

Carmarthenshire County Council

Machynys Hotel

Ecological Impact Assessment
(EcIA) Report

Issue | 17 December 2020

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 278688

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1 Introduction

1.1 Scope of the Report

Ove Arup and Partners Limited (Arup) has been commissioned by Carmarthenshire County Council (CCC), the Applicant, to prepare and submit an outline planning application, with all matters reserved, for a new 140-bed hotel, located on land to the west of Nicklaus Avenue, Machynys, Llanelli, Carmarthenshire (approximate National Grid Reference: SS 51187 98306). The site location is shown on Figure 1. The application will be submitted to the Local Planning Authority, CCC, on behalf of the Applicant, CCC.

Part of the commission was to undertake an Ecological Impact Assessment (EcIA) for the proposed development. This report reviews the findings of previous ecological studies, spanning the years 2007 to 2020, and documents the value of receptors identified and the predicted effects arising from the construction and operation of the proposed development. The report also outlines mitigation and enhancement measures.

1.2 Site Description

The proposed development site is located approximately 2.4 km to the south-east of Llanelli town centre and overlooking the Burry Inlet and the Millennium Coastal Path to the south and west.

The site is bounded by the B43034 coastal link road to the north, the access road to the Machynys Golf Club to the east, the golf course to the south and the Pentre Niklaus residential development to the west. The northern boundary has a number of landscaped bunds which form a visual screen between the site and the link road.

The development area covers part of the site occupied by the former Machynys brickworks in the early part of the 20th Century. Various water bodies on the site were created by the extraction of clay for the brickworks.

Subject to ongoing discussions with the local authority highways department and Golf and Country Club, access to the hotel may be provided via the private access road serving the existing Golf Club, or from the B4304. A new dedicated emergency and service vehicle access road to the west of the site could ensure that the hotel can be serviced discretely, keeping staff and service vehicles separate from guest vehicles if required. The service road and building levels will be set above minimum levels recommended in a Flood Consequences Assessment to reduce the risk of flooding and to ensure safe access for emergency vehicles at all times.

1.3 Description of the Proposed Works

Outline planning permission is sought for the construction of a new 140-bed hotel with associated car parking, access roads, landscape and infrastructure works,

including the importation of material for infilling of land to raise level for the development. An illustrative site layout plan is given in Appendix B.

This application follows a previous outline application which was granted (subject to conditions) on 10th April 2013 by CCC for a 125-bed hotel on the same site but has since expired.

1.4 Legislative Context

A framework of international (European), national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. The following core legislation exists to protect habitats and species of nature conservation importance:

- i. The Conservation of Habitats and Species Regulations 2017 (as amended) transposes Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) into UK law.
- ii. Wildlife and Countryside Act 1981 (as amended) (WCA);
- iii. Environment (Wales) Act 2016 including Section 7 (S7) biodiversity lists;
- iv. The Well-being of Future Generations (Wales) Act 2015;
- v. The Countryside and Rights of Way Act 2000;
- vi. The Hedgerow Regulations 1997;
- vii. Protection of Badgers Act 1992;
- viii. The Salmon and Freshwater Fisheries Act 1975;
- ix. The Eels (England and Wales) Regulations 2009; and
- x. The Invasive Alien Species (Enforcement and Permitting) Order 2019.

These pieces of legislation include a number of offences relating to protected species and requirements for licences to allow construction works to proceed. In addition, the Habitats Regulations set out the requirement for the consideration of the potential effects of a project on European Sites.

Actions which are prohibited by legislation can be made lawful on the approval and granting of a protected species licence from Natural Resources Wales (NRW), subject to conditions.

Details of the legislation are provided in Appendix A.

1.5 Policy context and Local Biodiversity Action Planning

Planning Policy Wales (2018)

Planning Policy Wales¹ sets the national policies in relation to development control through the Town and Country Planning Act 1990. This is supported by a series of Technical Advice Notes, with Technical Advice Note (TAN) 5² being of particular relevance to this report as it sets out the consideration of nature conservation in the determination of planning applications.

Nature Recovery Action Plan 2015

Welsh Government has produced a Nature Recovery Plan (NRP) which is aimed at addressing the underlying causes of biodiversity loss by putting nature at the heart of its decision-making, by increasing the resilience of Wales' natural systems (ecosystems), and by taking specific action for habitats and species. It sets out how Wales will deliver the commitments of the EU Biodiversity Strategy and the UN Convention on Biological Diversity to halt the decline in our biodiversity by 2020 and then reverse that decline. The plan builds on Wales' ground-breaking new legislative framework The Well-being of Future Generations (Wales) Act 2015.

Carmarthenshire Local Nature Recovery Plan

The Carmarthenshire Nature Recovery Action Plan³ has a focus on ecological resilience with connectivity as a central theme. This is part of a vision to restore and create better connected networks of habitats within the county, as well as networks of information sharing to inform action by a range of participants. A resilient natural environment in the county contributes the desire for a healthy, safe and economically sustainable Carmarthenshire.

A NRP is being developed based on the objectives of the national plan which address the issues that are driving the decline in biodiversity, and to support recovery:

- Engage and support participation and understanding to embed biodiversity throughout decision making at all levels;
- Safeguard species and habitats of principal importance and improve their management;
- Increase the resilience of Carmarthenshire's natural environment by restoring degraded habitats and habitat creation;
- Tackle key pressures on species and habitats; and,
- An improvement of evidence, understanding and monitoring.

¹ Welsh Government (2018). Planning Policy Wales.

² Welsh Assembly Government (2009). Technical Advice Note 5: Nature Conservation and Planning. Cardiff.

³ Carmarthenshire Nature Partnership (2020). Nature in Carmarthenshire: our approach for local action 2020 – 2030.

South West Wales Area Statement

NRW prepared an Area Statement against a backdrop of Welsh Government's declaration of a climate and a nature emergency. These two issues are interrelated and are in themselves symptoms of the unsustainable management of natural resources; so much so that many are describing this period we live in as the "Anthropocene" – the period when the dominant influence on both climate and our environment is human activity. The factors involved are complex and require a whole systems approach. As such both issues feature across all themes within the Area Statement, and within their own standalone themes.

The themes are:

- Reducing health inequalities
- Ensuring sustainable land management
- Reversing the decline of, and enhancing, biodiversity
- Cross-cutting theme: Mitigating and adapting to a changing climate

Wales Action Plan for Pollinators (2013)

The Action Plan for Pollinators in Wales⁴ recognises that: *“Pollinators are an essential component of our environment. Honey bees and wild pollinators including bumblebees, solitary bees, parasitic wasps, hoverflies, butterflies and moths and some beetles are important pollinators in Wales, for crops such as fruit and oil seed rape, clovers and other nitrogen fixing plants that are important to improving the productivity of pasture systems for livestock grazing, and wild flowers.”*

The Welsh Government has worked with industry and stakeholders to look in more detail at the evidence and issues around pollinators and their conservation in Wales. Following consultation, an 'Action Plan for Pollinators in Wales' was launched setting the strategic vision, outcomes and areas for action to halt and reverse pollinator decline in Wales. This plan aims to reduce and reverse the decline in wild and managed pollinator populations, which includes bees, some wasps, butterflies, moths and hoverflies, some beetles and flies. A pollinator task force comprising of key stakeholders is now active and a draft implementation plan is in place.

⁴ Welsh Government (2013). The Action Plan for Pollinators in Wales. Aberystwyth.

2 Methodology

2.1 Establishing Ecological Baseline

2.1.1 Review of Previous Data

In order to establish a baseline on which to conduct the impact assessment, historic survey reports for the site were reviewed and summarised, including:

- 2007 Ecological Assessment Report⁵;
- 2013 Habitats Regulations Assessment⁶;
- 2013 Reptile Survey Note⁷;
- 2013 Water Vole Survey Report⁸;
- 2015 Water Vole Survey Report⁹;
- 2017 Ecological Survey Update Report¹⁰;
- 2018 Water Vole Mitigation Strategy and Method Statement¹¹;
- 2018 Ecological Baseline Report (for the Llanelli Wellness and Life Science Village)¹²; and
- 2020 Ecological Appraisal Report (for the proposed Machynys Central Housing and Machynys Eco Park developments)¹³.

2.1.2 Desk Study

An updated desk study was undertaken to identify any existing ecological information relating to the site and its surroundings. The Multi-Agency Geographic Information for the Countryside (MAGIC) website¹⁴ was reviewed for information on internationally and nationally designated sites of nature conservation importance within 10km and 2km of the site, respectively. The search included Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar Sites, Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs). The search was extended to 30km for SACs designated for the presence of bats and/or otters.

Ecological records were obtained from Aderyn¹⁵ on 10th August 2020. The records included protected and priority species¹⁶ up to 2km from the site (only records from the last 10 years (2011 onwards) are discussed below) and included

⁵ Pryce Consultant Ecologists (2007). Machynys East and Machynys Central Development Sites Ecological Assessment.

⁶ Arup (2013). Machynys Central Residential Development and Eco-Park Development. Statement to Inform a Habitats Regulations Assessment.

⁷ Arup (2013). Machynys Residential Development Masterplan. Reptile Survey Report.

⁸ Arup (2013). Machynys Central Masterplan. Water Vole Survey Report.

⁹ Arup (2015). Machynys Water Vole Survey Report.

¹⁰ Arup (2017). Machynys Eco Park. Ecological Survey Update.

¹¹ Arup (2018). Machynys Central Residential Development, Llanelli. Water Vole Mitigation Strategy and Method Statement.

¹² Arup (2018). Llanelli Wellness and Life Sciences Village, Delta Lakes. Ecological Baseline Report.

¹³ Arup (2020) Machynys Central Housing and Machynys Eco Park Ecological Appraisal Report

¹⁴ www.magic.gov.uk [Accessed: 06/10/2020]

¹⁵ <https://aderyn.lercwales.org.uk/> [Accessed: 06/10/2020]

¹⁶ EU and UK legally protected species under the Conservation of Habitats and Species Regulations 2019 (as amended) and Wildlife and Countryside Act 1981 (as amended); and species present on the Species of Principal Importance in Wales list in response to Section 7 of the Environment (Wales) Act 2016 (known as Section 7 species).

details of local designations such as Local Wildlife Sites, Local Nature Reserves (LNRs) and Ancient Woodland Sites.

2.1.3 Field Survey

The aim of the update Extended Phase 1 Habitat Survey was to identify and map the habitats present within the site. The survey methodology followed the methodology set out in the JNCC's Handbook for Phase 1 Habitat Surveys¹⁷.

Extended Phase 1 Habitat Survey is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas of land on the basis of the vegetation communities present. The extended survey also provides an assessment of the potential for those habitats present to support legally protected or otherwise notable species.

Relevant species included all those protected by European or UK law, and notable species including those identified as being of principal importance in Wales, in response to Section 7 of the Environment (Wales) Act 2016, as follows:

- Appraising any buildings or trees within the boundary (from the ground only) for their suitability to support breeding, resting and hibernating bats using survey methods based on those outlined in the Bat Conservation Trust's Bat Surveys: Good Practice Guidelines¹⁸;
- Assessing the potential of terrestrial and aquatic habitats to support amphibians, both protected species and species of conservation concern¹⁹;
- Searching for signs of badger (*Meles meles*) activity including setts, tracks, foraging holes and latrines within and up to 30m from the site where possible²⁰;
- Assessing the suitability of habitats for nesting birds (including any old nests);
- Assessing the suitability of habitats for common species of reptiles; adder, (*Vipera berus*), grass snake (*Natrix helvetica*), slow worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*)²¹;
- Assessing the suitability of watercourses for water vole²², otter (*Lutra lutra*)²³ and white-clawed crayfish (*Austropotamobius pallipes*)²⁴.
- Assessing the suitability of habitats for dormice (*Muscardinus avellananrius*)²⁵;

¹⁷ JNCC (2016). Handbook for Phase 1 habitat Survey: technique for environmental audit.

¹⁸ Collins, J. (2016). Bat Surveys: Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.). The Bat Conservation Trust, London.

¹⁹ Odiham *et al.* (2000). in ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index.

²⁰ Harris, S., Cresswell, P. and Jefferies, D., 1989. Surveying Badgers. Mammal Society.

²¹ Gent, T. & Gibson, S. (2003). Herpetofauna Workers Manual. Joint Nature Conservation Committee, Peterborough.

²² Dean, M. *et al.* (2016). The Water Vole Mitigation Handbook (The Mammal Society Guidance Series). The Mammal Society, London.

²³ Chanin, P. (2003). Monitoring the Otter, *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10., English Nature, Peterborough.

²⁴ Peay, Stephanie (2002). Guidance on Habitat for White-clawed Crayfish and its restoration. Environment Agency.

²⁵ Bright, Paul, Morris, P, Mitchell Jones, T. (2006). The Dormouse Conservation Handbook 2nd ed. English Nature.

- Assessing the suitability of habitats for assemblages of notable invertebrates; and
- Searching for evidence of the presence of invasive plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and The Invasive Alien Species (Enforcement and Permitting) Order 2019, which are subject to strict legal control, such as Japanese knotweed (*Reynoutria japonica*), Himalayan balsam (*Impatiens glandulifera*) and giant hogweed (*Heracleum mantegazzianum*).

The survey was undertaken on the 1st December 2020 by suitably qualified Arup ecologists Kathryn Jones ACIEEM and Alexandra Kinsey ACIEEM. All accessible areas of the site were walked and relevant habitat types classified according to their vegetation types. The habitats present and Target Notes (TNs) have been mapped and presented in standard format.

2.2 Assessment Methodology

The assessment of impacts from construction and operation has followed the methodology which is set out in the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland²⁶.

2.2.1 Zone of Impact for Ecological Receptors

All plant and animal species and habitats that occur within the ‘zone of impact’ of the proposed development are defined as potential ‘ecological receptors’. The zone of impact for ecological features varies, depending on the nature and behaviour of the receptors, and also the type of impact that may affect them. In this chapter, the assessment of individual receptors is considered for the whole of the proposed development and in addition, the distances from the planning boundary listed in Table 1.

Table 1: Maximum Zone of Impact from proposed development Boundary for Ecological Features

Ecological Feature	Maximum Zone of Impact from the Site Boundary
Statutory designated European sites (including faunal species included as part of the designation), e.g. SAC.	10 km
Statutory Nationally designated sites (including faunal species included as part of the designation), including SSSIs and National Nature Reserves (NNRs)	2 km
Locally designated sites - LNRs	2 km
Protected and or notable species	Up to 2 km (species dependant)
Invasive non-native species	Within the site only

²⁶ CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

2.2.2 Valuing Ecological Receptors

The CIEEM guidelines recommend that the value of ecological receptors or features is determined based on a geographic frame of reference. For this assessment, the following geographic frame of reference is used:

- International;
- National (i.e. UK);
- Regional (i.e. West Wales);
- County (i.e. Carmarthenshire);
- Local (i.e. within circa 5km); and
- Less than Local (i.e. within the context of the proposed development and immediate vicinity).

2.2.3 Predicting and Characterising Ecological Impacts

In accordance with CIEEM guidelines, when describing impacts, reference is made to the following:

- Magnitude - i.e. the size of an impact in quantitative terms where possible;
- Extent - i.e. the area over which an impact occurs;
- Duration - i.e. the time for which an impact is expected to last;
- Reversibility - i.e. a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A temporary impact is one from which a spontaneous recovery is possible; and
- Timing and frequency - i.e. whether impacts occur during critical life stages or seasons and how often impacts occur.

Both direct and indirect impacts were considered: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through impacts on an intermediary ecosystem, process or receptor, e.g. a pollution event reducing the food source for a species such as otter or water vole.

2.2.4 Significance Criteria

In accordance with the CIEEM guidelines, a significant impact, in ecological terms, is defined as ‘an impact (whether negative or positive) on the integrity²⁷ of a defined site or ecosystem and/or the conservation status²⁸ of habitats or species within a given geographical area, including cumulative and in-combination impacts’. It is important to note however that in accordance with the CIEEM

²⁷ Integrity is the coherence of ecological structure and function, across a site’s whole area that enables it to sustain a habitat, complex of habitats and/or the levels of populations of species.

²⁸ Conservation status for habitats is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area. Conservation status for species is determined by the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area.

guidelines, the actual determination of whether an impact is ecologically significant is made irrespective of the value of the receptor in question.

The value of a feature that will be significantly affected is used to determine the geographical scale at which the impact is significant, e.g. an ecologically significant impact on a feature of county importance will be considered to represent a significant impact at a county level. This in turn is used to determine the implications in terms of legislation, policy and /or development management.

The assessment relies on professional judgement and guidance as provided within CIEEM Guidelines.

Any significant impacts remaining after mitigation (the residual impacts), together with an assessment of the likelihood of success of the mitigation, are the factors to be considered against legislation, policy and development management in determining the application.

2.3 Limitations

The findings presented in this report represent those at the time of survey and reporting, and data collected from available sources. Ecological surveys can be limited by factors affecting the presence of plants and animals, such as the time of year, migration patterns and behaviour.

Whilst not a full protected species or botanical survey, an Extended Phase 1 Habitat Survey allows an experienced ecologist to obtain a sufficient understanding of the ecology of a site in order to either evaluate the conservation importance of the site, and assess the potential for impacts on habitats and species likely to represent a material consideration in planning terms, or to ascertain that further surveys will be required before such an evaluation can be made.

The Extended Phase 1 Habitat Survey was undertaken during a sub-optimal period for botanical surveys (December). However, the site was visited in August 2020 by the same surveyors, during a field survey of the adjacent site, and therefore it is considered that sufficient data has been gathered to inform the following assessments.

Limitations for specific species and surveys are detailed within each report⁵⁻¹³. None of the limitations are considered to be significant or to have compromised the validity of the surveys or assessment.

The absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

3 Baseline Conditions

3.1 Desk Study

3.1.1 Designated Sites

3.1.1.1 European & National Sites

The search using MAGIC highlighted eight International Sites and two national sites within 10km and 2km of the site boundary, respectively. These comprised five SACs, two SPAs, one Ramsar site and two SSSIs. Details of these sites are given in Table 2, and locations shown on Figure 2.

