Wilder Ecology

Powering Communities and Nature: a holistic approach to solar generation

Over a decade of monitoring at Broxted Estate Solar Farm, Suffolk

Suffolk Wildlife Trust

July 2026

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Foreword from the Landowner

The main purpose of this report is twofold.

First to comment on the results, thus far, of some remarkable ecological surveys relating to the Solar Farm and surrounding area at Broxted. We believe these systematic surveys, which have been ongoing since 2013, represent one of the earliest of their scope and size in Europe. Second, to share our experiences with the intention of being of assistance to future solar schemes. We passionately believe that solar is the energy source of the 21st Century but is best delivered in a way which encompasses the clear and pressing need for energy with the needs of wildlife and the Community too. Importantly, alongside the delivery of biodiversity outcomes, the solar farm has generated over 350 GWhs of clean electricity for the local network since commissioning, avoiding many tens of thousands of tonnes of CO_2 emissions.

Invaluable as we hope it to be, this report should be seen as 'progress to date'. Together with our partners Cubico Sustainable Investments (Cubico)[1] and Suffolk Wildlife Trust (SWT), we are planning for the entirety of the 21st Century! We too are learning all the time and trying to implement such learning with vigour and rigour.

There are two watchwords from our experience at Broxted, which I would emphasise.

The first is 'partnership'. The second is 'integrated'. They have been fundamental to Broxted's success to date.

Our key partners at Broxted have been Cubico and SWT and together we form the Environmental Management Group (EMG) which dictates the conservation strategy at Broxted. The partnership between landowner and Solar Farm operator is fundamental in delivering a successful holistic approach. Cubico are exceptional partners in all respects and we share with them a long term vision for solar coupled with an unbending commitment to

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[1] *The Broxted Solar Project is jointly owned by GLIL Infrastructure and Cubico Sustainable Investments, with Cubico holding a majority stake and serving as the project manager.*

conservation, biodiversity and Community. Together we are committed to implementing these shared values throughout the 21st Century. Our partnership with SWT is of equal import, ensuring delivery of our commitment to conservation and biodiversity. From the inception of the Broxted Estate in 2011, SWT's advice and expertise has been outstanding. Again a partnership which we envisage to encompass the 21st Century.

But our partnerships at Broxted go much further. We have been fortunate to have a 'coalition of experts' who have helped forge Broxted over the last decade or so. Experts in woodland, hedgerows, livestock, arable farming and much more; their contributions are invaluable. I should also record the excellent strategic advice, from inception, of our agents Bidwells, in particular Ben Taylor. Quite aside from these professional relationships, we have created an informal 'Brains Trust' of local experts – experts on history, ornithology and entomology – all of whose input has been invaluable too.

And finally, there is our partnership with the Community, in particular the village of Hundon within which most of Broxted lies. Their interest and engagement is a constant source of encouragement and inspiration.

Land use and the rural landscape are constantly evolving - Broxted is very much a case in point - to meet society's needs and aspirations. The land has always been used as a source of energy and solar is the latest variant, but it needs to be a source marching in step with the Community, the landscape and the wider ecology. I hope this report helps in giving some modest guidance towards how this can be successfully achieved.

The report itself has been compiled by SWT and, on behalf of Navigator and Cubico, I thank them mightily. The main author is Simone Bullion, who led SWT's involvement with Broxted from the very beginning until her retirement in 2022. In writing the report she has been greatly assisted by Jo Green, Ellen Shailes and Alison Looser of SWT's Wilder Ecology consultancy. There are many other members of the SWT team who have contributed so much to Broxted, the surveys and ultimately this report. In particular I should mention Juliet Hawkins, Steve Piotrowski, Edward Jackson, David Hodkinson, Susan Stone and Jonny Stone. Their contribution to Broxted is immeasurable.

Finally, please remember that this is a progress report – I look forward to sharing the next instalment in about 10 years' time!

Charles Ryder

Navigator Land LLP

July 2026

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Executive Summary

Broxted Solar Farm lies within the Broxted Estate in west Suffolk. The landscape is predominantly arable, along with a range of lowland farmland habitats including grasslands, woodlands, hedgerows and ponds. When the solar farm began to produce energy in December 2013, it was the second largest in the UK. Notably, it was designed from the outset to be grazed by sheep and therefore represents a pioneering example of agrivoltaic technology at scale. Although larger schemes have since been developed, Broxted Solar Farm remains significant and provides an important case study for renewable energy generation alongside farming and biodiversity enhancement.

Photo 1: Common blue butterfly at Broxted Estate

This report covers the results of 12 years of ecological surveying within the Broxted Solar Farm and other parts of the Estate, whilst providing recommendations and guidance for other solar developments based on these data and our experiences.

The key findings from this report are summarised below:

- **Fundamental to the successful delivery of positive biodiversity outcomes was the early provision of an Integrated Management Strategy and the establishment of an active Environmental Management Group,** comprising the landowner, solar owner and ecological consultants. Consequently, biodiversity is embedded across multiple facets of the Estate enterprise, including energy generation, woodland enhancement, farming and food production and through community engagement. In contrast to most schemes, the solar farm habitat management has been retained by the landowner and is integral to that of the whole Estate and this delivers wider scale benefits.

- **The solar farm was constructed on 59 hectares of grassland of medium to very high distinctiveness but applying the mitigation hierarchy, the arrangement of the panels avoided most of the botanically rich areas.** The distance between the panel rows was also designed to be wider than is typical of many schemes, to reduce

the impact of shading and to benefit sheep grazing. The timing of construction was also carefully planned to limit impacts and there was no imported seed to any areas. In addition, two adjacent fields that had not been cultivated for some years were allocated to become 18 hectares of compensation grassland.

- **Botanical monitoring of the solar farm and compensation grassland commenced when construction was complete, using relocatable quadrats.** The influence of shading by the panels was noticeable very early on and this led to a rapid change in grassland condition. By four years there was a significant reduction in botanical species richness beneath the panels, with almost total loss of forbs. From there on, the grassland under the panels has stabilised to a mix of shade-tolerant grasses with creeping habit. This observation has implications for the type and condition of grassland that can realistically be achieved beneath solar panels when designing other schemes.

- **The wider spacing of the arrays allows sunlight to reach the grassland between the panel rows during the summer growth period, so the sward here is unaffected.** Notably, the introduction of extensive sheep grazing throughout the solar farm has provided significant improvements in the condition of the grassland in these and other areas of retained grassland, including the two compensation grasslands. Managing the grazing across the whole Estate, treating it as a much larger unit than just the solar farm itself, has been highly beneficial to implementing a sustainable, long-term grazing regime.

- **Two secondary woodlands are retained within the solar farm and these have improved in condition markedly due to sensitive management and the absence of deer browsing.** Consequently, where woodland can be retained within large solar schemes this can provide added ecological benefits, enhancing biodiversity on the site and beyond.

- **A retrospective Biodiversity Net Gain (BNG) assessment for the solar farm, the compensation grassland and the other significant grassland areas on the Estate indicates that twelve years on, there is a significant net gain in biodiversity units.** This is particularly due to the notable improvement in habitat condition of the unshaded grassland within the solar farm and the other areas of the Estate managed by grazing. The Statutory Metric calculations for these areas demonstrate an impressive biodiversity net gain of 41%. The Estate's Integrated Management Strategy, steered by the Environmental Management Group, has been key to delivering this success.

- **There is conflicting opinion on how the shaded habitat beneath solar panels should be defined in ecological terms, which has a bearing on the BNG outcome.** Considering the changes to the solar farm in isolation, these would have resulted biodiversity net loss of -8% if the shaded areas are defined as 'sealed surface' and a loss of over -1%, if defined as 'modified grassland'. This implies that construction of solar farms on existing grassland is highly unlikely to deliver a 10% Biodiversity Net Gain on the site alone, and that off-site compensation will be required.

- **The Broxted Estate is important for birds with 32 species recorded as breeding on site in 2025, including the globally threatened turtle dove.** Breeding and wintering bird surveys are undertaken annually. Within the solar farm the numbers of skylark, a bird of open habitats, have declined steadily, with no records after 2024. In contrast, the solar farm now has the highest population of meadow pipit compared to other areas on the Estate. Here, numbers have doubled in the last ten years, benefiting from the positive management and the panels acting as surrogate perches. This finding contrasts greatly with the regional trend for meadow pipit populations, which shows a notable decline during the same period.

- **Bat activity surveys, undertaken every five years, have recorded eight species of bat across the Estate,** although levels of activity within the solar farm are extremely low. Reptiles are also surveyed every five years. Common lizards are widespread within the solar farm and their populations have remained stable and appear to be increasing.

- **Community engagement is a key part of this solar project.** As well as the Broxted Solar Community Fund, a permissive footpath of over 3.5km was also created, with interpretation panels explaining the rich history of the site and its biodiversity. The landowner leads guided tours each year, sharing the ethos of the Integrated Management Strategy for the Estate to a wide range of stakeholders, local community and interested parties.

- **The positive outcomes for Broxted have been driven by the vision of the landowner,** who has built a closely aligned partnership with the solar owner and also with a third organisation, Suffolk Wildlife Trust. This collaboration has proved to be highly successful in enabling the delivery of multiple, interrelated objectives.

Introduction

Some 70 years after the land was requisitioned by the Ministry of Air (MoA), the Broxted Estate in south-west Suffolk was reacquired in 2011 by its original owners, the Ryder family, through their family partnership Navigator Land LLP. After much consideration, it became apparent that the Estate provided a significant opportunity to combine many aspects of rural land management with renewable energy generation, whilst still celebrating its history and biodiversity value and also supporting the local community. To help deliver this, the owners created an Integrated Management Strategy for the whole Estate, seeking to provide renewable energy generation alongside many facets of estate and farm management whilst supporting ecology and improving community access. At that time, the practice of using land for both energy generation and food production was relatively new. Broxted took it a stage further by delivering the concept of agrivoltaics at scale.

Today, a large solar farm operates alongside sheep and cattle grazing, arable farming with farmland bird enhancements, beneficial woodland management and new and restored hedges and ponds. The local community now has access via a permissive, surfaced, 3.8 km circular path around the former airfield perimeter track, with extensive views of farmland and its associated range of habitats.

The extensive grasslands of the former airfield had already been identified as being of ecological value, being designated as a County Wildlife Site in the 1990s. However, during their research into solar and ecology some 15 years ago, the owners realised that, at that time, there were very little data available anywhere in Europe on how operational solar farms influenced plant or bird assemblages. So this provided a valuable opportunity for investigation, albeit that many of the environmental factors are unique to this location.

Now more than 12 years after construction, we report on the ecological outcomes of constructing a solar farm on existing grassland and the effectiveness of its integration into the wider Broxted Estate, together with the initial results from the long term monitoring scheme. We also present an evaluation of whether this scheme delivers Biodiversity Net Gain (BNG), had this requirement been in force at the time of the planning consent. It is hoped that our experience can be treated as ‘lessons learned’ and that this case study will provide useful guidance for others planning similar schemes.

SECTION A

Implementing the Integrated Management Strategy

1. History of the site

The Estate lies on a plateau with heavy boulder clay soils, a feature which makes the grasslands distinctive due to being slightly calcareous, but also prone to winter waterlogging. Records from 1611 onwards indicate much of the site was arable, although some areas of grassland remained which may date back to the former Broxted (also written as Broxstead or Broxtie) medieval deer park (one of three deer parks listed in Hundon parish), which existed approximately from 1200 until 1600. Some of these areas of grassland are known to have persisted as permanent pasture through to the early 20th Century, until 1936/7 when the land was requisitioned as an airfield by the Ministry of Air (MoA) in response to concern about the military build-up taking place in Germany. Royal Air Force (RAF) Stradishall was built as a bomber command base and whilst almost entirely situated within Hundon parish, it was named as such to avoid confusion by pilots with two other existing RAF airfields near London (Hendon and Heston).

Photo 2: Broxted Agricultural Team With Horses circa 1937

During construction of the airfield, hedgerows were removed and the farmhouse known as Broxted Lodge was demolished along with other buildings in the hamlet of Scotch Green. The arable areas became grassland and, whilst undocumented, it is believed that some grass seed was introduced to facilitate the establishment of the sward. Two photographs of the site dating from 1937/38 show farm machinery including a seed drill, adding credence to this theory.

The airfield opened in May 1938 but unfortunately, due to the heavy, wet soils the grass runways were found to be unsuitable and were quickly replaced by concrete, although grassland persisted in most other areas. The airfield was defined by a perimeter road, of which the southern and eastern sections represented the former main road between Haverhill and Bury St Edmunds. Surrounding the perimeter extensive dispersal points were added later, with hard standing for planes and associated storage facilities. The bomb store was located to the north-west of the airfield, whilst the location of the main hangers was immediately beyond the Estate's current northern boundary.

After the end of the war in 1945 RAF Stradishall continued to be used, initially as a fighter station during the Cold War before it became a RAF Air Navigation Training School post 1960. However, in 1970 RAF Stradishall closed. The concrete runways were removed in the late 1970's, leaving only the airfield perimeter track although elements of underground concrete emplacements remain. The hangers and offices to the north were initially used to house the Ugandan Asians suddenly expelled by Idi Amin in 1972 and subsequently became part of His Majesty's Prison (HMP) Highpoint facility in 1977.

Around 1980, a series of woodlands were planted by the Ministry of Defence (MoD) as part of a strategy to break up the landscape to reduce the risk of future invasion by air from a hostile force. Most of the airfield continued as an intermittently used military exercise area, while parts were leased on a piecemeal basis and sporadically farmed. However, after discussions which spanned decades, the land was sold back in September 2011 to the original owners under Critchel Down Rules.

The Broxted Estate is now owned by Navigator Land LLP (Navigator). Navigator itself is owned and controlled by the Ryder family who have farmed the area for some generations. Additional fields in the south were added in February 2012 and, together with some subsequent acquisitions to the south-west and north-west, they form part of the Estate as it is known today. Overall, the landholding represents approximately 700 acres (~280ha).

2. Place names of fields, woods and other features

When Navigator reacquired the land to form the Broxted Estate, none of the fields, woods, ponds, or other landscape features had existing names. Following nearly three years of detailed research, names were finally ascribed reflecting Broxted's history and the families associated with it, including that of its owners. Key documents were the history of deer parks in Suffolk, including Broxted (Hoppitt 1992), Hundon's Tithe Map of 1845 and the comprehensive book detailing RAF Stradishall (Adams & Whitehouse 1996).

3. County Wildlife Site designation and Suffolk Wildlife Trust involvement

In the early 1990s, 89ha of grassland and woodland on the former airfield was designated as a County Wildlife Site (CWS) for its botanical and ornithological interest, although surveys at that time were limited due to its existing use as a MoD training ground. The designation is non-statutory, but it recognises the site's high value for wildlife. CWSs in Suffolk are agreed by a panel of representatives including Suffolk County Council, Suffolk Biodiversity Information Service, Natural England and Suffolk Wildlife Trust (SWT).

The CWS was originally named as 'Stradishall Airfield' and included all the grassland within the perimeter track as well as two areas of woodland to the east which were thought at the time to have particular ornithological interest in winter. However, after 10 years of extensive surveys, the boundary of the CWS was re-evaluated in 2021 to include only the grassland and

woodlands within the former airfield perimeter track. The CWS was also renamed Broxted Park in recognition of its links to the former medieval deer park (Figure 1).

