



Craig Y Perthi Solar Farm

Environmental Statement

Chapter 06: Ecology

Prepared for

RWE

RWE Renewables UK

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6.0 ECOLOGY AND NATURE CONSERVATION

6.1 Introduction

6.1.1 This assessment was prepared by Colin Hicks BSc (Hons), a Member of the Chartered Institute of Ecology and Environmental Management with 25 years' experience as a professional ecologist.

6.1.2 This chapter of the Environmental Statement assesses the likely significant effects from the construction, operation and decommissioning of Craig y Perthi Solar Farm (as described in Chapter 4) on the following environmental receptors and/or resources:

- i) Nature conservation sites designated for ecological interest features.
- ii) Protected and notable habitats.
- iii) Protected and notable species.
- iv) Invasive non-native species.

6.2 Methodology and Scope of Assessment

Legislation and Guidance

6.2.1 The following legislation and guidance documents have been reviewed as part of the assessment process. Brief summaries of these documents are provided along with the implications for the assessment of ecology and nature conservation.

European Red Data lists (IUCN, 2000)

6.2.2 International Union for Conservation of Nature (IUCN) and the European Commission have been working together on an initiative to assess around 6,000 European species according to IUCN regional Red Listing Guidelines. Through this process they have produced a European Red List identifying those species which are threatened with extinction at the European level so that appropriate conservation action can be taken to improve their status.

The Wildlife and Countryside Act (WCA) 1981 (as amended)

6.2.3 This Act is the primary legislation that protects animals, plants, and certain habitats in the UK. This includes the designation and protection of some of the best areas of



natural environmental as Sites of Special Scientific Interest (SSSI). The following SSSI are within the zone of influence:

- i) Gwent Levels - Nash and Goldcliff SSSI.
- ii) Langstone-Llanmartin Meadows SSSI.
- iii) Penhow Woodlands SSSI.
- iv) Gwent Levels - Magor and Undy SSSI.
- v) Gwent Levels - Whitson SSSI.
- vi) Gwent Levels – Redwick Llandeenny SSSI.
- vii) Magor Marsh SSSI.
- viii) Severn Estuary SSSI.
- ix) River Usk (Lower Usk) SSSI.

6.2.4 The following animals are protected to different degrees under Schedules within this Act:

- i) All bats.
- ii) Otter.
- iii) Water Vole.
- iv) All native reptiles.
- v) All native amphibians.

The Conservation of Habitats and Species Regulations 2017

6.2.5 The Conservation of Habitats and Species Regulations 2017 consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994 in respect of England and Wales. The 1994 Regulations transposed Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law.

6.2.6 The Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species. These sites form a network termed Natura 2000 and include Special Areas of Conservation (SAC) and Special Protection Areas (SPA). The Severn Estuary SPA and Severn Estuary SAC are within 4.1km of the Site.

6.2.7 All bats, otter, common dormice, and great crested newt are listed as European Protected Species. It is an offence deliberately to kill, capture, or disturb a European



Protected Species, or to damage or destroy the breeding site or resting place of such an animal.

Protection of Badgers Act 1992

- 6.2.8 The Protection of Badgers Act 1992 consolidated and improved previous legislation. Under the Act it is an offence to kill, injure or take a Badger, or to damage or interfere with a sett used by a Badger unless a licence is obtained from a statutory authority.

The Eels (England and Wales) Regulations 2009

- 6.2.9 This regulation applies to fishing, restocking, export and the passage of Eel, including “the construction or maintenance of a structure in or near waters that amounts to, or is likely to amount to, an obstruction.”

The Hedgerow Regulations 1997

- 6.2.10 The Hedgerows Regulations 1997 protect certain hedgerows from being removed (uprooted or destroyed) if they meet certain criteria.

The Countryside and Rights of Way (CROW) Act 2000

- 6.2.11 This Act increases measures for the management and protection for Sites of Special Scientific Interest (SSSI) and strengthens wildlife enforcement legislation.

Circular 06/2005 Biodiversity and geological conservation – statutory obligations and their impact within the planning system

- 6.2.12 This circular provides administrative guidance on the application of the law relating to planning and nature conservation as it applies in England. It complements the national planning policy in the National Planning Policy Framework and the Planning Practice Guidance.

Natural Environment and Rural Communities Act 2006

- 6.2.13 The Act made amendments to both the Wildlife and Countryside Act 1981 and the Countryside and Rights of Way (CROW) Act 2000. For example, it extended the CROW biodiversity duty to public bodies and statutory undertakers.



UK Post-2010 Biodiversity Framework, 2012

- 6.2.14 The UK Post-2010 Biodiversity Framework, published in July 2012, succeeds the UK BAP and 'Conserving Biodiversity – the UK Approach', and is the result of a change in strategic thinking.

The natural choice: securing the value of nature (2011) (Natural Environment White Paper)

- 6.2.15 This White Paper outlines the Government's vision for the future of landscape and ecosystem services.

Environment (Wales) Act 2016

- 6.2.16 Part 1 of the Environment Act sets out Wales' approach to planning and managing natural resources at a national and local level with a general purpose linked to statutory 'principles of sustainable management of natural resources' defined within the Act.

Section 6- Biodiversity and resilience of ecosystems duty

- 6.2.17 Section 6 of the Act places a duty on public authorities to “*seek to maintain and enhance biodiversity*” so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to “*promote the resilience of ecosystems*”. The duty replaces the section 40 duty in the Natural Environment and Rural Communities Act 2006 (NERC Act 2006), in relation to Wales, and applies to those authorities that fell within the previous duty.

- 6.2.18 Public authorities will be required to report on the actions they are taking to improve biodiversity and promote ecosystem resilience.

Section 7- Biodiversity lists and duty to take steps to maintain and enhance biodiversity

- 6.2.19 Section 7 replaces the duty in section 42 of the NERC Act 2006. The Welsh Ministers will publish, review and revise lists of living organisms and types of habitats in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales.



- 6.2.20 The Welsh Ministers must also take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section, and encourage others to take such steps
- 6.2.21 Water vole, otter, common dormice, noctule, common Pipistrelle, (brown) long-eared bat, lesser horseshoe bat, grass snake, great crested newt, hedgerows and reen (coastal and floodplain grazing marsh) are all included on the biodiversity lists, and are present within the Site.

County Level

- 6.2.22 Newport City Council's Local Biodiversity Action Plan (LBAP) has a list of special habitats and species in the area and outlines how, in partnership, they plan to protect and enhance them.
- 6.2.23 Water Vole, Otter, Great Crested Newt, Noctule, Common Pipistrelle, (Brown) Long-eared bat, Lesser Horseshoe bat, hedgerows and reen (coastal and floodplain grazing marsh) are all included on the LBAP and are present at the Site boundaries.

Assessment Site and Zone of Influence

- 6.2.24 The Assessment Site includes all areas within the planning application boundary and any adjacent areas that may be affected by the Proposed Development.
- 6.2.25 The Zone of Influence is the area encompassing all predicted negative ecological effects from the Proposed Development, both those which would occur as a result of land-take and habitat loss, and those which would occur through disturbance, such as noise.
- 6.2.26 The study area for the biological records search provided by South East Wales Biodiversity Records Centre (SEWBReC) in Cardiff is 5 km radius, centred on Assessment Site for notable species and 1 km for non-statutory nature conservation sites. The data will identify and locate records of species of animals and plants recorded in the search area over the last 50 years and will identify sensitive ecological receptors.



6.2.27 Location of statutory nature conservation sites within 5km was determined from Natural Resources Wales datasets¹.

6.2.28 The Zone of Influence for ecological receptors during the construction, operation and decommissioning phases is detailed in Table 6.1

Table 6.1 Solar farm Zone of Influence on ecological receptors (construction, operation, and decommissioning)

Ecological feature	Zone of influence - Construction	Zone of influence – Operation	Zone of influence – Decommissioning
Hedgerows, reedbeds, ponds, eutrophic standing waters, coastal and floodplain grazing march, arable field margins	Site area	Site area	Site area
Shrill Carder Bee <i>Bombus sylvarum</i>	Site area	Site area	Site area
Badgers	Site area plus 30 m buffer	Site area	Site area plus 30 m buffer
Breeding birds	Site area plus 250 m buffer	Site area plus 250 m buffer	Site area plus 250 m buffer
Winter birds	Site area plus 250 m buffer	Site area plus 250 m buffer	Site area plus 250 m buffer
Passage birds	Site area plus 250 m buffer	Site area plus 250 m buffer	Site area plus 250 m buffer
Nocturnal birds	Site area	Site area	Site area
Water vole	Site area plus 30 m buffer	Site area	Site area plus 30 m buffer
Otter	Site area plus 50 m buffer (100 m where natal habitat present)	Site area	Site area plus 50 m buffer
Bats	Site area	Site area	Site area
Common Dormouse	Site area for ditch enhancement	Site area	Site area
Reptiles	Site area	Site area	Site area
Amphibians (common and widespread)	Site area plus 30 m buffer	Site area	Site area plus 30 m buffer
Great Crested Newts	Site area plus 100 m buffer where accessible	Site area	Site area plus 100 m buffer where accessible
Aquatic invertebrates associated with the reed network	Site area	Site Area	Site Area
Aquatic plants associated with the reed network	Site area	Site Area	Site Area
Terrestrial invertebrates along reed banks and associated with hedgerows	Site area	Site area	Site area
Internationally designated sites	5 km	5 km	5 km
Nationally designated sites	5 km	5 km	5 km

¹ <https://lle.gov.wales/catalogue/item/ProtectedSitesSitesOfSpecialScientificInterest/?lang=en>

Ecological feature	Zone of influence - Construction	Zone of influence – Operation	Zone of influence – Decommissioning
Local Sites of importance for nature conservation	1 km	1 km	1 km

Assessment Methodology

Preliminary Ecological Appraisal

- 6.2.29 A Preliminary Ecological Appraisal (Appendix 6.1) was completed by an experienced ecologist and managed by a Member of the Chartered Institute of Ecology and Environmental Management (CIEEM).
- 6.2.30 Habitats were classified using the Phase 1 Habitat Survey methodology developed by the Joint Nature Conservation Committee (JNCC, 2010²) and modified by the Institute of Environmental Assessment (IEA, 1995³). The main plant species were recorded, and broad habitat types mapped. Habitats encountered are described within the Results section, with a map included within the report. Plant species were identified according to Stace (1997⁴).
- 6.2.31 During this survey, any obvious evidence of protected species was noted, and site habitats were assessed for their potential to support notable or protected species.

Desktop survey

- 6.2.32 The desktop survey collated existing biological records for the Assessment Site and adjacent areas and identified any nature conservation sites that may be affected by the proposals. This comprises an important part of the assessment process, providing information on ecological issues that may not be apparent during the Site survey. Consultees for the data search included:
- i) South East Wales Biodiversity Records Centre - records of protected/notable species and non-statutory nature conservation sites within 2 km of the

² Joint Nature Conservation Committee (JNCC), 2010. *Handbook for Phase 1 Habitat Survey - a Technique for Environmental Audit*. Reprinted by JNCC, Peterborough

³ Institute of Environmental Assessment (IEA), 1995. *Guidelines for Baseline Ecological Assessment*, Institute of Environmental Assessment. E&FN Spon, aJn Imprint of Chapman and Hall. London.

⁴ Stace, C., 1997. *New Flora of the British Isles*. 2nd edition. Cambridge University Press, Cambridge.



Assessment Site and non-statutory nature conservation sites within 4 km of the centre of the Assessment Site.

- ii) Natural Resources Wales datasets – location of statutory nature conservation sites within 5 km.

6.2.33 Species data was examined for protected and notable species records. An assessment was then made, based on known habitat preferences, as to whether these species might be present within the Site and how they might be affected by the proposal.

6.2.34 The location of nature conservation sites was examined to determine their ecological and landscape relationships with the proposed site. An assessment was then made of how the sites may be affected by the proposal, considering these relationships, and the species and/or habitat types for which the nature conservation site was chosen.

6.2.35 In compliance with the terms and conditions relating to its commercial use, the full desk study data is not provided.

Aquatic invertebrates and Shrill Carder Bee

6.2.36 An aquatic invertebrate survey (Appendix 6.7) was completed using the standard methodology employed for aquatic invertebrate sampling across the Gwent Levels⁵.

6.2.37 A bumblebee survey (Appendix 6.8) was completed targeting Shrill Carder Bee *Bombus sylvarum* and the Brown-banded Carder Bee *Bombus humilis*, both of which are known to have nationally significant populations on the Gwent Levels. A transect which included areas with flowers such as thistles was walked in warm, sunny conditions and any bumblebees recorded.

Badgers

6.2.38 A walkover survey was completed as part of the preliminary ecological appraisal within the Proposed Development site and a 30 m buffer. This was completed during daylight hours. All features resulting from badger activity, including sett entrances,

⁵ A manual for the survey and evaluation of the aquatic plant and invertebrate assemblages of grazing marsh ditch systems Version 6. Downloaded 14/05/2020 from <https://cdn.buglife.org.uk/2019/07/2013Manual.pdf>



latrines, foraging scrapes and well-worn pathways, were accurately mapped using a handheld GPS receiver. Where necessary, digital images of features were collected, and all entrances were assessed as to their level of use and placed into the following categories:

- i) Active – well-worn entrances with evidence of recent badger activity including paw prints, fresh bedding or excavations.
- ii) Occasional use – entrances open but with small amounts of live vegetation or leaves along tunnel base. Evidence of excavations in last few months with old bedding seeding in spoil heap.
- iii) Abandoned - partially collapsed entrance or completely filled with leaf litter. Spoil heap reduced by erosion with no pathway leading to the entrance. Includes badger sett entrances that have been adopted by rabbit or fox.
- iv) Status unknown – tunnels which have firm evidence of badger habitation at some time in the past (either tunnel shape or evidence of seeded bedding/badger hair in spoil) but now appear to be inhabited by rabbits or foxes.

6.2.39 Dependent on how entrances were clustered and their importance to the local Badger populations they were also classified as part of a:

- i) Main sett – a large cluster of entrances, continually occupied and used for breeding.
- ii) Annex sett – a smaller cluster, usually occupied and close to the main sett and connected to it by well-worn pathways.
- iii) Subsidiary sett - seasonally occupied and some distance from the main sett.
- iv) Outlier – small number of entrances, sometimes only one. Used sporadically and no obvious connection to main sett.

Amphibians, including Great Crested Newt

6.2.40 An assessment for the potential for the Assessment Site to support common and widespread amphibians (common toad, common frog, palmate newt, and smooth newt) was made during the preliminary ecological appraisal.

6.2.41 All accessible waterbodies within 100 m of the Assessment Site were evaluated for their potential to support great crested newt by calculating a habitat suitability index



(HSI) as per ARG UK Advice Note 5.⁶ This allowed eDNA sampling to be targeted to 7 water bodies with an HSI of average or above.

6.2.42 Water samples for eDNA analysis to determine presence of great crested newt were collected from seven waterbodies within the survey area. The survey visits were carried out within the optimum period of mid-April to late June.

6.2.43 The eDNA sampling kits were supplied by SureScreen Scientifics and the survey methodology followed the Natural England protocol (Biggs *et al*, 2014⁷).

6.2.44 Further details of the great crested newt survey are reported in Appendix 6.2.

Otter

6.2.45 Field signs of Otter were searched for by an ecologist who meets the required competency level for Otter surveys (CIEEM, 2020⁸) during the preliminary ecological appraisal. This required an inspection of all reed banks and channel features within 30 m of the Proposed Development. Spraint, footprints, slides, and possible holts and couches were looked for. Further details of the otter survey are reported in Appendix 6.4

Water Vole

6.2.46 All areas within 10 m of watercourses and 30 m of the development footprint were carefully searched for field signs of Water Vole during the preliminary ecological appraisal. This was completed by an ecologist who meets the required competency level for Water Vole surveys (CIEEM, 2020⁹). Field signs include:

⁶ Downloaded 06/02/2020 from <https://www.arguk.org/downloads-in-pages/resources/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5>

⁷ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

⁸ CIEEM, 2020. Technical Guidance Series. Competency for species survey: Otter. Downloaded on 08/02/2020 from <https://cieem.net/wp-content/uploads/2019/02/CSS-EURASIAN-OTTER-April-2013.pdf>

⁹ CIEEM, 2020. Technical Guidance Series. Competency for species survey: Water Vole. Downloaded on 06/02/2020 from <https://cieem.net/wp-content/uploads/2019/02/CSS-WATER-VOLE-April-2013.pdf>



- i) Burrows - holes along the water's edge, and in the bank above, that are wider than high with a diameter of 4-8 cm.
- ii) Latrines - collections of droppings that are 8-12 mm long, 4-5 mm wide, cylindrical with blunt ends, green/brown/black and have no odour.
- iii) Grazed lawns - nursing females on the nest graze vegetation around the burrow entrance short to form a 'lawn'.
- iv) Feeding remains - neat piles of chewed lengths of vegetation up to 10 cm long and with 45 degree cuts to their ends.
- v) Runways in vegetation - low runs or tunnels 5-10cm wide pushed through the vegetation leading to the water's edge, burrow entrances or favoured feeding areas.
- vi) Water Voles sightings.

6.2.47 Further information regarding water vole is provided in Appendix 6.5.

Flora (reens)

6.2.48 Habitats were classified using a variation on the National Vegetation Classification (NVC) Survey methodology (Rodwell, J.S., 2006¹⁰), with identification of stands of vegetation at particular sample points chosen along the reens. All vascular plants found within the aquatic, margin and bank environments at areas identified as having uniform stand of vegetation within a 10 m length for each sample point, using 1 m² quadrats (size of quadrat chosen to take into account size and difficulty of sampling aquatic habitat in reens), were recorded. As per NVC methodology, plant species found in each quadrat were then accorded a Domin value of cover/abundance, with each species then being assigned a constancy/frequency value. For plant communities occupying areas without obvious stands of vegetation, quadrats were not used, but species lists compiled and Domin values estimated.

6.2.49 Further details of the NVC survey are reported in Appendix 6.6.

¹⁰ Rodwell, J.S. (2006) *National Vegetation Classification: Users' Handbook*. Peterborough: Joint Nature Conservation Committee.



Ditches

- 6.2.50 There are no ditches associated with the Gwent Levels – Redwick Llandevenny SSSI following amendments made to the Scheme. Ditches within the site have been categorised in the same way as ditches within the Gwent Levels SSSI based on NRW categories.
- 6.2.51 Ditches in favourable condition are categorised as:
- i) 1 - Ditch open on one side and hedged on other side (single hedged).
 - ii) 4a - Intermittent hedge (gappy hedge) on one or both sides of ditch.
 - iii) 4b - Ditch has water in it (at least 5cm deep) and no hedge on either side (ditch is open).
- 6.2.52 Ditches in unfavourable condition are categorised as:
- i) 2 - ditch hedged on both sides (double hedged).
 - ii) 2d - ditch hedged on both sides (double hedged) and dry.
 - iii) 3 - Ditch is dry and has no hedge on either side (is open).
 - iv) 4c - hedge on one side of ditch and intermittent hedge (gappy hedge) on other side.

Limitations

- 6.2.53 All areas of the Assessment Site were readily accessible during surveys. However, it must be realized that surveys only provide a snapshot of a site at a given time.
- 6.2.54 Although some plant species would have not been visible during the preliminary ecological appraisal, this is not considered a significant constraint as further botanical surveys were completed along reens during the optimal survey period.



Impact assessment method

- 6.2.55 The assessment of impacts has been carried out in accordance with the principles described by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).¹¹
- 6.2.56 The ecological feature or resource that is affected by an impact is referred to as the receptor. Impacts are considered in terms of the value of the receptor in the context of nature conservation, and the character of the impact. From these the significance of the impact is determined.
- 6.2.57 As part of the impact assessment, the available means to avoid, minimise, or mitigate for adverse impacts are incorporated into the design, so that the final impact assessment identifies the residual (net) impacts that are predicted. The consequences for development control, policy guidance and legislative compliance can then be identified.

Method for valuation of receptors

- 6.2.58 The nature conservation value, or potential value, of an ecological receptor is determined within the following geographic context:
- i) International importance (e.g., internationally designated sites such as Special Areas of Conservation, Special Protection Areas, Ramsar sites).
 - ii) National importance (e.g., nationally designated sites such as Sites of Special
 - iii) Scientific Interest or species populations of importance in the UK context).
 - iv) County importance (e.g., SNCI, habitats and species populations of importance in the context of Newport).
 - v) Local importance (e.g., important ecological features such as old hedges, woodlands, ponds).
 - vi) Site importance (e.g., habitat mosaic of grassland and scrub which may support a diversity of common wildlife species).
 - vii) Negligible importance. Usually applied to areas such as built development or areas of intensive agricultural land.

¹¹ CIEEM, 2018. GUIDELINES FOR ECOLOGICAL IMPACT ASSESSMENT IN THE UK AND IRELAND Terrestrial, Freshwater, Coastal and Marine. Ver 1.1 Downloaded 06/02/2020 from <https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/>



- 6.2.59 The examples are not exclusive and are subject to further professional ecological judgment.

