SUNNICA ENERGY FARM

EN010106

Volume 6

6.2 Appendix 8C: Terrestrial habitats and flora report

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

18 November 2021
Version number: 00

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Sunnica Energy Farm

Appendix 8C: Terrestrial habitat and flora report

Regulation Reference:	**Regulation 5(2)(a)**
Planning Inspectorate Scheme Reference	**EN010106**
Application Document Reference	**EN010106/APP/6.2**
Author	**Sunnica Energy Farm Project Team**

Version	**Date**	**Status of Version**
Rev 00	18 November 2021	Application Version

Executive summary

AECOM was instructed by Sunnica Limited to undertake Phase 2 botanical surveys, including National Vegetation Classification (NVC) survey) of grasslands, hedgerow and arable flora surveys for the proposed Sunnica Energy Farm (hereafter referred to as 'the Scheme'). The Scheme is a new solar farm scheme that would connect to the national electricity transmission network.

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

Section 41 of the NERC Act (NERC Act S41) 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 S41 list includes hedgerows and arable field margins. Decision-makers are required to have regard to the conservation of biodiversity in England when carrying out their normal functions; consideration of the S41 list is integral to this.

The Hedgerow Regulations 1997 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.

Surveys for the Scheme were undertaken between 2020 and 2021, at appropriate times of year for survey.

Based on the evaluation of the grassland surveyed (including swamp vegetation) against the criteria provided further on in this report, these grasslands range from local to county nature conservation importance and includes acid grassland and calcareous grassland.

All accessible arable fields in the Order limits were surveyed for important arable plants, recording lists of scarce arable plant species for each field surveyed. These surveys identified arable field margins of up to county nature conservation importance.

Hedgerow surveys were carried out in accordance with the relevant methods described in the Hedgerows Regulations. The survey of each hedgerow for 'importance' were assessed against the Wildlife and Landscape Criteria, detailed in the Hedgerow Regulations (1997). Only one hedgerow fulfilled the criteria for 'Important' under the Regulations and is of county nature conservation importance.

Table of contents

Table of Tables

1 Introduction

1.1.1 In March 2019, AECOM undertook a Preliminary Ecological Appraisal (PEA) (Ref 1) of the Sunnica Energy Farm site on behalf of Sunnica Ltd. This PEA identified the need for follow-up ecological surveys and assessments to help determine a baseline and potential impacts of the proposed Sunnica Energy Farm (hereafter referred to as the Scheme) on protected or notable[1] species. As part of this work, AECOM undertook Phase 2 botanical surveys (including National Vegetation Classification (NVC) survey), a hedgerow survey and an arable flora survey between 2019 and 2021 within the Scheme boundary (the Development Consent Order (DCO) Site) (the Site) (also referred to as the Order limits) (**Figure 1**).

1.2 The Scheme

1.2.1 Sunnica Energy Farm (the Scheme) is a new solar energy farm proposal that will deliver electricity to the national electricity transmission network. Sunnica Limited is proposing to install ground mounted solar photovoltaic (PV) panel arrays to generate electrical energy from the sun and combine these with a Battery Energy Storage System (BESS) which will connect to Burwell National Grid Substation in Cambridgeshire.

1.2.2 Electricity will be generated at Sunnica East Site A, near Isleham in Cambridgeshire; Sunnica East Site B, near Worlington and Freckenham in Suffolk; Sunnica West Site A near Chippenham and Kennett in Cambridgeshire; and Sunnica West Site B, near Snailwell in Cambridgeshire. All locations will comprise ground mounted solar PV panel arrays, supporting electrical infrastructure and, with the exception of Sunnica West Site B, a BESS.

1.2.3 Supporting electrical infrastructure will include on-site substations on Sunnica East Site A and Sunnica East Site B and Sunnica West Site A, and on-site cabling between the different electrical elements across the Scheme. The generating equipment of the Scheme will be fenced and protected via security measures such as Closed Circuit Television. Inside the fenced areas, in addition to the generating equipment will be, internal access tracks, and drainage. It is not proposed for any area to be continuously lit.

1.2.4 Visual, ecological and archaeological mitigation is proposed which includes proposed grassland planting and new woodland; retention of existing woodland, wetlands and other vegetation; provision of replacement habitat; and offsetting areas, where there will be no development. The BESSs will consist of a compound and battery array to allow for the importation, storage and exportation of energy to the National Grid. There will also be areas at Sunnica East Site A and Sunnica East Site B for office and storage facilities for use during the Scheme's operation.

1.2.5 The Scheme will be connected to a new substation extension at the existing Burwell National Grid Substation, using 132 kilovolt (kV) cables buried underground. The cables will run between Sunnica East Site A, Sunnica East Site B and Sunnica West Site A (Grid Connection Route A), and then from Sunnica

[1] A notable species is a species with a conservation designation, but no legal protection.

West Site A to Sunnica West B and onwards to the Burwell National Grid Substation (Grid Connection Route B). The Burwell National Grid Substation Extension will convert the 132kV to 400kV. The 400kV cables will be buried and will connect the Scheme to the existing Burwell National Grid Substation to allow distribution to the national transmission network.

1.2.6 The Scheme will have two main access points, one north of Elms Road at Sunnica East Site B and one south of La Hogue Road at Sunnica West Site A. The main access route to Sunnica West Site A will be via the Chippenham junction of the A11, to the north of junction 38 of the A14. Sunnica East Site B will be accessed via the A11 and B1085. A number of secondary access points are proposed to access the individual land parcels through construction, operation, and decommissioning phases.

1.2.7 The Scheme is defined as a Nationally Significant Infrastructure Project (NSIP) and will require a Development Consent Order (DCO) from the Secretary of State for Business, Energy and Industrial Strategy (Secretary of State), due to its generating capacity exceeding 50 megawatts (MW).

1.2.8 The Scheme comprises the following key areas:

a. Solar Farm Sites:
    i. Sunnica East Site A;
    ii. Sunnica East Site B;
    iii. Sunnica West Site A; and
    iv. Sunnica West Site B.
b. associated electrical infrastructure areas for connection to the national transmission system:
    i. Grid Connection Route A (connecting the Sunnica East Site A with the Sunnica East Site B and then connecting to the Sunnica West Site A);
    ii. Grid Connection Route B (connecting the Sunnica West Site A and Sunnica West Site B and the Burwell National Grid Substation); and
    iii. Burwell National Grid Substation Extension.

1.2.9 **Figure 1** shows the locations of these key areas.

1.3 Site description

1.3.1 A summary description of the habitats within the Scheme boundary (made up of the four Sites (see section 1.2.1)) is provided below and a more detailed description of the habitats is provided in the PEA report (Ref 1). The extent of the Scheme is shown in **Figure 1**.

Sunnica East Site

1.3.2 The Sunnica East Site is split into two sub-sites, one to the north of Freckenham (referred to as Sunnica East Site A) and the other to the south of Worlington (referred to as Sunnica East Site B). These two sites are approximately 1km apart and are separated by agricultural fields. The Sunnica East Site A encompasses an

area of approximately 224ha and includes land within the county of Suffolk and Cambridgeshire. Sunnica East Site B lies within Suffolk and encompasses an area of approximately 319ha (**Figure 1**).

1.3.3 The landscape features within the Sunnica East Site A and Sunnica East Site B consist of arable agricultural fields interspersed with individual trees, hedgerows, linear tree belts, small woodland blocks, farm access tracks and local roads.

1.3.4 The landscape features immediately surrounding the Sunnica East Site A and Sunnica East Site B comprise small rural villages, including Worlington to the north, Barton Mills to the north-east, Red Lodge and Freckenham to the south and Isleham to the west. Industrial land uses adjoin the A11 to the south of the Sunnica East Site with an industrial installation of a 7.5MW solar farm situated adjacent to the south-eastern extent of the Sunnica East Site and an anaerobic digestion (AD) plant located to the south of the Sunnica East Site.

Sunnica West Site

1.3.5 The Sunnica West Site is located within the East Cambridgeshire District Council administrative area, approximately 3km north east of Newmarket and 6.5km east of Burwell.

1.3.6 Sunnica West is split into two sub-sites, one to the south-east (referred to as Sunnica West Site A) and the other to the north-west of Snailwell (referred to as Sunnica West Site B). These two sites are approximately 1km apart, separated by agricultural fields and Chippenham Road. The Sunnica West Site A encompasses an area of approximately 373ha and includes land to the east and west of the A11, consisting of agricultural fields bounded by trees, managed hedgerows, linear tree shelter belts, small woodland and copses and farm access tracks. Sunnica West Site B encompasses an area of approximately 66ha and comprise of agricultural fields, grassland, small woodland and copses, farm access tracks and irrigation ditches fed by the River Snail which runs along the western and northern boundaries of the Site (**Figure 1**).

1.3.7 The surrounding landscape comprises regularly shaped arable fields interspersed with managed hedgerows, tall shelter belts of trees and in the Chippenham Hall area, a parkland landscape with mature individual trees. Much of the area is also characterised by grazed paddocks, horse gallops and exercise tracks.

Cable route corridors

1.3.8 The Scheme will connect to the existing Burwell National Grid Substation via a cable route corridor. The cable route corridors under consideration are Grid Connection Route A, which connects the Sunnica East Site A with the Sunnica East Site B and then runs between the Sunnica West Site A and the Sunnica East Site B; and Grid Connection Route B, between the Sunnica West Site A and Sunnica West Site B and the Burwell National Grid Substation.

Grid Connection Route A

1.3.9 Grid Connection Route A connects the Sunnica East Site A with Sunnica East Site B and crosses two minor roads and arable farmland (**Figure 1**).

1.3.10 Heading south from the Sunnica East Site B, the cable route corridor for Grid Connection Route A crosses the River Kennett, pastoral farmland, the Chippenham footpath 49/7 (a Public Right of Way (PRoW)) and B1085 (**Figure 1**).

Grid Connection Route B

1.3.11 Heading east from the Burwell National Grid Substation, the cable route corridor for Grid Connection Route B crosses agricultural fields and a number of roads including the B1102 and A142. Grid Connection Route B also crosses a number of watercourses, including the Burwell Lode, New River, and the River Snail, as well as a number of drainage ditches associated with Burwell Fen, Little Fen, the Broads, and agricultural drains (**Figure 1**).

1.3.12 The cable route corridor for Grid Connection Route B crosses a PRoW (footpath 92/19) before crossing the railway line and the A142 Newmarket / Fordham Road. The Route then runs alongside Snailwell Road and across the River Snail into Sunnica West Site B.

Burwell National Grid Substation Extension

1.3.13 The habitat within the Burwell National Grid Substation Extension (surrounding the existing substation) comprises small grassland fields to the east of the existing substation (bordered by hedgerows and mature trees) and arable land to the south and west of the existing substation (**Figure 1**).

1.4 Scope of the report

1.4.1 The PEA report (Ref 1) identified habitats of principal importance (listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006) (Ref 2) which could be potential constraints to the works or influence the design and implementation of the Scheme. The habitats comprise:

a. lowland dry acid grassland;
b. lowland calcareous grassland;
c. arable field margins;
d. flood-plain and grazing marsh; and
e. hedgerows

1.4.2 This report includes the following information:

a. relevant legislation and policy;
b. methods for desk and field-based assessments undertaken between 2019 and 2021;
c. limitations to the surveys undertaken and any assumptions made as a result of any incomplete data;
d. survey results including habitat location, size, floristic and structural composition; and
e. biodiversity importance of the habitats.

1.4.3 This report is a technical appendix to accompany the Environmental Statement (ES) for the DCO application.

2 Relevant Legislation and Policy

2.1 Legislation

2.1.1 Part 1 of the Wildlife and Countryside Act 1981 (as amended) (Ref 3) affords specific protection to flora listed on Schedule 8 (flora, fungi and lichens).

2.1.2 Section 13 of this act protects plants from picking and sale of plants or parts of plants listed in Schedule 8, as follows:

a. intentional picking, uprooting or destruction (Section 13 1a);

b. selling, offering for sale, possessing or transporting for the purpose of sale (live or dead, part or derivative) (Section 13 2a); and

c. advertising (any of these) for buying or selling (Section 13 2b).

2.1.3 In certain circumstances, licences can be granted to permit some actions prohibited under the Act (Ref 3).

2.1.4 Section 41 of the 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, dry acid grassland and calcareous grassland priority 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:

a. "*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*

b. *promote the taking by others of such steps*."

Hedgerows

Hedgerow regulations

2.1.5 The Hedgerow Regulations 1997 (the Regulations) (Ref 4), made under the Environment Act 1995 (Ref 5), 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.

2.1.6 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.

2.1.7 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. Hedgerows that are younger than 30 years old are excluded

if supportive evidence of age can be provided, as are any hedgerows that mark the boundary (curtilage) of a house.

2.1.8 In addition, the Regulations qualify 'important' hedgerows that meet the following list of criteria:

a. it must have a continuous length of or exceeding 20m;

b. has a continuous length of less than 20m, but meets another hedgerow (by intersection or junction) at each end; and

c. it must be more than 30 years old.

2.1.9 In addition to the above criteria, to be deemed 'important', a hedgerow must meet one or more of the following criteria:

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 Wildlife and Countryside Act 1981 (as amended) ;

b. 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, (as defined in Schedule 1 of the Regulations) and

c. the hedgerow includes one or more of the following:

- at least seven qualifying woody species (see Schedule 3 of the Regulations), on average, in a 30m length;
- at least six qualifying woody species, on average, in a 30m length, plus at least three Associated Features within Part II Criteria (Schedule 1 of the Regulations);
- at least six qualifying woody species including a Black Poplar *Populus nigra* subspecies *betulifolia*; Large-leaved Lime *Tilia platyphyllos*, Small-leaved Lime *Tilia cordata* or Wild Service-tree *Sorbus torminalis*; or
- at least five qualifying woody species, on average, in a 30m length and at least four Associated Features within Part II Criteria (Schedule 1 of the Regulations).

2.2 National and local planning policy

2.2.1 National and local planning policy relevant to nature conservation is provided in detail in the PEA report for the Scheme (Ref 1), which is also included as Appendix 8B of the ES.

2.3 Priority habitats

2.3.1 The UK Biodiversity Action Plan (UKBAP) (Ref 6) was launched in 1994 and established a framework and criteria for identifying species and habitat types of conservation concern. From this list, action plans for priority habitats and species of conservation concern were published and have subsequently been succeeded by the UK Post-2010 Biodiversity Framework (July 2012) (Ref 7). The UK Post 2010 Development Framework is relevant in the context of Section 40 of the NERC

Act (Ref 2), meaning that priority species and habitats are material considerations in planning. These habitats and species are identified as those of conservation concern due to their rarity or a declining population trend.

2.4 Local biodiversity action plan

2.4.1 The Scheme is located within two counties, Cambridgeshire and Suffolk. The Cambridgeshire and Peterborough Biodiversity Action Plan (Ref 8) and Suffolk Biodiversity Action Plan (Ref 9) provides the local nature conservation strategy for identifying threats to species within these counties and sets out the actions necessary to conserve them. These Biodiversity Action Plans provide context to inform identification of threatened / uncommon species within the district / 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.

3 Methods

3.1 Desk study

3.1.1 A desk study was undertaken in December 2018 through Cambridgeshire & Peterborough Environmental Records Centre (CPERC) and Suffolk Biodiversity Information Service (SBIS), to obtain relevant flora and habitat records within the preceding ten years and within a 2km radius of the Order limits. This included searches for:

a. Protected Plants under Schedule 8 Wildlife and Countryside Act 1981 (Ref 10);
b. Priority Species (i.e. LBAP / NERC Act Section 41 species) (Ref 2);
c. GB Red List species (IUCN) (Ref 11);
d. Notable species (i.e. Nationally Rare and Scarce species);
e. Cambridgeshire and Peterborough Additional Species of Interest (CPASI); and
f. Suffolk Rare Plants.

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 areas of unimproved/semi-improved grassland, floodplain and grazing marsh and arable margins, within the Order limits. These are shown on **Figure 2** and referenced in **Table 3-1**. The survey area for hedgerows included all mature hedgerows within the Order limits (**Figure 3**).

Table 3-1: Survey areas for grassland and arable flora within the Order limits

Scheme area	Survey area (see Figure 2)	Habitat type
Sunnica East Site A	AF 14, 19, 20, 21	Arable Flora/Arable Field Margins*#
	T10a and T10b	Drain and marginal / emergent vegetation
	T10c	Semi-improved neutral grassland
Sunnica East Site B	T6 (including Worlington Heath County Wildlife Site (CWS))	Lowland dry acid grassland*#
	T8, T9, T13, T16	Inland dune vegetation / Lowland dry acid grassland*#
	T7 (includes part of Badlingham Lane CWS)	Lowland calcareous grassland*#
	T14	Drain and marginal / emergent vegetation
	AF2, 3, 7, 16 to 18, 22 to 25.	Arable Flora/Arable Field Margins*#
	T12	Semi-improved neutral grassland

Scheme area	Survey area (see Figure 2)	Habitat type
Sunnica West Site A	T1, T2, T15	Scattered grasses, tall ruderal herbs and ephemeral/short perennial vegetation, semi-improved grassland
Sunnica West Site B	T1 and T2	Floodplain and grazing marsh*/marshy grassland
	T3, T4, T5	Semi-improved neutral grassland
	AF 8, 9, 10, 11, 13	Arable field margins*
Burwell National Grid Substation Extension	AF27	Arable field margins*
Grid Connection Route A	T25, T27	Species poor semi-improved neutral grassland
	T26	Semi-improved neutral to acidic grassland verge
	AF31	Arable field margins*
Grid Connection Route B	T17, T18, T21, T24	Drainage ditches / running water and marginal / emergent vegetation
	T19	Grassland verge/hedge bank
	T20, T23	Semi-improved neutral to acidic grassland / set-aside
	T22	Semi-improved calcareous sown grassland
	AF28, AF29, AF30	Arable field margins*
Notes on Table 3-1 = * indicates a priority habitat type; # indicates a Local Biodiversity Action Plan habitat (in Suffolk only)		

Grassland survey

3.2.2 The survey of grassland focused on lowland acid and lowland calcareous priority habitat within the Order limits. A few discrete areas of these habitat types had been identified in the PEA report (Ref 1) at Sunnica East Site A and B as meeting these criteria. In addition, an area of floodplain grassland/semi-improved grazing land at Sunnica West Site B was surveyed. Notes were also made of notable species present along tracks, set-aside grassland and other potential interesting habitats on the Site.

3.2.3 The survey was undertaken by two experienced botanists on 9, 10 and 16 July 2019. Notes on additional species were also made earlier in the year in some of the acid and calcareous grassland habitats on the 29 May and 6 June 2019. An early season visit to some of these areas and new areas within the Scheme was undertaken on 14, 27 and 28 May 2020. A survey of the grid connection routes was undertaken on 19, 20, 21 May and 1 June 2021.

3.2.4 Where appropriate the National Vegetation Classification (NVC) survey was carried out (where applicable) in accordance with the standard methodology as detailed for grasslands in Rodwell (1992) (Ref 12). The NVC survey involved recording plant species present within a 2m x 2m quadrat (for short herbaceous vegetation) or a 4m x 4m quadrat (for tall and more open herb communities). In each discrete grassland type, up to five randomly selected quadrats were recorded, depending

on the extent and variability of the grassland. Each plant species in a quadrat was given a by eye estimate of cover using the Domin scale and bare ground was recorded where present

3.2.5 Other typical and/or noteworthy plant species in the wider grassland woodland, but not picked up in the quadrats was also recorded. Such species, even if rare within the ground flora, could be relevant for the classification of the associated NVC community. Each discrete grassland type was assigned, where applicable, to its relative NVC community using the keys and descriptions given in Rodwell (1992) (Ref 12). Botanical nomenclature in this report follows that of Stace (2019) (Ref 13) for vascular plants and Atherton et al. (2010) (Ref 14) for bryophytes. The scientific name is given only the first time the species is mentioned in the main text.

