

Pathfinder Clean Energy (PACE) Ltd
UKZ157 Tydd Solar Farm
Biodiversity Net Gain Assessment and Strategy
(Fenland District Council)



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Summary

1. This Biodiversity Net Gain Assessment and Strategy Statement has been prepared on behalf of Pathfinder Clean Energy Ltd. (PACE) Ltd in support of a planning application for a ground-based solar farm on farmland to the east of Sutton St Edmund, Lincolnshire. The site contains land within two different planning authorities' administrative boundaries, and the calculations and narrative below are specific to the eastern part of the site, administered by Fenland District Council.
2. The baseline primary habitats within the development site are arable farmland with fields bounded by (mostly grass) tracks and with a network of drainage ditches. The drainage ditches typically hold water for more than 4 months of the year (some, including Lady Nunn's Old Eau and Treading Drain hold water throughout the year) but many of the smaller ditches were dry at the time of the first Phase 1 habitat survey in the summer of 2022, and some held still little or no open water in February 2025. There is a small copse of approximately 1.2ha on the western site boundary, but this ecological feature is devalued by the significant presence of non-native and invasive tree and shrub species and the virtual absence of an understorey or any natural regeneration due to deer pressure. There are no hedgerows on the site. There is very little grassland on the site, with compacted and mowed grass access tracks/field margins in places and the slopes of ditch banks largely dominated by coarse grasses. In the summer of 2023 there was a patch of gamebird crop near the copse, and this persisted into 2024, but this had been recultivated by February 2025.
3. Field surveys determined that only the water courses (and their banks) and the small copse adjacent to the western site boundary had any significant ecological value, and these features were reduced in value by their poor condition at the time of survey. An additional survey in February 2025 found the condition of the larger ditches (which had received maintenance engineering works since the earlier surveys) to be slightly improved due to the clearance of shading vegetation, but other condition scoring criteria still placed the condition of these watercourses as poor. In brief, the baseline biological/ecological value of the application site was poor.
4. There are no trees or hedgerows within the site, and the only woody vegetation consisted of a few stunted elder *Sambucus nigra* growing in the pylon base footprints.
5. The main proposed habitat changes, which will lead to clear improvements in the ecological value of the site and therefore qualify as Biodiversity Net Gains, are:
 - a) The creation of 3.63ha of new native (and locally appropriate species composition) tree lines and copses with associated native hedgerow/scrub understorey and edges.
 - b) Improvements to the value of the existing copse by removing non-native and invasive species, planting (and protecting) native saplings and by increasing its size (by more than 10%). Please note that this is not included in BNG calculations as it is outside the Fenland development site, but will be connected to the proposed additional woodland planting.
 - c) The conversion of the land currently under arable cultivation to native grassland with wildflowers, under and between solar panels on raised frames. This new grassland will be managed for wildlife interest and will have unimpeded access for all wildlife with the exception of deer (deer are to be excluded to protect vegetation, including new saplings, and to prevent possible damage to panels from larger deer species such as fallow deer).
6. In total, the proposals outlined here will deliver a clear Biodiversity Net Gain across the site that will be beneficial to local wildlife, will safeguard and benefit protected species and will contribute to the resilience of the wider local ecosystems.

1 Introduction

This assessment has been prepared on behalf of Pathfinder Clean Energy Ltd. (PACE) in support of a planning application for a solar farm on “land to the east of Guanockgate Road, Gorefield, Lincolnshire PE13 4PL.”

The site is situated less than 1km east of Sutton St Edmund and approximately 2km west northwest of Gorefield. The centre of the site is located at approximate grid coordinates TF 38286 12786. The site is poorly defined by roads, with Broad Drove West leading onto Elloe Bank only touching the northeastern corner of the site, and no other paved roads on the site boundaries. The western boundary of the Fenland part of the site is defined by Lady Nunn’s Old Eau (drain) and the southern boundary by Treading Bank. The current land use is arable production (winter wheat in the 2022 and 2025 growing seasons).

The application proposes the temporary installation of ground mounted solar photovoltaic (PV) farm with battery storage and substation; along with ancillary infrastructure and security/deer fencing, landscaping provision, ecological enhancements and associated works. The footprint of the proposed development would fall on land that is currently under intensive cultivation (including annual ploughing), while all existing habitats on the site such as ditches, a small copse and the very few other trees and shrubs on the site would remain *in situ*. No habitats of ecological value will be lost, and all existing habitats will be increased in extent and/or enhanced.

All water courses/drainage features will be retained and would not be subject to any negative change. Water quality improvements are expected, but cannot be quantified or guaranteed for the purposes of this assessment due to the connectivity of linked watercourses and Internal Drainage Board maintenance processes.

