

HAWKESWOOD ECOLOGY

Specialists in Ecological Survey and Assessment

17 Heol Henrhyd, Coelbren, Nr. Ystradgynlais, POWYS. SA10 9PG. Tel/Fax: 01639 701304
Mobile: 07957 154794 E-mail: hawkeswoodecology@btinternet.com
VAT Reg No 926 9271 93
(Proprietors: Niki and Eric Hawkeswood)



PRELIMINARY ECOLOGICAL APPRAISAL

SUN FIELDS, DREAM FIELDS, LLANDARCY.

ON BEHALF OF

HALE ENERGY LTD

March 2023

Ref: HE/34/2021 – Issue 1

Copyright and Non-Disclosure Notice

The contents and layout of this report are subject to copyright owned by Hawkeswood Ecology (© Hawkeswood Ecology 2023) save to the extent that copyright has been legally assigned by us to another. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report.

The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Hawkeswood Ecology. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third Party Disclaimer set out below.

Third Party Disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Hawkeswood Ecology at the instruction of, and for use by, our client(s) named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Hawkeswood Ecology excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

We confirm that in preparing this Report we have exercised reasonable skill and care, taking into account the project objectives, the agreed scope of the work, prevailing site conditions and the degree of manpower and resources allocated to the project.

All habitat and protected species surveys present a ‘snapshot’ of conditions existing and species present, or considered having potential to be present, at the time of survey. Many species are mobile and distributions can vary across time. Results and findings presented in this report should be considered with these factors in mind.

Protected species surveys are recognised as having a ‘shelf life’ of two years maximum in normal circumstances. Surveys older than this are unlikely to be accepted by a Local Planning Authority or Natural Resources Wales as viable documentation without just cause.

CONTENTS

Summary	4
1. Introduction	5
2. Surveyor Experience	5
3. Methodology and Constraints	5
4. Desktop Study Findings	6
5. Field Survey Findings	9
6. Discussion and Impact Assessment	11
7. Relevant Legislation and Policies	15
8. Recommendations	18
9. Conclusions	20
10. Bibliography	20

FIGURES

Figure 1: Phase 1 Habitat Survey

APPENDICES

- Appendix 1 DAFOR scale of cover abundance
- Appendix 2 Target Notes
- Appendix 3 Species list
- Appendix 4 Photographs

SUMMARY

Hawkeswood Ecology was instructed to carry out a Preliminary Ecological Appraisal on land at Sun Fields, Dream Fields, Gelli Bwch Farm, Llandarcy in relation to a proposed solar panel scheme. The Site is currently dominated by agriculturally modified grassland, semi-improved acid grassland, dense scrub and recently cleared scrub.

The Site lies south of Llandarcy in open countryside cresting a hill with resultant north and south facing slopes. The fields are managed by grazing and cutting but there has been significant encroachment of scrub, much of which has recently been cleared. The north eastern boundary is demarked by an existing unused track which is largely blocked by bramble and woody scrub with the development of a number of semi mature oak trees. The northern boundary along the unnamed road is a semi-natural broad leaved woodland which appears to have developed along the line of an early track/road.

The main areas of interest are the field boundaries, the woodland to the north of the Site and the semi-improved acidic grassland on the south facing slope. It was noted that there are some rocky outcrops in this field. Areas of scrub encroachment from the field boundaries have recently been cleared to ground in places. The scrub is dominated by gorse with hawthorn, oak and holly present.

The southern boundary is a wooded area outside the construction zone. This is on a steep south facing slope with a largely open oak canopy and an understory dominated by bracken and bramble.

The Site boundaries were considered to have potential to support reptiles and there was evidence of badger tracks across the fields; a fox was seen during the survey. The Site boundaries are suitable for breeding birds, however the open fields were considered too heavily managed to support any significant numbers so breeding birds. No open habitat birds (i.e. skylark) were noted during the Site visit. The location of the Site in an exposed locality may make it even less suitable for birds when considered along with the agricultural improvements that have occurred.

Recommendations are made in relation to safe clearance of scrub in regard to possible presence of amphibians and reptiles and a further walk over habitat assessment is needed at a more appropriate time of year. Prior to any further scrub clearance a badger survey should be carried out. Given the tilted nature of the panels, no impacts are foreseen on bats or flying aquatic invertebrates.

The outcomes of the habitat assessment are required prior to a fully informed assessment being made of potential impacts, negative or positive, from the proposed scheme.

1 INTRODUCTION

- 1.1 Hawkeswood Ecology was instructed Hale Energy Ltd to carry out a Preliminary Ecological Appraisal (PEA) on land known as Sun Fields, Dream Fields, Llandarcy. It is proposed to develop two fields as a solar power project on the Site. The approximate central Grid reference of the Site is SS 71423 94835.
- 1.2 The Site consists of two fields bounded by derelict hedge banks, scrub and areas of woodland. The fields are agriculturally modified with one most likely fully agriculturally improved and the other semi-improved grassland. A further habitat assessment at an appropriate time of year is recommended to properly assess the value of the grassland.
- 1.3 The objectives of the survey are:
 - To ascertain the habitats and species present within the Site;
 - To assess the ecological and nature conservation value of the Site;
 - To assess the potential ecological impacts of any proposed development;
 - To provide recommendations to mitigate the proposed works.
- 1.4 The PEA was carried out on 24th January 2023.

2 SURVEYOR EXPERIENCE

- 2.1 The surveyor and report author is Eric Hawkeswood. Eric has many years experience of broad habitat and detailed botanical and species surveying. He has extensive experience of protected species survey and holds Natural Resources Wales scientific and conservation licenses for bats and dormice. He has been a professional in the nature conservation field for thirty four years formerly working as Reserves Manager and Conservation Officer at Gwent Wildlife Trust and Woodland Manager for the Ruperra Conservation Trust. Eric has worked as an Ecological Consultant as joint proprietor of Hawkeswood Ecology since 2001.

3 METHODOLOGY AND CONSTRAINTS

Desktop Study

- 3.1 The South East Wales Biodiversity Records Centre (SEWBReC) was asked to provide records of protected species and habitats from a radius of 1 kilometres of the approximate Site centre. Records post 2000 were assessed, those of earlier dates were not considered unless of specific interest or of locally important species.

Preliminary Ecological Appraisal

- 3.2 The Preliminary Ecological Appraisal (PEA) was carried out in line with the guidance issued by The Chartered Institute for Ecology and Environmental Management (2013) and consisted of a walk-over survey of the proposed Site considering features within and adjacent to it. Habitats were categorised according to the Phase 1 Habitat Survey guidelines (JNCC, 2010) and annotated onto a map (Figure 1). Plant assemblages were described using the DAFOR scale of cover abundance

(Appendix 1) and each habitat was recorded using Target notes (Appendix 2); a species list of plants identified during survey is given in Appendix 3 and photographs are given in Appendix 4.

- 3.3 In addition, the Site was assessed for its potential to support protected species.

Constraints

- 3.4 The survey was undertaken at a time of year where a proper habitat assessment could not be made. Recommendations for further survey are made in this report.