Impact Assessment Criteria

- 6.2.60 The assessment of potential impacts arising due to the development considers on-site impacts (i.e., within the footprint of the works) and those that may occur to adjacent and more distant ecological features.

- 6.2.61 Potential effects on valued receptors, adverse or positive, are identified for both the construction and operational phases. The effects are then assessed and characterised according to the following criteria:

- i) Direction (positive, adverse, or neutral).
- ii) Magnitude of impact.
- iii) Spatial extent over which the impact would occur.
- iv) The temporal duration of the impact.
- v) Permanence.
- vi) Frequency and timing.
- vii) Potential for cumulative effects.

- 6.2.62 The assessment identifies any information gaps and any uncertainties that may be material in the confidence of predicting effects. Confidence levels are assigned following the CIEEM (2016) scale. Confidence in predictions is given as:

- i) Certain/near-Certain: probability estimated at 95% chance or higher.
- ii) Probable: probability estimated above 50% but below 95%.
- iii) Unlikely: probability estimated above 5% but less than 50%.
- iv) Extremely Unlikely: probability estimated at less than 5%.

- 6.2.63 The precautionary principle is applied whenever there is substantial doubt. The impact timescale is given as:

- i) Acute, immediate, and discrete.
- ii) Short-term: 0-3 years.
- iii) Medium term 3-10 years.
- iv) Long term: >10 years.



6.2.64 Effects include, but are not restricted to:

- i) Loss or change of habitat.
- ii) Disturbance during construction, operation, and decommissioning.
- iii) Chemical effects from airborne pollutants.
- iv) Contravention of legal status or protection (including where the receptor would not meet or exceed the value threshold).

6.2.65 The assessment identifies those positive and negative impacts that would be significant, based on the integrity and the conservation status of the ecological feature. Impacts are unlikely to be significant where features of local value or sensitivity are subject to small scale or short-term impacts. However, where there are several small-scale impacts that are not significant alone, it may be that, cumulatively, these may result in an overall significant impact.

6.2.66 For the purposes of this assessment, the significance of the effect is determined using the matrix in Table 6.2 where the scale of the effect is measured against the value of the receptor.

6.2.67 Ecologically significant impact is defined as an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area. For the purposes of this assessment, the effects that are identified in shaded cells in Table 6.2, are significant.

Table 6.2 Table of significant effects based on scale of effect and geographical importance:

		Evaluation of nature conservation receptor				
		Very high / International	High / national	Medium / regional	Low / local	Negligible / site only
Scale of Effect	Major positive effect	Large positive	Large positive	Large positive	Large positive	Large positive
	Intermediate positive effect	Moderate positive	Moderate positive	Moderate positive	Moderate positive	Moderate positive
	Minor positive effect	Slight positive	Slight positive	Slight positive	Slight positive	Slight positive
	Neutral	None	None	None	None	None
	Minor negative effect	Slight adverse	Slight adverse	Slight adverse	Slight adverse	None
	Intermediate negative effect	Large adverse	Large adverse	Moderate adverse	Slight adverse	None
	Major negative effect	Very large adverse	Very large adverse	Large or moderate adverse	Slight adverse	None

European Protected Sites - Definition of significant effects

6.2.68 For a European Protected Site, such as SPA, the integrity of a site is:

'The coherence of the ecological structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.'

6.2.69 Disturbance should not have a significant effect on the integrity of a European Protected Site.

European Protected Species - Definition of significant effects

6.2.70 The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) require that disturbance should not:

'significantly affect the ability of any significant group of animals of that species to survive, breed, or rear or nurture their young; or the local distribution or abundance of that species'.

6.2.71 Any effect above this threshold would be defined as significant for a European Protected Species.

Mitigation

6.2.72 Where there is potential that the Proposed Development would have a significant effect on a valued ecological feature of nature conservation interest, recommendations for mitigation are made based on the following mitigation hierarchy detailed in Paragraph: 018 Reference ID: 8-018-20140306 of National Planning Practice Guidance;

- i) Avoidance – significant harm to wildlife species and habitats should be avoided through design.
- ii) Mitigation – where significant harm cannot be wholly or partially avoided, it should be minimised by design, or by the use of effective mitigation measures that can be secured by, for example, conditions or planning obligations.
- iii) Compensation – where, despite whatever mitigation would be effective, there would still be significant residual harm, as a last resort, this should be properly compensated for by measures to provide for an equivalent value of biodiversity.



Enhancement

- 6.2.73 Enhancements are additional to any mitigation measures that are necessary to deal with potential impacts on site. They are an opportunity to provide new benefits for biodiversity as a consequence of the development being implemented.

6.3 Baseline

Statutory nature conservation sites

Gwent Levels – Redwick Llandevenny SSSI

- 6.3.1 **Following amendments made since the Previous Application, the Proposed Development has no land located within the Gwent Levels – Redwick Llandevenny SSSI.** As such the Gwent Levels – Redwick and Llandevenny SSSI now sits outside/adjacent to the Site. The Gwent Levels constitute the lowlands between Cardiff and Chepstow, and are drained by an ordered network of drainage ditches. They are an example of one of the most extensive areas of reclaimed wet pasture in Great Britain, which includes the Somerset Levels, Romney Marsh and the Pevensey Levels, and is the largest area of its kind in Wales. Together these Levels systems constitute a national series of sites each with its own special features.
- 6.3.2 The Gwent Levels reens are rich in plant species and communities, many of which are rare or absent in other Levels systems. This is due to the variety of reen types and their management regimes, and the timing of the management which results in a staggered programme across the Levels. The regular maintenance of some reens provides conditions for submerged species such as hairlike pondweed *Potamogeton trichoides* and open water emergents such as arrowhead *Sagittaria sagittifolia* an opportunity to flourish.
- 6.3.3 Others are less intensively managed, and some have become completely overgrown by weeds and hedges. The aquatic invertebrate fauna is very diverse, and the Gwent Levels compares well with similar areas in Britain. Many nationally rare or notable species are present such as *Haliplus mucronatus* and *Hydrophilus piceus*. The area is important in the Welsh context for its snails and dragonflies and includes the species *Physa heterostropha* and *Brachytron pratense* respectively. The large number of hedgerows add to the diversity of the area, and together with the main



reen banks provide a habitat for nationally important assemblages of terrestrial invertebrates such as *Pipunculus fonsceai* and *Tomosvaryella minima*.

- 6.3.4 The Redwick and Llandeenny area supports rich assemblages of invertebrate species including *Chalcis sispes*, a parasite of the Stratiomys fly larvae, the beetle *Scirtes orbicularis* and the drone fly *Pharhelophilus consimilis*.
- 6.3.5 The area also contains a number of nationally rare plant species including the rare *Myriophyllum verticillatum* located in peaty ditches in the northern part of the Site and the brackish water crowfoot associated with the ditches bordering the sea wall.

Gwent Levels- Nash and Goldcliff SSSI

- 6.3.6 Approximately 1.9km of the cable route will pass along a tow lane highway within this SSSI. **The Proposed Development would be buried within the existing public highway.**
- 6.3.7 The Gwent Levels constitute the lowlands between Cardiff and Chepstow and are drained by an ordered network of drainage ditches. They are an example of one of the most extensive areas of reclaimed wet pasture in Great Britain which includes the Somerset Levels, Romney Marsh and the Pevensey Levels, and is the largest area of its kind in Wales. Together these Levels systems constitute a national series of sites each with its own special features.
- 6.3.8 The Gwent Levels reens are rich in plant species and communities, many of which are rare or absent in other Levels systems. This is due to the variety of reen types and their management regimes and the timing of the management which results in a staggered programme across the Levels. The regular maintenance of some reens provides conditions for submerged species such as hairlike pondweed *Potamogeton trichoides* and openwater emergents such as arrowhead *Sagittaria sagittifolia* an opportunity to flourish. Others are less intensively managed and some have become completely overgrown by weeds and hedges.
- 6.3.9 The aquatic invertebrate fauna is very diverse and the Gwent Levels compares well with similar areas in Britain. Many nationally rare or notable species are present such as *Haliphus mucronatus* and *Hydrophilus piceus*. The area is important in the Welsh context for its snails and dragonflies and includes the species *Physa heterostropha* and *Brachytron pratense* respectively. The large number of hedgerows add to the diversity of the area and together with the main reen banks provide a habitat for

nationally important assemblages of terrestrial invertebrates such as *Pipunculus fonscai* and *Tomosvaryella minima*.

- 6.3.10 The Nash and Goldcliff area forms an important part of the Gwent Levels system and is of particular botanical interest as it is the only area in Wales for the Least Duckweed *Wolffia arrhiza*. There is also an interesting community where two species of hornwort *Ceratophyllum submersum* and *C. demersum* grow together.
- 6.3.11 The invertebrate interest is also high, as rare and notable species such as *Odontomyia ornata*, *Oplodontha viridula* and *Hydaticus transversalis* are present.

Magor Marsh SSSI

- 6.3.12 Magor Marsh SSSI is located 2.2 km to the south-east of the Proposed Development. This SSSI is the largest remnant of the formerly extensive fenlands near the Gwent coast. It lies on estuarine alluvium but receives run-off from an area of Carboniferous Limestone. The site supports a variety of reed *Phragmites australis*, sedge *Carex* spp. and submerged and emergent aquatic plants. There are areas of wet meadow and both Willow *Salix* spp. and Alder *Alnus glutinosa* carr with an intersecting system of drainage ditches known as reens, and ponds. It is an important breeding ground for water and marsh birds including Cetti's Warbler, Reed Warbler, Coot, Moorhen, Water Rail and Little Egret.
- 6.3.13 Due to separation distance, adverse effect on this SSSI can be discounted at this stage.

Severn Estuary SSSI

- 6.3.14 The Seven Estuary 4.1 km to the south lies on the south-west coast of Britain at the mouth of four major rivers (the Severn, Wye, Usk and Avon) and many lesser rivers. The immense tidal range (the second highest in the world) and classic funnel shape make the Severn Estuary unique in Britain and very rare worldwide. The intertidal zone of mudflats, sand banks, rocky platforms and saltmarsh is one of the largest and most important in Britain. The estuarine fauna includes: internationally important populations of waterfowl; invertebrate populations of considerable interest; and large populations of migratory fish, including the nationally rare and endangered Allis Shad *Alosa alosa*. The SSSI forms the major part of a larger area of estuarine habitat, which includes the Upper Severn Estuary, the Taf/Ely Estuary and Bridgwater Bay.

- 6.3.15 The estuary has a diverse geological setting and a wide range of geomorphological features, especially sediment deposits. It is important for the interpretation of coastline dynamics and land-forms, and also past changes, in sea level, sediment supply, climate and river flow. The estuary's overall interest depends on its large size, and on the processes and interrelationships between the intertidal and marine habitats and its fauna.
- 6.3.16 Beds of eel-grass *Zostera spp.* occur on the more sheltered mud and sand banks. The estuary fringes have large areas of saltmarsh. These are generally grazed by sheep and/or cattle, a significant factor determining the plant communities. A range of saltmarsh types is present, with both gradual and stepped transitions between bare mudflat and upper marsh. Glassworts *Salicornia spp.* and Annual Sea-blite *Suaeda maritima* colonise bare mud on the lower saltmarshes, and disturbed areas at higher levels. Common Cord-grass *Spartina anglica* is abundant on the seaward fringes of marshes, where it occurs as dense monocultures, or with other species, such as Sea Aster *Aster tripolium*, Greater Seaspurrey *Spergularia media* and Common Saltmarsh-grass *Puccinellia maritima*.
- 6.3.17 The middle marsh is mainly dominated by Common Saltmarsh-grass, and frequent associates include Sea-milkwort *Glaux maritima*, English Scurvygrass *Cochlearia anglica* and Sea Arrowgrass *Triglochin maritima*, together with two nationally scarce plants Bulbous Foxtail *Alopecurus bulbosus* and Slender Hare's-ear *Bupleurum tenuissimum*. There are a few localities for an uncommon middle marsh community, which is characterised by Sealavender *Limonium vulgare* and Thrift *Armeria maritima*.
- 6.3.18 Prominent species on the upper marsh are Red Fescue *Festuca rubra* and Saltmarsh Rush *Juncus gerardi*. Nationally scarce species occurring on the upper marshes include Sea Clover *Trifolium squamosum* and Sea Barley *Hordeum marinum*. Highly saline drying pans on the upper marsh support a community with abundant Reflexed Saltmarsh-grass *Puccinellia distans* and Lesser Seaspurrey *Spergularia marina*.
- 6.3.19 The highest saltmarsh around the driftline is usually dominated by Sea Couch *Elymus pycnanthus*, with Spear-leaved Orache *Atriplex prostrata*. Some brackish pools and depressions on the upper marshes have small stands of Common Reed *Phragmites australis* or Sea Club-rush *Scirpus maritimus*. Corn Parsley *Petroselinum segetum*, a European rarity, occurs within the Site.

- 6.3.20 The fluctuating salinity and highly mobile sediments with consequent high turbidity limits the benthic invertebrates to relatively few species. Those which are tolerant of such conditions occur in very high densities on the more stable mudflats. The most prominent species are ragworm *Nereis spp.*, Lugworm *Arenicola marina*, Baltic Tellin *Macoma balthica* and the spire shell *Hydrobia ulvae*. A greater variety of invertebrates tend to occur on the intertidal rock platforms, a more stable habitat with rock pools and a relatively high cover of seaweeds.
- 6.3.21 Seven species of migratory fish move through the Estuary between the sea and rivers. There are particularly large numbers of Atlantic Salmon *Salmo salar* and Common Eel *Anguilla anguilla*. The other species are Allis Shad, the nationally rare Twaite Shad *Alosa fallax*, the Sea Trout *Salmo trutta*, Sea Lamprey *Petromyzon marinus* and the Lampern or River Lamprey *Lampetra fluviatilis*.
- 6.3.22 The SSSI is of international importance for wintering and passage wading birds, with total winter populations averaging about 44,000 birds. Numbers can be considerably higher during severe winters when, owing to its mild climate, the Severn supports wader populations that move in from the colder coasts of Britain. The SSSI holds most of the estuary's internationally important Curlew *Numenius arquata* and Redshank *Tringa totanus* populations, and most of its nationally important Ringed Plover *Charadrius hiaticula* and Grey Plover *Pluvialis squatarola* populations. Other waders that occur in significant numbers within the SSSI are Common Snipe *Gallinago gallinago*, Knot *Calidris canutus*, Whimbrel *Numenius phaeopus* and Turnstone *Arenaria interpres*.
- 6.3.23 The SSSI is internationally important for Dunlin *Calidris alpina* and supports about 7.5% of the British wintering population of this species. The estuary as a whole supports about 10.5% of the British wintering population and is the single most important wintering ground of Dunlin in Britain.
- 6.3.24 In late winter and early spring, the SSSI supports nationally important numbers of Shelduck *Tadorna tadorna*, following the partial dispersal from their moulting grounds in Bridgwater Bay. There are also significant numbers of Wigeon *Anas penelope*.

River Usk (Lower Usk) SSSI

- 6.3.25 The River Usk (Lower Usk) is a rare example of a large mesotrophic lowland river which has not been subject to significant modification by man. Of particular

significance to the river's morphology and biology are the extensive deposits of fluvio-glacial and alluvial material in the Usk valley between Abergavenny and Newport. The Lower Usk has developed a wide floodplain with a complex and active system of meanders, cut-off and back channels which contribute to the biological interest and diversity of the Site.

- 6.3.26 The main plant communities present are those that are characteristic of rivers running over hard and soft sandstones with changing base status merging into brackish waters in its lowest reaches.
- 6.3.27 The river shows a clear downstream succession in plant communities due in part to the rapid transition from mesotrophic to nutrient rich in its lower reaches and increasing salinity as it nears its confluence with the Severn Estuary.
- 6.3.28 The invertebrate fauna is characteristic of a large lowland river. Of special interest are the craneflies associated with silty river margins in the vicinity of Newbridge on Usk. The fish fauna is of international significance including several rare and scarce species and there is an expanding population of otters *Lutra lutra*. Several scarce higher plant species occurring along the river's tidal reaches are also of special interest.
- 6.3.29 Whilst not a special feature of the Site, there is a good range of breeding birds associated with riverine habitats.
- 6.3.30 The SSSI incorporates adjacent areas of riparian habitat which directly support the special interest of the river. These include woodlands dominated by alder *Alnus glutinosa* and willows *Salix spp.*, marshy grassland, stands of tall herb, swamp and fen vegetation, salt-marsh and coastal grassland.
- 6.3.31 Due to separation distance, adverse effect on this SSSI can be discounted at this stage.
- 6.3.32 The Severn estuary 4.1 km to the south has been given a number of International designations.

Severn Estuary RAMSAR

- 6.3.33 The Severn Estuary is one of the largest estuaries in Britain and it has the second largest tidal range in the world. Its classic funnel shape and southwest orientation makes it susceptible to extreme weather conditions in the east Atlantic. There are



large urban developments on the estuary. The high tidal range leads to strong tidal stream and high turbidity, producing communities characteristic of the extreme physical conditions of liquid mud and tide-swept sand and rock. The site is particularly important for the run of migratory fish between the sea and rivers via the estuary. Species using the estuary include *Salmo salar*, *S. trutta*, *Petromyzon marinus*, *Lampræta fluviatilis*, *Alosa alosa*, *A. fallax* and *Anguilla anguilla*.

- 6.3.34 The estuary is also important for migratory birds during spring and autumn migrations. During the five year period 1987/88 to 1991/92 the estuary supported nationally important numbers of Common Ringed Plover *Charadrius hiaticula*, Dunlin *Calidris alpina*, Whimbrel *Numenius phaeopus*, and Common Redshank *Tringa totanus*. The site also regularly supports more than 20,000 waterfowl. In the five year period 1988/89 to 1992/93 the average peak count was 68,026 waterfowl, comprising 17,502 wildfowl and 50,524 waders. These included internationally important numbers of Greater White-fronted Goose *Anser albifrons albifrons* (3,002), Shelduck *Tadorna tadorna* (2,892), Gadwall *Anas strepera* (330), Dunlin *Calidris alpina* (41,683) and Common Redshank *Tringa totanus* (2,013). Several other species occur in nationally important numbers.

Severn Estuary SPA

- 6.3.35 This area has been designated an SPA due to its importance during the spring and autumn migration periods for waders moving up the west coast of Britain, as well as in winter for large numbers of waterbirds, especially swans, ducks and waders.
- 6.3.36 This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:
- i) Over winter:
 - a) Bewick's Swan *Cygnus Columbianus bewickii*, 280 individuals representing at least 4.0% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)
 - b) This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:
 - ii) On passage:

- a) Ringed Plover *Charadrius hiaticula*, 655 individuals representing at least 1.3% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)
 - iii) Over winter:
 - a) Curlew *Numenius arquata*, 3,903 individuals representing at least 1.1% of the wintering Europe - breeding population (5 year peak mean 1991/2 - 1995/6)
 - b) Dunlin *Calidris alpina alpina*, 44,624 individuals representing at least 3.2% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6)
 - c) Pintail *Anas acuta*, 599 individuals representing at least 1.0% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)
 - d) Redshank *Tringa totanus*, 2,330 individuals representing at least 1.6% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
 - e) Shelduck *Tadorna tadorna*, 3,330 individuals representing at least 1.1% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)
 - iv) Assemblage qualification: A wetland of international importance:
 - a) The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl.
 - b) Over winter, the area regularly supports 93,986 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Gadwall *Anas strepera*, Shelduck *Tadorna tadorna*, Pintail *Anas acuta*, Dunlin *Calidris alpina alpina*, Curlew *Numenius arquata*, Redshank *Tringa totanus*, Bewick's Swan *Cygnus columbianus bewickii*, Wigeon *Anas penelope*, Lapwing *Vanellus vanellus*, Teal *Anas crecca*, Mallard *Anas platyrhynchos*, Shoveler *Anas clypeata*, Pochard *Aythya ferina*, Tufted Duck *Aythya fuligula*, Grey Plover *Pluvialis squatarola*, White-fronted Goose *Anser albifrons albifrons*, Whimbrel *Numenius phaeopus*.
- 6.3.37 There is unknown potential for passage and wintering birds, that are an interest feature of the Severn Estuary SPA and Severn Estuary Ramsar, to be occasionally present within this Site.

- 6.3.38 It is very likely that eel associated with the Ramsar are present within reens and may occasionally traverse the Site when moving between watercourses. The Proposed Development would not create barriers to these movements and no mitigation for eel is recommended.

Severn Estuary SAC

- 6.3.39 The Severn Estuary SAC has been designated for:
- i) Annex I habitats that are a primary reason for selection of this site:
 - a) Estuaries - Habitat occurrence description not yet available.
 - b) Mudflats and sandflats not covered by seawater at low tide - Habitat occurrence description not yet available.
 - c) Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) - Habitat occurrence description not yet available.
 - ii) Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:
 - a) Sandbanks which are slightly covered by sea water all the time
 - iii) Reefs.
 - iv) Annex II species that are a primary reason for selection of this site:
 - a) Sea lamprey *Petromyzon marinus* – Species occurrence description not yet available.
 - b) River lamprey *Lampetra fluviatilis* – Species occurrence description not yet available.
 - c) Twait shad *Alosa fallax* – Species occurrence description not yet available.