A field survey was carried out in July 2022 to determine the ecological baseline of the site and its immediate surroundings before the proposed development commences, to evaluate the likely ecological changes that could result from the development and to explore the opportunities for delivering realistic, deliverable, measurable and contextually valuable biodiversity net gains during the life of the project and beyond. This survey was supplemented by further surveys, the most recent being on 27th February 2025 to determine whether conditions on the site had changed over the intervening period and to update habitat condition assessments following watercourse works. The figure at Appendix 1 shows the site’s baseline habitats on 27th February 2025, and Appendix 2 shows the proposed layout and biodiversity enhancements within the Fenland section of the application.

This report aims to satisfy the requirements and recommendations of regional planning objectives and national legislation, including reference to: -

- The (superseded) Lincolnshire Biodiversity Action Plan 2011-2020 (3rd Ed)¹
- The Greater Lincolnshire Nature Partnership’s Local Nature Recovery Strategy (2020)²
- National Planning Policy Framework (NPPF)
- “Conservation 21 Natural England’s Conservation Strategy for the 21st Century”³
- The now superseded/devolved but still useful resources at; *UK biodiversity Action Plan* (UK BAP)⁴
- Environment Act 2021⁵
- Interim Nature Recovery Network for Fenland (2023)⁶.

¹ Lincolnshire Biodiversity Action Plan (3rd Edition) (website removed).

² [Nature Strategy 2020.pdf \(glnp.org.uk\)](#)

³ [conservation-21.pdf \(publishing.service.gov.uk\)](#)

⁴ [UK BAP | JNCC - Adviser to Government on Nature Conservation](#)

⁵ [Environment Act 2021 \(legislation.gov.uk\)](#)

⁶ [Fenland Interim Nature Recovery Network Final - July 2023](#)

2 Methods

Desk studies that helped inform this assessment are outlined in part 3 of the Preliminary Ecological Appraisal Report (AW Ecology dated November 2022). In brief, the following resources were consulted prior to conducting field surveys (and subsequently to verify information when necessary).

- Lincolnshire Environmental Records Centre;
- Cambridgeshire and Peterborough Environmental Records Centre;
- Multi-Agency Geographical Information for the Countryside (MAGIC, 2022);
- National Biodiversity Network Atlas⁷
- Ordnance Survey mapping;
- Aerial photography;
- The Woodland Trust online Ancient Tree Inventory;
- Lincolnshire Biodiversity Action Plan (BAP);
- Fenland Local Plan 2021-2040 (Draft Consultation Document dated August 2022); and
- Greater Lincolnshire Nature Partnership's Local Nature Recovery Strategy
- Interim Nature Recovery Network for Fenland (July 2023).
- Recently (February 2025) published RSPB/Cambridge University solar farm research findings⁸.

Field surveys consisted of walkover inspections of the land and habitats present following standard Phase 1 survey methodology (JNCC, 2010) and covered all accessible parts of the site, including boundary features. There were no limitations to the field surveys that persisted across all survey efforts. Surveys of the watercourses were compromised in the initial surveys by the choking vegetation that shaded the water (completely in many ditches) and blocked any view of the ditch banks to check for mammal burrows, but these limitations were overcome in later surveys.

The Biodiversity Net Gain principles applied are in accordance with and/or adapted from the suggested strategies outlined in the BRE (2014) document *National Solar Centre Biodiversity Guidance*⁹, and the RSPB/Cambridge University research findings. The main outcome of applying these principles and priorities to this project is to propose the creation of meadow grassland with appropriate wildflower content in accordance with current best practice, to create new woodland and understorey shrub features, to enhance existing habitats where possible and to incorporate multiple small mammal (badger and smaller) access points through all the array compounds. The site layout and proposed enhancements are illustrated on the "Mitigation and Enhancement Plan" drawing attached at Appendix 2).

Natural England's most recent (as of March 2025) Biodiversity Metric Calculation Tool was used to analyse the value of the habitat changes being proposed.

⁷ [NBN Atlas - UK's largest collection of biodiversity information](#)

⁸ [Solar farms managed for nature can boost bird numbers and biodiversity](#)

⁹ [NSC-Biodiversity-Guidance.pdf \(bre.co.uk\)](#)

3 Baseline Conditions

As stated above, the site is currently arable farmland with no buildings, no hedgerows and very few trees. The summer of 2022 immediately preceding the initial Phase 1 survey was unusually hot and dry, and the ditches on the site will have dried up to a greater extent and/or earlier than in a more typical year.

