Wrexham Legacy Site, Solar Development

Ecology Report

Produced for Corylus Planning and Environmental Ltd

By Applied Ecology Ltd

May 2014

Document Control:

Version	Date	Version Details	Prepared by	Checked by	Approved by
1.0	21.03.2014	Final	RJH	DP	DP
2.0	22.05.2014	Final (with minor revisions)	RJH		

Prepared for: Corylus Planning and Environmental Ltd

Title: Wrexham Legacy Site, Solar Development – Ecology Report

Project number: 0815

Document version: 2.0

Document status: Final (with minor revisions)

Document date: 22 May 2014

Signed on behalf of Applied Ecology Ltd:

Dr Duncan Painter

Director

APPLIED ECOLOGY LTD

St. John's Innovation Centre
Cowley Road
Cambridge
CB4 0WS

Tel: 01223 422 116
Fax: 01223 420 844
Mobile: 07725 811 777
Email: info@appliedecology.co.uk

Contents

1	**Introduction**	**1**
	Background	1
2	**Existing Biological Records**	**3**
	Designated Sites	3
	Legally Protected and Notable Species	3
3	**Habitats and Plants**	**4**
	Approach	4
	Survey Findings	4
4	**Protected Animal Species**	**7**
	Approach	7
	Survey Findings	7
	Evaluation	8
5	**Conclusions and Recommendations**	**10**
	Conclusions	10
	Reasonable Avoidance Method Statements	10
	Design Guidance	10
Appendix 1		**13**
	Target Notes	13
Appendix 2		**17**
	NE Technical Information Note TIN101	17

Figures

Figure 1.1: Site location 2

Figure 3.1: Phase 1 habitat map 6

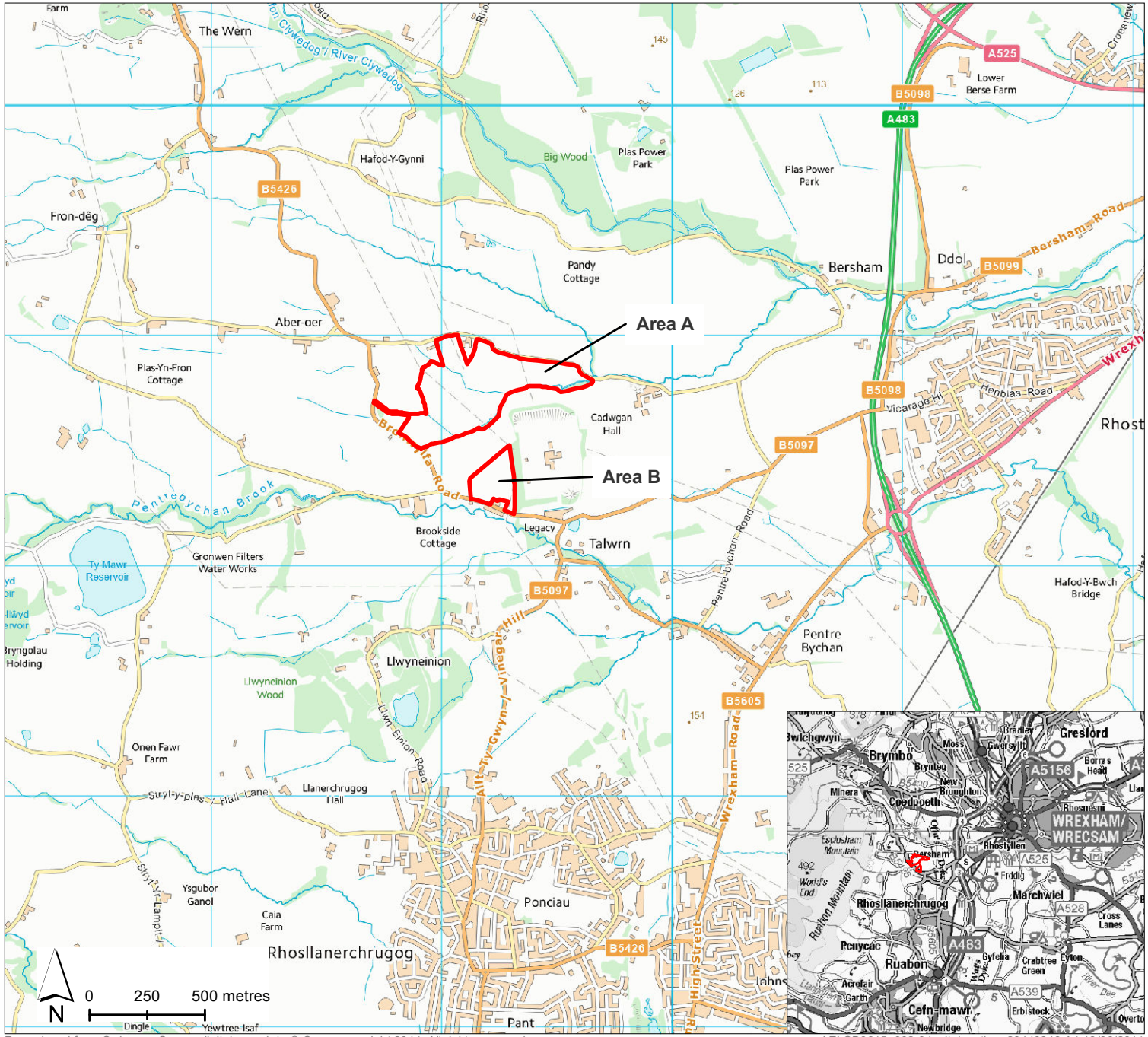
1 Introduction

Background

1.1 Applied Ecology Ltd (AEL) was appointed by Corylus Planning and Environmental Ltd in March 2014 to undertake an extended Phase 1 habitat survey of an area of land known as the Wrexham Legacy Site (the 'Site') located around 3km to the southwest of Wrexham (central OS grid reference SJ 29115 48757). The need for the ecology survey relates to a proposal to use the Site as a location for a new solar development. The Site comprises two separate land areas as shown by **Figure 1.1**. These are:

- **Area A** (18.41 ha) - a series of five improved grassland fields with hedgerow and woodland boundaries, and a central and southern shallow flowing drainage ditch/stream;
- **Area B** (3.47 ha) - a single improved grassland field enclosed by hedgerows and located immediately west of a large electricity sub-station (the Legacy Substation).

1.2 This ecology report provides a summary of the results of a biological record search (completed by North Wales Environmental Information Service (NWEIS) on behalf of AEL) and a combined Phase 1 habitat and a protected animal species walkover survey undertaken by AEL on 12 March 2014. The report provides an evaluation of the potential ecological effects, and highlights the key ecological constraints and opportunities in relation to the Site's use for solar development.



Reproduced from Ordnance Survey digital map data © Crown copyright 2014. All rights reserved.

AELCB0815_002-01_sitelocation_20140319 A4 19/03/2014

Wrexham Legacy Site

Site Location

study area

Figure 1.1

Main Map Scale @ A4: 1:25,000

Surveyed by: RJH	
Survey date: 12 March 2014	
Drawn by: RAH	
Checked by: RJH	
Status: Final	

Applied Ecology Ltd

2 Existing Biological Records

2.1 The NWEIS was commissioned by AEL to complete a biological data search (designated sites and protected / BAP species) for the Site and a surrounding 1 km land area around the Site's central point. The data was received on 14 March 2014.

Designated Sites

2.2 No statutory wildlife sites (i.e. Site of Special Scientific Interest) are located within the search area.

2.3 Four Local Wildlife Sites (LWS) are present beyond the Site but are at least partly within the search area, namely Legacy Substation (W218), Crematorium (W222), Big Wood (W217) and Bronwylfa (W219). The closest of these is Legacy Substation which adjoins Area B to the east. No details or site citations were provided as part of the data search.

2.4 A number of blocks of Ancient Woodland were also identified by the data search. Of specific note is a single small block of Ancient Woodland located within the Site at the eastern end of the southern boundary of Area A.

Legally Protected and Notable Species

2.5 Records of legally protected and notable species records were provided by NWEIS for land within the search area. No protected or notable species appear to have been recorded from the Site itself. The key species records in relation to the proposed development, either due to their close proximity to the Site, or because of the presence of potentially suitable on-Site habitat can be summarised as follows:

- Great crested newt *Triturus cristatus* – Four post-2000 off-site records of Great crested newt (GCN) were provided for land very close to the Area B. The 1:25,000 scale OS map does not show water-bodies in the locations of the records and it is not known if ponds are present in these locations.
- Breeding birds – Off-site records of Pied flycatcher *Ficedula hypoleuca*, Linnet *Carduelis cannabina*, Green woodpecker *Picus viridis* and Tawny owl *Strix aluco* from the Legacy Substation.
- Hedgehog *Erinaceus europaeus* – A record from the Legacy Substation.
- Butterflies – Records of Small heath *Coenonympha pamphilus*, Grayling *Hipparchia semele* and Wall *Lasiommata megera* from the Legacy Substation.

3 Habitats and Plants

Approach

3.1 A Phase 1 habitat survey of the Site was undertaken by AEL ecologist Rob Hutchinson (MCIEEM) on 12 March 2014. All habitats present were classified and mapped according to standard Phase 1 habitat survey categories[1].

3.2 Notes were made of the key habitats, and where appropriate a list of the plant species present and an estimate of their individual relative abundance was recorded according to the DAFOR scale. The habitat map has been digitised and presented using a Geographical Information System (ArcView GIS).

Survey Findings

3.3 The Phase 1 habitat map is presented in **Figure 3.1**, and habitat target notes are provided in **Appendix 1**.

Area A

3.4 The site consisted of five fields of species-poor improved pasture grassland. The five fields all supported species-poor grassland dominated by perennial rye-grass *Lolium perenne*, but varied slightly in their species composition and appearance in relation to their management history. For instance the south-western field (target note 2) was relatively recently sown ley-type grassland, and the easternmost field (target note 7) was a long established improved pasture with a greater variety of associated species. A few mature oaks were present in the central field.

3.5 The majority of the field boundaries supported species-rich hedgerows dominated by a mix of hawthorn *Crataegus monogyna*, holly *Ilex aquifolium* and hazel *Corylus avellana*, and often with frequent mature oaks *Quercus robur*. The southern boundary supported a belt of semi-natural broad-leaved woodland along a north-facing slope, with the eastern end classified as Ancient Woodland according to the NWEIS data search. The woodland canopy was dominated by mature oak, with some sycamore *Acer pseudoplatanus*, ash *Fraxinus excelsior* and wild cherry *Prunus avium*, and an understorey mainly of hazel and holly. Plants present in the ground layer included bluebell *Hyacinthoides non-scripta*, ivy *Hedera helix*, dog's mercury *Mercurialis perennis*, lords-and-ladies *Arum maculatum* and lesser celandine *Ranunculus ficaria*, and were indicative of long-established woodland.