Table 2: Details of statutory sites within 10km and 2km of the site boundary, for International and national sites, respectively

Site Name	Features	Distance and Orientation from Site (Approx.)
International Sites (within 10km)		
Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC	Annex I habitats present within the SAC include: sandbanks which are slightly covered by sea water all the time; estuaries; mudflats and sandflats not covered by seawater at low tide; large shallow inlets and bays; Salicornia and other annuals colonizing mud and sand; and Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>). Annex II species present within the SAC include: twaite shad (<i>Alosa fallax</i>); sea lamprey (<i>Petromyzon marinus</i>); river lamprey (<i>Lampetra fluviatilis</i>); allis shad (<i>Alosa alosa</i>); and otter.	426m south west
Burry Inlet SPA	Over winter the area regularly supports northern pintail (<i>Anas acuta</i>), northern shoveler (<i>Anas clypeata</i>), Eurasian teal (<i>Anas crecca</i>), Eurasian wigeon (<i>Anas penelope</i>), dunlin (<i>Calidris alpina alpina</i>), red knot (<i>Calidris canutus</i>), Eurasian oystercatcher (<i>Haematopus ostralegus</i>), Eurasian curlew (<i>Numenius arquata</i>), grey plover (<i>Pluvialis squatarola</i>), common shelduck (<i>Tadorna tadorna</i>), common redshank (<i>Tringa totanus</i>), and an internationally important assemblage of birds (34962 waterfowl).	426m south west
Burry Inlet Ramsar Site	The site is designated for satisfying Ramsar Criterion 5 (peak count of 41,655 waterfowl in winter) and Ramsar Criterion 6 (peak count of 857 redshank in spring/autumn, and a peak count of 2687 northern pintail, 14,861 Eurasian oystercatcher, and 3618 red knot in winter). Species/populations identified subsequent to designation for possible future consideration under criterion 6 include 467 Northern shoveler in winter.	426m south west
Gower Commons /	Annex I habitats present within the SAC include northern Atlantic wet heaths with <i>Erica tetralix</i> ;	5.1km south

Site Name	Features	Distance and Orientation from Site (Approx.)
Tiroedd Comin Gwyr SAC	European dry heaths; Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) Annex II species present within the SAC include southern damselfly (<i>Coenagrion mercuriale</i>) and marsh fritillary butterfly (<i>Euphydryas (Eurodryas, Hypodryas) aurinia</i>).	
Carmarthen Bay Dunes / Twyni Bae Caerfyrddin SAC	Annex I habitats present within the SAC include embryonic shifting dunes; "Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")"; "Fixed coastal dunes with herbaceous vegetation ("grey dunes")"; dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>); and humid dune slacks. Annex II species present within the SAC include narrow-mouthed whorl snail (<i>Vertigo angustior</i>), petalwort (<i>Petalophyllum ralfsii</i>) and fen orchid (<i>Liparis loeselii</i>).	5.8km west
Bristol Channel Approaches / Dynesfeydd Mlr Hafren SAC	This SAC is designated for the presence of Annex II species harbour porpoise (<i>Phocoena phocoena</i>).	6.6km west
Gower Ash Woods / Coedydd Ynn Gwyr SAC	Annex I habitats present within the SAC include <i>Tilio-Acerion</i> forests of slopes, screes and ravines and alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion, Alnion incanae, Salicion albae</i>)	8km south
Bae Caerfyrddin / Carmarthen Bay SPA	Over winter the area regularly supports common scoter (<i>Melanitta nigra</i>).	8.8km west
National Sites		
Pyllau Machynys (Machynys Ponds) SSSI	The site comprises one large pond with a group of three smaller pools to the east, linked by fen-carr. These moderately nutrient-rich ponds, and the inter-connecting areas of fen and carr, have developed a distinctive and, for Wales, an uncommon community of invertebrates, which includes a high proportion of species which are regarded as indicators of habitat quality; there are also faunistic elements that are more characteristic of fens and marshes of lowland southern England and which are noticeably rare in Wales. The dragonfly fauna is particularly diverse. Machynys Ponds are additionally noted for their botanical interest.	35m south
Burry Inlet and Loughor Estuary SSSI	The largest estuarine complex within the old West Glamorgan county and Borough of Llanelli. Comprising extensive areas of grazed saltmarsh, sand and mud flats, the area is internationally significant for its wader and wildfowl populations with overwintering totals averaging in excess of 46,000 birds.	426m south west

3.1.1.2 Local Sites

Aderyn returned information on one non-statutory site within the 2km search area. This was the North Dock Dunes LNR, located approximately 861m north west.

North Dock Dunes LNR is a rare sand dune habitat with a high diversity of specialist flora and fauna. Species on the dunes include lady's bedstraw (*Galium verum*), cat's-ear (*Hypochaeris radicata*), wild pansy (*Viola tricolor*) and the parasitic common broomrape (*Orobanche minor*) while sea holly (*Eryngium* sp.) and greater knapweed (*Centaurea scabiosa*) occur on broken ground. The specialist invertebrate life of the dunes contains species that are more commonly associated with warmer climates further south, for example, the sand hill snail (*Theba pisana*) originates in the Mediterranean and here is at the most northerly point in its world distribution. In summer many can be seen clinging to plant stems to avoid the hot sand.

3.1.2 Review of Previous Data

Table 3 below contains a summary of the previous ecological surveys undertaken on the site.

Table 3: Previous ecology survey reports

Survey Report	Methodology	Results
2007 Ecological Assessment Report ⁵	An Extended Phase 1 Habitat Survey of the site was undertaken in 2004. Breeding bird surveys were also undertaken in 2004. The phase 1 survey was then updated in May, June & July 2007.	<p>The 2007 report referenced breeding bird surveys undertaken in 2004, during which breeding territories were identified for lapwing (<i>Vanellus vanellus</i>), linnet (<i>Linaria cannabina</i>) and skylark (<i>Alauda arvensis</i>), with blackbird (<i>Turdus merula</i>), dunnoek (<i>Prunella modularis</i>), greenfinch (<i>Chloris chloris</i>), meadow pipit (<i>Anthus pratensis</i>), stonechat (<i>Saxicola rubicola</i>), whitethroat (<i>Sylvia communis</i>) and willow warbler (<i>Phylloscopus trochilus</i>) also recorded breeding within the site.</p> <p>Habitat on site was considered unsuitable for otter. No evidence of water vole was identified, but the ditch on site was considered to provide suitable habitat due to the variety of foraging species, though it was largely dry at the time of survey. It was considered likely that water vole would colonise the ditch if the channel was deepened to hold water permanently.</p> <p>No reptiles were identified during the survey, but habitat was considered suitable. Where the ditch was wetter, it was considered suitable for breeding common frog (<i>Rana temporaria</i>).</p> <p>The site was not considered to be suitable for supporting badgers, dormice or roosting bats.</p>
2013 Habitats Regulations Assessment ⁶	A screening assessment was undertaken to assess the likelihood of significant effects upon the international designated sites within 10km of the Machynys Central site immediately west of the site.	<p>The following potential effects were identified:</p> <ul style="list-style-type: none"> • Pollutants or high sediment load in surface water run-off from active construction areas;

Survey Report	Methodology	Results
		<ul style="list-style-type: none"> • Disturbance to species caused by increased use of the site, construction activities etc; • Noise and vibration disturbance to species; and • Physical restrictions to species movements. <p>The screening assessment concluded that there were no likely significant effects, either alone or in-combination with other plans and projects, resulting from the proposed development at Machynys Central.</p>
2013 Reptile Survey Note ⁷	37 artificial refugia were laid across the site and the Machynys Central site and checked on five occasions during late September and the first week of October 2012 during mild weather conditions.	<p>No reptiles were identified within the site. However, autumn 2012 was an unseasonably wet period and this may not be characteristic of the site in normal conditions.</p> <p>It was considered that the habitats within the site would remain largely suitable for reptiles in normal dry conditions and it cannot be ruled out that they might colonise the site at some point in the future, particularly in drier conditions.</p>
2013 Water Vole Survey Report ⁸	A water vole survey was undertaken of the ditches on site and of the water bodies within Machynys Golf Course in August 2013.	<p>Potential signs of water vole (feeding stations and runs) were identified within the largest pond on the golf course. However, no droppings or burrows were identified.</p> <p>It was considered that water voles were not present within the ditch on site at the time of survey. Due to the lack of water within the ditch, growth of scrub and the availability of abundant better quality habitat within the immediate surroundings it was also considered that water voles were not likely to utilise the ditch to forage on a regular basis.</p>

Survey Report	Methodology	Results
2015 Water Vole Survey Report ⁹	A water vole survey was undertaken of the ditches on site and of the water bodies within Machynys Golf Course in October 2015.	<p>Signs of water vole were identified again on the large golf course pond (droppings, feeding stations and a nest). However, no burrows were identified.</p> <p>No water vole field signs were noted within the ditch on site. Due to the limited water level and the presence of dry sections within the ditch, along with overgrown scrub, it was considered that the ditch had negligible potential to support water voles. Evidence of pollution / contamination was also identified within this ditch, indicated by an oily water surface layer. In addition is less likely that water vole would utilise this ditch to burrow or forage in due to availability to more favourable habitats within the adjacent golf club waterbodies.</p>
2017 Ecological Survey Update Report ¹⁰	An Extended Phase 1 Habitat Survey of the site was undertaken in April 2017.	There had been little change in the habitats present within the site compared to the previous studies. Some of the areas of bramble have been cleared and there was evidence of some spray treatment of Japanese knotweed close to the existing roads.
2018 Water Vole Mitigation Strategy and Method Statement ¹¹	At this time, it was proposed that the ditches on site would be lost to the development. Therefore, a construction mitigation strategy was written in 2016 and revised in 2018 after consultation with CCC and NRW, due to the likely presence of water voles within habitats adjacent to the site.	Proposals included a pre-construction survey of the ditch for water voles. If burrows were found then further consultation would be required, since no evidence of water vole has ever been found within the ditch. Displacement by directional strimming of vegetation and then a destructive search were proposed, prior to removal of the ditch. Habitat connectivity corridors were recommended within the site and from the site to the golf course, as well as off-site habitat creation for water voles and on-site planting for water voles.
2018 Ecological Baseline Report (for	A reptile survey and water vole survey, of which the survey area included the site, were undertaken as part of the	The water vole survey of the ditch found no evidence of water voles. The ditch was assessed as having negligible potential for water voles as it

Survey Report	Methodology	Results
the Llanelli Wellness and Life Science Village) ¹²	ecological assessment for the Llanelli Wellness and Life Science Village, just north of the B4304. The reptile survey was undertaken between September and October 2016 and the water vole survey was undertaken in October 2016.	<p>appeared to be dry for the majority of the year and contains no aquatic or emergent vegetation. The ditch had been colonised by scrub and willow.</p> <p>Both common lizard and slow worm were recorded within the site. Both adult and sub-adult common lizard were recorded with a maximum count of 11 animals.</p>
2020 Ecological Appraisal (for the Machynys Central Housing & Eco Park) ¹³	An Extended Phase 1 Habitat Survey was undertaken and riparian mammal surveys of the ditches on site and of the water bodies within Machynys Golf Course were undertaken, including a camera trap survey of the ditch running along the southern boundary.	<p>Grassland and scrub habitats on site were considered suitable for common reptiles and amphibians (a common lizard was seen on site) and invertebrate communities.</p> <p>Trees and scrub were considered to provide suitable habitat for common nesting bird species and limited foraging/commuting habitat for bats. No suitable roosting habitat for bats was identified.</p> <p>Evidence of otter was identified within the golf course, however the habitats on site were considered sub-optimal. Potential evidence of water vole was identified within the golf course. No evidence of water voles was found on site and none were recorded on the cameras. The ditch on site was completely dry with little riparian vegetation and so considered sub-optimal for water vole. It is considered that water vole are absent from site.</p> <p>Invasive non-native plant species (Japanese knotweed and Japanese rose (<i>Rosa rugosa</i>)) were identified on site and montbretia (<i>Crocoshia x crocosmiiflora</i>) was identified at the golf course.</p>

3.2 Extended Phase 1 Habitat Survey

3.2.1 Habitats

Desk Study

Aderyn returned data on one priority habitat area within 2km, this being an NRW Priority Area comprising a Coastal Saltmarsh, located approximately 445m west.

2020 Field Survey

A total of 12 JNCC habitat types were identified within the site boundary. These are shown on Figure 3 and are described in the following sections. Photographs of habitats are provided within the corresponding section at the end of this report and target notes are given in Table 5 below.

3.2.1.1 Mixed Plantation Woodland (A1.3.2)

One area of mixed plantation woodland was recorded to the west of the site. The canopy comprised silver birch (*Betula pendula*), pine (*Pinus* sp.), willow (*Salix* sp.), pedunculate oak (*Quercus robur*) and ash (*Fraxinus excelsior*), with an understorey and ground flora of ivy (*Hedera helix*) and bramble (*Rubus fruticosus* agg.). An earth embankment was present around the edges of the woodland. This habitat is shown in Photographs 5 & 10.

3.2.1.2 Dense Scrub (A2.1)

Several areas of dense scrub were present on site, forming a mosaic with areas of grassland. This habitat was also present along the banks of waterbody 1 (see Figure 3 for locations of waterbodies) and along the northern border of the site. These were generally dominated by bramble with rose (*Rosa* sp.), blackthorn (*Prunus spinosa*), osier (*Salix viminalis*) and sea buckthorn (*Hippophae rhamnoides*) also present. This habitat is shown in Photographs 2 & 6.

3.2.1.3 Scattered Scrub (A2.2)

Scattered was present along the eastern boundary. Species present included bramble, sea buckthorn, willow and Canadian fleabane (*Erigeron canadensis*). This habitat is shown in Photograph 8.

3.2.1.4 Scattered Broadleaved Trees (A3.1)

Lines of planted broadleaved trees were present along the northern and eastern boundaries of the site. Species included whitebeam (*Sorbus* sp.), willow (*Salix* sp.) and sycamore (*Acer pseudoplatanus*). This habitat is shown in Photographs 3 & 4.

3.2.1.5 Semi-improved Neutral Grassland (B2.2)

This was the dominant habitat type within the site. A relatively good diversity of species was recorded, including false oat-grass (*Arrhenatherum elatius*), cock's-foot (*Dactylis glomerata*), common knapweed (*Centaurea nigra*), yarrow (*Achillea millefolium*), tansy (*Tanacetum vulgare*), mugwort (*Artemisia vulgaris*), creeping cinquefoil (*Potentilla reptans*), silverweed (*Argentina anserina*), common hogweed (*Heracleum sphondylium*), fescue (*Festuca* sp.), ox-eye daisy (*Leucanthemum vulgare*), an evening primrose species (*Oenothera* sp.) and sedge species (*Carex* sp.). This habitat is shown in Photograph 2.

3.2.1.6 Marshy Grassland (B5)

Marshy grassland was present to the north of the site, dominated by rushes (*Juncus* sp.) and rosebay willowherb (*Chamerion angustifolium*). This habitat is shown in Photograph 1.

3.2.1.7 Tall Ruderal (C3.1)

A small patch of ruderal habitat was present in the southeast of the site. Species here included common nettle, an evening primrose, tansy, common hogweed and bramble.

3.2.1.8 Amenity Grassland (J1.2)

The road verge to the north and east of the site was short mown grassland dominated by perennial rye-grass (*Lolium perenne*) and annual meadow grass (*Poa annua*).

3.2.1.9 Introduced Shrub (J1.4)

One small stand of montbretia (TN1) was identified in the north of the site. Sea buckthorn was also scattered throughout the site. Introduced shrub was present adjacent to the link road in the north of the site, forming a hedgerow. Species present included *Pyrocantha* species, Wilson's honeysuckle (*Lonicera nitida*) and laurel species (*Prunus* sp.). This habitat is shown in Photograph 4.

3.2.1.10 Dry Ditch (J2.6)

Dry ditches were present along the southern boundary running into the golf course (waterbodies 1 and 3). Waterbody 1 held small puddles of water in some places. The banks were grassed and it was bordered by alder (*Alnus glutinosa*) and willow trees and some bramble, but there was little other emergent vegetation. Litter was also present within the ditch. Waterbody 3 was completely dry and more heavily choked with bramble. Alder, willow and osier trees also bordered the ditch. This habitat is shown in Photographs 6 & 7.

3.2.1.11 Bare Ground (J4)

The site was bisected by a footpath running east to west.

3.2.1.12 Other habitat - Tarmac Surface (J5)

Roads formed the boundaries to the north and east of the site.

3.2.2 Species

3.2.2.1 Bats

Desk Study

15 records of bats were returned from within 2km of the site, comprising the following species: greater horseshoe bat (*Rhinolophus ferrumequinum*) (five records), common pipistrelle (*Pipistrellus pipistrellus*) (five records), soprano pipistrelle (*P. pygmaeus*) (three records) and unknown bat species (*Chiroptera*) (two records).

Two of these were records of roosts, with one being of an unknown bat species (495m north east) and one of greater horseshoe bat (3.6km north west).

2020 Field Survey

One tree on site (TN2) was identified as providing low bat roost suitability. It was a willow tree with two small cavities in two limbs. It is shown in Photographs 11 & 12.

Woodland edge and scrub habitat within the site may provide habitat for foraging and commuting bats, though this is relatively limited.

3.2.2.2 Badger

Desk Study

Aderyn returned two records of badger, located 1.9km and 2km north.

2020 Field Survey

The grassland on site provides suitable habitat for foraging badger, with woodland and hedgerows providing suitable cover for sett building. However, the site is not well connected to other wooded habitat in the wider environment. No setts or other signs of badger were identified during the survey. Fox (*Vulpes vulpes*) scats were identified within the grassland and a fox hole (TN3) was identified on the bank of waterbody 3. During the 2020 water vole surveys, a fox hole was also identified along the bank of waterbody 1.

3.2.2.3 Dormice

Desk Study

No records of dormouse were returned.

2020 Field Survey

Although woodland, scrub and hedgerow habitat is present on site, it lacks connectivity to suitable habitat in the wider landscape, and is therefore not considered to be suitable for dormice. This, along with the lack of dormouse records returned by Aderyn means that this species is not considered further in this report.

