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ECOLOGICAL APPRAISAL
LAND AT ROSEDEW FARM, LLANTWIT MAJOR, VALE OF GLAMORGAN

ISSUE 2.0

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Editorial History

Activity	Date	Name / reason
Draft 1	19th January 2015	Denis Jackson
Issue 1	20th January 2015	Denis Jackson / inclusion of comments received
Issue 2	20th February 2015	Denis Jackson / updated as a result of additional historical information received from site agronomist and subsequent discussion with Vale of Glamorgan Planning Ecologist.

Contents

1 NON-TECHNICAL SUMMARY

In order to determine the ecological impact of a proposed new ground-mounted solar photovoltaic installation, an ecological appraisal was undertaken of the site. The work included assessments of the habitats present, the potential for protected species to be present and assessments of any potential impacts of the development on those habitats and species, both present on site and within the zone of influence of the proposed development.

The habitats on site comprise improved grass leys and hedgerows. The grass leys are a follow-on crop from Oilseed Rape and historical evidence shows that both this crop, and those previously planted here, have been subject to significant nutrient inputs and chemical controls which substantially reduce their ecological value. Only the hedgerows on site are considered to have any potential to hold protected species (Dormouse, breeding birds) and no evidence of use of the site by any protected species, other than occasional foraging by birds, was observed during the course of survey.

There was only one pond within 500m of the site boundary, approximately 270m distant. When investigated however, this pond was found to contain large Koi carp and is considered to have only negligible potential to support Great Crested Newt and no further survey work is required in respect of this species.

The current development proposals do not require any removal or modification of hedgerows, and on that basis, no further site surveys are recommended and no pre-development protected species licencing will be required. However, because there remains some residual potential for offences in respect of protected species to be committed, a precautionary method of working is required. This includes on-site briefings prior to development commencing, possible phasing of works to avoid sensitive times of year, or where not possible, on site ecological supervision, together with mitigation for loss of habitats, and biodiversity enhancement to comply with Planning Policy Wales.

In the unlikely event that protected species are found on site during the course of development, all work must cease until the appointed project ecologist and/or Natural Resources Wales have been contacted for advice. In these circumstances, it may be necessary to secure a Natural Resources Wales Development Licence before works may recommence

2INTRODUCTION

2.1 BACKGROUND

Wyedean Ecology Ltd. was commissioned by Asbri Planning Ltd, on behalf of Mr. Rhodri Davies, to undertake an ecological assessment of a parcel of land, forming part of Rosedew Farm, Llantwit Major, in support of a planning application. This report details the findings of that assessment and provides recommendations in respect of mitigation and on-going management of the site to ensure that no offences are committed in respect of protected species, and to ensure long-term biodiversity gains.

2.2 ASSESSMENT AND REPORT OBJECTIVES

The survey and report have been designed thus:

- A desk study to identify, collate, analyse, and interpret historical biological records, and other ecological reference material pertaining to the site;
- A field survey to collect new biological and ecological data from the site;
- To identify what, if any, additional ecological surveys or assessments may be required; and
- To use all the above data, as appropriate, to determine the positive and/or negative impacts on biodiversity which will accrue as a result of the proposed development, and to determine the significance of those impacts on the habitats and species present on the site.

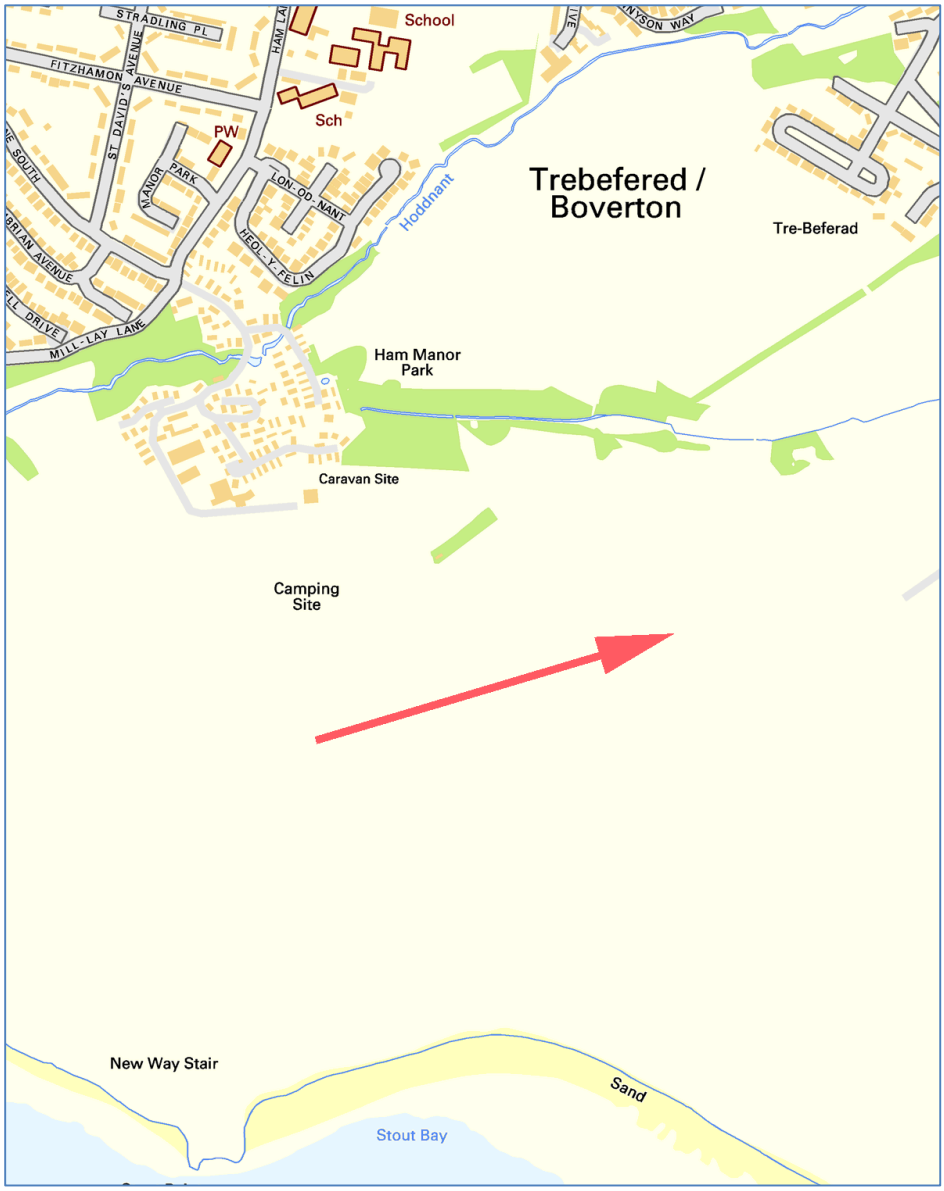
2.3 SITE LOCATION AND EXTENT OF SURVEY

The proposed development site lies close to the sea, at the southern edge of the village of Llantwit Major. The approximate centroid of the site is located at National Grid Reference SS 97762 67569. The whole site lies within the jurisdiction of Vale of Glamorgan Council (VGC). A map showing the approximate location of the site is provided in Figure 1.

The desk study considered a circular area with a 2km radius, centred on the approximate centroid of the proposed development site. The field survey examined the area within the confines of the site boundary but also considered those habitats immediately adjacent to that

boundary, at least up to 50m beyond it. In addition, all ponds and other water bodies which could be identified within 500m of the proposed development were, where access could be obtained, evaluated for the likely presence of Great Crested Newt.

Figure 1 – Location map. The approximate centre of the development site is indicated by a red arrow.



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2.4 PROPOSED DEVELOPMENT

Final details of the proposed development had not been finalised at the time of writing, but the development proposal is for a 5MW photovoltaic array, using existing field access points. The

array will be fenced with a standard 2 – 2.5m high stock fence, which will be installed at least 5m from existing boundary features. We are advised that the current development proposals do not require any modification or removal of existing boundary features, including hedges and trees.

2.5 CRITERIA FOR EVALUATION

The site was assessed for its ecological value and the potential impact of the proposed development using the recommendations given in the IEEM (now CIEEM) Guide for Ecological Impact Assessment (2006). The method applied in this report is given in Appendix 1.

2.6 NOMENCLATURE

The common name of flora and fauna is given in the main text of the report and Latin names are used for species where no common name is available. All binomial names for species recorded on site are given in Appendix 2.

3 RELEVANT LEGISLATION AND POLICY GUIDANCE SUMMARY

In order to understand the implications of the findings detailed in this report, it is necessary to first understand the statutory frameworks that exist to both protect the natural environment and to regulate development and its impact upon it.

Much of this legislation in the United Kingdom (UK) derives directly from international treaties and agreements but, recognising that key differences in environmental priorities can exist at national, regional, and local levels, there exists what can be a complex, often legally binding, framework which local planning authorities have a statutory duty to implement as part of the planning process.

In general, the intent of this substantial body of legislation is to provide protection of environmental capital for the benefit of people and wildlife, both now and in the future. Some of the legislation exists to identify and designate special protection for specific sites, or geographical areas, to protect especially valuable, threatened, or rare habitats and species found there whilst other legislation protects individual species, regardless of where they are found.

3.1 INTERNATIONAL LEGISLATION

The UK, as a member of the European Union, has an obligation to implement (theoretically within two years), all European Council Directives. Of particular relevance to this report are Council Directive 92/43/EC, on the Conservation of Natural Habitats and of Wild Flora and Fauna (the Habitats Directive), and Council Directive 2009/147/EC on the Conservation of Wild Birds (the Birds Directive).

This legislation requires all member states to designate, based on specific criteria, protected areas including Special Areas of Conservation (SAC) and Special Protection Areas (SPA). These European Directives are transposed, with very little modification, into UK law through the Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitat Regulations).

These European Council Directives also identify certain European Protected Species (EPS) that, because of their particular scarcity or vulnerability, at a European level, are offered special protection wherever they are found, whether that be inside a specially designated area or not. European Protected Species which may be material to the proposed development considered in this report include:

- Bats (all species);
- Great Crested Newt;
- Dormouse; and
- Otter.

3.2 NATIONAL (UK) LEGISLATION

In addition to the European Directives outlined in section 3.1, there are native UK statutes which provide certain protection for both species and habitats including (but not limited to):

- The Conservation of Habitats and Species Regulations (2010) (as amended);
- The Wildlife and Countryside Act (1981) (as amended): this legislation includes the definition of legally protected Sites of Special Scientific Interest (SSSI);
- Countryside and Rights of Way Act (2000) (The CRoW Act);
- The Natural Environment and Rural Communities Act (NERC Act)(2006);
- The Protection of Badgers Act (1992);
- Wild Mammals (Protection) Act (1996);
- The Hedgerow Regulations (1997);
- Weeds Act (1959);
- The Environmental Protection Act (1990);
- Environmental Protection Act (Duty of Care) Regulations (1991); and
- The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended).

Where a specific habitat or species is identified, during the course of this assessment, as material to the proposed development, reference will be made to the relevant statutory instrument, but one specific element of UK legislation is considered further in this section

The Natural Environment and Rural Communities (NERC) Act (2006)

As well as making provision for the formation of Countryside Council for Wales (now Natural Resources Wales (NRW)) and the Commission for Rural Communities, this act builds on the CRoW Act by placing the duty to "*have regard… to the purpose of conserving biodiversity"* on all public authorities, including Local Planning Authorities. Section 42 of the NERC Act requires NRW to publish a list of species and habitats which are of principal importance for the purpose of conserving biodiversity (now known as the Section 42 or S42 list) and to take steps to further their conservation.

Currently, the S42 list has identified 56 habitats and 943 species of principle importance in the UK. These habitats and species are all considered to be national conservation priorities, "*requiring action*". The UK Biodiversity Action Plan (UKBAP) (JNCC 2008) was established to plan, implement, and monitor appropriate actions to improve the fortunes of these UKBAP habitats and species. The impact of any proposed development on UKBAP habitats and species is a material consideration for Local Planning Authorities considering such proposals.

3.3 NATIONAL (WALES) LEGISLATION

3.3.1 NATIONAL PLANNING POLICY FRAMEWORK

Planning Policy Wales (PPW), Edition 7, (Welsh Government, 2014), together with Technical Advice Note 5 (Welsh Government, 2009) details the government's policy and requirements for the planning system in Wales in general, and specifically, how it should consider biodiversity, and the natural environment.