3.6 Wet drainage ditches crossed through the site in two locations, and ran along the southern boundary of the Site where the channel formed a sinuous stream at the base of the wooded slope.

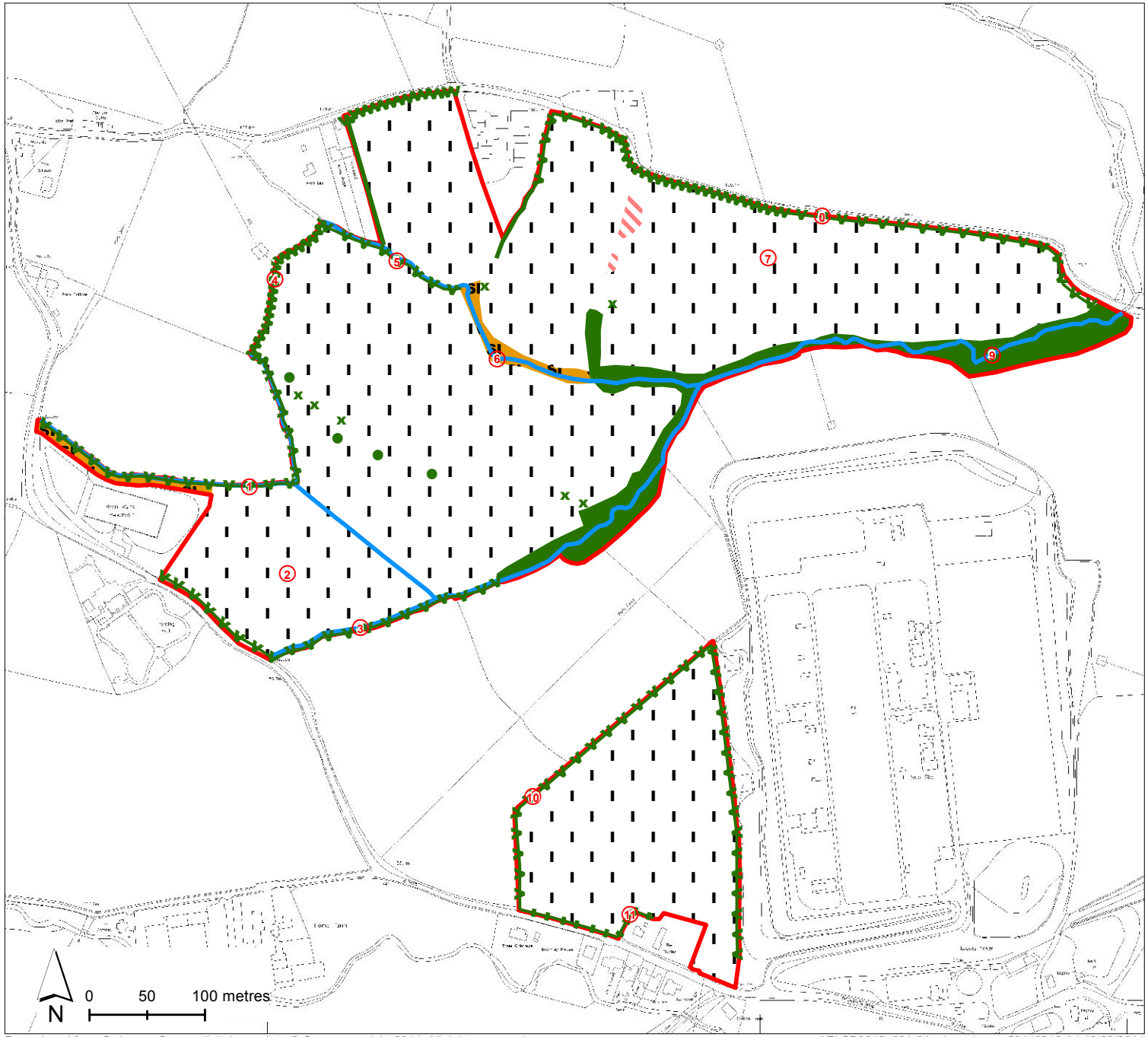
[1] JNCC (1993). *Handbook for Phase 1 Habitat Survey – A technique for Environmental Audit*. JNCC. Peterborough.

Area B

3.7 Area B comprised a single improved grassland field with a species-rich managed hedgerow of holly, sycamore, ash, hazel and blackthorn *Prunus spinosa* around the western, northern and eastern boundary, and a poor hedgerow to the south.

Evaluation

3.8 The improved grassland fields within Areas A and B are of low habitat and botanical value and do not represent a significant constraint to the Site's future use as a solar farm. The woodland, in particular the Ancient Woodland along the southern boundary of Area A, together with the hedgerows, trees and ditches/stream are of significant habitat value in the local context and should be retained, protected and enhanced going forward.