3.2.2.4 Otter

Desk Study

10 records of otter were returned, with the closest being of live observations approximately 1.5km north west.

2020 Field Survey

During the riparian mammal surveys undertaken in 2020¹³, it was considered likely that otter were active adjacent to the site, with evidence of otter (comprising old spraints and potential pathways) recorded around the golf course ponds, however, no suitable breeding habitats were identified. Potential feeding signs (cockle shells) were identified in waterbody 1 on site. No signs of otter were found along waterbody 3. No otters were recorded during the camera trap survey.

No further signs of otter were identified during the December 2020 Extended Phase 1 Habitat Survey.

3.2.2.5 Water Vole

Desk Study

Aderyn returned 12 records of water vole, with the closest being 435m south east.

2020 Field Survey

A water vole survey was conducted between August and September 2020¹³, which identified potential water vole signs around the golf course ponds. Two camera traps were set up along waterbody 1 but no water vole were recorded on them. No signs were recorded along waterbodies 1 or 3 within the site boundary, and water vole were considered likely absent from the site. The results of this survey are shown on Figure 4.

Additionally, no signs of water vole were identified on site during the December 2020 Extended Phase 1 Habitat Survey. Although more suitable waterbodies for water vole are present to the south of the site, the potential for water vole to occur within the site is limited due to the close-mown grass of the adjacent golf course likely acting as a barrier to dispersal.

3.2.2.6 Birds

Desk Study

850 records of bird species were identified within 2km of the site. Of these, 194 records were of Schedule 1 species, comprising 31 species including Cetti's warbler (*Cettia cetti*), osprey (*Pandion haliaetus*), little gull (*Hydrocoloeus minutus*) and barn owl (*Tyto alba*). The closest of these was numerous records located approximately 120m south of barn owl, black tern (*Chlidonias niger*), black-tailed godwit (*Limosa limosa*), Cetti's warbler, greenshank (*Tringa nebularia*), hen harrier (*Circus cyaneus*), honey-buzzard (*Pernis apivorus*), Mediterranean gull (*Ichthyaetus melanocephalus*), osprey, peregrine (*Falco peregrinus*), pintail (*Anas acuta*), red kite (*Milvus milvus*) and snow bunting (*Plectrophenax nivalis*).

2020 Field Survey

The woodland, scrub, hedgerow and grassland habitats are likely to provide nesting habitat for a range of bird species. An old birds nest was identified within scrub habitat on site (TN5). In addition, more open areas with short grassland swards could support ground nesting species such as skylark or lapwing, although the site is likely to be too disturbed by dog-walkers and golfers.

The following species were identified on or passing over the site during the 2020 Extended Phase 1 Habitat Survey: blackbird (*Turdus merula*), blue tit (*Cyanistes caeruleus*), bullfinch (*Pyrrhula pyrrhula*), carrion crow (*Corvus corone*), goldfinch (*Carduelis carduelis*), great spotted woodpecker (*Dendrocopos major*), great tit (*Parus major*), jackdaw (*Corvus monedula*), long-tailed tit (*Aegithalos caudatus*), magpie (*Pica pica*), stonechat (*Saxicola rubicola*) and robin (*Erithacus rubecula*).

3.2.2.7 Reptiles

Desk Study

Aderyn provided 11 records of common lizard and eight records of slow-worm, with the closest records of both being approximately 343m west.

Four records of grass snake, with the closest being in a pond approximately 910m north east.

2020 Field Survey

In 2020¹³, an adult common lizard was recorded basking on a coltsfoot (*Tussilago farfara*) leaf just west of the site. Areas of scrub and wetter habitats to the west of the site, such as the marshy grassland, and the waterbodies in the south provide suitable habitat for other common reptile species including slow-worm and grass snake. A compost heap of cut grass (TN4) was present on site, which could provide suitable refuge for reptiles.

3.2.2.8 Amphibians

Desk Study

Two records of palmate newt (*Lissotriton helveticus*) were provided, both located approximately 915m north east, of four adults and of two breeding adults.

No records were provided of great crested newt. A search of publicly available OS mapping and aerial imagery revealed a small number of potential standing waterbodies suitable for breeding amphibians within 500m of the site boundary. Despite suitable habitat, great crested newts are very rare in Carmarthenshire²⁹.

2020 Field Survey

No amphibians were observed during the survey. The mosaic of grassland, scrub, dry ditches and woodland offers moderate quality terrestrial habitat providing a foraging and shelter resource for amphibians that may be present in local waterbodies. However, the suitability of the five identified waterbodies for common amphibian species is limited due to the close-mown grass of the adjacent golf course likely acting as a barrier to dispersal. A compost heap of cut grass (TN4) was present on site, which could provide suitable refuge for common amphibians.

A Habitat Suitability Index (HSI) assessment³⁰ was carried out for the five identified waterbodies in August 2020. The HSI is a numerical index which ranges from 0 to 1. It is calculated using 10 key habitat criteria and is based on the assumption that the habitat quality determines great crested newt presence/absence. Using this standard approach, waterbodies with high scores are more likely to support breeding great crested newt than those with a lower score. It is important to note that the HSI system is not sufficiently precise to conclude that any particular waterbody with a high score will support great crested newt or that any waterbody with a low score will not.

The results of this assessment are presented in Table 4. Locations of waterbodies are shown on Figure 4.

Table 4: HSI Assessment Results

Waterbody No.	HSI Score	HSI Category
1	0.34	Poor
2	0.47	Poor
3	0.34	Poor
4	0.48	Poor
5	0.51	Below average

²⁹ <https://cdn.naturalresources.wales/media/687859/eng-evidence-report-259-review-of-the-current-conservation-status-ccs-of-the-great-crested-newt-in-wales.pdf> [Accessed: 09/12/2020].

³⁰ Odiham *et al.* (2000). in ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index.

3.2.2.9 Invertebrates

Desk Study

84 records were provided of 48 invertebrate species. One of which is listed on Schedule 5 of the WCA (small blue (*Cupido minimus*) located 480m west), and 19 of which were Section 7 species including 10 recorded immediately west of the site boundary: lackey (*Malacosoma neustria*), garden tiger (*Arctia caja*), green-brindled crescent (*Allophyes oxyacanthae*), buff ermine (*Spilosoma lutea*), sallow (*Cirrhia icteritia*), minor shoulder-knot (*Brachylomia viminalis*), latticed heath (*Chiasmia clathrate*), shaded broad-bar (*Scotopteryx chenopodiata*), rosy rustic (*Hydraecia micacea*), and small phoenix (*Ecliptopera silaceata*).

2020 Field Survey

A relatively large range of flowering species were present to the west of the site in 2020¹³, which could support a good invertebrate population.

3.2.2.10 Other Section 7 Species

Desk Study

One record of grey seal (*Halichoerus grypus*) and one record of common seal (*Phoca vitulina*), both located approximately 1.8km south west.

13 records of west European hedgehog (*Erinaceus europaeus*), the closest being located approximately 147m south west.

Two records Section 7 vascular plant species: prickly saltwort (*Salsola kali* subsp. *kali*) located approximately 950m south and cornflower (*Centaurea cyanus*) approximately 1.4km north.

2020 Field Survey

No Section 7 plant species were identified on site during the survey. Grassland and scrub habitats on site are suitable for hedgehog, particularly towards the south and west near residential gardens. It is considered likely that this species is present on site. A compost heap of cut grass (TN4) was present on site, which could provide suitable refuge for small mammals.

3.2.2.11 Invasive Non-Native Species

Desk Study

112 records were provided of invasive non-native plant species, but none located within the site boundary. Japanese knotweed was recorded in close proximity to the north of the site.

13 records were provided of two introduced bird species: Canada goose (*Branta canadensis*) and Egyptian goose (*Alopochen aegyptiacus*), all generally located along the coast to the south of the site.

Four records were provided of invasive non-native mammal species: American mink (*Neovison vison*) and grey squirrel (*Sciurus carolinensis*).

2020 Field Survey

Three invasive non-native plant species were recorded to the west and south of the site during the 2020 survey¹³. These were: multiple stands of Japanese knotweed of varying sizes (including one stand adjacent to one of the waterbodies to the south which appeared to have been treated); two stands of montbretia (*Crocasmia* × *crocosmiiflora*); and one stand of Japanese rose (*Rosa rugosa*). American mink scats were also identified within the golf course.

One stand of montbretia (TN1) was identified on site during the December field survey.

3.2.3 Target Notes

Table 5: Target Note Descriptions

Target Note Number	Description
TN1	Single stand of montbretia on eastern edge of woodland.
TN2	Mature willow tree with two cavities at 1.5m facing southeast and northwest. Tree located in small wooded area adjacent to main road. Low bat roost suitability.
TN3	Single fox hole in eastern bank of waterbody 3.
TN4	Compost heap – cut grass from golf course. Suitable refuge for amphibians, reptiles and small mammals.
TN5	Old birds nest in sea buckthorn scrub.

4 Evaluation of Receptors

This section initially evaluates the nature conservation importance of the habitats and species present within the site and surrounding area in terms of their importance in an international, national, county, local and less than local or Site context as per the geographic scale identified in Section 2.2.2. Table 6 below evaluates all the ecological resources present or potentially present within the site. Those receptors with less than local or negligible value will not be assessed further.

Table 6: Nature Conservation Evaluation of Ecological Receptors at the Site

Ecological Feature	Evaluation	Conservation in the Context of the Development
European Protected Sites		
Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC	International	Located approximately 426m west of the site. Designated for Annex I estuarine habitats and Annex II fish species. Designated for otter, which may use the site for commuting purposes.
Burry Inlet SPA		Located approximately 426m west of the site. Designated for overwintering bird species and an internationally important assemblage of birds. Note the HRA undertaken for the project concludes no impacts on the SPA are likely to occur given separation distance and habitats on site.
Burry Inlet Ramsar Site		Located approximately 426m west of the site. Designated for winter and summer populations of birds. Note the HRA undertaken for the project concludes no impacts on the SPA are likely to occur given separation distance and habitats on site.
Gower Commons / Tiroedd Comin Gwyr SAC		Located approximately 5.1km south of the site. Designated for Annex I heath habitats and Annex II species: southern damselfly and marsh fritillary butterfly, which are unlikely to be present on site. Due to the large distance between this SAC and the site, it is considered unlikely that the SAC will be affected by the proposed development and is therefore not assessed further.
Carmarthen Bay Dunes / Twyni Bae Caerfyrddin SAC		Located approximately 5.8km west of the site. Designated for Annex I coastal habitats and Annex II species: narrow-mouthed whorl snail and fen orchid, which are unlikely to be present on site. Due to the large distance between this SAC and the site, it is considered unlikely that the SAC will be affected by the proposed development and is therefore not assessed further.
Bristol Channel Approaches / Dynesfeydd Mlr Hafren SAC		Located approximately 6.6km west of the site. Designated for Annex II species harbour porpoise. Due to the large distance between this SAC and the site, it is considered unlikely that the SAC will be

Ecological Feature	Evaluation	Conservation in the Context of the Development
		affected by the proposed development and is therefore not assessed further.
Gower Ash Woods / Coedydd Ynn Gwyr SAC		Located approximately 8km south of the site. Designated for Annex I woodland habitats. Due to the large distance between this SAC and the site, it is considered unlikely that the SAC will be affected by the proposed development and is therefore not assessed further.
Bae Caerfyrddin / Carmarthen Bay SPA		Located approximately 8.8km west of the site. Due to the large distance between this SAC and the site, it is considered unlikely that the SAC will be affected by the proposed development and is therefore not assessed further.
Nationally Protected Sites		
Pyllau Machynys (Machynys Ponds) SSSI	National	Located approximately 35m south of the site. Noted for flora and invertebrate communities, which may be impacted by the proposed development due to the close proximity.
Burry Inlet and Loughor Estuary SSSI		Located approximately 426m southwest of the site. Noted for estuarine habitats and bird populations, which may be impacted by the proposed development due to the proximity of the site to the Loughor estuary.
Locally Protected Sites		
North Dock Dunes LNR	Local	Located approximately 861m north west. Noted as a sand dune habitat with a high diversity of specialist flora and fauna.
Habitats		
Mixed plantation woodland, scrub, marshy grassland, semi-improved neutral grassland.	Local	These habitats are not considered to have significant value for nature conservation, although may provide habitat for protected species locally; namely nesting birds, reptiles, amphibians, small mammals and invertebrates, with limited commuting opportunities for bats and otters. No habitats on site were considered to be Section 7 habitats.
Species		
Bats - roosting	Local	Limited bat roosting habitat within the site, only one tree with low suitability. All bat species are protected through inclusion on Schedule 5 of the WCA and Schedule 2 of the Habitats Regulations. A number of bat species are also Section 7 species.
Bats - foraging	Local	Relatively limited area for foraging/commuting bats. Site bounded by main road to the north and residential developments to the west.
Badger	Less than Local	Limited suitability of habitat for use by badgers and no signs identified on site. Badger setts are protected from destruction and disturbance under the Protection of Badgers Act 1992.

Ecological Feature	Evaluation	Conservation in the Context of the Development
Otter	International	<p>No evidence of otter found within the site, and habitats considered to be sub-optimal. Cannot rule out presence, as suitable foraging habitat present and records in close proximity.</p> <p>Otter are protected through inclusion on Schedule 5 of the WCA and Schedule 2 of the Habitats Regulations. Otter are also Section 7 species.</p>
Water vole	Local	<p>No evidence of water vole found within the site, and habitats considered to be sub-optimal.</p> <p>Water vole receive full protection through its inclusion on Schedule 5 of the WCA. Water vole are also a Section 7 species.</p>
Other notable mammals (Section 7)	Less than Local	No signs found within the site but suitable habitat present. Unlikely to support significant populations of any section 7 mammals, though small numbers of hedgehogs likely present.
Birds	Local	<p>The site is considered to be suitable for common breeding bird species, including Section 7 species.</p> <p>All wild birds in the UK are protected under Section 1 of the WCA, which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy the nest (whilst being built or in use) or its eggs. Some rarer species (those listed under Schedule 1 of the Act) are afforded additional protection from disturbance when breeding.</p> <p>A number of bird species are a feature of the Burry Inlet SPA and Ramsar Site, internationally designated sites; however the HRA undertaken for the project concludes no impacts on the SPA are likely to occur given separation distance and habitats on site.</p>
Reptiles	Local	<p>A good population of common lizard and low population of slow-worm has been recorded within the site. It is also considered possible that grass snake may be present although they were not recorded during the surveys.</p> <p>All native reptiles are protected under Schedule 5 of the WCA with respect to killing, injury and sale only. All reptile species are Section 7 species.</p>
Amphibians	Local	<p>Great crested newt are considered to be absent from the site. It is possible that the site may support common amphibians such as common frog and palmate newt.</p> <p>Common toad are a Section 7 species.</p>
Invertebrates	Local	On the basis of the mosaic of habitats present, it is assumed that the site supports a typical invertebrate assemblage comprising predominantly common species.
Invasive non-native species	Negligible	Montbretia is present within the site. Japanese knotweed and Japanese rose are present adjacent to the site.

5 Impact Assessment

5.1 Potential Impacts

A commercial development, including associated car parking, access roads, landscape and infrastructure works, can have impacts on ecology and nature conservation in a number of ways during both construction and operation.

The potential impacts to habitats and species may be both permanent and/or temporary, and direct or indirect.

5.1.1 Potential Construction Effects

Potential impacts of the works during the construction phase, which includes site preparation, may be categorised as follows:

- Permanent habitat loss through vegetation clearance;
- Temporary habitat disturbance and/or degradation including pollution;
- Temporary and/or permanent habitat severance or physical restrictions to species movements;
- Disturbance to species during construction (noise, vibration and lighting);
- Species mortalities and injuries – e.g. through collisions with construction vehicles and direct contact through excavation works, falling and trapping in open excavations during construction.

Indirect effects are on displaced individuals occupying alternative habitat, which may result in reduced foraging success, increased competition and predation, genetic isolation and inbreeding, which can lead to local extinctions.

5.1.2 Potential Operational Effects

Potential ecological impacts of the works during the operational phase may be direct or indirect and may be categorised as follows:

- Habitat disturbance through increased use of the site and immediate surrounds;
- Species disturbance through increased light and noise pollution;
- Species mortalities and injuries through collision with vehicle traffic.

5.2 Mitigation and Enhancement

5.2.1 Mitigation During Construction

The following measures are recommended to prevent adverse effects on the ecological receptors on site and in the local area:

- Toolbox talks should be given to all operatives, detailing the protected sites and species and processes to follow;
- A reptile translocation programme²¹ is recommended due to the loss of suitable habitat. A suitable receptor site will need to be identified and enhanced prior to translocation, which could be within suitable habitat on or immediately adjacent to the site;
- All works should be undertaken in accordance with best practice guidance for pollution prevention³¹;
- All works should be undertaken during daylight hours to avoid disturbing nocturnal species where possible. Any required lighting should be directed away from habitats;
- All excavations should be covered overnight or a means of escape for animals provided;
- All works should be fenced to allow the safe crossing of animals through the site;
- All vegetation clearance should be minimised where possible and retained habitats protected (e.g. trees on site should be protected in line with BS5837:2012³²);
- Retained habitats on site should be enhanced for biodiversity (e.g. scrub clearance along ditches to encourage water voles and wildflower planting to benefit invertebrates);
- All vegetation clearance should be carried out outside of the breeding bird season (mid-February to mid-September). If this is not possible then a check for nests by a suitably qualified ecologist (SQE) should be undertaken within 24 hours of clearance. Should an active nest be found, no works will continue in this area until the chicks have fledged. If an active nest of a Schedule 1 bird is found then additional measures to avoid disturbance will be required;
- Pre-construction checks should be carried out by an SQE for badger, otter, water vole and invasive non-native plant species;
- If any protected species are encountered during the works, all work in the vicinity should stop immediately and a SQE contacted for advice on how to proceed;
- An Invasive Species Management Plan should be written, detailing the removal of the montbretia on site;
- The above measures should be captured within a Construction Environmental Management Plan (CEMP) for the site; and

³¹ <https://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppps-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/> [Accessed: 09/12/20].

³² British Standards Institute BS 5837:2012. Trees in relation to design, demolition and construction.