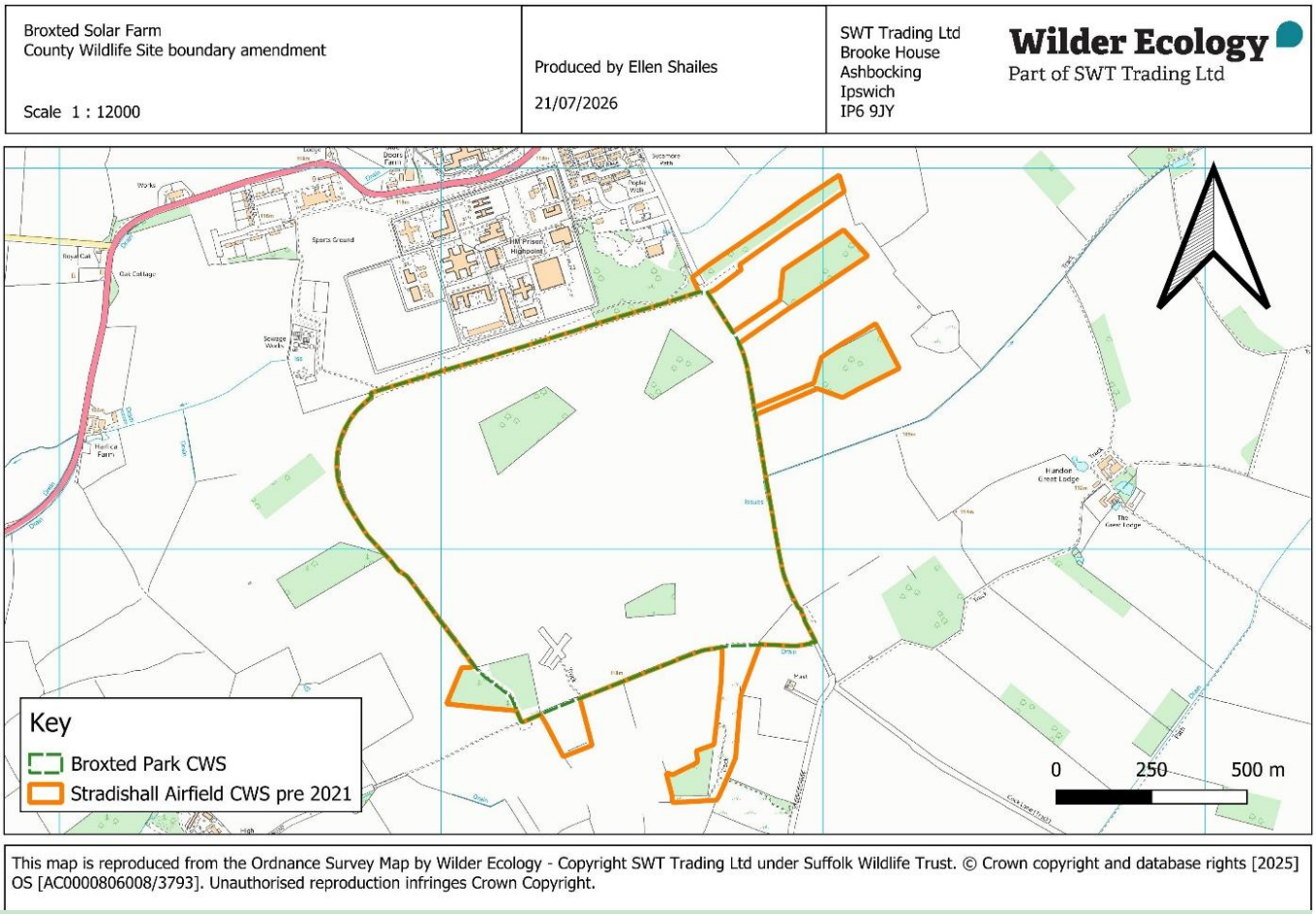

Figure 1: County Wildlife Site Boundary Amendment

SWT involvement with the Estate began in 2011, when it was commissioned by Navigator to undertake botanical and bird surveys. This was, in part, for the purposes of informing a screening decision under Environmental Impact Assessment (EIA) regulations regarding cultivation of some of the CWS and other grassland currently left fallow. The surveys also assisted in the preparation of a Farm Environment Plan (FEP) for a Higher Level Stewardship (HLS) application. A subsequent request was to use the survey findings to evaluate the impact of a solar farm on the CWS grassland, particularly with respect to the scheme's design. In order to survey such an extensive area of grassland, a systematic method was devised that would be effective at picking up variations and important characteristic species but could still be completed in a reasonable number of survey days.

Rather than attempt to record comprehensive species lists over the entire site, the variations in grassland quality and character were assessed and mapped by dividing the site into identifiable compartments. Within each compartment a walk-over survey assessed the frequency of 'grassland indicator species' and also recorded and mapped the presence of plants considered to be 'rare' or 'notable' and/or very strong indicators of unimproved grassland. Each grassland indicator species recorded in a compartment was assigned a

frequency using the DAFOR scale. Rare and notable species were recorded using a GPS to assign an Ordnance Survey grid reference to their location and to estimate the size of population. Both the list of indicator species and the list of rare/notable species were based on the site's localised botanical character and soil type, as well as those species that had been previously recorded.

The SWT walk-over surveys found a high number of boulder clay indicator species typical of unimproved/semi-improved neutral grassland in the central and south-western parts of the CWS, largely coinciding with the pre-1938 grassland (Figure 2). Botanical highlights included substantial populations of adder's tongue, as well as pignut, scattered pepper saxifrage and burnet saxifrage and these areas corresponded to species rich neutral grassland of the National Vegetation Classification (NVC) type MG5a (Rodwell, 1992). However, those areas of the CWS thought to be arable pre-1938 were species-diverse but generally lacking in rare or notable species, except for more mobile species such as common spotted-orchid and bee orchid and at the edges where some 'creep' of the more notable species appeared to have occurred. Due to sporadic grazing levels, the CWS grassland had a tall, tussocky structure with woody species beginning to colonise. Tall fescue, likely to have been introduced when the airfield was constructed, was widespread and dominant.

Bird surveys for the site consisted of winter and breeding bird surveys in 2012. The data were supplemented with a desktop survey of BTO Bird Atlas data collected over four

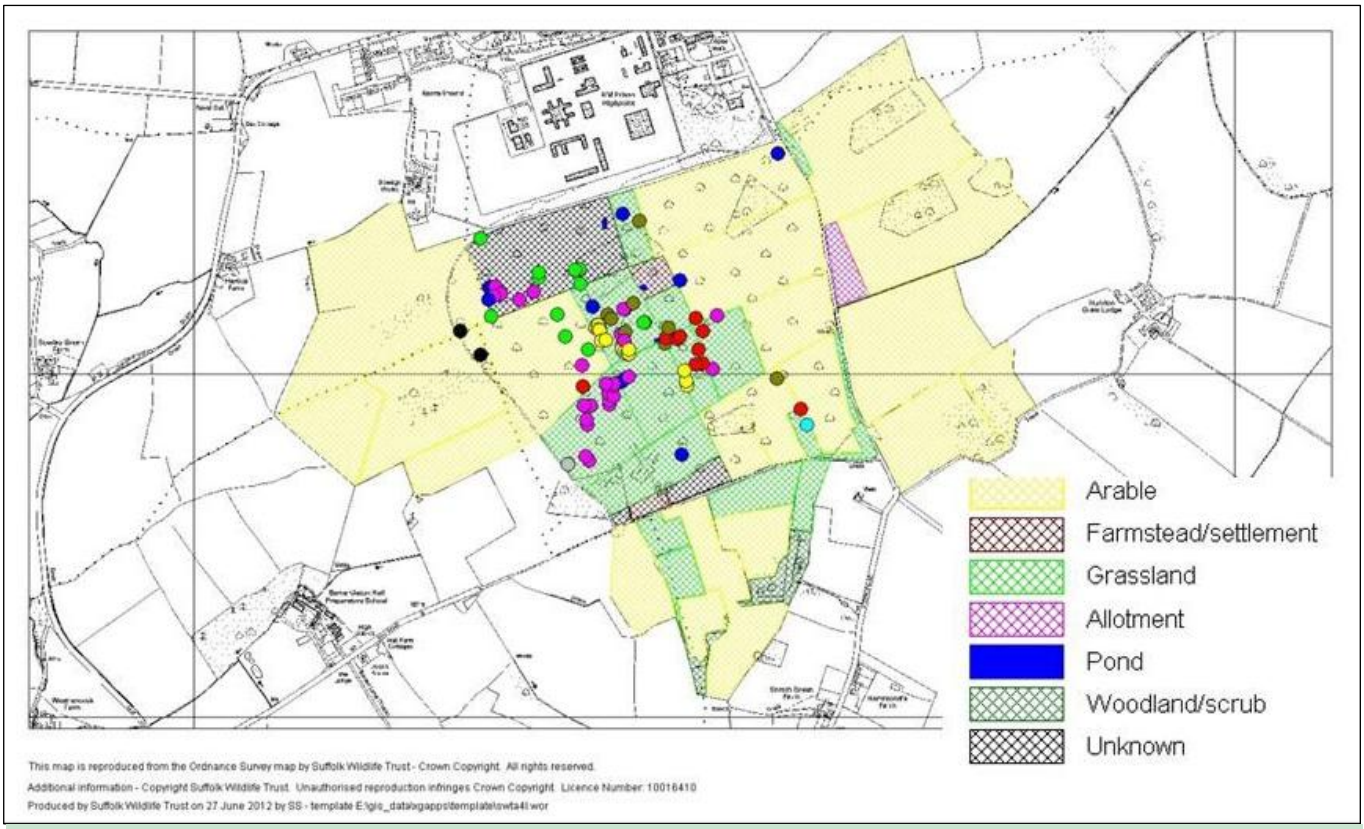

Figure 2: Location of historic areas of grassland prior to construction of airfield, with rare/notable plant records superimposed. Map taken from Preliminary Ecological Assessment (Stone et al. 2012)

summers/winters from 2008-2011. The SWT bird surveys found that the grassland and

arable fields of the estate were exceptionally good for birds with 43 species being noted in summer of 2012.

4. An Integrated Strategy for the Broxted Estate

At the time of the reacquisition, the arable farmland was poorly drained, the grasslands, woodlands and hedgerows had not been managed for a significant number of years and concrete and rubble associated with the former airfield also remained in places. This, combined with the overall complexity of the landholding, presented a notable challenge for realising the potential of the site. On SWT's advice, it was agreed that it was highly desirable on ecological grounds to keep the core of the former airfield as grassland, rather than pursue an arable reversion option with hedgerow planting. However, given the requirement to deliver other improvements elsewhere on the estate, additional income generation was required and so various renewable/green energy options were being considered by Navigator.

Whilst the high plateau was highly suitable for wind turbines, this was discounted because of their visibility and potential to cause division in the local community. A large solar scheme was viewed as being the most viable option for the following reasons: it would have low visibility in the landscape, be noiseless, low maintenance and generate low traffic volumes post construction. The design of the solar scheme could also allow for the grassland to be managed in an ecologically beneficial way through sheep grazing. Furthermore, solar was an energy source in which the family had a keen interest since the 1980s. From the outset, Navigator wanted the site to become an exemplar in terms of the rural economy, the environment and community life. To encompass these wide-ranging aims, an integrated strategy for the whole of the landholding was developed. This had the principal objective to deliver a well-managed and productive landscape generating food and energy (agrivoltaics), operating on a firm footing in the long term. This would be achieved through:

- Food production through crops, e.g. milling wheat;
- Food production through grazing of cattle and sheep;
- Energy production and carbon reduction through solar energy;
- Increased biodiversity supported by habitat enhancement and creation;
- Community access, involvement and enjoyment of the land;
- Recognition of and marking the history and heritage of the site.

5. The Solar Farm

A Planning Application (SE/12/1114/FUL) for a 35-megawatt solar farm was submitted to St Edmundsbury Borough Council (now West Suffolk Council) in August 2012 by Lark Energy Ltd, on behalf of Navigator. This was accompanied by an Environmental Statement prepared by DLP Planning Ltd, with the Ecological Impact Assessment (EcIA) undertaken by Delta-Simons Ltd Environmental Consultants. The EcIA incorporated the results of the earlier SWT

surveys and additional surveys by Delta-Simons Ltd for reptiles. No entomological surveys were carried out and due to the timing of the submission, there was no information obtained regarding grassland fungi.

The solar farm proposal was for two areas: a larger block situated on the northern and eastern part of the CWS grassland within the perimeter track (named Solar West) and a second smaller block on arable land that was set-aside and not being cultivated and situated to the north-east of the perimeter track (named Solar East). Such was the overall size of the site, the boundary encompassed two of the woodland blocks (ranging between 1.5ha and 2.8ha) previously planted by the MoD. At the request of the landowner, acting on advice from SWT, and in accordance with the mitigation hierarchy, the design was amended during the consultation period to avoid a greater proportion of the most botanically important areas. To further reduce the impact on the grassland, the spacing between the panel rows was increased from the more usual 4m to 7m, with the panel frame mountings placed directly into the grassland. Concrete pads were required for the inverters, but these would be located around the perimeter to facilitate regular access by maintenance machinery and to avoid soil compaction within the core of the grassland.

The proposals also included the provision of 18ha of compensatory grassland within the wider landholding. These two fields, surrounded by hedges, were designated as arable but in practice they were used as Set Aside and seldom farmed. The intention was to let the fields, now known as Clare Field and Hazel Field, develop naturally into permanent grassland with no reseeding, supported by beneficial management including topping and sheep grazing.

The scheme was consented on 10th December 2012. A number of planning conditions were attached including the requirement for a long-term management plan/environmental management strategy encompassing land within the solar farm, the areas of the CWS outside of the solar farm and areas proposed as compensation/enhancement habitat. The planning consent also required, at the behest of Navigator acting in conjunction with SWT, monitoring of key ecological groups. This included botanical and also breeding and wintering bird surveys to be undertaken annually for the life of the project, which is currently set at 25 years. The monitoring requirement also encompassed other groups including bats and grassland species such as reptiles. The strategy and outcomes of the annual monitoring would be overseen by an Environmental Management Group.

Following planning consent, the perimeter fence was erected but the gates were left unlocked. The grasslands were cut very short ahead of the bird nesting season to temporarily deter skylarks from nesting, preventing any active nests being damaged or destroyed during construction. As an additional measure, local people were enlisted with their dogs to regularly walk across the main area of grassland in Solar West until construction started. GPS marking of the panel rows also commenced in May and June. This regular disturbance was successful in deterring skylark from nesting in this interim period. The

availability of suitable nesting habitat on adjacent land ensured there would be continuity in the local skylark population.

Construction of the panel frames commenced in early July 2013 with the aim of finishing by early October, before the heavy clay soils were affected by increased autumn rainfall. Unfortunately, the loss of a shipping container overboard containing a substantial number of panels destined for the site resulted in completion being delayed until late November. This meant that a few areas became heavily rutted, which then had to be rolled and flattened the following year once the ground had dried out. Due to the existing ecological importance of the grassland no imported grass seed was used here or elsewhere on the Estate. Where grass and wildflower seed was required, it was gathered from within the Estate over a three-year period using SWT's seed harvester.

Photo 3: Wildflower-rich grassland within the solar farm

The solar operator was responsible for providing an Ecological Clerk of Works during construction, but the landowner also had a very significant role during this period. The undertaking of frequent visits to the site to oversee construction was key to limiting ecological impacts, as well as ensuring that the management strategy could be implemented without delay once construction was completed.

6. Environmental Strategy and the Management Group

The Environmental Management Group (EMG) was initiated in 2013 and meets annually with the following representatives: Charles Ryder and his land agent (Bidwells) representing Navigator, Cubico (the then sole solar farm owner) and the Lead Ecologist from SWT reporting on the monitoring outcomes. From the outset, the Consultancy Manager of SWT's ecological

consultancy has acted as the Lead Ecologist, supported by other members of the team. Other interested parties are invited to attend as required.

This group is a key component for ensuring the delivery of biodiversity outcomes alongside the operation of the solar farm. It reviews the actions of the previous year and makes decisions on the future management to meet the maintenance needs of the solar farm whilst optimising biodiversity outcomes. Any amendments to the monitoring protocols are also put to the EMG for discussion and approval. The group also reports on actions associated with the local community, such as planned closure of the permissive footpath, events and engagement with schools.

One of the first actions of the EMG was to commission a management plan for the solar farm and Compensation Grassland. This was produced by Juliet Hawkins on behalf of SWT's Ecological Consultancy and after a period of review was adopted in early 2016.

The plan sets out the following objectives, along with the means to achieve them:

- Avoid physical damage or disturbance to ecologically sensitive lowland grassland and associated wildlife, including nesting and overwintering birds and flowering plants, during maintenance operations of solar panels and associated infrastructure of Broxted Solar Farm.
- Maintain, improve and extend high quality lowland meadow in favourable condition for plants, nesting birds, hunting raptors, common lizard and invertebrates, with particular reference to the nationally important lowland meadow community and its associated species. Aim to extend high quality lowland meadow habitat in compensatory grassland (and beyond in HLS scheme).
- Monitoring/surveying to establish the effects of the solar farm on flora, birds, bats and common lizard and publicise the results of monitoring.
- Conserve the pattern and improve the structure and wildlife value of the existing ancient/species-rich hedgerow habitat and existing field patterns, including former deer park boundary to benefit nesting birds and invertebrates.
- Increase the extent and quality of scrub for a range of wildlife species on the site including breeding birds such as bullfinch, yellowhammer, turtle dove and nightingale; winter raptor roosts; winter feeding sites for migrant birds such as fieldfare; breeding and feeding sites for invertebrates such as butterflies and moths; and basking, foraging and hibernation sites for common lizard.
- Encourage local community interest and especially in summer using the site as an outdoor classroom for local schools and for those wishing to contribute to informal monitoring such as collection of biological records in a way that does not conflict with the wildlife interest of the site.
- Fulfil all legal and other obligations arising from wildlife law and planning conditions for example protection of species under EU and UK legislation, protection of nesting

birds protected under Schedule 1 of The Wildlife & Countryside Act 1981 and also the Environmental Impact Regulations (Agriculture) 2006.