Wrexham Legacy Site

Phase 1 Habitat Map

study area

Habitats:

- improved grassland
- semi-improved neutral grassland
- semi-natural broad-leaved woodland
- tall ruderal
- species-poor hedge (no trees)
- species-poor hedge with trees
- species-rich hedge (no trees)
- species-rich hedge with trees
- wet ditch/stream
- individual tree (indicative location)
- scattered scrub
- target notes

Figure 3.1

Map Scale @ A4: 1:5,000

Surveyed by: RJH	
Survey date: 12 March 2014	
Drawn by: RAH	
Checked by: RJH	
Status: Final	

Applied Ecology Ltd

Reproduced from Ordnance Survey digital map data © Crown copyright 2014. All rights reserved.

AELCB0815_001-01_phase1map_20140319 A4 19/03/2014

4 Protected Animal Species

Approach

4.1 A protected species walkover survey of the Site was undertaken in conjunction with the Phase 1 habitat survey on the 12 March 2014. Evidence of the presence of protected animal species was searched for, and in the absence of such evidence, an assessment of the suitability of the habitats present to support such species was made, based on biological records and using professional experience.

Survey Findings

4.2 In overall terms, the majority of the Site is considered to be of low value to protected animal species on the basis that it comprises short sward improved pasture grassland.

4.3 However, the boundary hedgerows, trees, woodland and ditches/stream, do have the potential to support a range of protected animal species, including badger, breeding birds, bats, water vole and otter. Although no water-bodies are present within the Site, the nearby off-site records of GCN indicate that this species could utilise suitable terrestrial habitat within the Site and the potential development effects on GCN do therefore require specific assessment.

4.4 Further commentary relating to these species and species groups according to the findings of the walkover survey and the suitability of the habitats present is provided below.

Great Crested Newt

4.5 Only a single water-body, a concrete vertical-sided series of water treatment tanks, is shown to occur within 250 m of the Site according to the 1:25,000 OS map (SJ 29567 48176). It is located on the southern side of Bronwylfa Road and is 230 m from Area B and >500 m from Area A. This water-body is considered to be unsuitable for breeding GCN given its use for water treatment, and it is not considered further.

4.6 However, as stated above, nearby off-site post-2000 records of GCN suggest that this species does breed in two locations close to Area B and could therefore utilise suitable terrestrial habitat within this part of the Site. Two of these GCN records are located close to Bryn Rhedyn Farm immediately south of Area B, and two records are from land to the east of the Legacy Substation.

4.7 The presence/absence of ponds suitable for breeding GCN in these locations would need to be confirmed by visual inspection. However, assuming GCN are present, the potential risk of significant effects occurring as a result of the proposed development will be dependent on the proximity of the GCN breeding ponds to development-related terrestrial habitat loss, the presence/absence of barriers to GCN movement, and the extent and quality of the habitats to be effected.

4.8 It is our understanding that current layout plans for the solar farm will restrict development to improved grassland habitats within Area A. Given Area A is located 320 m from the

closest GCN record, and assuming the development is restricted to low value habitat, the associated risk of significant impacts on GCN occurring as a result of the development is considered to be low.

Badger

4.9 Badgers are known to be present locally, but no evidence of badger presence in the form of latrines foraging, paths or setts was seen within the Site during the walkover survey. The presence of badger setts within the Site cannot however be discounted without further survey, although any setts would almost certainly be restricted to boundary habitats. A specific badger survey would be required if the proposed development is likely to result in the loss of or damage to boundary habitats.

Breeding Birds

4.10 The hedgerow boundaries, trees and woodland are likely to support a range of common breeding birds. However, these habitats are unlikely to support large or important assemblages of birds or individual species of high importance.

4.11 The improved pasture and arable fields are considered to be of negligible value for breeding birds in general, and are unlikely to be of importance for foraging barn owl as they are intensively managed and are unlikely to support significant populations of small mammal prey. The presence of ground nesting skylark cannot however be discounted.

Bats

4.12 A number of mature oak trees were present within hedgerows and woodland areas with features of potential value to roosting bats, and any mature trees that require tree works would need to be subject to ground level visual inspections prior to such work proceeding.

4.13 The hedgerows, woodland edge, and ditches/stream are also likely to be of value for foraging and commuting bats.

Water Vole and Otter

4.14 The stream to the southern boundary of Area A is a relatively small and shallow watercourse and lacked submerged and marginal aquatic vegetation. It is considered to be suboptimal for water vole and otter.

Evaluation

4.15 The improved grassland is considered to be of negligible value to protected animal species. However, the woodland, hedgerows, tree and stream do have the potential to be used by a range of protected animal species.

4.16 The need for specific protected animal species surveys will be dependent on details of the development proposed and the likely associated impacts. If the solar farm is restricted to areas of improved grassland within Area A, and all higher value habitats can be retained and protected by an undeveloped habitat buffer then significant impacts on protected

animal species could be minimised and the need for follow-up protected species survey work potentially avoided.

4.17 Significant adverse effects on GCN are unlikely to occur (assuming GCN are present in the locations suggested by the existing records) as a result of development within Area A given the records are 320 m from this area of the Site and the development will be restricted to low value short sward grassland pasture.

5 Conclusions and Recommendations

Conclusions

5.1 Current proposals for the solar farm show that development would be restricted to Area A. With the exception of the boundary habitats, this area comprises intensively managed and improved agricultural grassland, and the use of these fields for solar development is unlikely to have significant adverse effects on ecology, so long as marginal higher value habitats can be retained and protected.

Reasonable Avoidance Method Statements

5.2 On the basis of the current development proposals, the following measures are recommended and would need to be implemented to reduce risk of significant negative effects on protected animal species occurring as a result of the proposed development.