- An Ecological Management Plan, similar to that written for the Machynys Eco Park Development³³, should also be written for the site, which would detail long-term monitoring and management of habitats and species on site and well as ecological enhancement measures, including those listed in Section 5.2.3 below.

5.2.2 Operational Mitigation

- All lighting should be designed to minimise spill onto adjacent habitats in order to avoid disturbing nocturnal species;
- Vegetation screening should be included within the landscaping plans in order to reduce disturbance to species in adjacent habitats.

5.2.3 Enhancement Measures

The following measures are included within the Site Plan (Appendix B), which will enhance the biodiversity within the site and surrounding area, in line with national planning policy³⁴:

- The creation of a new pond on site with associated planting;
- The creation of a new reed bed on site that connects to the existing ditch to the south of the site and acts as a “green corridor,” connecting the site to adjacent retained habitats within the golf course;
- The retention of the existing ditches to the south of the site (waterbodies 1 and 3);
- The inclusion of soft landscaping of all areas of the site that are not associated with the building or access roads.

The following additional measures are recommended to further enhance the biodiversity within the site and surrounding area:

- The soft landscaping areas should comprise species-rich grasslands and native fruiting shrubs to provide a food source for invertebrates, birds and mammals;
- The retained ditches (waterbodies 1 and 3) should be enhanced for otter and water vole, for example by clearing the litter, reducing the scrub and planting up with aquatic and marginal species;
- Bird and bat boxes and insect houses should be installed on site;
- The consideration of green roofs in the design of the hotel; and
- Vegetation removed to enable the hotel construction could be retained and used as log piles/areas of brush to enhance the hibernacula habitat for invertebrates, reptiles, amphibians and small mammals.

³³ Pryce Consultant Ecologists (2013). Machynys Ecological Park, South Llanelli. Ecological Management Plan.

³⁴ Welsh Government (2018). Planning Policy Wales. Edition 10. Available online at: <https://beta.gov.wales/sites/default/files/publications/2018-12/planning-policy-wales-edition-10.pdf> [Accessed: 09/12/20].

5.3 Assessment of Potential Impacts & Residual Effects

5.3.1 Designated Sites

A number of international and national designated sites are located within relatively close proximity of the site, including the Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC, Burry Inlet SPA, Burry Inlet Ramsar Site and the Burry Inlet and Loughor Estuary SSSI (all located 426m southwest) and the Pyllau Machynys (Machynys Ponds) SSSI (located 35m south).

A statement to inform a Habitats Regulations Screening Assessment was produced in 2013, for the adjacent Machynys Central Housing and Ecopark development, which screened out any likely significant effects upon the designated sites. As the report was written prior to 2018 and therefore prior to *Coillte Teoranta vs People Over Wind and Sweetman*³⁵, the screening assessment included the following mitigation:

The proposed works will:

- Be retained within the site boundary;
- Be undertaken in accordance with pollution prevention guidance;
- Be controlled through a Site Management Plan;
- Adhere to good practice with chemicals on site (e.g. bunded containment, spill kits, etc.);
- Ensure excavations are covered or provide a suitable means of escape for otters overnight; and
- Plainly established and uncontroversial (PEU) good practice measures will be sufficient to avoid any water quality affecting the estuary SAC, SPA and Ramsar.

As screening assessments should no longer include mitigation or avoidance measures, a HRA for the hotel development has been undertaken by Arup³⁶. This also draws similar conclusions and predicts that that adverse effects on integrity will not occur. CCC as competent authority will determine the result of the HRA.

For any construction and site investigation works it is recommended that NRW are notified of the works due to the proximity of the Pyllau Machynys (Machynys Ponds) SSSI.

5.3.2 Habitats

The proposed works have the potential to cause loss of habitats on site to enable the hotel development, including grasslands, woodland and scrub. Retained habitats are at risk of potential degradation from pollution during construction. In

³⁵ People over Wind, Case C323/17 European Court of Justice, 12th April 2018.

³⁶ Arup (2020). Machynys Hotel. Statement to inform Appropriate Assessment.

the absence of mitigation, these impacts could result in significant negative effects at a local level.

With the inclusion of mitigation such as strict pollution prevention and the enhancement of retained habitats on site, it is considered that there would be **no significant residual effects**.

5.3.3 Bats

Potential Effects

The woodland and grassland habitats on site provide limited habitat for foraging and commuting bats. One tree with low suitability for roosting bats was identified on site. Bats are therefore at risk of potential habitat loss & degradation, disturbance, injury and mortality. In the absence of mitigation, these impacts could result in significant negative effects at a local level.

Mitigation

The tree with low bat roost suitability should be retained. If this is not possible, then the tree should be felled in sections under the direction of a bat-licensed ecologist.

The inclusion of new waterbodies and associated planting on site, which provides a connection to suitable habitat in the wider environment, will enhance commuting and foraging habitat for bats.

The suggested inclusion of species-rich grasslands, native fruiting shrubs and installing bat boxes on site would further enhance the site for bats.

General construction mitigation should include strict pollution prevention, sensitive working hours and lighting design.

Residual Effects

With the inclusion of the above mitigation, it is considered that there would be **no significant residual effects**.

5.3.4 Otter

Potential Effects

The ditches to the south of the site provide limited commuting opportunities for otter, although more suitable foraging habitat is present in the gold course ponds to the south of the site. Therefore, otter are at risk of potential habitat loss & degradation, disturbance, injury and mortality. In the absence of mitigation, these impacts could result in significant negative effects at an international level.

Mitigation

The ditches on site will be retained as part of the proposed development.

The suggested management of these ditches would further enhance the habitat for otters.

The inclusion of new waterbodies and associated planting on site, which provides a connection to suitable habitat in the wider environment, will enhance commuting and foraging habitat for otters.

General construction mitigation should include strict pollution prevention, sensitive working hours and lighting design and the covering of excavations overnight to avoid entrapment.

Residual Effects

With the inclusion of the above mitigation, it is considered that there would be **no significant residual effects**.

5.3.5 Water Vole

Potential Effects

Although water vole are considered absent from site due to a lack of suitable habitat, there is more optimal habitat to the south and east of the site and therefore the presence of water vole on site in the future cannot be completely ruled out. Therefore, water vole are potentially at risk of habitat loss & degradation, disturbance, injury and mortality. In the absence of mitigation, these impacts could result in significant negative effects at a local level.

Mitigation

The ditches on site will be retained as part of the proposed development.

The suggested management of these ditches would further enhance the habitat for water voles.

The inclusion of new waterbodies and associated planting on site, which provides a connection to suitable habitat in the wider environment, will enhance commuting and foraging habitat for water voles.

General construction mitigation should include strict pollution prevention, sensitive working hours and lighting design and the covering of excavations overnight to avoid entrapment.

Residual Effects

With the inclusion of the above mitigation, it is considered that there would be **no significant residual effects**.

5.3.6 Birds

Potential Effects

The site provides suitable nesting habitat for common breeding birds in the form of woodland and scrub. Ground nesting birds, including skylark, have previously been recorded breeding on the site, however it is considered unlikely that this would be the case now due to increased disturbance from dog walkers.

Therefore, birds are potentially at risk of habitat loss & degradation, disturbance, injury and mortality. In the absence of mitigation, these impacts could result in significant negative effects at a local level.

Mitigation

The inclusion of new waterbodies and associated planting on site, which provides a connection to suitable habitat in the wider environment, will enhance the habitat for birds.

The suggested inclusion of species-rich grasslands, native fruiting shrubs and installing bird boxes on site would further enhance the site for birds.

General construction mitigation should include strict pollution prevention and sensitive vegetation clearance (either outside of the breeding bird season or with a check by an SQE for active nests).

Residual Effects

With the inclusion of the above mitigation, it is considered that there would be **no significant residual effects**.

5.3.7 Reptiles & Amphibians

Potential Effects

Presence of common lizard and slow worm has been confirmed on site and amphibian species such as common frog and common toad are also likely to be present. The site is not considered to be suitable for any rarer species, such as adder or great crested newt. Therefore, common reptiles and amphibians are at risk of potential habitat loss & degradation, disturbance, injury and mortality. In the absence of mitigation, these impacts could result in significant negative effects at a local level.

Mitigation

The inclusion of new waterbodies and associated planting on site, which provides a connection to suitable habitat in the wider environment, will enhance the habitat for reptiles & amphibians.

The suggested inclusion of species-rich grasslands, native fruiting shrubs and the inclusion of log piles/areas of brash would further enhance the site for reptiles & amphibians.

General construction mitigation should include a reptile translocation programme, strict pollution prevention and the enhancement of retained habitats on site.

Residual Effects

With the inclusion of the above mitigation, it is considered that there would be **no significant residual effects**.

5.3.8 Invertebrates

Potential Effects

The grasslands on site were relatively diverse and therefore have the potential to support a range of invertebrate species. Invertebrates are therefore at risk of potential habitat loss & degradation and mortality. In the absence of mitigation, these impacts could result in significant negative effects at a local level.

Mitigation

The inclusion of new waterbodies and associated planting on site, which provides a connection to suitable habitat in the wider environment, will enhance the habitat for invertebrates.

The suggested inclusion of species-rich grasslands, native fruiting shrubs and the inclusion of log piles/areas of brash would further enhance the site for invertebrates.

General construction mitigation should include strict pollution prevention and the enhancement of retained habitats on site.

Residual Effects

With the inclusion of mitigation such as strict pollution prevention and the enhancement of retained habitats on site, it is considered that there would be **no significant residual effects**.

6 Conclusions

CCC are proposing a hotel development on the land at Machynys East, Llanelli. In summary, the following recommendations have been made:

- No further species-specific surveys are required, except for pre-construction checks for badger, otter, water vole and invasive non-native plant species;
- A Construction Environmental Management Plan should be adhered to, which should include recommendations such as:
 - Standard pollution control measures should be implemented during construction to protect habitats within/adjacent to the site;
 - Construction limited to daylight hours, any construction lighting to avoid sensitive habitats and any open excavations to be covered at night
 - If vegetation clearance is required during the nesting bird season, a nesting bird check by a SQE will be required and any nesting birds protected from disturbance during construction;
 - All vegetation clearance and earthworks should be sensitive to reptiles, amphibians and small mammals;
 - The montbretia on site must be considered in an Invasive Species Management Plan.
- An Ecological Management Plan should be written, which would detail the long-term management and monitoring of habitats and species on site;
- CCC as competent authority should undertake Appropriate Assessment of potential adverse impacts upon the integrity of the nearby designated sites, noting the findings of the SIAA that suggests adverse effects on integrity of European Sites will not occur;
- The Site Plan includes a new pond, a new reed bed and associated planting that link the site to habitats in the wider area. Additional biodiversity enhancement measures are proposed, including but not limited to the installation of bird and bat boxes on site, the inclusion of log/brush piles on site and the consideration of green roofs for the hotel.

With the inclusion of the mitigation detailed within this report, it is considered unlikely that the proposed development will have a significant negative impact upon the ecological receptors on site and in the local area.

This report has been written as the result of survey effort undertaken in December 2020 and as a review of the surveys on site between 2004 and 2020. This report refers within the limitations stated, to the condition or proposed development of the site at the time of inspections. Changes in legislation, guidance, best practice, etc. may necessitate a re-assessment/re-survey. It is also advised that if there is a delay of over two years in undertaking the Proposed Works, an update survey may

be required. No warranty is given as to the possibility of future changes in the condition of the site.

This report is produced solely for the benefit of CCC and no liability is accepted for any reliance placed on it by any other party. This report is prepared for the proposed uses stated in the report and should not be used in a different context.

Figures

Figure 1: Site Location Plan

Figure 2: Statutory Designated Sites

Figure 3: Extended Phase 1 Habitat Survey Results

Figure 4: Water Vole Survey Results

Photographs

	
<p>Photograph 1: showing the marshy grassland on site.</p>	<p>Photograph 2: showing the neutral grassland and dense scrub on site.</p>
	
<p>Photograph 3: showing amenity grassland with scrub and tree lines in the background.</p>	<p>Photograph 4: showing introduced shrub planting on site.</p>
	
<p>Photograph 5: showing the edge of the mixed plantation woodland.</p>	<p>Photograph 6: showing waterbody 3 encroached by bramble.</p>

	
<p>Photograph 7: showing standing water within waterbody 1.</p>	<p>Photograph 8: showing scattered scrub habitat.</p>
	
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<p>Photograph 11: showing the willow tree identified as having low bat roost suitability.</p>	<p>Photograph 12: showing one of the cavities on the willow tree with bat roost suitability.</p>

Appendix A

Legislation

A1 Relevant Legislation

Conservation of Habitats and Species Regulations 2017

The Conservation of Habitats and Species Regulations 2017 (the ‘Habitats Regulations’) transpose the requirements of Council Directive 92 / 43 / EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) into law within England and Wales. These regulations provide for the designation and protection of sites of European importance known as European or Natura 2000 Sites. European Sites comprise:

- Special Areas of Conservation (SACs) designated under the Conservation of Habitats and Species Regulations 2017;
- Special Protection Areas (SPAs) designated under the Wildlife and Countryside Act 1981 (as amended) (WCA)³⁷;
- Ramsar sites designated under the Ramsar Convention 1971; and
- Candidate and proposed SACs and SPAs.

The Habitats Regulations require that consideration is given to the implications of plans and projects (developments) on European Sites. Specifically, Regulation 63(1) states:

- a) *"A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which -*
 - i. is likely to have a significant effect on a European site or European marine site (either alone or in combination with other plans or projects), and
 - ii. is not directly connected with or necessary to the management of that site,
- b) *must make an appropriate assessment of the implications for that site in view of that site's conservation objectives."*

The formal consideration of effects on European Sites is therefore undertaken by the determining authority, such as Welsh Government (also known as the Competent Authority).

The Habitats Regulations also convey special protection to a number of species which are listed in Schedule 2 of the Regulations and are referred to as European Protected Species (EPS). Those relevant to the proposed development include:

- All UK resident bat species;
- Common dormouse (*Muscardinus avellanarius*);
- Great crested newt (*Triturus cristatus*); and
- Otter (*Lutra lutra*).

Regulation 43 makes it an offence to:

³⁷ The Wildlife and Countryside Act 1981 transposes the requirements of Directive 79 / 409 / EEC on the Conservation of Wild Birds (Birds Directive) in to UK law. The Birds Directive was updated through Directive 2009 / 147 / EC on the Conservation of Wild Birds.

- Deliberately capture, injure or kill any wild animal of a EPS;
- Deliberately disturb wild animals of such a species;
- Deliberately take or destroy the eggs of such a species;
- Damage or destroy a breeding site or resting place of such an animal.

Disturbance in the context of the offences above is disturbance which is likely to impair the ability of the animals to survive, to breed or reproduce, to nurture their young, to hibernate, to migrate; or to affect significantly the local distribution and abundance of the species.

Licences can be granted by Natural Resources Wales (NRW) for developments in Wales (sometimes referred to as EPS Licences or Derogation Licences) providing the purposes of the licence is for "*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 for the environment*".

Ramsar Convention 1971

Wetlands of International Importance (Ramsar Sites) declared under the Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 are considered European Sites as a matter of Government Policy.

Wildlife and Countryside Act 1981 (as amended)

A network of nationally designated sites was established through the designation of SSSIs under the Wildlife and Countryside Act (WCA). The protection afforded by the Act means it is an offence to carry out or permit to be carried out any operation listed within the notification without the consent of the Statutory Nature Conservation Organisation (in Wales being NRW). The protection afforded to SSSIs is used to underpin the designation of areas at a European Level.

The WCA also places obligations on Welsh Ministers and other public bodies with regard to the conserving and enhancing of the features of SSSIs in the exercise of their functions.

The WCA provides protection to EPS and other species, including wild birds, water voles and reptiles.

All wild birds, their nests and eggs are protected, with some rare species afforded extra protection from disturbance during the breeding season (these species are listed in Schedule 1 of the Act). It is illegal to take any wild bird or damage or destroy the nests and eggs of breeding birds. There are certain exceptions to this in respect of wildfowl, game birds and certain species that may cause damage.

Water vole receive protection under the WCA which prohibits the killing, injuring or taking by any method.

All native reptile species in the UK are subject to partial protection from intentional or reckless killing or injury only.

The Act also includes provisions for the control of Invasive Non-Native Species (INNS). Under these provisions it is an offence to:

- release or allow to escape into the wild any animal which is not ordinarily resident or a regular visitor to Great Britain, or is included in Schedule 9 of the Act;
- plant or otherwise cause to grow in the wild any plant which is included in Schedule 9 of the Act.

People undertaking works in proximity to INNS plants should take all reasonable steps and exercise all due diligence to avoid committing an offence.

The Invasive Alien Species (Enforcement and Permitting) Order 2019

The Invasive Alien Species (Enforcement and Permitting) Order 2019 came in to effect on 1st December 2019. This allows for the enforcement of the European Union (EU) Invasive Alien Species Regulation 1143/2014 on the prevention and management of invasive alien plant and animal species in England and Wales, including the relevant licenses, permits and rules for keeping invasive alien species.

This Order is similar to existing EU legislation, but there are a number of changes that apply to regulated species. If it is not a species of EU concern, then the Wildlife & Countryside Act (WAC; Section 14, Schedule 9) still applies.

Those working with in-scope plants need to be aware that the movement of live plants, or propagules, are covered by the Order – so, unless plants, or parts of plants are being moved for the purpose of eradication, then a licence would be needed from NRW to carry this action out.

It is an offence under Part 2 Article 3 (2) to:

‘release or allow to escape into the wild any specimen which is of a species of animal which (a) is not ordinarily resident in and is not a regular visitor to Great Britain in a wild state, or (b) is included in Part 1 of Schedule 2’.

It is also an offence under Part 2 Article 3 (3) to:

‘plant or otherwise cause to grow in the wild any specimen which is of a species of plant which is included in Part 2 of Schedule 2’.

Part 1 of Schedule 4 of the Order also amends the Wildlife and Countryside Act 1981 (as amended) to remove the animals and plants listed on Part 1, Schedule 2 of the Order from Schedule 9 of the Wildlife and Countryside Act.