The table below shows the list of existing habitat types found within the site boundary (red line) along with the approximate area of each habitat. The figure at Appendix 2 shows the location of these fields and the habitats recorded within the boundary (source: updated PEA dated November 2022).

HABITAT TYPE	APPROXIMATE AREA
Cropland - Cereal crops The majority of the site is comprised of arable fields. This habitat was recorded as Cereal Crops within the metric as per the "UK Hab" Habitat Classification terminology.	63. 65 ha
Arable field margins.	1.034ha
Ditches	C. 6.16km

Wildflower diversity across the site was very low and was clearly affected by herbicide spray drift (yellowing and contorted specimens visible, particularly along track edges). The field boundaries (other than ditch banks) consisted of very narrow field margins and some wider grassy field margin access tracks, with rank but generally sparse grasses (which had been mowed in places) with some ruderal weeds including ragwort, groundsel and shepherd's purse and poppy, with occasional patches of ox-eye daisy and lesser burdock. There was a patch of ground on the eastern edge of the copse that had recently been left uncultivated in 2022 and had been densely colonized by ruderal weeds dominated by (spear and creeping) thistle and ragwort. Subsequent enquiries revealed that this was a failed gamebird crop and this was subsequently recultivated.

The only permanent water on the site is some of the larger/deeper ditches (under IDB management) that are not prone to drying out in summer or during periods of low rainfall.



Figure 1. Western Edge of Copse.

The Phase 1 survey and subsequent surveys demonstrated the presence/absence of:

- a. Brown hares were distributed widely across the site, but rabbits were absent. Molehills were scattered along some of the wider field margins.
- b. Water voles were present in several ditches, and bank voles were abundant.
- c. A disused badger sett was present in the copse.
- d. Two species of deer - roe deer and Reeves' muntjac, were present in significant numbers on the site in 2022 as evidenced by sightings during the survey, the presence of numerous hoof prints and droppings and conspicuous evidence of deer-related browsing damage. A single Chinese water deer was also seen on the site in February 2025.
- e. No amphibians were observed during the field surveys, and no reptiles were seen.
- f. Twenty-four species of bird were recorded, of which fifteen were either confirmed as probably or possibly breeding. Three species of birds of conservation concern (BoCC) were identified as breeding on the site including skylark, reed bunting and grey partridge. One Schedule 1 bird species was noted – peregrine falcon – with two juveniles being seen on and around the site during the survey (but breeding on a communications tower away from the site). It was clear from the distribution of birds noted during the survey that the highest biodiversity and population density was associated with the small copse, with a smaller number of species inhabiting the reed fringes of the ditches and the open arable fields. A full list of birds recorded during the survey is included at Annex A to the Preliminary Ecological Appraisal report.
- g. Common butterflies typical of open grassland (10 species were recorded) and two species of bumblebee were noted wherever there were nectar sources available.
- h. Three species of dragonfly (brown and southern hawkers) and one of damselfly were noted, all locally common species and in low numbers.

The site is not subject to any statutory or non-statutory designations. The southern boundary of the site is 9.3km north of the Nene Washes SPA/Ramsar site and falls (just) within the site's Impact Risk Zone (IRZ) as it is within the 10km contour. It does not, however, lie within or adjacent to the identified "Goose and Swan Functional Land IRZs". There are no other statutory or (non-statutory) local conservation sites that are relevant to this application.

All baseline habitats were identified, their condition assessed and geotagged photographic evidentiary records taken during the Preliminary Ecological Appraisal and subsequent survey processes. The condition of the arable fields did not require assessment due to its low ecological value and the areas of modified grassland were assessed as "poor" due to their structure and very poor species diversity. The ditches were assessed as being in "poor" condition in accordance with Natural England's Biodiversity Metric Habitat Condition Assessment criteria. The proposed new habitats of lowland meadows and new tree/shrub plantings were conservatively projected to have a "moderate"

projected habitat condition. Photographs illustrating the conditions of the copse and ditches at the time of initial survey are attached at appendices 3 and 4, alongside two further images at appendix 5 collected in February 2025 were added to show post-works recent changes to some of the watercourses.



Figure 2. Western Site Boundary, Showing Track, Small Area of Improved Grassland and a Large Willow Tree (South Holland section).

The baseline Biodiversity Metric calculations are summarised as follows: -

On-site baseline	Habitat units	137.48
	Hedgerow units	0.00
	Watercourse units	24.64

4 Biodiversity Net Gain Proposals

There are two main proposals underpinning the Biodiversity Net Gain strategy for this project – the conversion of a little over 63.5ha of arable farmland into native grassland with wildflowers, and the creation of 3.63ha of new native woodland (in the form of tree lines and copses) with shrub understorey structure (this is an underestimate of the total new woodland/tree line creations, as gaps in the existing copse will also be filled with native species).