4 DESKTOP STUDY FINDINGS

- 4.1 SEWBRc reported a total of 704 priority and protected species records from the 1 kilometre search area of which less than 20 are found within 750 metres of the Site. By far the most records are recorded from the Tennant Canal corridor and wetlands to the south and east of the Site and the former Llandarcy oil refinery site to the north. All distances quoted are from the approximate centre of the search area so may be closer to the actual Site boundary.
- 4.2 Common pipistrelle is reported from the unnamed lane immediately to the north of the Site at two locations. All other bat records are related to the Tennant Canal or the former Llandarcy oil refinery site. Many, if not all of the Tennant canal and records along the lane near the Site are from a reputable observer carrying out a wider bat survey of the locality dating from around 2010-12.
- 4.3 Species recorded include common and soprano pipistrelle (nearest soprano record approximately 800 metres distant), noctule approximately 700 metres distant and a *Myotis* species bat from the Tennant Canal at 900 metres distance.
- 4.4 Bat species reported from the Llandarcy oil refinery range from distances of 620 metres to over a kilometre from the Site. The most significant species recorded is lesser horseshoe and significant roosts of this bat are known from the former refinery site. Other species reported from this area are common and soprano pipistrelle, brown long-eared and *Myotis* species bats.
- 4.5 Other Protected and Priority Species reported include otter, badger, water vole, great crested newt and other herpetofauna and a number of bird and invertebrate species. There are a number of otter records, mainly related to the Tennant Canal corridor and associated habitats, with the nearest identified location at 500 metres to the south.
- 4.6 Badger is reported from a number of locations around the Site with the nearest record from approximately 270 metres to the north. Other mustelids include stoat and weasel and polecat of which there are single records at a distance of 270 metres north of the Site for stoat and weasel and 600 metres for polecat. Water vole is recorded from the Tennant Canal corridor with the latest recording dating from 2003.
- 4.7 Great crested newts are known from the former Llandarcy Oil Refinery with the closest record from approximately 800 metres away. Other amphibia reported include common frog with the nearest record from approximately 300 metres north in Llandarcy Village, common frog from 650

meters south in Pant-Y-Sais and palmate newt from 750 metres in the Oil Refinery site. Reptiles recorded were common lizard and grass snake both recorded approximately 600 metres distant from Pant-Y-Sais.

- 4.8 Many of the bird species recorded could potentially occur in passage or forage over the Site, breeding is limited by the habitat present and its current management. Passerines such as bullfinch, song thrush, house sparrow, dunnoek and starling could potentially occur in suitable habitat. Other species such as reed bunting may occur in scrub and species such as redwing and lapwing could be seen in winter.
- 4.9 Invertebrate records provided relate mainly to the wetland habitats present along the Tennant Canal but some recorded butterfly and moth species are likely to pass through the Site.
- 4.10 Of the plant species noted only bluebell is likely to occur in the habitats present.
- 4.11 Other species of conservation concern relate mainly to birds with other records of invertebrates mainly from the Oil Refinery Site or the Tennant Canal and surroundings. Of the birds, many species are likely to forage or pass over the Site with breeding limited to birds of scrub or woodland. Species likely to occur include green woodpecker, long tailed tit, greenfinch whitethroat and willow warbler. Species such as swift and swallow are likely to over fly the Site as are black headed and lesser black backed gulls.
- 4.12 Species of Local Conservation Concern include records of bryophytes, lichens, invertebrates and vascular plant species which all relate to the Llandarcy Oil Refinery site and are unlikely to occur on Site.
- 4.13 Invasive non-native species recorded locally include Japanese knotweed, Wilson's honeysuckle, cotoneaster, Himalayan balsam and hybrid bluebell.
- 4.14 SEWBRc data is confidential and cannot be released into the public domain without prior permission in writing from SEWBRc. Hawkeswood Ecology holds the data on the client's behalf for one year (in accordance with conditions) in case of further query.
- 4.15 Hawkeswood Ecology hold a number of records from the Llandarcy area. Bat species noted include common and soprano pipistrelle, noctule and brown long-eared bats.

Designated Sites

- 4.16 At its nearest approach the Site is approximately 300 metres north of a multi designated area of nature conservation importance:
- Crymlyn Bog Special Area of Conservation;
 - Crymlyn Bog Wetland of International Importance (RAMSAR Site);
 - Crymlyn Bog and Pant-Y-Sais National Nature Reserve;
 - Pant-Y-Sais Site of Special Scientific Interest;
 - Pant-Y-Sais Local Nature Reserve.

- 4.17 The Special Area of Conservation (SAC) and Ramsar designations are related to the uncommon habits present on Site. For the SAC specifically there are three protected habitat types cited, two Annex I habitats, Transition mires and quaking bogs and Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* and one Annex II habitat, Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*. There are no direct hydrological connections to the SAC from the Site but the general watershed is in the southerly direction towards Jersey Marine.
- 4.18 The Ramsar Crymlyn Bog citation states that the Bog *‘comprises a floodplain-valley mire located within a lowland coastal context and is the most extensive wetland of its type in Wales. The mire features a complex mosaic of vegetation types, supporting examples of swamp, tall herb fen, fen meadow and carr communities. The site supports an exceptionally wide range of rich and poor fen communities, some of which bear a close floristic affinity to certain floodplain mires in East Anglia. The presence of significant areas of saw sedge Cladium mariscus swamp is notable in extensive stands of this uncommon vegetation type, occurring at only three other sites in Wales. Crymlyn Bog is part of a larger inter-estuarine complex which includes the adjacent Pant y Sais fen’*
- 4.19 Pant Y Sais Site of Special Scientific Interest (SSSI) is described as: *‘Predominantly an area of lowland fen located in a narrow valley which was a former course of the River Neath. The site supports a range of fenland communities including Sphagnum and bryophyte dominated areas of poorer fen vegetation, Molinia caerulea communities, swamp areas with abundant Typha latifolia and Typha angustifolia, and developing fen carr. Formerly part of the same hydrological system as Crymlyn Bog. The Tennant Canal section acts as a refuge for aquatic plants, including Butomus umbellatus which is rare in the county’.*
- 4.20 The designated Sites also enjoy further protections where designated as a national Nature Reserve (NNR) or Local Nature Reserve (LNR).
- 4.21 Other designated sites within the search area include a number of Neath Port Talbot (NPT) Sites of Importance for Nature Conservation (SINC) and a Wildlife Trust Nature Reserve. The whole of the Site lies within the generic NPT SINC, ‘Watercourses’ though none are present on the Site. Other than this the closest SINC is Jersey Marine Woodlands. This SINC actually impinges on and includes the Site boundaries. Qualifying features for the Jersey Marine Woodlands SINC are Native Woodlands, Scrub Communities, Lowland Meadows, Purple Moor-grass and Ruch Pastures and Other Bracken Communities.
- 4.22 Other SINC with the exception of Llandarcy Village Green are over 740 metres from the Site, Coed Darcy Great Crested Newt SINC is recorded some 900 metres west of the Site at its nearest approach. Llandarcy Village Green SINC is designated for the presence of Purple Moor-Grass and Rush Pasture, it lies approximately 400 metres north of the Site with no habitat connectivity. The Wildlife Trust Reserve is also a NPT SINC. This known as Red Jacket Fen and supports Scrub communities, Lowland fen, Reedbeds and Ponds and is approximately 740 metres south east of the Site.