3.2.6 NVC survey is not appropriate where vegetation has a history of prior disturbance, as heavily-disturbed or recently-established habitats would be unlikely to align with any of the described NVC communities. Where this was the case based on professional judgement, notes were made on the species and abundance only, rather than an NVC survey.

3.2.7 The rarity of higher plants given is based on Stace (2019) (Ref 13), where;

a. Uncommon – a species found in not more than 250 different 10 x 10km grid squares in the British Isles since 1987
b. Scarce - a species found in not more than 100 different 10 x 10km grid squares since 1987; and
c. Rare – a species found in not than 15 different 10 x 10km grid squares since 1987.

3.2.8 Protected species (WCA Schedule 8), priority species (S41) and notable species as listed on the Suffolk Rare Plant register and Cambridgeshire and Peterborough Additional Species of Interest (CPASI) are listed in the results.

Arable flora survey

3.2.9 All suitable, accessible arable fields in the survey area were surveyed for scarce arable flora on the 5, 6 and 29 May and 6 June 2019; from AF16 (Sunnica East Site B) onwards on the 14, 27 and 28 May 2020 and from AF28 onwards along the Grid Connections Areas on 20 May and 1 June 2021 at an optimal time 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.

3.2.10 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 considered as scarce, that is listed in the Great Britain and England Red Data Lists (Stroh et al., 2015 (Ref 11), Mcleod et al., 2017 (Ref 15) as Critically Endangered, Endangered, Vulnerable and Near Threatened, and those listed by Byfield & Wilson (2005) (Ref 16) as locally, regionally or nationally scarce. As such, data were only collected for those fields where scarce flora was found (see **Figure 2**, Annex A).

3.2.11 The survey results were used to determine the relative notability and importance of the scarce arable plant assemblages present. Byfield and Wilson (2005) (Ref 16) set thresholds to support this and subsequent nature conservation evaluation (see section 3.3). Thresholds have been defined based on the cumulative total of the weighted scores of species present at each discrete location (in this case, location = field). The threshold scores proposed for sites of international (European), national and county importance is given in **Table 3-2.**

3.2.12 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. Data held in the Multi-Agency Geographic Information for the Countryside (MAGIC) website (Ref 17) identify that the soil classification of the study area comprises a mixture of free draining slightly acid but base-rich soils (Soilscape Type 7), free draining slightly acid soils (Soilscape Type 10), and free draining lime-rich loamy soils (Type 5). The most appropriate substrate type, as quoted in **Table 3-2**, for the purposes of data analysis is therefore "Sands and Freely Draining Acidic Soils". A few fields comprised a heavier 'clay' soil. Whilst it is acknowledged there is some chalk or limestone influence these two categories used takes the precautionary approach as it has lower threshold value for nature conservation importance.

3.2.13 No criteria are available for the identification of assemblages of district or lower value/biodiversity importance. Professional judgement has been applied to this 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 3-2: Threshold scores for assessing the nature conservation importance of arable plant assemblages with reference to prevailing soil type

Geographic scale of nature conservation importance	Chalk and limestone derived soils (excluding clays)	Clays	Sands and freely draining acidic soils
European	90+	70+	70+
National	45 – 89	30 – 69	35 – 69
County	30 – 44	20 – 29	20 – 34
District	n/a	10 - 19 (or the presence of higher (7+) scoring species)	10 - 19 (or the presence of higher (7+) scoring species)
Local	n/a	1 – 9	1 – 9

Hedgerow surveys

3.2.14 The hedgerow survey followed Defra (Ref 18) and used the broad definition of a hedgerow, which defines a hedgerow 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*".

3.2.15 Hedgerow surveys were carried out in May and June 2021 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 18). Each hedgerow was assigned a unique identifier number and these (and their locations) are also presented in **Figure 3**.

3.2.16 The relevant hedgerows were surveyed and assessed against the Wildlife and Landscape Criteria, detailed in the Regulations. 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.

3.2.17 Any hedgerows that are not included within this report were scoped out of requiring any further assessment.

3.2.18 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.

3.2.19 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.

3.2.20 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.

3.2.21 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 Regulations survey need to be rounded to the nearest whole number.

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

a. where the length of the hedgerow does not exceed 30m, count the number of woody species present in the hedgerow;

b. 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;

c. 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

d. 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.

3.3 Biodiversity evaluation

3.3.1 An essential prerequisite step to allow ecological impact assessment of the Scheme is an evaluation of the relative biodiversity importance of the identified ecological features (encompassing nature conservation designations, ecosystems, habitat and species). This is necessary to set the terms of reference for the subsequent ecological impact assessment

3.3.2 The method of evaluation that has been utilised in this report has been developed with reference to the guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) (Ref 19). CIEEM 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.

3.3.3 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.

3.3.4 The importance of the habitats and plant species addressed in this report has been defined with reference to the geographical level at which the feature being assessed is considered to matter (**Table 3-3**). 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.

3.3.5 Guidance and criteria of potential relevance to the botanical features being assessed is summarised in **Table 3-3**. The identified guidance and criteria are not definitive and other criteria have been applied when relevant and appropriate e.g. see the Byfield and Wilson (2005) (Ref 16) method for scarce arable flora referenced in section 3.2.9 to 3.2.13.

Table 3-3: Geographic scale used to qualify the relative biodiversity importance of features

Geographic scale of importance	Definition	Example supporting guidance and assessment criteria
International	Europe	McLeod et al.(2017) (Ref 15), 'Guidelines for the selection of Special Areas of Conservation (SACs)'; specific guidance for scarce arable flora is given in Byfield & Wilson (2005) (Ref 16)
National	Great Britain/ England	Bainbridge (2013) (Ref 20), 'Guidelines for the selection of biological Sites of Special Scientific Interest (SSSIs)'; specific guidance for scarce arable flora in Byfield & Wilson (2005) (Ref 16)
Regional	East of England	No specific guidance available for Cambridgeshire and Suffolk, professional judgement is to be used. It will encompass features clearly of greater than county value but not of sufficient merit to demonstrate national value.

Geographic scale of importance	Definition	Example supporting guidance and assessment criteria
County	Cambridgeshire or Suffolk	Cambridgeshire and Peterborough Panel (2014)'County Wildlife Sites Selection Guidance' (Ref 21) and Suffolk County Wildlife Site Selection Criteria (Suffolkbis, 2010) (Ref 22) provide details on the selection method for county wildlife sites and details of the habitat types found within the counties.
Local /District	The Order limits	No specific guidance available, professional judgement is to be used.

3.4 Assumptions and limitations

Desk study

3.4.1 The aim of a desk study was to help characterise the baseline context of the Scheme and provide valuable background information that would not be captured by site surveys alone. Information obtained during the course of a desk study was dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a particular habitat or species does not necessarily mean that the habitats or species do not occur in the study area. Likewise, the presence of records for particular habitats and species did not automatically mean that these still occurred within the area of interest or were relevant in the context of the Scheme.

Field survey

Survey areas and access

3.4.2 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. All designated sites and notable grassland habitats were included within the survey where they are likely to be impacted by the Scheme. All arable margins were considered and surveyed where rare/scarce arable flora were present or likely to be present. Note that since the surveys commenced, the site boundary has been amended, resulting in arable flora survey results from 2019 that were undertaken in land just outside the Order limits.

3.4.3 These surveys concentrated on habitats likely to be directly impacted, and therefore, not all habitats were surveyed in detail.

3.4.4 It should be noted that a specific survey of invasive Schedule 9 species within the Site, such as wetlands and woodland, has not been undertaken, but they were recorded where present within the grasslands and arable habitats surveyed.

NVC survey

3.4.5 The NVC surveys were undertaken at an appropriate time of year during May to July and under suitable weather conditions for grassland survey. However, it should be noted that grassland survey results, and the description of communities types (where applicable), represent a current community evaluation at the time of survey (as opposed to one seeking to describe what the community was before any human

interference, or what it might become in the future). This is only a snapshot of the vegetation communities present and should not be interpreted as a static long-term reference.

Arable flora

3.4.6 There were some general limitations specific to surveys for scarce arable flora. These were:

a. Timings: The surveys were undertaken between May and early June, which represents the optimum time for recording scarce arable flora. However, not all arable plant species and populations may be apparent or identifiable during this period. Some later checks were also undertaken in late July 2019 and 2020 for additional species, therefore most of the scoring or more notable species were likely to have been apparent at these times.

b. Use of selective herbicides on crops observed throughout the year will have restricted the occurrence of scarce arable flora to areas unaffected by spray, such as field entrances/turning areas.

c. Not all crops are of equal value for scarce arable flora. Crops of the same type are not grown in the same fields year after year *i.e.* they are rotated on a regular cycle. Some crop types are more compatible than others with arable flora, depending upon the specific inputs required to maintain the crop (e.g. herbicides and fertilisers) and how closely the cultivation requirements of the crop matches the ecological requirements of the scarce flora present.

3.4.7 These limitations did not significantly limit this flora report and assessment.

4 Results

4.1 Desk study

Priority habitats

4.1.1 Relevant NERC Act 2016 Section 41 priority and LBAP habitats identified in the PEA report (Ref 1) are presented in **Table 4-1**.

Table 4-1: NERC Act S41 priority habitats and LBAP habitats relevant to the Scheme

Habitat	Scheme Area	NERC Act	LBAP	Supporting Comments
Arable Field Margins/Arable Land	Sunnica East Sites A and B, Sunnica West Sites A and B, Grid Connection Routes A & B and Burwell Substation.	✓	✓	Some arable field margins present in these areas fulfil the criteria for this priority habitat type based on the assemblages of important arable plant species.
Fenland Drainage Ditches	Grid Connection Route B	-	✓	The Grid Connection Route B crosses a number of drainage ditches around Burwell.
Floodplain and grazing marsh	Sunnica West Site B,	✓	✓	Grazing marsh present in fields next to the River Snail on Sunnica West Site B
Hedgerows	Sunnica East Sites A and B, Sunnica West Sites A and B, Grid Connection Routes,	✓	✓	Hedgerows are present within the Site.
Lowland Mixed Deciduous Woodland	Sunnica East Sites A and B, Sunnica West Sites A and B, Grid Connection Routes	✓	✓	Broad-leaved woodland is present within the Site. Mostly plantation woodland.
Lowland Dry Acid Grassland	Sunnica East Site B	✓	✓	A small area of dry acid grassland is present in the northern section of the Sunnica East Site B and associated with the Worlington Heath CWS and Badlingham Lane CWS.
Lowland Calcareous Grassland	Sunnica East Site B	✓	✓	A small area of calcareous grassland is present in the eastern and southern section of the Sunnica East Site B.
Rivers	Sunnica West Site B, Grid Connection Routes	✓	✓	The River Kennett and River Snail are likely to fulfil the criteria of this priority habitat type.
Standing Open Waters / Ponds	Sunnica East Sites A and B, Sunnica West Sites A and B, Grid Connection Routes	✓	✓	There are a number of waterbodies within the Site, including irrigation reservoirs and ponds.
Wood pasture and parkland	Sunnica West Site A	✓	✓	Chippenham Park and tree lines to the south within the Site

Protected, priority and notable flora species

4.1.2 The data search identified six Schedule 8 plants listed on the Wildlife and Countryside Act 1981 (Ref 10) relevant to the Scheme within 2km of the Order limits. These are:

a. Cambridge Milk-parsley *Selinum carvifolia*;
b. Fingered Speedwell *Veronica triphyllos*;
c. Small Alison *Alyssum alyssoides*;
d. Bluebell *Hyacinthoides non-scripta* (in respect of section 13 2a/b only);
e. Grass-poly *Lythrum hyssopifolium* (historic records from 2001, no recent records); and
f. Military Orchid *Orchis militaris*.

4.1.3 Cambridge Milk-parsley is located in Chippenham Fen SSSI and SAC and Snailwell Meadows SSSI, both located immediately adjacent to the north and south west of Sunnica West Site B.

4.1.4 There is an historic record from 2001 of Grass-poly within Chippenham Avenue Fields CWS, just outside the site boundary of Sunnica West Site A. There are no recent records of this species (checked by AECOM in 2019 and 2020) and the habitat present there at the time of survey is now unsuitable for this species (*i.e.* intensively managed arable).

4.1.5 Bluebell has been present within a 2km x 2km grid square around Freckenham. A further three species (Military Orchid, Fingered Speedwell and Small Alison) have been recorded over 1km from the Order limits.

4.1.6 NERC Act Section 41 species recorded on or within 2km of the Order limits comprise:

a. Annual Knawel *Scleranthus annuus**;
b. Basil Thyme *Clinopodium acinos**;
c. Broad-leaved Cudweed *Filago pyramidata*;
d. Fine-leaved Sandwort *Sabulina tenuifolia*;
e. Grape-hyacinth *Muscari neglectum*;
f. Purple Milk-vetch *Astragalus danicus*; and
g. Spanish Catchfly *Silene otitis*.

* = denotes a record within the Site.

4.1.7 An additional 85 other notable plant species; *e.g.* red list, nationally rare or scarce, those listed on the Suffolk Rare Plant register and CPASI, have been identified within 2km of the Order limits, many of which are only recorded to the monad scale (2km x 2km). There is an estimate (based on monad scale records provided by NBIS in Annex B) of approximately 20 species potentially occurring in suitable habitat within the Order limits, including Bur Medick *Medicago minima*, Cat-mint *Nepeta cataria*, Corn Spurrey *Spergula* arvensis and Hound's-tongue

Cynoglossum officinale. A full list of species and designations is provided in Annex B.

4.2 Field survey

Phase 2 / NVC grassland flora survey

4.2.1 A summary of the results of the Phase 2 / NVC grassland flora survey is presented in **Table 4-2**. Locations are shown on **Figure 2**, Annex A. Full survey results are provided in Annex C.

Table 4-2: Results of the Phase 2 / NVC grassland flora survey

Scheme area	Survey area (see Figure 2)	Results
Sunnica East Site A	T10 a/b	A drain dominated by Common Reed *Phragmites australis*, with Soft Rush *Juncus effusus*, Meadowsweet *Filipendula ulmaria*, Hemp Agrimony *Eupatorium cannabinum* and Common Water Plantain *Alisma plantago-aquatica*. It has affinity to the NVC community type S4 *Phragmites australis* swamp and reed-beds. Margins with additional species including Bifid Hemp-nettle *Galeopsis bifida*, Weld *Reseda lutea*, Marsh Woundwort *Stachys palustris* and False Oat-grass.
	T10 c	A set-aside field with bare ground and scattered tall ruderal herbs and grasses, with Bristly Ox-tongue *Helminthotheca echioides*, Fat Hen *Chenopodium album*, Mugwort *Artemisia vulgaris*, Creeping Bent *Agrostis stolonifera* and Great Brome. The nationally scarce Annual Beard-grass *Polypogon monspeliensis* is present here. It is likely to be a temporary habitat, with a species composition representative of other similar uncultivated arable habitats in this area.
Sunnica East Site B	T6 (including Worlington Heath County Wildlife Site (CWS))	One large field and part of another field to the east comprising short turf acid grassland, with the northern part (3.0 ha) of the larger field designated as Worlington Heath CWS. This larger field is fenced and grazed by a small number of horses. There are some damp depressions in the field (see notes below), taller patches of grassland and small areas of bare ground. Part of an adjacent field to the east also comprises short acid grassland and is cut occasionally with tractor mower. The vegetation is species diverse in places, with 51 species recorded during the survey. Constant species include Common Bent *Agrostis capillaris*, Smooth Hawk's-beard *Crepis capillaris*, Thyme-leaved Sandwort *Arenaria serpyllifolia*, Soft Brome *Bromus hordeaceus*, Ribwort Plantain, Sheep's Sorrel *Rumex acetosella*, Hare's-foot Clover *Trifolium arvense*, Lady's Bedstraw *Galium verum* and Yarrow. It includes the Nationally Scarce, Bur Medick and the NERC Act S41 species, Annual Knawel. There is no gorse, scrub or Thyme (*Thymus spp*.) as stated on the CWS citation. There are a few small depressions in the large field (from previous gravel extraction) with some marshy grassland vegetation (albeit dry in July 2019), including Yellow Marsh Cress *Rorippa palustris*, Purple Loosestrife *Lythrum salicaria*, Water Mint *Mentha aquatica*, Water Pepper *Persicaria hydropiper*, Tufted Forget-me-not *Myosotis laxa*, Toad Rush *Juncus bufonius*, Jointed Rush *Juncus articulatus*, Silverweed *Potentilla anserina*, Amphibious Bistort *Persicaria amphibia*, Common Spike-rush *Eleocharis palustris*, Reed Canary Grass *Phalaris arundinacea*, Yellow Loosestrife *Lysimachia vulgaris*, Gypsywort *Lycopus europaeus* and Yorkshire fog. These small areas don't match to an NVC community type but add to the floral diversity in this field. These small areas not valued separately in Section 5 and are included in the overall assessment of T6. T6 has affinity to NVC community type U1 *Festuca ovina-Agrostis capillaris-Rumex acetosa* grassland. Sheep's Fescue *Festuca ovina* is not a component of the vegetation here as per the NVC community descriptions (Rodwell, 1992) (Ref 12). This may be due to acidification and/or eutrophication experienced in these habitat types, *e.g.* agricultural

Scheme area	Survey area (see Figure 2)	Results
		intensification with fertilizer application (and nitrogen deposition) use of herbicides and pesticides, and potentially air pollution, which leads to a reduction in fine leaved grass species (such as sheep's fescue) and forb diversity (Stevens et al, 2010) (Ref 23).
Sunnica East Site B	T7	A grassland strip approximately 20m wide between fields with Sand Sedge *Carex arenaria* abundant. It includes part of Badlingham Lane CWS designated for species rich flora. There is no obvious management, apart from some low intensity Deer browsing and there is potential for future shading from planted trees. Other species include Great Brome *Anisantha diandra*, Thyme-leaved Sandwort, Soft Brome, Ribwort Plantain, Lady's Bedstraw, Common Couch and White Campion *Silene latifolia*. Bare ground covers 10 to 30%. It has affinity to the NVC community type SD10 *Carex arenaria* dune community. Badlingham Lane to the south is largely shaded by a parallel row of trees dominated by Scot's Pine *Pinus sylvestris*, with some grasses and tall herbs along the path, including Great Brome, Sterile Brome, Cock's-foot, Rough Chervil *Chaerophyllum temulum*, Common Gromwell *Lithospermum officinale*, Black Horehound *Balota nigra*, White Campion, Bladder Campion *Silene vulgaris*, Lady's Bedstraw and Bur-chervil *Anthriscus caucalis*.
	T8	A species rich acid grassland adjacent to T6 and with a similar species composition. Species include Common Bent, Common Stork's-bill, Ribwort Plantain, Sheep's Sorrel, Hare's-foot Clover, Viper's Bugloss, Squirrel-tail Fescue *Vulpia bromoides* and Yarrow. Three Nationally Scarce species recorded; Sand Catchfly *Silene conica*, Bur Medick and Purple Fescue *Vulpia ciliata* sub-species.*ambigua* and an 'uncommon' species recorded Smooth Cat's-ear *Hypochaeris glabra* (Stace, 2020) (Ref 13). The grassland is cut by tractor mower (seen cutting in June and August) to maintain a short sward. Similarly to T6, it has affinity to NVC community type U1 *Festuca ovina-Agrostis capillaris-Rumex acetosa* grassland.
	T9	A grassland strip similar to T7 so not surveyed in detail, comprising a 30m wide strip adjacent to Worlington Heath CWS (T6) to the east. Sand Sedge is abundant, with Common Ragwort *Jacobaea vulgaris* frequent and occasional Kidney Vetch *Anthyllis vulneraria*, Hound's-tongue and Common Toad Flax *Linaria vulgaria*. Scattered planted trees including Scot's Pine *Pinus sylvestris*, Corsican Pine *Pinus nigra* sub-species *larico*, Hawthorn and a Gum *Eucalyptus* species. No management is apparent and in the future there will shading from trees. It has affinity to the NVC community type SD10 *Carex arenaria* dune community.
	T12	A semi-improved grassland strip 10-20m wide between a conifer woodland and arable fields. Light acidic sandy soil with some calcareous influence. Species include Yorkshire Fog, Creeping Bent, False Oat-grass, Hound's-tongue, Welted Thistle, Fat Hen, Hare's-foot Clover, Viper's Bugloss, Creeping Thistle, Common Poppy, Mugwort and Flixweed *Descurainia sophia*. No management is obvious and there is shading from a pine plantation to the south. One 'uncommon' species (Stace, 2020) (Ref 13) Cat Mint *Nepeta cataria* is present along the access track.