- 6.3.40 Due to separation distances, it is extremely unlikely that the Proposed Development would have a significant adverse effect on the habitat and fish species for which this SAC has been selected.

River Usk SAC

- 6.3.41 The River Usk SAC has been designated for:
- i) Annex I habitats that are a primary reason for selection of this site:
 - a) Not Applicable.
 - ii) Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- a) Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation.
- iii) Annex II species that are a primary reason for selection of this site:
 - a) Sea lamprey *Petromyzon marinus*.
 - b) Brook lamprey *Lampetra planeri*.
 - c) River lamprey *Lampetra fluviatilis*.
 - d) Twaite shad *Alosa fallax*.
 - e) Atlantic salmon *Salmo salar*.
 - f) Bullhead *Cottus gobio*.
 - g) Otter *Lutra lutra*.
- iv) Annex II species present as a qualifying feature, but not a primary reason for site selection:
 - a) Allis shad *Alosa alosa*.

6.3.42 Due to separation distances, it is extremely unlikely that the Proposed Development would have a significant adverse effect on the habitat and fish species for which this SAC has been selected.

Non-statutory nature conservation sites

6.3.43 There are 15 non-statutory sites within the potential zone of influence. Which are presented below in Table 6.3.

Table 6.3 Table of significant effects based on scale of effect and geographical importance

Non-statutory site name	Distance from proposed solar PV farm	Comments
Cae Wall Wood Site of Importance for Nature Conservation (SINC)	400 m to the north	Adverse effects can be discounted due to separation distance
Craig-Y-Perthi Field North SINC	260 m to north-west	Adverse effects can be discounted due to separation distance
Craig-Y-Perthi Field South SINC	Adjacent to the Site	
Craig-Y-Perthi Wood SINC	Adjacent to the Site	
Dockwell Wood SINC	500 m to the east	Adverse effects can be discounted due to separation distance
Greenmoor Pool SINC	180 m to the south	Adverse effects can be discounted due to separation distance
Hartridge Fields SINC	730 m to east	Adverse effects can be discounted due to separation distance
Hartridge Wood SINC	950 m to the east	Adverse effects can be discounted due to separation distance
Monk's Ditch SINC	390 m to the east	Adverse effects can be discounted due to separation distance
Pamt Yr Eos Wood SINC	100 m to the north-west	Adverse effects can be discounted due to separation distance
Ridings Wood SINC	Adjacent to the Site	

Non-statutory site name	Distance from proposed solar PV farm	Comments
The Routes Wood SINC	380 m to the north-east	Adverse effects can be discounted due to separation distance
Underwood Field SINC	900 m to north-east	Adverse effects can be discounted due to separation distance
Upper Cottage Pond SINC	150 m to the east	Adverse effects can be discounted due to separation distance
Wilcrick Fort West SINC	440 m to the east	Adverse effects can be discounted due to separation distance

6.3.44 In addition, there are a number of areas of Ancient and Semi-natural woodland, an NRW priority woodland area and restored woodland within 1km.

Valued Habitats

6.3.45 A phase 1 habitat survey was completed in 2021. Recorded habitats are reported in Table 6.4.

Table 6.4 Habitats within the Assessment Site

Phase 1 habitat	Description	Ecological value
Cultivated/disturbed land - arable	The majority of the eastern extent of the Site comprises arable with narrow field margins bounded by hedgerows. These fields had low species diversity but aside from the crops (wheat mostly) include common and widespread species such as shepherds' purse <i>Capsella bursa-pastoris</i>, field pansy <i>Viola arvensis</i> and black grass <i>Alopecurus myosuroides</i>. Field margins were dominated by coarser grasses such as Yorkshire fog <i>Holcus lanatus</i> and sterile brome <i>Bromus sterilis</i> but also include forbs such as scented mayweed <i>Matricaria chamomilla</i> and cleavers <i>Galium aparine</i>.	Negligible
Species poor semi-improved grassland	Close-managed semi-improved grassland is present in the western extent of the Site and grazed by cattle and sheep. Sward height was generally low – 10 to 20 cm in height. The largest area comprises Llanwern Park. Common grass species present include frequent Perennial Rye-grass <i>Lolium perenne</i>, with occasional Yorkshire Fog and crested dogs tail <i>Cynosurus cristatus</i>, Ruderals such as occasional white clover <i>Trifolium repens</i>, sorrel <i>Rumex acetosa</i> and ragwort <i>Jacobaea vulgaris</i> were present in the sward. Grassland habitats within the lapwing mitigation area comprised mainly grasses with few herbs. Species include Yorkshire fog, cock's-foot, perennial rye-grass, smaller cats-tail, meadow foxtail, broad-leaved dock, common nettle, creeping buttercup and creeping thistle. Hairy sedge and soft rush were locally abundant, forming dense areas and scattered clumps often associated with shallow pools or ditches. Scattered scrub and ruderals are present in areas comprising bramble, teasel and thistle spp. This habitat is managed through light cattle grazing and silage cuts.	Site

Phase 1 habitat	Description	Ecological value
Improved grassland	Close-managed improved grassland is present in the southern extent of the Site and largely cut for silage. The dominant grass species was Perennial Rye-grass <i>Lolium perenne</i> , with occasional Yorkshire Fog crested Herbs included white clover. This habitat is of Site value for biodiversity.	Negligible
Scattered scrub and Continuous scrub	Scattered scrub is present around the field margins of the Site, particularly in the central sheep grazed fields where wire fences have replaced hedgerows. Dense scrub is most noticeable along the Site's southernmost boundary between the Site and the South Wales Main Line.	Site
Broadleaved Woodland	A small section of secondary broadleaved woodland dominated by pedunculate oak <i>Quercus robur</i> is present in the corner of an arable field in the north-eastern extent of the Site. The field layer comprises of ivy and bramble.	Site
Scattered trees	Mature trees are present throughout the Site, mostly confined to hedgerows. However, several mature trees are present in the arable fields. These are mostly pedunculate oak but also mature specimens of Common Ash <i>Fraxinus excelsior</i> and willow <i>Salix spp.</i> <i>sp.</i> A mature pedunculate oak tree bordering the Bishton – Llanwern road is considered to be a veteran tree. Furthermore, several stands of dead wood are present in internal hedgerows and are likely to be of value to wildlife in the area.	Site
Intact species-poor hedgerow; defunct species-poor hedgerow	The majority of the fields are bound by species-poor hedgerows, comprises predominately by common hawthorn <i>Crataegus monogyna</i> with other species such as blackthorn <i>Prunus spinosa</i> , dogwood <i>Cornus sanguinea</i> and elm <i>Ulmus spp.</i> present and are the result of former planting schemes. In the southern extent ditches are present beneath the hedgerows. These are heavily shaded in places and comprise of ruderals such as hogweed were able to grow. Hedgerows are an important biodiversity feature providing an area of semi-natural habitat for a range of species and corridors through the landscape for the dispersal of small animals.	Hedgerows are listed under Section 7 of the Environment (Wales) Act 2016 and are a Local Biodiversity Action Plan priority habitat. The hedgerows would not qualify as ecologically important for the purposes of the Hedgerow Regulations 1997 due a lack of species diversity. The hedgerows are of Local value for biodiversity.
Intact species-poor hedgerow; defunct species-poor hedgerow	The majority of the fields are bound by species-poor hedgerows, comprises predominately by common hawthorn <i>Crataegus monogyna</i> with other species such as blackthorn <i>Prunus spinosa</i> , dogwood <i>Cornus sanguinea</i> and elm <i>Ulmus spp.</i> present and are the result of former planting schemes. In the southern extent ditches are present beneath the hedgerows. These are heavily shaded in places and comprise of ruderals such as hogweed were able to grow. Hedgerows are an important biodiversity feature providing an area of semi-natural habitat for a range of species and corridors through the landscape for the dispersal of small animals.	Hedgerows are listed under Section 7 of the Environment (Wales) Act 2016 and are a Local Biodiversity Action Plan priority habitat. The hedgerows would not qualify as ecologically important for the purposes of the Hedgerow Regulations 1997 due a lack of species diversity.

Phase 1 habitat	Description	Ecological value
		The hedgerows are of Local value for biodiversity.
Hedge with trees, native species poor	Native hedgerows form the field boundaries in the lapwing mitigation area and comprised a mixture of shrubs and mature trees including hawthorn, blackthorn, holly, willow sp. and English oak. Some of the hedgerows featured wide margins of self-seeded shrubs and bramble, as well as wet ditches	Site
Swamp	At the time of survey, the swamp habitat, a former field pond, was dry and dominated by greater reedmace <i>Typha latifolia</i> . Other ruderals were present including hogweed and water mint <i>Metha aquatica</i> .	Site
Standing Water	Several large ditches cross the Site, bordering arable fields. Notably three of these are labelled on maps as the Riddings Reen (part of the SSSI), Llan Allen Winter Sewer (dry at the time of survey) and the Oxleaze Reen in the southern extent. Of these only the Oxleaze Reen had running water at the time of survey. The channel is shallow, heavily shaded by hedgerow and scrub on the southern banks and with a little water flow (less than 20 cm in depth). Elsewhere running water was present in the eastern extent of the Site, bordering the arable and improved fields. These channels were straight, up to 1m in height and dominant by marginal vegetation. In channel aquatic vegetation was present including hornworts, <i>Callitriche</i> spp, and <i>Potamogeton</i> spp. The ditches are in various states, many are dry and heavily shaded, some contain open water and are of Local value to wildlife.	Ditches and reens are part of an area of coastal and floodplain grazing marsh, and as such are listed under Section 7 of the Environment (Wales) Act 2016 and are a Local Biodiversity Action Plan priority habitat. These habitats are of Local value In the south-east of the Site, this habitat is part of a network of ditches that are an interest feature of the Gwent Levels – Redwick and Llandeenny SSSI. Accordingly, this habitat is of National value for biodiversity.
Bare Ground	Two small fields in the eastern extent of the Site have recently been sprayed and so are devoid of living vegetation.	Negligible
Fencing	Fencing is present within the Site forming the Site and field boundaries.	Negligible

Notable species

Amphibians

- 6.3.46 There are seven records for common frog, seven records for common toad, 12 records for smooth newt and four records for palmate newt within 5 km.
- 6.3.47 The majority of ditches lacked aquatic vegetation likely to support amphibians, were shallow and obstructed with leaf-litter.

- 6.3.48 Receptor evaluation: The Assessment Site is of Local value for common and widespread amphibians.
- 6.3.49 The biological records search returned 20 records for great crested newt. The nearest record is approximately 1.4 km to the east around Llanwern Steelworks and dates from 2017.
- 6.3.50 In 2021 HSI was calculated for 16 waterbodies in 2021 comprising two ponds, reens and larger ditches. The remainder off ditches lacked aquatic vegetation likely to support GCN, were shallow and obstructed with leaf-litter. In addition, most ditches were heavily shaded by scrubby hedgeline along both banks. On the basis of HSI, 8 water bodies were scoped-in for GCN eDNA sampling in 2021.
- 6.3.51 An additional area was added to the development in 2023 leading to a further 7 waterbodies being scoped in for analysis, whilst 4 water bodies that were dry in 2021 were revisited in an attempt to gain viable samples for eDNA along with 3 waterbodies with an HSI of poor in 2021.
- 6.3.52 In total 15 samples for eDNA analysis to determine presence of Great Crested Newt were collected from waterbodies. All results were Negative.
- 6.3.53 These surveys were then updated in 2026 for the Proposed Development.
- 6.3.54 Receptor evaluation: The Assessment Site is of Site value for Great Crested Newt.

Badgers

- 6.3.55 There are 35 records for badger within 5 km of the Site. No badger setts or well-trodden pathways are present within the zone of influence.
- 6.3.56 Receptor evaluation: The Assessment Site is of Site value for badgers.

Bats

- 6.3.57 There are 265 records for bats within 5 km of the Site. The species recorded are detailed in Table 6.5. The nearest record for a known bat roost is 0.6 km and describes a common pipistrelle roost in 2017/2018 at Llanwern Steelworks.

Table 6.5 Bat records within 5 km

Common name	Number of records
Common Pipistrelle	113
Greater Horseshoe	1
Lesser Horseshoe	25

Nathusius' Pipistrelle	1
Noctule	32
Soprano Pipistrelle	17
Whiskered	6
Daubenton's	4
Whiskered/Brandt's	2
Natterer's	4
Leisler's	1
Long-eared	4
Brown Long-eared	25
Pipistrelle	30

- 6.3.58 Many of the trees across the Site may hold potential for small numbers of roosting bats.
- 6.3.59 The majority of the Site is unlit and is likely to provide foraging habitat to a wide range of species with the woodland edges bordering the Site, the hedgerows, pasture, ditches and reens.
- 6.3.60 Surveys were completed in 2025 to support the Proposed Development.
- 6.3.61 Receptor evaluation: The Assessment Site is of Local value for Bats.

Common dormice

- 6.3.62 There are 82 records for hazel dormouse within 5 km. The nearest record is associated with Llanwern Steelworks in 2017/2018.
- 6.3.63 Habitats associated with the Assessment Site are suboptimal for this species due to limited diversity of native shrubs and a lack of connectivity to suitable dormouse habitats. No dormice were recorded. Further details regarding dormice are reported in Appendix 6.3.
- 6.3.64 Given Dormouse surveys were only undertaken due to a scheme of hedgerow clearance to facilitate SSSI improvements in the southeastern parcel, and this parcel has subsequently been removed / this proposed clearance will not take place, the surveys were no longer deemed relevant owing to limited hedgerow removal required to facilitate the Proposed Development.
- 6.3.65 Receptor evaluation: The Assessment Site is of Site value for common dormice.

Otter



6.3.66 There are 117 records for otter within 5km and this includes records within the Assessment Site. No evidence of otter was found although they are likely to be occasionally active along reens in the south of the Site.

6.3.67 Updated surveys were undertaken in 2026 for the Proposed Development.

6.3.68 Receptor evaluation The Assessment Site is of Site value for otter.

Water Vole

6.3.69 There are 1605 records for water vole within 5 km and this includes records within the Assessment Site.

6.3.70 During surveys, evidence of Water Vole activity was found in the south east of the Assessment Site.

6.3.71 Updated surveys were undertaken in 2026 for the Proposed Development.

6.3.72 Receptor evaluation: The Assessment Site is of Local value for water vole.

European Eel

6.3.73 There are 14 records for European eel *Anguilla anguilla* within 5km none of which are within the Assessment Site.

6.3.74 Although it is likely that Eels are present in reens, these are unlikely to be optimal habitats due to a lack of underwater refugia and regular maintenance. European eel are considered Critically Endangered¹².

6.3.75 Receptor evaluation: The Assessment Site is of Local value for European eel.

Reptiles

6.3.76 The biological record search returned 20 records for grass snake, 5 records for adder, two records for common lizard and 12 records for slow worm. None of these records are within the Site.

¹² Jacoby, D. & Gollock, M. 2014. *Anguilla anguilla*. The IUCN Red List of Threatened Species 2014: e.T60344A45833138. <https://dx.doi.org/10.2305/IUCN.UK.2014-1.RLTS.T60344A45833138.en>. Downloaded on 08 February 2020

6.3.77 Boundary habitats have some potential for grass snake, slow worm and common lizard, although the managed improved grassland and arable habitat within the footprint would be unlikely to support reptiles.

6.3.78 Receptor evaluation: The Assessment Site is of Local value for reptiles.

Invertebrates

6.3.79 The biological record search returned 1483 records for notable invertebrates within 5 km. These are listed in Table 6.6. None of these records are from within the Site.

Table 6.6 Notable invertebrates within 5 km of the Site

Latin name	Common name	Number of records	Conservation status
Hippodamia variegata	Adonis' Ladybird	3	RDB2 (UK) - NB, LBAP (CON), LI(BIS)
Agabus conspersus	Agabus conspersus	1	RDB2 (UK) - NB, RDB2 (UK) - S
Agathomyia wankowiczii	Agathomyia wankowiczii	1	RDB2 (UK) - S
Altica brevicollis	Altica brevicollis	1	RDB2 (UK) - NA, RDB2 (UK) - S
Anaglyptus mysticus	Anaglyptus mysticus	3	RDB2 (UK) - NB, LBAP (TRF)
Anagnota bicolor	Anagnota bicolor	2	RDB2 (UK) - N
Anaspis garneysi	Anaspis garneysi	2	LBAP (GWY)
Anobium inexpectatum	Anobium inexpectatum	1	RDB2 (UK) - NB
Anoscopus albifrons	Anoscopus albifrons	4	RDB2 (UK) - NB
Anoscopus albiger	Anoscopus albiger	2	RDB2 (UK) - NB
Anthocoris visci	Anthocoris visci	3	RDB2 (UK) - NB
Ennomos quercinaria	August Thorn	4	S7, LBAP (GWY, VOG), LI(BIS)
Eugnorisma glareosa	Autumnal Rustic	3	S7, LBAP (GWY, VOG)
Badister dilatatus	Badister dilatatus	4	RDB2 (UK) - NB
Badister unipustulatus	Badister unipustulatus	1	RDB2 (UK) - NB
Bagous alismatis	Bagous alismatis	11	RDB2 (UK) - NB
Bagous luteolus	Bagous luteolus	3	RDB2 (UK) - NB
Bagous tempestivus	Bagous tempestivus	1	RDB2 (UK) - NB
Calopteryx splendens	Banded Agrion	8	LBAP (CLY, SNP), LI(BIS), LI(SEWBRc)
Stratiomys potamida	Banded General	2	RDB2 (UK) - N
Tiliacea aurago	Barred Sallow	6	LBAP (BRG)
Agrochola lychnidis	Beaded Chestnut	9	S7, LBAP (GWY, VOG)
Calopteryx virgo	Beautiful Agrion	4	LBAP (CLY, SNP), LI(BIS), LI(SEWBRc)
Bembidion gilvipes	Bembidion gilvipes	1	RDB2 (UK) - NB
Berosus affinis	Berosus affinis	23	LBAP (NEW)
Biblopectus spinosus	Biblopectus spinosus	1	RDB2 (UK) - N
Odontomyia tigrina	Black Colonel	55	RDB2 (UK) - N
Sympetrum danae	Black Darter	1	LBAP (CLY, SNP), LI(BIS), LI(SEWBRc)
Andrena pilipes	Black Mining Bee	1	RDB2 (UK) - NB

Latin name	Common name	Number of records	Conservation status
<i>Pyrochroa coccinea</i>	Black-headed Cardinal Beetle	1	RDB2 (UK) - NB
<i>Orthetrum cancellatum</i>	Black-tailed Skimmer	22	LBAP (CLY, SNP), LI(BIS), LI(SEWBRcC)
<i>Blemus discus</i>	Blemus discus	1	RDB2 (UK) - NB
<i>Timandra comae</i>	Blood-vein	9	S7, LBAP (VOG)
<i>Chorisops nagatomii</i>	Bright Four-spined Legionnaire	2	RDB2 (UK) - N
<i>Lycia hirtaria</i>	Brindled Beauty	1	S7, LBAP (GWY, VOG)
<i>Ceramica pisi</i>	Broom Moth	1	S7, LBAP (GWY, VOG)
<i>Chesias rufata</i>	Broom-tip	1	S7, LBAP (BGW, CLY, CON, NEW, POW)
<i>Aricia agestis</i>	Brown Argus	3	LBAP (BRG, DEN)
<i>Lasius brunneus</i>	Brown Tree Ant	4	RDB2 (UK) - NA
<i>Bombus humilis</i>	Brown-banded Carder-bee	71	S7, LBAP (CER, CON, FLI, GWY, PEM, POW, VOG)
<i>Agrochola litura</i>	Brown-spot Pinion	1	S7, LBAP (GWY)
<i>Spilosoma lutea</i>	Buff Ermine	13	S7, LBAP (GWY, VOG)
<i>Bombus terrestris</i>	Buff-tailed Bumblebee	26	LBAP (FLI, MTR)
<i>Calamotropha paludella</i>	Bulrush Veneer	9	RDB2 (UK) - NB, LBAP (NEW)
<i>Calopteryx</i>	Calopteryx	1	LBAP (CLY), LI(SEWBRcC)
<i>Cantharis nigra</i> (=thoracica)	Cantharis nigra (=thoracica)	10	LI(BIS)
<i>Cassida hemisphaerica</i>	Cassida hemisphaerica	1	RDB2 (UK) - NA, RDB2 (UK) - S
<i>Cassida nobilis</i>	Cassida nobilis	1	RDB2 (UK) - NB, RDB2 (UK) - S
<i>Atethmia centrargo</i>	Centre-barred Sallow	7	S7, LBAP (GWY, VOG)
<i>Chaetarthria seminulum</i>	Chaetarthria seminulum	1	RDB2 (UK) - S
<i>Chaetocnema confusa</i>	Chaetocnema confusa	2	RDB2 (UK) - S
<i>Chartoscirta cocksii</i>	Chartoscirta cocksii	3	RDB2 (UK) - S
<i>Cheilotrichia imbuta</i>	Cheilotrichia imbuta	3	RDB2 (UK) - N
<i>Chlaenius nigricornis</i>	Chlaenius nigricornis	3	RDB2 (UK) - NB
<i>Chloriona vasconica</i>	Chloriona vasconica	2	RDB2 (UK) - NB
<i>Chlorops planifrons</i>	Chlorops planifrons	2	RDB2 (UK) - N
<i>Choleva glauca</i>	Choleva glauca	1	RDB2 (UK) - N
<i>Choragus sheppardi</i>	Choragus sheppardi	1	RDB2 (UK) - NA
<i>Tyria jacobaeae</i>	Cinnabar	16	S7, LBAP (GWY, VOG)
<i>Clusia tigrina</i>	Clusia tigrina	1	LBAP (GWY)
<i>Colobaea bifasciella</i>	Colobaea bifasciella	1	RDB2 (UK) - N
<i>Colobaea distincta</i>	Colobaea distincta	5	RDB2 (UK) - N
<i>Colobaea punctata</i>	Colobaea punctata	3	RDB2 (UK) - N
<i>Bombus pascuorum</i>	Common Carder Bee	54	LBAP (FLI, MTR)
<i>Lestes sponsa</i>	Common Emerald Damselfly	6	LBAP (CLY, SNP), LI(SEWBRcC), LI(VC42), LI(VC43), LI(VC47), LI(VC50)
<i>Corixa affinis</i>	Corixa affinis	2	RDB2 (UK) - S
<i>Craniophora ligustri</i>	Coronet	7	LBAP (BRG)
<i>Helotropha leucostigma</i>	Crescent	5	S7, LI(BIS)
<i>Cryptophagus populi</i>	Cryptophagus populi	1	RDB2 (UK) - N
<i>Mniotype adusta</i>	Dark Brocade	1	S7, LBAP (GWY, VOG)
<i>Xanthorhoe ferrugata</i>	Dark-barred Twin-spot Carpet	8	S7, LBAP (GWY, VOG)