Habitats

- 4.23 Habitats shown on Site from the NRW Terrestrial Phase 1 Habitat data include semi-improved acid grassland, semi-improved neutral grassland, semi-natural broadleaved woodland and dense bracken.

5 FIELD SURVEY FINDINGS

- 5.1 The survey red line area is dominated by grassland with woodland, dense scrub and developing scrub woodland. An issue in categorising the grasslands and their value correctly at this time of year is that many species are not yet visible. Recent works have removed areas of scrub which were still lying on the survey date. The fields are grazed and the adjacent woodland and scrub is open to grazing. The fields were cut for hay/haylage last year with little new growth at the time of survey. See Figure 1, Phase 1 map; Target Notes can be found in Appendix 1 and photographs in Appendix 4.

Grassland

- 5.2 There are two fields comprising the majority of the Site, they are currently grazed and have been cut. At TN 3 the field has the appearance of an agriculturally improved grassland with very few species present and cocksfoot and Yorkshire fog dominant. Broad leaved herbs are limited with ribwort plantain, creeping buttercup and common sorrel varying from being abundant to frequently occurring consecutively. There is little variation of the sward across the field.
- 5.3 At TN 7 the field is south facing and although still displaying few species the abundance of fescues and lack of Yorkshire fog and lower density of cocksfoot give the appearance of a more semi-natural grassland. Sheep's sorrel, a plant indicative of acid grasslands was present and common knapweed more frequently occurring, suggesting lower levels of improvement. The grassland is considered to be species poor and not in good condition but this could be partially because of the timing of the survey.
- 5.4 At TN9 is an area of species poor semi-improved acid grassland open to grazing and adjoining TN7, but not mechanically cut. This area forms a strip of open land between the cut field and the developing woodland at TN11. Common heather is locally abundant and common bent is abundant, *Festuca* species are also locally abundant. Bracken is coming to dominate large areas of this section. Ant hills are frequent in this area.

Woodland/Scrub

- 5.5 Woodland dominates the northern Site boundary (TN 12) and is developing on the steep slopes to the south (TN11). At TN1, on the trackway, there are developing semi-mature oak with some hawthorn amongst abundant bramble and bracken. Scrub is present on the Site boundaries and hedge banks with the most dominant areas at TN5 where it has encroached in to the fields and developed along the hedgebank at TN6.
- 5.6 All woodland on Site is open to grazing and as such the structure is poor with sparse shrubs and a grazed ground layer. The density of the scrub has prevented grazing and it is encroaching into the open fields.

- 5.7 The woodland at TN12 has developed alongside the unnamed road and appears to have developed along an abandoned track. It is the only woodland on Site with mature trees with common-sessile oak hybrids abundant and rarely occurring sycamore and adjoins a much larger off-Site woodland which includes areas of Semi-Natural Ancient Woodland. The scrub layer is grazed out and sparsely developed with occasional hawthorn. The ground layer was dominated by grasses with few broad leaved herbs present, the most abundant being Common nettle and creeping buttercup. At TN 11 is a developing woodland with a largely open canopy of semi-mature oak hybrids. Running south from the field at TN9, the woodland is developing on a steep south facing slope, the ground flora is largely dominated by bracken and bramble and hawthorn, gorse and blackthorn are all frequently occurring. At TN1, there is some woodland development with semi-mature hybrid oaks in places, but this is largely open area with abundant bracken and bramble. Hawthorn and sycamore are also present locally here.
- 5.8 The dense scrub at TN5 has recently been largely cleared by machine with some mature hawthorn removed. The scrub is dominated by gorse with bramble, hawthorn and ivy; the ground layer is largely bare.

Hedge banks

- 5.9 Hedgerows bound the east and western boundaries of the Site and one crosses the Site separating the two fields, at TN3 and 7. Only the hedge bank at TN2 supports mature trees with occasionally hybrid oak with rarely occurring holly. Other species noted were bracken, bramble, foxglove, mouse eared chickweed and red fescue.
- 5.10 At TN4 the hedge bank has been recently breached in two locations by machines. There are no hedgerow shrub or tree species present but gorse occasionally throughout and is abundant at the southern end of the hedge bank where it merges to the scrub at TN5. Species present are mainly grasses with common bent and cocksfoot the most common. Common heather and sheep's sorrel are both present indicating the acidic nature of the bank.
- 5.11 The hedge bank at TN6 has been largely colonised by dense scrub with gorse dominant. Much of this has recently been cleared by machine, the remaining ground flora is dominated by bramble and bracken.

Other Habitats

- 5.12 There are rocky outcrops present in the south of the Site (TN8) which support calcifuges such as the moss *Polystichum* and sheep's sorrel, indicating the acidic nature of the underlying geology. A new stoned entrance to the Site is in the north east corner.

Summary

- 5.13 The Site is intensively managed but also has had the field boundaries neglected allowing the development of scrub and some woodland. From survey it is difficult to quantify the value of the grassland and recommendations for further survey are made in Section 8.

Fauna

- 5.14 Faunal species observed during the survey were limited to a number of commonly occurring bird species either on or adjacent to the Site. Species noted were mistle thrush, raven, crow, robin, magpie, jackdaw, blackbird, wood pigeon, nuthatch blue tit and great tit.
- 5.15 Great crested newt are known from the former Llandarcy Oil Refinery to the west and north of the Site and this area is now part of the Coed Darcy GCN SINC. There are ponds near to the Site, one of which in the ownership of the Site owner has proved negative on eDNA testing (Pilkington, 2022); the other ponds are not accessible. No suitable breeding ponds are on or directly adjacent to the Site but the Site supports potential terrestrial habitat and this should be considered in any further removal of scrub.
- 5.16 The majority of the Site is heavily grazed and cut for keep and is therefore considered unsuitable to support significant populations of reptiles. The scrub and hedge banks are suitable habitat for species such as common lizard and possibly grass snake and there are records from within 600 metres of both species. Badgers paths were found across the Site during the Site walk over. Hedgehogs could occur in the locality.
- 5.17 Whilst bats are likely to forage over and around the Site, the development does not particularly offer any impacts upon them. Consideration to the possible presence of bats is given in Section 8, Recommendations.
- 5.18 The Site does not support suitable habitat for otter, dormouse or water vole. Given the improved nature of the majority of the Site, it is considered to be of low importance for invertebrates.