Scheme area	Survey area (see Figure 2)	Results
	T13	Short acid grassland similar to T6 and T8. A diverse range of species include Creeping Bent, Viper's Bugloss, Ribwort Plantain, Crested Hair-grass *Koeleria macrantha*, Lady's Bedstraw, Hare's-foot clover, Hound's-tongue, Yarrow, Biting Stonecrop *Sedum acre*, Mouse-ear Hawkweed *Pilosella officinarum*, Sheep's-sorrel, Thyme-leaved Sandwort, Spring Vetch *Vicia lathyroides*, Little Mouse-ear *Cerastium semidecandrum*, Field bindweed *Convolvulus arvensis*, Smooth Hawk's-beard and Whitish Feather-moss *Brachythecium albicans*. It includes the Nationally scarce Bur Medick and the uncommon Smooth Cat's-ear. It has affinity to NVC community type U1 *Festuca ovina-Agrostis capillaris-Rumex acetosa* grassland.
Sunnica East Site B	T14	Grassland around an irrigation reservoir, surrounded by arable fields. It comprises tall unmanaged grassland and ruderal herbs with calcareous influences (from chalk exposed through creation of the reservoir). The flora has frequent to abundant Wild Marjoram *Origanum vulgare*, Lady's Bedstraw, False-oat Grass, Mugwort, Common Nettle *Urtica dioica* and Bramble, with rare to occasional Clustered Bellflower *Campanula glomerata*, Greater Knapweed *Centaurea scabiosa*, Dropwort *Filipendula vulgaris* and Small Scabious. The highest species diversity is present on top of the reservoir banks, including two National Scarce species; Sickle Medick *Medicago sativa* sub-species *falcata* and Sand Lucerne *Medicago sativa notho* sub-species *varia* and an uncommon species Wild Basil *Clinopodium acinos* (Stace, 2020) (Ref 13). There is evidence of low level Rabbit grazing in places. It does not match an NVC community type.
	T16	A small area of unmanaged grassland and ephemeral/short perennial vegetation outside a corner of a livestock field. Species including Common Bent, Common Stork's-bill, Lesser Hawkbit *Leontodon saxatilis*, Little mouse-ear, Viper's-bugloss, Bur Chervil *Anthriscus caucalis*, Black Medick, Ivy-leaved Speedwell *Veronica hederifolia*, Slender Sandwort *Arenaria leptoclados* and the uncommon Smooth Cat's-ear.
Grid Connection Route A	T25	Semi-improved species-poor neutral grassland with tall ruderal herbs, previously grazed/disturbed. Species include Sterile Brome, Yorkshire Fog, Creeping Bent, Cock's-foot, Common Ragwort, Mugwort, Beaked Hawk's-beard *Crepis vesicaria*, Spear and Creeping Thistle, Common Nettle, White Campion, Creeping Buttercup.
	T26	Semi-improved neutral to acidic grass verge 5-10m wide along track edge with Sterile Brome, Great Brome, Yorkshire Fog, Perennial Rye-grass, False Oat-grass, Cock's-foot, Bladder Campion, White Campion, Hound's-tongue, Lady's-bedstraw, Bur-chervil and Field Scabious.

Scheme area	Survey area (see Figure 2)	Results
	T27	Species poor semi-improved neutral grassland dominated by grasses including Rough Meadow-grass, Yorkshire Fog, Cock's-foot and Creeping Bent.
Sunnica West Site A	T1	A track with bare hardstanding, scattered grasses, tall ruderal herbs and ephemeral/short perennial vegetation. A diverse mix of 40 species is present including False Oat-grass *Arrhenatherum elatius*, Yarrow *Achillea millefolium*, Common Agrimony *Agrimonia eupatorium*, Field Madder *Sherardia arvensis*, Black Medick *Medicago lupulina*, Wild Carrot *Daucus carota* and Common Stork's-bill *Erodium cicutarium*. It is adjacent to arable crops and unmanaged, and likely to be subject to some spray drift and disturbance from farm machinery.
	T2	A track similar to T1 with some additional species including Wild Basil *Clinopodium vulgare*, Scentless Mayweed *Tripleurospermum inodorum*, Red Fescue *Festuca rubra aggregate* and Nodding Thistle *Carduus nutans.*
	T15	Short perennial/ephemeral and unmanaged semi-improved grassland along a largely disused access track. Species include Hedgerow Crane's-bill *Geranium pyrenaicum*, Yarrow, Common Cudweed *Filago germanica*, Lesser Trefoil *Trifolium dubium*, Viper's Bugloss, Cat's-ear, Dove's-foot Cranes-bill, Dark Mullein *Verbascum nigrum*, Great Brome and Cock's-foot.
Sunnica West Site B	T3	A damp shallow ditch with marshy grassland/swamp vegetation transitioning to a species poor semi-improved grassland field. The area was cattle grazed later in the year and there are signs of previous cattle poaching. Species in the ditch include Yorkshire Fog *Holcus lanatus*, Lesser Pond Sedge *Carex acutiformis*, Hard Rush *Juncus inflexus*, Reed Canary Grass *Phalaris arundinacea* and Plicate Sweet-grass *Glyceria notata*. Occasional Hawthorn *Crataegus monogyna* scrub and scattered trees are present.
	T4	Mainly tall semi-improved neutral grassland (cut for hay), with a small area of more open and diverse sward adjacent to the River Snail. 32 species were recorded including False Oat-grass, Cock's-foot *Dactylis glomerata*, Ribwort Plantain *Plantago lanceolata*, Creeping Cinquefoil *Potentilla reptans*, Tufted Vetch *Vicia cracca*, Meadow Vetchling *Lathyrus pratensis* and Yorkshire Fog. It has affinity to NVC community type MG1a *Arrhenatherum elatius* grassland, *Festuca rubra* subcommunity.
	T5	Small areas of marshy grassland and swamp in a field, transitioning to semi-improved grassland in drier areas the south and east (including T4 grassland). Hard Rush, Common Couch *Elymus repens*, Yorkshire Fog, Hairy Sedge *Carex hirta* and Creeping Bent *Agrostis stolonifera* are frequent. This area has affinity to NVC community type MG10b *Holcus lanatus - Juncus effusus* rush pasture, *Juncus inflexus* subcommunity. Reed Canary Grass is locally more abundant or dominant in places. These areas have affinity to NVC community type S28 *Phalaris arundinacea* tall herb-fen.

Scheme area	Survey area (see Figure 2)	Results
Grid Connection Route B	T17	Drainage ditch with marginal / emergent vegetation including Fool's Water-cress *Apium nodiflorum*, Fat Duckweed *Lemna gibba*, Common Reed, Water-cress *Nasturtium officinale* and Common Comfrey *Symphytum officinale.*
Grid Connection Route B	T18	Drainage ditch with marginal / emergent vegetation dominated by a fringe of common reed. Occasional Reed Sweet-grass *Glyceria maxima*.
	T19	Grassland verge/hedge bank with Hedge Bedstraw *Galium album*, Germander Speedwell *Veronica chamaedrys*, Wood False-brome *Brachypodium sylvatica* adjacent to a species rich hedgerow.
	T20	Semi-improved neutral set-aside grassland alongside an arable field with Hedge Bedstraw, Rough Meadow-grass *Poa trivialis*, Smooth Meadow-grass *Poa pratensis*, Ribwort Plantain, Cow Parsley, Germander Speedwell, Cock's-foot, Cowslip *Primula veris*, Common Ragwort, White Clover *Trifolium repens*, Creeping Buttercup *Ranunculus repens*, Ground-ivy *Glechoma hederacea,* Bristly Ox-tongue and Common Vetch *Vicia sativa* subsp *segetalis*.
	T21	Small wet field drain with some marginal / emergent vegetation comprising Common Reed and Soft Rush.
	T22	Semi-improved calcareous seeded grassland along a road verge embankment. Not surveyed in detail as along the active highway. Grassland seed mix and new hedge planting. Species include Wild Marjoram, Wild Carrot *Daucus carota*, Red Fescue, Ox-eye Daisy *Leucanthemum vulgare*, Hedge Bedstraw, Tall Fescue *Schedonorus arundinaceus*, Hoary Plantain *Plantago media*, Viper's-bugloss and Field Scabious.
	T23	Small area of recently disturbed semi-improved neutral to acidic grassland next to a field margin. Species include Great Brome, Blue Fleabane *Erigeron acris*, Wild Carrot, Soft Brome *Bromus hordeaceus* subsp. *hordeaceus,* Sticky Mouse-ear *Cerastium glomeratum* and Common Cudweed.

Scheme area	Survey area (see Figure 2)	Results
	T24	The River Snail with marginal / emergent vegetation. Species include Common Reed, Branched Bur-reed *Sparganium erectum*, Fool's Water-cress, Water Starwort *Callitriche* species, Water forget-me-not *Myosotis scorpioides* and Yellow-iris *Iris pseudacorus*.
Notes on Table 4-2: T11 has been removed following Scheme boundary changes as it is outside of the Order limits		

Arable flora

4.2.2 The margins of all arable fields within the Order limits were searched for species of scarce arable flora. A total of 22 arable fields (AF2 to 26, see **Figure 2,** Annex A) were found to contain or had potential to contain scarce arable flora and were surveyed. The results are presented in **Table 4-3** with field locations shown on **Figure 2**, Annex A. Field AF15 was assessed based on the results of the Phase 1 habitat survey undertaken in 2018 (Ref 1) as there was no arable flora present here in 2019 (due to a change in crop type). Other fields were either not in cultivation, *e.g.* pig fields with bare soil or had no potential or visible for arable flora, *e.g.* sown field margins, or sprayed margins.

4.2.3 One field (AF11) is rated to be of county importance, eight fields are rated to be of district importance and 15 fields are of local importance for scarce arable flora. The remaining three fields surveyed and other arable fields within the Scheme did not contain any scarce arable flora. Nineteen species of scarce arable flora were recorded in the fields surveyed. These included four higher scoring species (7+):

a. Corn Chamomile *Anthemis arvensis* classified as Endangered in the UK and England (Stroh, *et al.* 2015 (Ref 11), Mcleod, *et al.* 2017 (Ref 15));

b. Corn Spurrey *Spergula arvensis* and Corn Marigold *Glebionis segetum* both classified as Vulnerable in the UK and England; and

c. Fine-leaved Fumitory *Fumaria parviflora* classified as Vulnerable in the UK and Near Threatened in England and is a Nationally Scarce species (Stace, 2019) (Ref 13).

4.2.4 There were two other scoring species classified as Near Threatened in the UK and England; Wild Pansy *Viola tricolour* sub-species *tricolor* and Common Cudweed. Other scoring species are listed as Least Concern in the Red Data Lists.

Table 4-3: Results of the survey for scarce arable flora

Scheme area	Field	Crop	Score and geographic importance	Scarce arable flora present with DAFOR# and score
Sunnica East Site A	AF14	Onion	n/a	None
Sunnica East Site A	AF19	Sugar beet	Local (2)	*Geranium pusillum* F (2)
	AF20	Onions	Local (3)	*Roemeria hybrida* R (3)
	AF21	Sugar beet	Local (2)	*Geranium pusillum* F (2)
Sunnica East Site B	AF2	Sugar beet	District (10)	*Lycopsis arvensis* O (1) *Descurainia sophia* O (3) *Lamium amplexicaule* R (1) *Roemeria hybridum* R (3) *Veronica polita* O (2)
	AF3	Sweetcorn	Local (4)	*Lycopsis arvensis* F (1) *Descurainia sophia* O (3)
Sunnica East Site B	AF7	Sweetcorn	District (13)	*Descurainia sophia* O (3)

Scheme area	Field	Crop	Score and geographic importance	Scarce arable flora present with DAFOR# and score
				Fumaria parviflora R (7) 1 plant at TL 70277 275 *Geranium columbinum* R (2) *Lamium amplexicaule* O (1)
Sunnica East Site B	AF16	Sugar beet	District (13)	*Lycopsis arvensis* R (1) *Anthriscus caucalis* F (3) *Descurainia sophia* O (3) *Viola tricolor* sub-species *tricolor* R (6)
Sunnica East Site B	AF17	Onion	District (11)	*Lycopsis arvensis* O (1) *Anthriscus caucalis* O (3) *Spergula arvensis* R (7) 8 plants TL69187178
	AF18	Wheat	District (12)	*Anthriscus caucalis* O (3) *Spergula arvensis* R (7) 12 plants TL69197105 *Veronica polita* R (2)
Sunnica East Site B	AF22	Onion	Local (6)	*Lycopsis arvensis* O (1) *Anthriscus caucalis* O to F (3) *Geranium pusillum* R (2)
	AF23	Wheat	Local (6)	*Lycopsis arvensis* R (1) *Anthriscus caucalis* F (3) *Geranium pusillum* R (2)
	AF24	Wheat	Local (5)	*Anthriscus caucalis* F (3) *Geranium pusillum* R (2)
	AF25	Onion	n/a	None
Grid Connection A	AF31	Sweetcorn	District (12)	*Anthriscus caucalis* O (3) *Filago germanica* R (6) *Geranium pusillum* R (2) *Lycopsis arvensis* R *(1)*
Sunnica West Site A	AF8	Potato	n/a	None
	AF9	Wheat	District (10)	*Anthemis arvensis* R (8) 1 plant at TL 6766 6811 *Veronica polita* R (2)
	AF10	Barley/Rye	Local (1)	*Lycopsis arvensis* O (1)
	AF11	Wheat	County (23)	*Lycopsis arvensis* O (1) *Descurainia sophia* O (3) *Filago germanica* R (6) *Glebionis segetum* O-F (7) approximately 100 plants along south and east

Scheme area	Field	Crop	Score and geographic importance	Scarce arable flora present with DAFOR# and score
				margins at TL 6729 6689 & TL 6751 6701 *Viola tricolor* sub-species *tricolor** F-A (6)
Sunnica West Site A	AF13	Sugar beet	Local (8)	*Lycopsis arvensis* R (1) *Fumaria parviflora* O (7) 4 plants at TL 6862 6833 *Lamium amplexicaule* R (1)
Sunnica West Site A	AF15 (surveyed 2018, see notes)	Sugar beet	Local (5)	*Kickxia elatine* R (3) *Kickxia spuria* R (2)
Sunnica West Site A	AF26	Oil-seed rape	Local (1)	*Lycopsis arvensis* O (1) *Lamium amplexicaule* O (1) *Geranium pusillum* R (2)
Sunnica West Site B	AF12	Onion	Local (6)	*Descurainia sophia* R (3) *Geranium columbinum* O (2) *Lamium amplexicaule* R (1)
Burwell National Grid Substation Extension	AF27	Beet	District (19)	*Chaenorhinum minus* R (1) *Euphorbia exigua* O (6) *Fumaria parviflora* R (7) 2 plants at TL 5770 6728 *Kickxia elatine* R (3) *Kickxia spuria* O (2)
Grid Connection B	AF28	Broad-beans	Local (1)	*Chaenorhinum minus* R (1)
	AF29	Wheat	Local (1)	*Sherardia arvensis* R (1)
	AF30	None	Local (4)	*Lycopsis arvensis* O (1) *Geranium pusillum* R (2) *Sherardia arvensis* R (1)
Notes on Table 4-3: # DAFOR: D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare; * The hybrid *Viola x contempta* also present (not scoring); AF1, AF4, AF5 and AF6 have been removed following Scheme boundary changes as they are outside of the Order limits				

Other arable flora records

4.2.5 During the Phase 1 habitat survey in 2018 (Ref 1) a Sugar Beet field (shown as AF15 on **Figure 2**, Annex A) at Sunnica West Site A (OS Grid Ref. TL 660 670) was found to contain two threshold scoring species; Sharp-leaved Fluellen *Kickxia elatine* (2 points) and Round-leaved Fluellen *Kickxia spuria* (3 points) and is therefore assessed as local importance. The crop in this field in 2019 was Wheat and no scoring species were seen.

4.2.6 A few arable flora 'scoring' species were also present along banks close to fields and in set-aside areas such which add to the value of the overall site. These included Flixweed *Descurainia sophia* and Bur-chervil *Anthriscus caucalis*.

Other flora species

4.2.7 A survey was undertaken in early July 2019 and late May 2020 for the WCA Schedule 8 and Endangered Grass-poly *Lythrum hyssopifolium* which has previously been recorded (in 2001) within Chippenham Avenue Fields CWS (see **Figure 3**, Annex A). The fields in 2019 and 2020 comprised intensively managed Wheat and there was no sign of this species. There is potential for it to occur in future if the land use changes and conditions are favourable for germination as the seed is very long-lived (Plantlife) (Ref 24).

4.2.8 There are nearby records of the Schedule 8 Cambridge Milk-parsley close to Sunnica West Site B (in designated sites), and as there is some potentially suitable habitat for this species within the Site, its presence in future is possible.

4.2.9 No invasive (WCA Schedule 9) or protected (WCA Schedule 8) plant species were noted during the surveys. Due to their inherent invasive nature the possibility in the future of Schedule 9 species within the Site cannot be ruled out. It should be noted that a detailed survey of all the habitats within the Site, such as wetlands and woodland, for Schedule 9 invasive non-native species has not been undertaken as they are retained (see limitations).

Hedgerows

4.2.10 A total of 58 hedgerows were surveyed (see **Table 4-4**) within the Order limits and the location of these are presented in **Figure 3**.

4.2.11 Of the 58 hedgerows surveyed, 30 hedgerows did not meet the initial criteria (*i.e.* over 30 years old, longer than 20m etc), one hedgerow (H15) was classified as 'Important' in terms of landscape and wildlife criteria under the Hedgerow Regulations and the other 27 hedgerows were classified as 'not important'.

4.2.12 Hedgerow H15 is species-rich (*i.e*. an average of 5 species or more), with important associated features. All other hedgerows are species-poor.