National Park and Access to the Countryside Act 1949 (as amended)

Local Nature Reserves (LNRs) can be given protection against damaging operations through powers within the National Parks and Access to the Countryside Act 1949. However, this protection is usually conveyed through inclusion of protection within local planning policy relating to these sites and other non-statutory sites such as Sites of Importance for Nature Conservation (SINCs).

The Protection of Badgers Act 1992

Badger (*Meles meles*) and their setts are protected under the Protection of Badgers Act 1992 which makes it an offence to kill, injure or take a badger, or interfere with a sett.

Hedgerow Regulations 1997

The Hedgerow Regulations 1997 set out a framework for the protection of hedgerows against removal where they are deemed to be important either due to their age, ecological or archaeological features. Approval is required from the local authority prior to the removal of important hedgerows. Local authorities can enforce the retention of Important Hedgerows through the issuing of Retention Notices.

Salmon and Freshwater Fisheries Act 1975 (as amended)

The Salmon and Freshwater Fisheries Act (SAFFA) is legislation that aims to protect freshwater fish, with a particularly strong focus on salmon and trout. The legislation covers a broad range of topics, but of particular relevance to development are those sections covering water pollution, habitat disturbance and fish migration routes.

Under Section 2 (4) it is an offence to wilfully disturb spawn, spawning fish or spawning areas and under Section 4 (1) it is an offence to knowingly permit the flow of poisonous matter and polluting effluents into river courses that are poisonous or injurious to fish or the spawning grounds, spawn or food of fish.

Sections 9 to 15 are concerned with fish passage and migration routes. It is the duty of the waterway owner that when constructing dams, screens or sluices to provide and maintain a facilitating fish pass for migrating salmon or trout. Section 9 allows the regulator to serve notice on the owner or occupier of a dam or obstruction, to install a fish pass where necessary. This section applies to dams which are either new or have been altered to create an increased obstacle to the passage of migratory salmonids. It is also applicable where dams in a state of disrepair have been rebuilt over at least one half of their length.

Eels (England and Wales) Regulations 2009

This implements Council Regulation (EC) No 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European eel. The regulations are focussed on the management of commercial eel fisheries (licences, catch returns and restocking) and the passage/migration of eels. The regulations afford powers to the regulators (Environment Agency and Natural Resources Wales) to implement eel recovery measures in all freshwater and estuarine waters in England and Wales.

Part 4 of the regulations is concerned with the passage of eels and makes it a legal requirement to notify the regulator of the construction, alteration or maintenance of any structure likely to affect the passage of eels. This include water intakes and outfalls, dams and weirs, sluices or any other in-river obstruction. Where any such structure exists, the owner, occupier or person in charge of the land on which the

dam, structure or obstruction lies may be required to construct and operate an eel pass to allow the free passage of eels.

The Environment (Wales) Act 2016

The Environment (Wales) Act 2016 places a duty on public bodies in Wales to conserve and enhance biodiversity in the exercise of their functions. This duty includes consideration of the resilience of ecosystems in terms of their diversity, connectivity, adaptability, scale and condition. The Act also reinforces duties in relation to the lists of species and habitats of importance and the duties to conserve and enhance those species and habitats. Within this chapter these are referred to as Section 7 Habitats and Species unless covered under other legal protections.

The Well-being of Future Generations (Wales) Act 2015

The Well-being of Future Generations Act requires public bodies in Wales to consider the long-term impacts of decisions on the social, cultural, environmental and economic well-being of both current and future generations.

In particular the Act includes a number of goals including to maintain and enhance a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change.

Wild Mammals (Protection) Act 1996

This Act operates in parallel with the legislation listed above conferring specific protection on rare or threatened mammal species by protecting all wild mammals from any action intended to cause unnecessary suffering.

Appendix B

Illustrative Site Layout Plan

B1 Illustrative Site Layout Plan



Key:

Building Footprint	
Hard Landscaping	
Parking (Indicative)	
Soft Landscaping	
Attenuation	
Site Boundary	

Max Parameters :
 Overall Site Area = 37,740m²
 Maximum gross development Area = 10,000m²

Illustrative Site Layout

Notes:

1. Illustrative masterplan layout only to define development quantum.
2. All matters are reserved, final design/layout is subject to design development.
3. Highway access is subject to development and agreement with the Local Authority as a reserved matters application or to be developed by the adjacent housing development.

P01	18/12/20	PB	AP	ME
Issued for Planning Purposes				
Issue	Date	By	Chkd	Appd

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Client
 Carmarthenshire County Council

Job Title
 Proposed Hotel at
 Machynys East, Llanelli

Drawing Title
 Illustrative Site Layout

Scale at A1	1:500
Discipline	Architectural
Job No	278688
Drawing Status	Outline Planning
Drawing No	AL-0-02
Issue	P01

Appendix C

Machynys Central Housing & Eco Park Ecological Appraisal

C1 Machynys Central Housing & Eco Park Ecological Appraisal

Carmarthenshire County Council

Machynys

Ecological Appraisal

Issue | 15 October 2020

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 277365

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ARUP

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Target Notes

1 Introduction

1.1 Scope of the Report

Ove Arup & Partners Limited (Arup) has been commissioned by Carmarthenshire County Council (CCC) to undertake an Ecological Appraisal of an area in Machynys (approximate National Grid Reference: SS 50949 98540), near Llanelli, Carmarthenshire. The site location is shown on Figure 1. Part of the commission was to undertake an update Preliminary Ecological Appraisal (PEA) of the site, to include an Extended Phase 1 Habitat Survey and also an updated water vole (*Arvicola amphibius*) survey.

This report reviews the findings of previous ecological studies of the site since 2007 and presents the results of the 2020 PEA and water vole survey. It has been prepared to identify any additional ecological constraints associated with the proposed works and inform the construction process by outlining appropriate mitigation measures as required.

1.2 Site Description

The site is located immediately south of the B4304 and west of the Machynys Golf Club. It comprises a relatively open area of grassland, with some patches of scrub and woodland. There is one ditch ('waterbody 1') that runs along the southern boundary of the site, immediately to the north of a gravel track used for access around Machynys Golf Course. The western extent of the golf course is located immediately south and east of the site and contains further water bodies including a large pond with a vegetated island approximately 30m to the south of the ditch at its nearest point. Residential areas are present to the west and south west, and an industrial estate is present to the north.

1.3 Description of the Proposed Works

The proposed works comprise two separate proposals:

- Machynys Central Housing: a residential development with associated infrastructure and landscaping to the east; and
- Machynys Eco Park: an environmentally sensitive community park to support informal leisure activity to the west.

These two proposals are immediately adjacent to one another, and for the purposes of this report are considered to be one combined site.

1.4 Objectives

The objectives of the 2020 PEA and water vole survey elements included the following:

- To provide an updated assessment of the habitats on site and their potential to support protected/notable species;
- Inform project design to allow significant ecological effects to be avoided or minimised wherever possible;
- Identify potential ecological enhancements relevant to the site and proposed project;
- Provide an updated habitat suitability assessment within the survey area for water vole;
- Determine the presence or likely absence of water vole within the survey area; and
- Determine the site distribution of and usage by any water vole found within the survey area.

The additional objectives of the Ecological Appraisal were to:

- Review all of the existing ecological data for the site;
- Provide a summary of this data; and
- Identify any key constraint and opportunities for the site.

1.5 Legislative Context

A framework of international (European), national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. The following core legislation exists to protect habitats and species of nature conservation importance:

- i. The Conservation of Habitats and Species Regulations 2019 (Amendment) (EU Exit) transposes Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) into UK law.
- ii. Wildlife and Countryside Act 1981 (as amended) (WCA);
- iii. Environment (Wales) Act 2016 including Section 7 (S7) biodiversity lists;
- iv. The Countryside and Rights of Way Act 2000;
- v. The Hedgerow Regulations 1997;
- vi. Protection of Badgers Act 1992;
- vii. The Salmon and Freshwater Fisheries Act 1975;
- viii. The Eels (England and Wales) Regulations 2009; and
- ix. The Invasive Alien Species (Enforcement and Permitting) Order 2019.

These pieces of legislation include a number of offences relating to protected species and requirements for licences to allow construction works to proceed. In addition, the Habitats Regulations set out the requirement for the consideration of the potential effects of a project on European Sites.

Actions which are prohibited by legislation can be made lawful on the approval and granting of a protected species licence from NRW, subject to conditions.

Details of the legislation are provided in Appendix A.

2 Methodology

2.1 Review of Previous Data

Historic survey reports for the site were reviewed and summarised, including:

- 2007 Ecological Assessment Report¹;
- 2013 Habitats Regulations Assessment²;
- 2013 Reptile Survey Note³;
- 2013 Water Vole Survey Report⁴;
- 2015 Water Vole Survey Report⁵;
- 2017 Ecological Survey Update Report⁶;
- 2018 Water Vole Mitigation Strategy and Method Statement⁷; and
- 2018 Ecological Baseline Report (for the Llanelli Wellness and Life Science Village)⁸.

2.2 Desk Study

An updated desk study was undertaken to identify any existing ecological information relating to the site and its surroundings. The Multi-Agency Geographic Information for the Countryside (MAGIC) website⁹ was reviewed for information on internationally and nationally designated sites of nature conservation importance within 10km and 2km of the site, respectively. The search included Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar Sites, Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs).

Ecological records were obtained from Aderyn¹⁰ on 10th August 2020. The records included protected and priority species¹¹ up to 2km from the site and

¹ Pryce Consultant Ecologists (2007). Machynys East and Machynys Central Development Sites Ecological Assessment.

² Arup (2013). Machynys Central Residential Development and Eco-Park Development. Statement to Inform a Habitats Regulations Assessment.

³ Arup (2013). Machynys Residential Development Masterplan. Reptile Survey Report.

⁴ Arup (2013). Machynys Central Masterplan. Water Vole Survey Report.

⁵ Arup (2015). Machynys Water Vole Survey Report.

⁶ Arup (2017). Machynys Eco Park. Ecological Survey Update.

⁷ Arup (2018). Machynys Central Residential Development, Llanelli. Water Vole Mitigation Strategy and Method Statement.

⁸ Arup (2018). Llanelli Wellness and Life Sciences Village, Delta Lakes. Ecological Baseline Report.

⁹ www.magic.gov.uk [Accessed: 06/10/2020]

¹⁰ <https://aderyn.lercwales.org.uk/> [Accessed: 06/10/2020]

included details of local designations such as Local Wildlife Sites, Local Nature Reserves (LNRs) and Ancient Woodland Sites.

2.3 Extended Phase 1 Habitat Survey

The aim of the update Extended Phase 1 Habitat Survey was to identify and map the habitats present within the site. The survey methodology followed the methodology set out in the JNCC's Handbook for Phase 1 Habitat Surveys¹².

Extended Phase 1 Habitat Survey is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas of land on the basis of the vegetation communities present. The extended survey also provides an assessment of the potential for those habitats present to support legally protected or otherwise notable species.

Relevant species included all those protected by European or UK law, and notable species including those identified as being of principal importance in Wales, in response to Section 7 of the Environment (Wales) Act 2016 (Appendix A), as follows:

- Appraising any buildings or trees within the boundary (from the ground only) for their suitability to support breeding, resting and hibernating bats using survey methods based on those outlined in the Bat Conservation Trust's Bat Surveys: Good Practice Guidelines¹³;
- Assessing the potential of terrestrial and aquatic habitats to support amphibians, both protected species and species of conservation concern¹⁴;
- Searching for signs of badger (*Meles meles*) activity including setts, tracks, foraging holes and latrines within and up to 30m from the site where possible¹⁵;
- Assessing the suitability of habitats for nesting birds (including any old nests);
- Assessing the suitability of habitats for common species of reptiles; adder, (*Vipera berus*), grass snake (*Natrix helvetica*), slow worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*)¹⁶;

¹¹ EU and UK legally protected species under the Conservation of Habitats and Species Regulations 2019 (as amended) and Wildlife and Countryside Act 1981 (as amended); and species present on the Species of Principal Importance in Wales list in response to Section 7 of the Environment (Wales) Act 2016 (known as Section 7 species).

¹² JNCC (2016). Handbook for Phase 1 habitat Survey: technique for environmental audit.

¹³ Collins, J. (2016). Bat Surveys: Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.). The Bat Conservation Trust, London.

¹⁴ Odiham *et al.* (2000). in ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index.

¹⁵ Harris, S., Cresswell, P. and Jefferies, D., 1989. Surveying Badgers. Mammal Society.

¹⁶ Gent, T. & Gibson, S. (2003). Herpetofauna Workers Manual. Joint Nature Conservation Committee, Peterborough.

- Assessing the suitability of watercourses for water vole¹⁷, otter (*Lutra lutra*)¹⁸ and white-clawed crayfish (*Austropotamobius pallipes*)¹⁹.
- Assessing the suitability of habitats for dormice (*Muscardinus avellanarius*)²⁰;
- Assessing the suitability of habitats for assemblages of notable invertebrates; and
- Searching for evidence of the presence of invasive plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and The Invasive Alien Species (Enforcement and Permitting) Order 2019, which are subject to strict legal control, such as Japanese knotweed (*Reynoutria japonica*), Himalayan balsam (*Impatiens glandulifera*) and giant hogweed (*Heracleum mantegazzianum*).

The survey was undertaken in suitable weather conditions (see Appendix B) on the 6th August 2020 by suitably qualified Arup ecologists Kathryn Jones ACIEEM and Alexandra Kinsey. All accessible areas of the site were walked and relevant habitat types classified according to their vegetation types. The habitats present and Target Notes (TNs) have been mapped and presented in standard format.

2.4 Water Vole Survey

Water vole surveys were carried out between August and September 2020 by Kathryn Jones ACIEEM and Alexandra Kinsey. They included five water bodies (shown on Figure 3), as identified through a desk study of Ordnance Survey data and an appraisal of the previous survey results for the site^{1;5;7}. Of these five water bodies, waterbody 1 was a ditch running along the southern boundary of the site and waterbodies 2 to 5 were all located outside of the site boundary to the south east.

Information was recorded during the surveys using standard recording sheets which were completed in the field using tablet devices. These had Global Positioning System (GPS) mapping capability enabled to record the location of the waterbody, any relevant signs, features, and/or any photographs taken.

For the purposes of the surveys, each waterbody was defined as:

- pond / lake – a semi-stagnant and isolated waterbody, using filled by a stream or by man-made means and which can dry out;
- ditch - minor man-made drainage channel which dries out on a regular basis e.g. field ditches.

¹⁷ Dean, M. *et al.* (2016). The Water Vole Mitigation Handbook (The Mammal Society Guidance Series). The Mammal Society, London.

¹⁸ Chanin, P. (2003). Monitoring the Otter, *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10., English Nature, Peterborough.

¹⁹Peay, Stephanie (2002). Guidance on Habitat for White-clawed Crayfish and its restoration. Environment Agency.

²⁰ Bright, Paul, Morris, P, Mitchell Jones, T. (2006). The Dormouse Conservation Handbook 2nd ed. English Nature.

Surveying was avoided for at least three days after heavy rain to ensure that field signs were not washed away and that the water level was not too high to obscure any field signs of the two species. Weather conditions during each of the survey visits are detailed in Appendix B.

The following sections describe the methodologies associated with Habitat Suitability Assessment and Presence/Likely Absence Survey.

2.4.1 Habitat Suitability Assessment

A habitat suitability assessment was undertaken on the 6th August 2020 and 15th September 2020 for each waterbody using specific criteria to assess their suitability to support water vole. Assessment of the habitat suitability indicates how likely water voles are to use a waterbody given the present habitat condition.

According to guidance¹⁷, the habitats which water voles are most likely to use are those that have a highly layered bank-side vegetation with tall grasses and stands of willow herb (*Epilobium* sp.), loosestrife (*Lythrum* sp.), meadowsweet (*Filipendula ulmaria*) or nettles (*Urtica dioica*), often fringed with thick stands of rushes (*Juncus* sp.), sedges (*Carex* sp.) and reeds (*Phragmites* sp.).

Each water vole utilises a series of burrows, which can extend 5-6 metres from the edge of the bank into the terrestrial habitat. Water voles require dense growth of herbaceous bankside, and emergent vegetation and the promotion of scrub or planting of trees is detrimental to them.

Habitat suitability assessments were carried out at each waterbody, with each being defined as being of high, moderate, low or negligible suitability for water vole based on the following criteria:

- rate of water flow;
- bank profiles;
- extent of suitable emergent and bankside herbaceous vegetation in providing shelter, food and nesting material;
- degree of cattle poaching (i.e. extent of damage to banks resulting from trampling by cattle);
- levels of site disturbance, e.g. proximity to Public Rights of Way (PRoW), farm vehicle access tracks or road traffic;
- potential for the water body to dry out;
- suitability of bank substrates for burrowing; and
- water quality.

Examples of habitat suitability assessments for water vole are as follows:

- High - habitat comprises a slow-flowing watercourse, less than 3m wide and 1m deep with moderately steep banks, minimal shading by trees and shrubs and luxuriant growth of emergent and bankside herbaceous vegetation to provide shelter and an abundance of food and nesting material.
- Moderate - habitat comprises a combination of the features associated with both high and low habitat suitability. For example, the flow and bank type

may be suitable; however heavy grazing by livestock may reduce the cover of herbaceous vegetation and trample suitable habitat for burrowing.

- Low - habitat comprises overhanging trees and/or shrubs reduce the abundance of emergent and bankside vegetation and thus the availability of water vole food plants. Other factors that indicate habitat of low suitability include widely fluctuating water levels, seasonal drying out of the watercourse channel and banks that are unsuitable for burrowing.
- Negligible - habitat where there is no waterbody present. Examples include a ditch which is completely overgrown with vegetation and cannot hold water and settlement pools/ditches which collect water polluted with sediment and/or chemicals.

2.4.2 Presence/Likely Absence Survey

Water vole survey guidance¹⁷ dictates that for an Environmental Assessment, surveyors should undertake one presence/absence survey within each half of the season (i.e. one visit in mid-April, May or June, and a second visit in July, August or September), totalling two separate visits to each waterbody. However, due to the late commission of the surveys, it was not possible to carry out an early season visit. As such, the first presence/absence survey visit was conducted in conjunction with the Extended Phase 1 Habitat survey and Habitat Suitability Assessment survey on the 6th August 2020. During this visit, two camera traps were deployed along waterbody 1 (locations of camera traps shown on Figure 4), in order to gather as much data as possible. These cameras were then collected during the second presence/absence survey visit on the 15th September 2020.