6 DISCUSSION AND IMPACT ASSESSMENT

- 6.1 The Site is dominated by agriculturally modified grassland with a field of apparently agriculturally improved grassland and another which has the characteristics of semi-improved acid grassland, a UKBAP priority habitat and Section 7 Habitat of Principal Importance under The Environment (Wales) Act 2016 as 'Lowland Dry Acid Grassland'. Initial consideration to this habitat does suggest it is species poor, however it is considered a walk over at an appropriate time of year is needed to properly assess its biodiversity value. The Site supports limited opportunities for protected species with the scrub/grassland mosaic offering potential for reptiles.
- 6.2 Due to the early season survey, the condition of the grasslands could not be properly categorised and further survey is recommended in the main season (May – July) to confirm the grassland types and their species richness or otherwise and typicalness of the habitat type.
- 6.3 There is also potential terrestrial habitat for great crested newts on Site, however the closest records are from approximately 900 metres away on the Coed Darcy Site. A pond on land to the east has been tested for great crested newt eDNA and found negative, there are ponds on adjacent land that were not accessible however, and these lie approximately 100 to 150 metres from the Site. Although there are obstacles for them to access the Site, a methodology for scrub clearance is provided in Section 8, Recommendations, to provide a safe clearance strategy.

- 6.4 The majority of the disturbance likely to occur from the proposals is to the grassland areas. The use of machinery to clear scrub from Site boundaries has been undertaken and does have the potential to impact upon reptiles, particularly if underground in shallow burrows or in the rootstock of the woody scrub. To avoid significant potential impacts recommendations are made in relation to the presence of reptiles in Section 8.
- 6.5 The process of installation of the solar panels and infrastructure has potential to disturb the ground vegetation and ongoing shade of parts of the grassland is likely to favour more shade tolerant species over those less so. The panels are fixed using ground anchors and disturbance is limited to the process of getting the panels to Site and fixing. The cables are laid in trenches that are up to 600mm deep and likely to be at least that in width. This may cause modification to and disturbance of the existing vegetation and recommendations are made in Section 8 to limit these effects.
- 6.6 During the construction phase, there is potential for spills of contaminants which may include construction materials or wash off of high particulate matter. Measures must be taken to prevent this and basic recommendations are made in Section 8. Removal of trees is not proposed, but the woodlands and scrub on Site form part of the Jersey Marine Woodlands SINC and should be protected against any significant intrusion to maintain the integrity of the SINC.
- 6.7 Currently the Site is heavily grazed and cut, Hawkeswood Ecology is not aware of the proposed post construction management of the Site but a reduction in overall grazing pressure is likely. This could offer opportunities to improve the biodiversity of the Site by planting or seeding which could offer benefits to invertebrates and potentially to predators of them through increased numbers of prey species. It would certainly be hoped for that there would be a significant reduction in applications of artificial fertilisers.
- 6.8 There are some concerns over the impacts of large scale solar farms on some species groups. These are addressed in Section 8, Recommendations. It is considered at this Site the principal potential impacts of solar farms have been identified as relating to bats, birds and invertebrates as identified in the Literature Review produced by BSG Ecology Ltd (2019).
- 6.9 The Site has potential to support foraging bats and foraging and breeding birds. For bats, there are concerns that the smooth panel surfaces can be mistaken for water and bats may collide with them. Experimental results are scarce and further work is necessary. It would seem that original findings from controlled experiments point to the fact that bats are not necessarily harmed with no evidence of collisions, but can mistake the panels for water and land on them. The tilted setting of the panels in the farm design mitigate against bats being affected in this way.
- 6.10 Impacts on birds largely relate to solar arrays unlike those proposed at Sun Fields. Most probably the main potential impact in this location with this sort of array would be displacement of ground nesting species. Due to the current intensive management of the Site it is deemed to be of very low importance for ground nesting birds. It is considered that the development may provide opportunities for species such as meadow pipit which may benefit from a reduction intensity in grazing and development of a more structured ground flora. At the current time the land management does not support open land ground nesting species such as curlew, lapwing and possibly skylark in any event as the sward is tightly grazed and disturbed throughout the season.

- 6.11 Concerns for invertebrates also relate to the panels being mistaken for water. However, given the exposed nature of the Site and the distance from suitable aquatic habitats, no significant impacts upon aquatic invertebrates are likely in this instance.
- 6.12 Under the Environment (Wales) Act 2016 and Well Being of Future Generations Act 2015 require Local Planning Authorities (LPA's) and other public bodies must seek to maintain and enhance biodiversity so far as consistent with the proper exercise of their functions and in so doing promote the resilience of ecosystems. Assessment of the Ecosystem Resilience is therefore an integral part of the LPA's duty and they will need to consider the impacts of the proposed development upon the resilience of the adjacent wooded areas in this context. LPAs are directed to consider the resilience of ecosystems early in the planning process to aid assessment of the impacts of any proposed development upon biodiversity. In addition, a letter from the Chief Planning Officer clarified planning requirements in relation to biodiversity impacts (see Section 8, Relevant Legislation and Policies paragraphs 8.17-8.19) points out the responsibility of the LPA to maintain and enhance biodiversity and to provide '*a net benefit for biodiversity*'.

Ecosystem resilience

- 6.13 The premise for Ecosystem Resilience is laid out in Section 4 of The State of Natural Resources Report, a 2018 document produced by Natural Resources Wales (NRW) on behalf of the Welsh Government. It lays out a framework for assessing ecosystem resilience. However, despite the duty placed on LPA's, there is no currently agreed format for this assessment.
- 6.14 Section 4 names five attributes that NRW consider 'building blocks' of ecosystem resilience, these are:
- Diversity
 - Extent
 - Condition
 - Connectivity
 - Adaptability
- 6.15 These factors are considered below, although none of them are considered 'stand alone' and all interrelate to some extent. It is also important to note that it is the responsibility of the LPA to assess Ecosystem Resilience and that any Site based report is not able to make judgements on a wider scale. As pointed out above, it is important to note that there is as yet no agreed format to undertake such an assessment.

Diversity

- 6.16 The habitats on Site can be placed into two broadly distinct areas, agriculturally improved grassland and woodland /scrub habitat bounding the fields and construction zone. The Site itself supports Jersey Marine Woodlands SINC offering habitats for breeding birds, reptiles and foraging bats. This habitat enjoys good connectivity to other nearby woodlands and pasture.

Extent

- 6.17 The whole Site is approximately five hectares of which the construction zone is approximately 2.5 hectares. The majority of affected habitat is grassland with some scrub removal necessary. It is

hoped the majority of this will be relatively unaffected and there is potential for improved habitat management.

Condition

- 6.18 The Site has been significantly modified by agricultural improvement leading to a likely reduction in its biodiversity potential and also from neglect of field boundaries resulting in scrub encroachment. Further survey is recommended to properly assess the condition of the grasslands.

Connectivity

- 6.19 The Site itself is well connected to the surrounding green spaces by hedgerows, woodland and scrub.