Table 4-4: Assessment of hedgerows within the Order limits

Hedgerow Number (with reference to Figure 3)	Meets initial criteria	Approximate Length (m)	Next to footpath or bridleway	Average Number of woody species per 30m section	Maximum woody species recorded within a 30m section	Summary of woody species recorded within any 30m section	Species-rich / Species-poor?	Hedgerow classified as 'Important' under the Regulations
H1	No	-	-	-	-	-	-	No
H2	No	-	-	-	-	-	-	No
H3	No	-	-	-	-	-	-	No
H4	No	-	-	-	-	-	-	No
H5	Yes	480	No	1.33	2	Elm sp, Common Hawthorn	Species-poor	No
H6	Yes	530	No	1.33	2	Common Hawthorn, Rosa sp.	Species-poor	No
H7	No	-	-	-	-	-	-	No
H8	Yes	300	No	1.00	1	Common Hawthorn	Species-poor	No
H9	Yes	430	No	1.00	1	Common Hawthorn	Species-poor	No
H10	No	-	-	-	-	-	-	No
H11	No	-	-	-	-	-	-	No
H12a	Yes	130	No	0.67	1	Elm sp.	Species-poor	No
H12b	Yes	140	No	0.67	1	Elm sp.	Species-poor	No
H13	Yes	180	No	1.00	2	Elm sp. Beech	Species-poor	No
H14	Yes	660	No	2.33	3	Elm sp. Common Hawthorn, Salix sp,	Species-poor	No

Hedgerow Number (with reference to Figure 3)	Meets initial criteria	Approximate Length (m)	Next to footpath or bridleway	Average Number of woody species per 30m section	Maximum woody species recorded within a 30m section	Summary of woody species recorded within any 30m section	Species-rich / Species-poor?	Hedgerow classified as 'Important' under the Regulations
H15	Yes	570	No	5.00	5	Elm sp, Field Rose, Beech, Common Hawthorn, Wild Privet, Blackthorn	Species-rich	Yes
H16	No	-	-	-	-	-	-	No
H17	Yes	430	No	1.00	1	Common Hawthorn	Species-poor	No
H18	Yes	260	No	2.67	3	Common Hawthorn, Blackthorn, Elm sp.	Species-poor	No
H19	Yes	210	No	1.67	2	Common Hawthorn, Blackthorn, Elm sp.	Species-poor	No
H20	Yes	270	No	1.67	2	Common Hawthorn, Blackthorn, Elm sp	Species-poor	No
H21	No	-	-	-	-	-	-	No
H22	No	-	-	-	-	-	-	No
H23	No	-	-	-	-	-	-	No
H24	Yes	230	No	2.67	4	Common Hawthorn, Elm	Species-poor	No

Hedgerow Number (with reference to Figure 3)	Meets initial criteria	Approximate Length (m)	Next to footpath or bridleway	Average Number of woody species per 30m section	Maximum woody species recorded within a 30m section	Summary of woody species recorded within any 30m section	Species-rich / Species-poor?	Hedgerow classified as 'Important' under the Regulations
						sp, Wild Privet, Rosa sp		
H25	Yes	230	No	3.00	4	Common Hawthorn, Elm sp, Rosa sp, Wild Privet	Species-poor	No
H26	Yes	240	No	3.67	4	Common Hawthorn, Elm sp, Rosa sp, Wild Privet	Species-poor	No
H27	Yes	240	No	3.33	4	Common Hawthorn, Elm sp, Rosa sp, Wild Privet	Species-poor	No
H28	No	-	-	-	-	-	-	No
H29	No	-	-	-	-	-	-	No
H30	No	-	-	-	-	-	-	No
H31	No	-	-	-	-	-	-	No
H32	Yes	395	No	2.33	4	Common Hawthorn, Elm sp, Rosa sp, Blackthorn	Species-poor	No
H33	No	-	-	-	-	-	-	No
H34	No	-	-	-	-	-	-	No
H35	No	-	-	-	-	-	-	No

Hedgerow Number (with reference to Figure 3)	Meets initial criteria	Approximate Length (m)	Next to footpath or bridleway	Average Number of woody species per 30m section	Maximum woody species recorded within a 30m section	Summary of woody species recorded within any 30m section	Species-rich / Species-poor?	Hedgerow classified as 'Important' under the Regulations
H36	Yes	430	No	1.00	1	Common Hawthorn	Species-poor	No
H37	No	-	-	-	-	-	-	No
H38	No	-	-	-	-	-	-	No
H39	No	-	-	-	-	-	-	No
H40	No	-	-	-	-	-	-	No
H41	No	-	-	-	-	-	-	No
H42	No	-	-	-	-	-	-	No
H43	Yes	650	No	1.67	2	Common Hawthorn, Rosa sp.	Species-poor	No
H44	Yes	260	No	1.67	2	Common Hawthorn, Rosa sp, Blackthorn	Species-poor	No
H45	No	-	-	-	-	-	-	No
H46	No	-	-	-	-	-	-	No
H47	No	-	-	-	-	-	-	No
H48	Yes	520	No	1.00	1	Common Hawthorn	Species-poor	No
H49	No	-	-	-	-	-	-	No
H50	No	-	-	-	-	-	-	No
H51	Yes	520	Yes	2.67	3	Common Hawthorn, Rosa sp, Blackthorn	Species-poor	No

Hedgerow Number (with reference to Figure 3)	Meets initial criteria	Approximate Length (m)	Next to footpath or bridleway	Average Number of woody species per 30m section	Maximum woody species recorded within a 30m section	Summary of woody species recorded within any 30m section	Species-rich / Species-poor?	Hedgerow classified as 'Important' under the Regulations
H52	Yes	190	No	2.00	4	Common Hawthorn, Rosa sp, Blackthorn, Ash	Species-poor	No
H53	Yes	145	No	1.00	2	Common Hawthorn, Rosa sp,	Species-poor	No
H54	Yes	305	No	2.33	3	Common Hawthorn, Rosa sp, Blackthorn	Species-poor	No
H55	Yes	190	No	0.67	1	Common Hawthorn	Species-poor	No
H32a	Yes	80	No	0.67	2	Common Hawthorn, Elm sp	Species-poor	No
H32b	No	-	-	-	-	-	-	No

5 Evaluation of biodiversity importance

5.1 Grasslands

5.1.1 Based on the evaluation of the grassland surveyed (including swamp vegetation) against the criteria provided, these grasslands range from local to county biodiversity importance (see summary in **Table 5-1** and locations on **Figure 2**, Annex A). An evaluation is provided below, including an assessment against priority habitat criteria where relevant.

Table 5-1: Habitat biodiversity importance

Scheme area	Survey area (see Figure 2)	Habitat type	Approximate area (ha)	Biodiversity importance
Sunnica East Site A	T10c	Set-aside field with bare ground and scattered tall ruderal herbs and grasses	3.1	Local
Sunnica East Site B	T6, T8 and T13	Acid grassland U1 *Festuca ovina-Agrostis capillaris-Rumex acetosa* grassland with up to three Nationally Scarce species.	11.7	County
Sunnica East Site B	T7, T9	Acid grassland SD10 *Carex arenaria* dune community	0.5	County
Sunnica East Site B	T10a/b	Drain with S4 *Phragmites australis* swamp and reed-beds	<0.1	District
Sunnica East Site B	T12	Semi-improved grassland acid to calcareous grassland	0.6	District
Sunnica East Site B	T14	Tall unmanaged grassland and ruderal herbs with calcareous influences, with two Nationally Scarce species.	1.1	County
Sunnica East Site B	T16	Short perennial/ephemeral and unmanaged semi-improved grassland	<0.1	Local
Grid Connection Route A	T25	Semi-improved species-poor neutral grassland	0.8	Local
Sunnica West Site A (south-east)	T1, T2	Scattered grasses, tall ruderal herbs and ephemeral/short perennial vegetation	0.9	Local
Sunnica West Site A (south-east)	T15	Short perennial/ephemeral and unmanaged semi-improved grassland	<0.1	Local
Sunnica West Site B (north-west)	T3	Marshy grassland/swamp	<0.1	District
Sunnica West Site B (north-west)	T4	Semi-improved grassland MG1a Arrhenatherum elatius grassland, Festuca rubra subcommunity	<0.1	Local
Sunnica West Site B (north-west)	T5	Semi-improved grassland/marshy grassland	0.7	District

Scheme area	Survey area (see Figure 2)	Habitat type	Approximate area (ha)	Biodiversity importance
		and swamp comprising MG10b *Holcus lanatus-Juncus effusus* rush pasture, *Juncus inflexus* subcommunity and S28 *Phalaris arundinacea* tall herb-fen		
Grid Connection Route B	T17	Drainage ditch with marginal / emergent vegetation (see Aquatic Ecology Chapter 8D).	0.05	Local
	T18	Drainage ditch with marginal / emergent vegetation (see Aquatic Ecology Chapter 8D).	0.05	Local
	T19	Grassland verge/hedge bank	0.02	Local
	T20	Semi-improved neutral set-aside grassland	0.3	Local
	T21	Small field drain with some marginal / emergent vegetation	0.03	Local
	T22	Semi-improved calcareous seeded grassland along road.	0.3	Local
	T23	Semi-improved neutral to acidic grassland	0.07	Local
	T24	The River Snail (see Aquatic Ecology Chapter 8D).	0.1	County
	T26	Semi-improved neutral to acidic grass verge.	0.06	Local
	T27	Species poor semi-improved neutral grassland.	0.53	Local

County importance

5.1.2 Each of the acid grassland habitats in Sunnica East Site B are rated as being of County importance. T6, T8 and T13 are categorised as U1 *Festuca ovina-Agrostis capillaris-Rumex acetosa* grassland and T7 and T9 are categorised as SD10 *Carex arenaria* dune community. All are examples of lowland dry acid grassland priority habitat (as defined under Section 41 of the NERC Act) (Maddock, 2011) (Ref 25). Approximately 30% of T6 is already designated as a County Wildlife Site. There are three Nationally Scarce plant species recorded during the survey in these areas; Bearded Fescue, Sand Catchfly and Bur Medick as well as a NERC Act Section 41 species, Annual Knawel and an uncommon species, Smooth Cat's-ear (Stace, 2019) (Ref 13). All these acid grassland habitats are located within the same local area and are mostly adjoined to each other within the Sunnica East Site B and cover a combined 12.16 hectares (ha).

5.1.3 To the south of Sunnica East Site B, at T14, there is approximately 1 ha of tall unmanaged grassland and ruderal herbs with calcareous influences, with two Nationally Scarce species present. Whilst not matching an NVC community type, it contains characteristic species and is an example of lowland calcareous grassland priority habitat (as defined under Section 41 of the NERC Act) (Maddock, 2011) (Ref 25). Based on this habitat type and size, along with the presence of two

Nationally Scarce plant species, Sickle Medick and Sand Lucerne, it is classified as of County Importance.

5.1.4 The River Snail (T24) is an example of Rivers Priority Habitat type and likely to be of up to County Value. Aquatic habitats are assessed further in Appendix 8E of the ES.

District importance

5.1.5 In Sunnica West Site B are two sites of district importance, comprising a small area (<0.1 ha) of marshy grassland/swamp at T3 and a 0.5 ha mosaic of semi-improved grassland/marshy grassland MG10b *Holcus lanatus-Juncus effusus* rush pasture, *Juncus inflexus* subcommunity and swamp S28 *Phalaris arundinacea* tall herb-fen. These are examples of floodplain and grazing marsh priority habitat (as defined under S41 of the NERC Act) (Maddock, 2011) (Ref 25). Whilst their size and species composition does not raise these habitats to County importance, mainly because they would not qualify as a County Wildlife Site (Cambridgeshire & Peterborough Panel, 2014) (Ref 21), they are higher than local importance for biodiversity.

5.1.6 Another site of district importance is nearby at Sunnica East B, T12, which comprises a small area (0.6ha) of semi-improved grassland acid to calcareous grassland with a local species of interest, Cat Mint (classified as a CPASI).

5.1.7 In the north of Sunnica East Site A at T10 is a drain (approximately 0.1 ha) with S4 *Phragmites australis* swamp and reed-beds. This is an example of reedbed priority habitat (as defined under Section 41 of the NERC Act) (Maddock, 2011) (Ref 25). Due to its small size, it would not meet Country Wildlife Site level criteria (Cambridgeshire & Peterborough Panel, 2014) (Ref 21), but it is of higher than local importance due to the lack of this type of habitat on site.

Local importance

5.1.8 All other habitats surveyed are of local importance (T1, T2, T4, T10c, T15, T16 to T23 and T25 to T27). These comprise semi-improved grassland, tall ruderal herbs, drainage ditches and ephemeral and, or short perennial vegetation. Whilst they have biodiversity value, they lack the size, species diversity or presence of rare and, or scarce species to be considered of district or higher biodiversity importance.

5.2 Arable flora

5.2.1 The biodiversity importance of the arable field margins for their arable flora is classified in accordance with the assessment method and shown in the results (**Table 4-2**). This is summarised below. See **Figure 2**, Appendix A for locations.

5.2.2 The following field is of county importance:

a. AF11 Sunnica West Site A.

5.2.3 The following fields are of district importance:

a. AF2, AF7, AF16, AF17, AF18 Sunnica East Site B;

b. AF9 Sunnica West Site A;

c. AF27 Burwell Substation; and

d. AF31 Grid Connection A.

5.2.4 The following fields are of local importance:

a. AF19, AF20, AF21 Sunnica East Site A;

b. AF3, AF22, AF23, AF24 Sunnica East Site B;

c. AF10, AF13, AF15, AF26 Sunnica West Site A;

d. AF12 Sunnica West Site B; and

e. AF28, AF29, AF30 Grid Connection B.

5.2.5 The remaining arable fields present within the Site are not classified (i.e. less than local importance), but they do contribute to the overall arable flora interest of the Site and may contain rare/scarce arable flora in future as this depends on individual field management and crop type.

5.3 Hedgerows

5.3.1 All hedgerows that will be impacted upon by the Scheme were surveyed for their 'importance' under the Hedgerow Regulations. One hedgerow, H15, is classified as 'important' and species-rich. H15 is located on the Sunnica West Site A, in Cambridgeshire and meets the criteria for CWS selection in Cambridgeshire: "*hedgerow systems at least 500m. in length and more than 2m. in width, with 5 or more woody species, and with at least part of the hedgerow allowed to flower and fruit"*. Therefore, H15 is of **county** nature conservation importance.

5.3.2 No other important or species-rich hedgerows are present within the Order limits. Therefore, with the exception of H15, all other hedgerows within the Order limits are of **Local** nature conservation importance.

6 References

Ref 1. AECOM, 2020. Sunnica Energy Farm Preliminary Ecological Appraisal.

Ref 2. HMSO (2006). The Natural Environment and Rural Communities Act. HMSO, London.

Ref 3. HMSO (1981). Wildlife & Countryside Act 1981. HMSO, London.

Ref 4. HMSO (1997). Hedgerow Regulations 1997. HMSO, London.

Ref 5. HMSO (1995) Environment Act (1995).

Ref 6. HMSO (1994) Biodiversity: The UK Action Plan. HMSO, London

Ref 7. JNCC, UK Post-2010 Biodiversity Framework, 2012, available at [redacted](Accessed July 2020)

Ref 8. Cambridgeshire and Peterborough Biodiversity Group, 2015. Cambridgeshire_Peterborough_Priority Species.

Ref 9. Suffolk Biodiversity Information Service, 2018. Priority Species List.

Ref 10. Anon, 1981. Wildlife & Countryside Act 1981. HMSO.

Ref 11. Stroh, P.A, S.J. Leach, T.A. August, K.J. WAalker, D.A. Pearman, F.J. Rumsey, C.A. Harrower, M.F. Fay, J.P. Martin, T. Pankhurst, C.D. Preston, I. Taylor (2014) A Vascular Plant Red List for England, Botanical Society of Britain and Ireland

Ref 12. Rodwell, J.S., (1992) British Plant Communities, Volume 3. Grasslands and montane communities. Cambridge University Press.

Ref 13. Stace, C.A., (2019) New Flora of the British Isles, 4th edition. C&M Floristics.

Ref 14. Atherton, I., Bosanquet, S. & Lawley, M, (2010) Mosses and Liverworts of Britain and Ireland: a field guide. British Bryological Society.

Ref 15. Mcleod, C.R., Yeo, M., Brown, A.E., Burn, A.J., Hopkins, J.J. & Way, S.F. The Habitats Directive: selection of Special Areas of Conservation in the UK.

Ref 16. Byfield, A.J. & Wilson, P.J. (2005) Important Arable Plant Areas: identifying priority sites for arable plant conservation in the United Kingdom.

Ref 17. Multi-agency Geographic Information for the Countryside (MAGIC). Natural England (2019).

Ref 18. DEFRA, (2007). Hedgerow Survey Handbook – a Standard Procedure for Local Surveys in the UK

Ref 19. Chartered institute of ecology and environmental management (CIEEM) (2018), Guidelines for Ecological Impact Assessment in the United Kingdom: Terrestrial, Freshwater, Coastal and Marine.

Ref 20. Bainbridge, I., Brown, A., Burnett, N., Corbett, P., Cork, C., Ferris, R., Howe, M., Maddock, A., Mountford, E. & Pritchard, S. (2013) Guidelines for the Selection of Biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selection.

Ref 21. Cambridgeshire and Peterborough Panel (2014) Cambridgeshire and Peterborough County Wildlife Sites, Selection Guidelines.

Ref 22. Suffolk Biodiversity Information Service (2010) Suffolk County Wildlife Site Selection Criteria, Suffolkbis, 2010.

Ref 23. Stevens, C.J., Thompson, K., Grime, J.P., Long, C.J., Gowing, D.J.G. (2010) Contribution of acidification and eutrophication to declines in species richness of calcifuges grasslands along a gradient of atmospheric nitrogen deposition. Functional Ecology 24 478-484

Ref 24. Plantlife. Available online.

Ref 25. JNCC. Priority Habitat Descriptions. Rev-2011.

Annex A Figures & Photographs

560000

570000

270000

Sunnica East Site A

Grid Connection Route A

Sunnica East Site B

Grid Connection Route B

Sunnica West Site B

Grid Connection Route B

Grid Connection Route A

Sunnica West Site A

Burwell National Grid Substation

0 2 4km

N

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

The Order Limits

Document Reference: EN010106/APP/6.3
APFP Regulation: 5(2)(a)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 1:
SITE LOCATION

Drawn	Checked	Approved	Date
BF	AB	NC	21/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:50,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_ECO_003	0

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_003_SiteLocation.mxd

LEGEND

The Order Limits

Sunnica East Site A

Sunnica East Site B

Sunnica West Site A

Sunnica West Site B

Grid Connection Route A1

Grid Connection Route A2

Grid Connection Route B1

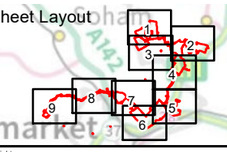
Grid Connection Route B2

Burwell National Grid Substation Extension

1 2 3 4 5 6 7 8 9

Document Reference: EN010106/APP/x.x
APFP Regulation: 5(2)(a)

Sheet Layout



Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2.0
FLORA SURVEYS 2019 TO 2021
PAGE 1 OF 10

Drawn	Checked	Approved	Date
BF	MP	NG	25/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:50,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_ECO_004	0

0 0.5 1 1.5 2 2.5km

N

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_004_Flora.mxd

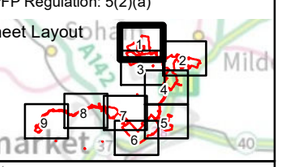
THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order Limits
- Phase2/NVC flora survey sites (T#)
- Arable flora survey site, local importance (AF#)
- Arable flora survey site, site importance (AF#)
- Flora photograph location, with reference

Document Reference: EN010106/APP/x.x
APFP Regulation: 5(2)(a)

Sheet Layout



Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2.1
FLORA SURVEYS 2019 TO 2021
PAGE 2 OF 10

Drawn	Checked	Approved	Date
BF	MP	NG	21/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:10,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_ECO_004	0

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_004_Flora.mxd

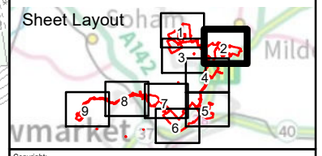
THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order Limits
- Phase2/NVC flora survey sites (T#)
- Arable flora survey site, district importance (AF#)
- Arable flora survey site, local importance (AF#)
- Flora photograph location, with reference

Document Reference: EN010106/APP/x.x
APFP Regulation: 5(2)(a)

Sheet Layout



Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2.2
FLORA SURVEYS 2019 TO 2021
PAGE 3 OF 10