Presence/likely absence surveys were carried out by hand searching for field signs and any features that could have the potential to be used by water vole.

Where possible a thorough search (every 1m) of the bankside vegetation was performed at each waterbody. The banks of waterbodies were surveyed up to a minimum of 2m from the waters' edge. The following water vole field signs were searched for: droppings (the most distinctive field sign to indicate recent use of a waterbody by water voles); latrines; feeding stations; burrows; and footprints.

2.5 Limitations

The findings presented in this report represent those at the time of survey and reporting, and data collected from available sources. Ecological surveys can be limited by factors affecting the presence of plants and animals, such as the time of year, migration patterns and behaviour.

Whilst not a full protected species or botanical survey, an Extended Phase 1 Habitat Survey allows an experienced ecologist to obtain a sufficient understanding of the ecology of a site in order to either evaluate the conservation importance of the site, and assess the potential for impacts on habitats and species likely to represent a material consideration in planning terms, or to ascertain that further surveys will be required before such an evaluation can be made.

The absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

As described within Section 2.4.2, the first of the water vole presence/absence survey visits would ideally have been conducted between mid-April and the end of June, but was instead conducted on the 6th August. Despite this limitation, it is considered that confidence can still be placed in the accuracy of the results due to the amount of data gathered via camera traps providing additional supplementary information for the site and the fact that waterbody 1 was dry during both survey visits, and therefore less suitable for water vole.

3 Results

3.1 Desk Study

3.1.1 Review of Previous Data

Table 1 below contains a summary of the previous ecological surveys undertaken on the site.

Table 1: Previous ecology survey reports.

Survey Report	Methodology	Results
2007 Ecological Assessment Report ¹	An Extended Phase 1 Habitat Survey of the site was undertaken in 2004. Breeding bird surveys were also undertaken in 2004. The phase 1 survey was then updated in May, June & July 2007.	<p>The 2007 report referenced breeding bird surveys undertaken in 2004, during which breeding territories were identified for lapwing (<i>Vanellus vanellus</i>), linnet (<i>Linaria cannabina</i>) and skylark (<i>Alauda arvensis</i>), with blackbird (<i>Turdus merula</i>), dunnock (<i>Prunella modularis</i>), greenfinch (<i>Chloris chloris</i>), meadow pipit (<i>Anthus pratensis</i>), stonechat (<i>Saxicola rubicola</i>), whitethroat (<i>Sylvia communis</i>) and willow warbler (<i>Phylloscopus trochilus</i>) also recorded breeding within the site.</p> <p>Habitat on site was considered unsuitable for otter. No evidence of water vole was identified, but the ditch on site was considered to provide suitable habitat due to the variety of foraging species, though it was largely dry at the time of survey. It was considered likely that water vole would colonise the ditch if the channel was deepened to hold water permanently.</p>

Survey Report	Methodology	Results
		<p>No reptiles were identified during the survey, but habitat was considered suitable. Where the ditch was wetter, it was considered suitable for breeding common frog (<i>Rana temporaria</i>).</p> <p>The site was not considered to be suitable for supporting badgers, dormice or roosting bats.</p>
2013 Habitats Regulations Assessment ²	A screening assessment was undertaken to assess the likelihood of significant effects upon the international designated sites within 10km of the site.	<p>The following potential effects were identified:</p> <ul style="list-style-type: none"> • Pollutants or high sediment load in surface water run-off from active construction areas; • Disturbance to species caused by increased use of the site, construction activities etc; • Noise and vibration disturbance to species; and • Physical restrictions to species movements. <p>The screening assessment concluded that there were no likely significant effects, either alone or in-combination with other plans and projects, resulting from the proposed development at Machynys.</p>
2013 Reptile Survey Note ³	37 artificial refugia were laid on site and checked on five occasions during late September and the first week of October 2012 during mild weather conditions.	No reptiles were identified within the site. However, autumn 2012 was an unseasonably wet period and this may not be characteristic of the site in normal conditions.

Survey Report	Methodology	Results
		It was considered that the habitats within the site would remain largely suitable for reptiles in normal dry conditions and it cannot be ruled out that they might colonise the site at some point in the future, particularly in drier conditions.
2013 Water Vole Survey Report ⁴	A water vole survey was undertaken of the ditch on site and of the water bodies within Machynys Golf Course in August 2013.	<p>Potential signs of water vole (feeding stations and runs) were identified within the largest pond on the golf course. However, no droppings or burrows were identified.</p> <p>It was considered that water voles were not present within the ditch on site at the time of survey. Due to the lack of water within the ditch, growth of scrub and the availability of abundant better quality habitat within the immediate surroundings it was also considered that water voles were not likely to utilise the ditch to forage on a regular basis.</p>
2015 Water Vole Survey Report ⁵	A water vole survey was undertaken of the ditch on site and of the water bodies within Machynys Golf Course in October 2015.	<p>Signs of water vole were identified again on the large golf course pond (droppings, feeding stations and a nest). However, no burrows were identified.</p> <p>No water vole field signs were noted within the ditch on site. Due to the limited water level and the presence of dry sections within the ditch, along with overgrown scrub, it was considered that the ditch had negligible potential to support water voles. Evidence of pollution / contamination was also identified within this ditch, indicated by an oily water surface layer. In addition is less likely that water vole would utilise this ditch to burrow or forage in due to availability to more favourable habitats within the adjacent golf club waterbodies.</p>
2017 Ecological Survey Update Report ⁶	An Extended Phase 1 Habitat Survey of the site was undertaken in April 2017.	There had been little change in the habitats present within the site compared to the previous studies. Some of the areas of bramble have been cleared and there

Survey Report	Methodology	Results
		was evidence of some spray treatment of Japanese knotweed close to the existing roads.
2018 Water Vole Mitigation Strategy and Method Statement ⁷	At this time, it was proposed that the ditch on site would be lost to the development. Therefore, a construction mitigation strategy was written in 2016 and revised in 2018 after consultation with CCC and NRW, due to the likely presence of water voles within habitats adjacent to the site.	Proposals included a pre-construction survey of the ditch for water voles. If burrows were found then further consultation would be required, since no evidence of water vole has ever been found within the ditch. Displacement by directional strimming of vegetation and then a destructive search were proposed, prior to removal of the ditch. Habitat connectivity corridors were recommended within the site and from the site to the golf course, as well as off-site habitat creation for water voles and on-site planting for water voles.
2018 Ecological Baseline Report (for the Llanelli Wellness and Life Science Village) ⁸	A reptile survey and water vole survey of the site were undertaken as part of the ecological assessment for the Llanelli Wellness and Life Science Village, just north of the B4304. The reptile survey was undertaken between September and October 2016 and the water vole survey was undertaken in October 2016.	<p>The water vole survey of the ditch found no evidence of water voles. The ditch was assessed as having negligible potential for water voles as it appeared to be dry for the majority of the year and contains no aquatic or emergent vegetation. The ditch had been colonised by scrub and willow.</p> <p>Both common lizard and slow worm were recorded within the site. Both adult and sub-adult common lizard were recorded with a maximum count of 11 animals.</p>

3.1.2 Statutory Sites

The search using MAGIC highlighted eight International Sites and two national sites within 10km and 2km of the site boundary, respectively. These comprised five SACs, two SPAs, one Ramsar site and two SSSIs. Details of these sites are given in Table 2, and locations shown on Figure 2.

Table 2: Details of statutory sites within 10km and 2km of the site boundary, for International and national sites, respectively.

Site Name	Features	Distance and Orientation from Site (Approx.)
International Sites		
Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC	Annex I habitats present within the SAC include: sandbanks which are slightly covered by sea water all the time; estuaries; mudflats and sandflats not covered by seawater at low tide; large shallow inlets and bays; Salicornia and other annuals colonizing mud and sand; and Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>). Annex II species present within the SAC include: twaite shad (<i>Alosa fallax</i>); sea lamprey (<i>Petromyzon marinus</i>); river lamprey (<i>Lampetra fluviatilis</i>); allis shad (<i>Alosa alosa</i>); and otter.	90m west
Burry Inlet SPA	Over winter the area regularly supports northern pintail (<i>Anas acuta</i>), northern shoveler (<i>Anas clypeata</i>), Eurasian teal (<i>Anas crecca</i>), Eurasian wigeon (<i>Anas penelope</i>), dunlin (<i>Calidris alpina alpina</i>), red knot (<i>Calidris canutus</i>), Eurasian oystercatcher (<i>Haematopus ostralegus</i>), Eurasian curlew (<i>Numenius arquata</i>), grey plover (<i>Pluvialis squatarola</i>), common shelduck (<i>Tadorna tadorna</i>), common redshank (<i>Tringa totanus</i>), and an internationally important assemblage of birds (34962 waterfowl).	90m west
Burry Inlet Ramsar Site	The site is designated for satisfying Ramsar Criterion 5 (peak count of 41,655 waterfowl in winter) and Ramsar Criterion 6 (peak count of 857 redshank in spring/autumn, and a peak count of 2687 northern pintail, 14,861 Eurasian oystercatcher, and 3618 red knot in winter). Species/populations identified subsequent to designation for possible future consideration under criterion 6 include 467 Northern shoveler in winter.	90m west
Gower Commons / Tiroedd Comin Gwyr SAC	Annex I habitats present within the SAC include northern Atlantic wet heaths with <i>Erica tetralix</i> ; European dry heaths; Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) Annex II species present within the SAC include southern damselfly (<i>Coenagrion mercuriale</i>) and marsh fritillary butterfly (<i>Euphydryas (Eurodryas, Hypodryas) aurinia</i>).	5.1km south
Carmarthen Bay Dunes / Twyni	Annex I habitats present within the SAC include: embryonic shifting dunes; "Shifting dunes along the	5.4km west

Site Name	Features	Distance and Orientation from Site (Approx.)
Bae Caerfyrddin SAC	shoreline with <i>Ammophila arenaria</i> ("white dunes"); "Fixed coastal dunes with herbaceous vegetation ("grey dunes)"; dunes with <i>Salix repens ssp. argentea</i> (<i>Salicion arenariae</i>); and humid dune slacks. Annex II species present within the SAC include narrow-mouthed whorl snail (<i>Vertigo angustior</i>), petalwort (<i>Petalophyllum ralfsii</i>) and fen orchid (<i>Liparis loeselii</i>).	
Bristol Channel Approaches / Dynesfeydd Mlr Hafren SAC	This SAC is designated for the presence of Annex II species harbour porpoise (<i>Phocoena phocoena</i>).	6.2km west
Gower Ash Woods / Coedydd Ynn Gwyr SAC	Annex I habitats present within the SAC include <i>Tilio-Acerion</i> forests of slopes, screes and ravines and alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)	8.1km south
Bae Caerfyrddin / Carmarthen Bay SPA	Over winter the area regularly supports common scoter (<i>Melanitta nigra</i>).	8.4km west
National Sites		
Pyllau Machynys (Machynys Ponds) SSSI	The site comprises one large pond with a group of three smaller pools to the east, linked by fen-carr. These moderately nutrient-rich ponds, and the inter-connecting areas of fen and carr, have developed a distinctive and, for Wales, an uncommon community of invertebrates, which includes a high proportion of species which are regarded as indicators of habitat quality; there are also faunistic elements that are more characteristic of fens and marshes of lowland southern England and which are noticeably rare in Wales. The dragonfly fauna is particularly diverse. Machynys Ponds are additionally noted for their botanical interest.	Immediately south east
Burry Inlet and Loughor Estuary SSSI	The largest estuarine complex within the old West Glamorgan county and Borough of Llanelli. Comprising extensive areas of grazed saltmarsh, sand and mud flats, the area is internationally significant for its wader and wildfowl populations with overwintering totals averaging in excess of 46,000 birds.	90m west

3.1.3 Non-Statutory Sites

Aderyn returned information on one non-statutory site within the 2km search area. This was the North Dock Dunes LNR, located approximately 831m north west.

North Dock Dunes LNR is a rare sand dune habitat with a high diversity of specialist flora and fauna. Species on the dunes include lady's bedstraw (*Galium verum*), cat's-ear (*Hypochaeris radicata*), wild pansy (*Viola tricolor*) and the parasitic common broomrape (*Orobanche minor*) while sea holly (*Eryngium* sp.) and greater knapweed (*Centaurea scabiosa*) occur on broken ground. The

specialist invertebrate life of the dunes contains species that are more commonly associated with warmer climates further south, for example, the sand hill snail (*Theba pisana*) originates in the Mediterranean and here is at the most northerly point in its world distribution. In summer many can be seen clinging to plant stems to avoid the hot sand.

3.1.4 Priority Habitats

An NRW Priority Area comprising a Coastal Saltmarsh is located approximately 62m west.

3.1.5 Protected and Notable Species

Records of protected and/or notable species were returned from Aderyn on 10th August 2020. Only records from the last 10 years (2011 onwards) are discussed below.

Table 3: Protected/notable species desk study records.

Species/Species Group	Description of Records
Bats	15 records of bats were identified within approximately 2km of the site, comprising the following species: greater horseshoe bat (<i>Rhinolophus ferrumequinum</i>) (five records), common pipistrelle (<i>Pipistrellus pipistrellus</i>) (five records), soprano pipistrelle (<i>Pipistrellus pygmaeus</i>) (three records) and unknown bat species (<i>Chiroptera</i>) (two records). Two of these were records of roosts, with one being of an unknown bat species (897m north east) and one of greater horseshoe bat (3.7km north west).
Dormouse	No records of dormouse were returned.
Riparian mammals	10 records of otter, with the closest being live observations approximately 1.5km north west. 12 records of water vole, with the closest being 838m south.
Badger	Two records of badger, located 1.9km and 2km north.
Marine mammals	One record of grey seal (<i>Halichoerus grypus</i>) and one record of common seal (<i>Phoca vitulina</i>), both located approximately 1.8km south.
Other Section 7 mammals	13 records of hedgehog, the closest being located immediately south of the site.
Birds	850 records of bird species were identified within 2km of the site. Of these, 194 records were of Schedule 1 species, comprising 31 species including Cetti's warbler (<i>Cettia cetti</i>), osprey (<i>Pandion haliaetus</i>), little gull (<i>Hydrocoloeus minutus</i>) and barn owl (<i>Tyto alba</i>). The closest of these was a Cetti's warbler approximately 392m north.
Reptiles and amphibians	Two records of palmate newt (<i>Lissotriton helveticus</i>), both located approximately 1.3km north east. No records were provided of great crested newt. A search of publicly available OS mapping and aerial imagery revealed a small number of potential standing waterbodies suitable for breeding amphibians within

Species/Species Group	Description of Records
	500m of the site boundary. Despite suitable habitat, great crested newts are very rare in Carmarthenshire ²¹ . 11 records of common lizard and eight records of slow-worm, with the closest records of both being approximately 185m south. Four records of grass snake, with the closest being in a pond approximately 1.3km north east.
Invertebrates	84 records were provided of 48 invertebrate species. One of which is listed on Schedule 5 of the WCA (small blue (<i>Cupido minimus</i>) located 469m west), and 19 of which were S7 species including 10 S7 recorded within the site boundary: lackey (<i>Malacosoma neustria</i>), garden tiger (<i>Arctia caja</i>), green-brindled crescent (<i>Allophyes oxyacanthae</i>), buff ermine (<i>Spilosoma lutea</i>), sallow (<i>Cirrhia icteritia</i>), minor shoulder-knot (<i>Brachylomia viminalis</i>), latticed heath (<i>Chiasmia clathrate</i>), shaded broad-bar (<i>Scotopteryx chenopodiata</i>), rosy rustic (<i>Hydraecia micacea</i>), and small phoenix (<i>Ecliptopera silaceata</i>).
Vascular Plants	929 records were provided of vascular plant species, two of which were of S7 species: prickly saltwort (<i>Salsola kali</i> subsp. <i>kali</i>) located approximately 1.2km south and cornflower (<i>Centaurea cyanus</i>) approximately 1.5km north.
Invasive Non-Native Species	112 records were provided of invasive non-native plant species, but none located within the site boundary. Japanese knotweed was recorded in close proximity to the north of the site. 13 records were provided of two introduced bird species: Canada goose (<i>Branta canadensis</i>) and Egyptian goose (<i>Alopochen aegyptiacus</i>), all located more than 950m from the site. Four records were provided of invasive non-native mammal species: American mink (<i>Neovison vison</i>) and grey squirrel (<i>Sciurus carolinensis</i>).

3.2 Extended Phase 1 Habitat Survey

3.2.1 Habitats

A total of 12 JNCC habitat types were identified within the site boundary. These are shown on Figure 3 and are described in the following sections. Photographs of habitats are provided within the corresponding section at the end of this report and target notes are given in Appendix C.

Mixed Plantation Woodland (A1.3.2)

One relatively small area of mixed plantation woodland was recorded to the west of the site, bordered by dense scrub and grassland. The canopy was comprised of sweet chestnut (*Castanea sativa*), laurel (*Laurus* sp.), poplar (*Populus* sp.), sycamore (*Acer pseudoplatanus*), oak (*Quercus* sp.), pine (*Pinus* sp.), willow (*Salix* sp.), horse chestnut (*Aesculus hippocastanum*), hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*), hazel (*Corylus avellana*) and cypress

²¹ <https://cdn.naturalresources.wales/media/687859/eng-evidence-report-259-review-of-the-current-conservation-status-ccs-of-the-great-crested-newt-in-wales.pdf> [Accessed: 06/10/2020].

(*Cupressus* sp.), with an understorey and ground flora of ivy (*Hedera helix*), lords and ladies (*Arum maculatum*), wood avens (*Geum urbanum*) and common nettle.

Dense Scrub (A2.1)

Several areas of dense scrub were present to the west of the site, forming a mosaic with areas of grassland, scattered scrub, woodland and bracken, and along the banks of waterbody 1. These were generally dominated by bramble (*Rubus fruticosus* agg.), with rose (*Rosa* sp.), buddleia (*Buddleja buddleja*), willow herb, blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*) and sea buckthorn (*Hippophae rhamnoides*).