This policy, and its associated Technical Advice Note (TAN), the relevant details of which are described below, recognises the importance of biodiversity and makes clear that the potential effects of development on all aspects of the natural environment is a material consideration for Planning Authorities when considering application for development consent. PPW requires that, wherever possible, development proposals should encourage developers to include opportunities to incorporate biodiversity in and around any developments and TAN 5 mandates that biodiversity conservation and enhancement is an integral part of planning for sustainable development.

Together, these documents place the following requirements on developers, local planning authorities, and other statutory agencies:

- To promote the conservation of landscape and biodiversity, in particular the conservation of native wildlife and habitats, to ensure that action in Wales contributes to meeting international responsibilities and obligations for the natural environment, to ensure that statutorily designated sites are properly protected and managed, safeguard protected species, and to promote the functions and benefits of soils, and in particular their function as a carbon store (PPW 5.1.2);

- To ensure that society's land requirements are met in ways which do not impose unnecessary constraints on development whilst ensuring that all reasonable steps are taken to safeguard or enhance the environment. However, conservation and development can often be fully integrated. With careful planning and design, not only can the potential for conflict be minimised, but new opportunities for sustainable development can also be created. For example, new development on previously developed land provides opportunities to restore and enhance the natural heritage through land rehabilitation, landscape management and the creation of new or improved habitats (PPW 5.1.3);

- That biodiversity and landscape considerations are taken into account at an early stage in both development plan preparation and development management. The consequences of climate change on the natural heritage and measures to conserve the landscape and biodiversity should be a central part of this (PPW 5.1.4);

- Natural heritage issues are not confined by administrative boundaries: they must be addressed strategically through consultation and collaboration with adjoining planning authorities. Moreover, in addressing these issues, local planning authorities need to work with other stakeholders, in particular, NRW and the voluntary sector (PPW 5.1.5);

- To ensure that policies contribute to the conservation of the abundance and diversity of native wildlife and its habitats and will minimise the adverse effects on wildlife where conflict of interest is unavoidable (PPW 5.2.3);

- To have close co-operation and partnership between public agencies, local communities and the private and voluntary sectors. In line with its commitment to active community involvement in the planning process, the Welsh Government supports the preparation of Local Biodiversity Action Plans (LBAPs) as a means of engaging communities and private sector organisations in the conservation and enhancement of biodiversity at the local level to achieve these national goals (PPW

5.2.6); and

- To promote approaches to development which create new opportunities to enhance biodiversity, prevent biodiversity losses, or compensate for losses where damage is unavoidable. Local planning authorities must address biodiversity issues, insofar as they relate to land use planning, in both development plans and development management decisions. Local planning authorities should consider how they might accommodate a response to climate change as part of their overall approach towards meeting biodiversity objectives. Ways in which the adaptation needs of biodiversity could be considered include identifying the scope for minimising or reversing the fragmentation of habitats and improving habitat connectivity through the promotion of wildlife corridors. Local planning authorities should ensure that development minimises impact within areas identified as important for the ability of species to adapt and/or to move to more suitable habitats (PPW 5.2.8).

3.4 LOCAL AND REGIONAL

3.4.1 VALE OF GLAMORGAN COUNCIL ADOPTED UNITARY DEVELOPMENT PLAN

The Vale of Glamorgan Unitary Development Plan (UDP) 1996-2011 was formally adopted in 2005 (VGC, 2005). The UDP sets out the Council's vision and objectives for the development and use of land in the Vale, together with the policies and proposals to implement them. From an ecological perspective, a number of policies within the Local Development Plan are considered of relevance to the site and these are listed below:

Policy ENV 2 – Agricultural Land

The best and most versatile agricultural land (Grades 1, 2 & 3) will be protected from irreversible development, save where overriding need can be demonstrated. Non-agricultural land or land of a lower quality should be used when development is proposed, unless such land has a statutory landscape, nature conservation of historic or archaeological designation which outweighs agricultural considerations.

Policy ENV 5 – The Glamorgan Heritage Coast

The special environmental qualities of the Glamorgan Heritage Coast will be conserved and enhanced. With the exception of limited informal recreation facilities at Cwm Colhuw, Ogmore-By-Sea and Dunraven, the remainder of the area will be treated as a remote zone with priority being given to agriculture, landscape and nature conservation.

Policy ENV 10 – Conservation of the Countryside

Measures to maintain and improve the countryside, its features and resources will be favoured, particularly in the Glamorgan Heritage Coast, areas of high quality landscape, and areas subject to development pressure and/or conflict such as the urban fringe.

Policy ENV 11 – Protection of Landscape Features

Development will be permitted if it does not unacceptably affect features of importance to landscape or nature conservation including: trees, woodland, hedgerows, river corridors, ponds, stone walls and species-rich grasslands.

Policy ENV 12 – Woodland Management

The improvement, management and extension of woodland tree cover and hedgerows, particularly of broadleaf native species, will be favoured, especially where it:

(i) Makes a significant improvement to the landscape such as on derelict land, the urban fringe, or in the vicinity of major road/rail corridors and quarries; or

(ii) It helps to diversify and extend wildlife habitats; or

(iii) It adds to recreational and educational opportunities.

Policy ENV 13 – International Areas of Nature Conservation Importance.

International sites which are designated or potential RAMSAR sites, Special Protection Areas or Special Areas of Conservation will be protected. Development or land use changes likely to have an adverse effect on such sites will not be permitted unless there is no alternative and there are imperative reasons of overriding public interest. Where such sites host a priority habitat or species (as listed in the EC Habitats Directive) developments will not be permitted unless required for reasons of human health or safety. If in exceptional circumstances development is permitted, appropriate conditions or agreed planning obligations will be used to secure adequate compensation or mitigation measures.

Policy ENV 14– National Sites of Nature Conservation Importance.

Development likely to have an adverse effect, either directly or indirectly on the conservation value of a National Nature Reserve, or a Site of Special Scientific Interest

will not be permitted unless it there is no alternative and it can be demonstrated that the benefits arising from the development clearly outweigh the benefits arising from the special interest of the site. If development is permitted, appropriate conditions or agreed planning obligations will be used to secure adequate compensation or mitigation measures.

Policy ENV 15– Local Sites of Nature Conservation Significance.

Development and land use change likely to have an unacceptable effect on a Local Nature Reserve, a Regionally Important Geological / Geomorphological Site, or a site shown to be of importance for nature conservation will not be permitted unless the reasons for the proposal clearly outweigh the local importance of the site. If development is permitted, appropriate planning conditions or agreed planning obligations will be used to ensure that the impact on nature conservation is minimised.

Policy ENV 16– Protected Species.

Permission will only be given for development that would cause harm to or threaten the continued viability of a protected species if it can be clearly demonstrated that:

(i) There are exceptional circumstances that justify the proposals;

(ii) There is no satisfactory alternative; and

(iii) Effective mitigation measures are provided by the developer.

4 DESKTOP STUDY

4.1 SUMMARY

The site does not contain any national or internationally designated statutory nature conservation designations such as Sites of Special Scientific Interest (SSSI), and there are none within 2km of the approximate site centroid.

4.2 BACKGROUND

The desk study is intended to identify historical and current information on statutory designations, known habitat types present, historical species records, and historical site usage.

It can inform the ecological assessment of the site, including the value of the habitats present on the site within a wider landscape setting.

4.3 METHODOLOGY

A data search was undertaken by the South East Wales Biodiversity Record Centre (SEWBReC) for information on and historical records of protected and/or scheduled species within a 2km radius of the site's central grid reference. The search also identified any statutory and non-statutory conservation and protected site designations, and included information on any historical habitat information that was available.

Aerial photographs and maps were examined, prior to the site visit, to obtain an initial overview of the habitat on the site and the surrounding areas. The Local Biodiversity Action Plan (LBAP) for the Vale of Glamorgan was also reviewed.

Because this development proposal requires the production of an Environmental Statement, Erica Dixon, Vale of Glamorgan Ecologist was formally consulted on the scope of the survey, and to obtain any additional species records or other site data which may be held by the authority.

4.4 CONSTRAINTS

There were no constraints to the desk study.

4.5 DESKTOP STUDY RESULTS

4.5.1 STATUTORY DESIGNATIONS

The site has no statutory designations. There are no internationally or nationally protected sites, such as SPA, SAC or Ramsar (Convention on Wetlands of International Importance especially as Waterfowl Habitat. Ramsar (Iran), 1971) sites, within 10km of the proposed development site. There were no Sites of Special Scientific Interest (SSSI) within the 2km search boundary.

4.5.2NON-STATUTORY DESIGNATIONS

The site has no non-statutory designations. There are no Local Nature Reserves within 2km of the site:

There are three Sites of Importance for Nature Conservation (SINCs) within 2km of the proposed development site (Table 1).

Table 1 SINC sites within 3km of the proposed development site.

Site	Approximate Distance (km)	Grid reference	Reason for designation
Cwm Colhuw	0.79	SS96556776	This site is a mosaic of semi-improved neutral and calcareous grassland with dense scrub and scrub woodland along Iron Age earthworks, supporting Section 42 bird species including Yellowhammer
West of Cwm Colhuw	0.91	SS96466786	This site is a mosaic of semi-improved neutral and calcareous grassland with dense scrub and scrub woodland along Iron Age earthworks, supporting Section 42 bird species including Yellowhammer
Summerhouse Bay West	1.75	SS99456648	A small area of semi-natural broad-leaved woodland and scrub on and around the remains of a hill fort.

4.6 VALE OF GLAMORGAN LOCAL BIODIVERSITY ACTION PLAN

The Vale of Glamorgan Local Biodiversity Action Plan (LBAP) identifies 20 Priority Habitats and 21 priority species.

The following LBAP ecosystems are either present on site or immediately adjacent to it:

- Ancient and/or species rich hedgerows
- Cereal field margins

The following LBAP species may also be relevant to the proposed development:-

- Bats (all species)
- Dormouse
- Chough
- Barn Owl

- Song Thrush
- Grey Partridge
- Lapwing
- Sky Lark
- Great Crested Newt

4.7 PROTECTED, PRIORITY, AND OTHER SPECIES

There were no historical species records made at the proposed development site, but there were records returned from within 400m of the site boundaries.

In total, 474 records of priority and protected species (including Section 42 species), 446 species records of national conservation concern, and 58 species records of local conservation concern were returned from the 2km search area. A list of protected and priority species within 2km of the site is provided in Appendix 3.

There were records of the following protected or priority species which are considered to be relevant to the development site:

- Bats (various species);
- Badger;
- Hedgehog;
- Great Crested Newt;
- Reptiles;
- Invertebrates; and
- Breeding birds.

4.7.1 WATER BODIES

Within 500m of the development site boundary, three water bodies were visible on Ordnance Survey Mapping. These were located to the north west of the site, and were subsequently investigated during the field survey component of this assessment.

5 FIELD SURVEY – EXTENDED PHASE 1 HABITAT SURVEY

5.1 SUMMARY

The following habitats were present on site:

- Improved Grassland; and
- Hedgerows; and

The site was considered to have potential to support the following protected species:

- Bats;
- Dormouse;
- Great Crested Newt;
- Badger;
- Hedgehog
- Reptiles
- Invertebrates; and
- Breeding birds.

5.2 BACKGROUND

A Phase 1 Habitat Survey is a method and habitat classification system that was developed by the Nature Conservation Council (now Joint Nature Conservation Committee) to map habitats and land use categories to a "*consistent level and accuracy"*. Vegetation and habitats are mapped to provide a summary of broad habitat types, allowing visual assessment of the extent and distribution, and where appropriate, target notes highlight any potential features of interest.

An Extended Phase 1 Habitat Survey also records provisional signs of protected or notable species (including European Protected Species) and assesses the potential suitability of the habitats on site and within the accessible surroundings to support such species. These species include (but are not limited to):

- Otter;
- Water Vole
- Bats (all species);
- Dormouse;
- Badger;
- Reptiles;
- Great Crested Newt; and
- Breeding birds.