Adaptability

- 6.20 NRW comments that:
‘Adaptability differs from the other attributes because it is part of the definition of resilience rather than an attribute that supports it. However, its inclusion in the Environment (Wales) Act is important because it emphasizes one of the most important features of resilience: dynamism and the ability to adapt to change.’
- 6.21 NRW also comments that *‘Adaptability cannot yet be quantified in an equivalent way to the other attributes and so we have not used it in the assessment of resilience in this State of Natural Resources Review’*. As such this cannot be considered in this report.
- 6.22 At its most simple, this would mean that the LPA must protect any biodiversity value of the of the Site and any impacts likely to affect adjacent areas. In this instance, it is considered that there are not likely to be any significant impacts if proper mitigation is put in place prior to, and in the course of, construction. Without mitigation, these impacts could be considered to be significant. Recommendations are made in Section 8 to ensure that any impacts are properly negated.

Predicted Development Impacts

- 6.23 The areas of the Site affected by the proposals are largely agriculturally improved grassland, including semi-improved acid grassland that requires further assessment to properly categorise it’s importance. In addition, the woodland and scrub on Site has been notified as a SINC and as such requires proper consideration in the planning process. In terms of protected species, there is some potential for reptiles and possibly great crested newts and this is addressed in section 8 Recommendations. At the current time there is not enough information to properly assess the potential impacts upon habitats on Site, however, based on the current survey data it is likely that these will be of a **minor negative significance** in a local (local area) context with some potential for an overall improvement over time.
- 6.24 In terms of the Crymlyn Bog Special Area of Conservation/Crymlyn Bog Wetland of International Importance (RAMSAR Site) it is considered the localised nature of the works will not result in any negative impacts and that as the development has no direct connections to the SAC/SPA it is of **no significance**. However, some recommendations are made in Section 8 to ensure they are properly considered in the construction period.

- 6.25 When considering the presence of reptiles and amphibians the limited extent of the proposed development is not expected to have any long term impacts, indeed, the inclusion of much of the currently formally intensively managed areas on the Site may well have benefits for them offering an increase in available foraging and possibly breeding area. It is considered that the proposals are unlikely to impact upon other protected species and if the recommendations made in Section 8 are fully implemented it is considered that the proposed development will result in **no adverse impact** upon protected species.

7 RELEVANT LEGISLATION AND POLICIES

Birds

- 7.1 Part I of the Wildlife and Countryside Act 1981 (as amended) makes it an offence (with certain limited exceptions and in the absence of a licence) intentionally to kill, injure or take any wild bird, or intentionally to damage, take or destroy its nest whilst being built or in use, or to take or destroy its eggs. Consequently, even common birds such as blackbirds or robins, and their nests and eggs are protected in this way. Any works involving removal or other management of trees or shrubs must be undertaken outside the breeding bird season (March- August).
- 7.2 Further, section 1(5) of Part 1 of the W&C Act states any person intentionally disturbing any wild bird included in Schedule 1 whilst it is building a nest or is in or near a nest containing eggs or young or disturbs the young of such a bird is committing an offence and liable to a special penalty.
- 7.3 The Conservation of Habitats and Species Regulations 2017 (as amended) has strengthened the protection of wild birds and their habitats. The Regulations now serve “To help preserve, maintain and re-establish habitats for wild birds.”
- 7.4 Under the amended Regulations, Local Planning Authorities (as well as national statutory conservation bodies such as Natural Resources Wales) are required to protect and create bird habitat.

European Protected Species

- 7.5 All UK bats and great crested newt are protected under the Wildlife and Countryside Act 1981. Schedule 5 of this act makes it illegal to intentionally kill, injure or take these animals. It is also an offence to intentionally damage or destroy their place of rest. In 2007 the offences of killing, injuring or taking species under Section 9(1), 9(2) and 9(4)a of European Protected Species listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) were removed to avoid duplication with their protection under Annex IV of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (The Habitats Directive) as amended. The regulations remove the defence of inadvertent or accidental damage to roosts and make the offence ‘absolute’.
- 7.6 They are also protected under Annex IV of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (The Habitats Directive) as amended which requires the United Kingdom government to provide European Protected Species with strict protection.

- 7.7 The Habitats Directive is transcribed into England and Wales Law by The Conservation of Habitats and Species Regulations 2017, this legislation consolidates amendments made to the earlier 2010 act. This legislation states in Part 3, Protection of Species, paragraph 43(1) that a person who:
- (a) deliberately captures, injures or kills any wild animal of a European Protected Species,
 - (b) deliberately disturbs wild animals of any such species,
 - (c) deliberately takes or destroys the eggs of such an animal, or
 - (d) damages or destroys a breeding site or resting place of such an animal,
- is committing an offence.
- 7.8 Further, with regard to disturbance of EPS, Paragraph 43(2) that disturbance is an act which is likely to:
- (a) to impair their ability—
 - (i) to survive, to breed or reproduce, or to rear or nurture their young, or
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
 - (b) to affect significantly the local distribution or abundance of the species to which they belong.
- 7.9 In the case of a development involving the loss or modification of a habitat which may affect an EPS the above legislation must be considered and it may be necessary to apply to Natural Resources Wales for a European Protected Species Derogation Licence EPSL.
- 7.10 The introduction of the Conservation of Habitats and Species Regulations 2017, has removed the defence of killing or injuring a protected species during a lawful operation, thus even in an instance where planning permission is granted, the presence of EPS must be considered and mitigated for prior to commencement of works. Under the above regulations, a derogation licence can only be given if three tests are satisfied:
- The action proposed is in the interest of preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance to the environment;
 - That there is not a satisfactory alternative;
 - That the action proposed will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.
- 7.11 Failure to satisfy the regulations and obtain an EPSL where required is likely to result in prosecution and can lead to severe fines of up to £5000 per animal and possible imprisonment.
- 7.12 Eight species of bat and great crested newt are listed in section 7 of the Environment Wales Act (2106). Section 7 of the Act provides a list of living organisms of principal importance for the purpose of maintaining and enhancing biodiversity in Wales. This is a list of species considered at threat within Wales and in need of conservation management to maintain and enhance population numbers.
- 7.13 A duty is placed on the Local Authority by the Welsh Assembly Government to maintain and enhance populations of species listed in Section 7.

Badgers

- 7.14 The Protection of Badgers Act (1992) makes it an offence to kill, injure, disturb or take a badger, or to damage or interfere with a sett without previously obtaining a licence from Natural Resources Wales (NRW).
- 7.15 The legislation states in Section 3:
A person is guilty of an offence if, except as permitted by or under this Act, he interferes with a badger sett by doing any of the following things—
(a) damaging a badger sett or any part of it;
(b) destroying a badger sett;
(c) obstructing access to, or any entrance of, a badger sett;
(d) causing a dog to enter a badger sett; or
(e) disturbing a badger when it is occupying a badger sett, intending to do any of those things or being reckless as to whether his actions would have any of those consequences.
- 7.16 Within this legislation, if a sett is present on or near a development Site, a licence is needed to hand dig within 10 metres of the sett, to use light machinery within 20 metres of the sett or to use heavy plant machine digging within 30 metres of the sett.