Latin name	Common name	Number of records	Conservation status
<i>Dasytes plumbeus</i>	Dasytes plumbeus	1	RDB2 (UK) - S
<i>Demetrias imperialis</i>	Demetrias imperialis	4	RDB2 (UK) - NB
<i>Dicraeus scibilis</i>	Dicraeus scibilis	3	RDB2 (UK) - N
<i>Dicraeus tibialis</i>	Dicraeus tibialis	1	RDB2 (UK) - N
<i>Dicranomyia ventralis</i>	Dicranomyia ventralis	3	RDB2 (UK) - N
<i>Ditaeniella grisescens</i>	Ditaeniella grisescens	1	RDB2 (UK) - N
<i>Dolichopus signifer</i>	Dolichopus signifer	1	RDB2 (UK) - S
<i>Dolichopus virgultorum</i>	Dolichopus virgultorum	1	RDB2 (UK) - S
<i>Donacia clavipes</i>	Donacia clavipes	2	RDB2 (UK) - NB
<i>Melanchra persicariae</i>	Dot Moth	5	S7, LBAP (GWY, VOG)
<i>Conistra rubiginea</i>	Dotted Chestnut	3	LBAP (NPT)
<i>Graphiphora augur</i>	Double Dart	1	S7, LBAP (BRG)
<i>Lateroligia ophiogramma</i>	Double Lobed	7	LI(VC42)
<i>Dryops similis</i>	Dryops similis	2	RDB2 (UK) - S
<i>Apamea remissa</i>	Dusky Brocade	3	S7, LBAP (GWY, VOG)
<i>Ennomos fuscantaria</i>	Dusky Thorn	8	S7, LBAP (GWY, VOG)
<i>Dytiscus circumcinctus</i>	Dytiscus circumcinctus	1	RDB2 (UK) - S
<i>Amphipoea oculatea</i>	Ear Moth	1	S7, LBAP (GWY, VOG)
<i>Bombus pratorum</i>	Early Bumblebee	15	LBAP (FLI, MTR)
<i>Ectemnius ruficornis</i>	Ectemnius ruficornis	1	RDB2 (UK) - NB
<i>Elachiptera austriaca</i>	Elachiptera austriaca	1	RDB2 (UK) - N
<i>Elaphrus uliginosus</i>	Elaphrus uliginosus	1	RDB2 (UK) - NB
<i>Tholera decimalis</i>	Feathered Gothic	3	S7
<i>Horisme tersata</i>	Fern	3	LBAP (BRG)
<i>Bombus campestris</i>	Field Cuckoo Bumblebee	3	LBAP (MTR)
<i>Diloba caeruleocephala</i>	Figure of Eight	5	S7, LBAP (VOG)
<i>Stratiomys singularior</i>	Flecked General	6	RDB2 (UK) - N
<i>Agrochola helvola</i>	Flounced Chestnut	1	S7, LBAP (GWY, VOG)
<i>Gabrieus bishopi</i>	Gabrieus bishopi	1	RDB2 (UK) - NB
<i>Bombus hortorum</i>	Garden Bumblebee	17	LBAP (FLI, MTR)
<i>Euxoa nigricans</i>	Garden Dart	1	S7, LBAP (GWY)
<i>Arctia caja</i>	Garden Tiger	4	S7, LBAP (GWY, VOG)
<i>Geomyza apicalis</i>	Geomyza apicalis	1	RDB2 (UK) - N
<i>Hepialus humuli</i>	Ghost Moth	12	S7, LBAP (GWY, VOG)
<i>Cordulegaster boltonii</i>	Golden-ringed Dragonfly	3	LBAP (CLY, SNP), LI(BIS), LI(SEWBRc)
<i>Gonomyia bifida</i>	Gonomyia bifida	2	RDB2 (UK) - N
<i>Hipparchia semele</i>	Grayling	2	S7, RDB1 (UK) - VU, LBAP (BRG, CDF, GWY, RCT, VOG), LI(SEWBRc), LI(VC43)
<i>Allophytes oxyacanthae</i>	Green-brindled Crescent	4	S7, LBAP (GWY, VOG)
<i>Agonopterix atomella</i>	Greenweed Flat-body	1	S7
<i>Acronicta psi</i>	Grey Dagger	11	S7, LBAP (GWY, VOG)
<i>Gymnetron villosulum</i>	Gymnetron villosulum	1	RDB2 (UK) - NB
<i>Gyrinus natator</i>	Gyrinus natator	3	RDB1 (UK) - RE
<i>Brachytron pratense</i>	Hairy Dragonfly	30	LBAP (BRG, CLY, GWY, PEM, SNP), LI(BIS), LI(SEWBRc)
<i>Harmonia axyridis</i>	Harlequin Ladybird	16	INNS

Latin name	Common name	Number of records	Conservation status
<i>Tholera cespitis</i>	Hedge Rustic	1	S7, LBAP (GWY, VOG)
<i>Helochares lividus</i>	<i>Helochares lividus</i>	72	LBAP (NEW)
<i>Helophorus alternans</i>	<i>Helophorus alternans</i>	2	RDB2 (UK) - NA, RDB2 (UK) - S
<i>Helophorus granularis</i>	<i>Helophorus granularis</i>	2	RDB2 (UK) - S, LBAP (GWY)
<i>Asilus crabroniformis</i>	Hornet robberfly	7	S7, RDB2 (UK) - N, LBAP (CER, CRM, GWY, PEM, VOG)
<i>Gasterophilus intestinalis</i>	Horse Bot Fly	1	RDB2 (UK) - N
<i>Grypus equiseti</i>	Horsetail Weevil	1	RDB2 (UK) - NB
<i>Hydaticus transversalis</i>	<i>Hydaticus transversalis</i>	27	RDB2 (UK) - S
<i>Hydrobia ventrosa</i> seg.	<i>Hydrobia ventrosa</i> seg.	1	LBAP (NEW)
<i>Hydrochus angustatus</i>	<i>Hydrochus angustatus</i>	1	RDB2 (UK) - S
<i>Hypnogyra angularis</i>	<i>Hypnogyra angularis</i>	1	RDB2 (UK) - NA
<i>Ischnomera cyanea</i>	<i>Ischnomera cyanea</i>	1	RDB2 (UK) - NB
<i>Potamopyrgus antipodarum</i>	Jenkins' Spire Snail	33	INNS
<i>Kissophagus hederæ</i>	<i>Kissophagus hederæ</i>	1	RDB2 (UK) - NB
<i>Bombus sylvarum</i>	Knapweed Carder Bee	104	S7, RDB2 (UK) - NB, LBAP (CER, FLI, PEM, VOG)
<i>Acronicta rumicis</i>	Knot Grass	10	S7, LBAP (GWY, VOG)
<i>Malacosoma neustria</i>	Lackey	9	S7, LBAP (GWY, VOG)
<i>Scolytus mali</i>	Large Fruit Bark Beetle	1	RDB2 (UK) - NB
<i>Polymixis flavicincta</i>	Large Ranunculus	1	LBAP (BRG)
<i>Rhizedra lutosæ</i>	Large Wainscot	8	S7, LBAP (BRG, GWY)
<i>Chiasmia clathrata</i>	Latticed Heath	2	S7, LBAP (GWY, VOG)
<i>Leopoldius signatus</i>	<i>Leopoldius signatus</i>	1	RDB2 (UK) - N
<i>Limonia trivittata</i>	<i>Limonia trivittata</i>	5	RDB2 (UK) - N
<i>Lipara rufitarsis</i>	<i>Lipara rufitarsis</i>	1	RDB2 (UK) - N
<i>Lissodema denticolle</i>	<i>Lissodema denticolle</i>	1	RDB2 (UK) - NB, RDB2 (UK) - S
<i>Lonchoptera scutellata</i>	<i>Lonchoptera scutellata</i>	1	RDB2 (UK) - S
<i>Eucera longicornis</i>	Long-horned Bee	3	S7, RDB2 (UK) - NA, LBAP (VOG)
<i>Vanoyia tenuicornis</i>	Long-horned Soldier	4	RDB2 (UK) - N
<i>Longitarsus aeneicollis</i>	<i>Longitarsus aeneicollis</i>	1	RDB2 (UK) - NB, RDB2 (UK) - S
<i>Conocephalus fuscus</i>	Long-winged Cone-head	6	LI(SEWBRcC)
<i>Noctua orbona</i>	Lunar Yellow Underwing	1	S7, LBAP (GWY, POW)
<i>Macrocera maculata</i>	<i>Macrocera maculata</i>	1	RDB2 (UK) - S
<i>Magdalis cerasi</i>	<i>Magdalis cerasi</i>	1	RDB2 (UK) - NB
<i>Melanargia galathea serena</i>	Marbled White	10	LBAP (SWN, VOG), LI(VC43)
<i>Euphydryas aurinia</i>	Marsh Fritillary	1	HDir, WCA5, S7, Bern, RDB1 (UK) - VU, LBAP (ANG, BBNP, CER, CON, CRM, GWY, PEM, POW, SNP, TRA, VOG),
<i>Megamerina dolium</i>	<i>Megamerina dolium</i>	2	RDB2 (UK) - N
<i>Melandrya caraboides</i>	<i>Melandrya caraboides</i>	1	RDB2 (UK) - NB
<i>Brachylomia viminalis</i>	Minor Shoulder-knot	6	S7, LBAP (GWY, VOG)
<i>Molophilus corniger</i>	<i>Molophilus corniger</i>	1	RDB2 (UK) - N, LBAP (CON)
<i>Caradrina morpheus</i>	Mottled Rustic	5	S7, LBAP (GWY, VOG)

Latin name	Common name	Number of records	Conservation status
<i>Amphipyra tragopoginis</i>	Mouse Moth	2	S7, LBAP (GWY, VOG)
<i>Aromia moschata</i>	Musk Beetle	5	RDB2 (UK) - NB, LBAP (TRF)
<i>Mycomya britteni</i>	<i>Mycomya britteni</i>	5	RDB2 (UK) - S
<i>Neoascia geniculata</i>	<i>Neoascia geniculata</i>	3	RDB2 (UK) - N
<i>Notaris scirpi</i>	<i>Notaris scirpi</i>	4	RDB2 (UK) - NB
<i>Watsonalla binaria</i>	Oak Hook-tip	6	S7, LBAP (GWY, VOG)
<i>Cymatophorina diluta</i>	Oak Lutestring	1	S7
<i>Orthonama vittata</i>	Oblique Carpet	3	S7, LBAP (BRG), LI(BIS)
<i>Leucania obsoleta</i>	Obscure Wainscot	2	LBAP (BRG)
<i>Odacantha melanura</i>	<i>Odacantha melanura</i>	9	RDB2 (UK) - NB
<i>Oedemera femoralis</i>	<i>Oedemera femoralis</i>	2	RDB2 (UK) - NB, RDB2 (UK) - S
<i>Oodes helopioides</i>	<i>Oodes helopioides</i>	11	RDB2 (UK) - NB
<i>Oscinella angularis</i>	<i>Oscinella angularis</i>	5	RDB2 (UK) - N
<i>Oscinella angustipennis</i>	<i>Oscinella angustipennis</i>	17	RDB2 (UK) - N
<i>Oscinisoma gilvipes</i>	<i>Oscinisoma gilvipes</i>	2	RDB2 (UK) - N
<i>Oulimnius troglodytes</i>	<i>Oulimnius troglodytes</i>	1	RDB2 (UK) - S
<i>Oxystoma cerdo</i>	<i>Oxystoma cerdo</i>	2	RDB2 (UK) - NB, LI(BIS)
<i>Oxytelus fulvipes</i>	<i>Oxytelus fulvipes</i>	2	RDB2 (UK) - NA
<i>Paederus fuscipes</i>	<i>Paederus fuscipes</i>	8	RDB2 (UK) - NB
<i>Parhelophilus consimilis</i>	<i>Parhelophilus consimilis</i>	4	RDB2 (UK) - S
<i>Boloria euphrosyne</i>	Pearl-bordered Fritillary	1	WCA5, S7, RDB1 (UK) - EN, LBAP (BBNP, CER, CON, DEN, FLI, PEM, POW), LI(SEWBRcC), LI(VC43)
<i>Peltodytes caesus</i>	<i>Peltodytes caesus</i>	15	RDB2 (UK) - S
<i>Phalacrocerca replicata</i>	<i>Phalacrocerca replicata</i>	2	RDB2 (UK) - N
<i>Phaonia atriceps</i>	<i>Phaonia atriceps</i>	1	RDB2 (UK) - N
<i>Pherbellia brunnipes</i>	<i>Pherbellia brunnipes</i>	1	RDB2 (UK) - N
<i>Pherbellia dorsata</i>	<i>Pherbellia dorsata</i>	7	RDB2 (UK) - N
<i>Pherbellia griseola</i>	<i>Pherbellia griseola</i>	1	RDB2 (UK) - N, LBAP (CON)
<i>Philhygra hygrobica</i>	<i>Philhygra hygrobica</i>	1	RDB2 (UK) - N
<i>Physella acuta</i>	<i>Physella acuta</i>	7	INNS
<i>Physella gyrina</i>	<i>Physella gyrina</i>	1	INNS
<i>Phytoecia cylindrica</i>	<i>Phytoecia cylindrica</i>	2	RDB2 (UK) - NB, LBAP (TRF)
<i>Eudonia delunella</i>	Pied Grey	2	RDB2 (UK) - NB
<i>Pisidium pseudosphaerium</i>	<i>Pisidium pseudosphaerium</i>	2	RDB2 (UK) - S, LBAP (POW)
<i>Chrysolina haemoptera</i>	Plantain Leaf Beetle	1	RDB2 (UK) - NB, RDB2 (UK) - S
<i>Platycheirus perpallidus</i>	<i>Platycheirus perpallidus</i>	1	RDB2 (UK) - N, RDB2 (UK) - S
<i>Platypalpus pseudociliaris</i>	<i>Platypalpus pseudociliaris</i>	1	RDB2 (UK) - S
<i>Platystethus nodifrons</i>	<i>Platystethus nodifrons</i>	1	RDB2 (UK) - N
<i>Orthosia gracilis</i>	Powdered Quaker	3	S7, LBAP (GWY, VOG)
<i>Melanthia procellata</i>	Pretty Chalk Carpet	3	S7, LBAP (GWY, VOG), LI(BIS)
<i>Prionychus ater</i>	<i>Prionychus ater</i>	7	RDB2 (UK) - NB
<i>Protapion difforme</i>	<i>Protapion difforme</i>	2	RDB2 (UK) - NB, LI(BIS)
<i>Protapion dissimile</i>	<i>Protapion dissimile</i>	1	RDB2 (UK) - NB, LI(BIS)
<i>Psacadina verbekei</i>	<i>Psacadina verbekei</i>	2	RDB2 (UK) - N
<i>Pseudocistela ceramboidea</i>	<i>Pseudocistela ceramboidea</i>	2	RDB2 (UK) - NB, RDB2 (UK) - S

Latin name	Common name	Number of records	Conservation status
<i>Pseudomalus violaceus</i>	<i>Pseudomalus violaceus</i>	1	RDB2 (UK) - NB
<i>Pterostichus anthracinus</i>	<i>Pterostichus anthracinus</i>	6	RDB2 (UK) - NB
<i>Pterostichus gracilis</i>	<i>Pterostichus gracilis</i>	1	RDB2 (UK) - NB
<i>Quedius scitus</i>	<i>Quedius scitus</i>	1	RDB2 (UK) - NB
<i>Erythromma najas</i>	Red-eyed Damselfly	2	LBAP (SNP, VOG), LI(BIS), LI(SEWBRcC)
<i>Bombus rudarius</i>	Red-shanked Carder-bee	2	S7, LBAP (FLI, MTR, VOG)
<i>Bombus lapidarius</i>	Red-tailed Bumblebee	36	LBAP (FLI, MTR)
<i>Rhinocyllus conicus</i>	<i>Rhinocyllus conicus</i>	1	RDB2 (UK) - NA
<i>Litologia literosa</i>	Rosy Minor	4	S7, LBAP (GWY, VOG)
<i>Hydraecia micacea</i>	Rosy Rustic	10	S7, LBAP (GWY, VOG)
<i>Thumatha senex</i>	Round-winged Muslin	11	LBAP (BRG)
<i>Sympetrum sanguineum</i>	Ruddy Darter	14	LBAP (CLY, SNP), LI(SEWBRcC), LI(VC42), LI(VC43), LI(VC47), LI(VC50)
<i>Hoplodrina blanda</i>	Rustic	9	S7, LBAP (GWY, VOG)
<i>Rutylapa ruficornis</i>	<i>Rutylapa ruficornis</i>	2	RDB2 (UK) - S
<i>Cirrhia icteritia</i>	Sallow	2	S7, LBAP (GWY, VOG)
<i>Sapromyza opaca</i>	<i>Sapromyza opaca</i>	5	RDB2 (UK) - N
<i>Sapromyza quadricincta</i>	<i>Sapromyza quadricincta</i>	6	RDB2 (UK) - N
<i>Ischnura pumilio</i>	Scarce Blue-tailed Damselfly	1	RDB1 (UK) - NT, LBAP (BGW, BRG, CLY, GWY, PEM, SNP, TRF), LI(BIS), LI(SEWBRcC)
<i>Beris clavipes</i>	Scarce Orange Legionnaire	2	RDB2 (UK) - N
<i>Scirtes orbicularis</i>	<i>Scirtes orbicularis</i>	11	RDB2 (UK) - S
<i>Sepedophilus testaceus</i>	<i>Sepedophilus testaceus</i>	1	RDB2 (UK) - N
<i>Ennomos erosaria</i>	September Thorn	5	S7, LBAP (VOG)
<i>Scotopteryx chenopodiata</i>	Shaded Broad-bar	8	S7, LBAP (GWY, VOG)
<i>Beris fuscipes</i>	Short-horned Black Legionnaire	1	RDB2 (UK) - N
<i>Conocephalus dorsalis</i>	Short-winged Cone-head	23	LBAP (BRG, TRF), LI(SEWBRcC)
<i>Leucania comma</i>	Shoulder-striped Wainscot	5	S7, LBAP (GWY, VOG)
<i>Plebejus argus</i>	Silver-studded Blue	1	WCA5, S7, RDB1 (UK) - VU, LBAP (CON, DEN, FLI, PEM, SNP), LI(SEWBRcC)
<i>Argynnis paphia</i>	Silver-washed Fritillary	2	LBAP (BRG, CDF, CON, FLI, MON, NEW, POW, SWN), LI(SEWBRcC), LI(VC43)
<i>Tetrix subulata</i>	Slender Ground-hopper	21	LBAP (BRG), LI(SEWBRcC)
<i>Cupido minimus</i>	Small Blue	2	WCA5, S7, RDB1 (UK) - NT, LBAP (CON, PEM, VOG), LI(SEWBRcC)
<i>Hemistola chrysoprasaria</i>	Small Emerald	6	S7, LBAP (GWY, VOG)

Latin name	Common name	Number of records	Conservation status
Coenonympha pamphilus	Small Heath	3	S7, RDB1 (UK) - NT, LBAP (GWY, VOG)
Ecliptopera silaceata	Small Phoenix	10	S7, LBAP (GWY, VOG)
Diarsia rubi	Small Square-spot	12	S7, LBAP (GWY, VOG)
Horisme vitalbata	Small Waved Umber	6	LBAP (BRG)
Leptophyes punctatissima	Speckled Bush-cricket	11	LI(SEWBRcC)
Eulithis mellinata	Spinach	1	S7, LBAP (GWY)
Nephoterix angustella	Spindle Knot-horn	1	RDB2 (UK) - NB
Asteroscopus sphinx	Sprawler	1	S7, LBAP (VOG)
Stenolophus skrimshiranus	Stenolophus skrimshiranus	2	RDB2 (UK) - NA
Stenus assequens	Stenus assequens	1	RDB2 (UK) - N
Stenus butrintensis	Stenus butrintensis	1	RDB2 (UK) - N
Stenus palustris	Stenus palustris	2	RDB2 (UK) - NB
Stenus pusillus	Stenus pusillus	1	RDB2 (UK) - NB
Chesias legatella	Streak	1	S7
Strigocis bicornis	Strigocis bicornis	1	RDB2 (UK) - NB
Tachyporus formosus	Tachyporus formosus	1	RDB2 (UK) - NA
Tachys bistriatus	Tachys bistriatus	1	RDB2 (UK) - NB
Tetanocera phyllophora	Tetanocera phyllophora	1	RDB2 (UK) - N
Tetanocera punctifrons	Tetanocera punctifrons	1	RDB2 (UK) - N
Thrypticus tarsalis	Thrypticus tarsalis	2	RDB2 (UK) - S
Tournotaris bimaculatus	Tournotaris bimaculatus	3	RDB2 (UK) - NB
Lenisa geminipuncta	Twin-spotted Wainscot	1	LBAP (BRG)
Typhamyza bifasciata	Typhamyza bifasciata	3	RDB2 (UK) - N
Tytthus pubescens	Tytthus pubescens	2	RDB2 (UK) - NB
Coenagrion pulchellum	Variable Blue Damselfly	11	RDB1 (UK) - NT, LBAP (BRG, CDF, GWY, SNP), LI(BIS), LI(SEWBRcC)
Bombus vestalis	Vestal (Southern) Cuckoo Bee	3	LBAP (MTR)
Monochroa palustrellus	Wainscot Neb	2	RDB2 (UK) - NB
Lasiommata megera	Wall	2	S7, RDB1 (UK) - NT, LBAP (GWY, VOG)
Spilosoma urticae	Water Ermine	1	LBAP (NEW)
Hydrelia sylvata	Waved Carpet	1	LBAP (BBNP, CER, CON, MON, POW)
Spilosoma lubricipeda	White Ermine	9	S7, LBAP (GWY, VOG)
Satyrrium w-album	White-letter Hairstreak	1	WCA5, S7, RDB1 (UK) - EN, LBAP (BRG, FLI, NEW, SWN, VOG), LI(SEWBRcC)
Bombus lucorum	White-tailed Bumblebee	12	LBAP (FLI, MTR)

6.3.80 A total of 11 invertebrate species were recorded during the field survey (Table 6.7), none of which are interest features of the Gwent levels SSSI, nor species of principal

importance for the purpose of maintaining and enhancing biodiversity in relation to Wales.