4.1 Grassland Creation

The formerly arable fields will be re-seeded with a commercially supplied native meadow seed mixture containing a varied mix of native meadow grasses and wildflower species that will be beneficial to a wide variety of invertebrates, including pollinators, and will also provide food sources and habitat for a wide variety of wildlife including birds and smaller mammals. The intention is to seek the cooperation of the Local Wildlife Trust to identify local donor sites as potential seed sources for selective reseeded as the site matures.

4.2 New Native Tree and Shrub Planting

The proposed species mix for the new tree lines and copses has not been finalized at the time of writing but will be of species consistent with the fenland setting, including *Quercus robur*, *Salix fragilis*, *Salix caprea*, *Corylus avellana*, *Crataegus monogyna* and *Prunus spinosa*. The proposed location and form of these new features is illustrated in the Mitigation and Enhancement Plan (see Appendix 2) and represents the creation of valuable new habitats that are currently entirely lacking from the site and the addition of visual interest in a currently monotonous landscape largely devoid of trees or hedges.

4.3 Other Enhancements

4.3.1 Copse (not included in BNG calculations). It is proposed to remove the invasive *Rhododendron ponticum* from the copse as a priority, and also to remove the non-native *Cupressocypariss leylandii* trees at the earliest opportunity. In the longer term the sycamore *Acer pseudoplatanus* should also be removed and replaced by appropriate native species, but in the near term the retention of the trees but in a reduced state (boughs removed) will provide useful shelter for the establishment of new saplings and understorey growth. The non-native and invasive species will be replaced by native species including English oak and hazel, and the copse will be expanded in area by a minimum of 10%. Deer fencing will be introduced to mitigate the currently damaging levels of deer pressure as described and illustrated in the PEA report. The net result would be to expand the existing copse and to significantly improve its condition (from the current “poor” assessment) by improving the species composition, encouraging the establishment of an understorey by planting and deer exclusion.

4.3.2 Reptile/Amphibian Refugia. It is proposed to construct a wood pile reptile/amphibian refuge on the southeastern edge of the copse (near one of the ditches), that would also provide habitat for a wide variety of invertebrates and fungi. The probability of success is probably low, but felled timber from non-native trees could be utilized and the decaying wood piles would benefit invertebrates and fungi and would provide shelter for rodents and hedgehogs.

4.3.3 Bird and Bat Boxes. In the early years of the proposed development, it is considered that there will be insufficient suitable habitat to support a resident bat population, and for this reason bat boxes are not proposed as part of the initial biodiversity/ecological mitigation proposals. The Lincolnshire Bat Group’s input at similar site supported the priority of creating new or enhanced foraging conditions and habitat connectivity for local bat populations rather than the installation of bat boxes, and that guidance has been followed here. The copse could support a small population of hole-nesting bird species such as blue tit and/or great tit and small species using open fronted boxes such as robin. Natural cavity nest sites are currently absent from the copse due to the absence of mature trees and/or woodpeckers, so it would be appropriate to install a small number (<5) of nest boxes suitable for small hole/cavity nesters on retained trees within the copse. There are currently no suitable locations for kestrel or barn owl nest boxes within the site boundaries, although this will change over time as the new trees mature.

5 Feasibility of Biodiversity Net Gain Proposals

All of the Biodiversity Net Gain proposals for this project are core parts of the development proposals rather than add-ons for the sole purpose of meeting targets. The switch from arable production to meadow establishment and maintenance is a logical and sustainable approach to the green landscaping of the ground holding the solar panels, and the new woodland/tree line features will define the site boundaries and visually screen the solar arrays to minimise visual impacts. Natural England's metric assessment matrices state "high" difficulty (and long timescales) in establishing lowland meadow habitats, and it is understood that the establishment of high-quality wildflower rich meadow on arable land that has just been taken out of production can be complicated, particularly in the early years, by the presence of residual agricultural fertilisers in the soil that can lead to lush growth of dominant grasses and ruderal weeds unless kept in check. This input, along with discussions with Local Wildlife Trusts at other locations, has led us to "work towards" lowland meadow creation where possible over the longer term, but to commit to the more easily achievable target habitat of "other lowland grassland" in the unshaded part of the arrays and "modified grassland" under the panel footprints where grasses may be stressed by shading and locally drier conditions (particularly at the southern edges of the panels). The proposed new species-rich native woodland/tree line habitats are given a "low" difficulty of creation by Natural England with fairly low (4-5 years) anticipated timescales for delivery.