- **Great Crested Newts** – No development is currently proposed within 250 m of known potential GCN breeding ponds and significant adverse effects, including killing and/or injuring individual GCN, are very unlikely to occur. No additional specific avoidance/mitigation measures are therefore considered necessary in relation to GCN.
- **Badger** – No evidence of badger presence was recorded during the walkover survey. The removal of boundary habitats will be restricted to an 11 m wide section of species-rich hedgerow, with the specific section to be lost comprising a low and gappy hedge without trees. A check for evidence of badger setts in this specific location would be completed by an ecologist in advance of any hedge removal or access provision.
- **Breeding Birds** – Any development-related site clearance or construction work would be completed outside of the normal bird breeding period (March-July, inclusive) or following an inspection by an ecologist that confirms the absence of breeding birds from areas to be affected.
- **Bats** – As stated by the Arboricultrual report (Tree Solutions Ltd, 14/AIA/WXM/139, 01, April 2014) no trees would need to be removed in order to accommodate the proposed development and all infrastructure has been positioned at an appropriate separation distance from retained trees such that no future conflicts will arise. No additional specific avoidance/mitigation measures are therefore considered necessary in relation to roosting bats.

Design Guidance

5.3 A range of additional sensitive design and ecological enhancement measures relevant to the Site should also be considered as part of the development going forward as follows:

- Avoid artificial lighting along hedgerow and woodland boundaries.
- Continue to manage the grassland fields (beneath the solar panels) as improved pasture grassland to miminise the risk of soil erosion and prevent the development of rank grassland that could be of potential value to wildlife going forward.

- Include new native tree, shrub and hedgerow planting, as part of the landscaping scheme.
- Install bird and bat boxes in mature trees around Site boundaries.

5.4 As Area B does not form part of the solar farm application, there is also a significant opportunity to offer substantial biodiversity enhancement on this land area through the relaxation of grazing and the creation of new ponds in the south of the field close to the reported GCN breeding pond near Bryn Rhedyn Farm.

5.5 Further details of best practice design, mitigation and enhancement for solar farms are provided by Nature England's Technical Information Note TIN101 Solar Parks: Maximising Environmental Benefits (**Appendix 2**).

Appendix 1
Target Notes

Phase 1 Habitat Survey Target Notes – AEL 12 March 2014

1. Unmanaged hedgerow with trees dominated by hawthorn *Crataegus monogyna* and hazel *Corylus avellana*, together with some holly *Ilex aquifolium*, oak *Quercus robur* and sycamore *Acer pseudoplatanus*. A shallow wet ditch was present along the northern side of the hedgerow.
2. Improved grassland pasture field dominated by perennial rye-grass *Lolium perenne*, and with frequent creeping buttercup *Ranunculus repens* and white clover *Trifolium repens*. Other plant species included Yorkshire-fog *Holcus lanatus*, cock's-foot *Dactylis glomerata*, broad-leaved dock *Rumex obtusifolius* and meadow buttercup *Ranunculus acris*.
3. Species-rich mixed woody hedgerow with frequent mature oak *Quercus robur* trees, and an associated wet flowing drainage ditch.
4. Managed species-rich hedgerow dominated by hazel *Corylus avellana*, with abundant holly *Ilex aquifolium*, frequent hawthorn *Crataegus momogyna*, and rare oak *Quercus robur* and beech *Fagus sylvatica*.
5. Hedgerow dominated by mature oak *Querus robur* standards, together some alder *Alnus glutinosa*, and scattered bushes of hawthorn *Crataegus monogyna* and holly *Ilex aquifolium*.
6. Narrow linear strip of semi-improved grassland dominated by Yorkshire-fog *Holcus lanatus* and Timothy *Phleum pratense*, along the edge of a following wet drainage ditch. The ditch lacked aquatic vegetation aside from a few small patches of in-channel; brooklime *Veronica beccabunga*.
7. Improved grassland pasture field dominated by perennial rye-grass *Lolium perenne* and Yorkshire-fog *Holcus lanatus*, together with some common sorrel *Rumex acetosa*, creeping buttercup *Ranunculus repens*, red fescue *Festuca rubra*, broad-leaved dock *Rumex obtusifolius*, cock's-foot *Dactylis glomerata*, lesser celandine *Ranunculus ficaria*, dandelion *Taraxacum* agg. and meadow buttercup *R. acris*.
8. Managed hedgerow of holly *Ilex aquifolium*, sycamore *Acer psuedoplatanus*, ash *Fraxinus excelsior*, hazel *Corylus avellana*, common gorse *Ulex europaeus* and blackthorn *Prunus spinosa*.
9. Semi-natural broad-leaved woodland (classified as Ancient Woodland according to the NWEIS data search) located on a north-facing slope and with flowing stream/drainage ditch at the slope base. The woodland canopy was dominated by mature oak *Quercus robur*, with some sycamore *Acer pseudoplatanus*, ash *Fraxinus excelsior* and wild cherry *Prunus avium*, and an understorey mainly of hazel *Corylus avellana* and holly *Ilex aquifolium*. Plants present in the ground layer included bluebell *Hyacinthoides non-scripta*, ivy *Hedera helix*, dog's mercury *Mercurialis perennis*, lords-and-ladies *Arum maculatum* and lesser celandine *Ranunculus ficaria*.
10. Managed hedgerow of holly *Ilex aquifolium*, mature oaks *Quercus robur*, hawthorn *Crataegus monogyna*, dog-rose *Rosa canina*, hazel *Corylus avellana*, blackthorn *Prunus spinosa*, goat willow *Salix caprea* and elder *Sambucus nigra*.
11. Species-poor screening hedgerow of Leyland cypress *x Cupressocyparis leylandii*.