Drawn	Checked	Approved	Date
BF	MP	NG	21/10/2021

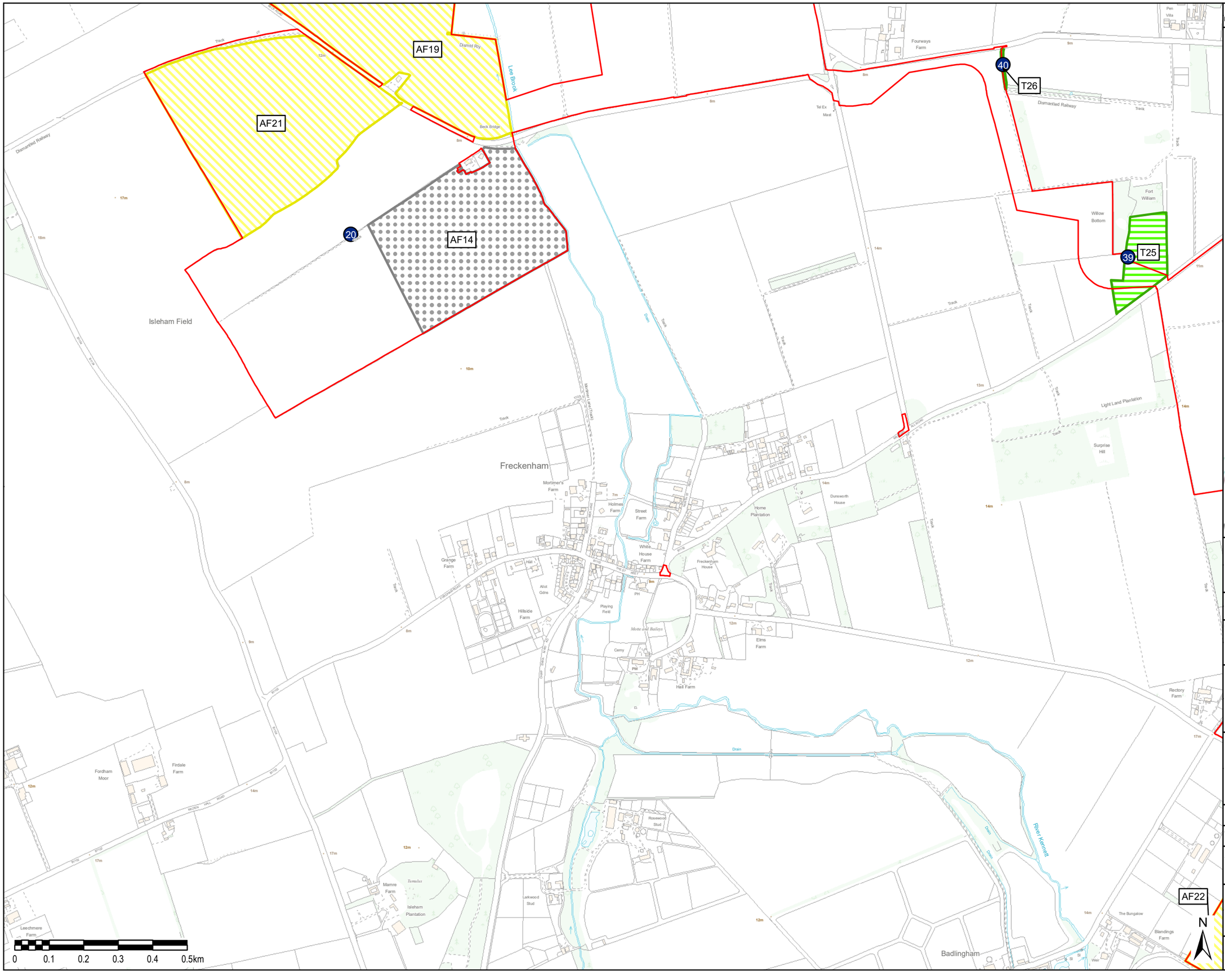
AECOM Internal Project No.	Scale @ A3
60589004	1:10,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number
60589004_ES_ECO_004

Rev
0

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_004_Flora.mxd



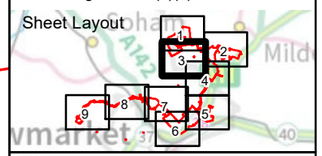
THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order Limits
- Phase2/NVC flora survey sites (T#)
- Arable flora survey site, local importance (AF#)
- Arable flora survey site, site importance (AF#)
- Flora photograph location, with reference

Document Reference: EN010106/APP/x.x
APFP Regulation: 5(2)(a)

Sheet Layout



Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2.3
FLORA SURVEYS 2019 TO 2021
PAGE 4 OF 10

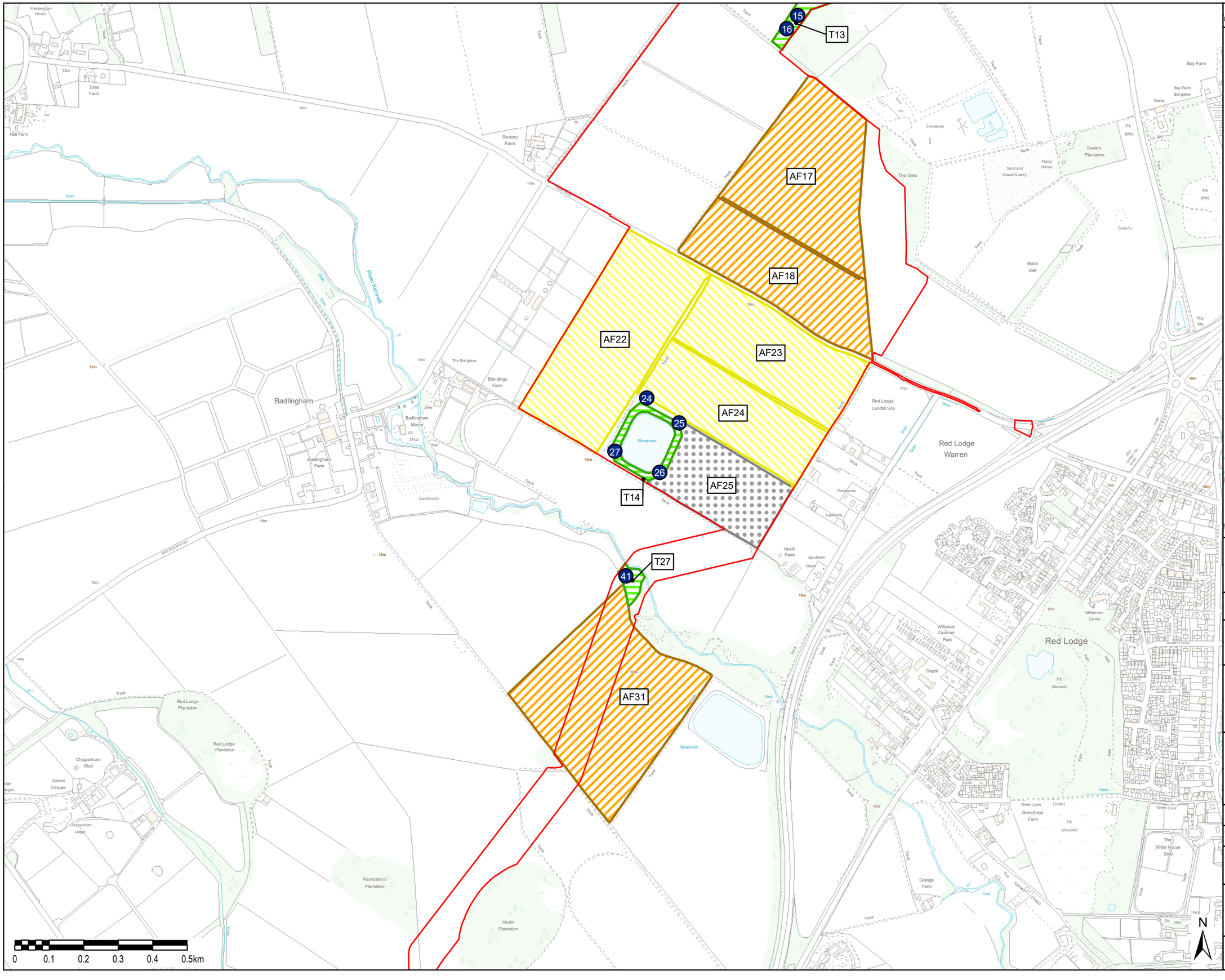
Drawn	Checked	Approved	Date
BF	MP	NG	21/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:10,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_ECO_004	0

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_004_Flora.mxd



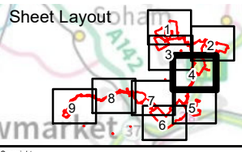
THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order Limits
- Phase2/NVC flora survey sites (T#)
- Arable flora survey site, district importance (AF#)
- Arable flora survey site, local importance (AF#)
- Arable flora survey site, site importance (AF#)
- Flora photograph location, with reference

Document Reference: EN010106/APP/x.x
APFP Regulation: 5(2)(a)

Sheet Layout



Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2.4
FLORA SURVEYS 2019 TO 2021
PAGE 5 OF 10

Drawn	Checked	Approved	Date
BF	MP	NG	21/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:10,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_ECO_004	0

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_004_Flora.mxd

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

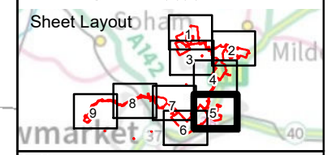
LEGEND

- The Order Limits
- Phase2/NVC flora survey sites (T#)
- Arable flora survey site, county importance (AF#)
- Arable flora survey site, district importance (AF#)
- Arable flora survey site, local importance (AF#)
- Arable flora survey site, site importance (AF#)

AF26 AF8 AF9 AF10 AF13 AF15 AF11 T15

Document Reference: EN010106/APP/x.x
APFP Regulation: 5(2)(a)

Sheet Layout



Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2.5
FLORA SURVEYS 2019 TO 2021
PAGE 6 OF 10

Drawn	Checked	Approved	Date
BF	MP	NG	21/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:10,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number
60589004_ES_ECO_004

Rev
0

0 0.1 0.2 0.3 0.4 0.5km

N

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_004_Flora.mxd

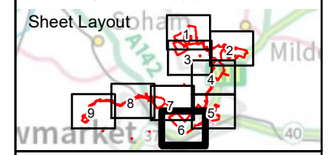
THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order Limits
- Phase2/NVC flora survey sites (T#)
- Arable flora survey site, county importance (AF#)
- Arable flora survey site, district importance (AF#)
- Arable flora survey site, local importance (AF#)
- Flora photograph location, with reference

Document Reference: EN010106/APP/x.x
APFP Regulation: 5(2)(a)

Sheet Layout



Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2.6
FLORA SURVEYS 2019 TO 2021
PAGE 7 OF 10

Drawn	Checked	Approved	Date
BF	MP	NG	21/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:10,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number
60589004_ES_ECO_004

Rev
0

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_004_Flora.mxd

0 0.1 0.2 0.3 0.4 0.5km

N

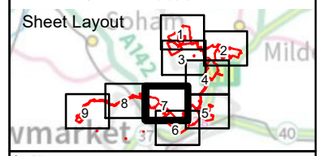
THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order Limits
- Phase2/NVC flora survey sites (T#)
- Arable flora survey site, local importance (AF#)
- Flora photograph location, with reference
- Target note

Document Reference: EN010106/APP/x.x
APFP Regulation: 5(2)(a)

Sheet Layout



Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2.7
FLORA SURVEYS 2019 TO 2021
PAGE 8 OF 10

Drawn	Checked	Approved	Date
BF	MP	NG	21/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:10,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_ECO_004	0

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_004_Flora.mxd

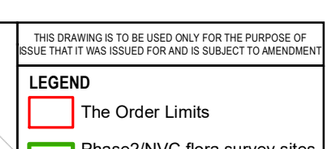
THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order Limits
- Phase2/NVC flora survey sites (T#)
- Arable flora survey site, local importance (AF#)
- Flora photograph location, with reference
- Target note

Document Reference: EN010106/APP/x.x
APFP Regulation: 5(2)(a)

Sheet Layout



Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2.8
FLORA SURVEYS 2019 TO 2021
PAGE 9 OF 10

Drawn	Checked	Approved	Date
BF	MP	NG	21/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:10,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_ECO_004	0

0 0.1 0.2 0.3 0.4 0.5km

N

File Name:\\Active Projects\Solar Associates\GIS\02_Maps\SEF_004_Flora.mxd

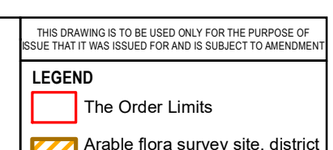
THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order Limits
- Arable flora survey site, district importance (AF#)
- Flora photograph location, with reference
- Target note

Document Reference: EN010106/APP/x.x
APFP Regulation: 5(2)(a)

Sheet Layout



Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2.9
FLORA SURVEYS 2019 TO 2021
PAGE 10 OF 10

Drawn	Checked	Approved	Date
BF	MP	NG	21/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:10,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number: 60589004_ES_ECO_004
Rev: 0

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_004_Flora.mxd

Photographs (see locations on Figure 2)

	
Photo 1	Photo 2
	
Photo 3	Photo 4
	
Photo 5	Photo 6

	
Photo 7	Photo 8
	
Photo 9	Photo 10
	
Photo 11	Photo 12
	

Photo 13	Photo 14
	
Photo 15	Photo 16
	
Photo 17	Photo 18
	
Photo 19	Photo 20

	
Photo 21	Photo 22
	
Photo 23	Photo 24
	
Photo 25	Photo 26
	

Photo 27	Photo 28
	
Photo 29	Photo 30
	
Photo 31	Photo 32
	
Photo 33	Photo 34
	

Photo 35	Photo 36
	
Photo 37	Photo 38
	
Photo 39	
	
Photo 41	

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order Limits
- Location of surveyed hedgerow

Sunnica East Site A

Grid Connection Route A

Sunnica East Site B

H32 H32a H32b H33 H34 H35 H36 H37 H38 H39 H40 H41 H42 H43 H44 H45 H46 H47 H48 H49 H50 H51 H22 H23 H24 H25 H26 H27 H28 H29 H30 H31

Isleham Field

Freckenham

Badlingham

Worlington

Red Lodge

Red Lodge Warren

Mildenhall

0 500 1,000 1,500m

N

Document Reference: EN010106/APP/6.3
APFP Regulation: 5(2)(a)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 3.1
HEDGEROW SURVEY

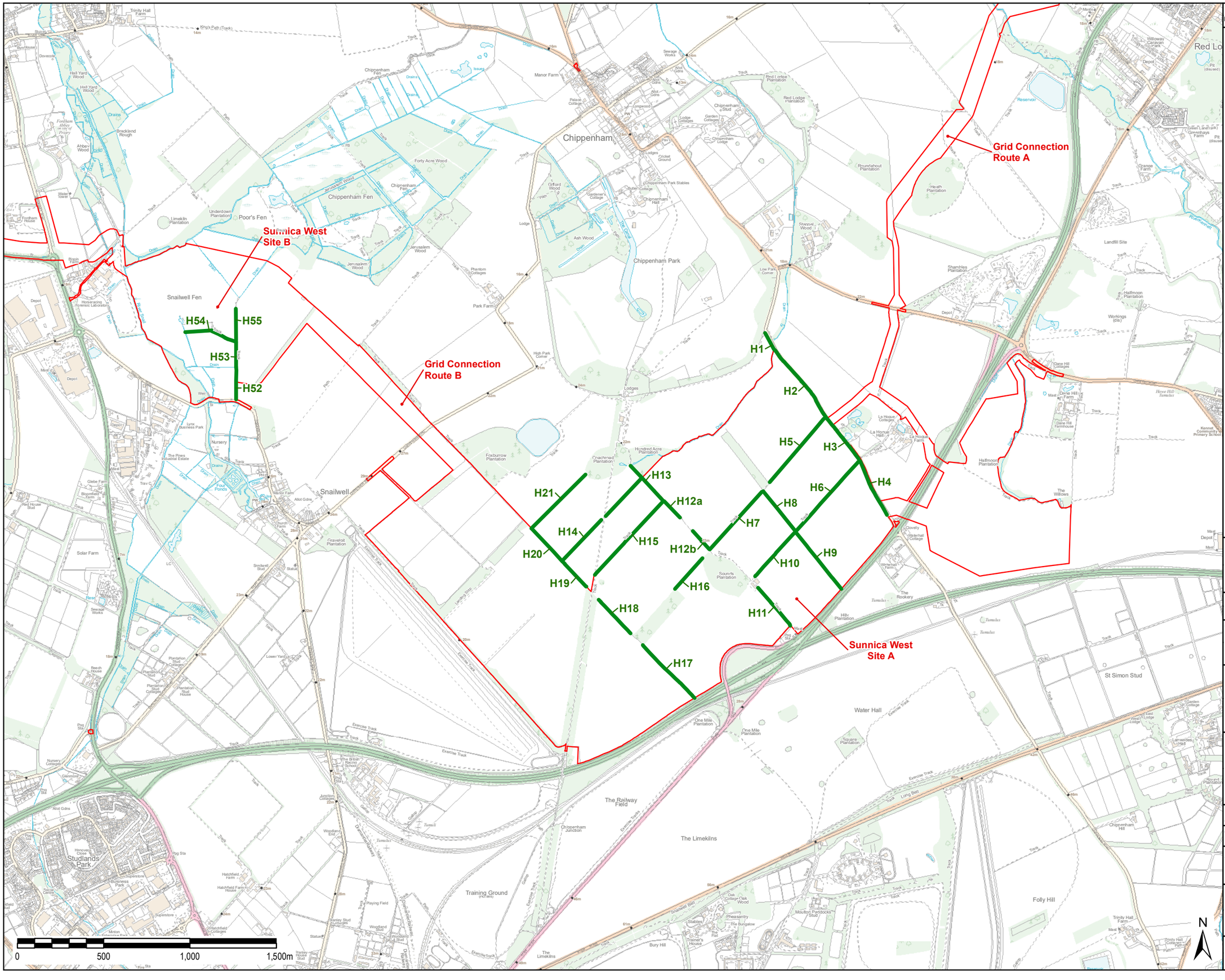
Drawn	Checked	Approved	Date
AD	NG	CLB	22/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:20,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_ECO_005	0

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_005_Hedges.mxd



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order Limits
- Location of surveyed hedgerow

Document Reference: EN010106/APP/6.3
APFP Regulation: 5(2)(a)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 3.2
HEDGEROW SURVEY

Drawn	Checked	Approved	Date
AD	NG	CLB	22/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:20,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_ECO_005	0

File Name:W:\Active Projects\Solar Associates\GIS\02_Maps\SEF_005_Hedges.mxd

Annex B Desk Study Results

Table B-1: Protected (WCA Schedule 8) and notable flora species in East Cambridgeshire within 2km of the Order limits

WCA8 - WCA Schedule 8, NS - Nationally Scarce, NR - Nationally Rare and CPASI - Cambridgeshire and Peterborough Additional Species of Interest

Common name and Scientific name	Location	Grid reference	Precision	Date	Comments	Selected designation
Bur Medick *Medicago minima*	Mamre Farm, Chippenham	TL66147134	10m	09-05-09	example grid ref	NS
		TL66147136	10m	09-05-09	example grid ref	NS
		TL66157132	10m	09-05-09	example grid ref	NS
Cambridge Milk-parsley *Selinum carvifolia*	Chippenham Fen	TL645698	100m	17-08-09	15 plants (11 flowering), Compt.2	CPASI, NR, WCA8
		TL6469	1km	20-07-11	5709 plants with 1568 (27.5%) flowering. 829 plants Compt. 1; 7 Compt. 8; 4329 Compt. 10; 524 Compt. 11. [no grid references provided by recorders, NPM, 13/1/2013]	CPASI, NR, WCA8
		TL64716968	10m	03-09-16	1 plant	CPASI, NR, WCA8
		TL64726968	10m	04-07-09	compartment on northeast side of main SE-NW drove	CPASI, NR, WCA8
		TL64736921	10m	03-09-16		CPASI, NR, WCA8
		TL64766923	10m	03-09-16		CPASI, NR, WCA8
		TL64776912	10m	03-09-16	plentiful in this general area	CPASI, NR, WCA8
		TL64776923	10m	03-09-16		CPASI, NR, WCA8