The Estate was subdivided into a series of management compartments (Table 1). As originally planned, the SWT surveys assisted with the preparation of a Farm Environment Plan (FEP) for a successful Higher Level Scheme (HLS) application for specific parts of the Estate including the CWS grassland to the south of the solar farm. The Management Plan areas are shown in Figure 3.

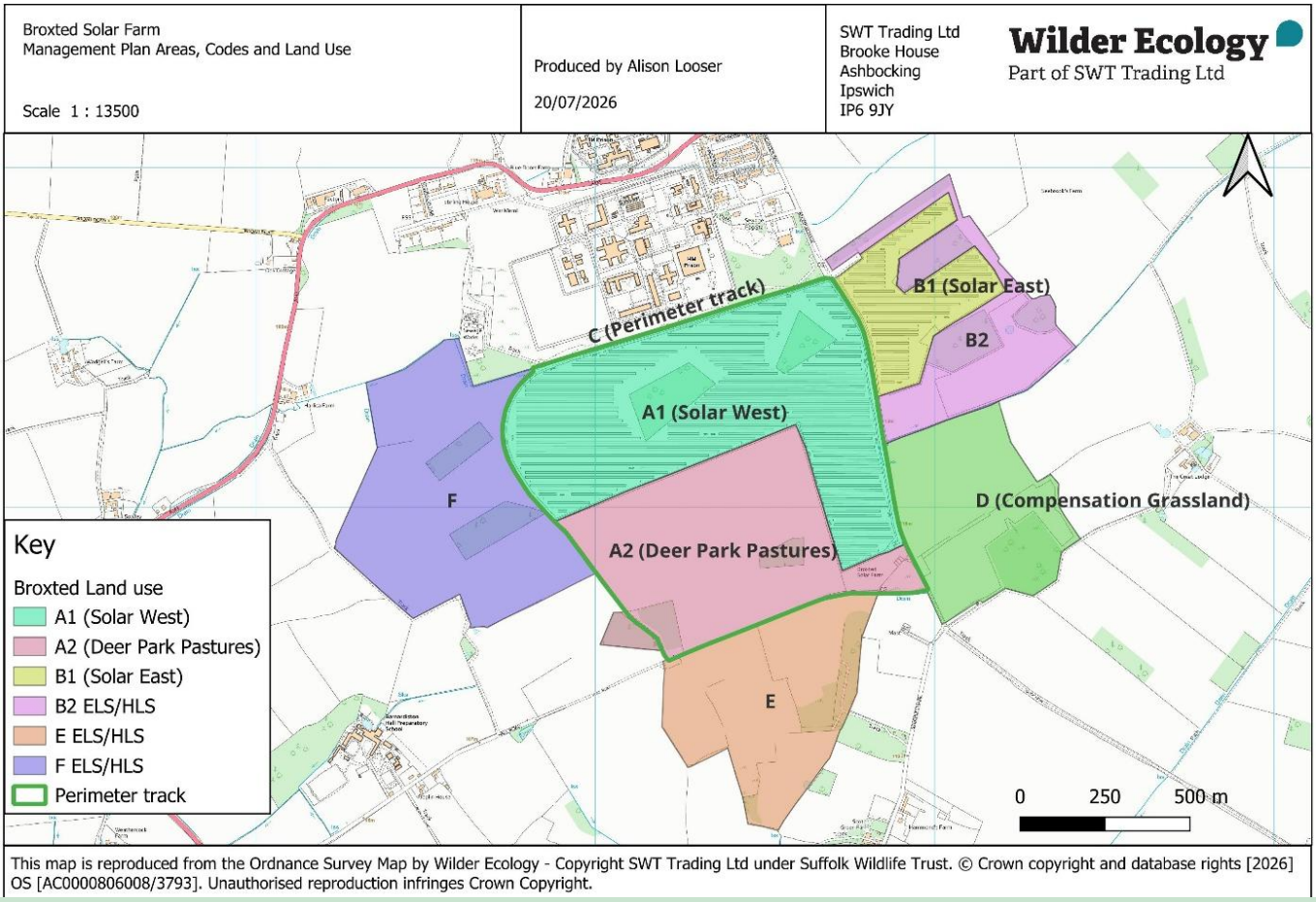

Figure 3: Management Plan areas, codes and land uses

Table 1: Management Plan areas, codes, and land uses

Management Plan codes	**Land use in 2011**	**Land use going forward**
A1 (CWS)	Grassland, sporadically grazed; woodland, unmanaged	Solar panels (Solar West); sheep grazing; woodland, managed
A2 (CWS)	Grassland, sporadically grazed; woodland, unmanaged	Higher Level Stewardship (HLS) agreement/Entry Level Stewardship (ELS); sheep and cattle grazing; woodland, managed

B1	Arable grassland, sporadically grazed	Solar panels (Solar East); sheep grazing
B2	Arable grassland, sporadically grazed; woodland, unmanaged	Arable and permanent grassland; HLS/ELS; woodland, managed
C	Access; hedgerow, unmanaged	Perimeter track; hedgerow, enhanced
D	Arable, not farmed for several years; hedged fields; woodland, unmanaged	Compensatory grassland; fields allowed to revert to grassland though natural regeneration; sheep grazing; hedgerow, enhanced; woodland, managed
E	Arable in part; woodland, unmanaged	HLS/ELS; arable; woodland, managed
F	Arable in part; woodland, unmanaged	HLS/ELS; arable; woodland, managed

7. Grassland management

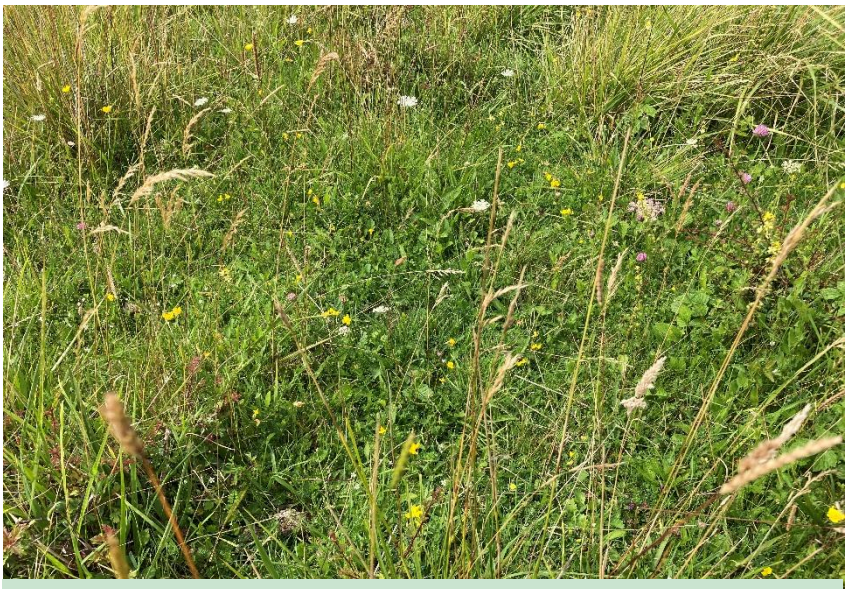

Photo 4: Flower rich sward in Compensation Grassland

There is a key element in which the management of the grassland within the solar farm differs from many other solar farms**.** As part of the solar farm lease to Cubico, Navigator insisted on retaining the management of the ground itself. So rather than the solar farm owner using a third-party contractor, Navigator manages the grassland. This is key to ensuring that the integrity of the Land Management Plan/Integrated Strategy is maintained and implemented in all respects. It also demonstrates the close working relationship and positive partnership between Landowner (Navigator) and solar farm majority owner and manager (Cubico).

Managing the grazing across the whole Estate, treating it as a much larger unit than just the solar farm itself, has been highly beneficial to implementing a sustainable, long-term grazing regime.

The liaison with the graziers and all the other grassland management is undertaken by Navigator, which means that this can be implemented in a responsive and efficient manner. In acknowledgement of the important role played by sheep grazing, only a minimal rent is charged to the grazier to cover the cost of watering. Likewise, the cattle grazier also makes a nominal payment.

7.1. Grazing

Key to this scheme was that sheep grazing would be used to improve the condition of grassland. To facilitate this, the panels were positioned 0.9m clear of the ground at their lowest edge (2.5m at the highest edge) and angled at 25-30 degrees. Electrical cabling was insulated to prevent damage from sheep. Unfortunately, sheep were found to be triggering the perimeter security systems, so a second internal stock fence had to be erected. Consequently, a 2-3m strip all the way around the solar farm perimeter must now be managed separately to the main grassland areas.

Photo 5: Sheep grazing within the solar farm

The benefits of sheep grazing have been magnified by the wide spacing between the solar arrays providing additional areas of unshaded grassland upon which sheep grazing can exert a positive effect. The distance between panel rows i.e. the back edge of one row to front edge of the next row is 7m at Broxted, whereas this is typically 4m or less at other sites.

The timing of sheep grazing has been critical as their arrival needs to coincide with the first flush of tall fescue before it becomes unpalatable. Tall fescue is a tall, tussock forming grass that can become dominant to the detriment of other more desirable plant species. Consequently, sheep numbers need to be appropriate to ensure ongoing improvements to the sward and floral diversity whilst not being too intrusive to impact ground nesting birds. As long as conditions are not too wet, the sheep arrive by 1st April and remain until late autumn. In 2025 these numbered 591 ewes with their lambs in the main grassland of Solar West, but the numbers annually are determined by grass growth. Higher densities are

allowed in the smaller Solar East as due to the recent history of that grassland the grazing can be more intensive. A flock here typically numbers 60 ewes with lambs.

The Compensation Grasslands are also grazed by sheep, although the timing of their arrival, numbers and duration of grazing varies from year to year. The aim is to have permanent, low intensity grazing by sheep from April to late October. Grazing the northern field (Hazel Field), was postponed until permanent stock fencing could be erected in 2021.

The location of water troughs is key to encouraging grazing across all parts of the site, otherwise areas furthest from the water source tend to be neglected. There is a water trough at the eastern end of the main solar grassland (Solar West), and the sheep tend to not wander too far from this feature, so installing another at the western end was considered. However, due to subsequent findings of meadow pipit and botanical surveys this has been put on hold since the last EMG meeting. The sheep are unloaded and loaded at the same points, which can cause some localised trampling at certain times of the year, but this cannot be avoided.

7.2. County Wildlife Site grassland in ELS/HLS agreement

In addition to the sheep flocks that are present within the solar farm and Compensation Grasslands, a herd of cattle summer-graze the main CWS grassland (Deer Park Pastures) outside of the solar farm from early April to mid-August, with some autumn sheep grazing in these areas too. In 2025, 60 cattle arrived for 117 days of grazing, followed by approximately 200 sheep. Sheep remain for as long as is possible depending on the ground conditions, but usually until early November.

7.3. Topping

Five different mowing machines are used for grassland management and cutting is delayed until after 20th August for most areas due to the risk of impacts to ground nesting birds. However, as it is essential for grass growth to be kept lower immediately under the front edge of the panels to prevent shading, a specialised, four-wheel, lightweight mower towed behind a lightweight Gator utility vehicle is deployed in late June to help reduce the tall fescue in these areas.

If November stays dry, then further cutting of the front edge of the panels takes place, at the lowest setting possible. If wet, then this cutting takes place when there is a hard frost in February. When the sheep arrive in April, they find the fresh growth in these recently cut areas to be very palatable, thus helping to restrict its growth later into the season.

Photo 6: Deer Park Pastures bird's-foot trefoil and grass vetchling

The grassland strip between the security fence and the stock fence is cut in November or early February to avoid any impact on reptile species.

To continue facilitating the development of the Compensation Grassland sward, mosaic topping is now included in the management regime for these two fields alongside grazing. This is particularly useful to reduce the height of the sward when it has not been effectively controlled by grazing and also to limit the colonisation of thorny shrubs such as hawthorn. Larger blocks of scrub have been allowed to develop, particularly in Hazel Field, which are managed on rotation to break up the patches into smaller units. Mosaic topping is also used in Deer Park Pastures as required.

8. Vehicles within the solar farm

Vehicle access is limited to quad bikes and small farm utility vehicles. Routes are restricted to main north-south tracks leaving almost all the grassland within the interpanel rows unaffected by vehicle movements. Solar panel cleaning takes place in late August/early September when bird nesting season is over and the ground is still hard. In the recent event of an inverter fire, large vehicle access was facilitated from the perimeter track by temporarily removing a panel of the perimeter fence to reduce tracking across the grassland. To reduce the risk of any future fires spreading a 3m buffer zone is kept short mown around the inverters.

9. Woodland and hedgerow management

The Broxted Estate woodlands consist of 14 blocks totalling 23.6ha. The majority of these date back from the MoD's 1980's planting scheme, which used a mixture of English oak, ash, Norway maple, field maple, beech, sycamore, poplar and alder. These remained largely unmanaged until the land was acquired by Navigator, who engaged a leading local woodland advisor, Rod Pass, to oversee their restoration.

The Woodland Management Plan objectives are threefold:

- Initiate sound silvicultural practices which will bring the neglected woodlands back into management.

- Removal of non-native species (particularly poplar) and the favouring of English oak as long-term retentions.
- The development and enhancement of a vigorous understorey with a well-developed and diverse woodland edge.

These objectives have been broadly achieved and the plantations are now managed as coppice-with-standards woodlands on a 7-to-10-year cycle to improve the shrub layer and maximise opportunities for nesting birds. The poplar has been removed, the English oaks thinned to allow them to grow on as standard trees, with natural regeneration and enrichment planting of native species.

The juxtaposition of the woodlands to the other habitats on site, including arable bird mixtures within the HLS farmland, is key to supporting the farmland bird assemblage, particularly in winter. However, deer browsing of regrowth is an ongoing issue despite a deer management programme being in place. For example, in Fitzgilbert Wood situated in the south-east of the Estate, there is limited understorey and during breeding bird surveys reduced activity has been noted compared with other woodlands on the Estate. In contrast, the two woodlands within Solar West are stock fenced and this, combined with the solar security fence, means that there is no negative impact of browsing by deer after coppicing. At an advisory visit by SWT in 2025, it was reported that these two woods now have a dense understory and are both in good condition. This has been an unforeseen benefit of the solar scheme.

Many of the native hedges surrounding and running through the site are important historic features. The eastern boundary corresponds to the earlier medieval park boundary between Great Park and Broxted Park. At the time of acquisition by Navigator most of the hedges were overstood and in need of management to improve their visual appearance and to provide shelter and food for birds and invertebrates. Over the last ten years these hedges have been maintained by rotational trimming and coppicing to encourage a dense thicket structure. The majority of the hedgerows across the site are now wide and tall without any gaps at the base or in the canopy, billowing out into grassland on at least one side. This has rejuvenated the 'Green Lane' effect along the old pre–War Haverhill to Bury St Edmunds Road.

Photo 7: Scrubby woodland edge and grassland next to solar farm

A significant amount of hedgerow planting has also taken place since 2012. Some 5.5km of either new hedge or gapped up hedges has been planted, using a nine species mix typical of the local area. This has resulted in a network of hedges creating strong habitat, natural landscaping and almost total screening of the solar farm.

10. Ponds

Photo 8: Restored pond on the estate

In 2012, several new ponds were created and two others restored. The pond to the east, known as Gus's Pond, is notable for its excellent water quality and contains a strong population of stonewort species, an indicator of clear water with very low nutrients. In 2022, essential work to repair the earthing ducts within the solar farm required additional soil, so a new pond (Solar Pond) was dug in the northern field of the Compensation Grassland (Hazel Field) to avoid the need for imported material. Its shallow banks and proximity to suitable food sources in the form of weedy seeds and scrub for nesting make this a valuable additional habitat for turtle dove (see Section 14: Ornithological Monitoring). Further ponds are planned for the estate, as well as ongoing management to reduce shading and maintain open water.

11. Community engagement

The plan for the Broxted Solar Farm from the outset was to include and support the local community. This was developed through a variety of methods including development of the Brains Trust, Broxted Solar Community Fund, installation of permissive paths, accompanying interpretation boards and provision of tours to view the Estate.

11.1. Brains Trust

This term, which is commonly used to describe any gathering of experts, is derived from the popular 1940-50s BBC radio and television programme of that name. In the particular case of the Broxted Estate, this represents an informal group of local experts, with interests in

ornithology, invertebrates and the history of RAF Stradishall, with was formed in 2014. Members of the group have undertaken surveys, provided detailed information for interpretation boards and assisted with tours of the site.