Table 6.7 Aquatic invertebrates recorded during field survey

Taxa	Latin name	Common name	Count
Mollusca	<i>Physa fontinalis</i>	Common Bladder Snail	14
	<i>Radix auricularia</i>	Ear Pond Snail	18
	<i>Lymnea stagnalis</i>	Great Pond Snail	1
	<i>Anisus vortex</i>	Whirlpool Ramshorn Snail	39
	<i>Gyalus albus</i>	White Ramshorn Snail	12
	<i>Valvata piscinalis</i>	Valve Snail	1
	<i>Gammarus pulex</i>	Freshwater Shrimp	6
Crustacea	<i>Asellus aquaticus</i>	Freshwater Hog-Louse	1
	<i>Notonecta glauca</i>	Common Backswimmer	3
Hemiptera	<i>Chironomidae</i> sp.	Midge larva	2
Diptera	<i>Erpobdela octoculata</i>	Freshwater Leech	3

6.3.81 The reens were considered suboptimal for rare and scarce invertebrates. Many are deep-sided, shaded by scrub and at the time of the survey covered in a dense blanket of duckweed. The results indicate they are currently of little importance for rare or scarce invertebrates.

6.3.82 Shrill Carder Bee surveys were undertaken in 2026 alongside updated Aquatic Invertebrate surveys to support the Proposed Development.

Plants

6.3.83 The biological record search returned 1483 records for notable plants within 5 km. These are shown in Table 6.8.

6.3.84 Improved grassland and arable habitats within the footprint of the proposed solar PV array do not support plants of restricted distribution, whilst no notable plants were recorded during the assessment of reens and ditches.

Table 6.8 Notable plants within 5 km

Latin name	Common name	Number of records	Conservation status
<i>Frangula alnus</i>	Alder Buckthorn	2	LBAP (GWY, NEW), LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR), LI(VC51, LR)
<i>Polypogon monspeliensis</i>	Annual Beard-grass	7	RDB2 (UK) - S

Latin name	Common name	Number of records	Conservation status
<i>Mercurialis annua</i>	Annual Mercury	2	LI(SEWBRcC), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR), LI(VC51, LR), LI(VC52, LR)
<i>Sagittaria sagittifolia</i>	Arrowhead	21	RDB1 (Wales) - VU, LI(SEWBRcC)
<i>Ophrys apifera</i>	Bee Orchid	5	CITES, LBAP (CLY, GWY, TRA, TRF), LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LS)
<i>Calystegia sepium</i> subsp. <i>roseata</i>	Bindweed	3	RDB2 (UK) - S, LBAP (GWY), LI(VC48, LS), LI(VC49, LR), LI(VC52, LR)
<i>Prunus padus</i>	Bird Cherry	2	LBAP (GWY), LI(SEWBRcC), LI(VC47), LI(VC49, LS)
<i>Neottia nidus-avis</i>	Bird's-nest Orchid	1	CITES, RDB1 (UK) - NT, LBAP (DEN, TRA, VOG), LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC49, LR), LI(VC50,
<i>Vicia bithynica</i>	Bithynian Vetch	1	RDB1 (Wales) - EN, RDB1 (UK) - VU, RDB2 (UK) - S, LBAP (DEN, VOG), LI(VC50, LR), LI(VC51, LR)
<i>Ballota nigra</i>	Black Horehound	1	LI(SEWBRcC)
<i>Populus nigra</i> subsp. <i>betulifolia</i>	Black Poplar	2	LBAP (CON, DEN, FLI, SNP, TRA, WRE), LI(SEWBRcC), LI(VC43), LI(VC48, LS), LI(VC50, LS), LI(VC52, LR)
<i>Populus nigra</i>	Black-poplar	3	LBAP (CRM, DEN, FLI, SNP, TRA, WRE), LI(SEWBRcC), LI(VC52)
<i>Carex vesicaria</i>	Bladder-sedge	1	LBAP (GWY), LI(SEWBRcC), LI(VC47), LI(VC48, LS), LI(VC49, LS), LI(VC50, LS), LI(VC51, LS), LI(VC52,
<i>Utricularia australis</i>	Bladderwort	1	LBAP (GWY), LI(SEWBRcC), LI(VC43), LI(VC49, LR)
<i>Veronica anagallis-aquatica</i>	Blue Water-Speedwell	44	LBAP (CON), LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR), LI(VC51, LR)
<i>Hyacinthoides non-scripta</i>	Bluebell	55	WCA8, LBAP (ANG, CLY, CON, FLI, SNP, TRA, TRF)
<i>Hyacinthoides non-scripta</i> x <i>hispanica</i> = <i>H. x massartiana</i>	Bluebell	11	INNS
<i>Juncus subnodulosus</i>	Blunt-flowered Rush	15	LBAP (BGW, BRG, GWY), LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC48, LS), LI(VC49, LS)
<i>Callitriche obtusangula</i>	Blunt-fruited Water-starwort	2	LI(SEWBRcC), LI(VC43), LI(VC47)

Latin name	Common name	Number of records	Conservation status
Potamogeton obtusifolius	Blunt-leaved Pondweed	3	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC49, LR), LI(VC50, LR)
Sparganium erectum subsp. neglectum	Branched Bur-Reed	1	RDB1 (Wales) - WL
Samolus valerandi	Brookweed	5	LBAP (CON), LI(SEWBRcC), LI(VC47), LI(VC51, LS)
Carex disticha	Brown Sedge	31	LBAP (BRG, CON, GWY), LI(SEWBRcC), LI(VC43), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR), LI(VC51, LS)
Rhamnus cathartica	Buckthorn	2	LI(SEWBRcC), LI(VC50, LS), LI(VC51, LS)
Alopecurus bulbosus	Bulbous Foxtail	3	RDB2 (UK) - S, LBAP (NEW, VOG), LI(SEWBRcC)
Buddleja davidii	Butterfly-bush	71	INNS
Elodea canadensis	Canadian Waterweed	23	INNS
Sinapis arvensis	Charlock	12	RDB1 (Wales) - VU
Prunus laurocerasus	Cherry Laurel	10	INNS
Allium schoenoprasum	Chives	1	RDB2 (UK) - S, LI(SEWBRcC), LI(VC43)
Ceratocapnos claviculata	Climbing Corydalis	1	LI(SEWBRcC), LI(VC47)
Schoenoplectus lacustris	Common Club-rush	2	LBAP (GWY), LI(SEWBRcC), LI(VC49, LS), LI(VC50, LS)
Spartina anglica	Common Cord-grass	5	LBAP (CON), LI(VC50, LR), INNS
Thalictrum flavum	Common Meadow-rue	10	LBAP (GWY), LI(SEWBRcC), LI(VC43), LI(VC49, LR), LI(VC50, LS), LI(VC52, LS)
Helianthemum nummularium	Common Rock-rose	2	LBAP (GWY), LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC48, LR), LI(VC49, LS)
Limonium vulgare	Common Sea-lavender	4	LBAP (CDF, CON), LI(SEWBRcC), LI(VC48, LS), LI(VC49, LR), LI(VC50, LR), LI(VC52, LS)
Oenanthe pimpinelloides	Corky-fruited Water-dropwort	3	RDB1 (Wales) - CR, LBAP (VOG), LI(SEWBRcC)
Ranunculus arvensis	Corn Buttercup	1	S7, RDB1 (Wales) - CR, RDB1 (UK) - CR, LBAP (VOG)
Glebionis segetum	Corn Marigold	2	RDB1 (UK) - VU, LBAP (GWY, VOG), LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR), LI
Petroselinum segetum	Corn Parsley	4	LBAP (NEW), LI(SEWBRcC)
Cicuta virosa	Cowbane	1	RDB2 (UK) - S, LBAP (CON, FLI), LI(VC51, LR)
Lagarosiphon major	Curly Waterweed	1	WCA9, INNS
Carex pseudocyperus	Cyperus Sedge	37	RDB1 (Wales) - NT, LBAP (GWY), LI(SEWBRcC),

Latin name	Common name	Number of records	Conservation status
			LI(VC47), LI(VC48, LR), LI(VC49, LR), LI(VC52, LR)
Narcissus pseudonarcissus subsp. pseudonarcissus	Daffodil	3	LBAP (TRF), LI(SEWBRcC), LI(VC43)
Lolium temulentum	Darnel	1	RDB1 (Wales) - RE, RDB1 (UK) - CR, RDB2 (UK) - R
Lepidium latifolium	Dittander	7	RDB2 (UK) - S, LBAP (CON, FLI)
Sambucus ebulus	Dwarf Elder	3	LBAP (GWY), LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LR), LI(VC51, LR), LI(VC52, LR)
Malva neglecta	Dwarf Mallow	10	RDB1 (Wales) - NT, LBAP (BRG), LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LS), LI(VC52, LR)
Euphorbia exigua	Dwarf Spurge	1	RDB1 (Wales) - NT, RDB1 (UK) - NT, LI(SEWBRcC), LI(VC49, LR), LI(VC50, LR), LI(VC51, LS), LI(VC52, L
Cirsium acaule	Dwarf Thistle	5	LBAP (DEN, FLI), LI(SEWBRcC), LI(VC47), LI(VC50, LR), LI(VC51, LR)
Dactylorhiza incarnata	Early Marsh-orchid	1	LBAP (BRG, GWY, TRA), LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC49, LR), LI(VC51, LS)
Dactylorhiza incarnata subsp. incarnata	Early Marsh-Orchid	2	LBAP (BGW, DEN, GWY, TRA), LI(SEWBRcC), LI(VC43), LI(VC48, LR), LI(VC49, LR), LI(VC51, LR)
Poa infirma	Early Meadow-grass	6	RDB2 (UK) - S
Lemna gibba	Fat Duckweed	83	LI(SEWBRcC), LI(VC47), LI(VC50, LR), LI(VC51, LR), LI(VC52, LR)
Galium uliginosum	Fen Bedstraw	16	LBAP (BRG, VOG), LI(SEWBRcC), LI(VC47), LI(VC49, LS), LI(VC51, LS), LI(VC52, LS)
Potamogeton pectinatus	Fennel Pondweed	47	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC48, LR), LI(VC49, LR)
Eleocharis quinqueflora	Few-flowered Spike-rush	1	LI(SEWBRcC), LI(VC47), LI(VC50, LR), LI(VC51, LS)
Cerastium arvense	Field Mouse-ear	1	RDB1 (Wales) - EN, LI(VC52, LR)
Lepidium campestre	Field Pepperwort	1	RDB1 (Wales) - VU, LI(VC47), LI(VC49, LR), LI(VC50, LR), LI(VC51, LS)

Latin name	Common name	Number of records	Conservation status
<i>Oenanthe aquatica</i>	Fine-leaved Water-dropwort	4	LI(SEWBRcC), LI(VC47), LI(VC51, LS)
<i>Butomus umbellatus</i>	Flowering-rush	8	RDB1 (Wales) - VU, LBAP (CON), LI(SEWBRcC), LI(VC43), LI(VC51, LR), LI(VC52)
<i>Gymnadenia conopsea</i>	Fragrant Orchid	3	S7, LBAP (BRG, TRA, VOG), LI(SEWBRcC), LI(VC43), LI(VC48, LS), LI(VC49, LS), LI(VC50, LR)
<i>Gymnadenia conopsea</i> subsp. <i>conopsea</i>	Fragrant Orchid	1	S7, LBAP (TRA)
<i>Heracleum mantegazzianum</i>	Giant Hogweed	7	WCA9, INNS
<i>Erophila glabrescens</i>	Glabrous Whitlowgrass	2	LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LR), LI(VC52, LS)
<i>Tragopogon pratensis</i> subsp. <i>minor</i>	Goat's-Beard	2	LI(VC48, LS)
<i>Rumex maritimus</i>	Golden Dock	1	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC50, LR)
<i>Ranunculus auricomus</i>	Goldilocks Buttercup	3	LI(SEWBRcC), LI(VC48, LR), LI(VC49, LS), LI(VC52, LS)
<i>Chenopodium bonus-henricus</i>	Good-King-Henry	1	RDB1 (UK) - VU, LBAP (GWY, VOG), LI(SEWBRcC), LI(VC48, LS), LI(VC49, LS), LI(VC50, LR), LI(VC52, LR)
<i>Lathyrus nissolia</i>	Grass Vetchling	8	LI(SEWBRcC), LI(VC43), LI(VC49, LR), LI(VC50, LS)
<i>Lactuca virosa</i>	Great Lettuce	1	LBAP (CON), LI(SEWBRcC), LI(VC50, LR)
<i>Rorippa amphibia</i>	Great Yellow-cress	7	LI(SEWBRcC), LI(VC47), LI(VC50, LR), LI(VC51, LR)
<i>Platanthera chlorantha</i>	Greater Butterfly-orchid	5	RDB1 (UK) - NT, LBAP (GWY, MON, TRA), LI(SEWBRcC), LI(VC43), LI(VC49, LS), LI(VC50, LS), LI(VC51, LS)
<i>Spirodela polyrhiza</i>	Greater Duckweed	117	LBAP (CON), LI(SEWBRcC), LI(VC47), LI(VC50, LS), LI(VC51, LR)
<i>Centaurea scabiosa</i>	Greater Knapweed	3	LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LR), LI(VC50, LS)
<i>Vinca major</i>	Greater Periwinkle	16	INNS
<i>Carex riparia</i>	Greater Pond-sedge	95	LBAP (BRG, DEN, GWY), LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC48, LS), LI(VC49, LS), LI(VC50, LS), LI(
<i>Spergularia media</i>	Greater Sea-spurrey	3	LBAP (CON), LI(SEWBRcC), LI(VC48, LS), LI(VC50, LS)
<i>Veronica agrestis</i>	Green Field-speedwell	4	LI(SEWBRcC), LI(VC48, LS)
<i>Helleborus viridis</i>	Green Hellebore	8	LI(SEWBRcC), LI(VC52, LR)

Latin name	Common name	Number of records	Conservation status
<i>Schoenoplectus tabernaemontani</i>	Grey Club-rush	3	LBAP (CON), LI(SEWBRcC), LI(VC47), LI(VC50, LR)
<i>Veronica polita</i>	Grey Field-speedwell	13	LI(SEWBRcC)
<i>Ranunculus sardous</i>	Hairy Buttercup	1	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC50, LR), LI(VC51, LS)
<i>Hypericum hirsutum</i>	Hairy St John's-wort	22	LI(SEWBRcC), LI(VC48, LR), LI(VC49, LR)
<i>Viola hirta</i>	Hairy Violet	6	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC49, LS), LI(VC50, LS), LI(VC52, LS)
<i>Parapholis strigosa</i>	Hard-grass	1	LBAP (CON), LI(SEWBRcC), LI(VC48, LS), LI(VC49, LR), LI(VC50, LR), LI(VC51, LS)
<i>Picris hieracioides</i>	Hawkweed Oxtongue	6	LI(SEWBRcC), LI(VC43), LI(VC49, LR), LI(VC50, LR), LI(VC51, LR)
<i>Luzula multiflora</i> subsp. <i>congesta</i>	Heath Wood-Rush	1	LI(VC47)
<i>Lamium amplexicaule</i>	Henbit Dead-nettle	1	LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC50, LR)
<i>Paris quadrifolia</i>	Herb-paris	11	LBAP (CDF, CON, FLI), LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC51, LS), LI(VC52, LR)
<i>Leycesteria formosa</i>	Himalayan Honeysuckle	7	INNS
<i>Plantago media</i>	Hoary Plantain	6	LI(SEWBRcC), LI(VC43), LI(VC48, LR), LI(VC49, LR), LI(VC50, LS), LI(VC52, LR)
<i>Jacobaea erucifolia</i>	Hoary Ragwort	17	LBAP (GWY), LI(VC47), LI(VC48, LR), LI(VC49, LS), LI(VC52, LS)
<i>Zannichellia palustris</i>	Horned Pondweed	26	LBAP (GWY), LI(SEWBRcC), LI(VC43), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR)
<i>Mimulus guttatus</i> x <i>luteus</i> = <i>M. x robertsii</i>	Hybrid Monkeyflower	1	LI(VC52, LR), INNS
<i>Stachys sylvatica</i> x <i>palustris</i> = <i>S. x ambigua</i>	Hybrid Woundwort	1	LBAP (GWY), LI(SEWBRcC), LI(VC48, LS), LI(VC49, LS)
<i>Impatiens glandulifera</i>	Indian Balsam	11	WCA9, INNS
<i>Orobanche hederaceae</i>	Ivy Broomrape	1	LBAP (ANG, CON), LI(SEWBRcC), LI(VC48, LR), LI(VC50, LS), LI(VC52, LS)
<i>Lemna trisulca</i>	Ivy-leaved Duckweed	77	LBAP (GWY), LI(SEWBRcC), LI(VC43), LI(VC49, LR)
<i>Fallopia japonica</i>	Japanese Knotweed	171	WCA9, INNS
<i>Rosa rugosa</i>	Japanese Rose	1	WCA9, INNS
<i>Torilis nodosa</i>	Knotted Hedge-parsley	3	LI(SEWBRcC), LI(VC47), LI(VC49, LS), LI(VC50, LR), LI(VC51, LR), LI(VC52, LS)