Appendix 2

NE Technical Information Note TIN101

Natural England Technical Information Note TIN101

Solar parks: maximising environmental benefits

Solar energy, in common with other forms of renewable and low carbon energy sources is a valuable part of the UKs energy future. This information note pulls together a summary of advice relating to solar parks, their siting, their potential impacts and mitigation requirements for the safeguarding of the natural environment and the opportunities there may be for financial support through environmental stewardship. The aim is to help developers and landowners consider how they might maximise the environmental benefits of a solar park whilst avoiding or minimising the risk of damaging environmental features. If you would like to discuss any issues please see the *Further information* section below for contact details.

Definition

Solar parks are installations of multiple solar photovoltaic (PV) modules, usually mounted 1.5-2.5 metres above either greenfield or brownfield land occupying between 2 and 15 hectares. These figures are based on current installations and technology and this note will be updated as the technology and circumstances develop. Other notes also may be written as and when required and information becomes available.

Background

Like any type of development, solar parks have the potential to affect the landscape, natural habitats, soils and geological and archaeological features. Damage may be caused during operation or when panels are being erected or decommissioned. Cumulative impacts might also occur when parks are sited close to one another. Well located and designed solar parks may not only avoid negative environmental impacts, but may also deliver additional benefits to the environment beyond low carbon energy.

Some solar farms will need planning permission from the planning authority, for more information contact your local council. If you are considering developing a solar park you can avoid any unnecessary delays and costs by discussing your proposals with Natural England at the earliest opportunity.

German solar farm with sheep grazing below panels

Our specialists should be able to advise you from the outset on what to do to safeguard the environment. To date (June 2011) Natural England has recommended consent to 90% of all onshore energy schemes (of all types) and 100% of those offshore. Schemes which progress smoothly share some common characteristics, including engagement with Natural England well before the formal consultation phase required by legislation.

© Natural England 2011

First edition 9 September 2011

www.naturalengland.org.uk

NATURAL ENGLAND

Key points

A range of technical considerations inform site selection and the detailed design of solar park developments. These include:

- solar resource;
- topography; and
- proximity to existing grid infrastructure.

Environmental considerations that also need to take into account include:

- soils and soil structure;
- wildlife habitats and designated sites;
- effects on specific wildlife species;
- damage to designated landscapes;
- effects on the character of the landscape;
- damage to geological and archaeological features; and
- implications of water run-off.

The importance of vegetation

Vegetation is vital for wildlife, and steps should be taken to reduce the risk of reducing vegetation, for example, through excess shade or lack of rainwater. Good vegetation cover is also needed to protect soil and water, as well as provide grazing for livestock. Therefore the need to retain, encourage and manage appropriate vegetation cover needs to be considered early in the design of any solar farm.

Soil protection and husbandry

The long term capability of agricultural land, in particular the *Best and Most Versatile* agricultural land, needs to be safeguarded during the construction, operation and decommissioning of solar panels. To maintain good soil structure and water infiltration:

- soil organic matter levels should be retained or enhanced;
- compact areas of soil should be loosened; and
- existing land drainage maintained.

Excessive run-off may need to be diverted to grassed soak-aways so as to avoid soil erosion.

Good soil husbandry includes avoiding unnecessary soil disturbance and avoiding trafficking on soils when they are wet as this will cause compaction. Trackways and other sealed areas should have carefully designed drainage to avoid creating a pathway for erosion.

Reversibility and permanence also need to be considered. How easy would it be to convert and decommission these areas and put them to other use?

Any development should leave the land capable of supporting agriculture, especially if it is *Best and Most Versatile*, and/or semi-natural habitats in the future.

For information on identifying best and most versatile agricultural land see TIN049 *Agricultural Land Classification: protecting the best and most versatile agricultural land* and for guidance on soil protection see the Defra publication *Construction Code of Practice for the Sustainable Use of Soil on Construction Sites*. Details are available in *Further information* below.

Protecting watercourses

The key to avoiding increased run-off and soil into watercourses is to maintain soil permeability and vegetative cover. Permeable land surfaces underneath and between panels should be able to absorb rainfall as long as they are not compacted and there is some vegetation to bind the soil surface. Spraying off vegetation to prevent it growing between the panels would increase the risks of erosion, carbon emissions, run-off and pollution to watercourses.

Any associated infrastructure such as concrete surfaces and tracks should be designed so as to avoid direct run-off into watercourses and other sensitive areas.

The risks of run-off and soil erosion are lowest on low gradient land and cohesive soils and highest on dry, sandy and steeply sloping soil surfaces.

Biodiversity

Protecting wildlife

The location of solar parks should avoid sites of high wildlife value, in particular, designated sites such as Sites of Special Scientific Interest (SSSIs), Special Protection Areas and Special Areas of Conservation. Any development proposed on land within or adjacent to designated sites is likely to have an adverse effect on the environmental features for which they were designated, in particular during the construction phase.