5.3 METHODOLOGY

Two walkover surveys were undertaken, by Mr Denis Jackson DipEnvSci MSc FSB MCIEEM, an ecologist who has eleven years professional ecological experience and holds survey and/or disturbance licences for Bats, Dormouse, Great Crested Newt, White-Clawed Crayfish, Barn

Owl, Red Kite and Goshawk. The survey visits took place on Thursday, 18th and Saturday 20th December. The survey was undertaken in accordance with the guidance on field surveying outlined in the Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit (JNCC 2010).

5.4 FIELD SURVEY RESULTS

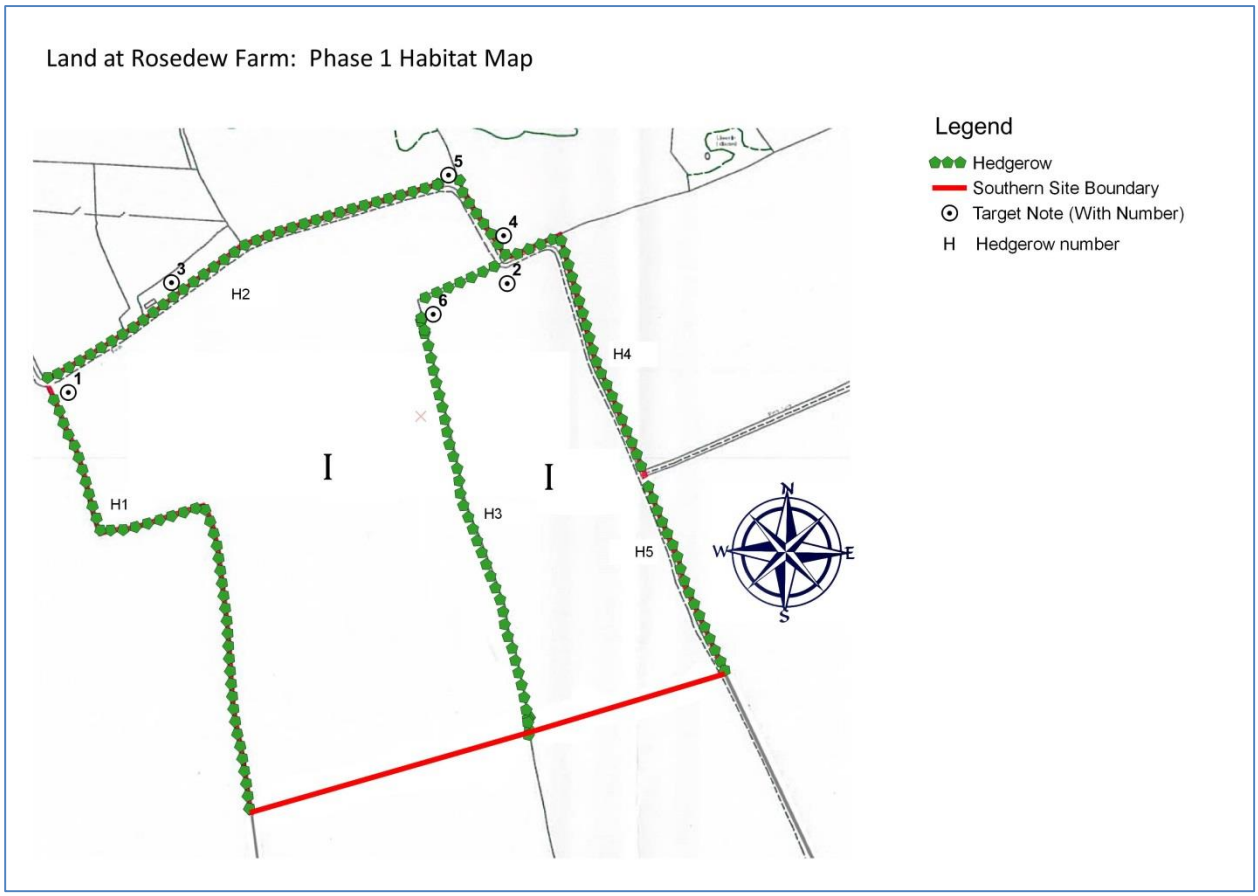
The habitats identified on site are described below and their extent and distribution is shown in Figure 1. A number of features of interest were recorded for which there is no appropriate categorisation in the Phase 1 mapping methodology. Theses have been identified as Target Notes (TN, detailed in Table 2).

Site photographs are provided in Appendix 4.

Table 2 Target Notes (TN).

Target Note number	Description
TN1	Gateway and track into field
TN2	Gateway and track into field
TN3	Row of mature trees on hedgerow boundary with some bat potential
TN4	Pair of mature trees on hedgerow boundary with some bat potential
TN5	Gateway into field
TN6	Gateway into field

Figure 1 Phase 1 habitat map



Map kindly supplied by Asbri Planning Ltd.

5.4.1 DETAILED DESCRIPTION AND HABITATS PRESENT

The site is approximately 14ha in size, and entirely comprises two recently planted grass leys (e.g. Plates 1 & 2), surrounded by hedgerows of varying ecological diversity and value (e.g. Plates 3 & 4), with occasional mature trees (e.g. Plates 5 & 6).

Access was via an existing gateway at the north western corner of the site (TN1, Plate 7). We are not aware of any public rights of way entering or crossing any part of the site.

A full list of botanical species present on site is given in Appendix 2.

5.4.1.1 IMPROVED GRASSLAND

This comprised the majority of the habitats present on site. This grass ley had been recently sown, as part of a rotation following on from Oilseed Rape on site. Numerous rape stalks, and an occasional seedling could be seen within the grass crop. A number of plants typical of arable

fields were noted, including Plantains, Creeping Buttercup and Speedwells. There was a little more diversity at field margins, but these were all less than 3m wide and all appeared to have been subject to herbicide spray-drift.

The SEWBReC data search returned only in a single botanical record of a priority or protected species; Shepherd's Needle *Scandix pecten-veneris.* This record dated from 1997 and was less than 1700m distant from the proposed development site.

In addition to these records however, consultation with the Vale of Glamorgan Ecologist revealed the presence nearby of a recently discovered population of Shepherd's Needle, only recorded at five sites in Wales since 2000. The same site was also discovered to hold a current population of Corn buttercup, *Ranunculus arvensis*. This is the only current site in Wales for this species. Both of these species are critically endangered, though once common plants of arable fields.

The Vale Ecologist was also able to inform us that there are rare or notable arable 'weeds' in the vicinity including Round-Leaved Fluellen *Kickxia spuria,* Sharp-Leaved Fluellen *Kickxia elatine,* Dwarf Spurge *Euphorbia exigua,* and Small-flowered Buttercup *Ranunculus parviflorus.* We are very grateful to Erica Dixon for providing these important records, which do not appear to be otherwise in the public domain.

5.4.1.2 HEDGEROWS

The site is bounded by hedges on all sides, with the exception of the southern boundary which is not demarcated on the ground. No hedgerows were considered to meet the ecological criteria for 'important' classification under the Hedgerow Regulations (1997) although it is possible that some may qualify under non-ecological criteria, e.g. as historical boundary features.

H1 and its associated hedge-bank**,** (e.g. Plate 8) was mostly Hawthorn and Blackthorn with some other species including Holly, Spindle, Dogwood and Wych Elm. This hedge did not appear to have been recently managed.

H2 did not have a hedge-bank beneath. This hedge, which forms the northern site boundary, was un-managed, and contained a number of mature trees (TN2), including Ash and Holme Oak (e.g. Plate 9). These trees were outwith the site boundary fence.

H3 (e.g. Plate 10 – note that this photograph was taken at the southern site boundary) was un-managed and comprised mostly of Hawthorn with other occasional woody species. Grasses and other vegetation on the hedge-bank here appeared to have been recently cut back to prevent encroachment onto the track-way along its western side.

H4 & H5 (e.g. Plates 11 & 12) were mostly of Hawthorn, with no hedge-bank. This hedge appeared to have been recently flailed. There were two mature trees outwith the site boundary fence, at TN4.

There were existing vehicular access points in hedges at TN1, TN2, TN5 and TN6.

5.4.2 INVASIVE SPECIES

No evidence of any non-native invasive species was found on site.

5.4.3 THE SITE IN THE CONTEXT OF THE WIDER ENVIRONMENT

The area subject to development proposals forms part of two larger arable fields, which extend to the south, beyond the perimeter of the development site. The western-most field continues south for approximately 300m before reaching the top of a high sea-cliff. The eastern-most field terminates at a stunted hedge after a similar distance. Both fields, outwith the proposed development site were planted with Winter Wheat, following on from Oilseed Rape, some seedlings of which were visible within the wheat crop. These areas, with the exception of the very narrow margins, all appeared to have been subject to herbicidal controls, with arable weeds largely absent. These fields were examined in detail. No signs of Badger or any other protected species were noted in these fields, or their associated hedgerows.

To the east and west, the site is surrounded by arable fields and hedgerows. To the north, are a number of small paddocks, which were all heavily horse-grazed, with a very short sward. Approximately 100m north of this boundary is a small area of deciduous woodland, with a small stream, known as Hoddnant, running through it, in a steep gully. This fast-flowing stream flows westward through a park home site. Two water bodies were shown on Ordnance Survey mapping along the course of this stream, but these were found, on investigation, to be widenings of the stream (e.g. Plate 13).

Another water body was shown on mapping at NGR SS 9742 6792, approximately 270m north of the site boundary. This small, ornamental pond was approximately 70m^2 and surrounded by concrete surfaces (e.g. Plate 14). There was very little aquatic vegetation present and a number of very large (50cm +) Koi Carp were observed (Plate 15).

No ponds or other static water bodies were identified within 500m of the site, although it remains possible that small ponds in gardens could exists, but not be identified on maps, or visible on the ground.

Because of the site's setting, within a mosaic of arable fields, the site is considered to be well connected, ecologically, with the wider environment.

5.4.4 PROTECTED SPECIES ASSESSMENT

5.4.4.1 BATS

The desk study did not identify any historic records of bats using the site for any purpose, but the data search contained records of *Pipistrellus* species within 1km of the site, and a further three bat species (two *Pipistrellus,* one *Plecotus*) between 1km and 2km distant

There are no features on site suitable for use by roosting bats, although there are three trees in hedges H2 and H4 (TN3 and TN4) which were categorised as Category 2 trees, with some potential to support roosting bats, according to the methodology given in Hundt (2012), although it should be noted that these trees are outwith the site boundary fence in both cases.

5.4.4.2 DORMOUSE

The desk study did not identify any records of Dormouse from the site and no records were returned from the SEWBReC search within the 2.km search area. There appears to be a known population of Dormouse approximately 1.2km to the north east in the St Athan / Llantwit Major area with a confirmed Dormouse nest (and thus likely breeding) found at the entrance to West Gate, MOD St Athan in approximately 2009 (Erica Dixon *pers. comm.*).

No signs of Dormouse were found during the habitat survey. The hedges do have some potential to support this species and this potential could be considerably enhanced by implementing appropriate hedgerow management prescriptions.

5.4.4.3 BADGER

The desk study did not identify any records of Badger from the site, with the nearest historical record more than 1.6km distant. No Badger setts or other evidence (e.g. paths, foraging signs, latrine pits, hairs, etc.) were found during the survey. The site offers little foraging potential for Badgers although it is possible that individuals may forage or traverse across it occasionally whilst moving between higher quality sites in the local area.

5.4.4.4 HEDGEHOG

The desk study identified five records of this species, the nearest being more than 1200m distant. No signs to suggest that this species might be using the site were found, although this may be a function of the time of year during which the field survey was undertaken. It is possible that individuals could be present, but if so, this is only likely to be within the hedgerows and, given that the site has been regularly sprayed with insecticide, it is unlikely that sufficient invertebrate prey species would be present to sustain a viable population. Hedgehogs are therefore not considered to be material to the development proposals, and therefore this species will not be considered further in this assessment.

5.4.4.5 REPTILES

The desk study did not identify any historic records of reptiles on the site. There were records of Grass Snake approximately 430m distant and a Slow Worm 1.6km distant. Only the hedges and their associated banks are considered to offer any potential reptile habitat, and any individuals present are unlikely to forage beyond these where they would be very exposed to avian and other predators as they crossed field margins. All hedges and their associated banks are to be retained and existing access points used. Reptiles are therefore not considered to be material to the development proposals, and therefore this species will not be considered further in this assessment.