11.2. Broxted Solar Community Fund (BSCF)

Funded each year by the solar farm, the BSCF fund is managed by Navigator and key members of the local community. Since its inception in 2014, the BSCF has awarded over £100,000 to a wide range of groups in the local community of Hundon with £1,500 ring fenced each year for Hundon Primary School.

11.3. Permissive footpath and boards

After the solar farm opened, Navigator Land created a permissive footpath for local walkers around the perimeter track. In addition, six interpretation boards designed by Suffolk Wildlife Trust were placed at strategic locations around the footpath. One explains the history of Broxted in general, with another covering the history of RAF Stradishall. There is also a panel highlighting the site's biodiversity interest and another explaining the solar farm. In addition, two further panels placed at each of the two entrance points to the permissive footpath provide general detail about the Broxted Estate.

Photo 9: Interpretation board at Broxted Estate

11.4. Tours of Broxted Estate

Each year, Navigator Land hosts around four tours of the Estate (usually in June and August), viewing it from a variety of locations and explaining the various features and activities within it. The local community and various interested organisations and societies have taken advantage of this offer. Recent tours have included representatives from solar developers, council ecologists, planning officers, RSPB and Wildlife Trust staff, to share lessons learned from the management of the solar farm.

SECTION B

Outcomes of Monitoring

12. Botanical monitoring

A Vegetation Monitoring Plan was drawn up early in 2014 by Jonny Stone of OHES Environmental (on behalf of SWT) to assess the effects of solar panels and the grazing management regime on the sward structure and composition and also the development of the Compensation Grassland.

The vegetation monitoring was based on relocatable 2m x 2m quadrat plots, distributed across the two solar farm blocks and Compensation Grassland. Sixteen plots were located within the CWS grassland of Solar West, six within the former arable land of Solar East and 10 within the area defined as Compensation Grassland. An additional 10 plots were also allocated within CWS grassland outside of the solar farm (Deer Park Pastures), managed under a HLS agreement. The majority of the plots in the solar farm were located in adjacent pairs to contrast between under the panels and within the interpanel rows. Annual surveys in late April/early May recorded a species list and a percentage cover value for each plot, as well as sward height, bare ground and moss cover.

The neutral grasslands of the CWS can be subdivided into 'calcareous clay pastures.' NVC places 'calcareous clay pastures' wholly within the *Lathyrus pratensis* sub-community of a broadly scoped MG5 *Cynosurus cristatus-Centaurea nigra* community (Rodwell, 1992). However, the Broxted Estate grasslands are not a good match for this and represent a less common form specific to the 'raw' clay soils of the boulder clay interfluves of East Anglia. Moreover, despite being designated as a CWS, some areas corresponding to more recent grassland represent a form of false oat-grass grassland (MG1) typical of semi-improved grassland, with a lower diversity of forbs compared with the more species-rich MG5 type of grassland found in other parts of the CWS (Stone, 2017).

13. Outcomes of post-construction botanical monitoring in Solar West (CWS grassland)

13.1. Grassland beneath the panels

Monitoring commenced in 2014 and changes to the vegetation beneath the panels was noticeable by the following year. The construction of the panels had an effect equivalent to creation of instant woodland shade over the grassland. Compared with the unshaded interpanel rows, the vegetation beneath the panels appeared 'drawn up' and there was already a noticeable reduction in forbs with a dominance of grasses. By 2016, marked changes were noted within the shaded plots, with a significant drop in species richness.

By 2018, the grassland under the panels had become a species-poor mix of shade tolerant grasses with creeping habit, primarily formed of rough meadow-grass, Yorkshire fog, common couch and creeping bent. Forbs were largely absent and bare ground had increased from an average of 2% to an average of 27%, indicating areas of die-back caused by shading and/or waterlogging. The litter layer had on average increased from 11% to an average of 47%.

Though it might be expected that the ground would be drier beneath the panels, the ground was observed to be softer and moister compared with the interpanel rows. This is likely to be due to the reduced drying effects of insolation beneath the panels and this will also have the effect of making the soils colder. The colder, wetter ground tends to slow plant growth rates and exacerbate winter die-back.

Further monitoring reports show that there is now a stable vegetation community beneath the panels dominated by grass species tolerant of permanent shade.

13.2. Interpanel rows and positive impact of grazing

Due to the relatively wide spacing of the panel rows, the grassland of the interpanel rows is unshaded during the summer growing season, although this is not the case for the remaining seasons and full shade is cast during the winter months. By 2019, the grazing regime was starting to have a positive impact on the grassland sward through grazing the edges of the tall fescue tussocks and repeat-grazing the more palatable grasses leading to height diversity. However, the vegetation of the interpanel areas is still recovering from past under-management and further floristic change is expected.

13.3. Mapping the development of the target grasslands

In 2019 there was a revision of the Vegetation Monitoring Plan. It was agreed with the EMG that the shaded plots would cease to be surveyed as they were showing little annual change. However, the monitoring plots in open grassland continued to provide a record of the long-term impact of grazing on the Solar Farm grasslands, particularly on their floristic composition. During spring 2019-2021 the grassland types in the interpanel rows and other grassland areas within the solar farm were mapped with the purpose of being able to assess the development of the target grassland types (Tables 2 and 3 and Figure 4). The character species of the Estate grasslands comprise meadow vetchling, black knapweed, hoary ragwort and smaller cat's-tail. Three further character species are more typical of Solar West: glaucous sedge, bird's-foot trefoil and common sorrel. As a group, these species are typical of winter-wet mildly calcareous grasslands.

The target grasslands are seen to be starting to develop in patches between the panel rows in Solar West, albeit with a slow rate of colonisation. Tall fescue grasslands still dominate in most areas. Positive changes have been most evident in the older grasslands identified in the Preliminary Ecological Assessment (Stone *et al.* 2012). Although there has been some expansion of the patches of these target swards, the rate of change is rather slow.

Notwithstanding, a similar grazing regime will continue, with continued changes in the types and extent of grasslands being mapped (Stone, 2021).

13.4. Compensation Grassland

By 2016, the sheep-grazed Compensation Grasslands were immature grasslands, lacking the species characteristic of the mature grasslands. By 2018, the number of species had increased, but the sward was still relatively open and scrub was beginning to colonise. Following mapping of the grassland types in 2022, most plots supported a number of character species of calcareous clay pastures, such as fairy flax and agrimony, (developing target grassland Type 4) and three years later now represent a mosaic of open, extensively grazed grassland with scrub blocks and bordered by rotationally managed thick-billowing hedgerows. A pond was constructed in the northern field in 2021 (Figure 5).

Table 2: Notable species codes

Code	Plant
AP	*Achillea ptarmica* - Sneezewort
CM	*Conopodium majus* - Pignut
DF	*Dactylorhiza fuchsii* - Common Spotted Orchid
LC	*Linum catharticum* - Fairy Flax
OA	*Ophrys apifera* - Bee Orchid
OV	*Ophioglossum vulgatum* - Adder's-tongue Fern
PS	*Pimpinella saxifraga* - Burnet Saxifrage
SP	*Succisa pratensis* - Devil's-bit Scabious
SS	*Silaum silaus* - Pepper Saxifrage
VH	*Viola hirta* - Hairy Violet

Table 3: Map legend for mapping of grassland types

Grassland Types		Provisional definition	
	1	Wet grassland with Hard Rush	
	(1)	Wet grassland	
	2	Track grassland with rutting	
	2/4	Rutted tracks fringed with target grassland	
	2/5	Rutted tracks fringed with Tall Fescue grassland	
	4	Target grassland	
	(4)	Target grassland (developing)	
	(5)	No character species	Tall fescue grasslands
	5+	Occasional character species	
	5	Tall fescue dominant	
	5-	Occasional negative indicators	
	6	General grassland	Ordinary grasslands
	7	Vehicular access	
	8	'Springs' area	

Western Solar Park – Grassland Recovery and other observations – 2021 (Map 2)

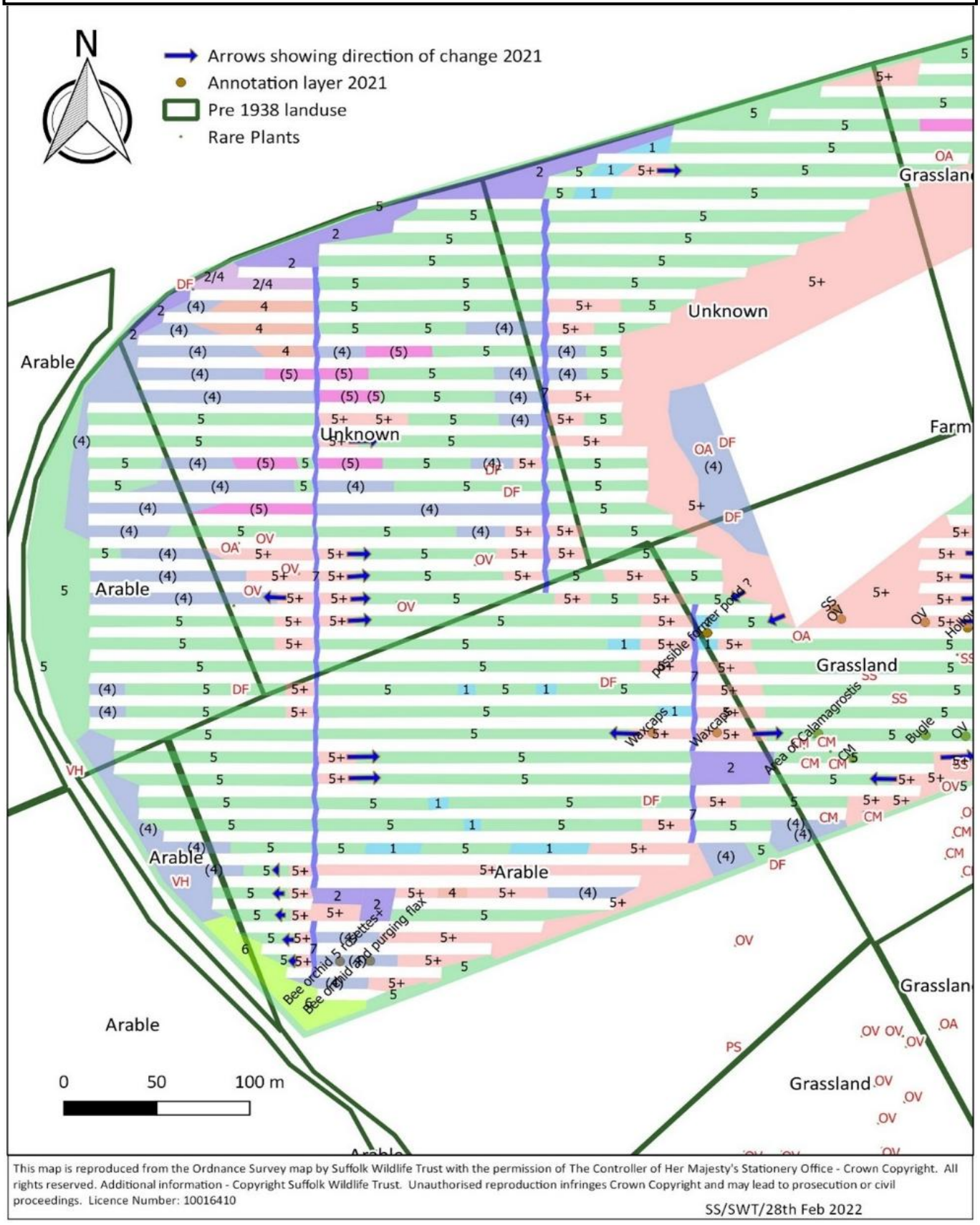

Figure 4: Overview of grassland types for western end of Solar West. Areas shown as (4) are developing target grassland and areas of 5+ indicate where further management may shift this category towards (4). Map taken from Broxted Solar Park Vegetation Monitoring Programme (Stone, 2021)

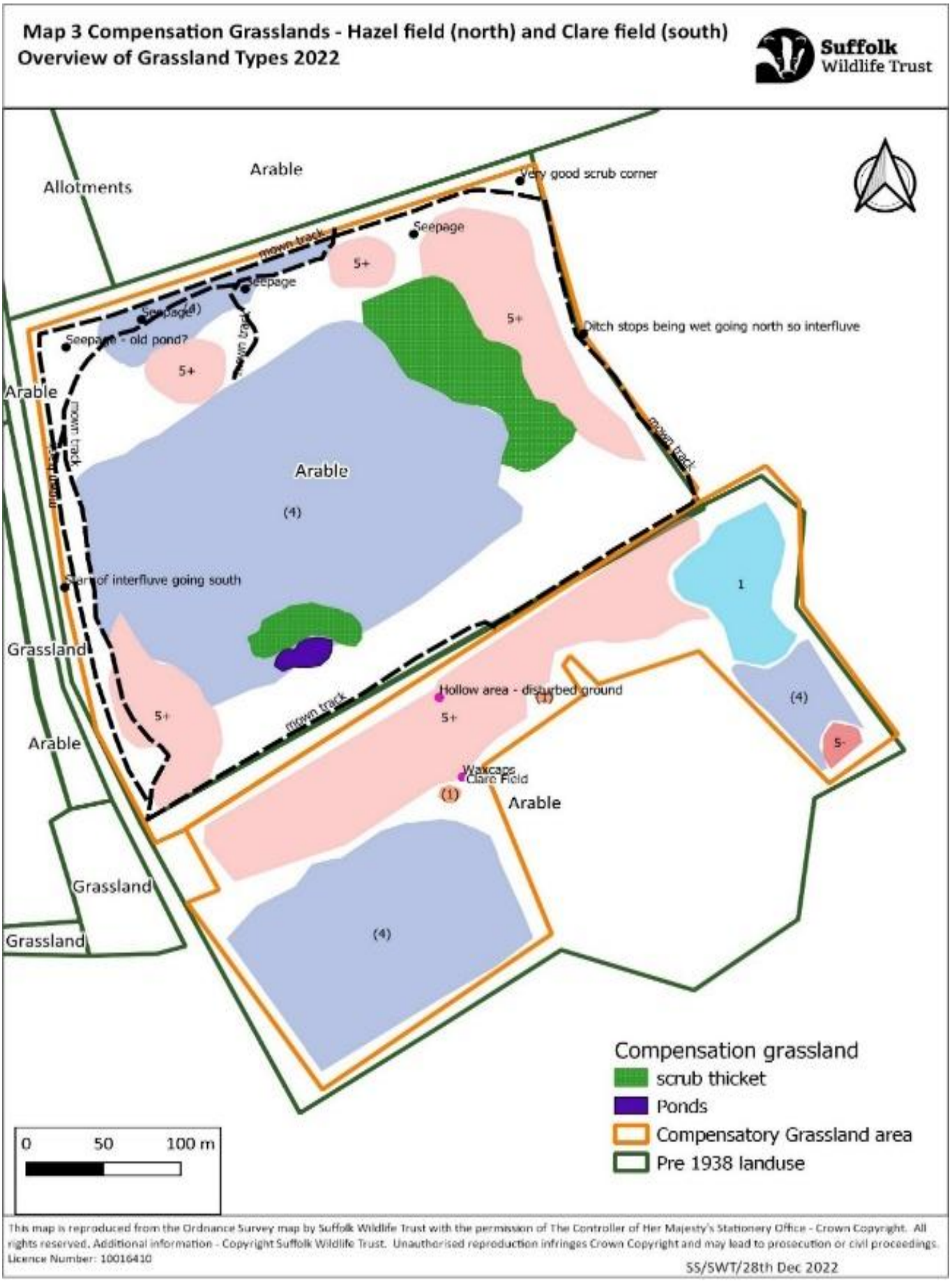

Figure 5: Overview of grassland types in Compensation Grassland (Management Plan Code D). Map taken from Broxted Solar Park Vegetation Monitoring Programme (Stone, 2022)

14. Ornithological monitoring

The monitoring methodology is a timed transect encompassing the wider Estate as well as the solar farm. Baseline winter and breeding bird surveys were conducted in 2012 prior to planning permission. Post construction, much of the route replicated the pre-construction surveys with minor adaptations to allow entry and exit through security gates in the solar farm. Two winter and two spring surveys were undertaken until 2015 when this was increased to three visits in summer and then three visits in winter from 2018 onwards.

14.1. Breeding bird surveys

During the summer of 2012 breeding bird surveys found that the grassland and arable fields at Broxted were exceptionally good for birds with 43 species recorded. Of these, nine species were red listed and 10 were amber listed as Birds of Conservation Concern (BoCC3) (Eaton *et al.,* 2009). A desktop study drawing on four years of BTO Bird Atlas data (2008-2011) provided a total of 68 breeding bird species recorded on or near the site (Stone *et al.,* 2012).