Throughout the evolution of this project, the Mitigation Hierarchy has been followed with avoidance of impacts being the preferred approach throughout (and reflected in the stated policy within this project of retaining all native trees, ditches and other ecologically valuable habitats across the site), and with appropriate impact mitigation/minimisation measures applied where some risks of impact are unavoidable (in this project these are primarily potential temporary disturbance impacts during works). The typical rehabilitation/restoration stages of the hierarchy are only minimally applicable within this project where the only existing habitats that will be negatively impacted are arable fields of very low ecological value that will be replaced by extensive areas of new habitats of higher ecological value for a wider range of species of flora and fauna. There are no proposed offsets associated with this project.

The proposed management of the vegetation within the solar array compounds by pulse grazing rather than mechanical cutting will lead to a greater diversity of habitats, including varying vegetation heights, creation of bare patches and soil disturbance, and will contribute to the replenishment of organic content in the soil profile. The removal of sheep between March and August inclusive will give flowering plants time to flower and set seed and will provide valuable habitat for grassland wildlife, including small mammals and ground nesting birds, to flourish. Over time, grazing and removal of stock will lead to a slow reduction in soil nutrient levels to the benefit of more varied meadow flora of the types seen in the remnant local meadows.

Management of the woodland planting will involve regular (annual) monitoring to check for any detrimental deterioration through damage and/or disease. The monitoring process will put forward suggested remedial work measures to ensure the long-term survival of the existing retained trees and the healthy development of new habitats. The grazing regime will also be reviewed annually to ensure that the stated objectives are delivered.

Funding for the landscaping and enhancement proposals has been considered throughout the evolution of this project and are accepted as being core elements of the project's fundamental costs. The green landscaping proposals (recultivation of fields to native grassland and tree and shrub) will occur during or immediately following the construction phase, while refugia and nest boxes will be installed when construction is complete and the risk of disturbance by construction activity has been removed.

6 Biodiversity Net Gain Delivery - Project Stages

Protection of existing wildlife and habitats and Biodiversity Net Gain aims and delivery will be considered throughout the project, with site contractors being briefed about aims, precautions and responsibilities during the construction phase. Green landscaping (soil preparation and seeding) within the solar array compounds will commence in stages across the site as soon as the installation works within each compound are completed. The creation of the new woodland sections will commence as soon as is practicable (dependent on best planting season and weather conditions) after construction works are completed.

The newly created grassland and hedgerow habitats will require close monitoring, particularly in the first few years, to determine that establishment has been successful and to remedy any areas of failure or weakness. The meadow grassland areas will be monitored for key factors including botanical diversity, variations in sward height and composition and other indicators of favourable conservation value. If after 4-5 years conditions diversity is still low or vegetation is too rank, changes to the maintenance regime will be considered with advice being sought from the Lincolnshire Wildlife Trust who have relevant experience in meadow creation/enhancement. Responsibility for auditing of the Biodiversity Net Gain programme will be carried by the appointed operative who will report to the relevant person at PACE Ltd (or its successor company or facility manager).

The new woodland/shrub planting will be initially audited in year 3 to determine whether the stated aims are on track to be delivered and, if not, what remedial action will be necessary. The grassland areas should be deliverable within a 4-5 year timescale and should also be audited for progress at year 3.

7 Conclusion

Biodiversity Net Gain at this site will be primarily delivered by:

- The conversion of existing arable farmland of low ecological value to wildflower rich native grasslands that are a scarce local habitat with much higher ecological value (that will increase over time);
- The creation of 3.63ha of native trees and shrubs; and
- Several smaller enhancements, including reseeded grass field margins and the installation of hibernacula and nest boxes.

Inputting the survey findings and proposals into Natural England's Biodiversity Metric Calculation Tool produces the following results:

Applying weighting for the stated priority habitats, including woodland and lowland meadow, Natural England's Biodiversity Metric Calculation Tool produces the following post-intervention results (Table 1), following the retention and/or enhancement of existing higher value habitats and the creation of significant new woodland and grasslands.