Latin name	Common name	Number of records	Conservation status
<i>Thymus pulegioides</i>	Large Thyme	1	LI(SEWBRcC), LI(Vc51, LR)
<i>Egeria densa</i>	Large-flowered Waterweed	1	INNS
<i>Tilia platyphyllos</i>	Large-leaved Lime	1	RDB2 (UK) - S, LBAP (CON, FLI), LI(Vc43)
<i>Lemna minuta</i>	Least Duckweed	29	INNS
<i>Typha angustifolia</i>	Lesser Bulrush	2	LI(SEWBRcC), LI(Vc43), LI(Vc48, LR), LI(Vc49, LR), LI(Vc50, LR), LI(Vc52, LS)
<i>Ficaria verna</i> var. <i>bulbifer</i>	Lesser Celandine	6	LI(Vc49, LS), LI(Vc52, LS)
<i>Spergularia marina</i>	Lesser Sea-spurrey	4	LI(SEWBRcC), LI(Vc49, LS)
<i>Bromus hordeaceus</i> x <i>lepidus</i> = <i>B. x pseudothominei</i>	Lesser Soft-brome	2	LBAP (GWY), LI(SEWBRcC), LI(Vc49, LS), LI(Vc52, LS)
<i>Potamogeton nodosus</i>	Loddon Pondweed	1	RDB1 (UK) - VU, RDB2 (UK) - R
<i>Carex extensa</i>	Long-bracted Sedge	2	LBAP (BRG, CON), LI(SEWBRcC), LI(Vc49, LS), LI(Vc50, LS), LI(Vc51, LR)
<i>Carex viridula</i> subsp. <i>brachyrrhyncha</i>	Long-stalked Yellow-sedge	1	LBAP (BRG, DEN, VOG), LI(SEWBRcC), LI(Vc47), LI(Vc49, LS), LI(Vc51, LS)
<i>Hippuris vulgaris</i>	Mare's-tail	2	RDB1 (Wales) - NT, LBAP (BGW, BRG), LI(SEWBRcC), LI(Vc48, LS), LI(Vc49, LR), LI(Vc50, LR), LI(Vc52, LS)
<i>Rumex palustris</i>	Marsh Dock	2	RDB1 (Wales) - EN, LI(SEWBRcC)
<i>Epipactis palustris</i>	Marsh Helleborine	2	CITES, LBAP (FLI, GWY, TRA, VOG), LI(SEWBRcC), LI(Vc47), LI(Vc48, LS), LI(Vc49, LR), LI(Vc51, LS)
<i>Stellaria palustris</i>	Marsh Stitchwort	1	S7, RDB1 (Wales) - VU, RDB1 (UK) - VU, LI(Vc47), LI(Vc52, LS)
<i>Viola palustris</i> subsp. <i>palustris</i>	Marsh Violet	1	LI(Vc47)
<i>Hordeum secalinum</i>	Meadow Barley	23	LBAP (GWY), LI(SEWBRcC), LI(Vc43), LI(Vc49, LS)
<i>Bromus commutatus</i>	Meadow Brome	4	LI(SEWBRcC), LI(Vc50, LR), LI(Vc51, LR), LI(Vc52, LR)
<i>Viscum album</i>	Mistletoe	63	LBAP (CDF, TRF), LI(SEWBRcC), LI(Vc48, LR), LI(Vc51, LR)
<i>Mimulus guttatus</i> x <i>luteus</i> x <i>cupreus</i>	Monkeyflower	1	INNS
<i>Crocsmia</i>	Montbretia	1	WCA9, INNS
<i>Crocsmia pottsii</i> x <i>aurea</i> = <i>C. x crocosmiiflora</i>	Montbretia	12	WCA9, INNS
<i>Myosotis laxa</i> subsp. <i>caespitosa</i>	<i>Myosotis laxa</i> subsp. <i>caespitosa</i>	6	LI(Vc47)

Latin name	Common name	Number of records	Conservation status
<i>Rorippa microphylla</i>	Narrow-fruited Water-cress	1	LBAP (CON), LI(SEWBRcC), LI(VC43), LI(VC50, LR)
<i>Lotus tenuis</i>	Narrow-leaved Bird's-foot-trefoil	2	RDB1 (Wales) - NT, LI(SEWBRcC)
<i>Lathyrus sylvestris</i>	Narrow-leaved Everlasting-pea	19	LI(SEWBRcC), LI(VC43), LI(VC49, LS)
<i>Alisma lanceolatum</i>	Narrow-leaved Water-plantain	3	LI(SEWBRcC), LI(VC47), LI(VC52, LR)
<i>Crassula helmsii</i>	New Zealand Pigmyweed	1	WCA9, INNS
<i>Epilobium brunescens</i>	New Zealand Willowherb	1	INNS
<i>Gastridium ventricosum</i>	Nit-grass	1	RDB1 (Wales) - DD, RDB2 (UK) - S, LBAP (BRG, SWN, VOG), LI(SEWBRcC)
<i>Rorippa islandica</i>	Northern Yellow-cress	1	RDB2 (UK) - S, LBAP (GWY), LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC50, LR), LI(VC52, LR)
<i>Elodea nuttallii</i>	Nuttall's Waterweed	15	INNS
<i>Chenopodium glaucum</i>	Oak-leaved Goosefoot	7	RDB1 (Wales) - VU, RDB1 (UK) - VU, RDB2 (UK) - S
<i>Linum bienne</i>	Pale Flax	1	LBAP (BRG), LI(SEWBRcC), LI(VC49, LR), LI(VC50, LR), LI(VC51, LS), LI(VC52, LS)
<i>Cortaderia selloana</i>	Pampas-grass	1	INNS
<i>Myriophyllum aquaticum</i>	Parrot's-feather	1	WCA9, INNS
<i>Oenanthe lachenalii</i>	Parsley Water-dropwort	4	LBAP (BRG, CON, GWY), LI(SEWBRcC), LI(VC47), LI(VC49, LS), LI(VC50, LR), LI(VC51, LS)
<i>Callitriche brutia</i>	Pedunculate Water-starwort	2	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC49, LS), LI(VC50), LI(VC51, LR), LI(VC52, LR)
<i>Silau silaus</i>	Pepper-saxifrage	6	LI(SEWBRcC), LI(VC47), LI(VC50, LS)
<i>Veronica catenata</i>	Pink Water-Speedwell	29	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR)
<i>Prunus lusitanica</i>	Portugal Laurel	1	INNS
<i>Lithospermum purpureocaeruleum</i>	Purple Gromwell	1	RDB1 (Wales) - EN, RDB2 (UK) - R, LBAP (DEN, SWN, VOG), LI(VC50, LR)
<i>Ajuga pyramidalis</i>	Pyramidal Bugle	1	RDB1 (UK) - VU, RDB2 (UK) - S
<i>Anacamptis pyramidalis</i>	Pyramidal Orchid	5	LBAP (BRG, CLY, TRA), LI(SEWBRcC), LI(VC47), LI(VC48, LS)
<i>Odontites vernus</i> subsp. <i>serotinus</i>	Red Bartsia	1	LI(VC47)

Latin name	Common name	Number of records	Conservation status
<i>Puccinellia distans</i>	Reflexed Meadow-Grass	3	LBAP (CON, DEN, GWY), LI(SEWBRcC), LI(VC48, LR), LI(VC49, LR), LI(VC51, LS), LI(VC52, LR)
<i>Rhododendron ponticum</i>	Rhododendron ponticum	3	WCA9, INNS
<i>Ceratophyllum demersum</i>	Rigid Hornwort	42	LBAP (BRG, CON), LI(SEWBRcC), LI(VC49, LR), LI(VC50, LR), LI(VC51, LR), LI(VC52, LS)
<i>Sedum forsterianum</i>	Rock Stonecrop	1	RDB2 (UK) - S, LBAP (CON), LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC49, LR), LI(VC50, LR), LI(VC51, LS)
<i>Wolffia arrhiza</i>	Rootless Duckweed	67	RDB1 (UK) - VU, RDB2 (UK) - S, LI(SEWBRcC)
<i>Trifolium scabrum</i>	Rough Clover	1	LBAP (CON, GWY), LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC48, LS), LI(VC49, LR), LI(VC50, LR), LI(VC51, LR)
<i>Geranium rotundifolium</i>	Round-leaved Crane's-bill	7	LBAP (BGW), LI(SEWBRcC), LI(VC52, LR)
<i>Mentha suaveolens</i>	Round-leaved Mint	1	RDB1 (Wales) - DD, RDB1 (UK) - DD, RDB2 (UK) - S, LI(SEWBRcC), LI(VC48, LS), LI(VC49, LS), LI(VC50, LR)
<i>Trifolium squamosum</i>	Sea Clover	2	RDB2 (UK) - S, LBAP (VOG)
<i>Sagina maritima</i>	Sea Pearlwort	2	LI(SEWBRcC), LI(VC47), LI(VC48, LS), LI(VC50, LR)
<i>Erodium maritimum</i>	Sea Stork's-bill	1	LBAP (ANG, BRG), LI(SEWBRcC), LI(VC48, LR), LI(VC51, LR), LI(VC52, LS)
<i>Seriphidium maritimum</i>	Sea Wormwood	1	LBAP (GWY), LI(SEWBRcC), LI(VC49, LR), LI(VC52, LR)
<i>Kickxia elatine</i>	Sharp-leaved Fluellen	1	LBAP (CON, GWY), LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR), LI(VC51, LR), LI(VC52, LR)
<i>Littorella uniflora</i>	Shoreweed	1	LBAP (BGW, BRG), LI(SEWBRcC), LI(VC47), LI(VC50, LS), LI(VC51, LR)
<i>Rosa stylosa</i>	Short-styled Field-rose	7	LI(SEWBRcC), LI(VC51, LR)
<i>Bupleurum tenuissimum</i>	Slender Hare's-ear	6	S7, RDB1 (UK) - VU, RDB2 (UK) - S, LBAP (CON, FLI, VOG), LI(VC51, LR)
<i>Arenaria serpyllifolia</i> subsp. <i>leptoclados</i>	Slender Sandwort	2	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC48, LR), LI(VC49, LS)
<i>Urtica urens</i>	Small Nettle	1	LI(SEWBRcC), LI(VC48, LS)

Latin name	Common name	Number of records	Conservation status
Potamogeton berchtoldii	Small Pondweed	47	LBAP (GWY), LI(SEWBRcC), LI(Vc43), LI(Vc47), LI(Vc48, LS), LI(Vc49, LS), LI(Vc51, LS)
Scabiosa columbaria	Small Scabious	1	RDB1 (Wales) - VU, LI(SEWBRcC), LI(Vc47), LI(Vc49, LS)
Bromus racemosus	Smooth Brome	14	LBAP (GWY), LI(SEWBRcC), LI(Vc49, LR), LI(Vc50, LR), LI(Vc51, LR), LI(Vc52, LR)
Symphoricarpos albus	Snowberry	19	INNS
Ceratophyllum submersum	Soft Hornwort	12	RDB1 (Wales) - VU, LI(SEWBRcC)
Hyacinthoides hispanica	Spanish Bluebell	9	INNS
Myriophyllum spicatum	Spiked Water-milfoil	10	LBAP (BGW, BRG), LI(SEWBRcC), LI(Vc48, LR), LI(Vc50, LR)
Ononis spinosa	Spiny Restharrow	6	LBAP (BRG), LI(SEWBRcC), LI(Vc49, LR), LI(Vc50, LR), LI(Vc52, LR)
Medicago arabica	Spotted Medick	7	LBAP (GWY), LI(SEWBRcC), LI(Vc49, LS), LI(Vc50, LR), LI(Vc51, LR), LI(Vc52, LR)
Euphorbia amygdaloides subsp. robbiae	Spurge	1	LI(SEWBRcC), LI(Vc43), LI(Vc47), LI(Vc50, LR), LI(Vc51, LS)
Daphne laureola	Spurge-laurel	5	LBAP (GWY), LI(SEWBRcC), LI(Vc47), LI(Vc49, LS), LI(Vc52, LS)
Iris foetidissima	Stinking Iris	26	LI(SEWBRcC), LI(Vc51, LS)
Sison amomum	Stone Parsley	29	LI(SEWBRcC), LI(Vc47), LI(Vc49, LS)
Trifolium fragiferum	Strawberry Clover	6	LI(SEWBRcC), LI(Vc48, LS), LI(Vc50, LR), LI(Vc51, LS)
Persicaria mitis	Tasteless Water-pepper	2	RDB1 (Wales) - VU, RDB1 (UK) - VU, RDB2 (UK) - S, LBAP (VOG), LI(Vc49, LR)
Carex strigosa	Thin-spiked Wood-sedge	12	LBAP (BRG), LI(SEWBRcC), LI(Vc43), LI(Vc47), LI(Vc50, LR), LI(Vc51, LR)
Allium triquetrum	Three-cornered Garlic	5	WCA9, INNS
Arenaria serpyllifolia subsp. serpyllifolia	Thyme-leaved Sandwort	2	LI(Vc47)
Malva arborea	Tree-mallow	4	LBAP (CON, DEN), LI(SEWBRcC), LI(Vc50)
Oenanthe fistulosa	Tubular Water-dropwort	52	S7, RDB1 (UK) - VU, LBAP (GWY, VOG), LI(SEWBRcC), LI(Vc43), LI(Vc47), LI(Vc48, LR), LI(Vc49, LS), LI
Carex elata	Tufted-sedge	14	LBAP (BRG, GWY), LI(SEWBRcC), LI(Vc49, LR), LI(Vc51, LR)

Latin name	Common name	Number of records	Conservation status
<i>Sparganium emersum</i>	Unbranched Bur-reed	13	LBAP (GWY), LI(SEWBRcC), LI(Vc49, LS), LI(Vc51, LS)
<i>Callitriche platycarpa</i>	Various-leaved Water-starwort	4	LI(SEWBRcC), LI(Vc47), LI(Vc48, LS), LI(Vc49, LS), LI(Vc50, LR), LI(Vc51, LS)
<i>Echium vulgare</i>	Viper's-bugloss	23	LBAP (BGW, GWY), LI(SEWBRcC), LI(Vc47), LI(Vc48, LS), LI(Vc49, LS), LI(Vc50, LS), LI(Vc51, LS), LI(V
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	2	WCA9, INNS
<i>Cotoneaster horizontalis</i>	Wall Cotoneaster	10	WCA9, INNS
<i>Myosoton aquaticum</i>	Water Chickweed	6	LBAP (BRG), LI(SEWBRcC), LI(Vc43), LI(Vc49, LR), LI(Vc51, LS)
<i>Elodea</i>	Waterweed	7	WCA9, INNS
<i>Viburnum lantana</i>	Wayfaring-tree	10	LI(SEWBRcC), LI(Vc51, LS)
<i>Misopates orontium</i>	Weasel's-snout	1	RDB1 (UK) - VU, LBAP (GWY), LI(Vc48, LR), LI(Vc49, LR), LI(Vc52, LR)
<i>Meconopsis cambrica</i>	Welsh Poppy	1	RDB2 (UK) - S, LBAP (CON, DEN, NPT), LI(Vc43), LI(Vc48, LS), LI(Vc49, LS)
<i>Bryonia dioica</i>	White Bryony	14	LI(SEWBRcC), LI(Vc49, LR)
<i>Sedum album</i>	White Stonecrop	7	INNS
<i>Nymphaea alba</i>	White Water-lily	2	LBAP (GWY), LI(SEWBRcC), LI(Vc49, LS)
<i>Sorbus aucuparia</i> x <i>aria</i> = <i>S. x thuringiaca</i>	Whitebeam	1	RDB1 (Wales) - VU
<i>Myriophyllum verticillatum</i>	Whorled Water-milfoil	6	RDB1 (Wales) - VU, RDB1 (UK) - VU, LI(Vc43), LI(Vc52, LR)
<i>Catabrosa aquatica</i>	Whorl-grass	23	LBAP (GWY, VOG), LI(SEWBRcC), LI(Vc43), LI(Vc47), LI(Vc49, LR), LI(Vc51, LR), LI(Vc52, LS)
<i>Brassica oleracea</i>	Wild Cabbage	1	RDB2 (UK) - S, LBAP (ANG, CON, VOG), LI(SEWBRcC), LI(Vc47), LI(Vc49, LS), LI(Vc50, LR), LI(Vc52, LS)
<i>Apium graveolens</i>	Wild Celery	3	LBAP (BRG), LI(SEWBRcC), LI(Vc48, LS), LI(Vc49, LR), LI(Vc50), LI(Vc52, LS)
<i>Reseda lutea</i>	Wild Mignonette	1	LBAP (BGW, GWY), LI(SEWBRcC), LI(Vc43), LI(Vc49, LR), LI(Vc50, LR)
<i>Viola tricolor</i>	Wild Pansy	1	RDB1 (Wales) - VU, RDB1 (UK) - NT, LI(SEWBRcC), LI(Vc47), LI(Vc48, LS), LI(Vc50, LS)
<i>Lonicera nitida</i>	Wilson's Honeysuckle	10	INNS
<i>Hordelymus europaeus</i>	Wood Barley	1	RDB1 (Wales) - VU, RDB2 (UK) - S, LI(Vc47), LI(Vc50)

Latin name	Common name	Number of records	Conservation status
<i>Euphorbia amygdaloides</i>	Wood Spurge	13	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC50, LR), LI(VC51, LS)
<i>Cirsium eriophorum</i>	Woolly Thistle	7	LBAP (BRG), LI(SEWBRcC), LI(VC43)
<i>Lamiastrum galeobdolon</i> subsp. <i>argentatum</i>	Yellow Archangel	7	WCA9, INNS
<i>Blackstonia perfoliata</i>	Yellow-wort	7	LBAP (GWY), LI(SEWBRcC), LI(VC47), LI(VC48, LR), LI(VC49, LS), LI(VC52, LS)
<i>Zannichellia palustris</i> subsp. <i>palustris</i>	<i>Zannichellia palustris</i> subsp. <i>palustris</i>	1	LBAP (GWY), LI(SEWBRcC), LI(VC43), LI(VC48, LR), LI(VC49, LR), LI(VC50, LR)

6.3.85 Receptor evaluation: **There are no sections of the Assessment Site within Gwent Levels - Redwick and Llandeenny SSSI as part of the updated plans.**

Future baseline

6.3.86 Provided water levels are appropriately managed, it is unlikely that the baseline would change significantly over the lifetime of the development.

6.4 Ecological evaluation of receptors

6.4.1 The ecological receptors to be considered for significant effects are given in Table 6.9 and are described in Appendix 6.9. These are of local or higher value; those ecological receptors that have less than local value are not considered further unless they are European Protected Species and there is potential for them to be present (in which case the regulatory context i.e. the Habitats Regulations 2017 is considered), or they are the subject of national legislation (i.e. Wildlife and Countryside Act 1981).

6.4.2 Impact associated with the Severn Estuary SPA, and avian interest features of nearby nature conservation sites are properly assessed within Chapter 7 Ornithology, and are not considered further here.

Table 6.9 Ecological receptors to be considered for significant effects

Receptor	Status	Valuation
Severn Estuary RAMSAR	Ramsar Convention of Wetlands	International
Gwent Levels SSSI - Redwick and Llandeenny	Wildlife and Countryside Act 1981	National (United Kingdom)

Receptor	Status	Valuation
Severn Estuary SSSI	Wildlife and Countryside Act 1981	National (United Kingdom)
Craig-Y-Perthi Field South SINC	Sites of Nature Conservation Importance	County (Newport)
Craig-Y-Perthi Wood SINC	Sites of Nature Conservation Importance	County (Newport)
Ridings Wood SINC	Sites of Nature Conservation Importance	County (Newport)
Coastal and floodplain grazing marsh	Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority habitat	County (Newport)
All hedgerows	Environment (Wales) act 2016, Section 7 Local biodiversity Action plan priority habitat Hedgerow Regulations 1997	Local
Reens	Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority habitat	County (Newport)
Ditches	Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority habitat	Local
Amphibians (common and widespread)	Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 (Common Toad)	Site
Great Crested Newt	European Protected Species Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority species	Site
Bats	European Protected Species Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority species	Local
Common Dormouse	European Protected Species Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority species	Site
Otter	European Protected Species Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority species	Site
Water Vole	European Protected Species, Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7 Local biodiversity action plan priority species	Local
European Eel	The Eels (England and Wales) Regulations 2009 Environment (Wales) Act 2016, Section 7	Local
Reptiles	Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7	Local
Invertebrates	Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7	National
Plants	Wildlife and Countryside Act 1981 Environment (Wales) Act 2016, Section 7	National

The need for an appropriate assessment

- 6.4.3 An appropriate assessment is required by Regulation 48 of the Habitats Regulations 1994 implementing Article 6(3) of the Habitats Directive (92/43/EEC) in the event that it is considered a plan or project, not connected with the management of that site, is likely to have a 'significant effect' on any European (Natura) site, i.e. Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites.

- 6.4.4 The purpose of appropriate assessment is to ensure that protection of the integrity of European sites is a part of the planning process at a regional and local level. Permission can only be granted if it can be ascertained that the plan or project would not affect the integrity of the European site.
- 6.4.5 It is appropriate to use the information assembled for this EclA when carrying out the appropriate assessment under the Habitats Regulations.
- 6.4.6 There are Natura sites within the surrounding area. A Habitat Regulations Assessment has been completed, including an appropriate assessment, and draws on information within this report.