Common name and Scientific name	Location	Grid reference	Precision	Date	Comments	Selected designation
		TL64776986	10m	10-07-10	single plant at grassland/fen interface in compartment centred at TL64756988	CPASI, NR, WCA8
		TL64826915	10m	03-09-16	plentiful in this general area	CPASI, NR, WCA8
		TL648692	100m	17-08-09	18 plants (12 flowering), Baxter's W. Ride	CPASI, NR, WCA8
		TL649691	100m	17-08-09	TL649691-TL647691, 10458 plants (2958 flowering), Compt.10 (non-flowering numbers extrapolated from 5 2x2m quadrats)	CPASI, NR, WCA8
		TL649699	100m	17-08-09	895 plants (616 flowering), Compt.1	CPASI, NR, WCA8
		TL65106930	10m	03-09-16	4-5 plants	CPASI, NR, WCA8
		TL65126928	10m	03-09-16	1 plant	CPASI, NR, WCA8
		TL651693	100m	17-08-09	83 plants (46 flowering), Compt.11	CPASI, NR, WCA8
	Snailwell Meadows SSSI	TL63936781	10m	16-08-08	single flowering plant and a couple of non-flowering ones	CPASI, NR, WCA8
		TL63936782	10m	2012	1 mature plant and 6 seedlings in S meadow (48 plants in 2011). No plants were seen in the NE meadow, TL64056813, which had been grazed and topped (there had been 81 flowering and 17 non-flowering plants here in 2011).	CPASI, NR, WCA8
		TL63946781	10m	22-07-11	72 plants (7 flowering) in S meadow. S meadow unmown and ungrazed.	CPASI, NR, WCA8
		TL639678	100m	08-08-09	50 plants (12 flowering)	CPASI, NR, WCA8
		TL64016813	10m	16-08-08	single flowering plant	CPASI, NR, WCA8

Common name and Scientific name	Location	Grid reference	Precision	Date	Comments	Selected designation
		TL64026813	10m	16-08-08	single non-flowering plant	CPASI, NR, WCA8
		TL64036815	10m	22-07-11	17 non-flowering plants, NE meadow. NE meadow topped and grazed by 40 cattle.	CPASI, NR, WCA8
		TL64046809	10m	16-08-08	single flowering plant	CPASI, NR, WCA8
		TL64046811	10m	16-08-08	c.14 plants	CPASI, NR, WCA8
		TL64056812	10m	08-08-09	35 plants (25 flowering) here and at TL64066811	CPASI, NR, WCA8
		TL64066809	10m	16-08-08	6 flowering plants and single non-flowering plant	CPASI, NR, WCA8
		TL64066810	10m	16-08-08	single flowering plant	CPASI, NR, WCA8
		TL6468	1km	16-08-08	about 26 plants seen in Field 5, east of River Snail (see other records for precise grid refs of plants)	CPASI, NR, WCA8
Cat-mint *Nepeta cataria*	Chippenham	TL6869	1km	09-05-09		CPASI
	Wicken Fen: Hurdle Hall Farm	TL562669	100m	27-07-12	fishing pond (single flowering plant on disturbed soil of bankside footpath)	CPASI
Common Twayblade *Neottia ovata*	Fordham Woods	TL6369	1km	2008	Very scarce - e.g. beside path on eastern fringe of wet wood. Several more plants in this area in 2008, apparently responding well to brush clearing nearby.	CPASI
		TL6369	1km	2011	After work on the new boardwalk, only 41 twayblades could be found this year, down from a peak of 72 in 2009.	CPASI
		TL6369	1km	2012	62 were counted in colony near the entrance. The colony was reduced due to the construction of the boardwalk in 2010, but is now recovering.	CPASI

Common name and Scientific name	Location	Grid reference	Precision	Date	Comments	Selected designation
		TL6369	1km	Jun-10	Found in 1/3 quadrats	CPASI
Dwarf Spurge *Euphorbia exigua*	Fordham	TL634684	100m	30-06-10		CPASI
	Reach	TL569665	100m	13-08-13		CPASI
	Wicken Fen	TL5667	1km	07-08-10		CPASI
Early Marsh-orchid *Dactylorhiza incarnata*	Chippenham Fen	TL647698	100m	10-07-10		CPASI
Fen Pondweed *Potamogeton coloratus*	Chippenham Fen	TL6469	1km	10-07-10		CPASI, NS
		TL651695	100m	04-07-09	also in many drains over the fen	CPASI, NS
	Wicken Fen	TL562695	100m	27-07-10	locally abundant in many of the drains on Bakers Fen	CPASI, NS
		TL565696	100m	27-07-10	locally abundant in many of the drains on Bakers Fen	CPASI, NS
Fine-leaved Fumitory *Fumaria parviflora*	Isleham Allotments (Fordham Road)	TL64407378	10m	17-07-10		NS
Lesser Water-plantain *Baldellia ranunculoides*	Burwell	TL591689	100m	May-08	In ditch cleared out last winter, water depth 10-20cm, TL587689 to TL594691.	CPASI
		TL592690	100m	05-07-08		CPASI
Marsh Dock *Rumex palustris*	Burwell Fen	TL56426891	10m	20-07-12	R	CPASI
	Wicken Fen	TL561698	100m	27-07-10		CPASI
		TL561699	100m	14-08-09	frequent in drawdown zones	CPASI
		TL564697	100m	27-07-10		CPASI
		TL5669	1km	24-07-10		CPASI
	Wicken Fen: Baker's Fen	TL563693	100m	05-09-13		CPASI
Narrow-leaved Water-plantain *Alisma lanceolatum*	Wicken Fen	TL565698	100m	01-07-08	Occasional	CPASI
		TL568699	100m	03-08-10		CPASI

Common name and Scientific name	Location	Grid reference	Precision	Date	Comments	Selected designation
Purple Fescue *Vulpia ciliata subsp. ambigua*	Mamre Farm, Chippenham	TL66147137	10m	09-05-09		NS
River Water-dropwort *Oenanthe fluviatilis*	Wicken Fen	TL56	10km	17-08-09		CPASI
		TL568699	100m	16-07-09	In the Lode	CPASI
	Wicken Fen: Monk's Lode	TL56926998	10m	20-07-12	R	CPASI
Shining Pondweed *Potamogeton lucens*	Wicken Fen	TL568699	100m	02-08-09		CPASI
		TL568699	100m	17-08-09	R.	CPASI
		TL568699	100m	03-07-10	In the River	CPASI
	Wicken Fen: Monk's Lode	TL56926998	10m	20-07-12	R	CPASI
Sickle Medick *Medicago sativa subsp. falcata*	Freckenham Road RSV CWS	TL6671	1km	27-06-12	Medicago sativa aggregate was just coming to flower and it was not possible to confirm the relative abundance of different sub-species. On the basis of the material examined good subsp. falcata and subspecies varia were however considered to be present.	NS
Southern Marsh-orchid *Dactylorhiza praetermissa*	Chippenham Fen	TL647698	100m	10-07-10		CPASI
		TL64786953	10m	04-07-09		CPASI
Water-violet *Hottonia palustris*	Chippenham Fen	TL64916976	10m	17-08-09	abundant in ditch with clear water at edge of woodland, S of Compt.1	CPASI
	New River and Monk's Lode CWS	TL571701	100m	17-08-11	In water	CPASI
		TL576698	100m	17-08-11	In water	CPASI
	Wicken Fen	TL562697	100m	01-07-08	Frequent	CPASI
		TL565696	100m	01-07-08	Frequent	CPASI
		TL568699	100m	17-08-09	R.	CPASI
	Wicken Fen: Monk's Lode	TL56926998	10m	20-07-12	R	CPASI

Common name and Scientific name	Location	Grid reference	Precision	Date	Comments	Selected designation
Whorled Water-milfoil *Myriophyllum verticillatum*	Wicken Fen	TL568699	100m	17-08-09	R.	CPASI

Table B-2: Protected (WCA Schedule 8) and notable flora species in Suffolk within 2km of the Order limits

WCA8 - WCA Schedule 8, NS - Nationally Scarce, NR - Nationally Rare, RLGB -Red List

Common name and Scientific name	Location	Site detail	Grid reference	Year	Obs Comments	Designation	Abundance
Corn Chamomile *Anthemis arvensis*	Red Lodge Heath	Warren Road, Red Lodge	TL703704	2011		RLGB.EN	18 Count
	Worlington	near proposed Red Lodge primary school site	TL70247055	2011		RLGB.EN	19 Count of present
Loose Silky-bent *Apera spica-venti*	Herringswell	edge of beet field	TL718704	2012		RLGB.Lr(NT)	
Hairy Rock-cress *Arabis hirsuta*	Mildenhall A1065/C616 Thetford Rd junction		TL729750	2017		Suffolk Rare Plant	
	Mildenhall A1065/C616 Thetford Rd junction	152	TL728750	2017		Suffolk Rare Plant	
	Red Lodge Heath	Warren Road, Red Lodge	TL703704	2011		Suffolk Rare Plant	
Purple Milk-vetch *Astragalus danicus*	Worlington Golf Course and surrounding habitat		TL702735	2010		RLGB.EN, ScotBL, Sect.41, UKBAP	
Harebell *Campanula rotundifolia*	Mildenhall Woods		TL7375	2011		Suffolk Rare Plant	
Carline Thistle *Carlina vulgaris*	Barton Mills		TL71187268	2016	Several plants on west side of Newmarket Road near	Suffolk Rare Plant	

Common name and Scientific name	Location	Site detail	Grid reference	Year	Obs Comments	Designation	Abundance
					A11 near junction		
Field Mouse-ear *Cerastium arvense*	Mildenhall A1065/C616 Thetford Rd junction	152	TL728750	2017		Suffolk Rare Plant	
	Mildenhall A1065/C616 Thetford Rd junction		TL729750	2017		Suffolk Rare Plant	
	Joans Meadow		TL694734	2012		Suffolk Rare Plant	
	Mildenhall Woods		TL7375	2011		Suffolk Rare Plant	
Lesser Calamint *Clinopodium calamintha*	Barton Mills (Cherry Hill) C623	1 South	TL721719	2017		NS-excludes, RLGB.VU	
Lily-of-the-valley *Convallaria majalis*	Mildenhall		TL71857461	2013		Suffolk Rare Plant	
Hound's-tongue *Cynoglossum officinale*	Red Lodge Warren	1	TL697706	2016	170 plants	RLGB.Lr(NT)	
	Joans Meadow		TL694734	2012		RLGB.Lr(NT)	
Treacle-mustard *Erysimum cheiranthoides*	Mildenhall		TL6974	2013		Suffolk Rare Plant	
Spurge *Euphorbia amygdaloides subsp. robbiae*	Barton Mills		TL7173	2016		CITESB	
Dwarf Spurge *Euphorbia exigua*	Mildenhall		TL6974	2013		CITESB, RLGB.Lr(NT)	
Common Cudweed *Filago vulgaris*	Mildenhall	just S of Mildenhall	TL70877425	2016	a few plants on disturbed surface of	RLGB.Lr(NT), ScotBL	

Common name and Scientific name	Location	Site detail	Grid reference	Year	Obs Comments	Designation	Abundance
					public footpath in one place (N bank of River Lark)		
	Mildenhall Woods		TL7375	2011		RLGB.Lr(NT), ScotBL	
Dropwort *Filipendula vulgaris*	Barton Mills (Cherry Hill) C623	1 East	TL725720	2017		ScotBL	
	Barton Mills (Cherry Hill) C623	Westernmost end of north verge (single specimen)	TL72007221	2017		ScotBL	
Dense-flowered Fumitory *Fumaria densiflora*	Mildenhall	Mildenhall Hub	TL703746	2016	At field margin	Suffolk Rare Plant	1 Count of present
	Mildenhall		TL69847444	2013	One plant at edge of potato field on south side of track	Suffolk Rare Plant	
Fine-leaved Fumitory *Fumaria parviflora*	Mildenhall	Mildenhall Hub	TL703746	2016	At field margin	NS-excludes, RLGB.VU	1 Count of present
	Mildenhall		TL69847444	2013	Five plants at edge of potato field on south side of track	NS-excludes, RLGB.VU	
Common Rock-rose *Helianthemum nummularium*	Barton Mills (Cherry Hill) C623	Eastern end of north verge	TL72007221	2017		Suffolk Rare Plant	
	Barton Mills (Cherry Hill) C623	1 East	TL725720	2017		Suffolk Rare Plant	

Common name and Scientific name	Location	Site detail	Grid reference	Year	Obs Comments	Designation	Abundance
	Worlington Golf Course and surrounding habitat		TL702735	2010		Suffolk Rare Plant	
Field Scabious *Knautia arvensis*	Barton Mills (Cherry Hill) C623	1 West	TL720721	2017		Suffolk Rare Plant	
	Joans Meadow		TL694734	2012		Suffolk Rare Plant	
	Mildenhall Woods		TL7375	2011		Suffolk Rare Plant	
Bur Medick *Medicago minima*	Red Lodge Warren	4	TL697706	2016	approx 30 plants at 4 locations	NS-excludes, RLGB.VU	
	Joans Meadow		TL694734	2012		NS-excludes, RLGB.VU	
Sickle Medick *Medicago sativa subsp. falcata*	Barton Mills (Cherry Hill) C623	1 East	TL725720	2017		NS-excludes	
	Joans Meadow		TL694734	2012		NS-excludes	
Fine-leaved Sandwort *Minuartia hybrida*	Barton Mills		TL71697377	2016	Flint wall on south side of the Street opposite the church	NS-excludes, RLGB.EN, Sect.41, UKBAP	
Minuartia hybrida subsp. tenuifolia	Barton Mills Churchyard		TL717738	2016		NS-excludes, RLGB.EN, Sect.41, UKBAP	
Grape-hyacinth *Muscari neglectum*	Tuddenham C624	96 West	TL730719	2017		NR-excludes, RLGB.VU, Sect.41, UKBAP	

Common name and Scientific name	Location	Site detail	Grid reference	Year	Obs Comments	Designation	Abundance
	Tuddenham Gallops		TL7254171860	2016		NR-excludes, RLGB.VU, Sect.41, UKBAP	2 Count of present
	Tuddenham Gallops		TL7245071802	2016		NR-excludes, RLGB.VU, Sect.41, UKBAP	12 Count of present
	Cherry Hill and The Gallops	6	TL722721	2016	68	NR-excludes, RLGB.VU, Sect.41, UKBAP	
	Tuddenham Gallops		TL7247871821	2016		NR-excludes, RLGB.VU, Sect.41, UKBAP	7 Count of present
	Tuddenham Gallops		TL7228471688	2016		NR-excludes, RLGB.VU, Sect.41, UKBAP	6 Count of present
	Tuddenham Gallops		TL7252371850	2016		NR-excludes, RLGB.VU, Sect.41, UKBAP	13 Count of present
	Tuddenham Gallops		TL7225671675	2016		NR-excludes, RLGB.VU, Sect.41, UKBAP	62 Count of present
Bee Orchid *Ophrys apifera*	West Row Churchyard	West Row, church	TL674754	2016		CITESB	
Prickly Poppy *Papaver argemone*	Mildenhall		TL69847444	2013	Two plants at edge of potato field on south side of track	RLGB.VU, ScotBL	
Rough Poppy *Roemeria hybrida*	Mildenhall	Mildenhall Hub	TL703746	2016	At field margin	ScotBL	1 Count of present
	Mildenhall		TL698744	2013	Locally frequent at	ScotBL	

Common name and Scientific name	Location	Site detail	Grid reference	Year	Obs Comments	Designation	Abundance
					edge of potato field on south side of track		
	Mildenhall		TL70007440	2013	A few plants at edge of potato field on south side of track	ScotBL	
Hoary Plantain *Plantago media*	Barton Mills Churchyard	Barton Mills, church	TL716738	2016		ScotBL	
	Worlington Churchyard	Worlington, church	TL691738	2013		ScotBL	
	Joans Meadow		TL694734	2012		ScotBL	
Perfoliate Pondweed *Potamogeton perfoliatus*	Mildenhall		TL698741	2013	One patch in River Lark	Suffolk Rare Plant	
	Worlington	U/S MILDENHALL MTR SITE	TL6890074300	2009	LARK	Suffolk Rare Plant	
Hoary Cinquefoil *Potentilla argentea*	Red Lodge Warren	4	TL697706	2016	about 20 plants within 1.5m radius of grid	RLGB.Lr(NT), ScotBL	
Wild Clary *Salvia verbenaca*	Mildenhall A1065/C616 Thetford Rd junction		TL729750	2017		ScotBL	
	Mildenhall A1065/C616 Thetford Rd junction	152	TL728750	2017		ScotBL	
	West Row		TL6775	2016		ScotBL	

Common name and Scientific name	Location	Site detail	Grid reference	Year	Obs Comments	Designation	Abundance
	Moulton	bridge	TL6964	2012		ScotBL	
	Joans Meadow		TL694734	2012		ScotBL	
Small Scabious *Scabiosa columbaria*	Barton Mills (Cherry Hill) C623	1 East	TL725720	2017		Suffolk Rare Plant	
	Barton Mills (Cherry Hill) C623	South branch, east side	TL72007221	2017		Suffolk Rare Plant	
	Barton Mills (Cherry Hill) C623	1 South	TL721719	2017		Suffolk Rare Plant	
	Joans Meadow		TL694734	2012		Suffolk Rare Plant	
	Mildenhall Woods		TL7375	2011		Suffolk Rare Plant	
Annual Knawel *Scleranthus annuus*	Barton Mills		TL7234271724	2016		RLGB.EN, ScotBL, Sect.41, Sect.42, UKBAP	
	Barton Mills		TL7218871623	2016		RLGB.EN, ScotBL, Sect.41, Sect.42, UKBAP	
Night-flowering Catchfly *Silene noctiflora*	Herringswell	edge of beet field	TL718704	2012		RLGB.VU, ScotBL	
	Worlington Chalk Pit		TL701715	2002		RLGB.VU, ScotBL	
	Freckenham		TL67R	2001		RLGB.VU, ScotBL	1 Count of Default
	Mildenhall		TL67X	2000		RLGB.VU, ScotBL	
	Tuddenham		TL77F	2000		RLGB.VU, ScotBL	
	Herringswell		TL76E	1999		RLGB.VU, ScotBL	

Common name and Scientific name	Location	Site detail	Grid reference	Year	Obs Comments	Designation	Abundance
Spanish Catchfly *Silene otites*	Worlington Golf Course and surrounding habitat		TL702735	2010		NR-excludes, RLGB.EN, Sect.41, UKBAP	
	Cherry Hill and The Gallops	Barton Mills Cherry Hill sub site 6	TL722721	2009	R(3)	NR-excludes, RLGB.EN, Sect.41, UKBAP	
Breckland Thyme *Thymus serpyllum*	Red Lodge Warren		TL697706	2016		NR-excludes	
Fingered Speedwell *Veronica triphyllos*	Barton Mills	to TL7213571749	TL7214871801	2016		NR-excludes, RLGB.EN, Sect.41, UKBAP, WCA8	1400 Count of present
	Cherry Hill and The Gallops		TL722721	2016	1400 plants - estimate	NR-excludes, RLGB.EN, Sect.41, UKBAP, WCA8	

Table B-3: WCA Schedule 9 plants – East Cambridgeshire within 2km of the Order limits

Common name and Scientific name	Location	Grid reference	Precision	Date	Comments	Selected designations
Canadian Waterweed *Elodea canadensis*	Isleham	TL67M	2km	29-05-10		WCA9ii
	New River and Monk's Lode CWS	TL571701	100m	17-08-11	In water	WCA9ii
		TL576698	100m	17-08-11	In water	WCA9ii
		TL581698	100m	17-08-11	In water	WCA9ii
	Wicken Fen	TL574699	100m	03-07-10	In the River	WCA9ii
False-acacia *Robinia pseudoacacia*	Isleham	TL67M	2km	29-05-10	planted	WCA9ii
New Zealand Pigmyweed *Crassula helmsii*	Wicken Fen	TL560695	100m	20-05-11	Large patches/rafts in the large shallow pool	WCA9ii
		TL561695	100m	27-07-10		WCA9ii
		TL561699	100m	28-05-10	Bakers Fen pool	WCA9ii
		TL562695	100m	20-05-11	Fq clumps	WCA9ii
		TL563694	100m	27-07-10		WCA9ii
	Wicken Fen: Baker's Fen	TL560695	100m	30-07-13	dominant, large areas	WCA9ii
		TL561693	100m	06-07-12	F (LD at margins)	WCA9ii
		TL561693	100m	28-09-12	occ-freq	WCA9ii
Nuttall's Waterweed *Elodea nuttallii*	Burwell Lode	TL565690	100m	03-07-12	F	WCA9ii
	Wicken Fen: Monk's Lode	TL56926998	10m	20-07-12	O	WCA9ii
Wall Cotoneaster *Cotoneaster horizontalis*	Burwell	TL594669	100m	27-02-14		WCA9ii
	Isleham	TL67M	2km	29-05-10	on wall	WCA9ii
Yellow Archangel *Lamiastrum galeobdolon subsp. argentatum*	Isleham	TL67M	2km	29-05-10		WCA9ii