5.4.4.6 GREAT CRESTED NEWT

There were no historical records of this species returned from the site or within the 2km search buffer. There are no ponds on site. A Habitat Suitability Index (HSI) was undertaken of the only static water body found within 500m of the site boundary, in accordance with the protocol given by Oldham *et al* (2010). The results, shown in Figure 2, (below) suggest that this pond is unlikely to support Great Crested Newt, in particular because of the large Koi Carp present.

This pond in nearly 300m distant from the development site boundary, and only the hedgerows and their associated banks have any potential to support this species during the terrestrial phase of their life-cycles.

It is therefore concluded that no further survey work for this species is required, and Great Crested Newt will not be considered further in this assessment.

Figure 2. Habitat Suitability Index calculation.

Scores		
SI1 - Location	0.5	
SI2 - Pond area	0.08	Approximately 70 sq metres
SI3 - Pond drying	0.9	Doesn't dry
SI4 - Water quality	0.33	Almost no submerged plants and a number of large Koi carp (50cm +)
SI5 - Shade	1	None
SI6 - Fowl	1	Absent
SI7 - Fish	0.01	Many large Koi Carp present
SI8 - Ponds	0.001	None identified on mapping within 1km
SI9 – Terrestrial habitat	0.33	Surrounded by hard standing and walls
SI10 - Macrophytes	0.8	Assumed 50% summer coverage by Lillies - probably an over-estimate,
Habitat Suitability Index	0.18	
Suitability:	**Poor**	

5.4.4.7 INVERTEBRATES

There were no invertebrate records from the site, and no records of rare, and/or protected invertebrate species nearby. The hedges and associated hedge-banks do have some potential to support a range of invertebrate species, but this is likely to be limited due to the limited botanical diversity, and the likelihood of insecticidal spray drift from agricultural operations. Because of this, it is considered unlikely that any significant invertebrate populations could be present.

It is therefore concluded that no further survey work for invertebrates is required, and this group will not be considered further in this assessment.

5.4.4.8 BREEDING BIRDS

The desk study did not identify any historic records of breeding birds on the site but there were many records of a wide variety of species in the local area, with 13 avian species within 1km of the site, including Eurasian Tree Sparrow *Passer montanus,* Grey Partridge *Perdix perdix,* European Golden Plover *Pluvialis apricaria,* Black-Headed Gull *Chroicocephalus ridibundus*, Common Kestrel *Falco* tinnunculus, Common Bullfinch *Pyrrhula pyrrhula,* Song Thrush *Turdus philomelos,* Sky Lark *Alauda arvensis,* Yellow Wagtail *Motacilla flava,* Black Redstart, *Phoenicurus ochruros,* Osprey, *Pandion haliaetus,* Marsh Tit *Poecile palustris,* and Barn Owl *Tyto*

alba. It should be noted however that many of the species mentioned are likely to be passage migrants, rather than local breeders.

We are advised by the LPA Ecologist that the local area along the sea cliffs in which the development site is located is noted for its important populations of breeding Sky Lark, and Lapwing.

The hedgerows on site have potential to offer breeding opportunities for a range of passerine species such as Dunnock, Blackbird and Song Thrush. During the survey, House Sparrow, Starling, Chaffinch, Blue and Great Tit, Dunnock, Bullfinch, Chiffchaff and Collared Dove were seen and/or heard on, or immediately adjacent to, the site.

Historical information provided to us by the client's agronomist (David Llewellyn *pers comm*) shows that the proposed development site has been intensively managed for many year, with a rotation that has included Winter Wheat and Oilseed Rape, together with high levels of inputs and herbicide/insecticide application.

5.5 CONSTRAINTS

The survey was carried out at a time of year when many plant species had finished flowering and others may not be apparent at all, without any visible signs above ground. In particular, it is not possible to determine whether or not any of the rare arable weed species known to be present locally are in fact on this site, nor to determine whether the site is in use by any ground-nesting birds, including Sky Lark.

However, we do not consider the un-seasonal timing of the survey to be a constraint to the general characterisation of the habitats present and, because of the intensive management regime and crop-types which have been grown, it is highly unlikely that ground nesting birds would be using the site, nor that rare arable plants would be present and it is considered that no further surveys in respect of these species will be required.

5.6 HABITATS – EVALUATION, IMPACT CHARACTERISATION, AND ASSESSMENT

5.6.1 IMPROVED GRASSLAND

Evaluation

Improved, intensively managed grassland is a wide-spread agricultural habitat type, both nationally, and within the local area. This habitat is characterised by limited botanical diversity, although it can have value to other species, in particular, breeding birds. Although the data

search did not identify any relevant, recent protected or priority botanical species records from the site or nearby, those provided privately by the LPA Ecologist show that there are at least two critically endangered arable weed species nearby. There is some potential for these species to be present in the grass leys present on site, but any such presence would not be evident at the time of year the field survey was undertaken. Historical information provided to us by the client's agronomist (David Llewellyn *pers comm*) shows that the site has been intensively managed, and regularly cropped all year, with a rotation that has included Winter Wheat and Oilseed Rape. The historical presence of significant infestations of Black Grass has resulted in regular herbicidal treatments to deal with this, together with the frequent application of broad-leaved herbicides to reduce other agricultural weeds. The site has also been subject to the application of regular chemical inputs to sustain and improve productivity.

On the basis of the results of the field survey, and the supporting historical data which has been supplied, it is considered that the improved neutral grassland habitats on this site are of **local-low ecological importance** and are unlikely to be of value to any species outside the immediate site boundary.

Impact characterisation

It is anticipated that much of grassland areas will be lost to the development, with a 5m buffer retained between the area of development and the existing hedges.

Impact assessment without mitigation

It is considered that there will be a **certain permanent significant adverse impact** on these habitats.

Significance of the impact without mitigation

The significance of the impact is considered to be **slight**.

Mitigation and enhancement recommendations

The following prescriptions will be implemented on site which, in addition to increasing botanical diversity, are likely to increase the diversity and abundance of invertebrates on site:

- A suitably qualified and experienced Project Ecologist will be appointed and retained to supervise works on site, and provide advice as required. The Project Ecologist will require a personal disturbance licence for Dormouse (if found), issued by Natural Resources Wales;

- Before work commences, a briefing, sometimes known as a 'toolbox talk' will be given by the Project Ecologist, to staff and contractors working on site, to make

them aware of all ecological considerations relevant to the site. The talk will provide advice in respect of the role of construction staff in preserving and enhancing ecological features on site, and what is required from them in order to avoid committing any offence;

- If possible, a minimum grassland buffer of 10m should be retained from all hedges. In any event, a minimum buffer of at least 5m will be maintained in all circumstances;

- Although no evidence of use by Badger or other mammals was found, it remains possible that these animals do cross or otherwise use the crop area and therefore, gaps will be created every 30m at the base of any security fence installed, with minimum dimensions of 20cm x 20cm to allow animals to pass freely.

- Retained grassland both between and beneath PV panels, at site boundaries, and along all access routes, will be subject to a conservation management regime for the lifetime of the scheme to increase botanical diversity, and to provide habitat enhancement for breeding birds and other species. The management prescriptions will include:

    - Allowing grassland throughout the area of the development to grow tall throughout the summer period, followed by low-density sheep grazing from late September until the end of February the following year. Grassland may also be mown, if required, but not before September 15th at the earliest, and aftermath grazing will still be required.

- Before construction work begins, a post-development Ecological Management Plan (EMP) will be submitted to the local planning authority for approval. This plan will contain fully detailed management and monitoring prescriptions for the lifetime of the development.

Impact assessment with mitigation

With mitigation and enhancement, it is considered that there will be a **probable significant long-term positive impact**.

Significance of the impact with mitigation

The significance is considered to be **large** (positive).

5.6.2 HEDGROWS

Evaluation

Hedgerows are both a Local and National Biodiversity Action Plan habitat, and are therefore of **high national ecological importance.** At this site hedgerows are moderately diverse, but most are gappy, and do not appear to have been managed for some years. Some appear to have suffered from herbicidal spray-drift. The hedges are likely to be used by a range of relatively common passerine species and, because of the coastal location of the site, may also have some value to migrating birds. There is also some potential for them to be used by Dormouse. There is considerable opportunity to obtain potentially significant biodiversity gains by applying simple management prescriptions to the existing hedges, and to plant a new hedge along the southern boundary to improve ecological connectivity.

On the basis of the results of the field survey, and the supporting historical data which has been supplied, it is considered that the hedgerows on this site are of **local-low ecological importance.**.

Impact characterisation

None of the hedgerows present will be subject to development although there is potential for accidental damage to take place due to the presence of heavy plant during the construction phase of the development.

Impact assessment without mitigation

It is considered that there could be an **extremely unlikely moderate medium-term adverse** impact on the hedges as a result of the proposed development.

Significance of the impact without mitigation

The impact is considered to be of **moderate** significance.

Mitigation and enhancement recommendations

Although mitigation in respect of the hedgerows is not required *per se,* the current poor ecological condition of the hedges does offer a significant potential for biodiversity enhancement and the following recommendations will be implemented to ensure compliance with the requirements for all developments to offer biodiversity enhancement contained within Planning Policy Wales (2014):

- Before development commences, a sheep-proof fence will be erected on the development-side of all existing and new hedges where a suitable pre-existing

fence does not exist. The detailed location and spacing from the existing hedges must be agreed in advance with the Project Ecologist. This fencing will deter machinery operators from damaging the hedge, and serve to prevent damage by grazing animals post-development. It may be that the overall site fence detailed in Section 5.6.1 would fulfil this requirement;

- To improve ecological connectivity, and to provide additional habitat for Dormouse and nesting birds, a hedge, with hedge-bank, will be planted at the southern site boundary connecting H1 and H5. There is a boundary shown at this approximate location on the 1877 – 1878 Ordnance Survey 1:2,500 map series. Planting will comprise a mix of native species of local provenance such as Blackthorn, Dog Rose, Elder, Guelder Rose, Hawthorn, Hazel, Holly, Wild Privet and Wych Elm. Under-planting with species such as Ivy and Honeysuckle will serve to further improve the ecological value of the hedgerow thus created. Hedgerow trees will also be incorporated;

- Gaps in existing hedges will be planted-up with native hedge species (see above) and again, will include some trees in the planting regime, such as Field Maple *Acer campestris*;

- Suitable short and medium-term after-care will be provided for all new plantings, in particular, to avoid damage from rabbits;

- Hedges will be cut in sections, in a rota, to encourage re-growth. Hedges will only be cut every two or three years, when hedge height has reached at least 2m. Cutting will be carried out between November and February to avoid the Dormouse and avian breeding seasons. Ideally, hedgerows would be managed by laying re-growth in cut sections which will thicken up the hedge and allow more hedgerow plants to become established; and

- Detailed on-going management prescriptions, covering the life of the development, and including full details of the proposed hedge planting (species, methods, timescales and management commitments) will be provided within the EMP and submitted to the Local Planning Authority for approval, before construction works commence. The EMP must also demonstrate how the proposed planting works, and on-going management, will be resourced.

Impact assessment with mitigation

It is considered that there would be a **negligible short-term** impact followed by a **probable significant long-term positive impact** as the hedgerow improvements and new increase the quality and connectivity of the hedgerow habitats present. .

Significance of the impact with mitigation

The impact is considered to be of **large** positive significance

6 PROTECTED SPECIES

6.1 BATS

6.1.1 SUMMARY

The site has no features of potential value to roosting bats, and only limited potential to support foraging and/or commuting bats. No further survey work or licencing is required, but a precautionary approach is required to avoid disturbance to potential flight lines. In addition, bats will benefit from biodiversity enhancement measures outlined elsewhere in this report.

6.1.2. LEGISLATION

All British bats, any place used for shelter or protection, or a breeding site or resting place (their roosts), are fully protected under the Wildlife and Countryside Act 1981 (as amended), and the Conservation of Habitats and Species Regulations 2010 (as amended). It is an offence to kill, injure, or disturb a bat. It is also an offence to disturb, damage, destroy, or obstruct access to a bat roost, whether bats are present or not.

Where a European protected species, such as bats, are present and an offence would be committed by undertaking any work, a development may usually only proceed under a licence issued by NRW, which is the appropriate authority responsible for issuing licences under the above Regulations.