Thirteen years on, in summer 2025, the wider estate supported a total of 52 species, 32 of which were recorded as breeding, including six BoCC5 (Stanbury *et al.,* 2021) red listed and 13 amber listed species (Hodkinson, 2025). It should be noted the Birds of Conservation Concern lists have been updated twice over the monitoring period, changing the designation of a number of species.

14.1.1. Skylark and meadow pipit

Over time, the grasslands associated with the solar arrays have consistently supported relatively few breeding bird species, with the most significant being skylark and meadow pipit.

Skylark is a long term BoCC red listed species due to a significant decline in numbers since the mid 1970s. In May 2012, 12 singing males were recorded in the northern half of the CWS grassland and 18 in the southern half. Construction of the solar farm took place in 2013. In April 2014, 16 singing males were recorded in Solar West, rising to 20 in 2015. An additional survey in June 2015 confirmed skylark were breeding within the main solar farm, in the area between the western plantation and the western perimeter fence. No active nests were located, but adults were seen perched on top of the panels carrying 'food in the bill'. In the same year, the SWT botanical surveyors noted from a distance that skylark were perching on the top of panels and flying down to areas of grassland just under the lower edge of the panels, implying they were visiting nests (Susan Stone, *pers. comm.)*.

However, from 2016 there was a steady decline in numbers of singing males over the solar panels stabilising at two singing males by 2020 onwards. More recently in 2024 and 2025 no singing males have been recorded in this area. A specialist of open habitats, it appears that the influence of the solar panels has changed the habitat to an extent that this area is now

Photo 10: Meadow pipits perching on the solar panels

unsuitable for skylark. This effect was not seen immediately but started to be noticeable three years after construction. Despite there being large (2.6ha and 1.9ha) open grassland patches within Solar West adjacent to the woodlands, it appears that these patches are too small and enclosed to be considered as sufficiently open country by skylark.

Photo 11: Meadow pipit nest in the estate

In the CWS grassland to the south (Deer Park Pastures) skylark numbers have fluctuated from year to year, but without a clear pattern. This is illustrated by 14 singing males recorded in 2023 and 2024 (Hodkinson 2023 and 2024), but only six singing males in 2025 (Hodkinson 2025). The Compensation Grasslands continue to hold a small but stable population of skylark (seven singing males in 2025). Overall, the Estate supported around 30 pairs of skylark in 2023, 27 pairs in 2024, but only 16 pairs in 2025.

Whilst all the main grassland areas hold populations of BoCC5 amber listed meadow pipit their numbers appear to be increasing in each compartment, particularly in Solar West where numbers have doubled since 2015. There were 29 singing males in 2025, concentrated towards the western section of Solar West, with an overall count for the Estate of 74 singing males. These gains are set against a backdrop of a regional population decline of 40% since 2015 (Hodkinson, 2025), showing the value of the habitat management that has been undertaken to date. Most meadow pipit in the East of England region breed along the coastline. Inland breeding populations of the size found at Broxted are therefore a rarity and of county significance.

The contrast between the decline of skylark and the increase in meadow pipit is noteworthy and likely reflects subtle differences in habitat preferences. The steady decline of skylark within the solar farm is a reflection of their strong association with open countryside and strong avoidance of edge habitat, which the solar arrays replicate. Although meadow pipit is

found in similar open habitats, they also frequent mosaic landscapes, often perching on bushes or other similar structural features near their nest. The solar panels are being used in the same way.

14.1.2. Other farmland birds

A count of 19 red listed yellowhammer was recorded for the whole Estate in 2025. One pair of yellowhammer appears to have colonised the solar arrays since 2020, although linnet and reed bunting appear to have stopped using this habitat entirely. However, the Compensation Grassland has been colonised by yellowhammer in recent years. Linnet numbers remain fairly stable but are showing signs of increasing over the past five years with a count of 63 for the whole Estate in 2025.

The Estate is notable for having two to three pairs of red listed turtle dove visiting each year. The population trend for turtle dove in the UK is one of sharp decline, with a 98% reduction since 1993. Of the 119 species monitored by Breeding Bird Survey, turtle dove shows the largest UK decline of any species over the period of monitoring (Heywood *et al.,* 2025). The Estate has been implementing measures to support turtle dove in the form of encouraging weedy seed patches, development of scrub, billowing hedges and also pond construction with shallow margins.

14.2. Wintering bird surveys

Winter bird surveys are also undertaken each year. A desktop study encompassing BTO Bird Atlas data with survey data for four winters (2007/8-2010/11) provided a total of 59 wintering bird species recorded on or near Broxted (Stone *et al.,* 2012).

The diversity of species recorded each winter has fluctuated very little over time and during the past eight winters, the number of species encountered has remained within a range of 39-43 (Hodkinson, 2025). As well as farmland birds and common species of woodland birds, winter visitors such as fieldfare, redwing and snipe also occur. In the winters of 2024/25 and 2025/26 short-eared owl was recorded on site, demonstrating the continuing value of the site for wintering raptors (Hodkinson, 2026). However, trends in wintering species take longer to emerge owing to the variability of winter weather and how this influences mobile species searching for food and shelter. In the grassland compartments numbers vary considerably year on year. Overall, meadow pipit, redwing, fieldfare, and snipe all exhibit highly stochastic but generally stable trends. Linnet (red listed) is the only species that appears to be showing a positive wintering trend, whilst skylark exhibits a negative trend.

15. Other species monitoring

Repeat surveys are undertaken for reptiles and bats on a quinquennial basis.

15.1. Reptiles

A pre-construction survey conducted in 2012 recorded a peak count of 61 common lizard indicating a low population within the grasslands of Solar West and Solar East. Reptile surveys were carried out in 2016 and 2021 with the next due to take place in 2026. A total of 600 heavy duty roof felt 0.5m x 0.5m square artificial refugia felts are deployed to first bed in, followed by seven reptile survey visits in suitable weather conditions. The repeat surveys broadly replicate the pre-construction survey which utilised grassland and woodland edges but now also include the Compensation Grasslands and the northern edge of the CWS grassland (Deer Park Pastures). Despite the winter-wet nature of the site, common lizard are frequently recorded along with occasional grass snake. The peak counts for common lizard have increased between 2016 (count of 11 common lizards) and 2021 (peak count of 179 common lizard and one grass snake). Figure 6 shows the distribution of reptiles during the 2021 survey. A number of other species have also been recorded under the felt mats including common shrew, pygmy shrew, water shrew, field vole, bank vole, wood mouse, common frog and common toad. Of notable interest is the regular occurrence of water shrew under the mats, in areas well away from any ponds.

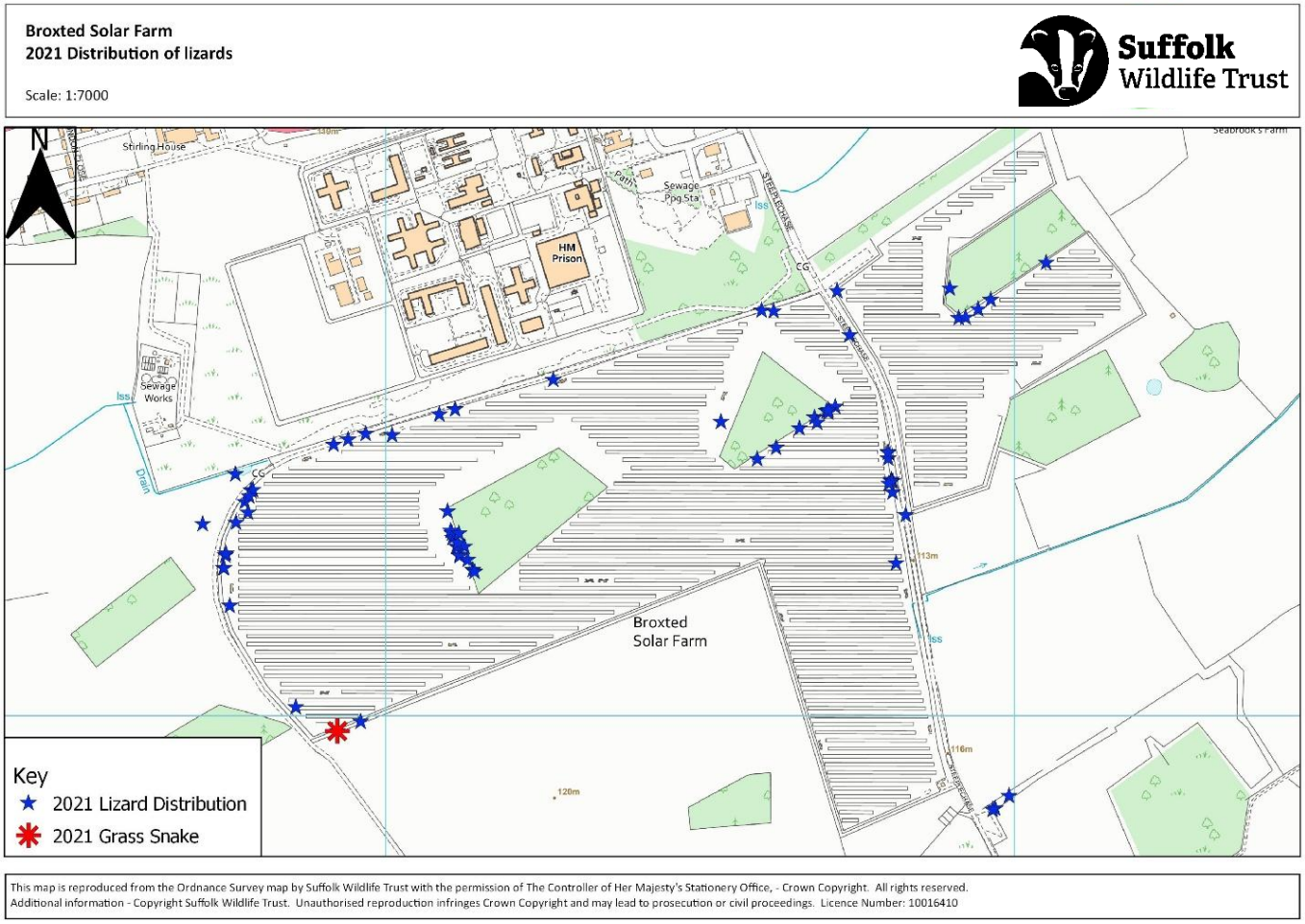

Figure 6: Reptile distribution results from 2021 survey.

15.2. Bats

Bat activity surveys commenced in 2014. The survey method is a timed transect walk commencing at sunset and lasting about two hours, using ultrasonic bat detectors and recorders. The route follows the perimeter track after circumnavigating the two woodlands within Solar West. This is supplemented by static acoustic monitoring with static detectors deployed at three locations: A – close to the main entrance in a woodland belt north of Solar East, B – in the hedgerow between Hazel Field and Clare Field and C – on the western edge of Lancaster Wood, near the south-western corner of Deer Park Pastures. An additional static detector survey was included in 2025 to assess bat activity both within the solar arrays and Compensation Grassland. The surveys take place in August, during a period of warm weather, although the 2014 survey was noted to have colder overnight temperatures than normal for the time of year. Refer to Figure 7 for transects and static locations.

15.2.1. Transect surveys

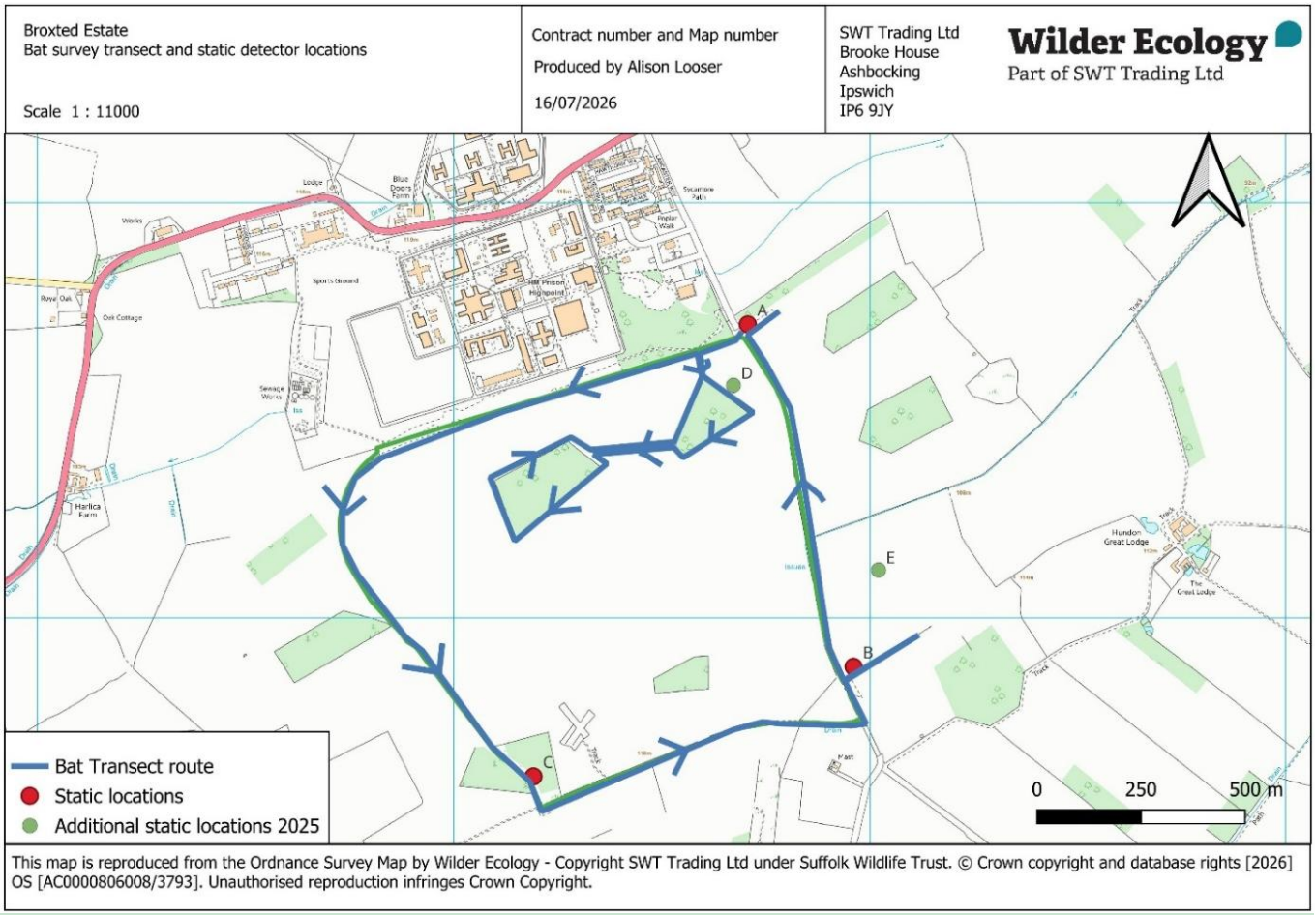

Figure 7: Bat transect route and static detector locations

During the transect surveys bats were detected in each survey along most areas of the transect, with the exception of the north-western corner and within the solar farm itself.

The majority of the bat activity has been recorded along the southern and eastern boundaries. The acoustic data acquired from the transect shows that the total number of

bat registrations has increased since 2014, with the 2019 survey having the most activity. The species recorded include common pipistrelle, soprano pipistrelle, barbastelle and an unidentified myotis species. In the first transect in 2014 only two species were recorded, in 2019 all four were recorded, then three in 2024. The Myotis species was only recorded in 2014. There was no evidence that bats were utilising Solar West for commuting or foraging.

15.2.2. Static detector surveys

The static detector survey data showed an increase in bat activity since the 2014 baseline at locations A and B, with a decrease seen at location C. The highest diversity of species was recorded at locations B and C in the 2024 survey with six species and one generic group recorded: common pipistrelle, soprano pipistrelle, noctule, serotine, barbastelle, brown long-eared and a myotis species.

15.2.3. Additional 2025 Static data

Reviewing previous bat survey data, a more direct comparison of data collection from within the solar farm and outside the solar farm was required. Therefore, two static detectors were deployed for seven nights. One was mounted on a post in Solar West (location D) in close proximity to Halifax Wood. The second (location E) was fixed to a post within the middle of Hazel Field in the Compensation Grassland. The Hazel Field detector recorded common pipistrelle activity on five of the seven nights. Other species recorded here were serotine and Nathusius' pipistrelle – the latter being a new species for the site. Within the solar farm only common pipistrelle was recorded with very low activity averaging around one registration a night. This low level of detection is consistent with findings of a 2024 study by Bristol University which found that solar farms had a significant negative effect on bat activity, with six out of the eight species recorded showing a significant decrease in activity. The study demonstrated that this decrease in activity was not caused by lower insect abundance at the sites studied and further work is needed to understand the mechanism causing decreased bat activity (Tinsley, 2024).