Table B-4: WCA Schedule 9 plants – Suffolk within 2km of the Order limits

Common name and Scientific name	Location	Site detail	Grid reference	Year
Nuttall's Waterweed *Elodea nuttallii*	Worlington	JUDES FERRY	TL677747	2012
	Mildenhall	D/S MILDENHALL MTR SITE	TL688745	2011
	Worlington	U/S MILDENHALL MTR SITE	TL689743	2011
Giant Hogweed *Heracleum mantegazzianum*	Mildenhall	just S of Mildenhall	TL70877424	2016
	Barton Mills	Lark at Mildenhall	TL709742	2011
Indian Balsam *Impatiens glandulifera*	Kentford	R Kennett	TL7068	2017

Annex C Field Survey Results

Project Name	Sunnica	Date: 9/7/19	Recorders	MP, CL	Area	T1 and T2	Photo ref.	1, 2	

Broad vegetation type	Grassland Tall-herb fen Swamp	X ☐ ☐	Substrate	Acid Calcareous Neutral Not known	☐ ☐ X ☐	Condition	Improved Semi-improved Unimproved Not relevant	☐ X ☐ ☐				
Hydrology	Wet Dry Transitional	☐ X ☐	Age/ origin	Sown/recent origin Semi-natural	☐ X	Aspect	n/a	Slope	n/a	Water Depth	n/a	

Layers Mean Height	0.3	m		cm		mm	Habitat Area	2000m2 (approx.)
Layers Cover	40	%		%		%	Quadrat/sample size	n/a

Species List T1 and T2	Domin	Species List T1 and T2	Domin	Species List (additional species at T2 only)	Domin
Achillea millefolium	3	*Jacobaea vulgaris*	1	*Tripleurospermum inodorum*	3
Potentilla reptans	3	*Trifolium campestre*	2	*Prunella vulgaris*	1
Arrhenatherum elatius	5	*Geum urbanum*	1	*Potentilla anserina*	2
Plantago lanceolata	2	*Sedum acre*	2	*Carduus nutans*	1
Urtica dioica	3	*Campylopus introflexus*	4	*Festuca rubra*	3
Artemisia vulgaris	2	*Agrostis stolonifera*	3	*Clinopodium vulgare*	2
Agrimonia eupatoria	2	*Trifolium pratense*	1		
Trifolium repens	3	*Ononis repens*	1		
Scorzoneroides autumnalis	3	*Daucus carota*	2		
Sherardia arvensis	1	*Heracleum sphondylium*	1		
Arenaria serpyllifolia	2	*Centaurea debeauxii*	1		
Echium vulgare	1	*Dactylis glomerata*	2		
Erodium cicutarium	2	*Anisantha diandra*	1		
Sisymbrium officinale	1	*Phleum bertolonii*	3		
Medicago lupulina	3	*Ballota nigra*	1		
Linaria vulgaris	2	*Hypericum perforatum*	1		
Silene dioica	2	*Lolium perenne*	1		
Lotus corniculatus	1	*Convolvulus arvensis*	2		
Tragopogon pratensis	1				
Bare rock/hardstanding	60%			60%	
Bare soil	0			10%	
Leaf litter/ thatch	0			0	
Permanent open water	0			0	

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%
DAFOR	D= Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations
Two hardstanding tracks (T1 and T2), adjacent to arable crops. Some ephemeral /short perennial vegetation and taller semi-improved grassland. Unmanaged.

Photo 1. T1 Hardstanding and semi-improved grassland

Photo 2. T2 (as T1 with some bare soil near field entrance)

Project Name	Sunnica	Date: 9/7/19	Recorders	MP, CL	Area	T3		Photo ref.	3		
Broad vegetation type	Grassland X Tall-herb ☐ fen X Swamp		Substrate	Acid ☐ Calcareous ☐ Neutral X Not known ☐		Condition		Improved ☐ Semi-improved X Unimproved X Not relevant ☐			
Hydrology	Wet ☐ Dry ☐ Transitional X		Age/ origin	Sown/recent origin ☐ Semi-natural X		Aspect	n/a	Slope	n/a	Water Depth	0 (damp soil)

Layers Mean Height	0.5	m	0.2	cm		mm	Habitat Area	100m2 (approx.)	
Layers Cover	90	%	30	%		%	Quadrat/sample size	n/a	

Species List	Domin	Species List	Domin
Holcus lanatus	6	*Rumex conglomeratus*	1
Carex acutiformis	4	*Lathyrus pratensis*	1
Glyceria notata	4	*Epilobium hirsutum*	1
Persicaria amphibia	3	*Filipendula ulmaria*	2
Agrostis stolonifera	4	*Phalaris arundinacea*	4
Cardamine pratensis	1	*Juncus articulatus*	1
Alopecurus geniculatus	2	*Hypericum tetrapterum*	1
Equisetum palustris	1	*Veronica catenata*	1
Equisetum arvensis	3	*Iris pseudacorus*	2
Juncus inflexus	5	*Pulicaria dysenterica*	2
Bare rock/hardstanding	0		
Bare soil	5%		
Leaf litter/ thatch	0		
Permanent open water	0		

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

Damp shallow ditch in semi-improved grassland field (cattle grazed later in the year). Marshy grassland/swamp vegetation in ditch transitioning to species poor semi-improved grassland. Occasional hawthorn scrub and scattered trees.

Photo 3. Damp shallow ditch with marshy grassland/swamp vegetation

Project Name	Sunnica	Date	9/7/19	Recorders	MP, CL	Area	T4	Photo ref.	4,5	Sheet no.	

Broad vegetation type	Swamp ☐ Grassland X Mire ☐ Tall-herb ☐ Heath ☐ fen ☐ Maritime ☐ Open habitat	Substrate	Acid ☐ Calcareous ☐ Neutral X Not known ☐	Condition	Improved ☐ Semi-improved X Unimproved ☐ Not relevant ☐

Hydrology	Wet ☐ Transitional ☐ Dry X	Age/ origin	Sown/recent origin ☐ Semi-natural X	Aspect	n/a	Slope	n/a	Water Depth	n/a

Layers Mean Height	0.8	m	0.2	m		cm		mm	Habitat Area	10	m x	80	m
Layers Cover	20	%	95	%		%		%	Quadrat/sample size	4	m x	4	m

Quadrat	1		2		3		4		5		Frequency (I-V)
Quadrat Grid Reference	TL63806838		TL63796841		TL63776841		TL63736846		TL63696847		
Species List	%	Domin	%	Domin	%	Domin	%	Domin	%	Domin	
Agrostis stolonifera		4		2						3	III
Arrhenatherum elatius		4		5		6		5		5	V
Dactylis glomerate		3		4		4		3		2	V
Festuca rubra		8		6		6		6		7	V
Plantago lanceolate		4		4		3		8		5	V
Lathyrus pratensis		3		4		4		5		2	V
Trifolium pratense		3		1		1				3	IV
Potentilla reptans		5		3		4		1		2	V
Vicia cracca		2		3		3				3	IV
Medicago lupulina		2								1	II
Cirsium arvense		3		2							II
Prunus spinosa		1									I
Holcus lanatus				3		3		5		2	IV
Galium verum				2		2				4	III
Carex hirta				1		1				1	III
Rumex acetosa				1							I
Leucanthemum vulgare								4		3	II
Heracleum sphondylium								1		1	II
Crataegus monogyna (seedling)								1			I
Trisetum flavescens								1			I
Achillea millefolium								1			I
Taraxacum officinale aggregate								1			I
Equisetum arvense								1			I
Senecio erucifolius										2	I
Centaurea debeauxii										4	I
Phleum bertolonii										2	I
Pseudoscleropodium purum										3	I
Festuca pratense										2	I

Rubus fruticosa aggregate.										1	I
Bare rock/hardstanding											
Bare soil											
Leaf litter/ thatch											
Permanent open water											

Further information required, see back of sheet

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%
Quadrat sizes	Short herbaceous 2x2m; tall and more open herb communities 4x4m; species poor, very tall herbaceous 10x10m; linear features such as streams, ditches, verges can use strips e.g 1x4m, 2x8m.
Frequency	Number of quadrats which the species occurs in, use Roman numerals I to V, where I=20% of quadrats and V=100%.

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

More diverse, open sward of semi-improved neutral grassland adjacent to the River Snail. Cattle grazed later in the year. Some scrub along the river, none in the grassland.

Photo 4. Semi-improved grassland next to the River Snail

Photo 5. Close up of grassland

Other flora in wider habitat area- accurate typing of vegetation may require information on other flora present but missed by the quadrats

Other species noted include *Pulicaria dysenterica* and *Galium mollugo*) Marshy grassland/swamp areas to the north-east (see T5). Larger area of species poor semi-improved grassland to east dominated by *Arrhenatherum elatius* and *Cirsium arvense* (cattle grazed later in the year).

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%
Frequency	Number of quadrats which the species occurs in, use Roman numerals I to V.

Project Name	Sunnica	Date	9/7/19	Recorders	MP, CL	Area	T5	Photo ref.	6,7	Sheet no.	

Broad vegetation type	Swamp X Mire ☐ Heath ☐ Maritime ☐	Grassland X Tall-herb ☐ fen ☐ Open habitat	Substrate	Acid ☐ Calcareous ☐ Neutral X Not known ☐	Condition	Improved ☐ Semi-improved X Unimproved ☐ Not relevant ☐
Hydrology	Wet ☐ Dry ☐	Transitional X	Age/ origin	Sown/recent origin ☐ Semi-natural X	Aspect n/a	Slope n/a Water Depth n/a

Layers Mean Height	1.25	m	0.6	m		cm		mm	Habitat Area	50	m x	100	m
Layers Cover	100	%	10	%		%		%	Quadrat/sample size	10	m x	10	m

Quadrat	1		2		3		4		5		Frequency (I-V)
Quadrat Grid Reference	TL63706852		TL63686854		TL63726863		TL63706863		TL63686863		
Species List	%	Domin	%	Domin	%	Domin	%	Domin	%	Domin	
Elytrigia repens		7		2		7		2			IV
Holcus lanatus		5		5		4		5		3	V
Juncus inflexus		5				6					II
Carex hirta		2		5		2		4		3	V
Agrostis stolonifera		2		7				2		3	IV
Phleum pratensis		4		3							II
Arrhenatherum elatius		3						2			II
Sonchus arvensis		2				3					II
Rumex obtusifolius		1				1					II
Rumex crispus		1		1							II
Ranunculus repens		2		5							II
Senecio erucifolius				1							I
Sonchus asper				1							I
Festuca arundinacea				2							I
Plantago major				1							I
Poa trivialis						2					I
Dactylis glomerate						4					I
Cirsium arvense						2					I
Phalaris arundinacea								6		10	II
Equisetum arvense										2	I
Bare rock/hardstanding											
Bare soil											
Leaf litter/ thatch			2				5		6		
Permanent open water											

Further information required, see back of sheet

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%
Quadrat sizes	Short herbaceous 2x2m; tall and more open herb communities 4x4m; species poor, very tall herbaceous 10x10m; linear features such as streams, ditches, verges can use strips e.g 1x4m, 2x8m.
Frequency	Number of quadrats which the species occurs in, use Roman numerals I to V, where I=20% of quadrats and V=100%.

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations
Marshy grassland and swamp mosaic, dominated by Elytrigia repens, Holcus lanatus and Carex hirta, with locally dominant stands of Phalaris arundinacea. Cattle grazed later in the year. No standing water but damp soil (July 2019).

Photo 6. Marshy grassland with swamp and S.I. grassland

Photo 7. *Phalaris arundinacea* swamp

Other flora in wider habitat area- accurate typing of vegetation may require information on other flora present but missed by the quadrats
Species poor semi-improved grassland to the south dominated by *Arrhenatherum elatius* and *Cirsium arvense* (cattle grazed later in the year). Arable field to the north (onions).

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%
Frequency	Number of quadrats which the species occurs in, use Roman numerals I to V.

Project Name	Sunnica	Date	9/7/19	Recorders	MP, CL	Area	T6	Photo ref.	8,9	Sheet no.	

Broad vegetation type	Swamp ☐ Grassland X Mire ☐ Tall-herb ☐ Heath ☐ fen ☐ Maritime ☐ Open habitat	Substrate	Acid X Calcareous ☐ Neutral ☐ Not known ☐	Condition	Improved ☐ Semi-improved ☐ Unimproved X Not relevant ☐

Hydrology	Wet ☐ Transitional ☐ Dry X	Age/ origin	Sown/recent origin ☐ Semi-natural X	Aspect	n/a	Slope	n/a	Water Depth	n/a

Layers Mean Height	0.2	M		m		cm		mm	Habitat Area	250	m x	400	m
Layers Cover	90	%		%		%		%	Quadrat/sample size	2	m x	2	m

Quadrat	1		2		3		4		5		Frequency (I-V)
Quadrat Grid Reference	TL69217292		TL69197292		TL69097292		TL69047283		TL69057276		
Species List	%	Domin	%	Domin	%	Domin	%	Domin	%	Domin	
Arenaria serpyllifolia		2		2		3		1		1	V
Medicago minima (Nationally Scarce)		4									I
Crepis capillaris		4		4		2		2		2	V
Sedum acre		1									I
Bromus hordeaceus		4		2		2		3		5	V
Agrostis capillaris		7		5		5		5		4	V
Plantago lanceolata		3		4		5		4		4	V
Rumex acetosella		3		2		3		5		3	V
Echium vulgare		2						4		1	III
Erodium cicutarium		3						2		2	III
Geranium molle		2		1						1	III
Carex hirta		2									I
Trifolium campestre		2									I
Trifolium arvensis		3		3		4		5		5	V
Hypochaeris radicata		2		2							II
Trisetum flavescens		1		1		3					III
Phleum bertolonii		3		1		1		1			IV
Taraxacum officinale aggregate		1		1						1	III
Quercus robur		1									I
Holcus lanatus				1							I
Galium verum				3		5		4		4	IV
Achillea millefolium				3		4		2		2	IV
Trifolium repens				1							I
Dactylis glomerata				3							I
Jacobaea vulgaris				1							I
Convolvulus arvensis				2							I
Scleranthus annuus								1			I
Anthoxanthum odoratum						3					I

Silene latifolia				1				1			II
Arrhenatherum elatius		2		2							II
Ononis repens						1					I
Lotus corniculatus						3					I
Rhytidiadelphus squarrosus		3		2							II
Koeleria macrantha						4					I
Cerastium semidecandrum						2		1			II
Leontodon saxatile						1		1			II
Plantago coronopus								2			I
Hypochaeris glabra								1		1	II
Aira caryophyllea								1			I
Bare rock/hardstanding											
Bare soil	10%		8%		2%		5%		15%		
Leaf litter/ thatch	25%		10%		2%		5%		5%		
Permanent open water											

Further information required, see back of sheet

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%
Quadrat sizes	Short herbaceous 2x2m; tall and more open herb communities 4x4m; species poor, very tall herbaceous 10x10m; linear features such as streams, ditches, verges can use strips e.g 1x4m, 2x8m.
Frequency	Number of quadrats which the species occurs in, use Roman numerals I to V, where I=20% of quadrats and V=100%.

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

Short turf acid grassland, with part of the field designated as Worlington Heath Country Wildlife Site. Horse grazed (2 horses) some damp depressions in the field (see notes below). Some taller grassland. Also includes part of field to east with short acid grassland and cut occasionally with tractor mower.

Photo 8. Short acid grassland

Photo 9. Site overview

Other flora in wider habitat area- accurate typing of vegetation may require information on other flora present but missed by the quadrats

Spergula arvensis present outside quadrats at TL69019 72963. A few damp depressions (see photo 9) with marshy grassland with *Rorippa palustris, Lythrum salicaria, Mentha aquatica, Myosotis laxa, Juncus bufonis, Potentilla anserina, Persicaria amphibia, Eleocharis palustris, Lysimachia vulgaris, Lycopus europaeus* and *Holcus lanatus*.

Project Name	Sunnica	Date	10/7/19	Recorders	MP, CL	Area	T7	Photo ref.	10	Sheet no.	

Broad vegetation type	Swamp ☐ Mire ☐ Heath ☐ Maritime ☐ Grassland X Tall-herb fen ☐ Open habitat ☐	Substrate	Acid X Calcareous ? Neutral X Not known ☐	Condition	Improved ☐ Semi-improved X Unimproved X Not relevant ☐
Hydrology	Wet ☐ Dry X Transitional ☐	Age/ origin	Sown/recent origin ☐ Semi-natural X	Aspect	S

Slope	5%	Water Depth	n/a

Layers Mean Height	0.5	M		m		cm		mm	Habitat Area	20	m x	100	m
Layers Cover	85	%		%		%		%	Quadrat/sample size	4	m x	4	m

Quadrat	1		2		3		4		5		Frequency (I-V)
Quadrat Grid Reference	TL69087253		TL69127248		TL69147246		TL69157243		TL69177241		
Species List	%	Domin	%	Domin	%	Domin	%	Domin	%	Domin	
Anisantha diandra		5		6		5		6		4	V
Echium vulgare		2				1		4			III
Plantago lanceolata		4		2		1		1		2	V
Jacobaea vulgaris		3									I
Galium verum		5		1		4		4		1	V
Elytrigia repens		3		4		4		3		3	V
Lycopsis arvensis		1									I
Carex arenaria		4		6		6		4		8	V
Agrostis capillaris		1		1				3			III
Vulpia myuros		2						2		2	III
Agrostis stolonifera		2									I
Bromus hordeaceus		3		3		1		1		2	V
Quercus robur (seedling)		1									I
Arenaria serpyllifolia		2		2		2					III
Erodium cicutarium		2		2				2			III
Chenopodium album		1		1		1				1	IV
Achillea millefolium		3		2							II
Silene latifolia		3		1		3		3		3	V
Sedum acre				1							I
Avena fatua				1							I
Erigeron canadensis				2							I
Urtica dioica				3				2		1	III
Artemisia vulgaris				3				4			II
Lactuca virosa						2					I
Arrhenatherum elatius						2					I
Hypochaeris radicata						1					I
Dactylis glomerate						2		3		2	III
Taraxacum officinale aggregate						1				1	II

Senecio vulgaris						1		1			II
Lolium perenne								2			I
Reseda luteola										2	I
Bare soil/sand	15%		5%		15%		10%		5%		
Leaf litter/ thatch	20%		10%		30%		20%		30%		

Further information required, see back of sheet

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%
Quadrat sizes	Short herbaceous 2x2m; tall and more open herb communities 4x4m; species poor, very tall herbaceous 10x10m; linear features such as streams, ditches, verges can use strips e.g 1x4m, 2x8m.
Frequency	Number of quadrats which the species occurs in, use Roman numerals I to V, where I=20% of quadrats and V=100%.

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

Grassland strip c.20m wide between fields with *Carex arenaria* abundant. No obvious management, potential future shading from trees. Pig field to south.

Photo 10. Acid grassland vegetation dominated by *Carex arenaria*

Other flora in wider habitat area- accurate typing of vegetation may require information on other flora present but missed by the quadrats

Cynoglossum officinale also present outside of quadrats.

Project Name	Sunnica	Date	10/7/19	Recorders	MP, CL	Area	T8	Photo ref.	11	Sheet no.	