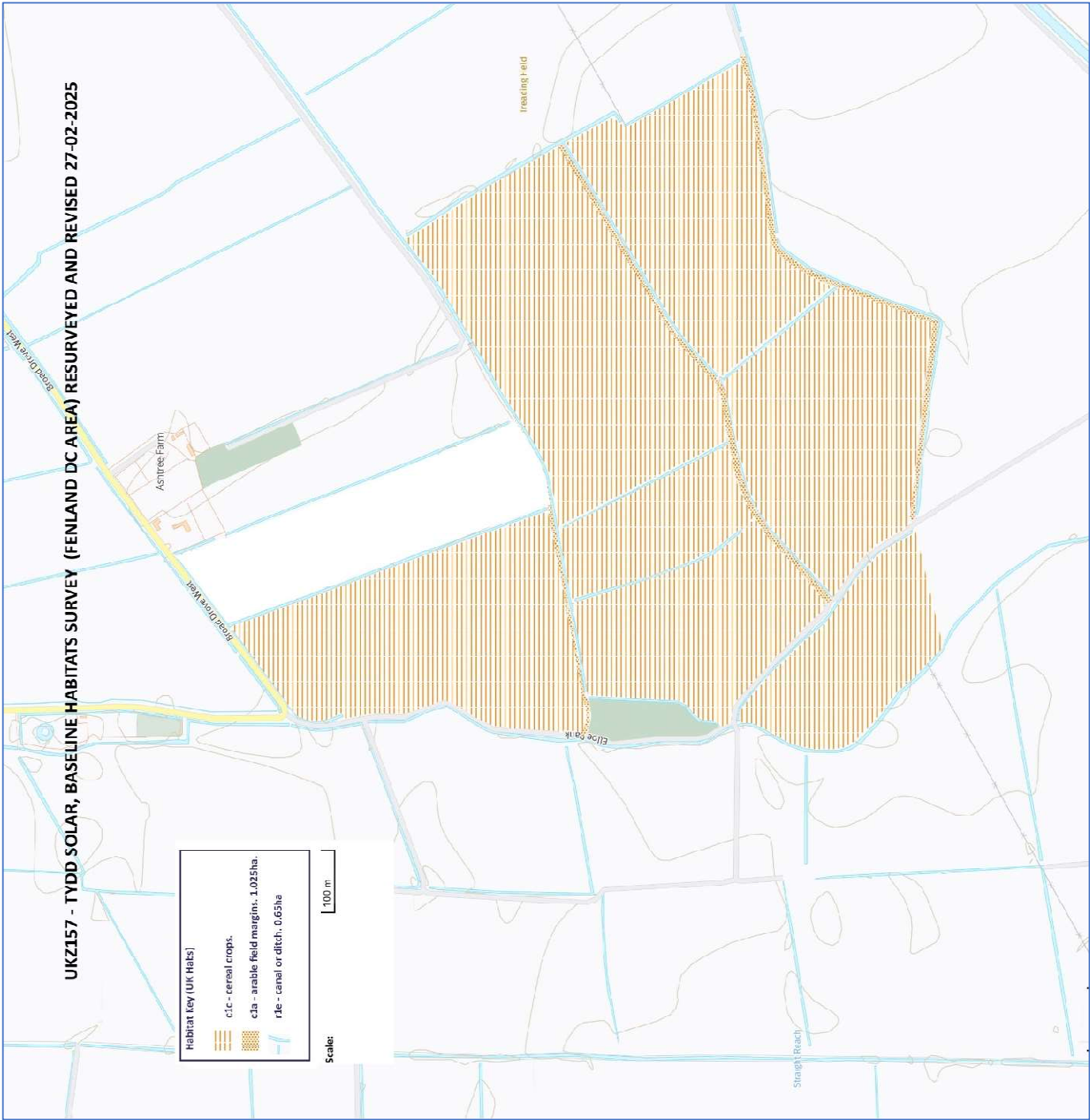
On-site baseline	<i>Habitat units</i>	137.48
	<i>Hedgerow units</i>	0.00
	<i>Watercourse units</i>	24.64
On-site post-intervention (Including habitat retention, creation & enhancement)	<i>Habitat units</i>	331.60
	<i>Hedgerow units</i>	0.00
	<i>Watercourse units</i>	24.64
On-site net change (units & percentage)	<i>Habitat units</i>	194.12 (+141.2%)
	<i>Hedgerow units</i>	0.00
	<i>Watercourse units</i>	0.00

Table 1. Biodiversity Metric Calculator “Headline” Results.