15.2.4. Summary of bat species on site

Eight species of bat have now been recorded across the Estate: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, serotine, barbastelle, brown long-eared and Daubenton's bat. A member of the Myotis genus has also been recorded that could not be identified to species level. However, it should be noted that within the solar arrays of Solar West only one species has been recorded, common pipistrelle with very low activity.

SECTION C

Biodiversity Net Gain

16. Setting parameters for a retrospective BNG Calculation

Biodiversity Net Gain (BNG) was introduced under the Environment Act (2021) and became mandatory for planning permissions granted on or after 12 February 2024, so does not apply to this project. However, there is merit in applying the biodiversity metric to assess whether this scheme does deliver a net gain at the halfway stage of the consented period.

The relevant on-site areas for the metric calculations are defined as the two solar farm areas (Solar West and Solar East) and the central track with two lengths of hedgerow either side which runs between Solar West and Solar East. This relates to the site boundary or red line boundary of the planning application for the solar farm in 2012 (see Figure 8). Whilst at the time of the application there was no specific requirement to quantify off-site habitat enhancement or creation to achieve an overall net gain, habitat enhancement and creation measures were put in place to compensate for the loss of lowland meadow on site. This was in accordance with the relevant Local Plan Policy of that time for St Edmundsbury Borough Council: NE1: Impact of Development on sites of Biodiversity and Geological Importance.

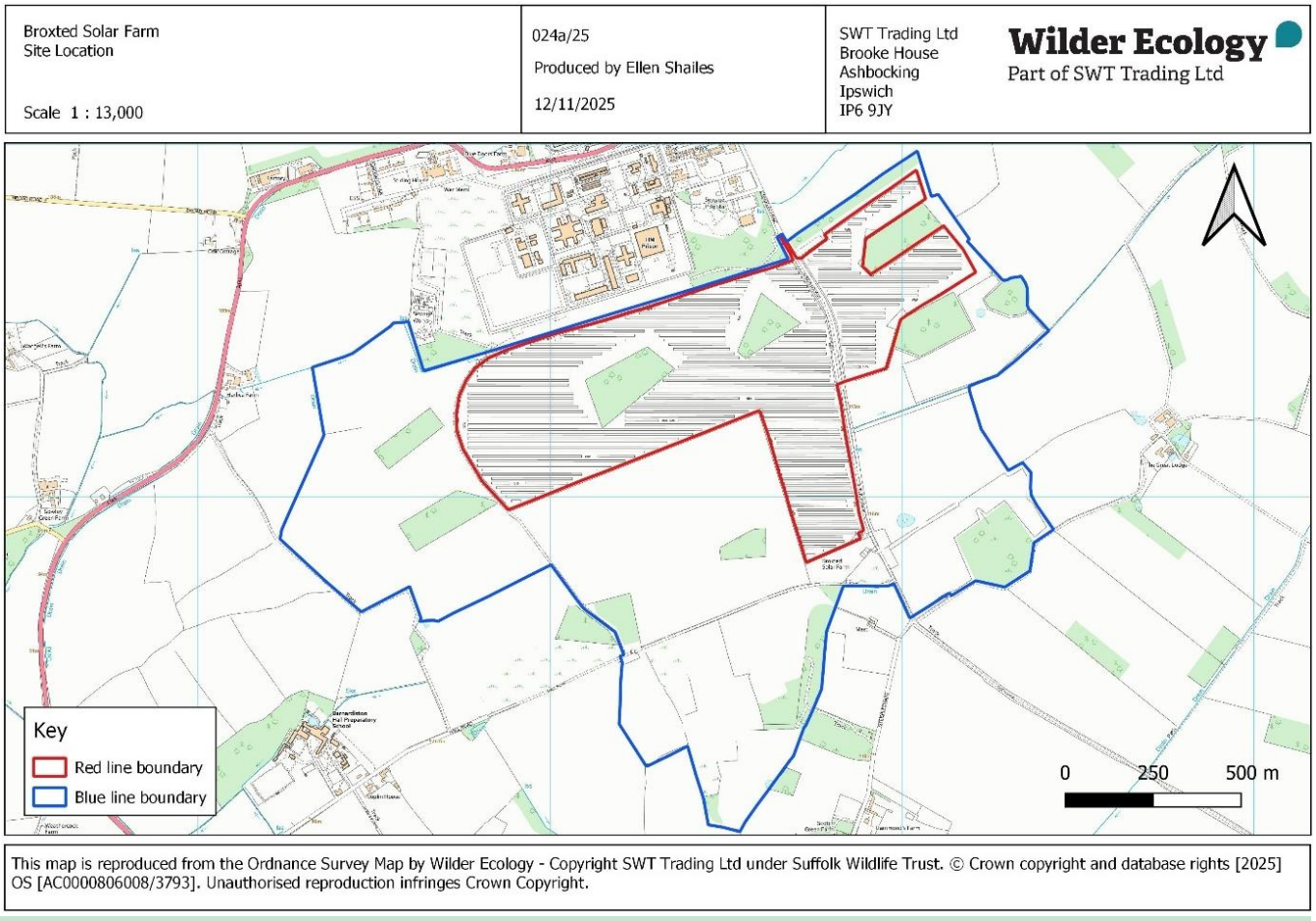

Figure 8: Blue line boundary of ownership and red line planning application boundary as 2012

The relevant off-site areas for the metric calculations are defined as the Compensation Grassland (Hazel and Clare Fields), Deer Park Pastures and several hedgerows which were created or enhanced during the relevant period. The enhancement of the Compensation Grasslands (Hazel and Clare Field) was agreed as part of the original planning consent in 2012. The enhancement of Deer Park Pastures was also included in the metric calculations, despite this not being agreed as part of the original planning consent. It was considered appropriate to include this area in the overall metric calculations for the Estate because when the Broxted Solar Farm was developed in 2013, this also resulted in the implementation of the Integrated Management Strategy which included management recommendations to enhance the condition of Deer Park Pastures. It is considered that if Biodiversity Net Gain had been mandatory at the time of the planning consent, then Deer Park Pastures would have been included as off-site enhancement of lowland meadow.

The blue line boundary in Figure 8 denotes the boundary of the Broxted Estate at the time of the solar farm planning application in 2012, and all off-site habitat creation and enhancement has been carried out within this area. As part of the Integrated Management Strategy other habitats such as ponds have been created or enhanced. However, only the pond created within the Compensation Grassland was included in the off-site metric calculations.

The BNG metric requires habitat types to be defined in a specific way, with UK Habitat Classification being most frequently used. Developed in 2018, this is a relatively new, unified approach to classifying habitats and an updated Version 2 was published in 2023 (UKHab Ltd, 2023). It is intended to assist ecologists, environmental managers, landscape architects and other land-based operatives to identify, map and describe habitats in a consistent way. It has particular application to ecological impact assessment, habitat metrics and to provide a more consistent baseline for monitoring land use change.

It must be stated that whilst UK Habitat Classification Version 2 (UKHab 2.0) can be undertaken for the habitats as they exist at this current time, being able to retrospectively apply this to the habitats as they were in 2012 (the baseline) has significant limitations. Similarly, condition assessments can be conducted on the existing habitats but can only be estimated for the baseline habitats. Consequently, these assessments are based on extrapolation from the original SWT reports and the familiarity of the authors with the site over many years and represent a best estimate of the situation at that time.

17. Baseline habitats and their condition

The Preliminary Ecological Assessment (PEA) produced by Stone *et al.* (2012) classified the CWS grassland into five categories. The descriptions of these categories were used to help determine baseline habitat types and codes for the on and off-site habitats at the Broxted Estate. See Figures 9 and 10 for baseline habitat maps for on and off-site habitats.

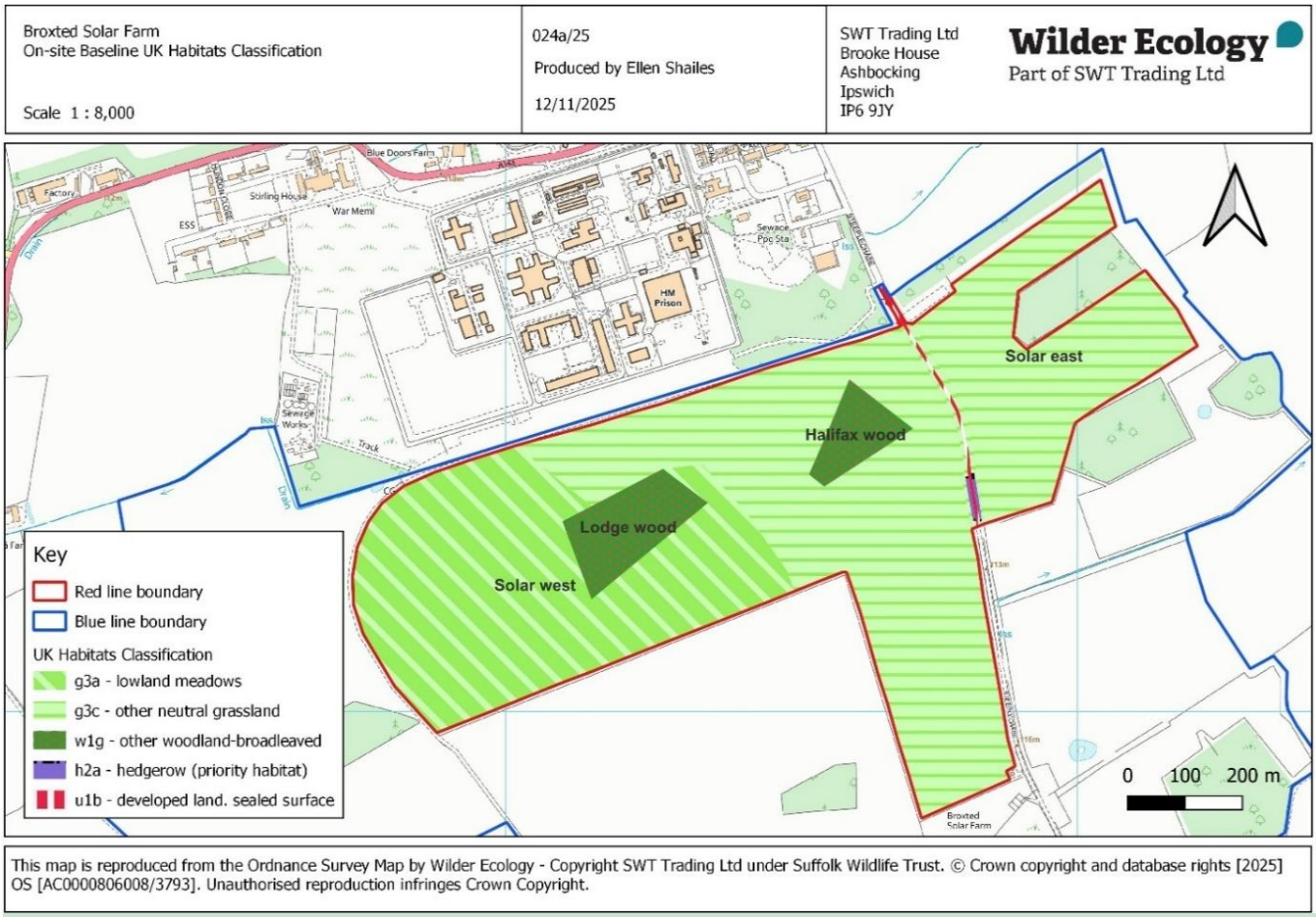

Figure 9: Predicted on-site baseline habitats within Broxted Solar Farm as they were in 2012

The grasslands of the CWS broadly fall into two main categories:

Type 1: The most diverse compartments that include significant populations of rare and notable species such as adder's tongue, orchid species, pepper saxifrage, burnet saxifrage and devil's-bit scabious. It is proposed to define these areas as lowland meadow (UK Habitats Classification code g3a). This includes the western part of Solar West and most of Deer Park Pastures.

Type 2: Compartments lacking significant populations of rare and notable species. It is proposed to define these areas as other neutral grassland (UK Habitat Classification code g3c). This includes the eastern part of Solar West.

A third category, Grassland Type 3, described areas with no rare and notable species and including some obvious signs of nutrient enrichment and negative indicators. Very little of Type 3 was recorded overall, apart from a small area on the eastern side of the CWS, within Solar West and another small area on the southern boundary. It is therefore also proposed to define these relatively insignificant areas as other neutral grassland (UK Habitat Classification code g3c).

Photo 12: Wildflower meadow within the solar farm

Grassland Types 4 and 5 relate to the Compensation Grassland and the two areas of fallow arable grassland in Solar East respectively. Both areas were part of the WW2 airfield but reverted to arable use soon after. In 2012, Solar East had been uncultivated for about ten years and was species poor. It is unknown if sowing was undertaken to help establish a grass sward. The Compensation Grassland had been out of production for at least three years, with a well-developed sward and scrub growth in some areas. Despite these areas being recorded as species poor, it is proposed that these areas are also categorised as other neutral grassland (UK Habitat Classification code g3c), because there is not enough evidence to confirm that they were modified grassland (UK Habitat Classification code g4) at the time and classifying them as such could overstate the potential biodiversity uplift of the scheme overall.

BNG condition assessments for other neutral grassland and lowland meadow within the CWS were difficult to define and could only be gleaned from the original reports and discussions with the surveyors. These areas were largely unmanaged with only sporadic grazing and therefore lacked a varied sward height. The presence of indicator species varied across the site, but it is assumed that throughout most of the grassland there were less than 10 vascular plant species per m^2. Based on the Statutory Biodiversity Metric condition assessment, this implies that the lowland meadow and other neutral grassland within the CWS were in moderate condition.

Solar East, which was categorised within the PEA as Type 5 species poor grassland was considered to be other neutral grassland in moderate condition. This area of grassland may have been in poor condition because field notes from 2012 indicate it had quite a lot of bare ground with species typical of early colonisation such as creeping bent and bristly ox-tongue. However, there is insufficient evidence within the PEA to confirm this and therefore its condition was retrospectively assessed as moderate in order not to overestimate the potential biodiversity uplift.

The Compensation Grassland was categorised within the PEA as Type 4 species poor grassland which had been arable more recently than Solar East. Throughout the Compensation Grassland there was also well-developed scrub growth, as well as a more open sward and areas of bare ground. This description of the Compensation Grassland provides evidence to suggest that this grassland is likely to have been in poor condition at baseline based on the Statutory Biodiversity Metric condition assessment, due to having an unvaried sward height, cover of bare ground above 5%, cover of scrub above 5% and less than 10 vascular plant species per m^2.

Most of the woodlands on site were planted by the MoD in the 1980's and therefore in 2012 were still immature. Google imagery from 2010 and 2011 shows the plantation rows still clearly visible with a uniform structure throughout the woodlands. Halifax Wood and Lodge Wood now lie within Solar West, Paunten Wood is located within the CWS grassland to the south. The PEA described these woodlands as even aged plantations with little or no understorey. It is proposed to define these woodlands as other broadleaved woodland (UK Habitats Classification code w1g) in poor condition due to their lack of a varied age and vertical structure, open space, recognisable woodland plant community, veteran trees and deadwood.

Hedgerows on site are described as species rich native hedgerows within the PEA and therefore defined as species rich native hedgerows (UK Habitat Classification code h2a5), likely to be in moderate condition.

18. Current habitats and their condition

18.1. Methodology

Two survey visits were made on 9th and 16th May 2025 by SWT surveyors to determine the current UK Habitats Classification types and conditions for on- and off-site habitats. The grassland within the solar farm was surveyed using 34 randomly distributed 2m x 2m quadrat plots across the solar farm, including quadrats between the interpanel rows and underneath the solar panels. The off-site grasslands including Deer Park Pastures and the Compensation Grassland were surveyed using a walk over survey. All species were recorded and percentage cover assigned using the DAFOR scale. Woodlands on site were surveyed using the Sylva Woodland Condition Assessment methodology which requires five survey plots to

be assessed. The hedgerows on site were condition assessed by walking along the length of each hedgerow using the Statutory Metric Condition Assessment criteria.