Embedded Mitigation

- 6.4.7 The design and layout of the Proposed Development has responded to the location's value and sensitivities to reduce the magnitude of such impacts through primary (embedded) mitigation as summarised below:
- i) Avoidance of construction in the accepted nesting season (March to August inclusive) in areas where nesting birds have been recorded.
 - ii) Existing farm access tracks and gateways should be used wherever possible during construction, operation and decommissioning. Any hedgerow lost would be replaced resulting in no net loss of hedgerow habitat. **Approx. 11 km of new hedgerow is proposed on-site with minimal hedgerow loss to be incurred, with existing farm tracks and entrances used within the design.**
 - iii) During construction, operation and decommissioning buffers would be maintained from reens at the field margins, with wider buffers from the main reens. No obstructions would be placed within watercourses in order to minimise impacts on Otter, Water Vole, Reptiles and amphibians. **All land within the SSSI has been removed from the updated Proposed Development, resulting in no Reens now being in close proximity to the Proposed Development. Where watercourses are present within the scheme, a minimum 7m buffer has been adopted.**
 - iv) The site would not be artificially lit during construction, operation and decommissioning in order to minimise impacts on bats, invertebrates, Otter and nocturnal bird movements. **No permanent lighting is proposed on-site.**
 - v) Wet meadow and hedgerow planting would aim to achieve no net loss in valued habitats. **Approx. 43.3 ha of diverse new wildflower meadow (EM2, EM8 and**

EM10 or similar) is proposed on-site, replacing monocultural cropping/poor condition grassland on-site.

- vi) Existing watercourse crossing points would be used by construction traffic where possible to minimise potential impacts.
- vii) Solar panels would be bolt anchored to a metal frame (table), which would be mounted on steel posts driven or secured into the ground (the pile driven sub-construction method). Solar panels will not be vertically aligned. No substantial areas of concrete construction would be required, with the exception of foundations for the transformer stations and substation preventing unnecessary land take and impacts on semi-improved and improved grassland bird foraging and breeding habitats.
- viii) Solar arrays would be installed with significant clearance between rows, which would permit vegetation growth beneath and continue to provide bird foraging and potential nesting habitat.
- ix) Solar panels would be positioned at an inclined angle and this, along with the large gaps between rows this would enable birds to distinguish the surface from a water body.
- x) The Proposed Development would not require land take from any field margins which will be enhanced with wildflower meadow enhanced with Shrill Carder Bee food plants.
- xi) During construction, operation and decommissioning 12 m buffers from the main reens would be implemented in line with National Resources Wales (NRW) requirements.
- xii) The Proposed Development has been designed so that it there would be no obstructions to watercourses, therefore allowing any fauna to commute freely.
- xiii) Stock fencing would be included in the design around the solar panel arrays, but margins would be maintained that are a minimum of 15 m from woodland, 12 m from reens; and 7 m from ditches and 5 m from hedgerows.
- xiv) Habitats with potential for reptiles likely to be affected by construction activities would be de-vegetated prior to any site activities under the supervision of a suitably qualified ecologist. Grassland to be removed would initially be strimmed to a height of no more than 20cm, having first used an ecologist to walk and beat the habitat. This would encourage reptiles to disperse naturally into the neighbouring uncut vegetation to the sides. After at least 24hrs a second cut would be made as close to ground/bank level as possible.

- xv) During dry periods, damping down exposed excavations and transitional surfaces would be adopted to suppress dust.

Construction Phase Effects

6.4.8 During the construction phase, there is predictable adverse effects, which are generally unavoidable; many are temporary or short term and can be minimised as part of construction management, but some have the potential for more lasting effect. These include:

- i) temporary habitat loss associated with temporary access routes, cable trenches, storage, and site buildings and site compounds.
- ii) areas for plant maintenance and for storage of oils, fuels and chemicals.
- iii) dust generation.
- iv) environmental incidents and accidents.
- v) acoustic disturbance and vibration from construction activities.
- vi) ground excavation.
- vii) horizontal directional drilling operations.
- viii) removal of site offices and temporary compounds/tracks.
- ix) vegetation clearance.

Operational Phase

- 6.4.9 Buffers to woodland, reens, hedgerows and ditches established during the construction phase would be retained during the operational phase. These buffers would be delineated by a suitable fence.
- 6.4.10 Following construction, temporary access tracks would be removed, and the footprint of the track and bare areas beneath the solar arrays restored to agricultural grassland by re-seeding with a suitable grass mix. For the cable route, top and sub-soils would be stored separately and replaced in sequence following trenching, and the route re-seeded with a suitable grass mix.
- 6.4.11 In a central swathe through the Site, buffer grassland would be cut for hay in late September and enhanced for shrill carder bee through additional plantings of wildflowers.
- 6.4.12 Areas around the site would be enhanced for a number of pollinators, including shrill carder bee. Partially shaded habitats along panel margins and between rows would



be sown with a flower mix suitable to include common knapweed, tufted vetch, selfheal and hedge woundwort.

Efficacy of the secondary mitigation proposed

- 6.4.13 The majority of valued ecological receptors are associated with field boundary features. By ensuring boundary features are protected during all phases of development, the associated ecological receptors would be properly protected, and adverse effects avoided.
- 6.4.14 Suitable management of buffer and panel margin grassland across the Site will provide significant habitat gain for Shrill Carder Bee.
- 6.4.15 The re-seeding of bare ground, and hydro-seeding permanent access tracks and parking/storage areas will minimise the loss of grazing habitat, although there would be some unavoidable loss of this habitat due to transformer stations, the substation and its access track (which will utilise existing farm tracks where possible).
- 6.4.16 The adoption of a no night-works policy during the bat active period will ensure light-averse bats and nocturnal birds can continue to forage within the Assessment Site during the construction phase. Bats would continue to use the Assessment Site following development, with the retention of exclusion zones and reduced agricultural management likely to enhance the operational site for bats.
- 6.4.17 The reasonable avoidance measures recommended to minimise impact on reptiles is regularly recommended for sites where they may be present. Due to their escape response to vibration and noise, this is a very effective measure to minimise impact and avoid an offence under relevant wildlife legislation, whilst protection of boundary habitats within an exclusion zone will ensure the local conservation status of these species is maintained.

6.5 Assessment of Likely Significant Effects

Construction Phase

- 6.5.1 During the construction phase, there is predictable adverse effects which are generally unavoidable; many are temporary or short term and can be minimised as part of construction management, but some have the potential for more lasting effect. These include:



- i) Temporary habitat loss associated with temporary access routes, cable trenches, storage, site buildings and site compounds;
 - ii) areas for plant maintenance and for storage of oils, fuels and chemicals;
 - iii) dust generation;
 - iv) environmental incidents and accidents;
 - v) lighting;
 - vi) acoustic disturbance and vibration from construction activities;
 - vii) ground excavation;
 - viii) horizontal directional drilling operations;
 - ix) removal of site offices and temporary compounds; and,
 - x) vegetation clearance.
- 6.5.2 However, any permanent loss of habitat under the development is addressed as an operational impact.
- 6.5.3 The potential for adverse impacts has been minimised as far as possible through the application of good practice techniques and adherence to well-designed method statements. These would be managed strictly through the LEMP, CTMP and CEMP and are detailed as Primary (embedded) and Secondary mitigation.

Designated sites

Severn Estuary Ramsar

- 6.5.4 The Proposed Development is 4.1km to the north of the Severn Estuary Ramsar which is of International value.
- 6.5.5 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels which would impact European Eel populations. There is also potential for direct harm or injury, and the creation of barriers to their movement.
- 6.5.6 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, will ensure there is negligible potential for an adverse effect on this Ramsar during the construction phase.

Gwent Levels- Redwick and Llandeenny SSSI

- 6.5.7 None of the Proposed Development is located within Gwent Levels – Redwick and Llandeenny SSSI, which is of National (UK) value. The Site sits adjacent to this SSSI.
- 6.5.8 The primary pathway of effect would be through changes in water quality and water levels, and damage to reens and ditch habitats.
- 6.5.9 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, will ensure there is negligible potential for an adverse effect on this SSSI during the construction phase.

Gwent Levels- Nash and Goldcliff SSSI

- 6.5.10 1.9 km of the proposed cable route will pass along a highway within Gwent Levels – Nash and Goldcliff SSSI which is of National (UK) value.
- 6.5.11 No ecological pathway of effect exists for effect on direct damage to habitats. The primary pathway of effect would be through changes in water quality.
- 6.5.12 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, will ensure there is negligible potential for an adverse effect on this SSSI during the construction phase of the cable route.

Severn Estuary SSSI

- 6.5.13 The Proposed Development is 4.1 km to the north of the Severn Estuary SSSI which is of National (UK) value.
- 6.5.14 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels which would impact European Eel populations. There is also potential for direct harm or injury, and the creation of barriers to their movement.
- 6.5.15 Protection of boundary habitats, and adoption of the CEMP, which will detail protection of watercourses, surface water management and dust minimization, will ensure there is negligible potential for an adverse effect on this Ramsar during the construction phase.



Craig-Y-Perthi Field South SINC, Craig-Y-Perthi Wood SINC and Ridings Wood SINC

- 6.5.16 The Proposed Development is adjacent to these SINC's which are of County (Newport) importance.
- 6.5.17 The primary pathway of effect would be through dust deposition and accidental damage.
- 6.5.18 Adoption of the CEMP to control dust deposition and buffer of habitat margins will ensure there is negligible potential for an effect on this SINC during the construction phase.

Valued Habitats

Coastal and floodplain grazing marsh

- 6.5.19 The southern part of the Proposed Development is within an area of Coastal and floodplain grazing marsh of County importance. Land is in rotation and grassland (grazing marsh) areas will vary year on year. However, this habitat type is a landscape definition and the whole site should be considered as part of it.
- 6.5.20 The primary pathway of effect would be through direct habitat loss and damage.
- 6.5.21 It is near-certain that there would be a temporary loss of a limited extent of this habitat to the construction phase associated with ground disturbance, compounds, storage areas and cable trenching. Following construction, re-seeding bare areas will ensure this negative effect would be minor, and short term for the period of construction.

Hedgerows

- 6.5.22 Hedgerows associated with field boundaries are of Local value, some with trees.
- 6.5.23 The primary pathway of effect would be through direct habitat loss and damage.
- 6.5.24 Protection of boundary habitats will ensure it is near-certain that there would be no effect on this receptor during the construction phase.

Reens

- 6.5.25 The site is enclosed in some areas by reens which are of County value.



6.5.26 The primary pathway of effect would be through direct habitat loss and damage, and changes in water quality and water levels.

6.5.27 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization will ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

Ditches

6.5.28 Fields are enclosed by hedgerows some associated with ditches that are of Local value.

6.5.29 The primary pathway of effect would be through direct habitat loss and damage, and changes in water quality and water levels.

6.5.30 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization will ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

Notable species

Amphibians

6.5.31 The Assessment Site is of Local value for common and widespread amphibians.

6.5.32 The primary pathway of effect would be through impacts to reens, ditches and adjacent terrestrial habitats, such as direct habitat loss and damage, and changes in water quality and water levels.

6.5.33 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization will ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

Great Crested Newt

6.5.34 The Assessment Site is of Site value for Great Crested Newt.



- 6.5.35 The primary pathway of effect would be through impacts to reens, ditches and adjacent terrestrial habitats, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury.
- 6.5.36 Disturbance, harm or injury to Great Crested Newt could be considered an offence under relevant wildlife legislation.
- 6.5.37 Protection of boundary habitats, adoption of the CEMP which details protection of watercourses, surface water management and dust minimization will ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

Bats

- 6.5.38 The Assessment Site is of Local value for bats.
- 6.5.39 The primary pathway of effect would be through impacts to habitat features used by foraging bats, such as direct habitat loss and damage. There would be a short-term loss in grassland habitat associated with construction due to storage areas/compounds although these habitats are of little value for bats.
- 6.5.40 No potential roosting habitats would be affected and there is negligible potential for disturbance, direct harm or injury.
- 6.5.41 Protection of boundary habitats and no night working will ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

Common Dormice

- 6.5.42 The Assessment Site is of Site value for common dormice.
- 6.5.43 The primary pathway of effect would be through impacts to habitat features used by dormice, such as direct habitat loss and damage.
- 6.5.44 Very little hedgerow habitats would be lost within the area for the solar array due to use of existing field gates/accesses used by the operational farm.
- 6.5.45 Protection of boundary habitats and no night working will ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

Otter



- 6.5.46 The Assessment Site is of Site value for Otter.
- 6.5.47 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury.
- 6.5.48 Protection of boundary habitats, no night working, and informed siting of HDD drilling rigs as detailed within the LEMP will ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

Water Vole

- 6.5.49 The Assessment Site is of Local value for Water Vole.
- 6.5.50 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury.
- 6.5.51 Protection of boundary habitats, no night working, and informed siting of HDD drilling rigs as detailed within the LEMP will ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

European Eel

- 6.5.52 The Assessment Site is of County value for European Eel, whilst they are an interest feature of the Severn Estuary Ramsar.
- 6.5.53 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury, and the creation of barriers to their movement.
- 6.5.54 Protection of boundary habitats will ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

Reptiles

- 6.5.55 The Assessment Site is of Local value for reptiles.
- 6.5.56 The primary pathway of effect would be through impacts to reens and ditches, and other boundary habitats, such as direct habitat loss and damage, and changes in



water quality and water levels that may affect prey items. There is also potential for direct harm or injury.

- 6.5.57 Protection of boundary habitats and adoption of reasonable avoidance measures during site clearance will ensure it is near-certain that there would be no effect on this receptor during the construction phase.

Invertebrates

- 6.5.58 Areas of the Assessment Site nearby the Gwent Levels SSSI - Redwick and Llandeenny.
- 6.5.59 The primary pathway of effect would be through impacts to reens and ditches, and boundary habitats, such as direct habitat loss and damage, and changes in water quality and water levels. There is also potential for affect associated with any works that impact hedgerows and damage to grassland in the south east of the site suitable for shrill carder bee.
- 6.5.60 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, and sensitive timing of construction within potential shrill carder bee habitat would ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

Plants

- 6.5.61 Areas of the Assessment Site are nearby the Gwent Levels SSSI - Redwick and Llandeenny.
- 6.5.62 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels.
- 6.5.63 Protection of boundary habitats, and adoption of the CEMP which details protection of watercourses, surface water management and dust minimization, will ensure it is near-certain that there would be a negligible effect on this receptor during the construction phase.

Operational phase

- 6.5.64 During the operational phase, effects may arise from:



- i) Maintenance.
 - ii) Changes in land-management. These can be positive, associated with changes in agricultural practices from an intensively managed monocultural crop sown on a yearly basis and subject to ongoing pesticide and chemical fertiliser usage to a diverse grassland when the Proposed Development is built, along with the creation of buffers to reens, ditches and extensive new hedgerow/wildflower meadow creation.
- 6.5.65 The potential for adverse impacts have been minimised as far as possible through the application of good practice techniques and adherence to well-designed method statements. These would be managed through the LEMP and are detailed as Primary (embedded) and Secondary mitigation.

Designated sites

Severn Estuary Ramsar

- 6.5.66 The Proposed Development is 4.1km to the north of the Severn Estuary Ramsar which is of International value.
- 6.5.67 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels which would impact European Eel populations. There is also potential for direct harm or injury, and the creation of barriers to their movement.
- 6.5.68 Improved water quality associated with changes in land management combined with protection of boundary habitats and ditch management plan make it near-certain that there would be a negligible effect on this receptor during the operational phase.

Gwent Levels – Redwick and Llandeenny SSSI

- 6.5.69 The Proposed Development is located nearby the Gwent Levels – Redwick and Llandeenny SSSI which is of National (UK) value, but not within it.
- 6.5.70 The primary pathway of effect would be through changes to adjacent land management affecting water quality. There would be no permanent habitat loss of interest feature habitats to the operational phase.

- 6.5.71 Improved water quality associated with changes in land management combined with protection of boundary habitats make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Gwent Levels – Nash and Goldcliff SSSI

- 6.5.72 1.9 km of the proposed cable route will pass within an existing highway within Gwent Levels – Nash and Goldcliff SSSI which is of National (UK) value.
- 6.5.73 No realistic pathway of effect exists for adverse effect during the operational phase and it is certain that there would be a negligible effect on this receptor during the operational phase.

Severn Estuary SSSI

- 6.5.74 The Proposed Development is 4.1 km to the north of the Severn Estuary SSSI which is of National (UK) value.
- 6.5.75 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels which would impact European Eel populations. There is also potential for direct harm or injury, and the creation of barriers to their movement.
- 6.5.76 Improved water quality associated with changes in land management combined with protection of boundary habitats and ditch management plan make it near-certain that there would be a negligible effect on this receptor during the operational phase.

Craig-Y-Perthi Field South SINC, Craig-Y-Perthi Wood SINC and Ridings Wood SINC

- 6.5.77 The Proposed Development is adjacent to these SINC's which are of County (Newport).
- 6.5.78 There is no likely primary pathway of effect.
- 6.5.79 Due to separation distance, it is certain that there would be a negligible effect on this receptor during the operational phase.

6.6 Habitats

Coastal and floodplain grazing marsh



- 6.6.1 Part of the Proposed Development is within an area of Coastal and floodplain grazing marsh of County importance.
- 6.6.2 The primary pathway of effect would be through direct habitat loss.
- 6.6.3 Solar panels are mounted on driven piles with an extremely small footprint. Transformers, the substation and associated access tracks will result in the loss of a small area of habitat.
- 6.6.4 Development will stabilise land use with the majority of the operational site managed with grazing or cutting. It is near certain that there would be a negligible effect on this receptor during the operational phase.

Hedgerows

- 6.6.5 Hedgerows associated with field boundaries are of Local value.
- 6.6.6 The primary pathway of effect would be through direct habitat loss.
- 6.6.7 Protection of boundary habitats, use of existing accesses and extensive new hedgerow creation / enhancement make it near-certain that there would be a **negligible effect** on this receptor during the operational phase.

Reens

- 6.6.8 The site is enclosed in some areas by reens which are of County value.
- 6.6.9 The primary pathway of effect would be through direct habitat loss and damage, and changes in water quality and water levels.
- 6.6.10 Improved water quality associated with reduced management pressures on land that is currently an intensively managed habitat and the creation of an additional grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses.
- 6.6.11 Combined with the protection of boundary habitats, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Ditches

- 6.6.12 Ditches are of Local value.



- 6.6.13 The primary pathway of effect would be through direct habitat loss and damage, and changes in water quality and water levels.
- 6.6.14 Improved water quality associated with reduced management pressures on land that is currently an intensively managed grassland habitat and the creation of an additional grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats, this will make it certain that the development will have a moderate positive effect on this receptor for the period of its operation.

Amphibians, including Great Crested Newt

- 6.6.15 The Assessment Site is of Local value for common and widespread amphibians.
- 6.6.16 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. Buffer habitats to field boundaries will provide improved habitat and cover.
- 6.6.17 Improved water quality associated with reduced management pressures on land that is currently an intensively managed grassland habitat and the creation of an additional grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Bats

- 6.6.18 The Assessment Site is of Local value for bats.
- 6.6.19 The primary pathway of effect would be through impacts to habitat features used by foraging bats, such as direct habitat loss and damage. The development will result in reduced management pressures on intensively managed grassland habitat, with the creation of additional grassland habitats that is currently in arable rotation. Pastoral grazing of habitats beneath panels is likely to improve its value for foraging bats, whilst improved water quality within reens and ditches will result in increased numbers of prey items for bats.
- 6.6.20 No potential roosting habitats would be affected and there is negligible potential for disturbance, direct harm or injury.



- 6.6.21 Changes in land management and improved water quality associated with these changes and protection of boundary habitats make it is near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Common Dormice

- 6.6.22 The Assessment Site is of Site value for common dormice.
- 6.6.23 The primary pathway of effect would be through impacts to habitat features used by dormice, such as direct habitat loss.
- 6.6.24 Limited hedgerow habitats would be lost within the Site due to use of existing farm field accesses, with extensive new hedgerow creation/enhancement proposed (~11km).
- 6.6.25 Protection of boundary habitats and no night working will ensure it is near-certain that there would be a negligible effect on this receptor during the operational phase.

Otter

- 6.6.26 The Assessment Site is of Site value for Otter.
- 6.6.27 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, changes in water quality and water levels that could increase prey items such as amphibians and fish and lighting of the site at night. Habitat loss to the operational phase will not affect this receptor.
- 6.6.28 Improved water quality associated with reduced management pressures on land that is currently an intensively managed grassland habitat and the creation of additional grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats and no lighting of the operational site at nights, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Water Vole

- 6.6.29 The Assessment Site is of Local value for Water Vole.



- 6.6.30 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. Habitat loss to the operational phase will not affect this receptor.
- 6.6.31 Improved water quality associated with reduced management pressures on land that is currently an intensively managed grassland habitat and the creation of additional grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

European Eel

- 6.6.32 The Assessment Site is of County value for European Eel, whilst they are an interest feature of the Severn Estuary Ramsar and a sub-feature of the Severn Estuary SAC.
- 6.6.33 The primary pathway of effect would be through impacts to reens and ditches, such as direct habitat loss and damage, and changes in water quality and water levels. Habitat loss to the operational phase will not affect this receptor.
- 6.6.34 Improved water quality associated with reduced management pressures of intensively managed grassland/monocultural arable land and the creation of an additional 43.3 ha of wildflower meadow habitats that is currently largely in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses. Combined with the protection of boundary habitats and improved ditch management, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Reptiles

- 6.6.35 The Assessment Site is of Local value for reptiles.
- 6.6.36 The primary pathway of effect would be through impacts to reens and ditches, and other boundary habitats, such as direct habitat loss and damage, and changes in water quality and water levels that may affect prey items.
- 6.6.37 Improved water quality associated with reduced management pressures of intensively managed grassland/monocultural arable land and the creation of an additional 43.3 ha of wildflower meadow habitats that is largely currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to



watercourses. Combined with the protection of boundary habitats and improved ditch management, this will make it near-certain that the development will have a minor positive effect on this receptor for the period of its operation.