A licence would require completion of an application form, together with a Method Statement which should include (but not be limited to) the mitigation proposed (such as the replacement or compensation roost), timescales, phasing of the works, lighting proposals, roofing and timber material details, protection of the roost and bats during and after the works, and a post-development monitoring programme.

6.1.3 BATS – EVALUATION, IMPACT CHARACTERISATION, AND ASSESSMENT

Evaluation

Bats are protected by both international and domestic UK legislation because of long-term, significant declines in their populations. Bats are therefore of **high international ecological importance**.

There are no features on site with potential to support roosting bats at any time of year, although there are three mature trees in hedge lines (but outwith the site boundary fencing) with low roost potential. The hedges also have some probability to be of value to foraging and commuting bats but the grass leys and other crops, planted in rotation on the main part of the development site are intensively managed, and unlikely to provide worthwhile invertebrate biomass on which bats can feed. The habitats on site are therefore considered to be of **local-low** ecological value to and for bats.

Impact characterisation

Only the hedges have been assessed as having any potential value to bats and, as previously noted, neither these nor any other boundary feature will be directly impacted by the development proposals and therefore, there will be no loss of landscape connectivity. There is some potential for light-spill from any security lighting required by the development to disrupt flight-lines, both during, and post construction.

There is some potential for bats to suffer injury as a result of collision as a result of bats attempting to drink from the panels, or collision with vertically aligned panels, which bats may try to fly through, although there is little evidence to support this (e.g. Greif & Siemers, 2010, Natural England, 2011) and this potential hazard cannot therefore be considered material to the development proposals.

Impact assessment without mitigation

It is considered that without mitigation there would be an **unlikely moderate short-term adverse** impact on any foraging bats using this area, as they locate new flight-lines between pre-existing foraging areas due to disruption from additional lighting.

Significance of the impact without mitigation

It is considered that the significance of the impact is **moderate**.

Mitigation recommendations

To avoid impacts on bats as a result of disturbance to foraging along hedge-lines, the following prescriptions will be followed:-

- No construction works will take place on site more than 30 minutes after sunset or before sunrise, to minimise the impact of lighting on construction vehicles on any using the site;

- Security and other external lighting will be kept to an absolute minimum, and will be specified and installed in such a way as to prevent light-spill onto hedges. The LPA may require a lighting plan to be submitted and approved before construction commences; and

- Implement the recommendations for mitigation and enhancement given elsewhere in this report in respect of the grassland and hedges.

Impact assessment with mitigation

With the mitigation described, it is considered that there will be a **probable major long-term positive** impact on bats as a result of the proposed hedgerow improvements.

Significance of the impact with mitigation

It is considered that the significance of the impact is **large** (positive).

6.2 DORMOUSE

6.2.1 SUMMARY

No signs of Dormouse were found on site but there are breeding records in the local area. The hedges on site have some potential to support this species, and it is possible they are present within some or all of the hedges. No hedges are being impacted by the proposed development and therefore neither further surveys, nor a development licence will be required, but a precautionary approach is recommended to avoid inadvertently committing any offence.

6.2.2 LEGISLATION

Dormice, any place used for shelter or protection, or a breeding site or resting place are fully protected under the Wildlife and Countryside Act 1981 (as amended), and the Conservation of Habitats and Species Regulations 2010 (as amended). Their places of shelter are protected at

all times, whether the animal is present or not. It is an offence to kill, injure, or disturb a Dormouse.

Where a European protected species, such as Dormouse, is present and an offence would be committed by undertaking any work, a development may usually only proceed under a licence issued by Natural Resources Wales, which is the appropriate authority responsible for issuing licences under the above Regulations.

A licence would require completion of an application form, together with a Method Statement which should include (but not be limited to) the mitigation proposed (such as hedgerow enhancements), timescales, and phasing of works, together with a post-development monitoring programme.

6.2.3 DORMOUSE – EVALUATION, IMPACT CHARACTERISATION, AND ASSESSMENT

Evaluation

Dormice are protected by both international and domestic UK legislation because of long-term, significant declines in their populations. Dormice are therefore of **high international ecological importance**.

The record centre search did not reveal any historical records from the site, and no records were returned within 2km. Information received from the Vale of Glamorgan Ecologist however, did reveal that there are recent breeding records nearby. Some of the hedges on site are considered to have potential to support this species, in particular those with greater species diversity and fewer gaps. It is therefore considered that the site has **high** potential value to and for Dormice and in the absence of a targeted Dormouse survey, presence of this species on site should therefore be assumed.

Impact characterisation

Current development proposals do not require any interference, modification or removal of any hedges on site. Because of this, it is considered extrmely unlikely that Dormice will be adversely affected by the development proposals and therefore, on that basis, neither further surveys nor a development licence will be required to allow planned works to take place. A precautionary approach is however required to avoid inadvertently committing any offence. If at any point it is desired to modify, breach or remove any hedgerow on site, then a Dormouse survey will be required, and potentially a Natural Resources Wales development licence, dependent on survey outcomes.

Impact assessment without mitigation

It is considered that there will be a **neutral** impact on Dormice as a consequence of the proposed development.

Significance of the impact without mitigation

The impact to on Dormice is considered to be of **neutral** significance.

Mitigation recommendations

Although no habitat suitable for use by Dormouse will be directly affected by the proposed development, the following mitigation is required, to avoid committing any offence:

- In the unlikely event that Dormice are discovered, or if any accidental damage to an existing hedge takes place, work will cease immediately until the Project Ecologist has been able to visit the site and provide advice; and

- Pre-construction fencing of hedges together with the hedge enhancement and management prescriptions provided in Section 5.6.2 of this report will be implemented in full;

Impact assessment with mitigation

It is anticipated that there will be a **probable major long-term positive** impact on Dormice as a result of the proposed hedgerow improvements.

Significance of the impact with mitigation

The impact for Dormice is considered to be **large (positive)**

6.3 BADGER

6.3.1 SUMMARY

No Badgers or signs of Badgers were found on site and the habitats present are not considered likely to support them although it remains possible that they could occasionally use the site to move about within their territory. No further survey work is recommended, and no development licence required, but a precautionary approach is required to avoid unintentionally committing any offences.

6.3.2 LEGISLATION

Badgers are protected under the Protection of Badgers Act 1992, mainly to prevent cruelty to badgers as a result of badger baiting. (They are also listed on Appendix III of the Bern Convention). It is an offence:

- to wilfully kill, injure, take (capture), possess or cruelly ill-treat a Badger;
- to attempt to wilfully kill, injure, take (capture), possess or cruelly ill-treat a Badger; or
- to intentionally or recklessly interfere with a sett.

(Sett interference is generally considered to include damaging or destroying a sett, obstructing access to a sett, and/or disturbing a badger whilst it is occupying a sett.

A development licence would be required for works which may disturb or destroy a badger sett. Disturbance may include working near a sett, particularly if such work is undertaken using heavy plant or machinery, or requires any work below the surface of the soil.

6.3.3 BADGER – EVALUATION, IMPACT CHARACTERISATION, AND ASSESSMENT

Evaluation

Badgers are protected by UK legislation and therefore they are of **high national ecological importance.**

No evidence, such as snuffle holes or latrine pits, was found to suggest that Badgers are using the site. No potential areas suitable for sett building were present on site and it is certain that there are no setts within the site boundary. The value of the habitats on site to foraging badgers will vary depending on the crop planted, but it is considered that the habitats on site are likely to provide only very limited foraging due to the intensive nature of management prescriptions applied. It is therefore considered to be of **local-low** value to and for this species.

Impact characterisation

The proposed development will result in the loss of suitable low-quality foraging habitat for badgers as a result of site fencing, and potential to disrupt existing commuting routes between other parts of the territories of any Badgers that might be resident in the local area. During the construction phase of the development, there is potential for any badgers entering the site to become killed or injured as a result of falling into open trenches, or consuming hazardous materials.

Impact assessment without mitigation

It is considered that there would be a **highly unlikely significant short-term adverse impact** on Badgers during the construction phase of the project, followed by a **probable significant long-term adverse** impact during the operational phase of the project as a result of the loss of foraging habitat.

Significance of the impact without mitigation

Without mitigation, the impact is considered to be of **large** significance.

Mitigation recommendations

The follow measures will be implemented:

- The recommendations contained in Section 5.6.1, in respect of fencing, and habitat improvements will be implemented in full;
- All materials that could cause a hazard to Badgers, such as fuels, oils and other chemicals are stored in a manner that prevents badgers accessing them;
- All pits, trenches and other sub-surface workings that could entrap badgers are either covered at night to prevent access, or provided with a means of escape, such as a suitably propped and secured plank, at a shallow angle to the surface; and
- The Project Ecologist will be "on call" for the duration of the project and will be consulted in the event that Badgers be observed on site. Development licences will be sought if necessary although a requirement for licencing is considered to be extemely unlikely.

Impact assessment with mitigation

With all recommended mitigation, it is considered that there will be an **extremely unlikely significant short-term adverse impact** on Badgers during the construction phase of the project, followed by a **probable significant moderate long-term positive** impact during the operational phase of the project as a result of improvements to foraging habitats.

Significance of the impact with mitigation

The impact is considered to be **moderate** (positive).

6.4 BREEDING BIRDS

6.4.1 SUMMARY

The hedges have potential to support breeding for a range of common passerines, and may also offer some value to migratory birds on passage. The grassland area has only very limited potential to value to ground nesting birds such as Sky Lark and Lapwing.

To avoid committing any offence, precautionary approach is also required to avoid causing disturbance to birds nesting in hedges and within the grassland areas.

6.4.2 LEGISLATION

All birds are fully protected by the Wildlife and Countryside Act 1981 (as amended) against killing, injury, taking, and additionally, when they are attempting to breed during the breeding season, disturbance. Included in this protection are all nests (at whatever stage of construction or use) and all dependent young until such time as the nest is abandoned and the young have fledged and become independent.

Some species, such as Barn Owl *Tyto alba*, are included on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) which extends the protection making it an offence to kill, injure, take, disturb, or sell at all times of the year. This also applies to their nests and all dependent young. Where Barn Owl is present, and may be adversely impacted by an activity, work may need to be phased to avoid the main breeding season (April to August inclusive, although Barn Owl have been recorded breeding in all months of the year) and mitigation may be required.

6.4.3 BIRDS – EVALUATION, IMPACT CHARACTERISATION, AND ASSESSMENT

Evaluation

Birds are protected by UK legislation and therefore they are of **medium to high national ecological importance.**

The hedgerows on site have potential to offer breeding opportunities for a range of passerine species common in the local area such as Dunnock, Blackbird and Song Thrush. The crop area (currently grassland), has potential to be used by ground nesting birds, such as Sky Lark and Lapwing. With enhancement, the hedges have potential to support a wider range of breeding birds, including Grasshopper Warbler and Yellow Hammer, both species of conservation concern, which are known to breed in the local area.

Information received during the course of formal consultation with the Vale of Glamorgan Ecologist (Erica Dixon *pers comm*) suggests that the area in which the development site is located is important for nesting Sky Lark and Lapwing, something that was not apparent from the data received from SEWBReC.

Historical information provided to us by the client's agronomist (David Llewellyn *pers comm*) shows that the site has been regularly cropped all year, with a rotation that has included Winter Wheat and Oilseed Rape, together with high levels of inputs and herbicide/insecticide application. Sky Lark breeding success in arable environments in generally dependent on the type of crop, and its associated management and this holds true for most avian species. Autumn sown crops, such as Winter Wheat, generally grow too thick (thus obscuring sight-lines) to allow more than a single brood to be raised in a season, and these crops are frequently avoided by this, and other avian species. Regular cropping through the breeding season, together with high levels of insecticide applied to the crop, and thus reducing invertebrate prey availability, is likely to further reduce the probability of ground-nesting birds being present. It is therefore considered extremely unlikely that the site would be used by ground nesting birds species, such as Sky Lark, and that any such use is likely to be occasional and opportunistic. Overall, the site is therefore considered to be of **local-low** to breeding birds.

Impact characterisation

None of the hedges will be lost to, or directly impacted by, the development proposals, but there is some potential for birds nesting in hedges to be disturbed during the construction phase of the development. Hedge nesting passerine species are likely to continue to forage along hedges themselves, and along existing field margins.

The majority of the grassland areas on site will be covered and shaded by the photovoltaic panels. Evidence suggests that there is little risk of avian fatality due to striking panels (RSPB, 2011) and, although this hypothesis requires further evaluation, it appears to be the only data available to assess the potential risk at this time.