Solar parks can affect wildlife where they are near sites of high wildlife value. For example, near a bat roost where the land may be used for foraging or to navigate to foraging sites, thereby reducing the foraging area available to them. There are some indications that very large, unbroken expanses of uniform solar panels may mimic water surfaces on which insects may attempt to settle and breed. If this proves to be a problem, then mitigation measures will be sought and publicised.

Very little research has been conducted to date, but one laboratory study undertaken by Bjoern Siemers and Stefan Grief (2010) showed that bats attempted to drink from the panels and occasionally collided with them. If the plates were vertically aligned they often crashed into them when attempting to fly through them. Juvenile bats are expected to be more prone to this behaviour. Some birds and invertebrates are also likely to be affected by solar parks developed close to areas of high wildlife value.

Where a solar park is proposed within or close to such sensitive sites, the planning application should include a detailed assessment of the likely impacts on the ecological interest of the sites and contain practical measures which avoid or minimise any adverse effects on their features of interest. Any solar park close to a designated site will need to demonstrate that it would not compromise the objectives of the designation.

Biodiversity: mitigation

With specialist ecological advice there may be opportunities to mitigate potential impacts on species and habitats through measures such as:

- Precise layout and spacing of PV modules.
- Habitat creation and enhancement on adjacent land to offset habitat loss.
- Timing of construction activity.
- Careful use of lighting.

Sites with low wildlife value, for example, intensive arable or grassland fields are likely to offer greatest opportunity for wildlife. Not only will they avoid adverse impacts, but they are also more likely to deliver environmental benefits.

Biodiversity enhancement

Solar park sites, especially on sites of lower existing biodiversity value may offer opportunities to deliver enhancement measures.

These should be considered on a site by site basis and are likely to be most effective when they contribute to local biodiversity priorities identified through your local Biodiversity Action Plan. These should be available on the web.

Creating grasslands and hedgerows on the areas around the panels is likely to offer most benefits for plant and animal communities. You can also consider creating ponds where the conditions are appropriate and planting wild bird seed mixtures for birds and nectar and pollen rich margins for bees and butterflies.

You need to consider what ongoing management will be required to maintain the habitat and who and how this will be done. You can get advice from a variety of sources, including consultants and voluntary groups, as well as Natural England.

Some habitats require more management than others. For example if you want to establish flower-rich grassland around panels you will need to graze or cut and remove the herbage. Grazing is best and sheep or goose grazing is likely to be more suitable than cattle grazing, which is unlikely to be practical.

Establishing native trees and hedgerows will provide nesting, roosting and foraging opportunities for birds and invertebrates. They can also help screen the panels where they may be intrusive in the landscape.

When planning and creating habitats consider long term management issues, such as:

- Is the management sustainable while the park is operating?
- Will the habitat survive and continue to be managed once the park has been decommissioned?

A management plan should help establish clear objectives and responsibilities for management and maintenance of any habitats created. The plan should also consider the budget needed to cover regular maintenance. If you are not the landowner, then local farmers may be best able to do this flexibly in response to need.

Landscape

It is recognised that solar parks can change the character and visual experience of a given area or landscape, and that they may become an element of the future UK landscape as part of our response to climate change. Careful site selection and design is the best way to avoid or minimise potential adverse landscape and visual impacts.

The location and design can be informed by existing Landscape Character Assessments and by responding to any landscape and visual assessments that are undertaken.

Designated landscapes

The presence of a designated landscape for example a National Park or an Area of Outstanding Natural Beauty is likely to reduce the degree to which a solar park can be successfully accommodated, and a proposal within, or close to, one of these sites will need to demonstrate that it would not compromise the objectives of designation.

Landscape character considerations

Table 1 on page 6 identifies landscape character factors that can aid site selection and design. It provides a general guide, but is not a rigid checklist as most landscapes will display a mixture of factors indicating both greater and lesser degree to which solar PV parks can be accommodated, these should be considered ‘in the round’.

Visual considerations

Generally impacts are likely to be greater in hilly areas and more easily avoided or mitigated against in flatter areas. Solar parks are also likely to be more acceptable where there are simple landscape patterns, such as those associated with later phases of agricultural enclosure.

Where the land form is flatter existing and new natural features (for example, trees, hedgerows, ridges) as well as buildings, roads and railways are more likely to screen solar parks.

Historic environment

The historic environment is linked to wider landscape considerations and in some locations can also be an important feature in its own right. Solar parks should not be located on Scheduled Ancient Monuments. Other archaeological sites should also be avoided as they could easily be damaged, even where they are not visible above soil level.

Geology and geomorphology

Geological and geomorphological features may be designated as SSSIs or Local Geological Sites or may be an important part of the local landscape character. The siting of solar parks should take full account of designated geological and geomorphological features and in particular ensure they do not impact of the integrity and visual appreciation of geomorphological landforms and processes.

Landscape enhancement

Where enhancement measures (these may also be biodiversity measures) will contribute to a local landscape strategy or enhancement plan, solar park developments may be able to leave a positive landscape legacy.

Single Payment Scheme

If you have land which is being developed as a solar park, you will need to consider whether it needs to be deducted from any claim for payments under the Single Payment Scheme (SPS). This section explains how the SPS eligibility rules relate to solar park land.

To be eligible for SPS, the land must be predominantly used for agricultural activity and, with limited exceptions, this requirement applies throughout the whole calendar year. For further information about the SPS eligibility rules please read the latest version of the SPS Handbook for England which is available on the Rural Payments Agency website (see link in *Further information* below).

