?	3 woodland herbs within 1m of hedge margin?	Gaps <10% of hedge?	Bank or wall along at least half of the hedge?	Ditch at least half the length?	Connections scoring 4 or more points?	Parallel hedge within 15m?	Protected species (as defined by the Regs?)	PRoW running parallel?	Species-rich?	Important hedgerow?
169	90	Yes	2.5	No	No	Yes	No	No	No	Yes	No	Yes	No	No
170	240	Yes	3.7	No	No	Yes	No	No	No	No	No	No	No	No
171	90	Yes	3.0	No	No	Yes	No	No	No	Yes	No	Yes	No	No
174	350	Yes	3.0	Yes	No	Yes	No	No	No	No	No	No	No	No
187	380	Yes	3.0	No	No	No	No	No	No	No	No	No	No	No
188	545	Yes	2.7	No	No	Yes	No	No	No	No	No	No	No	No

Annex C: Figures

Figure 8C-1: Arable Flora Survey July 2022

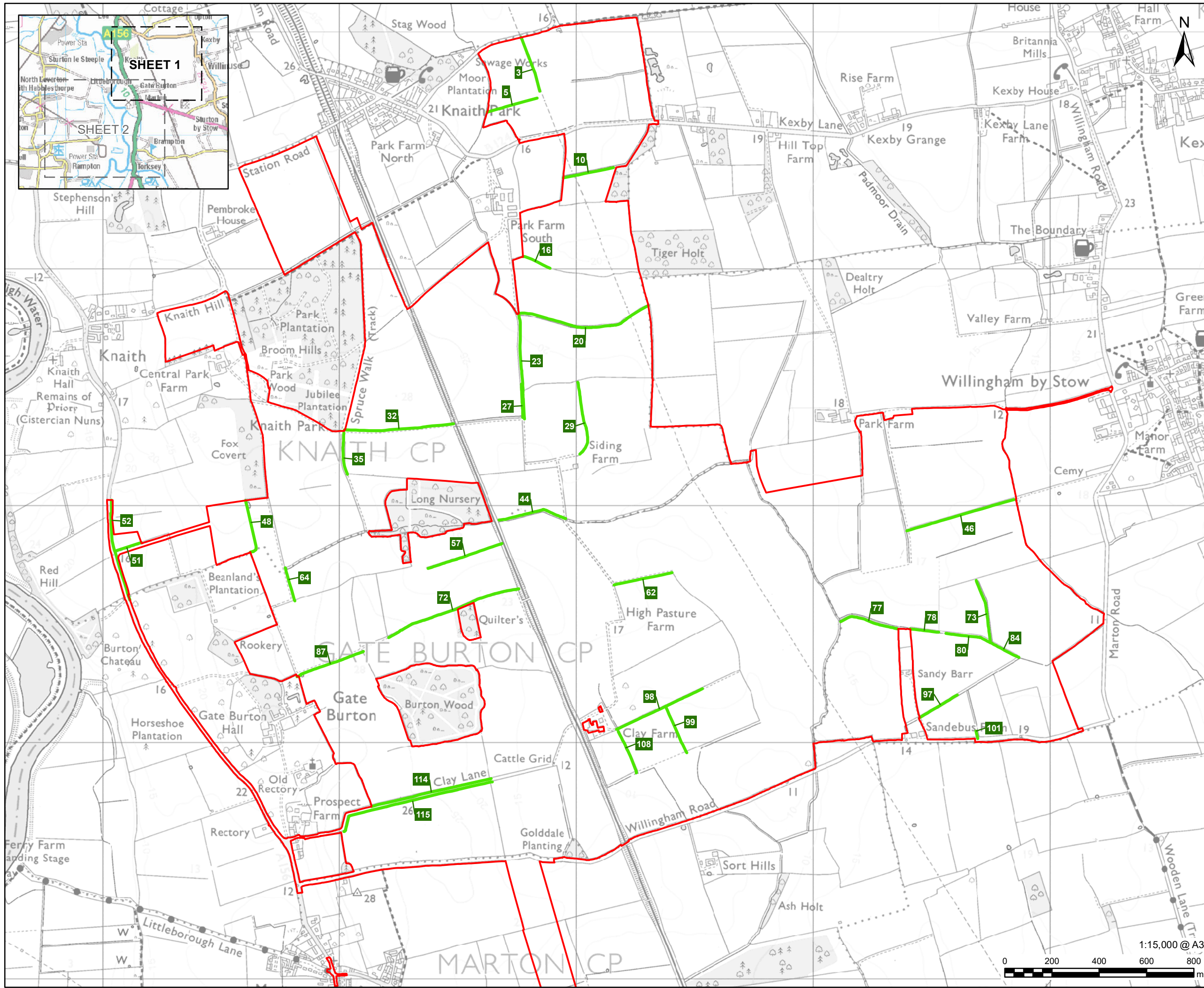


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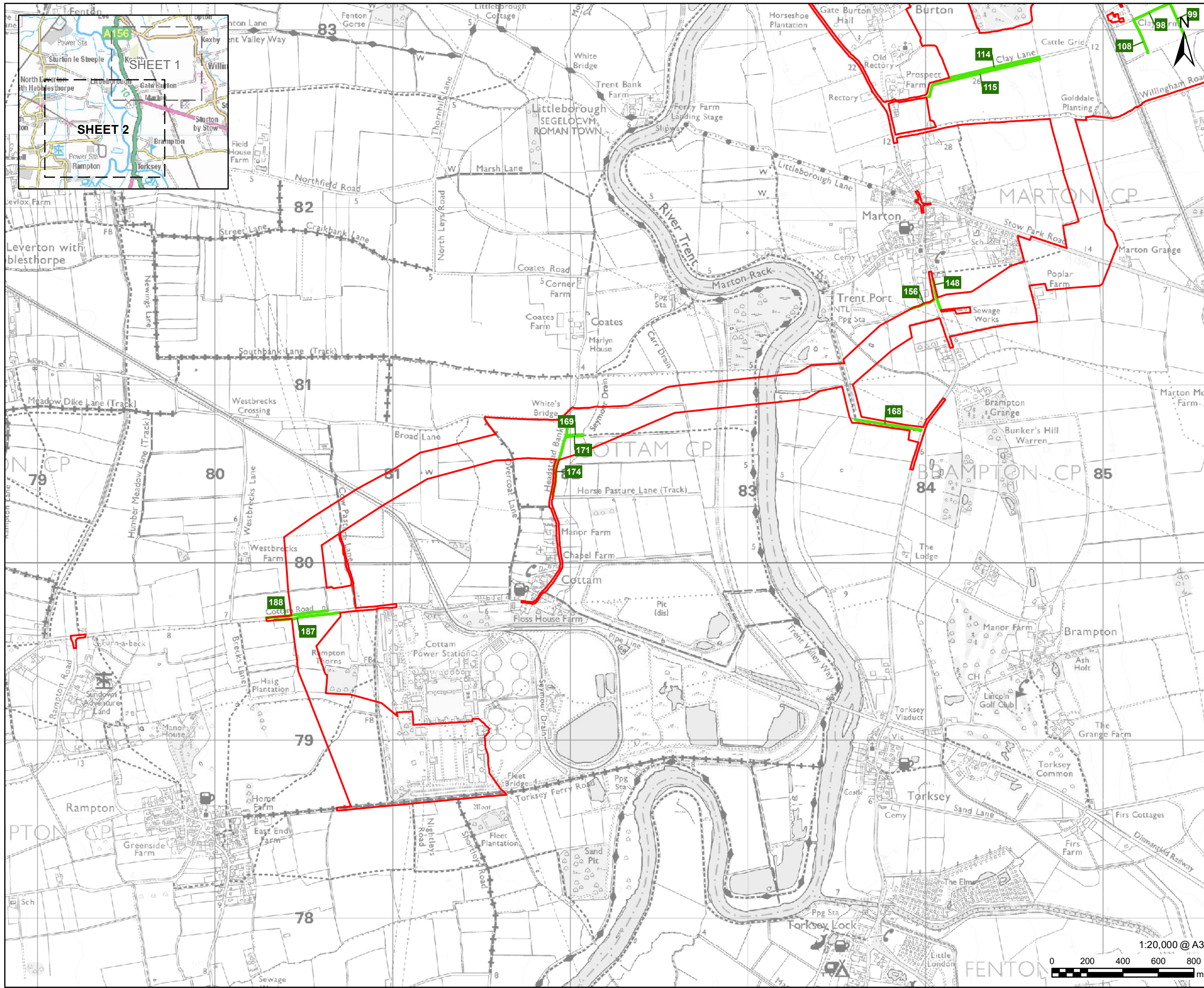


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Figure 8C-2: Hedgerow Survey



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