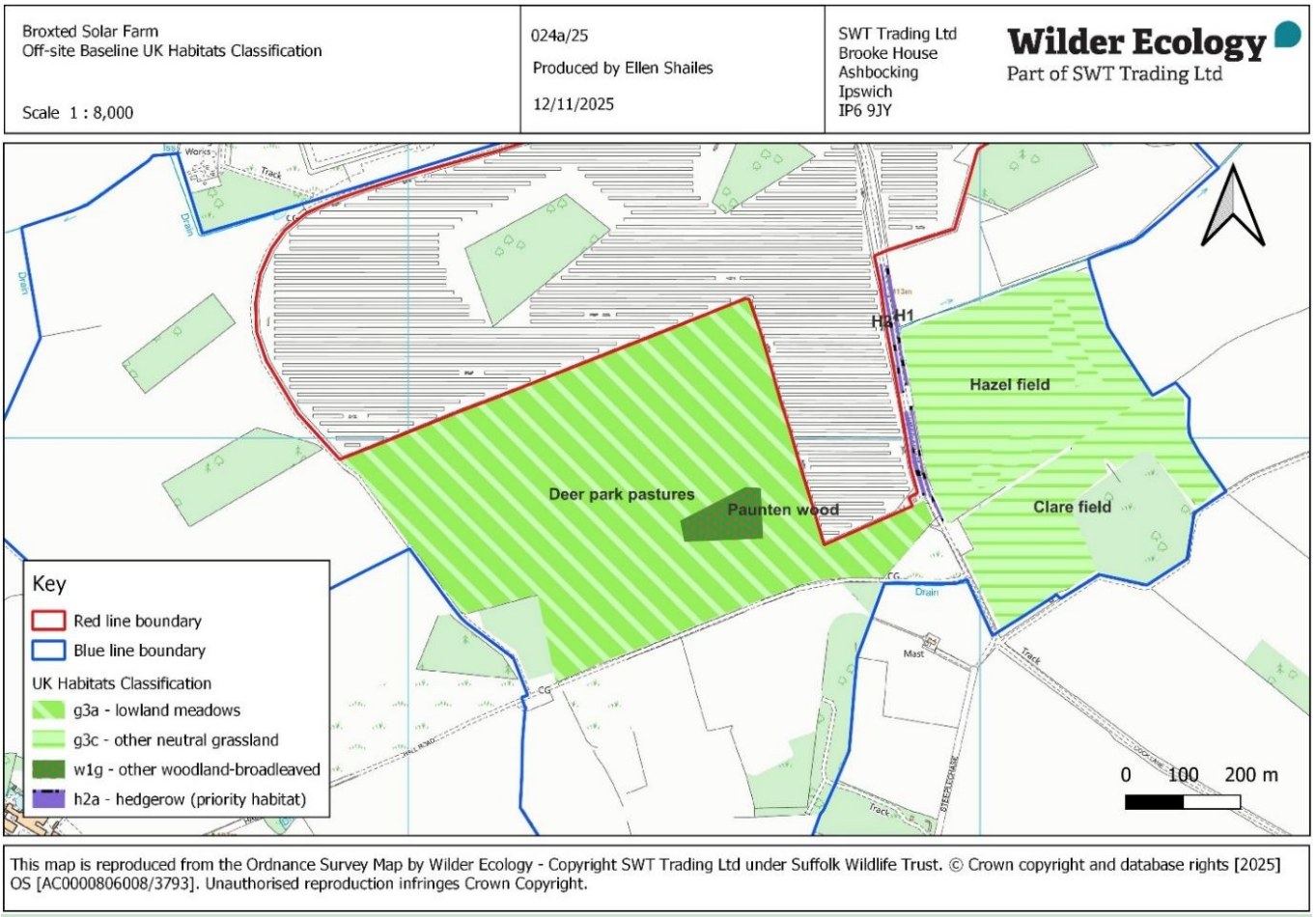

Figure 10: Off-site Baseline Area and Linear habitats

18.2. Grassland within the solar farm

UKHab 2.0 now states that grassland beneath the panels should be recorded as other developed land (u1b6) or developed land; sealed surface with an essential secondary code of 83 – solar panel array. The definition for this states that '*An arrangement of ground-mounted or 'floating' solar photovoltaic panels designed for renewable electricity generation. Record the strips of panels as u1b6 and the strips of vegetation between the rows separately*.' (UKHab Ltd, 2023) This urban classification within the Statutory Metric achieves a biodiversity value of zero. This classification alleviates previous concerns about what type and condition of grassland can be achieved beneath solar panels, particularly when reseeding. Notably our survey provided supporting evidence that 12 years on after construction, the original medium to high distinctiveness grassland shaded beneath the panels has reverted to species-poor grassland (UK Habitat Classification code g4: modified grassland), dominated by grasses with a loss of most herbaceous species other than abundant common nettle in some areas. This lower value modified grassland beneath the solar panels was assessed as being in poor condition consistent with the findings of Montag *et al* (2026).

Areas of Solar West unshaded by the solar panels, including the interpanel rows and areas of open grassland, were assessed as being split between lowland meadow (habitat of high distinctiveness) to the west of this area and other neutral grassland to the east. These areas of lowland meadow were assessed as being in good condition with 10 or more vascular plant species per m^2 and a high proportion of characteristic indicator species frequent throughout including agrimony, meadow vetchling, glaucous sedge, cowslip and bird's-foot trefoil. Species associated with unimproved grassland were also recorded including adder's tongue, pepper saxifrage, quaking grass and common spotted-orchid. The sward height was varied throughout with tussocky areas dominated by tall fescue and shorter sheep grazed and mown areas.

The unshaded areas of other neutral grassland within solar west and solar east were also assessed as being in good condition. In these areas grasses were more dominant but indicator species were present throughout including bird's-foot trefoil, ox-eye daisy and meadow vetchling. Species richness seems to have improved since the PEA, particularly within Solar East where indicator species such as cowslip, meadow vetchling and crested dog's-tail are occasional. Species which occurred frequently on site in 2012 such as field horsetail, ragwort and bristly ox-tongue and are typical of more recent arable reversion sites, were either not present or very rare.

18.3. CWS grassland outside of the solar farm

Deer Park Pastures was assessed as being lowland meadow in good condition, with indicator species frequent to occasional throughout including adder's tongue, quaking grass, lady's bedstraw and agrimony. A combination of cattle and sheep grazing has helped to improve the condition of this area of unimproved grassland by opening up the sward.

The Compensation Grasslands seem to have undergone the most significant change since the 2012 survey, improving from a likely poor condition in 2012 to good condition other neutral grassland in 2025. Indicator species occur throughout the grassland including sweet vernal grass, bird's-foot trefoil, cowslip and meadow vetchling. Sheep grazing has created a varied sward with scattered scrub and within Hazel Field two areas of mixed scrub have been allowed to develop. A pond has also been created to provide suitable habitat to support turtle dove which breed on site. The pond and mixed scrub were assessed as being in moderate condition.

18.4. Other habitats

Hedgerows on site are well managed and assessed as being in good condition, being generally allowed to grow tall and wide with management undertaken where required to reduce gaps within the hedge. In many cases, at least one side of the hedgerow is left undisturbed and allowed to extend out into adjacent rough grassland, improving suitability for a range of farmland bird species.

Woodlands within the solar farm have improved in condition due to implementation of the Woodland Management Plan and the exclusion of deer due to the solar farm security fencing. These woodlands are now assessed as being in moderate condition. Within the woodlands the plantation rows are less visible, and a combination of thinning and coppicing of woodland edges has allowed a more diverse age and vertical structure to develop.

19. BNG Calculation

19.1. Strategic Significance

The recently published Suffolk Local Nature Recovery Strategy (LNRS) (SCC, 2025) is now in place for the area. This requires the strategic significance to be classified as low in the baseline, and then any habitat enhancement or creation on site that is consistent with the potential measures mapped onto the Suffolk LNRS Local Habitat Map is to be classified as high post intervention.

The mapped potential measures for the site include; PM02 Deciduous Woodland Restoration, PM07 Scrub Creation, PM20 Other Neutral Grassland Restoration, PM24 Lowland Meadows and Pastures Restoration (SCC, 2025). Hedgerow creation and enhancement within the farmed landscape is also included as an unmapped measure within the LNRS. This means that most of the habitat creation and enhancement measures undertaken on site are either mapped or unmapped measures within the LNRS and can therefore be classified as having high strategic significance post development. The only habitat creation on site not mapped within the LNRS is the pond creation within the Compensation Grassland, which therefore does not have the strategic significance uplift applied.

19.2. Summary of change in biodiversity units

The on- and off-site baseline biodiversity unit value was calculated using the PEA (Stone *et al.*, 2012) to estimate the baseline habitat type and condition for the site in 2012. The habitat enhancement and creation which took place on site from 2012 to 2025 was mapped and the calculated areas entered into the Statutory Metric tool. The on- and off-site metric calculations are summarized below in Table 4 and Table 5 For the post intervention habitats from the 2025 survey refer to Figure 11. below. The summary of the final BNG calculations is provided in Table 6.

Table 4. Summary of on-site change by habitat type – Statutory Metric calculation

Broxted Solar Farm Change by broad habitat type					
Change in Habitat Type		**Area/ha**	**Biodiversity Unit Value**		**Summary of Change**
Baseline	**Post Intervention**	Baseline	Baseline	Post intervention	**Unit change**
Lowland meadow (Solar West beneath panels)	Developed land - sealed surface/buildings	9.16	146.56	0	-146.56
Lowland meadow (Solar West)	Lowland meadow	12.35	197.60	284.49	86.89
Other neutral grassland (Solar West and East combined beneath panels)	Developed land - sealed surface/buildings	14.64	117.12	0	-117.12
Other neutral grassland (Solar West and East combined)	Other neutral grassland	22.11	176.88	274.64	97.76
Other neutral grassland (Solar East grassland outside sheep fence)	Lowland meadow	0.83	6.64	13.63	6.99
Other broadleaved woodland (Lodge and Halifax woods)	Other broadleaved woodland	4.22	16.88	33.01	16.13
Developed land - sealed surface (Track)	Developed land - sealed surface	0.30	0	0	0
Other neutral grassland (Grassland along track)	Other neutral grassland	0.52	4.16	4.16	0
	TOTAL	**64.13**	**665.84**	**609.92****	**-55.92****
Change in Linear Habitat Type		**Length/km**	**Biodiversity Unit Value**		**Summary of Change**
Baseline	**Post intervention**	Baseline	Baseline	Post intervention	**Unit change**
Species-rich native hedgerow	Species-rich native hedgerow	0.17	1.33	1.33	0
	TOTAL	**0.17**	**1.33**	**1.33**	**0**

** slight rounding errors in metric

Table 5. Summary of off-site change by habitat type with Compensation Grassland and Deer Park Pastures

Broxted Solar Farm Change by broad habitat type						
Change in Habitat Type		**Area/ha**		**Biodiversity Unit Value**		**Summary of change**
Baseline	**Post Intervention**	Baseline	Post intervention	Baseline	Post intervention	**Unit change**
Other neutral grassland (Hazel Field)	Other neutral grassland	10.22	10.22	45.12	102.11	65.08
	Mixed scrub	0.9	0.9		6.93	
	Ponds (priority habitat)	0.16	0.16		1.16	
Other neutral grassland (Clare Field)	Other neutral grassland	6.66	6.66	26.62	66.50	39.88
Lowland meadow (Deer Park Pastures)	Lowland meadow	32.36	32.36	517.76	745.42	227.66
Other broadleaved woodland (Paunten Wood)	Other broadleaved woodland	0.98	0.98	3.92	3.92	0
	TOTAL	**51.28**	**51.28**	**593.42**	**926.04**	**332.62**

Change in Linear Habitat Type		**Length/km**		**Biodiversity Unit Value**		**Summary of Change**
Baseline	**Post intervention**	Baseline	Post intervention	Baseline	Post intervention	**Unit change**
Species-rich native hedgerow	Species-rich native hedgerow	0.80	1.51	6.41	19.15	12.74
	TOTAL	**0.80**	**1.51**	**6.41**	**19.15**	**12.74**

Figure 11: On- and Off-site Post Intervention Area and Linear habitats

Broxted Solar Farm Post Intervention UK Habitats Classification Scale 1 : 10,000	024a/25 Produced by Ellen Shailes 26/03/2026	SWT Trading Ltd Brooke House Ashbocking Ipswich IP6 9JY **Wilder Ecology** Part of SWT Trading Ltd

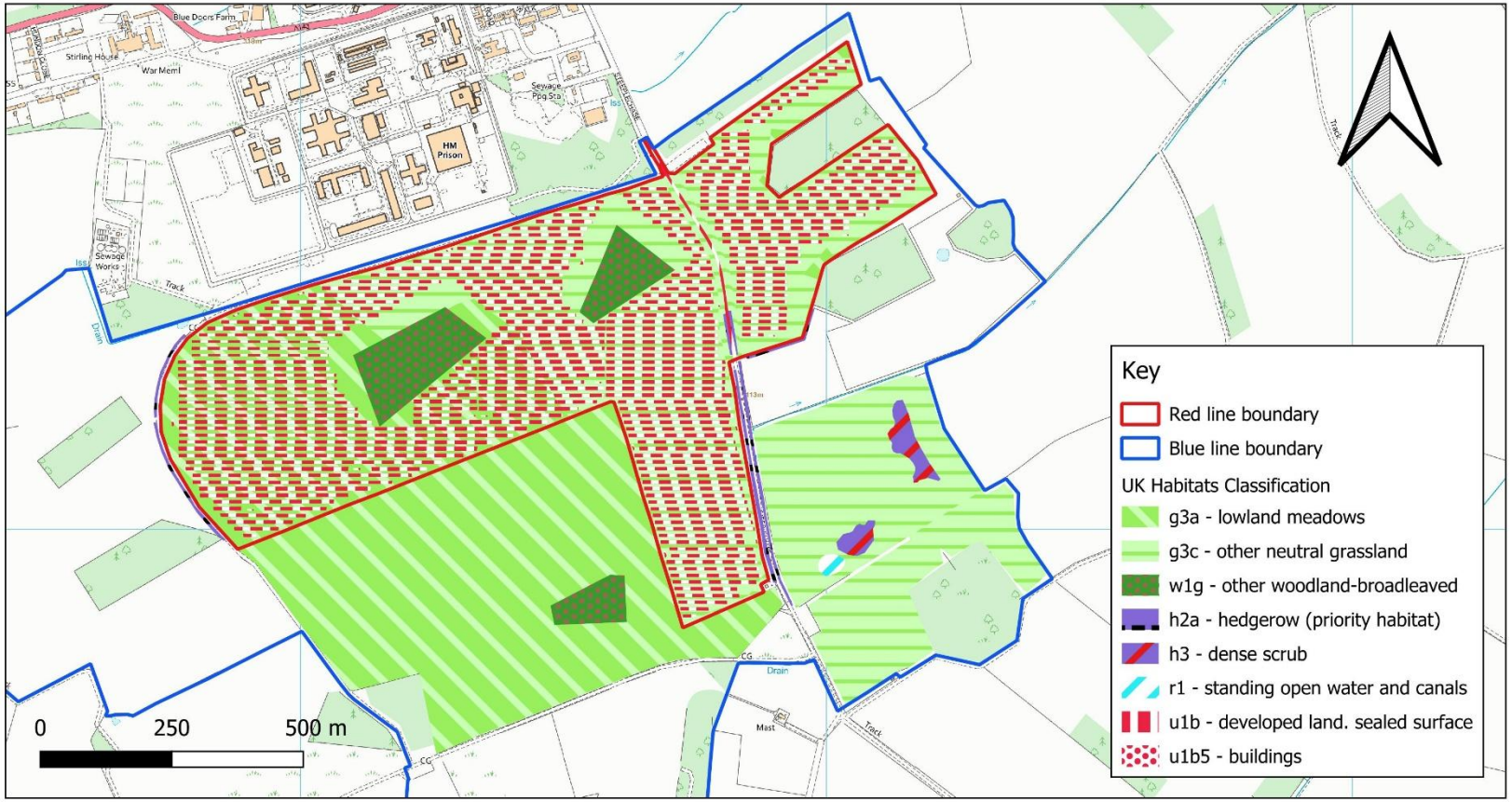

Table 6. Summary of final BNG calculations with Compensation Grassland and Deer Park Pastures enhancement

Final Results	On-site	Off-site	Total
Net habitat unit change	-55.92	332.62	276.70
Net habitat % change	-8.40%	56.05%	41.56%
Net hedgerow unit change	0.00	12.74	12.74
Net hedgerow % change	0.00	198.87%	959.62%
Trading rules satisfied?			**YES**

19.3. BNG Summary

19.3.1. On-site BNG

The on-site Statutory Metric calculations demonstrate that the creation of a solar farm at the Broxted Estate has caused an overall reduction in biodiversity units (BU), from a baseline of 665.84 BU to 609.86 BU, a reduction of -55.92 BU which equates to a decline of -8.40%. All hedgerows on site were retained. This overall loss of biodiversity units on-site is due to the loss of 9.16ha of lowland meadow and 14.64ha of other neutral grassland beneath the solar panels. Despite the 2025 survey demonstrating the improved condition of the remaining areas of lowland meadow, other neutral grassland and woodland within the solar farm, this was not sufficient to achieve a net gain on-site.