Invertebrates

- 6.6.38 The Assessment Site is of National value for invertebrates of restricted distribution.
- 6.6.39 The primary pathway of effect would be through impacts to reens and ditches, and boundary habitats, such as direct habitat loss and damage, and changes in water quality and water levels.
- 6.6.40 Improved water quality associated with reduced management pressures on land that is currently intensively managed grassland habitat and the creation of an additional grassland habitats that is currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses.
- 6.6.41 Combined with creation of an additional 43.3 ha Shill Carder Bee wildflower habitat linking across the site and over sowing, and the protection of other boundary habitats, this would make it near-certain that the development will have a moderate positive effect on this receptor for the period of its operation.

Plants

- 6.6.42 The Assessment Site is of National value for plants of restricted distribution.
- 6.6.43 The primary pathway of effect would be through impacts to reens and ditches, and boundary habitats, such as direct habitat loss and damage, and changes in water quality and water levels.
- 6.6.44 Improved water quality associated with reduced management pressures land that is currently intensively managed grassland/monocultural cropland and the creation of an additional of grassland habitats / 43.3 ha of new wildflower meadows that is largely currently in arable rotation will minimize chemical/nutrient inputs and sediment transfer to watercourses.
- 6.6.45 The creation of buffer grasslands and protection of boundary habitats, this will make it near-certain that the development will have a moderate positive effect on this receptor for the period of its operation.

Decommissioning



- 6.6.46 After 40 years of operation, it is likely that the Site would be restored to its original condition. During decommissioning, the above ground infrastructure (solar panels and supports, inverters, switchgear, CCTV & fencing) and the underground cabling would be removed from site. Other than the access for the Substation, tracks would be removed, unless the landowner wishes for them to be retained.
- 6.6.47 The site is to be reinstated to its former state and condition, as at the date of the lease. As such, the land would be returned to its original state - available and suitable for its current agricultural use.
- 6.6.48 The baseline for receptors assessed here are those present prior to the construction phase.
- 6.6.49 Decommissioning impacts would be assessed through updated habitat and species surveys prior to works to allow an informed assessment taking into account future wildlife legislation and guidelines and changes to the Assessment Site during its operational life. Mitigation would be designed on the basis of this future assessment.

Designated sites

- 6.6.50 Adverse effects on designated sites are unlikely during decommissioning. If an effect were to occur, it would be minor and short term, and would likely be associated with changes in water quality, water levels and temporary habitat loss.

Valued Habitats

- 6.6.51 Adverse effects on habitats are near-certain during decommissioning although they would likely be limited to terrestrial habitats. The primary pathway of effect would be through direct habitat loss and damage associated with compounds, storage areas and cable recovery
- 6.6.52 It is near-certain that there would be a temporary loss of a small extent of valued habitat to the decommissioning phase. This negative effect would be minor, short term.

Notable species

- 6.6.53 Adverse effects on notable species are unlikely during decommissioning. However, it is likely that notable species legislation and guidance will change during the



operational phase of the development and an updated assessment would be necessary prior to decommissioning.

6.7 Residual Effects and Conclusions

- 6.7.1 Residual impacts on valued ecological receptors during the construction and operational phases are minimal, with no effect being significant at the level of assessment. Detail of potential impacts and their significance at the level of assessment are given in Table 6.10. Where no reasonable pathway of effect exists and pre-mitigation impact has been discounted, the receptor is not considered here.

Table 6.10 Assessment of residual effects

Receptor / resource	Phase	Nature of Potential Impact on receptor / resource	Embedded mitigation	Secondary mitigation	Residual effect	Significant / not significant	Monitoring requirements
Severn Estuary RAMSAR	Construction	Direct habitat loss and damage, and changes in water quality and water levels affecting European Eel	CEMP which details protection of watercourses, surface water management and dust minimization. Exclusion zones to boundary features would be protected by a suitable fence.		Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained
Gwent Levels SSSI - Redwick and Llandeenny	Construction	Changes in water quality, water levels, and habitat loss. Dust deposition	CEMP which details protection of watercourses, surface water management and dust minimization. Exclusion zones to boundary features would be protected by a suitable fence.		Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained
Gwent Levels SSSI – Nash and Goldcliff	Construction (cable route)	Changes in water quality and water levels	CEMP which details protection of watercourses, surface water management and dust minimization. Exclusion zones to boundary features		Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained
Severn Estuary SSSI	Construction	Changes in water quality, water levels, and habitat loss. Dust deposition	CEMP which details protection of watercourses, surface water management and dust minimization. Exclusion zones to boundary features would be protected by a suitable fence.	Exclusion zones to boundary features would be delineated by a suitable fence. Damping down during dry periods	Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained



Receptor / resource	Phase	Nature of Potential Impact on receptor / resource	Embedded mitigation	Secondary mitigation	Residual effect	Significant / not significant	Monitoring requirements
Craig-Y-Perthi Field South SINC	Construction	Dust deposition	CEMP which details dust minimization. Exclusion zones to boundary features would be protected by a suitable fence.	Damping down during dry periods	Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained
Craig-Y-Perthi Wood SINC	Construction	Dust deposition	CEMP which details dust minimization. Exclusion zones to boundary features would be protected by a suitable fence.	Damping down during dry periods	Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained
Ridings Wood SINC	Construction		CEMP which details dust minimization. Exclusion zones to boundary features would be protected by a suitable fence.				Ensure CEMP is enacted, and exclusion zones are maintained
Coastal and floodplain grazing marsh	Construction	Habitat loss and damage		Following construction, bare areas would be restored by re-seeding. For the cable route, top and sub-soils would be stored separately and replaced in sequence following trenching and the route re-seeded	Minor, adverse	Not significant	Ensure CEMP is enacted, and reseeded is completed and managed



Receptor / resource	Phase	Nature of Potential Impact on receptor / resource	Embedded mitigation	Secondary mitigation	Residual effect	Significant / not significant	Monitoring requirements
All hedgerows	Construction	Habitat loss and damage	Exclusion zones to boundary features would be protected by a suitable fence.	Exclusion zones to boundary features would be protected by a suitable fence.	Negligible	Not significant	Ensure exclusion zones are created and managed
Reens	Construction	Changes in water quality, water levels, and habitat loss. Dust deposition	CEMP which details protection of watercourses, surface water management and dust minimization.	Exclusion zones to boundary features would be protected by a suitable fence. Damping down during dry periods	Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained
Ditches	Construction	Changes in water quality, water levels, and habitat loss. Dust deposition	CEMP which details protection of watercourses, surface water management and dust minimization.	Exclusion zones to boundary features would be protected by a suitable fence. Damping down during dry periods	Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained
Amphibians (common and widespread)	Construction	Habitat loss and damage, and changes in water quality and water levels	CEMP which details protection of watercourses, surface water management and dust minimization.	Exclusion zones to boundary features would be protected by a suitable fence	Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained
Great Crested Newt	Construction	Habitat loss and damage, and changes in water quality and water levels	CEMP which details protection of watercourses, surface water management and dust minimization.	Exclusion zones to boundary features would be protected by a suitable fence	Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained
Bats	Construction	Habitat loss and damage	Exclusion zones to boundary features would be protected by a suitable fence.	No night works would be completed.	Negligible	Not significant	Ensure exclusion zones are maintained



Receptor / resource	Phase	Nature of Potential Impact on receptor / resource	Embedded mitigation	Secondary mitigation	Residual effect	Significant / not significant	Monitoring requirements
Common Dormouse	Construction	Habitat loss and damage	Exclusion zones to boundary features would be protected by a suitable fence.	No night works would be completed.	Negligible	Not significant	Ensure exclusion zones are maintained
Otter	Construction	Habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury.	CEMP which details protection of watercourses, surface water management and dust minimization. Exclusion zones to boundary features would be protected by a suitable fence.	Exclusion zones to boundary features would be protected by a suitable fence. No night works would be completed. Locations of HDD rigs would be informed by pre-construction surveys for Water Vole and Otter	Negligible	Not significant	Ensure exclusion zones are maintained. Pre-construction surveys for Water Vole and Otter completed in good time prior to HDD
Water Vole	Construction	Habitat loss and damage, and changes in water quality and water levels. There is also potential for direct harm or injury.	CEMP which details protection of watercourses, surface water management and dust minimization. Exclusion zones to boundary features	Exclusion zones to boundary features would be protected by a suitable fence. No night works would be completed. Locations of HDD rigs would be informed by pre-construction surveys for	Negligible	Not significant	Ensure exclusion zones are maintained. Pre-construction surveys for Water Vole and Otter completed in good time prior to HDD



Receptor / resource	Phase	Nature of Potential Impact on receptor / resource	Embedded mitigation	Secondary mitigation	Residual effect	Significant / not significant	Monitoring requirements
				Water Vole and Otter			
European Eel	Construction	Habitat loss and damage, and changes in water quality and water levels	CEMP which details protection of watercourses, surface water management and dust minimization. Exclusion zones to boundary features	Exclusion zones to boundary features would be protected by a suitable fence. Damping down during dry periods	Negligible	Not significant	Ensure exclusion zones are maintained.
Reptiles	Construction	Habitat loss and damage, and changes in water quality and water levels that may affect prey items. There is also potential for direct harm or injury.	Exclusion zones to boundary features	Habitats with potential for reptiles would be de-vegetated prior to any site activities under the supervision of a suitably qualified ecologist. Exclusion zones to boundary features would be protected by a suitable fence.	Negligible	Not significant	Ensure exclusion zones are maintained.
Invertebrates	Construction	Habitat loss and damage, and changes in water quality and water levels	CEMP which details protection of watercourses, surface water management and dust minimization.	Exclusion zones to boundary features would be protected by a suitable fence.	Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained



Receptor / resource	Phase	Nature of Potential Impact on receptor / resource	Embedded mitigation	Secondary mitigation	Residual effect	Significant / not significant	Monitoring requirements
			Exclusion zones to boundary features	Damping down during dry periods			
Plants	Construction	Habitat loss and damage, and changes in water quality and water levels	CEMP which details protection of watercourses, surface water management and dust minimization. Exclusion zones to boundary features	Exclusion zones to boundary features would be protected by a suitable fence. Damping down during dry periods	Negligible	Not significant	Ensure CEMP is enacted, and exclusion zones are maintained
Severn Estuary RAMSAR	Operation	Impacts to reens and ditches, changes in water quality and water levels which would impact European Eel populations	Exclusion zones to boundary features retained	Ditch management	Negligible	Not significant	Monitoring ditch management through a ditch management plan.
Gwent Levels SSSI - Redwick and Llandeenny	Operation	Improved water quality	Exclusion zones to boundary features retained	Ditch management	Minor, positive	Not significant	Monitoring ditch management through a ditch management plan
Severn Estuary SSSI		Impacts to reens and ditches, changes in water quality and water levels	Exclusion zones to boundary features retained	Ditch management			Monitoring ditch management through a ditch management plan
Barecroft Fields SNCI	Operation	None			Negligible	Not significant	
Craig-Y-Perthi Field South SINC	Operation	None			Negligible	Not significant	



Receptor / resource	Phase	Nature of Potential Impact on receptor / resource	Embedded mitigation	Secondary mitigation	Residual effect	Significant / not significant	Monitoring requirements
Craig-Y-Perthi Wood SINC	Operation	None			Negligible	Not significant	
Ridings Wood SINC	Operation	None			Negligible	Not significant	
Coastal and floodplain grazing marsh	Operation	Direct habitat loss	Existing farm access tracks would be used wherever possible. No substantial areas of concrete construction would be required.	Following construction, construction phase access tracks would be removed, and the footprint of the track and bare areas beneath the solar arrays restored to agricultural grassland by re-seeding with a suitable grass mix	Negligible	Not significant	
Intact hedge, native species rich	Operation	Direct loss of habitat extent	Exclusion zones to boundary features retained. Existing gateways would be used		Negligible	Not significant	
Reens	Operation	Improved water quality	Exclusion zones to boundary features retained	Ditch management	Minor, positive	Not significant	Monitoring ditch management through a ditch management plan
Ditches	Operation	Improved water quality	Exclusion zones to boundary features retained	Ditch management	Moderate, positive	Not significant	Monitoring ditch management through a ditch management plan



Receptor / resource	Phase	Nature of Potential Impact on receptor / resource	Embedded mitigation	Secondary mitigation	Residual effect	Significant / not significant	Monitoring requirements
Amphibians (common and widespread)	Operation	Improved water quality	Exclusion zones to boundary features retained		Minor, positive	Not significant	
Great Crested Newt	Operation	Improved water quality	Exclusion zones to boundary features retained	Ditch management	Minor, positive	Not significant	Monitoring ditch management through a ditch management plan
Bats	Operation	Improved foraging habitats	Exclusion zones to boundary features retained and larger trees and linkage maintained where ditch management is proposed.		Minor, positive	Not significant	
Common Dormouse	Operation	Accidental harm during hedgerow management		Hedgerows managed in winter months	Negligible	Not significant	
Otter	Operation	Improved water quality	Exclusion zones to boundary features retained No new lighting regime would be introduced adjacent to any watercourses		Minor, positive	Not significant	
Water Vole	Operation	Improved water quality	Exclusion zones to boundary features No new lighting regime would be introduced adjacent to any watercourses		Minor, positive	Not significant	
European Eel	Operation	Improved water quality	Exclusion zones to boundary features	Exclusion zones to boundary features would be protected by a suitable fence	Minor, positive	Not significant	



Receptor / resource	Phase	Nature of Potential Impact on receptor / resource	Embedded mitigation	Secondary mitigation	Residual effect	Significant / not significant	Monitoring requirements
Reptiles	Operation	Improved water quality with associated increases in prey items	Exclusion zones to boundary features	Exclusion zones to boundary features would be protected by a suitable fence	Minor, positive	Not significant	
Invertebrates	Operation	Improved water quality	Exclusion zones to boundary features	Exclusion zones to boundary features would be protected by a suitable fence Ditch management Creation of Shrill Carder bee habitat	Minor, positive	Not significant	Monitoring ditch management through a ditch management plan Monitoring of shrill carder bee habitat
Plants	Operation	Improved water quality	Exclusion zones to boundary features	Exclusion zones to boundary features will be protected by a suitable fence Comprehensive ditch management	Minor, positive	Not significant	Monitoring ditch management through a ditch management plan



6.8 Enhancement

- 6.8.1 Enhancement is improved management of ecological features or provision of new ecological features, resulting in a net benefit to biodiversity, which is unrelated to a negative impact or is 'over and above' that required to mitigate/compensate for an impact.
- 6.8.2 Enhancement measures should be designed to deliver biodiversity objectives that are specified in relevant policy documents, and evidence should be provided to support the likelihood of delivering the predicted benefit. They should be incorporated into scheme design and assessed within the EclA. To ensure that enhancements are enduring, their delivery and management should normally be guaranteed through a legal obligation, such as, in England and Wales, a planning obligation under section 106 of the Town and Country Planning Act 1990, or its equivalent provision elsewhere.
- 6.8.3 Approximately **43.3 ha of new wildflower meadow habitat** throughout the site, and its margins, would be enhanced for Shrill Carder Bee.
- 6.8.4 Forty woodcrete bat boxes, alongside another 40 bird boxes would be fitted onto trees.
- 6.8.5 Grassland management within all buffer areas will create a more diverse sward through natural succession.
- 6.8.6 Areas of retained grassland and sown areas associated with the panels would be managed together after the first year. The intension is that areas beneath the panels would be grazed by sheep at suitable stocking levels (around 6-8 animals per ha), although this may change during the lifetime of the solar farm depending on changing agricultural practices and management. If any changes to grazing/management are required during the lifetime of the project, it would be agreed in advance in writing with planning authority and NRW.
- 6.8.7 Any large (>2m) gaps in hedgerows on the northern side of ditches would be in-filled with native hedgerow species. This would comprise shrubs and trees of local provenance on the Gwent Levels tree list, and the species mix will reflect the mix within the adjacent hedgerow sections. Prior to planting, locations would be agreed in writing with the planning authority and NRW. In addition to this, **over 11km of new hedgerow planting / enhancement is proposed as part of the plans.**



Monitoring

- 6.8.8 Monitoring will include aquatic habitats and aquatic invertebrates, Shrill Carder Bee and water quality. Aquatic invertebrate and Shrill Carder Bee surveys will follow the methodology adopted for this assessment. Water quality monitoring methodology would be agreed with Natural Resources Wales.

Delivery of mitigation and monitoring proposed

- 6.8.9 In line with Scoping Direction this ES provides reference to how the delivery of measures proposed to prevent/ minimise adverse effects is secured (through legal requirements or other suitably robust methods) and whether relevant consultees are aware of the measures proposed.
- 6.8.10 Mitigation, enhancement and monitoring is proposed for valued receptors. This is detailed within the LEMP and it is expected that this would be secured through a pre-commencement planning condition requiring the LEMP to be approved by NCC and NRW.

6.9 Cumulative effects

- 6.9.1 Cumulative impacts are those additional changes caused by a proposed development in conjunction with similar developments, or as the combined effect of several developments taken together.
- 6.9.2 An assessment of the cumulative impact arising from the solar farm development at this site requires that the relevant information relating to the individual impact of adjacent developments is available.
- 6.9.3 Approved developments that have the potential for a cumulative impact, and with sufficient data available within the public domain, are considered here.
- 6.9.4 Cumulative impacts arising from two or more developments may be:
- i) Additive – effects are summed
 - ii) Antagonistic – the cumulative impacts are less than their summed values
 - iii) Synergistic – the cumulative impact is greater than the summed impact.



*Monmouthshire County Council application DM/2019/01937 Land At Vinegar Hill
Vinegar Hill Undy Monmouthshire*

- 6.9.5 The application description is: Hybrid planning application - Outline planning application for up to 155 dwellings, associated open space and infrastructure with all matters excluding access reserved, of which full planning permission is sought for 72 dwellings, associated open space and infrastructure.
- 6.9.6 Following adoption of mitigation, no significant impacts were predicted for statutory nature conservation sites, habitats or species. Cumulative effects are unlikely.

Monmouthshire County Council application DC/2016/00883 Rockfield Farm, The Elms, Undy, Caldicot, Monmouthshire, NP26 3EL

- 6.9.7 The application description is: Master planned development of 13.8 hectares of land for residential use and employment use; up to 266 Proposed residential units and approximately 5575 square meters of B1 floor space.
- 6.9.8 No formal assessment of impacts has been made. NRW have made no objection indicating that impacts on protected species and designated sites is unlikely. Cumulative effects are unlikely.

Monmouthshire County Council application DM/2018/01606 Rockfield Farm, The Elms, Undy, Caldicot, Monmouthshire, NP26 3EL

- 6.9.9 The application description is: Reserved matters application (pursuant to outline application) for the development of 144 dwellings and associated engineering works. | Rockfield Farm The Elms Undy Monmouthshire NP26 3EL.
- 6.9.10 No formal assessment of impacts has been made. NRW have made no objection indicating that impacts on protected species and designated sites is unlikely. Cumulative effects are unlikely.

*Monmouthshire County Council application DM/2020/00103 Magor Brewery
Newport Road Magor Caldicot*

- 6.9.11 The application description is: Erection of sixteen fermentation vessels, enclosed supporting structure and external stairs; extension of existing high level access walkway; earth works; and temporary works including re-use of existing car park as



vessel assembly site, creation of two temporary replacement car parks, temporary site roads and walkways, and associated works.

- 6.9.12 No formal assessment of impacts has been made and no NRW comments received. This project cannot be objectively taken into account in this assessment.

Newport City Council application 06/0471 Glan Llyn Development Site - Queensway Llanwern Newport South Wales

- 6.9.13 This is a complex application that has been running for nearly two decades. In the initial ES it is stated that:

- i) Providing all site works are undertaken in accordance with best practice guidance the Proposed Development will not have an impact upon any sites designated for their nature conservation value.
- ii) Specialist surveys were undertaken for otter, water vole, reptiles, amphibians and invertebrates. The surveys did not identify any current or historic use of the site by any of these species. The ecological assessment concluded that there was no evidence to indicate the presence of any other protected or notable wildlife in and adjacent to the site.

- 6.9.14 Cumulative impacts in association with this project are unlikely.

Conclusion

- 6.9.15 Cumulative impacts associated with the Proposed Development and other relevant schemes are unlikely to be significant.



Appendix 6.1 – Preliminary Ecological Appraisal

Appendix 6.2 – Great Crested Newts Survey Report

Appendix 6.3 – Dormouse Survey Report

Appendix 6.4 – Otter Survey Report

Appendix 6.5 – Water Vole Survey Report

Appendix 6.6 – NVC Plant Survey Report

Appendix 6.7 – Aquatic Invertebrate Survey Report

Appendix 6.8 – Shrill Carder Bee Survey Report

Appendix 6.9 – Ecological Receptors