Environment (Wales) Act 2016

- 7.17 The Welsh Government has made a commitment to reversing the decline in biodiversity in Wales and increasing the resilience of its ecosystems. This is in part fulfilled by the Environment (Wales) Act 2016 which introduces a new biodiversity duty, which highlights biodiversity as an essential component of ecosystem resilience.
- 7.18 Section 6 of the Act places a duty on public authorities to ‘seek to maintain and enhance biodiversity’ and ‘promote the resilience of ecosystems’ in the exercise of their functions. Section 7 places a duty on Welsh Ministers to identify lists of living organisms and types of habitat (priority habitats and species) in Wales that are of key significance to sustain and improve biodiversity in relation to Wales. Local Authorities have a duty to consider this list when considering planning applications, applying the principles of sustainable management of natural resources. The Section 7 list is a revised list of the Section 42 list in the Natural Environment and Rural Communities Act, 2006.

Protected Sites

- 7.19 International sites for biodiversity are those designated under international conventions and directives. Crymlyn Burrows SAC and SPA is local to the Site but is unlikely to be impacted by the proposed works, no significant impacts are foreseen and measures to ensure their integrity are considered in Section 8, Recommendations. However Local authorities have a duty to consider the statutory protection afforded to such sites when considering planning applications.
- 7.20 The Wildlife and Countryside Act 1981 (as amended) affords protection to nationally important Sites of Special Scientific Interest (SSSIs) and local authorities again have a duty to consider their statutory protection when considering planning applications. Pant Y Sais SSSI lies approximately

400 metres south of the Site, it is also part of the Crymlyn Bog SAC. It is considered that the SSSI will be not impacted by the proposals.

Sites of Importance for Nature Conservation (SINC)

- 7.21 Sites of Nature Conservation Interest (SINC) are sites which contain features of substantive nature conservation value at a local level. The sites are designated through a Local Sites Partnership (LSP), using an agreed set of criteria. They do not enjoy statutory protection but must be considered in the planning process. The destruction of a SINC or damage to it through any development must be justified against the loss of natural interest. Jersey Marine Woodlands SINC includes woodland and scrub on Site and is therefore a material consideration during the planning process.

TAN 5

- 7.22 Planning Policy Wales Technical Advice Note (TAN) 5, Nature Conservation and Planning, provides advice on how the planning system should contribute to biodiversity protection and enhancement. TAN 5 recognises the importance of biodiversity and the enjoyment of it. TAN 5 requires Local Planning Authorities (LPAs) to protect and enhance biodiversity during the planning process and to encourage sustainable developments. It also requires LPA's to ensure that protected Sites are properly accounted for within the planning system.

Securing Biodiversity Enhancements

- 7.23 The Chief Planning Officer sent a letter to LPAs (dated 23rd October 2019) following the refusal of the planning application. This letter has provided clarification on the Welsh Governments approach to Paragraph 6.4.5 of Planning Policy Wales 10 which sets out that “*planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means that development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity.*”
- 7.24 The purpose of this letter was to clarify that in light of the legislation and Welsh Government policy outlined above, where biodiversity enhancement is not proposed as part of an application, significant weight will be given to its absence, and unless other significant material considerations indicate otherwise it will be necessary to refuse permission. Biodiversity enhancement therefore will need to be included in any future planning application.

8 RECOMMENDATIONS

- 8.1 A further walk over assessment of the grassland is required to be undertaken at an appropriate time of year when most flowering plants can be expected to be visible.
- 8.2 Any works on trees and scrub should be undertaken outside the accepted bird breeding season of March to August. There is no licence for the destruction of active bird nests and nest translocations invariably fail, in addition nest searches are often unsuccessful and miss nesting birds. Development timing is a key consideration should such works prove necessary. Checks should also be made prior to works undertaken outside the breeding season if the weather is fine as climate warming is leading to an extended breeding season.

- 8.3 In addition, if any trees are identified for removal, an inspection for potential use by roosting bats should be undertaken before works commence.
- 8.4 Before any further scrub clearance is undertaken a search will be made for the presence of badger setts.
- 8.5 Removal of scrub will be undertaken with due regard to the potential presence of reptiles and great crested newt. The following methodology is recommended:
- Clearance works will be undertaken in warm weather, preferably 10°C or above in dry conditions;
 - All works will be undertaken by hand operated machinery (i.e. brushcutters/chain saws);
 - Initial cuts will be made to a minimum height of approximately 10cm and will not reach to the ground level;
 - Before a cut is made to ground level, the Site will be walked over by a suitably experienced ecologist to look for great crested newts. **Should their presence be proven work will cease immediately and Natural Resources Wales (NRW) contacted to advise on the possible need for development licensing;**
 - Following this, the scrub may be removed by machinery under a watching brief by the appointed ecologist.
- 8.6 An area will be identified during the construction phase where chemicals and building materials can be safely stored and bonded to prevent contamination of the adjacent habitats. Measures to prevent and deal with any pollution incidents will be clearly outlined in a Construction Environmental Management Plan (CEMP).
- 8.7 Although not considered to be of major significance, given the location of the Site measures should be investigated to reduce the attraction of flying aquatic invertebrates to the solar panels to prevent unnecessary egg laying. BSG summarise in their Literature Review of potential ecological impacts that Hungarian research has shown non-reflective surfaces or white gridding of the panels can reduce occurrence of this. White gridding the panels would also be likely to deter bats from accessing the panels although the angle they will be deployed at is likely to prevent any incidents with bats mistaking the surfaces for water.
- 8.8 In relation to birds there are likely to be no negative impacts. The current use of the land does not support open land ground nesting species, i.e. curlew, lapwing and possibly skylark and the closing of the Site to intensive management may offer opportunities to species such as meadow pipit in a previously unsuitable area.
- 8.9 The major impact on the ground vegetation would appear to be the trenching for cabling. It is recommended at this point, prior to a re-evaluation of the grassland, that the turfs in the semi-improved acid grassland area are removed and stored during trenching and replaced on completion.
- 8.10 Post construction management should be considered. This may include enhancement by seeding in the agriculturally modified field at TN3 and low intensity grazing across the Site. The retention of hedge banks and other physical features and replanting with hedgerow species where feasible is

encouraged (see below 8.11). There is potential for short term wildflower meadows to be created in the area of TN3 to enhance the Site for invertebrates or retain the Site as long term pasture but considering plug planting to enhance biodiversity.

- 8.11 Hedgerow and Tree roost protection zones (RPZ) will be outlined for retained trees and hedgerows will comply with BS 5837:2012 – Trees in relation to design, demolition and construction.
- 8.12 Any landscaping plan should introduce native species reflecting those present in the local area (all native species should be of local provenance). Woody plantings in particular should reflect those present in local hedgerows and woodlands. Typical include hazel, hawthorn, blackthorn, dog rose common gorse and holly. Other species that might be considered for their potential to support invertebrates or fruits include guelder rose, dogwood, crab apple and elder.

9 CONCLUSIONS

- 9.1 The Site is dominated by grassland but further walk over survey is recommended at an appropriate time of year to properly assess its value.
- 9.2 Recommendations are made to maintain and enhance the biodiversity value of the Site.
- 9.3 At this point, if recommendations made are implemented, there are no apparent ecological reasons that would prevent the proposed scheme from going ahead. Final conclusions will be made following the recommended later habitat assessment at which point the recommendations made will be reviewed and altered if necessary.