SPS eligibility: land use

For a land parcel to be eligible for SPS, you must be able to demonstrate that the land is predominantly used for agricultural activity. This is easier to do if the land is being grazed or harvested rather than if it is just being kept in Good Agricultural and Environmental Condition (GAEC).

In a land parcel which is predominantly used for agricultural activity, any areas which are taken up by the solar panels themselves, in a way that does not allow the areas underneath to be grazed or used for agricultural activity, will not be eligible for SPS. These areas must therefore be shown on the Rural Land Register (RLR) as SPS ineligible features, and must be deducted from any SPS application.

Where the solar panels are elevated from the ground, such as on a mast or framework of multiple poles, the area of the mast itself (or of the poles), and any associated hard-standing, is not eligible but the land surrounding it (ie under the panels) may be eligible, provided it can still be used for agricultural activity, for example if it is capable of being grazed. Such eligible land may be claimed for SPS, and should be shown on the RLR as part of the maximum eligible area for SPS.

If the predominant use of the land parcel is for solar panels, ie non-agricultural activity, the whole land parcel will be ineligible for SPS.

SPS eligibility: land availability

The farmer must be carrying out an agricultural activity on the land (at least maintaining it in good agricultural and environmental condition) and have it at their disposal on the date of the application deadline (usually 15 May) of the scheme year. The land must also remain eligible for SPS for the full calendar year.

SPS eligibility during the installation

Depending on how much of the land parcel is affected by the work, and the extent to which it is affected, it is unlikely that the land parcel will be eligible while this is being done. Therefore the land parcel should probably be excluded from the claimed area for the scheme year in which the solar park is being set up.

Agri-environment schemes

Developers and land managers have sought clarification on the extent to which solar PV affects, or is compatible with, Environmental Stewardship agreements. There is some potential for solar PV parks to coexist with agricultural land use and/or land managed for nature conservation benefit. The extent to which this occurs will depend on the existing land use and, where agri-environment agreements are in place, the requirements of those schemes. The criteria used to identify eligible land under SPS also applies to agri-environment schemes.

Entry Level Stewardship

Based on Section 1.3 (the eligibility section) of the 3rd edition of the Entry Level Stewardship Handbook, where the land can be grazed or used for any agricultural purpose then it can count towards the points target for the agreement. However, management options must not be placed directly on this land. Part parcel or boundary options can be located on the specific land parcel as long as they are not directly located on the actual area covered by solar arrays.

Higher Level Stewardship

Your local Natural England Adviser should be contacted for advice when considering Higher Level Stewardship and the impact of solar PV parks. They will be able to interpret the proposals and determine the potential impact from the installation of the solar panels. The issues raised within this guidance should be considered in the round by the adviser before a decision is made regarding an application or agreement.

Cross compliance

If you claim SPS, Uplands Transitional Payment and/or Environmental Stewardship, all your

agricultural land must also meet the cross compliance requirements, including keeping the land in Good Agricultural and Environmental Condition (GAEC), for the whole of the calendar year.

If you have concerns about complying with any cross compliance rules during the installation of the solar park, it may be possible to get a derogation by requesting one from the Rural Payments Agency in advance of the work taking place and explaining what standards may not be met. See below for a link to the cross compliance advice website.

Further information

Natural England Technical Information Notes are available to download from the Natural England website: **www.naturalengland.org.uk**. In particular see:

- TIN049 *Agricultural Land Classification: protecting the best and most versatile agricultural land*

See also:

Construction Code of Practice for the Sustainable Use of Soils on Construction Sites
www.defra.gov.uk/publications/2011/03/27/construction-cop-soil-pb13298/

Rural Payments Agency **rpa.defra.gov.uk**

Cross compliance
www.defra.gov.uk/crosscompliance/

For further information and details of your local Natural England Adviser contact the Natural England Enquiry Service on 0300 060 0863 or e-mail **enquiries@naturalengland.org.uk**.

Prepared by Natural England in consultation with NFU and FWAG. Editor Susie Smith. Photograph courtesy of Low Carbon Solar Partners.

You may reproduce as many individual copies of this report as you like, provided this is not for commercial purposes, and such copies stipulate that copyright remains with Natural England, 1 East Parade, Sheffield, S1 2ET.

© Natural England 2011

Table 1 Landscape character factors

Factor	Increased chance that solar parks can be accommodated in the landscape	Reduced chance that solar parks can be accommodated in the landscape
Landform (also related to visual factors such as elevation and viewing angle)	Absence of strong topographical variety. Featureless, convex or flat.	Presence of strong topographical variety or distinctive landform features
Landscape pattern and complexity	Simple, regular or uniform	Complex, rugged and irregular
Settlement and man-made influence	Presence of contemporary structures, for example, utility, infrastructure or industrial elements. Presence of roads and tracks in the landscape	Absence of modern development, presence of small scale, historic or vernacular settlement, roads and tracks
Inter-visibility with adjacent landscapes	Little inter-visibility with adjacent sensitive landscapes or viewpoints	Strong inter-visibility with sensitive landscapes. Forms an important part of a view from sensitive viewpoints
Perceptual aspects (sense of remoteness, tranquillity)	Close to visible signs of human activity and development	Physically or perceptually remote, peaceful or tranquil

© Applied Ecology Ltd, 2014