Scattered Scrub (A2.2)

Two areas of scattered scrub were recorded, located centrally within the site. Species present included bramble, gorse (*Ulex europaeus*), willow and broom (*Sarothamnus scoparius*).

Scattered Broadleaved Trees (A3.1)

A line of planted broadleaved trees was present along the northern boundary of the site, which connect into a small block of semi-natural broadleaved woodland just outside of the site boundary to the east.

Semi-improved Neutral Grassland (B2.2)

This was the dominant habitat type within the site. A good diversity of species was recorded, including false oat-grass (*Arrhenatherum elatius*), cock's-foot (*Dactylis glomerata*), common knapweed (*Centaurea nigra*), yarrow (*Achillea millefolium*), bird's-foot trefoil (*Lotus corniculatus*), tansy (*Tanacetum vulgare*), tufted vetch (*Vicia cracca*), red bartsia (*Odontites vernus*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*), common restharrow (*Ononis repens*), wild parsnip (*Pastinaca sativa*), imperforate St. John's-wort (*Nolina cismontana*), wild strawberry (*Fragaria vesca*), mugwort (*Artemisia vulgaris*), creeping cinquefoil (*Potentilla reptans*), silverweed (*Argentina anserina*), common hogweed (*Heracleum sphondylium*), fescue (*Festuca* sp.), white campion (*Silene latifolia*) and common broomrape.

Marshy Grassland (B5)

Marshy grassland was present to the south of the site, comprising rushes, sedges, melilot (*Melilotus* sp.), purple loosestrife, fleabane (*Erigeron* sp.) and pendulous sedge (*Carex pendula*).

Continuous Bracken (C1.1)

A small area of bracken (*Pteridium aquilinum*) was located in the west, adjacent to a larger area of dense scrub.

Standing Water (G1)

Three standing waterbodies (waterbodies 2, 4 and 5) were present outside of the site boundary to the south east, within the golf course. These are described in further detail within the Water Vole Survey results section below.

Short Perennial Vegetation (J1.3)

This habitat type was relatively small, located in the north of the site, and comprised wild carrot (*Daucus carota*), selfheal (*Prunella vulgaris*), imperforate St. John's-wort, yarrow and wild parsnip. Common centaury (*Centaureum erythraea*) was also present here.

Introduced Shrub (J1.4)

Two areas of Japanese knotweed were present in the west, and one large area of sea buckthorn was present in the east of the site. Sea buckthorn was also scattered throughout the site.

Dry Ditch (J2.6)

A dry ditch was present along the southern boundary running into the golf course (waterbodies 1 and 3). This is described in further detail within the Water Vole Survey results section below.

Hardstanding (J5)

A small area of hardstanding was present to the north west located just off of Pentre Nicklaus Avenue, housing a small pad mounted transformer.

3.2.2 Protected and/or Notable Species

Bats

No trees on site were identified as being suitable to support roosting bats. Woodland edge and scrub habitat within the site may provide habitat for foraging and commuting bats, though this is relatively limited.

Dormouse

Although woodland, scrub and hedgerow habitat is present on site, it lacks connectivity to suitable habitat in the wider landscape, and is therefore not considered to be suitable for dormice. This, along with the lack of dormouse records returned by Aderyn means that this species is not considered further in this report.

Riparian mammals

It is considered likely that otter are active within and adjacent to the site, with a potential otter pathway and old otter spraints on a rock identified by waterbody 2 (TN1 and TN2 on Figure 3), and potential feeding remains (five cockle shells) and footprints identified adjacent to waterbody 1 (TN3 on Figure 3). However, habitats on site and adjacent to the waterbodies surveyed are not considered

suitable for breeding otter. Waterbody 5 was considered to have the most potential for resting otter, though no signs were identified.

Full details of the water vole survey are detailed in Section 3.3 below.

Badger

The grassland on site provides suitable habitat for foraging badger, with woodland and hedgerows providing suitable cover for sett building. No setts were identified during the survey, but potential badger dung was observed in one location (TN5 on Figure 3). No other signs of badger were identified.

Other mammals

Grassland and hedgerow habitats on site are suitable for hedgehog, particularly towards the south and west near residential gardens. It is considered likely that this species is present on site.

A red fox (*Vulpes vulpes*) hole was identified in the bank of waterbody 1 (TN6 on Figure 3).

Birds

The woodland, scrub, hedgerow and grassland habitats are likely to provide nesting habitat for a range of bird species. In addition, more open areas with short grassland swards could support ground nesting species such as skylark or lapwing, although the site is likely to be too disturbed by dog-walkers.

Reptiles

An adult common lizard was recorded basking on a coltsfoot (*Tussilago farfara*) leaf (TN7 on Figure 3). Areas of scrub and wetter habitats on site, such as the marshy grassland and the waterbodies in the south provide suitable habitat for other common reptile species including slow worm and grass snake.

Amphibians

No amphibians were observed during the survey. The mosaic of grassland, scrub, dry ditches and woodland offers moderate quality terrestrial habitat providing a foraging and shelter resource for amphibians that may be present in local waterbodies. However, the suitability of the five identified waterbodies for common amphibian species is limited due to the close-mown grass of the adjacent golf course likely acting as a barrier to dispersal.

A Habitat Suitability Index (HSI) assessment²² was carried out for the five identified waterbodies. The HSI is a numerical index which ranges from 0 to 1. It is calculated using 10 key habitat criteria and is based on the assumption that the habitat quality determines great crested newt presence/absence. Using this standard approach, waterbodies with high scores are more likely to support breeding great crested newt than those with a lower score. It is important to note that the HSI system is not sufficiently precise to conclude that any particular

²² Odiham *et al.* (2000). in ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index.

waterbody with a high score will support great crested newt or that any waterbody with a low score will not.

The results of this assessment are presented in Table 4. Locations of waterbodies are shown on Figure 3.

Table 4: HSI Assessment Results

Waterbody No.	HSI Score	HSI Category
1	0.34	Poor
2	0.47	Poor
3	0.34	Poor
4	0.48	Poor
5	0.51	Below average

Invertebrates

A relatively large range of flowering species were present on site, which could support a good invertebrate population. This included red bartsia, which is a popular food plant of the shrill carder bee (*Bombus sylvarum*) (a Section 7 species, and one of the UK's rarest bumblebees²³). A number of ant hills were also recorded at on Machynys mound (TN8 on Figure 3) and adjacent to waterbody 1 (TN9 on Figure 3).

Invasive Non-Native Species

Three invasive non-native species were recorded on site:

- Japanese knotweed – multiple stands of Japanese knotweed of varying sizes, both within the site boundary and adjacent to the waterbodies outside of the site boundary (TN10 to TN13 on Figure 3), including one stand adjacent to waterbody 5 which appeared to have been treated (TN14 on Figure 3);
- Montbretia (*Crocsmia × crocosmiiflora*) – two stands within the site boundary (TN15 and TN16 on Figure 3) and all along the eastern edge of waterbody 5 (TN17 on Figure 3); and
- Japanese rose (*Rosa rugosa*) – at the edge of an area of scattered scrub within the site boundary (TN18 on Figure 3).

²³ Page, S., Lynch S., Wilkins, V. and Cartwright, B (2020). A Conservation Strategy for the Shrill carder bee *Bombus sylvarum* in England and Wales, 2020–2030. Bumblebee Conservation Trust, Stirling, Scotland UK.

3.3 Water Vole Survey

3.3.1 Habitat Suitability Assessment

Two waterbodies were assessed as having high suitability for water vole, one was assessed as having moderate suitability and two were assessed as having negligible suitability. A summary of the habitat suitability assessment results is provided in Table 5 below, with results shown on Figure 4. Photographs of the waterbodies are given at the end of this report.

Table 5: Habitat Suitability Assessment Results.

Waterbody No.	Description	Water Vole Suitability
1	This ditch had steep (>45°) banks and was dry at the time of the survey. The channel was 1-2m wide. The earth bank as unfenced with the neighbouring land used as a golf club, which was the same for all other waterbodies. The ditch supported a limited number of species including teasel, bramble, knapweed, ragwort, thistle and some trees.	Negligible
2	This pond had flat (<10°) banks, with a water depth of at least 1-2m. The channel width was >20m with a still flow speed. The earth bank was unfenced. Some foraging resources for water vole were present. Vegetation included reeds, lily pads and some trees.	Moderate
3	This ditch had steep (>45°) banks and was dry at the time of the survey. The channel was 1-2m wide. The earth bank as unfenced. Foraging resources for water vole were limited. Vegetation included trees (alder) and bramble.	Negligible
4	This pond had flat (<10°) banks, with a water depth of at least 1-2m. The channel width was >20m with a still flow speed. The earth bank was unfenced. Some foraging resources for water vole were present. Vegetation was similar to that recorded within waterbody 5, and included rushes, hazel, alder, reeds, willowherb and water mint.	High
5	This pond had flat (<10°) banks, with a water depth of at least 1-2m. The channel width was >20m with a still flow speed. The earth bank was unfenced. Vegetation included hogweed, water mint, bramble, willowherb, reeds and hemp agronomy. Trees were present towards the centre, including willow, alder, and hawthorn. Some invasive species were present, including Japanese knotweed and montbretia.	High

3.3.2 Presence/Likely Absence Survey

Potential signs of water vole, including burrows, droppings and feeding stations were recorded during both visits around waterbodies 2 and 4. However, the signs were not clear enough to be certain that they were water vole, with the exception of one feeding station of 12cm remains on the north-eastern bank of waterbody 2.

Photographs of the findings are given at the end of this report and locations are shown on Figure 4.

No signs of water vole were identified along the ditch within the site boundary (waterbody 1), and no water vole were recorded by the two deployed camera traps. Furthermore, American mink scats were recorded around the northern bank of waterbody 2, approximately 35m from waterbody 1. Water vole are particularly vulnerable to predation by American mink. It is therefore considered that water vole are likely absent from waterbody 1 (i.e. the only waterbody located within the site boundary). This species is therefore not considered further in this report.

Numerous signs of bank vole (*Myodes glareolus*) including droppings and feeding stations, were identified around waterbodies 2, 4 and 5.

4 Appraisal & Recommendations

The PEA has identified potential pathways of impact between the proposed works and ecological features within/surrounding the site including designated sites, notable habitats and protected/notable species: bats, riparian mammals, badger, hedgehog, red fox, breeding birds, reptiles and common amphibian species.

Avoidance and mitigation measures are recommended below in order to prevent adverse effects from the proposed works on ecological features of the site.

The ecological constraints and opportunities below are also appraised with reference to the following documents:

- 2013 Machynys Eco Park Ecological Management Plan²⁴;
- 2013 Macynys Eco Park Planning, Design and Access Statement²⁵; and
- 2014 Machynys Central Residential Development Planning, Design and Access Statement²⁶.

4.1 Designated Sites

A number of international and national designated sites are located within relatively close proximity of the site, including the Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC, Burry Inlet SPA, Burry Inlet Ramsar Site and the Burry Inlet and Loughor Estuary SSSI (all located 90m west) and the Pyllau Machynys (Machynys Ponds) SSSI (located immediately south east).

A statement to inform a Habitats Regulations Screening Assessment was produced in 2013, which screened out any likely significant effects upon the designated sites. As the report was written prior to 2018 and therefore prior to *Coillte Teoranta vs People Over Wind and Sweetman*²⁷, the screening assessment included the following mitigation:

The proposed works will:

- Be retained within the site boundary;
- Be undertaken in accordance with pollution prevention guidance;
- Be controlled through a Site Management Plan;
- Adhere to good practice with chemicals on site (e.g. bunded containment, spill kits, etc.);

²⁴ Pryce Consultant Ecologists (2013). Machynys Ecological Park, South Llanelli. Ecological Management Plan.

²⁵ Arup (2013). Machynys Eco Park, Llanelli. Planning Design and Access Statement.

²⁶ Arup (2014). Machynys Central Residential Development, Llanelli. Planning Design and Access Statement.

²⁷ People over Wind, Case C323/17 European Court of Justice, 12th April 2018.

- Ensure excavations are covered or provide a suitable means of escape for otters overnight; and
- Plainly established and uncontroversial (PEU) good practice measures will be sufficient to avoid any water quality affecting the estuary SAC, SPA and Ramsar.

Although a screening assessment should no longer include mitigation measures, it is considered that even if a Stage 2 Appropriate Assessment were undertaken, the conclusion would still be that the integrity of the designated sites would not be adversely affected, with the inclusion of the above mitigation. CCC as competent authority should determine if the above judgement is correct.

4.2 Habitats

The proposed works have the potential to cause loss of habitats on site to enable the Machynys Central Housing development, including broadleaved trees and scrub. Any clearance should be minimised where possible. Retained trees on site should be protected in line with BS 5837:2012²⁸. Standard pollution control measures should be implemented during construction to protect all retained habitats.

Furthermore, any Tree Preservation Orders (TPOs) within the site boundary should be obtained from Carmarthenshire County Council to establish trees for retention within.

The Machynys Eco Park development will be retaining and improving the habitats on site. A “green corridor” is also proposed as part of the Central Housing Development in order to link the Eco Park with off-site habitats bordering the golf course to the south. Whilst the habitats that are present on site remain broadly similar to those identified within the 2013 Management Plan, there has been greater colonisation of grasslands and scrub, therefore the Eco Park plans may need to be updated in order to account for this. Ecological monitoring and reporting on the establishing habitats on site is also proposed for ten years post-construction.

4.3 Bats

The woodland habitat on site and wet habitats to the south east provide suitable habitat for foraging and commuting bats. No potential roosting habitats were identified on site. Construction works should be restricted to daylight hours and any artificial lighting that may be required should be directed away from woodland and waterbodies in order to minimise disturbance to bats.

The Machynys Eco Park development proposals include the retention of existing wooded areas and the creation of ponds and new woodlands, which will enhance the site for bats. The habitat enhancements will also benefit invertebrate

²⁸ British Standards Institute BS 5837:2012. Trees in relation to design, demolition and construction.

populations, which will improve the source of food for bats on site. Five bat boxes are also proposed be installed on retained mature trees.

4.4 Otter

Evidence of otter activity was recorded within and adjacent to the site boundary around waterbodies 1 and 2. However, waterbody 1 on site is not considered to be suitable for breeding otter. As a precautionary measure, a pre-construction check for otter should be carried out for works close to waterbody 1. Works should also be restricted to daylight hours where possible and any artificial lighting that may be required should be directed away from such waterbodies. Any excavations should be covered overnight or a means of escape for mammals provided.

The Machynys Eco Park development proposals include the retention of existing wooded areas and the creation of ponds and new woodlands, which will enhance the site for otters. The Machynys Central Housing Development proposals include a green corridor connecting the habitats within the Eco Park to the suitable waterbodies on the golf course south of the site.

4.5 Badger

A pre-construction survey for badger should be conducted to establish the presence of any new setts that may be disturbed by the proposed works, and a badger licence obtained if necessary.

Even if setts are found to be absent, it is recommended that good practice measures are adopted during construction to avoid accidental harm to badgers, such as safe protection of open excavations at the end of each working day or providing means of escape for mammals. Works should also be avoided at night-time and if lighting is required, this should be directed away from wooded or scrub areas.

The Machynys Eco Park development proposals include habitat enhancements, which will provide habitat for badgers and also improve foraging opportunities by benefitting invertebrate populations on site.

4.6 Other Mammals

All vegetation clearance and earthworks should be conducted following site-specific Method Statements produced by ecologists to avoid harm to animals, such as hedgehogs and foxes, including habitat manipulation methods and staged vegetation clearance. Toolbox talks and ecological watching briefs by an ECoW should be conducted to move any remaining animals, if found, into safe areas.

The Machynys Eco Park development proposals include the retention of existing grasslands and wooded areas and the creation of new grasslands and woodlands, which will enhance the site for small mammals by providing habitat and also by enhancing the site for their invertebrate food source. The Machynys Central Housing Development proposals include a green corridor connecting the habitats within the Eco Park to habitats south of the site.

4.7 Birds

Any vegetation clearance should be undertaken outside of the breeding bird season (i.e. outside of March-August), where possible. If clearance is required within breeding bird season, a pre-works check for bird nests by a Suitably Qualified Ecologist (SQE) will be required. If active nests are found, a suitable exclusion zone should be set up and no work should continue in the area until the chicks have fledged and left the vicinity.

The Machynys Eco Park development proposals include the retention of existing grasslands and wooded areas and the creation of ponds, reed-beds and new woodlands, which will enhance the site for birds. The habitat enhancements will also benefit invertebrate populations, which will improve the source of food for birds on site. Five bird boxes are also proposed be installed on retained mature trees.

4.8 Reptiles & Amphibians

Presence of common lizard and slow worm has been confirmed on site. The site is not considered to be suitable for any rarer species, such as adder.

As described above, sensitive vegetation clearance methods should be employed to avoid impacts to reptile species that may be present and also to any amphibians such as common frog or common toad (*Bufo bufo*).

The Machynys Eco Park development proposals include a mosaic of grasslands, ponds and wetland habitats, along with the retention of existing scrub, which will enhance the site for reptiles and amphibians. The habitat enhancements will also benefit invertebrate populations, which will improve the source of food on site. Four reptile and amphibian refugia are also proposed in suitable locations, e.g. on south-facing banks or in the vicinity of pond margins.

It is recommended that the reptile population on site is monitored in years 1, 3 and 5 post-construction and any necessary improvement measures should be noted within the yearly ecological habitat monitoring reports.

4.9 Invertebrates

The grasslands on site were relatively diverse and therefore have the potential to support a wide range of invertebrate species.

The Machynys Eco Park development proposes to retain much of the grassland as well as providing habitat enhancements, including a mosaic of grasslands, ponds and wetland habitats. The habitat enhancements will benefit local invertebrate populations.

4.10 Invasive Non-Native Plant Species

Invasive non-native species were identified on site and steps must be taken to ensure that these species do not spread accidentally. The safe removal of any invasive non-native species should be detailed in an Invasive Species

Management Plan within the contractor's RAMS, as required, to ensure that all site activities are controlled and are in accordance with best practice procedures. The Management Plan should also detail measures for any works located in close proximity to invasive species. Invasive species that are not due to be removed as part of the works should be fenced off.