Broad vegetation type	Swamp ☐ Grassland X Mire ☐ Tall-herb fen ☐ Heath ☐ Open ☐ Maritime ☐ habitat	Substrate	Acid X Calcareous ☐ Neutral ☐ Not known ☐	Condition	Improved ☐ Semi-improved X Unimproved X Not relevant ☐
Hydrology	Wet ☐ Transitional ☐ Dry X	Age/ origin	Sown/recent origin ☐ Semi-natural X	Aspect	n/a

Slope	n/a	Water Depth	n/a

Layers Mean Height	0.3	M		m		cm		mm	Habitat Area	200	m x	70	m
Layers Cover	90	%		%		%		%	Quadrat/sample size	2	m x	2	m

Quadrat	1		2		3		4		5		Frequency (I-V)
Quadrat Grid Reference	TL68987281		TL68957280		TL68947274		TL68937268		TL68977250		
Species List	%	Domin	%	Domin	%	Domin	%	Domin	%	Domin	
Agrostis capillaris		1		2		2		3		4	V
Cynoglossum officinale				1							I
Erodium cicutarium		2		1		2		1		2	V
Holcus lanatus		1		1							II
Cirsium arvense		2									I
Trifolium arvense		4		6		4		5		5	V
Echium vulgare		4		4		4		1		4	V
Jacobaea vulgaris		4		3		3					III
Silene conica (N.S)		2									I
Medicago minima (N.S.)		3				1		3			III
Vulpia ciliata ssp.*ambigua (N.S.)*		1									I
Arenaria leptoclados		5		4		2					III
Plantago lanceolata		4		2		5		5		5	V
Rumex acetosella		2		4		2				3	IV
Anthoxanthum odoratum		1		5							II
Anisantha diandra		3		2		3					III
Hypochaeris radicata		1									I
Crepis capillaris		2		1		1					III
Vulpia bromoides		3		4		4		7		3	V
Linaria vulgaris		1						1			II
Anthyllis vulneraria						2					I
Reseda luteola						1		1			II
Pilosella officinalis						3					I
Taraxacum officinale aggregate						2				1	II
Dactylis glomerata						1					I
Galium verum						1		4			II
Trifolium campestre								2			I

Silene latifolia								1		1	II
Geranium molle								1			I
Viola arvensis						1		1			II
Convolvulus arvensis										2	I
Agrostis stolonifera										1	I
Viola x *contempta*										1	I
Tripleurospermum inordorum										1	I
Hypochaeris glabra (uncommon)										1	I
Bare soil/sand	20%		5%		20%		5%		15%		
Leaf litter/ thatch					2%		10%		5%		

Further information required, see back of sheet

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%
Quadrat sizes	Short herbaceous 2x2m; tall and more open herb communities 4x4m; species poor, very tall herbaceous 10x10m; linear features such as streams, ditches, verges can use strips e.g 1x4m, 2x8m.
Frequency	Number of quadrats which the species occurs in, use Roman numerals I to V, where I=20% of quadrats and V=100%.

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

Species rich acid grassland similar to T6 (County Wildlife Site area to the east). Occasionally cut by tractor mower (seen cutting in June and August). Arable field to west and north. Three Nationally Scarce (N.S) and an 'uncommon' species recorded (Stace, 2020).

Photo 11. Acid grassland vegetation

Project Name	Sunnica	Date	10/7/19	Recorders	MP, CL	Area	T9	Photo ref.	12	Sheet no.	

Broad vegetation type	Swamp ☐ Grassland X Mire ☐ Tall-herb fen ☐ Heath ☐ Open habitat ☐ Maritime ☐	Substrate	Acid X Calcareous ☐ Neutral X Not known ☐	Condition	Improved ☐ Semi-improved X Unimproved X Not relevant ☐
Hydrology	Wet ☐ Transitional ☐ Dry X	Age/ origin	Sown/recent origin ☐ Semi-natural X	Aspect n/a	Slope n/a Water Depth n/a

Layers Mean Height	0.5	M		m		cm		m m	Habitat Area	2500m2			
Layers Cover	100	%		%		%		%					

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

Acid/dune grassland strip similar to T7 so not surveyed in detail, comprising a c.30m wide strip adjacent to Country Wildlife Site (T6) (to the east). *Carex arenaria* abundant, *Jacobaea vulgaris* frequent and occasional *Anthyllis vulneraria, Cynoglossum officinale, Linaria vulgaria*. Scattered planted trees including *Pinus sylvestris*, *Pinus nigra* ssp. *larico*, *Crateagus monogyna* and *Eucalyptus* sp. Newly planted hedge. No management is obvious, potential future shading from trees. Arable field (carrots) to west and T8 to the south.

Photo 12. Unmanaged acid/dune grassland vegetation with scattered trees.

Project Name	Sunnica	Date	16/7/19	Recorders	MP	Area	T10 (a,b,c)	Photo ref.	12,13	Sheet no.	

Broad vegetation type					Substrate			Condition		
	Swamp	X	Grassland	X		Acid	☐		Improved	☐
	Mire	☐	Tall-herb fen	☐		Calcareous	☐		Semi-improved	X
	Heath	☐	Open habitat	☐		Neutral	☐		Unimproved	X
	Maritime	☐				Not known	X		Not relevant	☐

Hydrology					Age/ origin			Aspect	n/a	Slope	n/a	Water Depth	0.5m
	Wet	X	Transitional	X		Sown/recent origin	X						
	Dry	X				Semi-natural	X						

Layers Mean Height		M		m		cm		mm	Habitat Area	2.9 ha set-aside field
Layers Cover		%		%		%		%		800m ditch length

Species List T10a – Drain margins	DAFOR	Species List T10b – aquatic/emergent	DAFOR	Species List 10c – set-aside	DAFOR
Phragmites australis	D	*Alisma plantago-aquatica*	O	*Persicaria maculosa*	F
Eupatorium cannabinum	O	*Juncus effusus*	F	*Plantago lanceolata*	O
Sonchus arvensis	R	*Lemna trisulca*	F	*Tripleurospermum inodorum*	F
Agrostis stolonifera	O	*Filipendula ulmaria*	O	*Hypochaeris radicata*	O
Arrhenatherum elatius	O	*Eupatorium cannabinum*	F	*Elytrigia repens*	F
Elytrigia repens	O	*Phragmites australis*	A	*Capsella bursa-pastoris*	O
Melilotus officinalis	R	Open water	50%	*Crepis capillaris*	R
Calystegia sepium	O	Species List 10c – set-aside		*Trifolium dubium*	R
Chenopodium album	R	*Helminthotheca echioides*	F	*Scorzoneroides autumnalis*	R
Galeopsis bifida	R	*Chenopodium album*	F	*Sisymbrium officinalis*	O
Papaver rhoeas	R	*Sinapis arvensis*	O	*Lycopsis arvensis*	R
Reseda lutea	R	*Agrostis stolonifera*	O	*Agrostis gigantea*	R
Papaver somniferum	R	*Tussilago farfara*	O	*Lepidium didymum*	O
Stachys palustris	O	*Polypogon monspeliensis (N.S)*	R	*Erigeron canadensis*	F
Lythrum salicaria	O	*Sisymbrium altissimum*	R	*Festuca rubra*	O
Centaurea debeauxii	R	*Anisantha diandra*	O	*Fallopia convolvulus*	R
		Hypochaeris glabra	R	*Artemisia vulgaris*	F
		Barbarea vulgaris	R	Bare ground	40%

DAFOR	D= Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

Notes made on selected habitats in a large open arable and pig rearing area to the north west of the site (Sunnica East). Habitats comprise a drain, with emergent and marginal vegetation and a set-aside field. Note that aquatic macrophytes not surveyed in detail (where present).

Photo 12. Drain with Phragmites australis dominant

Photo 13. Set-aside field

Project Name	Sunnica	Date	16/7/19	Recorders	MP	Area	T11	Photo ref.	14, 15	Sheet no.	

Broad vegetation type	Swamp ☐ Grassland X Mire ☐ Tall-herb fen ☐ Heath ☐ Open habitat ☐ Maritime ☐	Substrate	Acid ☐X Calcareous ☐ Neutral ☐ Not known	Condition	Improved ☐ Semi-improved X Unimproved X Not relevant ☐

Hydrology	Wet ☐ Transitional ☐ Dry X	Age/ origin	Sown/recent origin ☐ Semi-natural X	Aspect	South/west	Slope	0-10 %	Water Depth	n/a

Layers Mean Height	0.8	M	0.3	m		cm		mm	Habitat Area	0.7 ha			
Layers Cover	50	%	80	%		%		%	Quadrat/sample size	4	m x	4	m

Quadrat	1		2		3		4		5		Frequency (I-V)
Quadrat Grid Reference	TL7083672190		TL7083272184		TL7085672146		TL7088172140		TL7087672080		
Species List	%	Domin	%	Domin	%	Domin	%	Domin	%	Domin	
Festuca rubra		1		3		3		3		3	V
Scabiosa columbaria		1				2				1	III
Crepis capillaris		3		2		2		1		1	V
Arrhenatherum elatius		5		6		5		5		5	V
Plantago lanceolata		4		4		4		4		3	V
Daucus carota		4		2		3		2		2	V
Linaria vulgaris		3		3		1				4	IV
Achillea millefolium		2		1						2	III
Dactylis glomerata		4		3		3		4		5	V
Pilosella officinarum		1									I
Glechoma hederacea										2	I
Bromus hordeaceus		4		2		3		1		3	V
Trifolium campestre		3		2		3					III
Phleum bertolonii		4		1		2				3	IV
Jacobaea vulgaris		3		1		1		1			IV
Vicia sativa sub-species *nigra*		1				1					II
Deschampsia cespitosa		1									I
Pastinaca sativa		2		1		2		2			IV
Rubus fruticosa aggregate		5		1						1	III
Cirsium arvense				4		1		3		1	IV
Cornus sp. (seedling)				1							I
Carduus crispus				1				1		1	III
Cynoglossum officinale				1				1			II
Rosa species (seedling)				1		1				1	III
Torilis japonica				1		2					II
Hypochaeris radicata				1							I

Aninsantha sterilis				2		3					II
Agrimonia eupatoria						3					I
Helminthotheca echioides						2		1			II
Geranium columbinum						2		1			II
Erigeron canadensis						1					I
Erigeron acer						1					I
Centaurea scabiosa								2			I
Galium verum								2			I
Holcus lanatus						1		1		2	III
Agrostis stolonifera		3		2							II
Trisetum flavescens								1			I
Convolvulus arvensis								1			I
Inula conyza										1	I
Bare soil/sand	20%		5%		10%		7%		5%		
Leaf litter/ thatch	10%		20%		20%		40%		40%		

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%
Quadrat sizes	Short herbaceous 2x2m; tall and more open herb communities 4x4m; species poor, very tall herbaceous 10x10m; linear features such as streams, ditches, verges can use strips e.g 1x4m, 2x8m.
Frequency	Number of quadrats which the species occurs in, use Roman numerals I to V, where I=20% of quadrats and V=100%.

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

A small area of semi-improved to unimproved species calcareous grassland within a wider area of species poor semi-improved grassland and scrub. A diverse range of species (38 within the quadrats), including red fescue, smooth hawk's-beard, small scabious *Scabiosa columbaria*, false oat-grass, ribwort plantain, wild carrot, cock's-foot and soft brome. Other localised calcareous indicators in small numbers include welted thistle *Carduus crispus* and ploughman's-spikenard *Inula conyza*. No sign of recent management, with some vehicle access causing disturbance across the site and some spray drift along the edges. Bramble *Rubus fruticosa* aggregate scrub encroachment and frequent creeping thistle *Cirsium arvense* and common ragwort. Large arable field to west.

Photo 14. Site overview

Photo 15. Close-up of vegetation with *Scabiosa columbaria*

Project Name	Sunnica	Date	16/7/19	Recorders	MP, CL	Area	T12	Photo ref.	16	Sheet no.	

Broad vegetation type	Swamp ☐ Grassland X Mire ☐ Tall-herb fen ☐ Heath ☐ Open habitat ☐ Maritime ☐	Substrate	Acid X Calcareous X Neutral ☐ Not known ☐	Condition	Improved ☐ Semi-improved X Unimproved ☐ Not relevant ☐
Hydrology	Wet ☐ Transitional ☐ Dry X	Age/ origin	Sown/recent origin X Semi-natural X	Aspect N	Slope 5% Water Depth n/a

Layers Mean Height	0.6	M		m		cm		mm	Habitat Area	15	m x	500	m
Layers Cover	100	%		%		%		%					

Species List	DAFOR				
Holcus lanatus	F				
Agrostis stolonifera	O				
Arrhenatherum elatius	F				
Cynoglossum officinale	R				
Carduus nutans	R				
Chenopodium album	F				
Cirsium arvense	R				
Trifolium arvense	R				
Papaver rhoeas	R				
Achillea millefolium	O				
Echium vulgare	O				
Artemisia vulgaris	F				
Descurainia sophia	O				
Nepeta cataria (an uncommon species)	R				
Agrostis capillaris	O				

DAFOR: D= Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

Semi-improved field margin strip 10-20m wide between woodland and arable field. Light acidic sandy soil with some calcareous influence Light acidic sandy soil with some calcareous influence. No management is obvious. Shading from pine plantation to the south. Arable field (sweetcorn) to north. One 'uncommon' species (Stace, 2020) *Nepeta cataria* is present along access track.

Photo 16. Set-aside grassland vegetation.

Project Name	Sunnica	Date	14/5/20	Recorders	MP	Area	T13	Photo ref.	17,18	Sheet no.	

Broad vegetation type	Swamp ☐ Grassland X Mire ☐ Tall-herb fen ☐ Heath ☐ Open habitat ☐ Maritime ☐	Substrate	Acid X Calcareous ☐ Neutral ☐ Not known ☐	Condition	Improved ☐ Semi-improved X Unimproved X Not relevant ☐
Hydrology	Wet ☐ Transitional ☐ Dry X	Age/ origin	Sown/recent origin X Semi-natural X	Aspect N	Slope N Water Depth n/a

Layers Mean Height	0.1	m		m		cm		mm	Habitat Area	25	m x	200	m
Layers Cover	70	%		%		%		%	Quadrat/sample size	2	m x	2	M

Quadrat	1		2		3		4		5		Frequency (I-V)
Quadrat Grid Reference	TL68987281		TL68957280		TL68947274		TL68937268		TL68977250		
Species List	%	Domin	%	Domin	%	Domin	%	Domin	%	Domin	
Agrostis capillaris		5		6		6		4		4	V
Sedum acre		3		3		3		2		2	V
Erodium cicutarium		2		1		1		2		1	V
Holcus lanatus		2		1		2		2		2	V
Poa pratense		3		2							II
Trifolium arvense		2				3		2		2	IV
Echium vulgare		4		4		4		2		2	V
Cerastium semidecandrum		4		2		2					
Medicago minima				2		1		1			
Arenaria leptoclados						1				1	II
Plantago lanceolata		4		4		4		5		5	V
Rumex acetosella		2		2		3		3		2	V
Anisantha sterilis		4		4				4			III
Pilosella officinalis								4			I
Cerastium glomerata						1					I
Reseda lutea						2					I
Vulpia bromoides										1	I
Vicia lathyroides						2					I
Achillea millefolium				1		3		3		3	IV
Dactylis glomerata								1			I
Bromus hordeaceus								1			I
Hypnum cupressiforme								2		3	II
Anthoxanthum odoratum										3	I
Anisantha diandra										1	I
Silene latifolia				1							I
Geranium molle								1			I
Festuca rubra agg				2							I
Convolvulus arvensis				1		2		2		1	IV
Brachythesium albicans		4		3		3		2			IV
Hypochaeris glabra (uncommon)		1									I

Koeleria macrantha								1		2	II
Bare soil/sand	30%		30%		15%		40%		45%		
Leaf litter/ thatch	2%		2%		5%		4%		2%		

Domin scale	1: few individuals, 2: several individuals, 3: many individuals, 4: 4-10%, 5: 11-25%, 6: 26-33%, 7: 34-50%, 8: 51-75%, 9: 76-90%, 10: 91-100%
Quadrat sizes	Short herbaceous 2x2m; tall and more open herb communities 4x4m; species poor, very tall herbaceous 10x10m; linear features such as streams, ditches, verges can use strips e.g 1x4m, 2x8m.
Frequency	Number of quadrats which the species occurs in, use Roman numerals I to V, where I=20% of quadrats and V=100%.

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

A grassland strip with a similar species composition and community type as T6 and T8. Previously cut, probably similar to T8 by tractor mower. Pig field to west and woodland to east.

Photo 17. Site overview

Photo 18. Close up of vegetation

Project Name	Sunnica	Date	16/7/19	Recorders	MP	Area	T14	Photo ref.	19,20	Sheet no.	

Broad vegetation type	Swamp ☐ Grassland X Mire ☐ Tall-herb fen ☐ Heath ☐ Open habitat ☐ Maritime ☐	Substrate	Acid ☐X Calcareous ☐ Neutral ☐ Not known	Condition	Improved ☐ Semi-improved ☐ Unimproved X Not relevant ☐
Hydrology	Wet ☐ Transitional ☐ Dry X	Age/ origin	Sown/recent origin ☐X Semi-natural	Aspect n/a	Slope 10% Water Depth n/a

Layers Mean Height	0.3	M		m		cm		mm	Habitat Area	20	m x	500	m
Layers Cover	90	%		%		%		%					

Species List	DAFOR	Species List	DAFOR		
Origanum vulgare	A	*Reseda luteola*	R		
Plantago lanceolata	F	*Campanula glomerata*	O		
Galium verum	F	*Rubus fruticosa* aggregate	F-LA		
Centaurea scabiosa	O	*Achillea millefolium*	F		
Daucus carota	F	*Anisantha sterilis*	O		
Arrhenatherum elatius	A	*Arenaria serpyllifolia*	R		
Dactylis glomerata	F	*Malva sylvestris*	O		
Bromus hordeaceus	O	*Medicago sativa* ssp. *falcata* (N.S)	O		
Silene latifolia	O	*Medicago sativa* nothosubspecies*varia* (N.S)	R		
Leucanthemum vulgare	O	*Clinopodium acinos (uncommon)*	O		
Lotus corniculatus	O	*Filipendula vulgaris*	R		
Anthriscus sylvestris	O	*Silene vulgaris*	R		
Scabiosa columbaria	O-F	*Potentilla sanguisorba*	R		
Hypericum calycinum	LA	*Campanula rotundifolia*	R		
Bare ground	5%				
DAFOR	D= Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare (L= Locally)				

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

Tall unmanaged grassland and tall ruderal herbs with calcareous influences around an irrigation reservoir, surrounded by arable fields. Higher species diversity on the exposed top of the banks, including two National Scarce (N.S) *Medicago sativa ssp. falcata* and *Medicago sativa notho* subspecies *varia* and an uncommon species wild basil *Clinopodium acinos* (Stace, 2020).

Photo 19. Site overview

Photo 20. Close up of vegetation

Project Name	Sunnica	Date	31/7/19	Recorders	MP	Area	T15	Photo ref.	21	Sheet no.	

Broad vegetation type	Swamp ☐ Grassland X Mire ☐ Tall-herb fen ☐ Heath ☐ Open habitat ☐ Maritime ☐	Substrate	Acid ☐ Calcareous ☐ Neutral X Not known ☐	Condition	Improved ☐ Semi-improved X Unimproved ☐ Not relevant ☐
Hydrology	Wet ☐ Transitional ☐ Dry X	Age/ origin	Sown/recent origin X Semi-natural X	Aspect n/a	Slope 0 Water Depth n/a

Layers Mean Height	0.5	M	0.2	m		cm		mm	Habitat Area	5	m x	100	m
Layers Cover	50	%	20	%		%		%					

Species List	DAFOR	Species List	DAFOR		
Verbascum nigrum	R	*Achillea millefolium*	F		
Conium maculatum	O	*Anisantha diandra*	O		
Arrhenatherum elatius	O	*Echium vulgare*	F		
Dactylis glomerata	F	*Vulpia myuros*	O		
Geranium pyrenaicum	O	*Geranium mole*	O		
Silene latifolia	R	*Bromus hordeaceus*	O		
Trifolium dubium	O	*Filago germanica*	LF		
Scorzoneroides autumnalis	O				
Bare ground	30%				
DAFOR	D= Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare (L= Locally)				

Descriptive notes: negative indicators species (weeds), shrub/tree cover, management regime, other impacts, limitations

Short perennial/ephemeral and unmanaged semi-improved grassland along track. Arable wheat field to south and hedge/plantation woodland to north.

Photo 21. Site overview with *Filago germanica* in foreground