It should also be noted due to conflicting opinions on how to categorise habitat under panels that an alternative metric calculation assigning the areas under the panels as g4 - modified grassland in poor condition - was conducted for comparison. This calculation provided a net loss of -9.99 BU or -1.5%, which falls well below the required minimum 10% had this been applicable at the time. However, for consistency, the overall conclusions below are based on the UKHab 2.0 definition that grassland beneath the panels should be recorded as other developed land.

19.3.2. Off-site BNG

Several off-site measures were undertaken across the wider Estate to create new habitats and enhance existing habitats on site. Three new lengths of hedgerow were created, and other smaller sections of hedgerow were planted to link and extend existing hedgerows on site. A rolling programme of rotational trimming and coppicing of hedgerows has been introduced to improve the condition of existing hedgerows. Sheep grazing was also introduced to the Compensation Grassland with topping used alongside grazing to control

scrub encroachment. A pond has been created, and areas of permanent scrub have developed which has created a mosaic of habitats suitable for a wider range of species.

The enhancement of Deer Park Pastures through a combination of mixed livestock grazing, rotational topping and scrub control has proved crucial to the scheme achieving the minimum 10% net gain. Without the enhancement of this large area of lowland meadow the overall uplift in habitat units would have only been 49.04 BU resulting in an uplift of 7.36%, below the required 10%. The enhancement of lowland meadow was also required to satisfy the metric trading rules which require enhancement or creation of the same habitat type to replace losses of very high distinctiveness habitats such as lowland meadow.

Including Deer Park Pastures, the off-site Statutory Metric calculations demonstrate that off-site habitat creation and enhancement measures at the Broxted Estate have increased the Biodiversity Units from a baseline of 593.42 BU to 926.04 BU, an uplift of 332.62 BU which equates to an uplift of 56.05%.

There was also an off-site increase in hedgerow units, from a baseline of 6.41 BU to 19.15 BU, an uplift of 12.74 BU which equates to an uplift of 198.87%.

19.3.3. Overall BNG across the Broxted Estate

Overall, there is a significant net gain in biodiversity units. This is due to the successes of on-site and off-site enhancement of grassland and woodlands and the creation of hedgerows, scrub and ponds across the Broxted Estate. The overall Statutory Metric calculations for the site demonstrate an overall uplift in habitat units of 276.70 BU which equates to an uplift of 41.56%. There is also a significant overall uplift in hedgerow units of 12.74 BU which equates to an uplift of 959.62%, this is due to the off-site creation of 0.71km of hedgerow and the enhancement of 0.8km of hedgerow from moderate to good condition.

SECTION D

Leasons Learned

20. Broad conclusions

Each solar site will have its own attributes and while some of these 'lessons learned' are applicable across the board, others are of a particular nature which will be applicable to only some sites. The grasslands of Broxted Estate are in many ways unique due to their topography, soil type and history, so comparisons with other sites should be made with care.

When the Broxted Estate was created in 2011/12, largely on the site of the former airfield of RAF Stradishall, it was a relatively 'blank canvas'. For practical purposes, there were no pre-existing land uses in operation which provided an unconstrained opportunity to create something special. However, the vast majority of solar farms will be created on land which has pre-existing uses.

Navigator's vision was for Broxted to become be an exemplar from which lessons in terms of development and management of solar farms could be learnt. When the majority of the planning for the solar farm took place in 2012, there was very little knowledge about solar farms in respect of their impact on botany and ornithology. Indeed, many recent literature reviews have found a distinct lack of empirical evidence regarding long-term impacts of solar on biodiversity (Fleming, 2025; Green, 2025; Järviö *et al*, 2026). The establishment of such a long-term ecological monitoring programme at Broxted was therefore pioneering for its time.

Photo 13: Sunrise over Broxted Solar Farm

Recently Solar Energy UK (2025) and Montag *et al* (2026) have published a set of standardised approaches to monitor biodiversity in solar farms. At Broxted the monitoring that has been conducted over the 12 years included seven of their nine suggested Key Components (Site Information, Standard Survey Information, Management Plan Compliance, Site Management, UKHab Survey, Fixed Point Photographs and Ad-hoc Sightings). Also included are six of the eleven Additional Components (Control Site Data, Biodiversity Net gain Assessment, Breeding Bird Survey, Wintering Bird Survey, Other Species Specific – Reptile Surveys, Bat Surveys).

Whilst the layout of the solar farm avoided most of the species-rich areas, some construction did occur on grassland of very high distinctiveness. However, the design of the scheme and the timing of construction sought to reduce impacts on these areas as much as feasibly possible.

Twelve years of positive habitat management have ensued since construction, but despite the 2025 survey demonstrating the improved condition of the unshaded grasslands and also the two woodlands within the solar farm, this was not enough to achieve a biodiversity net gain for the site alone.

The improvement in condition of the off-site Compensation Grassland during the last 12 years is notable, changing from poor to good, and also helps confirm the timescales by which this uplift in condition is achievable. When this information was added into the metric the scheme was then seen to deliver a biodiversity net gain, but still below the benchmark of 10%. It is only by the addition into the metric of the remaining area of lowland meadow (Deer Park Pastures) and the positive outcome of its management, that a significant biodiversity net gain for the whole project was finally achieved.

Photo 14: Deer Park Pastures with cattle grazing

The difficulty in retrospectively applying the biodiversity metric should again be acknowledged, as there is room for error in the baseline attributes, despite the conservative approach. Nevertheless, from the Broxted results it appears that construction of solar farms on existing grassland is unlikely to deliver a 10% biodiversity net gain on-site alone and that off-site compensation is essential.

The latest guidance provided by UKHab 2.0 acknowledges the decline in ecological value due to shading by solar panels and that grassland beneath the panels should be recorded as other developed land. Masefield & Jessop (2024) raised concerns that many solar farm BNG reports propose medium or higher distinctiveness grassland between and beneath solar panels without evidence that such habitats are achievable. The outcome of the long-term botanical monitoring at Broxted verifies the significant decline in quality and condition of shaded grassland. Consequently, there is little validity to the guidance provided by Solar Energy UK (2022) which states that for the purposes of BNG calculations, in most cases, habitats within solar farms can be classified as other neutral grassland of moderate condition and a similar habitat can also be achieved beneath the panels. The findings of the botanical monitoring at Broxted clearly show this is not the case for shaded grasslands.

This also has implications for solar farm sites constructed on arable land in that any seeding beneath the panels should be with a grass-dominated mix applicable to the soil type. More expensive, flower-rich mixes should be reserved for unshaded parts of the site such as the margins or other blocks of habitat. Where the interpanel row spacing is 7m or more, then if feasible, flower-rich mixes could also be sown here, but there would be no benefit in doing this for sites where the arrays are more closely spaced.

Prior to construction, the large expanse of grassland of the former airfield supported a high population of breeding skylark. Monitoring work has shown that over time, skylark numbers are negatively influenced by the presence of solar panels. The converse appears to be the case for meadow pipit where the numbers are increasing in Solar West, as well as on the rest of the Estate. Other farmland bird species have been positively influenced by management of the wider Estate including turtle dove, yellowhammer and linnet.

Given that land use including energy infrastructure should also contribute to nature recovery and support biodiversity net gain (Gov.UK, 2026), this strengthens the expectations around habitat creation and management, long-term ecological stewardship and a solar farm design that improves ecological condition rather than merely mitigating harm. The findings from the pioneering monitoring at Broxted should therefore be considered as a valuable case study for future planning of solar farms.

Finally, despite widespread concern that solar sites are taking over land required for food production, the recent publication of The Land Use Framework for England (Gov.UK, 2026) identifies that solar generation is anticipated to expand to occupy only around 1% of England's land by 2035, with a clear expectation that much of this will remain in agricultural use through grazing and other forms of integrated or multifunctional land management. Broxted represents an exemplary example of how this can be achieved.

21. Lessons Learned: Strategy and Partnership

From the outset, there was a clear and wide-ranging strategy for the solar farm which also took into account the surrounding estate and neighbourhood. The justification was that a holistic approach delivers far greater benefits than when a solar farm is simply 'parachuted' into a defined area.

In terms of Strategy and Partnership, the key points are:

- The 'Integrated Strategy' created for Broxted encompasses all the key threads: energy, food production, landscape, wildlife conservation, community and history. It is driven, monitored and adhered to by all the interested parties.

- Strong and aligned long-term partnerships are a prerequisite for success. The key long-term partners are the Landowner(s) and the solar farm owner. In the case of

Broxted, Navigator and Cubico have worked very closely together since its inception and Suffolk Wildlife Trust is also integral to the shared vision. Sharing the same vision and sharing the same determination to fulfil the strategy is fundamental for success on all levels. On the one hand this allows for discussion about long-term planning and opportunity for the solar operation itself and on the other hand it ensures that all the other important factors – whether, for example, relating to ecology or to the community – are embedded into future plans. The partnership between Navigator and Cubico has now been formalised to run through to 2098, allowing planning for the entire 21st Century.

- Community engagement and involvement are also essential. Given the pressing need for the development of solar and other renewables, engaging with the community and understanding their particular needs and concerns is so important if such developments are to be delivered successfully.

- Embedded in the Strategy is the key principle to plan with care and foresight. For example, sheep grazing of the solar farm was included from the outset. Thus, panel heights, electric cable protection, stocking density, watering points and movements of in and out of the site were all factored into the design. The early discovery that sheep were triggering the security cameras was unforeseen. However, this was resolved by perimeter stock fencing and the requirement for separate grass management between the two fences.

22. Lessons Learned: Policy and Process

A key factor which differentiates Broxted from most other solar farms is that Navigator insisted on retaining the management of the land within the solar farm and this is written into the solar farm lease. Normally this responsibility is delegated to the Operations and Maintenance Contractors who work for the solar farm operator. Consequently, at Broxted the solar farm grassland management can be integrated with that of the wider Estate, delivering far greater ecological benefits and also economies of scale than if it were undertaken in isolation.

It also means that all the important protocols relating to the solar farm grassland are adhered to, such as the timing and nature of activities within the solar farm throughout the year. For example, from mid-March to mid-August the ground bird nesting season dictates that no vehicular movements are allowed, except on specified routes and with specified low impact vehicles.

In terms of policy and process, the key points are:

- An Environmental Management Group (EMG) is not a standard procedure for most solar farms and Broxted is very much a pioneer in this respect. However, for larger

projects, the involvement of ecological specialists is becoming increasingly important.

- At Broxted, the EMG is formed by Navigator, Cubico and Wilder Ecology (SWT). The group collectively oversees the policy for biodiversity and conservation management. This remit extends beyond the solar farm to encompass the whole Broxted Estate. This enables a more efficient approach to management, as well as providing greater biodiversity benefits.

- Delivery of the Integrated Strategy is driven by key long-term partners. At Broxted, the 'coalition of experts' work as a team under the strategic direction of Navigator and the guidance of the EMG. It encompasses solar generation, grassland management, livestock, biodiversity and habitat creation and management, arable farming, agri environment schemes and also acknowledgement of the rich history of the site.

- Policies and processes/protocols are reviewed annually by the EMG to ensure that they are meeting the strategic objectives. Inevitably as time evolves and lessons are learned, there are adjustments.

23. Lessons Learned: Specifics and Operational

Grassland Management is complex at Broxted. Within the solar farm, this has to balance the needs of the solar operation, biodiversity (including ground nesting birds) and sheep grazing. To achieve the optimum results there needs to be flexibility, for example, adjusting to weather conditions in each particular year. A balance between grazing (the primary grassland management tool) and topping is therefore constantly reviewed in an adaptive way. This attention to detail is achievable because the landowner is responsible for grassland management within the solar farm and has intimate knowledge of the local conditions.

Managing the grazing across the whole Estate, treating it as a much larger unit than just the solar farm itself, provides a regime that is more secure in the long-term. Annual advice from conservation grazing experts at SWT working with both the landowner and the graziers has also helped maximise the positive effects of grazing. Investment in the correct equipment for grassland management is also important. At Broxted five different mowing machines are used.

In terms of specifics and operational, the key points are:

- The detailed annual botanical surveys have been essential to understanding how the grassland changed due to the shading of the panels and how management has enhanced other on-site and off-site areas. After the initial 10 years of monitoring and

grassland management, the botanical monitoring has now evolved to encompass a more advisory remit.

- The discussions of the EMG are essential to inform all members of the ongoing maintenance operations of the solar farm. This means that both monitoring and habitat management can be adapted to fit in with necessary activities in a straightforward way.

- The outcome of all the monitoring work is presented to the group annually and this helps inform future grassland management and habitat creation and enhancement opportunities. Review of the stocking densities and the timing and duration of grazing (whether it be for sward height reduction or botanical purposes, or both) are essential to deliver an evolving and responsive year-on-year management regime.

- Habitat management and creation have also been adapted as general trends and the requirements of specific species are identified. For example, the globally threatened turtle dove requires not only scrub for nesting and seed-rich plants as a food source, but also proximity to shallow ponds for drinking. Consequently, the creation of new ponds has been a key objective given that there were none present in 2012. There are now five and the locations have been identified for further ponds; their creation is an important and continuing policy.

- The solar farm encompasses two woods – Lodge and Halifax – and whilst this was initially considered a drawback two benefits have now been identified. It was necessary to retain an area to the north of each wood as open grassland (rather than being used for solar panels) because of the threat of shading of the solar panels as the trees grow. These grassland areas have botanical diversity and provide benefits to ground nesting birds such as meadow pipit, as well as providing additional areas for sheep grazing. Furthermore, these woods are now protected from deer damage by the solar farm fence. Deer are causing significant damage in many woods in the East of England, but Lodge and Halifax Woods have a dense understorey that benefits both silviculture and wildlife. Designing in woodland within large solar farms should therefore be encouraged.

- Engagement with the community is an important part of the Integrated Strategy and has been successfully implemented through access, tours and the creation of the Broxted Solar Community Fund (BSCF) in 2014. Access to Broxted is through a permissive footpath created in 2012 which skirts the perimeter of the solar farm. It is regularly used and walkers can view the six interpretation boards around the footpath which set out details about the history, conservation, wildlife, solar energy and RAF Stradishall. In the summer, tours of Broxted are arranged for local community groups and organisations.

- Broxted is continually trying to learn from others. Some larger tours in the summer include planners, ecologists, consultants and solar developers not just as a means of demonstrating Broxted's commitment to excellence but to provide opportunities for new ideas and initiatives to be discussed and, where appropriate, implemented.

Photo 15: Wildflower-rich grassland within solar farm

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Appendix

Solar Specification

- Approximately 120,000 solar panels, with each of the panels positioned 0.9m clear of the ground (to allow grazing beneath), angled at 25-30 degrees to horizontal to provide a length of 6.0m with an overall height of 2.5m. They are fixed to metal frames which are driven or screwed directly into the ground up to 1m-1.5m in depth (depending on soil conditions) constructed in rows positioned 7m apart facing south.

- 18 inverters and transformers are housed together in buildings measuring approximately 12.1m in length x 2.4m in width x 2.8m high mounted on concrete plinths located within a defined spatial arrangement around the perimeter of the site. The colour finish is dark green.

- 1no. control building/monitoring room is located to the northern boundary of Solar West measuring 4.0m in length x 2.4m in width x 2.6m in height finished in dark green colour.

- 1no. customer room (switching station) is located to the south-eastern corner of the site measuring 6.0m in length x 3.2m in width x 2.8m in height finished in dark green colour.

- 1no. District Network Operators (sub-station) is located to the south-eastern corner of the site measuring 5.0m in length x 4.0m in width x 2.6m in height finished in facing brick.

- 97 CCTV cameras located on freestanding support poles adjacent to the fenced boundary of the site measuring a maximum of 4.0m in height. A green weld mesh wire fence with multiple gates demarcates the boundaries of Solar West and Solar East. The fence measures 2.1m in height. The gates measure 6.2m in width x 2.1m in height.

- Energy generation consented for 32mw and feeds into the 33kv line, but generation is mostly 23mw due to capacity of the grid.

- Panel cleaning takes place annually using distilled water. At Broxted there is no issue with lichen encrustation which normally requires chemicals to facilitate its removal.

- Since commissioning the solar farm has generated over 350 GWhs of clean electricity for the local network, avoiding many tens of thousands of tonnes of CO_2e emissions.

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