10 BIBLIOGRAPHY

Nature Conservancy Council, 1990, (2010 revision), *The Handbook for Phase 1 Habitat Survey – a technique for environmental audit*, JNCC

The Wildlife and Countryside Act 1981 (as amended).

The Conservation of Habitats and Species Regulations, 2017 (as amended), HMG.

Bats and Artificial Lighting in the UK, Guidance Note 08/18 (2018) Bat Conservation Trust, Institution of Lighting Professionals.

Chartered Institute of Ecology and Environmental Management (2013), '*Guidelines for Preliminary Ecological Appraisal*'

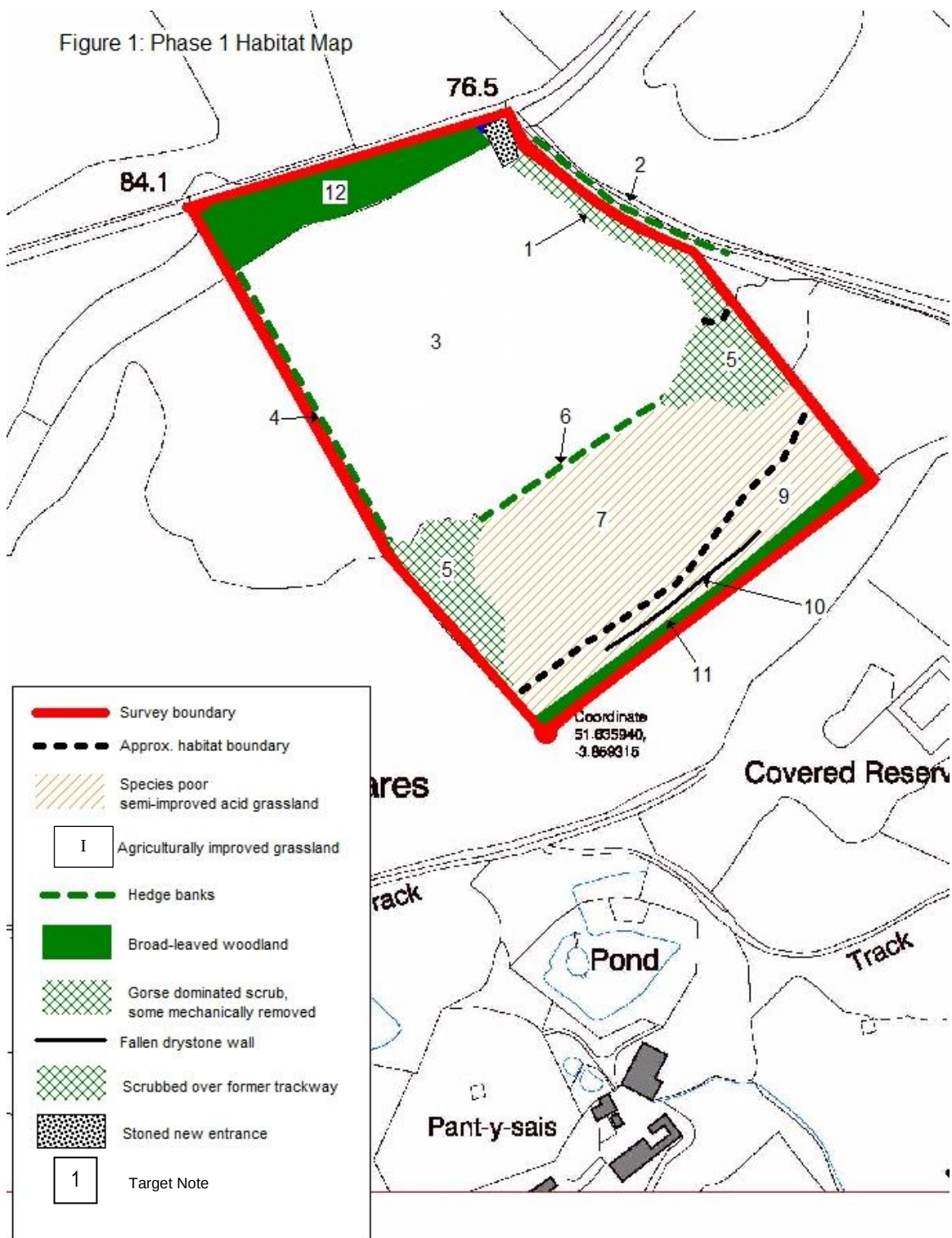
'*Vital nature: Making the connections between biodiversity and the people and places of Wales NRW's strategic steer for biodiversity to 2022*', Natural Resources Wales, 2018.

Taylor, R., Conway, J., Gabb, O., Gillespie, J. (2019) *Potential impacts of ground mounted photovoltaic solar panels, An Introduction and Literature review* Published online

Jen Pilkington, 2022, '*Preliminary Ecological Assessment, Gelli Bwch Farmhouse and Holiday Lets*'. JP Ecological Services

**FIGURE 1:
PHASE 1 HABITAT MAP**

Figure 1: Phase 1 Habitat Map



GELL BWCH, LLANDARCY, NEATH

APPENDIX 1
DAFOR SCALE OF COVER ABUNDANCE

The DAFOR scale is used as a simple measure of cover abundance for individual plant species within a habitat. The scale is as follows:

- D Dominant
- A Abundant
- F Frequent
- O Occasional
- R Rare
- (L Locally – sometimes used as a prefix to the above)

APPENDIX 2
PHASE 1 HABITAT SURVEY TARGET NOTES

- Former trackway now overgrown with bracken and bramble. Bounded by a field bank to the north east but open to grazing from the field. Semi-mature hybrid oak are locally frequent with occasionally occurring sycamore. Species recorded were:

<i>Species</i>	<i>Frequency</i>
Bracken	O-LF
Bramble	F
Cocksfoot	O-LF
Common bent	LF
Common knapweed	O
Common nettle	F
Creeping bent	LF
Creeping buttercup	O
Hawthorn	O
Sessile/common oak hybrid	LF
Ivy	F
Red fescue	LA
Rough meadow grass	LF
Sycamore	O

- Hedgebank alongside Track (TN1). No ditch and very few trees or shrubs present. Oak occurs occasionally with rarely occurring holly. Species recorded were:

<i>Species</i>	<i>Frequency</i>
A moss <i>Polytrichum</i> sp	O
A moss <i>Thuidium</i> sp	LF
Bracken	O-LF
Bramble	F
Cocksfoot	O
Common bent	A
Foxglove	O
Hawkbite sp	R
Holly	R
Sessile/common oak hybrid	O
Ivy	F
Mouse-eared chickweed	R
Red fescue	F

- Agriculturally modified field which is grazed and cut. Has a north facing aspect and appears to be a re-seeded sward. It is species poor but common knapweed was

noted, bracken and gorse scrub is encroaching from the field boundaries. Badger paths noted around field boundary. Species recorded were:

<i>Species</i>	<i>Frequency</i>
Bracken	LF
Cocksfoot	LF
Common knapweed	O
Common sorrel	F
Creeping buttercup	F-LA
Gorse	O
Meadow buttercup	R
Perennial rye-grass	A
Red fescue	O
Ribwort plantain	A
Yorkshire fog	A

4. Hedge bank bounding west of Site, No woody species present for most of the length apart from gorse, acidic nature of the bank shown by the presence of heather and bracken. Machine breakthroughs in two locations. Species present were:

<i>Species</i>	<i>Frequency</i>
A moss, <i>Dichranum</i> sp	LF
Bracken	O-LF
Bramble	LF
Cocksfoot	F-LA
Common bent	A
Common gorse	O-LA
Common heather	LF
Common sorrel	O
Feather moss sp	LF
<i>Festuca</i> sp	F
Sheep's sorrel	O

5. Area of gorse dominated scrub recently cleared by machine. Other species noted included hawthorn, bramble and ivy. The ground layer is largely bare ground.
6. Hedge bank, no standards generally disturbed by clearance of gorse scrub. Bramble and bracken are both frequently occurring.
7. The second field, with a southerly aspect and appearing floristically different from the field at TN3. Also grazed and cut as part of the same unit, there are some rocky outcrops present (TN8). It is considered this grassland may be of more importance and needs re-assessment at an appropriate time of year. Badger paths noted on the field boundary and across the field. Species recorded were:

<i>Species</i>	<i>Frequency</i>
Cocksfoot	F
Common knapweed	LF
Common sorrel	F
Creeping buttercup	F
Crested dog's-tail	F
Dandelion	LF
<i>Festuca</i> sp	A
Ribwort plantain	A
Sheep's sorrel	O

8. Rocky outcrops within the field, small number of these with common bent, *Polytrichum* and sheep's sorrel occurring frequently.
9. Area of uncut but grazed semi-improved acid grassland. A number of ant hills have developed in this area. Species recorded were:

<i>Species</i>	<i>Frequency</i>
A moss, <i>Dicranum</i> sp	F
Bracken	LA
Cocksfoot	F
Common bent	A
Common heather	LA
Common knapweed	O-LF
<i>Festuca</i> sp	LA
Ribwort plantain	O
Yorkshire fog	O

10. Fallen drystone wall.
11. Area to south of TN7, uncut but open to grazing leading to steep slope to south east. A transition from the SI acid grassland to the slope with increasingly dense bracken. A woodland canopy forming over parts of the area with semi-mature oak occurring frequently. Amongst the developing shrub layer hawthorn, blackthorn and gorse are frequent. The ground flora is dominated by dense bramble and bracken.
12. Semi-natural broadleaved woodland alongside the unnamed road to the northern boundary of the Site. Appearing to have developed along a former trackway, it is open to grazing. The canopy consists of frequent oak, probably sessile/common hybrids and rarely occurring sycamore. The shrub layer is sparse and poorly developed with occasionally hawthorn and the ground layer is dominated by grasses. Species recorded were:

Preliminary Ecological Appraisal, Sun Fields, Dream Fields, Llandarcy.
Hawkeswood Ecology – March 2023

<i>Species</i>	<i>Frequency</i>
Sessile/common oak hybrid	F
Sycamore	R
Hawthorn	R
Ivy	F
Rough meadow grass	F
Bare	F
Bramble	O-LF
Common bent	F
Common nettle	F
Creeping buttercup	F

APPENDIX 3
LIST OF PLANT SPECIES RECORDED IN THE SURVEY

<i>Species</i>	<i>Scientific Name</i>
A moss <i>Polytrichum</i> sp	<i>Polytrichum</i> sp
A moss <i>Thuidium</i> sp	<i>Thuidium</i> sp
A moss, <i>Dichranum</i> sp	<i>Dichranum</i> sp
Blackthorn	<i>Prunus spinosa</i>
Bracken	<i>Pteridium aquilinum</i>
Bramble	<i>Rubus fruticosus</i>
Cocksfoot	<i>Dactylis glomerata</i>
Common bent	<i>Agrostis capillaris</i>
Common gorse	<i>Ulex europaeus</i>
Common heather	<i>Calluna vulgaris</i>
Common knapweed	<i>Centaurea nigra</i>
Common nettle	<i>Urtica dioica</i>
Common sorrel	<i>Rumex acetosa</i>
Creeping bent	<i>Agrostis stolonifera</i>
Creeping buttercup	<i>Ranunculus repens</i>
Crested dog's-tail	<i>Cynosurus cristata</i>
Dandelion	<i>Taraxacum officinale</i> agg
Feather moss sp	<i>Hypnales</i> sp
<i>Festuca</i> sp	<i>Festuca</i>
Foxglove	<i>Digitalis purpurea</i>
Gorse	<i>Ulex europaeus</i>
Hawkbit sp	<i>Leontodon</i> sp
Hawthorn	<i>Crataegus monogyna</i>
Holly	<i>Ilex aquifolium</i>
Ivy	<i>Hedera helix</i>
Meadow buttercup	<i>Ranunculus acris</i>
Mouse-eared chickweed	<i>Cerastium fontanum</i>
Red fescue	<i>Festuca rubra</i> agg
Ribwort plantain	<i>Plantago lanceolata</i>
Rough meadow grass	<i>Poa trivialis</i>
Sessile/common oak hybrid	<i>Quercus robur</i> x <i>petraea</i>
Sheep's sorrel	<i>Rumex acetosella</i>
Sycamore	<i>Acer pseudoplatanus</i>
Yorkshire fog	<i>Holcus lanatus</i>

APPENDIX 4
PHOTOGRAPHS



The entrance with the former trackway (TN1), to the right.



Looking along the former trackway TN1.



Hedge bank, TN2



TN3 Improved grassland



Improved grassland TN3.



Hedge bank TN4, new machinery access visible.



Gorse scrub TN5, largely cleared by machine



Looking east along hedge bank at TN6



Looking from TN5 across field TN7, probable species poor semi-improved acid grassland



Looking north across TN7 showing a rocky outcrop (TN8)



Across TN7 to TN5



The unmanaged area of species poor grassland with encroaching dense bracken falling to developing woodland (TN11)



Looking west along TN11



East along TN11 showing common heather



Badger paths across the fields (Particularly TN7 and field boundaries)



Machine cleared are east of TN6 hedge bank



Woodland at TN12



The poorly structured nature of TN12

HAWKESWOOD ECOLOGY

Specialists in Ecological Survey and Assessment

17 Heol Henrhyd, Coelbren, Nr. Ystradgynlais, POWYS. SA10 9PG. Tel/Fax: 01639 701304
Mobile: 07957 154794 E-mail: hawkeswoodecology@btinternet.com
(Proprietors: Niki and Eric Hawkeswood)

**A partnership of professionals delivering
answers since 2001**

*Hawkeswood Ecology is an Ecological Consultancy working
in Wales offering a wide range of expertise in ecological
assessment for a broad range of clients.*