Although it is considered extremely unlikely that any ground-nesting birds could be present, should any individuals so be, any works undertaken during the breeding season could result in the killing, injuring or disturbance of adult birds and their dependent young, and/or damage and destruction of nests and eggs.

Impact assessment without mitigation

It is considered that, without mitigation, there will be an **unlikely moderate short-term adverse** impact on any birds breeding in hedgerows due to disturbance during construction activities and an **extremely unlikely significant permanent adverse** impact on any birds breeding in the grassland areas during the construction phase of the project.

Significance of the impact without mitigation

The impact is considered to be **large**.

Mitigation recommendations

Works will only proceed in accordance with the following:

- Construction works will only be undertaken outwith the breeding bird season (i.e. only between October and March inclusive). Where this is not possible, clearance may only take place after an ecological assessment and approval (i.e. where no breeding birds are present. Where breeding birds are present, no clearance will be allowed within 20m of the nest site;

- The recommendations contained within Sections 5.6.1 and 5.6.2 of this report, if fully implemented, will result in improvements to hedges which will benefit nesting passerines, and an increase in the diversity and abundance of weed seeds and invertebrates, both important food sources for birds; and

- Nesting features for birds, such as nesting bricks for House Sparrows, and platforms for House Martins should be incorporated in any equipment housings on site as appropriate.

Impact assessment with mitigation

With the mitigation described, It is considered that the impact during the construction phase of the project will be **negligible**, followed by a **probable significant long-term positive** impact as a result of the habitat improvements contained elsewhere in this report.

Significance of the impact with mitigation

The significance of the impact is considered to be **large** (positive)

7 CONCLUSION AND RECOMMENDATIONS

The site is typical of many coastal agricultural sites in the district. The whole site has been heavily modified by man, and the majority of the habitats present are transitional (currently improved grass leys), and dependent on management and cropping regimes, which in the last decade, have been intensive and the crops grown have been of a type generally considered to

be of lesser value to wildlife. The site is not subject to any statutory designations, and there are none nearby with potential to be affected by the development proposals.

There were no publically available records of protected or priority species on or adjacent to the site, but consultation with the LPA revealed the presence nearby of a number of rare plants, a European Protected Species (Dormouse), and that the local area is important for breeding Sky Lark and Lapwing. The hedgerows have potential to support breeding birds and Dormouse therefore, although these will not be directly impacted by the development proposals, a precautionary method of working has been included to avoid inadvertently committing any offence. Because of the management history of the site, there is only very low potential for the grassland areas to be used by ground-nesting bird species but again, a precautionary method of working in respect of ground nesting birds has also been included to avoid inadvertently committing any offence.

There is no suitable roosting habitat on the site for bats, although it is possible that the hedges have some value to commuting bats. These commuting routes could be disturbed or disrupted by additional lighting on site and therefore, recommendations have been made to reduce this.

Although there is a static water body within 500m, it is considered extremely unlikely that this is in use by Great Crested Newt, and the habitats on the proposed development site offer little of value for that species in the terrestrial phase of its life-cycle.

There are no indications that Badger use the site and any such use is likely to be limited to occasional movement between higher quality sites nearby. Despite this low probability for ise, there remains some potential for Badgers to be present, and therefore, recommendations have been provided to mitigate for habitat loss, and to permit Badgers to traverse the site should they wish to do so.

No signs of use by any other protected species were found, and it is considered extremely unlikely that any other protected species are present, at any time of year.

Specific mitigation measures have been given in respect of timing of works, and post-development grassland and hedgerow management. These measures, if implemented in full, have potential to considerably increase site biodiversity and offer an overall net gain in compliance with Planning Policy Wales. .

8 DISCLAIMER

This report and the opinions herein have been prepared by Wyedean Ecology Ltd, with all reasonable care, skill, and attention to detail as set out within our standard terms and conditions. No explicit warranty is provided as to their accuracy.

This report has been prepared for the exclusive use of the commissioning party and unless otherwise agreed in writing by Wyedean Ecology Ltd, no other party may use, make use of, or rely on the contents of the report. No liability is accepted by Wyedean Ecology Ltd for any use of this report other than for the purposes for which it was originally prepared and provided.

The lack of evidence of a protected species does not mean they are not currently present, nor does it preclude their presence at some future date. The survey methods used are suitable to establish the presence of a population of protected species, and, in accordance with published best practice methodologies, are considered to show adequate effort in determining that a species is likely to be absent, or at least present for such a limited period of time, or at such low population levels, that the habitats present on site are highly unlikely to be significant to that population.

Any ecological survey can only identify what was present on site when it was conducted. Habitat types and usage by species can change over time, and if development works do not begin within two years of the date of this report, further survey work will be required to identify any change of use of the site, in particular by protected species.

9 COPYRIGHT

10 REFERENCES

IEEM **(2006)** Guidelines for Ecological Impact Assessment in the United Kingdom. Winchester, IEEM

JNCC **(2010)** Handbook for Phase 1 habitat survey – A Technique for Environmental Audit. Peterborough, JNCC

JNCC **(2012)** UK biodiversity action plan. [Available Web] http://jncc.defra.gov.uk/page-5155 [Accessed May 1st 2014]

Baker, J., Beebee T., Buckley, J., Gent, A. and Orchard, D. **(2011).** Amphibian Habitat Management Handbook. Bournemouth: Amphibian and Reptile Conservation,

Convention on Wetlands of International Importance especially as Waterfowl Habitat. Ramsar (Iran), **(1971**). UN Treaty Series No. 14583. As amended by the Paris Protocol, 3 December 1982, and Regina Amendments, 28 May 1987

Council Directive on the conservation of Natural Habitats and of Wild Flora and Fauna (the Habitats Directive) EC Directive 92/43/EEC **(1992)** [Available Web] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043 [Accessed April 27th 2014]

Council Directive 2009/147/EC on the Conservation of Wild Birds (The Birds Directive) **(2009)** [Available Web] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147 [Accessed April 27th 2014]

The Conservation of Habitats and Species Regulations **(2010)** London: TSO

The Countryside and Rights of Way Act **(2000)** (The CRoW Act) London: TSO

The Environmental Protection Act **(1990)** London: TSO

Greif S. and Siemers B., M. **(2010)** Innate recognition of water bodies in echolocating bats. Nature Communications, 2(1), 107.

Hundt, L. **(2012)** Bat Surveys - Good Practice Guidelines (2nd Ed). Bat Conservation Trust.

The Hedgerow Regulations **(1997)** London: TSO

Natural England **(2011)** Technical Information Note TIN101 - Solar Parks: maximising environmental benefits. Peterborough: Natural England.

The Natural Environment & Rural Communities Act **(2006)** Section 42 List of Species of Principal Importance for Conservation of Biological Diversity in Wales, London: TSO

Oldham, R. S., Brady, L. D., Sewel, D. L. & Baker, J. M. R. **(2010)** ARG Advice Note 4: Great Crested Newt Habitat Suitability Index: Amphibian and Reptile Conservation.

Planning Policy Wales (PPW), Edition 7, **(2014),** Cardiff: Welsh Government

The Protection of Badgers Act **(1992)** London: TSO

RSPB **(2011)** Solar Power. RSPB Briefing

Technical Advice Note 5, **(2009)** Nature Conservation and Planning. Cardiff: Welsh Government

The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations **(1999)** (as amended) London: TSO

Vale of Glamorgan Council **(2005)** Unitary Development Plan [Available Web] https://www.valeofglamorgan.gov.uk/files/Living/Planning/Policy/UDP/UDP.pdf [Accessed 18th February 2015]

The Weeds Act **(1959)** London: TSO

The Wildlife and Countryside Act **(1981)** (as amended) London: TSO

Wild Mammals (Protection) Act **(1996)** London: TSO

11 APPENDIX 1 ECOLOGICAL IMPACT ASSESSMENT (ECIA)

Following the recommendations given in Guidelines for Ecological Impact Assessment in the United Kingdom (IEEM 2006), the impact of the proposed development on a site is assessed in two stages. First, the ecological value of the site is established, and placed within a geographical frame of reference. Once this baseline has been established, the scale of any positive or negative impact of the proposed development on the site can be determined. The process followed to determine ecological value and impact is described below.

11.1 GEOGRAPHICAL FRAME OF REFERENCE

The geographical context of a site is important. Some sites, such as estuaries holding large numbers of wintering shorebirds, may be important to the global population of some species. Small sites, holding very common species, may only be important at a very local level. Sites are categorised according to the following table:

Area Type	**Examples**
International	Global or European
National	Country, eg England, Wales or Scotland
Regional	County, eg Gloucestershire, Monmouthshire
Local	Parish or District
Zone of Influence	A proposed development site and its immediate surrounding area

11.2 ECOLOGICAL VALUE

Value	Examples
Very High	Internationally designated or proposed sites such as Ramsar Sites, Special Protection Areas, Biosphere Reserves, and Special Areas of Conservation, or otherwise meeting criteria for international designation. Sites supporting populations of internationally important species.
High	Nationally designated sites such as Sites of Special Scientific Interest (SSSIs), or non-designated sites meeting SSSI selection criteria, National Nature Reserves (NNRs), Nature Conservancy Review (NCR) Grade 1 sites, viable areas of key habitats within the UK Biodiversity Action Plan. Sites supporting viable breeding populations of Red Data Book (RDB) species (excluding scarce species), or supplying critical elements of their habitat requirements.
Medium	Sites containing viable areas of threatened habitats listed in a regional Biodiversity Action Plan, comfortably exceeding Sites of Importance for Nature Conservation (SINC) criteria, but not meeting SSSI selection criteria. Sites supporting viable populations of Nationally Scarce species or those included in the Regional Biodiversity Action Plan on account of their rarity, or supplying critical elements of their habitat requirements.
Low	Undesignated sites or features considered appreciably enriching the habitat resource within the context of the Parish or neighbourhood (eg a species-rich hedgerow).
Negligible	Low-grade and widespread habitats with little or no ecological or conservation value.
Uncertain	The value has not been ascertained.

11.3 ASSESSMENT OF IMPACT

Having determined the ecological value of the site, the potential impacts on it as the result of the proposed development are assessed, applying the criteria below.

11.3.1 LIKELIHOOD OF OCCURANCE

The likelihood of the impact occurring has been taken from the EcIA Guidelines and based on a standard 5% statistical confidence.

Confidence Level	Definition
Certain/near-certain	Estimated probability > 95%
Probable	Estimated probability 50%-94%
Unlikely	Estimated probability 5%-49%
Extremely unlikely	Estimated probability < 5%

11.3.2 POTENTIAL MAGNITUDE OF THE IMPACT

The magnitude of any impact is, where possible, quantified and based on the area (of a habitat), the numbers of animals or plants, and/or the ecological value of the habitat or species

impacted. Each habitat and species (or group of species, eg birds) is assessed independently as each may respond differently to the same impact.

Magnitude	**Definition**
Significant	Total loss of the feature.
Major	Extensive modifications leading to a change in the character of the feature.
Moderate	Noticeable changes to the character of the feature.
Minor	Slight changes to the character of the feature.
Neutral	No change.

11.3.3 DURATION OF THE IMPACT

The duration of an impact is important. For example, species may easily tolerate temporary disturbance to a habitat outside the breeding season but permanent loss of that habitat could result in a decline in the population. The effect of the duration of any impact will vary between species and only broad, general definitions can be given here.

Duration	**Definition**
Permanent	Irreversible impact.
Long-term	Between 5 and 10 years.
Medium-term	For the duration of the project to 5 years post-development
Short-term	For the duration of the project to 12 months post-development

11.3.4 POSITIVE OR NEGATIVE IMPACT

Development can have positive or negative impacts on individual habitats and/or species and determining this is a key element of determining the overall effect of the development proposals.

Impact Effect	**Definition**
Positive	Enhances and improves the ecological value of a habitat or species.
Neutral	Neither enhances or adversely affects the ecological value of a habitat or species.
Adverse	Reduces or compromises the ecological value of a habitat or species.

11.3.5 EXTENT OF THE IMPACT

This defines the geographical extent of an impact. For the purpose of this report, this may, in general, be taken to be the area enclosed within the site boundary with the exception of mobile species, such as birds, where a specific area of extent will be defined.