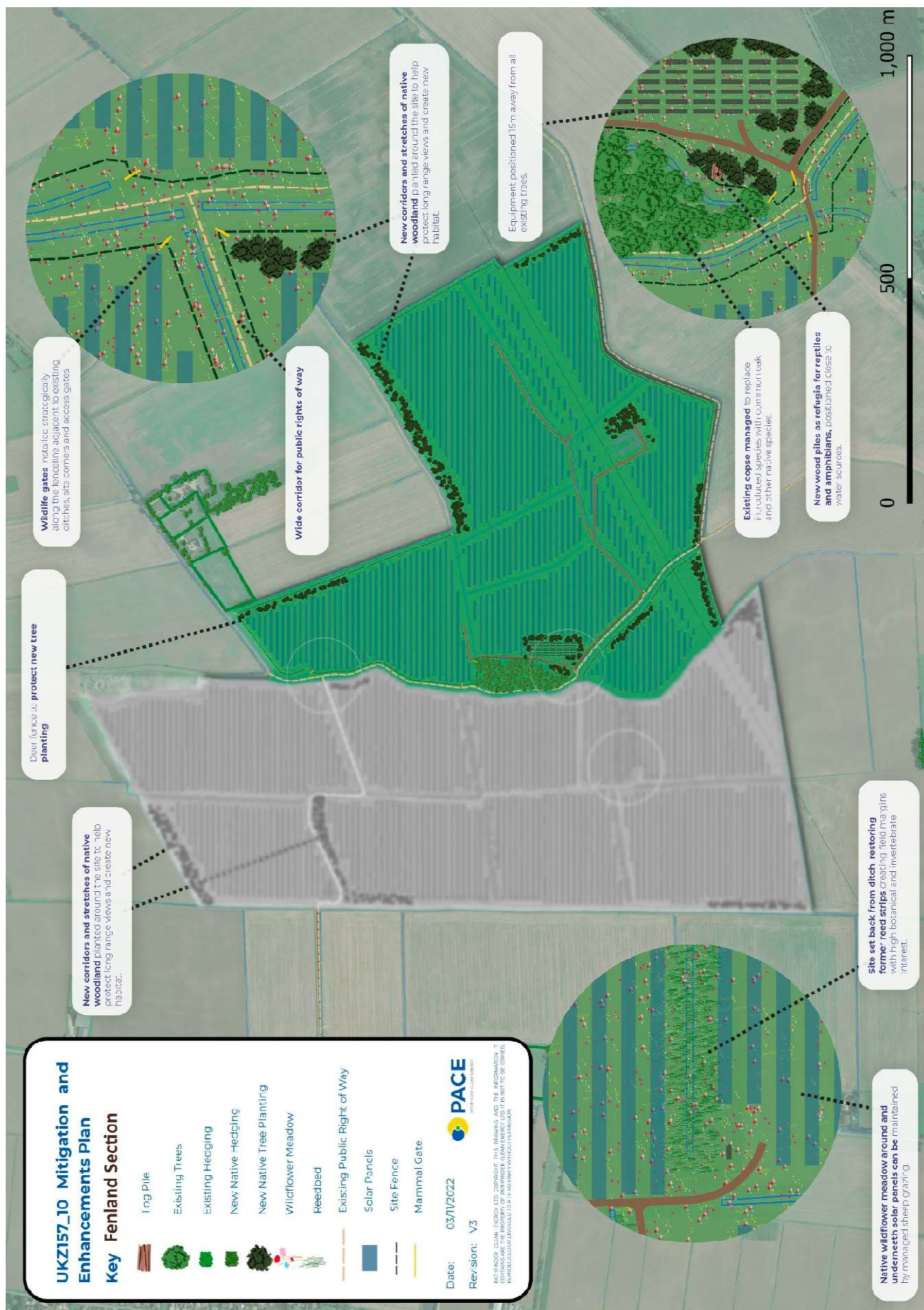
Following determination of the application, a more detailed biodiversity management plan will be produced as part of a planning condition. The figures in the table below should therefore be treated as an approximate indication of likely net gain from the proposed development that may be further improved following consultation during the planning process.

There is a very strong increase in the habitat units ascribed to the proposed post-development environment and it is clear that the proposed development, with its associated landscaping and ecological enhancement proposals, would deliver a significant Biodiversity Net Gain to the local environment.