Any impacts on watercourses will be assessed over a greater area, as any impact may affect not just the area where the impact first occurs but also, potentially, downstream of this. The extent of an impact will depend directly on the impact and its cause, eg a pollution incident involving a chemical spill will potentially affect a larger area than one involving a small disturbance of the river substrate.

11.3.6 REVERSIBILITY OF THE IMPACT

A temporary impact is one which is reversible either immediately or within a short timescale with the implementation of correct mitigation. A permanent impact is one from which recovery is not possible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. One action may have both reversible and irreversible effects.

11.3.7 TIMING AND FREQUENCY OF THE IMPACT

The timing of an action may affect the impact that it has (eg replacing a roof in winter will reduce the impact on breeding bats). However, the frequency of an action will also have an effect, eg small, frequent disturbances may result in a greater impact than a single, larger disturbance event.

11.3.8 SIGNIFICANCE OF THE IMPACT

Once the ecological value of the site has been determined, and the overall effect of the impact assessed, the significance of the impact, both before and after any applicable mitigation is assessed. Where two levels of significance are available, professional judgement is exercised to determine that which is most appropriate.

		Magnitude of Impact				
		Significant	**Major**	**Moderate**	**Minor**	**Neutral**
Ecological Value of Species or Habitat	**Very High**	Very large	Large / very large	Moderate / large	Slight	Neutral
	High	Large / very large	Moderate / large	Slight / moderate	Slight	Neutral
	Medium	Moderate / large	Moderate	Slight	Neutral / slight	Neutral
	Low	Slight / moderate	Slight	Neutral / slight	Neutral / slight	Neutral
	Negligible	Slight	Neutral / slight	Neutral / slight	Neutral	Neutral

12 APPENDIX 2 SPECIES LIST

The species found on site during the field surveys are detailed below. For plants, the relative abundance of each species is given, using the DAFOR abundance scale.

Latin name	**Common Name**	**Comments**
Hedgerow and Grassland plants		
Acer campestre	Field Maple	Rare in hedges
Achillea millefolium	Yarrow	Occasional at field edges
Agrostis capillaris	Common Bent	Locally frequent at field edges
Alliaria petiolata	Garlic Mustard	One plant in hedge
Anagallis arvensis subsp. Arvensis	Scarlet Pimpernel	Rare in grass leys
Anthriscus sylvestris	Cow Parsley	Occasional at field edges
Arrhenatherum elatius	False Oat-Grass	Locally frequent at field edges
Capsella bursa-pastoris	Shepherd's Purse	Rare
Cerastium fontanum	Common Mouse-ear	Occasional in grass leys
Cerastium glomeratum	Sticky Mouse-ear	Occasional in grass leys
Chenopodium spp.	Goosefoot	One plant near TN 5
Cirsium arvense	Creeping Thistle	Rare at field edges
Cirsium vulgare	Spear Thistle	Rare at field edges
Clematis vitalba	Traveller's-joy	Rare in hedges
Cornus sanguine	Dogwood	Rare in hedges
Corylus avellana	Hazel	Occasional in some hedges
Crataegus monogyna	Hawthorn	Frequent in hedges
Dactylis glomerata	Cock's-foot	Occasional at field edges
Euonymus europaeus	Spindle	Rare in hedges
Fraxinus excelsior	Ash	Occasional in hedges
Fumaria muralis	Common Ramping-fumitory	Rare in grass leys
Galium album	Hedge Bedstraw	Locally frequent in hedges
Galium aparine	Cleavers	Occasional in hedges
Geranium molle	Dove's-foot Crane's-bill	Locally frequent at field edges
Geranium robertianum	Herb-Robert	Frequent in hedges
Hedera helix	Common Ivy	Frequent in hedges
Heracleum sphondylium	Hogweed	Rare at field edges
Holcus lanatus	Yorkshire-fog	Frequent in hedges
Hypericum Spp.	Imperforate St John's-wort	Rare in hedges
Ilex aquifolium	Holly	Occasional in hedges
Lapsana communis	Nipplewort	Occasional
Lolium perenne	Perennial Rye-grass	Dominant as sown ley in fields
Malus sylvestris	Crabapple	Rare in hedges
Medicago lupulina	Black Medick	Rare in grass ley

Latin name	**Common Name**	**Comments**
Phleum pretense	Timothy	Occasional in hedges
Picris echioides	Bristly Ox-tongue	One small patch at field edge
Plantago lanceolata	Ribwort Plantain	Occasional
Plantago major	Greater Plantain	Occasional
Poa annua	Annual Meadow-grass	Frequent at field edges and hedges
Polygonum aviculare agg.	Knotgrass	Rare in grass ley
Potentilla anserine	Silverweed	Occasional in grass ley
Prunus laurocerasus	Cherry Laurel	One plant in H2
Prunus spinosa	Blackthorn	Frequent in hedges
Quercus ilex	Holme Oak	One specimen in H2
Quercus petraea	Sessile Oak	Occasional mature tree in hedges
Ranunculus repens	Creeping Buttercup	Frequent
Rubus fruticosus agg.	Bramble	Frequent – locally dominant in hedges
Rumex acetosa	Common Sorrel	Occasional in grass ley
Rumex crispus	Curled Dock	Occasional
Sambucus nigra	Elder	Occasional in hedges
Senecio vulgaris	Groundsel	Occasional in grass ley
Sonchus oleraceus	Smooth Sow-thistle	Rare at field edges
Stellaria media	Common Chickweed	Occasional in grass ley
Taraxacum agg.	Dandelion	Occasional in grass ley
Torilis japonica	Upright Hedge Parsley	Rare in hedges
Trifolium pratense	Red Clover	Rare in grass ley
Trifolium repens	White Clover	Rare in grass ley
Tripleurospermum inodorum	Scentless Mayweed	Occasional in grass ley and at field edges
Ulmus glabra	Wych Elm	Locally frequent in hedges, esp. H1
Urtica dioica	Common Nettle	Occasional in hedges
Veronica arvensis	Wall Speedwell	Occasional in grass ley, mostly at edges
Veronica persica	Common Field-speedwell	Rare in grass ley
Veronica serpyllifolia	Thyme-leaved Speedwell	Occasional in grass ley
Viola arvensis	Field Pansy	Occasional in grass ley

13 APPENDIX 3 SEWBREC DATA SEARCH RESULTS

Protected and priority species, within 2km of the development site.

Scientific Name	Common Name	Status
Accipiter gentilis	Northern Goshawk	WCA1.1, WCA9, Bonn, CITES, LBAP (CLY, CON, POW, VOG)
Alauda arvensis	Sky Lark	BDir22, S42, LBAP (ANG, BBNP, CER, CLY, CON, CRM, DEN, FLI, GWY, PEM, POW, SNP, TRF, VOG), WBAm(RSPB), UKBR(RSPB)
Alcedo atthis	Common Kingfisher	BDir1, WCA1.1, Bern, LBAP (CLY, CON, DEN, FLI, GWY, POW, TRA), WBAm(RSPB), UKBAm(RSPB)
Anguilla anguilla	European Eel	S42, UKBAP, RD1 (UK), LBAP (CLY, CON, GWY, VOG)
Anguis fragilis	Slow-worm	WCA5, S42, UKBAP, Bern, LBAP (ANG, CLY, CON, DEN, FLI, GWY, POW, SNP, TRA, VOG)
Anser albifrons	Greater White-fronted Goose	BDir22, S42, UKBAP, Bern, Bonn, RD2 (UK), WBR(RSPB), LBAP (BBNP), UKBAm(RSPB)
Anthus trivialis	Tree Pipit	S42, UKBAP, Bern, LBAP (CON, DEN, FLI, GWY, POW, VOG), WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)
Arvicola amphibius	European Water Vole	WCA5, S42, UKBAP, LBAP (ANG, BBNP, CER, CLY, CON, CRM, DEN, FLI, GWY, PEM, POW, SNP, TRA, TRF, VoG)
Bufo bufo	Common Toad	WCA5, S42, UKBAP, Bern, LBAP (ANG, CLY, CON, DEN, FLI, GWY, POW, TRA, VOG)
Calidris maritima	Purple Sandpiper	WCA1.1, Bonn, Bern, LBAP (CON, VOG), UKBAm(RSPB)
Calidris pugnax	Ruff	BDir1, BDir22, WCA1.1, Bonn, LBAP (CON), WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)

Scientific Name	Common Name	Status
Cettia cetti	Cetti's Warbler	WCA1.1, LBAP (ANG, PEM, VOG)
Charadrius hiaticula	Ringed Plover	S42, Bonn, Bern, LBAP (BBNP, CON, CRM, GWY, VOG), WBAm(RSPB)
Chiroptera	Unspecified Bat	WCA5, S42, LBAP (ANG, DEN, FLI, RCT, SNP, TRA, TRF)
Chroicocephalus ridibundus	Black-headed Gull	BDir22, S42, Bonn, WBR(RSPB), LBAP (GWY, VOG), UKBAm(RSPB)
Circus aeruginosus	Eurasian Marsh Harrier	BDir1, WCA1.1, Bonn, CITES, LBAP (CON), WBAm(RSPB), UKBAm(RSPB)
Circus cyaneus	Hen Harrier	BDir1, S42, Bonn, CITES, WBR(RSPB), LBAP (BBNP, CON, DEN, FLI, GWY, POW, SNP, VOG), UKBR(RSPB)
Cupido minimus	Small Blue	WCA5, S42, UKBAP, RD1 (UK), LBAP (CON, PEM, VOG), LI(SEWBReC)
Dendrocopos minor	Lesser Spotted Woodpecker	s42, ukbap, Bern, WBR(RSPB), LBAP (BBNP, CON, DEN, FLI, GWY, POW, VOG), UKBR(RSPB)
Emberiza calandra	Corn Bunting	S42, UKBAP, WBR(RSPB), LBAP (CON, DEN, FLI), UKBR(RSPB)
Emberiza citrinella	Yellowhammer	S42, UKBAP, Bern, WBR(RSPB), LBAP (ANG, BBNP, CLY, CON, CRM, DEN, FLI, GWY, PEM, POW, SNP, VOG), UKBR(RSPB)
Emberiza schoeniclus	Reed Bunting	S42, UKBAP, Bern, LBAP (BBNP, CER, CLY, CON, DEN, FLI, GWY, PEM, POW, VOG), WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)
Erinaceus europaeus	West European Hedgehog	S42, UKBAP, Bern, LBAP (ANG, BGW, BRG, CON, FLI, GWY, NEW, POW, RCT, VOG)
Falco columbarius	Merlin	BDir1, WCA1.1, Bonn, Bern, CITES, LBAP (CON, DEN, FLI, GWY, POW), WBAm(RSPB), UKBAm(RSPB)

Scientific Name	Common Name	Status
Falco peregrinus	Peregrine Falcon	BDir1, WCA1.1, Bonn, Bern, CITES, LBAP (ANG, CLY, CON, GWY, PEM, POW, TRF, VOG), UKBAm(RSPB)
Falco subbuteo	Eurasian Hobby	WCA1.1, Bonn, Bern, CITES, LBAP (CON, GWY, POW, VOG), WBAm(RSPB)
Falco tinnunculus	Common Kestrel	S42, Bonn, Bern, CITES, WBR(RSPB), LBAP (ANG, CLY, CON, DEN, FLI, GWY, PEM, POW, VOG), UKBAm(RSPB)
Ficedula hypoleuca	Pied Flycatcher	S42, Bonn, WBR(RSPB), LBAP (CON, GWY, POW, SNP, VOG), UKBAm(RSPB)
Fringilla montifringilla	Brambling	WCA1.1, LBAP (CON)
Hipparchia semele	Grayling	S42, UKBAP, RD1 (UK), LBAP (BRG, CDF, GWY, RCT, VOG), LI(BIS), LI(SEWBReC)
Hyacinthoides non-scripta	Bluebell	WCA8, LBAP (ANG, CLY, CON, FLI, SNP, TRA, TRF)
Lepus europaeus	Brown Hare	S42, UKBAP, Bern, LBAP (ANG, BBNP, CER, CLY, CON, CRM, DEN, FLI, GWY, PEM, POW, SNP, TRF, VOG)
Limosa limosa	Black-tailed Godwit	BDir22, WCA1.1, UKBAP, Bonn, RD1 (UK), LBAP (CON, GWY), WBAm(RSPB), UKBR(RSPB)
Linaria cannabina	Linnet	S42, Bern, WBR(RSPB), LBAP (ANG, BBNP, CER, CLY, DEN, FLI, PEM, VOG), LBAP (CON, GWY), UKBR(RSPB)
Locustella naevia	Common Grasshopper Warbler	S42, UKBAP, WBR(RSPB), LBAP (BBNP, CON, DEN, FLI, GWY, POW, VOG), UKBR(RSPB)