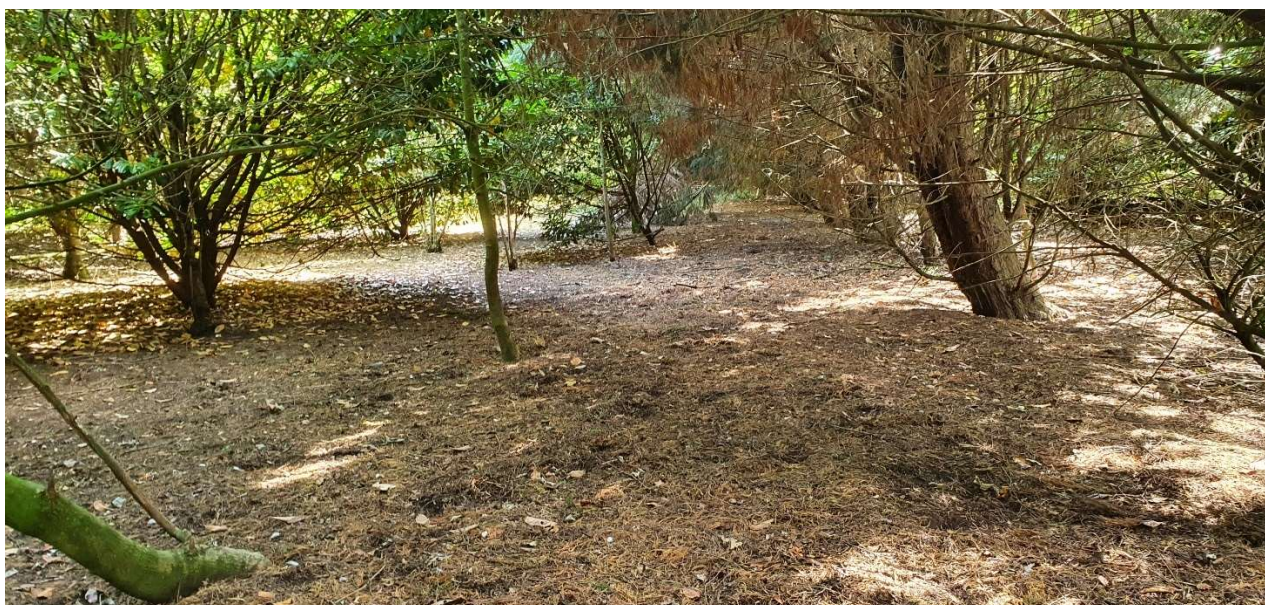
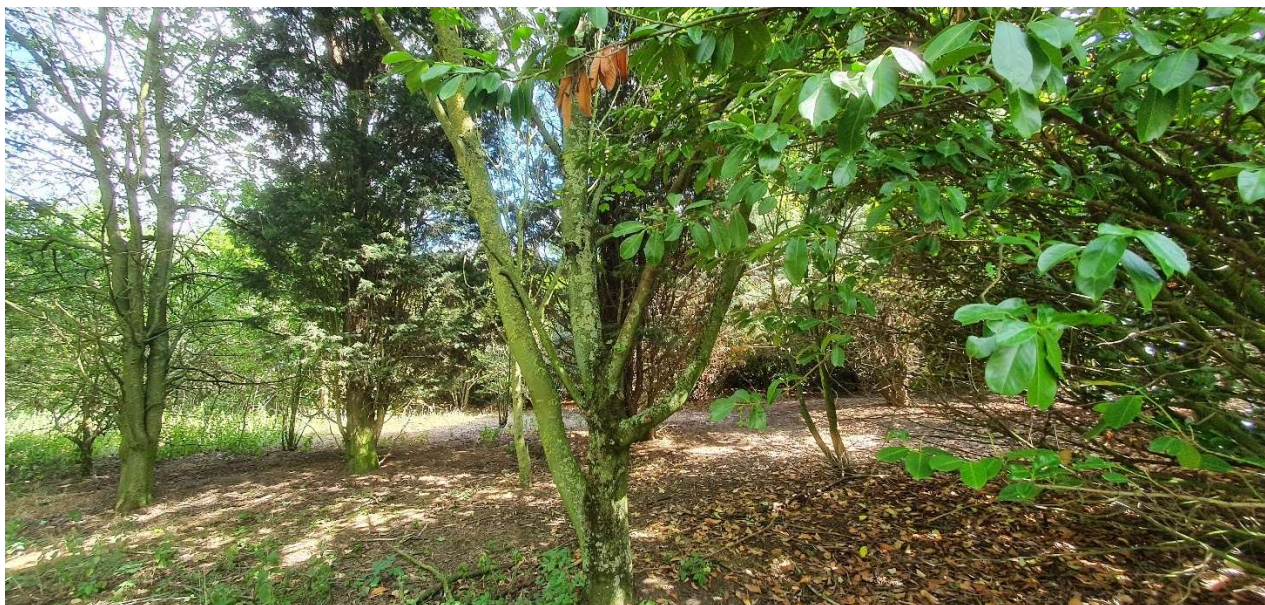
Appendix 1. Baseline Habitats Survey



Appendix 2. Mitigation and Enhancement Plan



Appendix 3. Images Showing Conditions at Copse on 15th July 2022.



Appendix 4. Images Showing Condition of Ditches on 15th July 2022.



Lady Nunn's Old Eau – Heavy Duckweed and Filamentous Algal Growth in Small Areas of Open Water.



Complete Shading of Water by Reed Growth.

Appendix 5. Images Showing Condition of Ditches on 24th February 2025.



Lady Nunn's Old Eau after IDB maintenance works.



Filamentous algal mats still present in areas of low flow rate.