Scientific Name	Common Name	Status
Loxia curvirostra	Common Crossbill	WCA1.1, Bern, LBAP (CON, POW)
Melanitta nigra	Common Scoter	BDir22, WCA1.1, S42, UKBAP, Bonn, LBAP (ANG, BBNP, CER, CON, CRM, DEN, FLI, GWY, PEM, VOG), WBAm(RSPB), UKBR(RSPB)
Meles meles	Eurasian Badger	BA, Bern, LBAP (CLY, CON, DEN, FLI, PEM, POW, TRF, WRE)
Micromys minutus	Harvest Mouse	S42, UKBAP, LBAP (BRG, CON, FLI, GWY, VOG), LI(BIS)
Milvus milvus	Red Kite	BDir1, WCA1.1, WCA9, Bonn, CITES, RD1 (UK), LBAP (CON, CRM, GWY, POW), WBAm(RSPB), UKBAm(RSPB)
Motacilla flava	Yellow Wagtail	S42, UKBAP, Bern, WBR(RSPB), LBAP (CON, DEN, FLI, POW, TRA, VOG), UKBR(RSPB), UKBAm(RSPB)
Muscicapa striata	Spotted Flycatcher	S42, UKBAP, Bonn, Bern, WBR(RSPB), LBAP (BBNP, CER, CLY, CON, DEN, FLI, GWY, PEM, POW, VOG), UKBR(RSPB)
Natrix natrix	Grass Snake	WCA5, S42, UKBAP, Bern, LBAP (ANG, CLY, CON, DEN, FLI, GWY, POW, SNP, TRA, VOG)
Numenius arquata	Eurasian Curlew	BDir22, S42, UKBAP, Bonn, RD1 (UK), WBR(RSPB), LBAP (ANG, BBNP, CLY, CON, CRM, DEN, FLI, GWY, PEM, POW, SNP, VOG), UKBAm(RSPB)
Numenius phaeopus	Whimbrel	BDir22, WCA1.1, Bonn, LBAP (CON, GWY), WBAm(RSPB), UKBR(RSPB)
Nyctalus noctula	Noctule Bat	EPS, HDir, WCA5, S42, UKBAP, Bonn, Bern, RD2 (UK), LBAP (ANG, CLY, CON, DEN, FLI, GWY, POW, SNP, TRA, TRF, VOG)

Scientific Name	Common Name	Status
Ostrea edulis	Native Oyster	S42, UKBAP, LBAP (GWY), LBAP (PEM, VOG)
Pandion haliaetus	Osprey	BDir1, WCA1.1, Bonn, CITES, LBAP (GWY), WBAm(RSPB), UKBAm(RSPB)
Passer domesticus	House Sparrow	S42, UKBAP, LBAP (CLY, CON, FLI, GWY, VOG), WBAm(RSPB), UKBR(RSPB)
Passer montanus	Eurasian Tree Sparrow	S42, UKBAP, WBR(RSPB), LBAP (ANG, BBNP, CER, CLY, CON, CRM, DEN, FLI, GWY, PEM, POW, VOG), UKBR(RSPB)
Perdix perdix	Grey Partridge	BDir21, S42, UKBAP, WBR(RSPB), LBAP (ANG, BBNP, CLY, CON, DEN, FLI, GWY, POW, TRF, VOG), UKBR(RSPB)
Phocoena phocoena	Common Porpoise	EPS, HDir, WCA5, S42, UKBAP, Bonn, Bern, CITES, RD1 (UK), RD2 (UK), LBAP (ANG, CER, CON, CRM, DEN, GWY, PEM, VOG)
Phoenicurus ochruros	Black Redstart	WCA1.1, Bern, LBAP (GWY, VOG), WBAm(RSPB), UKBAm(RSPB)
Pipistrellus	Pipistrelle	WCA5, LBAP (ANG, DEN, FLI, SNP, TRA, TRF)
Pipistrellus pygmaeus	Soprano Pipistrelle	EPS, HDir, S42, UKBAP, Bonn, Bern, RD2 (UK), LBAP (ANG, BBNP, CLY, DEN, FLI, GWY, PEM, POW, SNP, TRA, TRF, VOG)
Plecotus auritus	Brown Long-eared Bat	EPS, HDir, WCA5, S42, UKBAP, Bonn, Bern, RD2 (UK), LBAP (ANG, CLY, CON, DEN, FLI, GWY, POW, SNP, TRA, TRF, VOG)
Plectrophenax nivalis	Snow Bunting	WCA1.1, Bern, LBAP (CON), WBAm(RSPB), UKBAm(RSPB)

Scientific Name	Common Name	Status
Pluvialis apricaria	European Golden Plover	BDir1, BDir22, S42, Bonn, WBR(RSPB), LBAP (BBNP, CON, CRM, FLI, GWY, POW, SNP, VOG), UKBAm(RSPB)
Poecile palustris	Marsh Tit	S42, UKBAP, Bern, RD2 (UK), WBR(RSPB), LBAP (BBNP, CON, DEN, FLI, GWY, POW, VOG), UKBR(RSPB)
Prunella modularis	Hedge Accentor	S42, UKBAP, Bern, RD2 (UK), LBAP (CON, POW, VOG), UKBAm(RSPB)
Pyrrhula pyrrhula	Common Bullfinch	S42, UKBAP, WBR(RSPB), LBAP (BBNP, CER, CLY, CON, DEN, FLI, GWY, PEM, TRF, VOG), UKBR(RSPB), UKBAm(RSPB)
Rana temporaria	Common Frog	HDir, WCA5, Bern, LBAP (ANG, CLY, CON, FLI, POW, TRA)
Rhinolophus hipposideros	Lesser Horseshoe Bat	EPS, HDir, WCA5, S42, UKBAP, Bonn, Bern, RD2 (UK), LBAP (ANG, BBNP, CLY, CON, CRM, DEN, FLI, GWY, MON, PEM, POW, SNP, TRA, TRF, VOG, WRE)
Scandix pecten-veneris	Shepherd's-needle	S42, UKBAP, RD1 (UK), RD2 (UK), LBAP (CER, CON, POW, VOG), WVP
Stercorarius parasiticus	Arctic Skua	UKBAP, LBAP (CON), WBAm(RSPB), UKBR(RSPB)
Sturnus vulgaris	Common Starling	BDir22, S42, UKBAP, Bern, RD2 (UK), WBR(RSPB), LBAP (BBNP, CON, FLI, GWY, VOG), UKBR(RSPB)
Sylvia undata	Dartford Warbler	BDir1, WCA1.1, RD1 (UK), LBAP (VOG), WBAm(RSPB), UKBAm(RSPB)
Tringa nebularia	Common Greenshank	BDir22, WCA1.1, Bonn, LBAP (CON, POW)

Scientific Name	Common Name	Status
Triturus cristatus	Great Crested Newt	EPS, HDir, WCA5, S42, UKBAP, Bern, RD1 (UK), RD2 (UK), LBAP (ANG, BBNP, CLY, CON, DEN, FLI, MON, POW, SNP, TRA, TRF, VOG, WRE)
Turdus iliacus	Redwing	BDir22, WCA1.1, LBAP (CON, POW), WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)
Turdus philomelos	Song Thrush	BDir22, S42, UKBAP, Bern, RD2 (UK), LBAP (ANG, BBNP, CER, CLY, CON, DEN, FLI, GWY, PEM, POW, SNP, TRF, VOG, WRE), WBAm(RSPB), UKBR(RSPB)
Tyto alba	Barn Owl	WCA1.1, WCA9, Bern, CITES, RD2 (UK), LBAP (ANG, CLY, CON, CRM, DEN, FLI, GWY, PEM, POW, SNP, TRA, VOG, WRE), WBAm(RSPB), UKBAm(RSPB)
Vanellus vanellus	Northern Lapwing	BDir22, S42, UKBAP, Bonn, WBR(RSPB), LBAP (ANG, BBNP, CLY, CON, CRM, DEN, FLI, GWY, MON, PEM, POW, SNP, TRF, VOG), UKBR(RSPB), UKBAm(RSPB)

KEY TO SPECIES STATUS ABBREVIATIONS:

BA = Protection of Badgers Act

UKBAP = UK Biodiversity Action Plan Priority Species

UKBAP (R) = UK Biodiversity Action Plan Priority Species (Research only species)

BDir1 = EC Birds Directive Annex 1 Species

BDir21 = EC Birds Directive Annex 2.1 Species

BDir22 = EC Birds Directive Annex 2.2 Species

Bern = The Bern Convention on the Conservation of European Wildlife and Natural Habitats

Bonn = The Bonn Convention on the Conservation of Migratory Species of Wild Animals Species

CITES = Convention on International Trade in Endangered Species

EPS = European Protected Species

HDir = EU Habitats Directive Species

RD1 (Wales) = Welsh Red Data Book listing based on IUCN guidelines

RD1 (UK) = UK Red Data Book listing based on IUCN guidelines

RD2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce)

WBR (RSPB) = RSPB Welsh Red listed birds (not based on IUCN criteria)

WBAm (RSPB) = RSPB Welsh Amber listed birds (not based on IUCN criteria)

UKBR (RSPB) = RSPB UK Red listed birds (not based on IUCN criteria)

UKBAm (RSPB) = RSPB UK Amber listed birds (not based on IUCN criteria)

S42 = Natural Environment and Rural Communities Act 2006 (Section 42)

WCA1.1 = Wildlife and Countryside Act Schedule 1 Part 1 Species

WCA5 = Wildlife and Countryside Act Schedule 5 Species

WCA8 = Wildlife and Countryside Act Schedule 8 Species

WCA9 = Wildlife and Countryside Act Schedule 9 Species

INNS = Invasive Non-Native Species

WSG.P = Guidelines for the Selection of Wildlife Sites in South Wales - Primary species

WSG.C = Guidelines for the Selection of Wildlife Sites in South Wales - Contributory species

WVP = IUCN Threat Listing of Welsh Vascular Plants

LBAP (xxx) = Local Biodiversity Action Plan Species (see key below)

LI (SEWBReC) = Locally Important Species (as identified by local specialists) in SEWBReC area.

LI (BIS) = Locally Important Species (as identified by local specialists) in BIS* area.

LI (BRYO-MON) = Locally or nationally scarce or rare bryophyte in Monmouthshire.

LI (VC##) = Locally Important Species (as identified by local specialists) in Vice County ##

LI (VC##, LS) = Locally Scarce in Vice County ##

LI (VC##, LR) = Locally Rare in Vice County ##

LI (VC##, EX) = Extinct in Vice County ##

LI (VC##, UR) = Under Recorded in Vice County ##

14 APPENDIX 4 SITE PHOTOGRAPHS

Plate 1 – General view of grassland area where PV panels will be located.

Plate 2 – General view of grassland area where PV panels will be located.

Plate 3 – Example of hedge and associated bank.

Plate 4 – This Wych Elm hedge had once been managed by laying, but did not appear to have been managed for some time.

Plate 5 – Example of matures trees along, but outwith, site boundaries.

Plate 6 – Example of matures trees along, but outwith, site boundaries.

Plate 7 –Main site access point (TN 1), arrowed red.

Plate 8 – View of hedge H1 looking south from TN 1.

Plate 9 – View of H2, showing mature trees along northern site boundary.

Plate 10 – H3 and associated bank, looking north.

Plate 11 – View of H4 which appeared to have been recently flailed.

Plate 12 – View of H5 which appeared to have been recently flailed.

Plate 13 – View of widening in Hoddnant Brook which mapping suggested had potential to support Great Crested Newt but which was found to be unsuitable for that species.

Plate 14 – View of ornamental pond which was evaluated for potential to support Great Crested Newt but found to be generally unsuitable.

Plate 15 – The ornamental pond featured in Plate 14 contained a number of large Koi Carp, likely to consume any amphibians and their eggs/fry present in the pond.