The treatment/removal of invasive species from the site is proposed within the current Machynys Eco Park Ecological Management Plan.

4.11 General Mitigation During Construction

The following measures, additional to those in the current Ecological Management Plan, are recommended to prevent adverse effects on the ecological receptors on site and in the local area:

- All works should be undertaken in accordance with best practice guidance for pollution prevention²⁹.
- If any protected species are encountered during the works, all work in the vicinity should stop immediately and a SQE contacted for advice on how to proceed.
- These measures should be captured within a Construction Environmental Management Plan (CEMP) for the site.

4.12 Enhancement Measures

The following measures, additional to those in the current Ecological Management Plan, are recommended to enhance the biodiversity within the site and surrounding area, in line with national planning policy³⁰:

- The replacement of any removed vegetation with fruiting species to provide a food source for invertebrates, birds and mammals;
- Along with the proposed installation of bird and bat boxes within the Eco Park, a number of insect houses could also be built;
- Vegetation removed to enable the Machynys Central Housing Development, could be retained and used as log piles/areas of brash to enhance the hibernacula habitat for reptiles, amphibians and small mammals.

²⁹ <https://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/> [Accessed: 06/10/20].

³⁰ Welsh Government (2018). Planning Policy Wales, Edition 10. Available online at: <https://beta.gov.wales/sites/default/files/publications/2018-12/planning-policy-wales-edition-10.pdf> [Accessed: 06/10/20].

5 Conclusions

Carmarthenshire County Council are proposing residential and ecological park developments in Machynys. In summary, the following recommendations have been made:

- No further species-specific surveys are required, except for pre-construction checks for badger, otter and water vole.
- The current Eco Park layout may need to be adjusted in order to take into account the updated distribution of habitats on site.
- Construction mitigation as proposed within the current Ecological Management Plan should be adhered to, which includes but is not limited to:
 - Standard pollution control measures should be implemented during construction to protect habitats within/adjacent to the site;
 - If vegetation clearance is required during the nesting bird season, a nesting bird check by a SQE will be required and any nesting birds protected from disturbance during construction;
 - All vegetation clearance and earthworks should be sensitive to reptiles, amphibians and small mammals;
 - The Japanese knotweed, montbretia and Japanese rose on site must be considered in an Invasive Species Management Plan; and
- Construction mitigation measures additional to those in the current Ecological Management Plan include: construction limited to daylight hours, any construction lighting to avoid sensitive habitats and any open excavations to be covered at night;
- Enhancement measures additional to those in the current Ecological Management Plan include: the creation of insect houses.
- The mitigation measures should all be captured within a CEMP for the site.
- Monitoring surveys are recommended for reptiles in order to ensure that the Eco Park site continues to provide suitable habitat for these species.
- CCC as competent authority should determine if the judgement regarding the 2013 HRA is still correct.

This report has been written as the result of survey effort undertaken in August and September 2020 and as a review of the surveys on site between 2004 and 2018. This report refers within the limitations stated, to the condition or proposed development of the site at the time of inspections. Changes in legislation, guidance, best practice, etc. may necessitate a re-assessment/re-survey. It is also advised that if there is a delay of over two years in undertaking the Proposed

Works, an update survey may be required. No warranty is given as to the possibility of future changes in the condition of the site.

This report is produced solely for the benefit of Carmarthenshire County Council and no liability is accepted for any reliance placed on it by any other party. This report is prepared for the proposed uses stated in the report and should not be used in a different context.

Figures



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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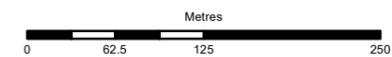
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Issue	Date	By	Chkd	Appd
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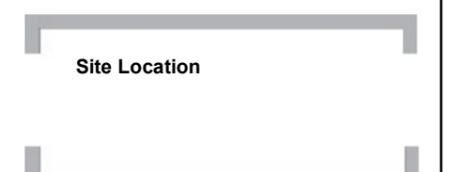
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Client
Carmarthenshire County Council

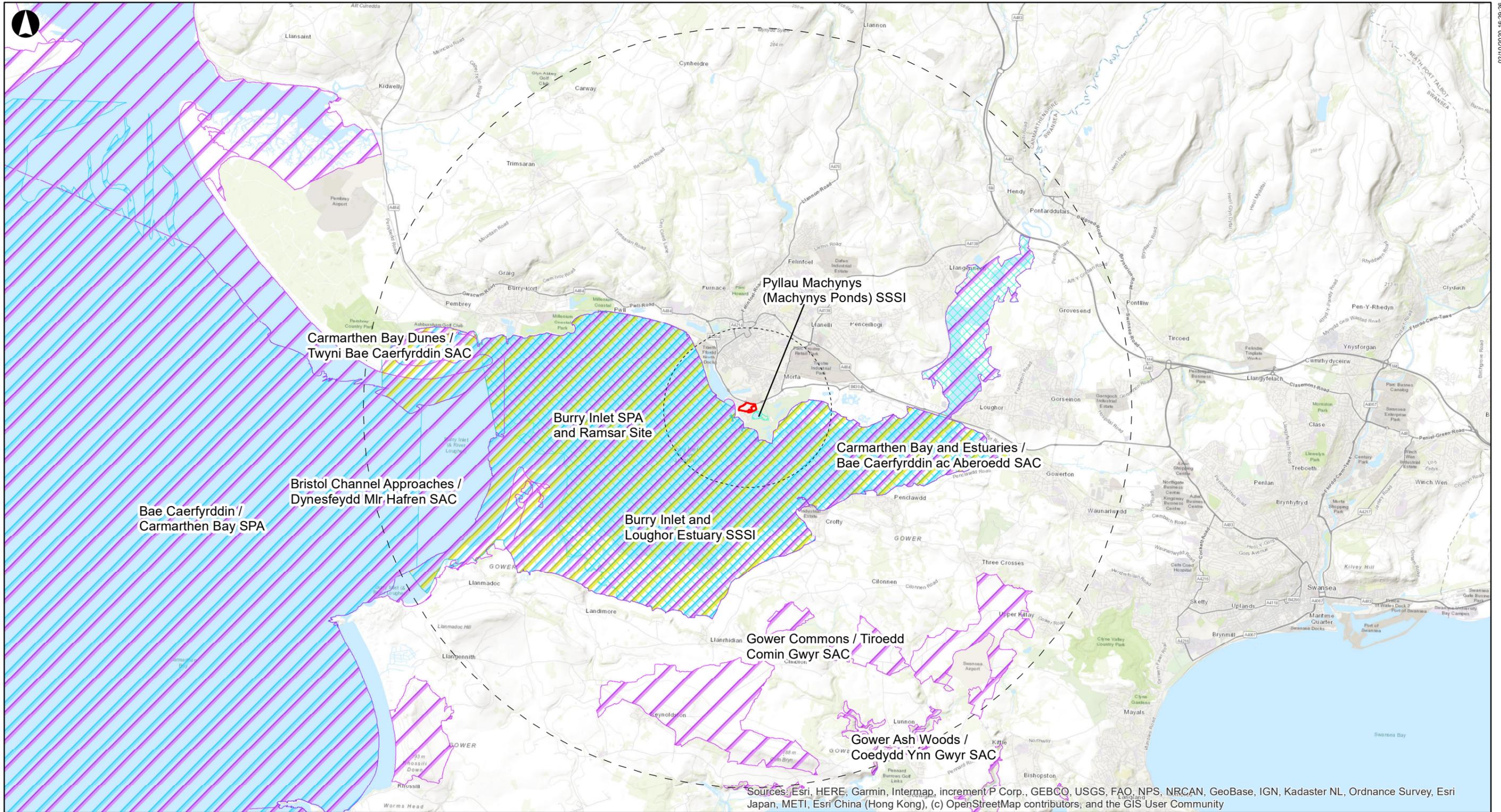
Job Title
Machynys



Scale at A3
1:5,000

Job No 277365-00	Drawing Status For Issue
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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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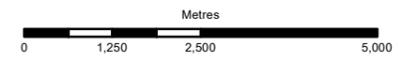
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-  10km buffer
-  2km buffer
-  Special Area of Conservation (SAC)
-  Special Protection Area (SPA)
-  Ramsar Site
-  Site of Special Scientific Interest (SSSI)

F1	2020-10-02	EA	PC	PC
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Issue	Date	By	Chkd	Appd
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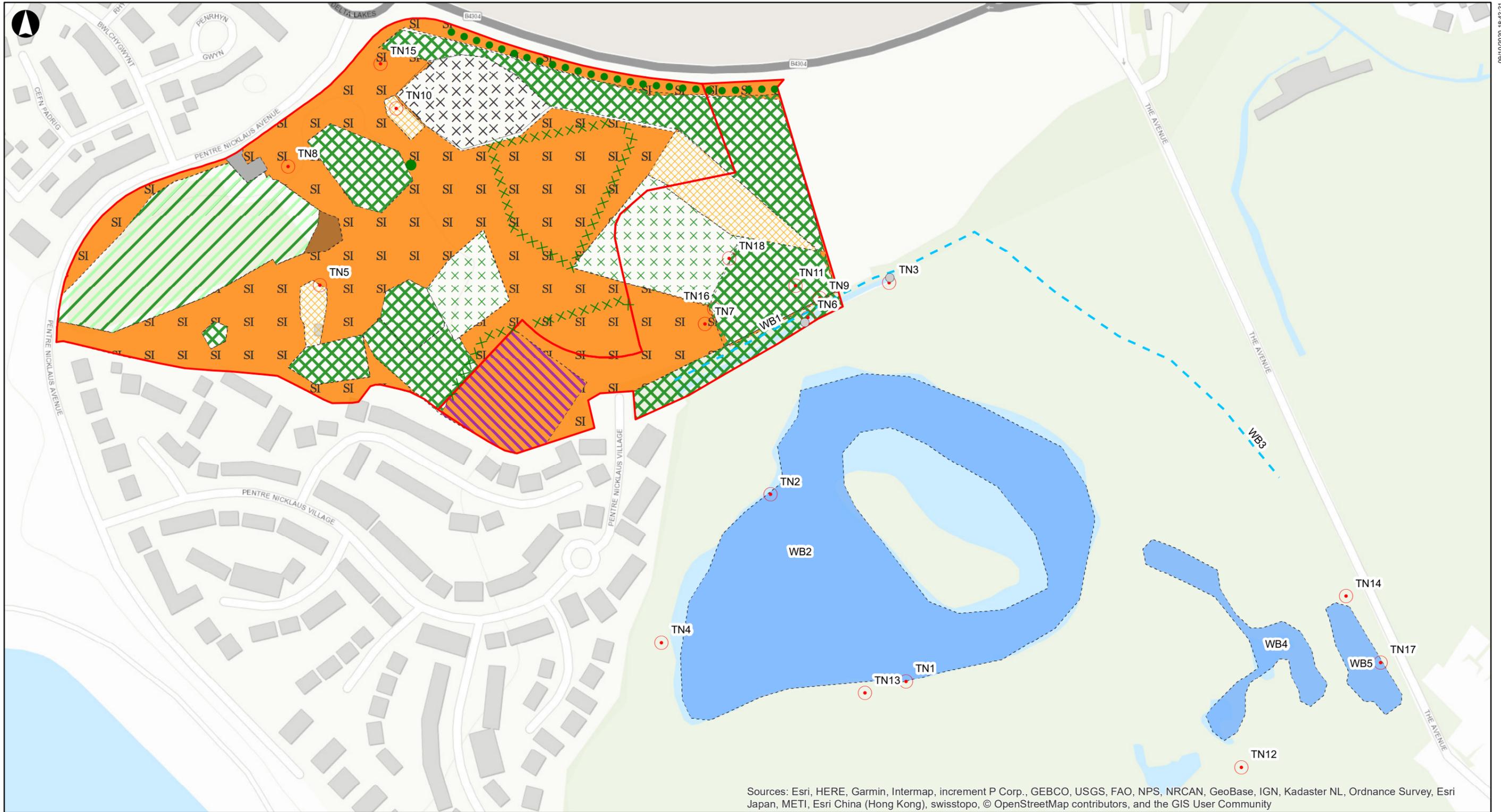
Job Title
Machynys

Statutory Designated Sites

Scale at A3
1:100,000

Job No
277365-00 Drawing Status
For Issue

Drawing No
002 Issue
F1



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Legend

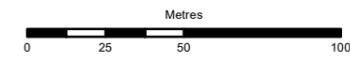
- Site boundary
- Camera trap
- Scattered broad-leaved trees
- Target note
- Scattered scrub boundary
- Broad-leaved tree line
- Dry ditch
- Mixed plantation
- Dense scrub
- Scattered scrub
- Semi-improved neutral grassland
- Marshy grassland
- Continuous bracken
- Standing water
- Short perennial vegetation
- Introduced shrub
- Gravel and concrete

F1	2020-10-02	EA	PC	PC
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Issue	Date	By	Chkd	Appd

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Client
Carmarthenshire County Council

Job Title
Machynys

Extended Phase 1 Habitat Survey Results

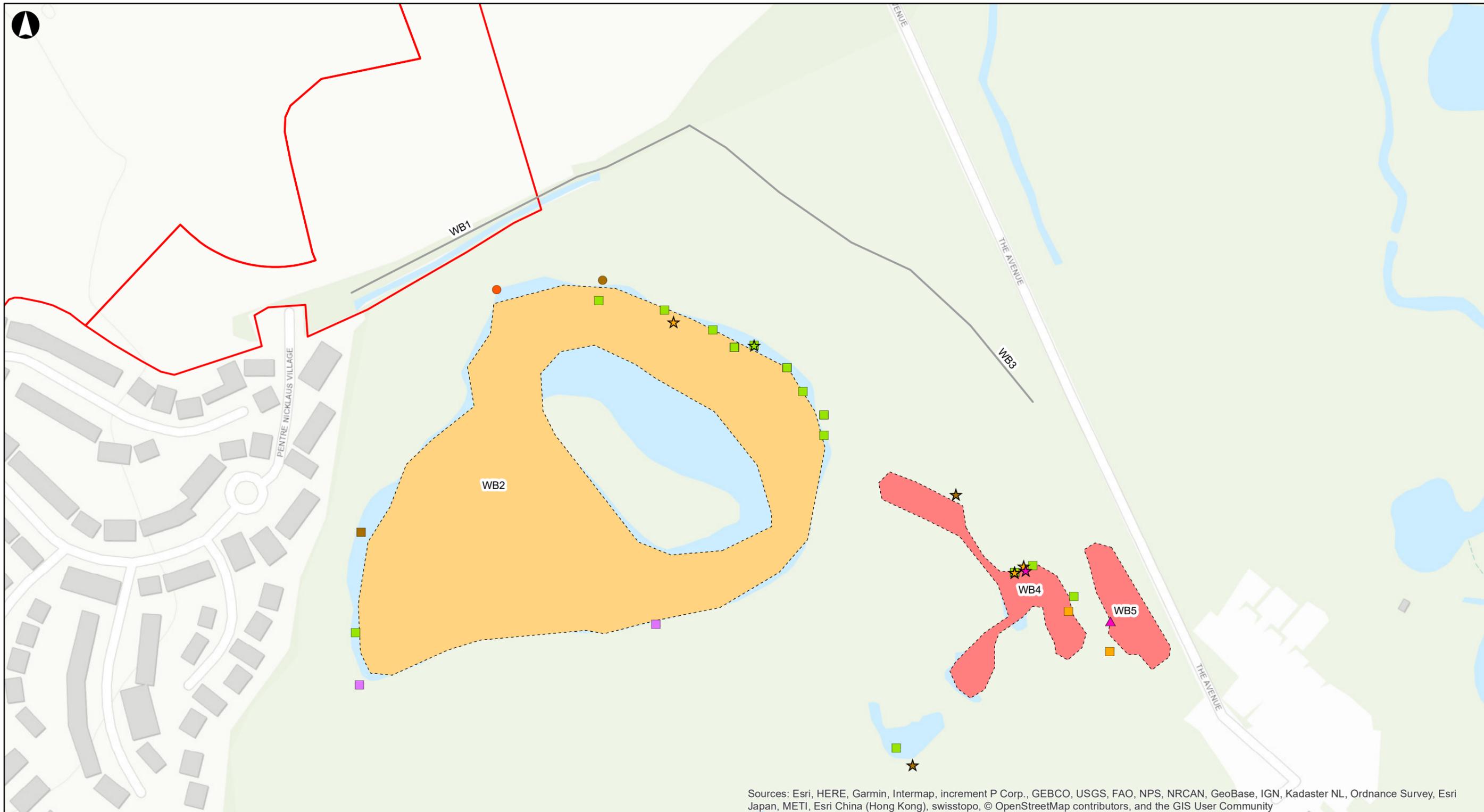
Scale at A3
1:2,250

Job No
277365-00

Drawing Status
For Issue

Drawing No
003

Issue
F1



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

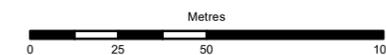
Legend

- Site boundary
- ★ Burrow (potential water vole)
- ★ Droppings (potential water vole)
- ★ Feeding station (water vole)
- ★ Feeding station (potential water vole)
- ▲ Burrows (potential rat)
- Droppings (bank vole)
- Feeding station (bank vole)
- Feeding station (likely bank vole)
- Feeding station and droppings (bank vole)
- American mink footprint
- American mink scat
- Negligible suitability
- Moderate suitability
- High suitability

F1	2020-10-15	EA	PC	PC
Issue	Date	By	Chkd	Appd

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Client
Carmarthenshire County Council

Job Title
Machynys

Water Vole Survey Results

Scale at A3
1:2,000

Job No 277365-00	Drawing Status For Issue
Drawing No 004	Issue F1

Photographs



Photograph 1: Waterbody 1



Photograph 2: Waterbody 1



Photograph 3: Waterbody 2



Photograph 4: Waterbody 2



Photograph 5: Potential water vole feeding signs



Photograph 6: Waterbody 3



Photograph 7: Waterbody 3



Photograph 8: Waterbody 3



Photograph 9: Waterbody 4



Photograph 10: Waterbody 4



Photograph 11: Waterbody 5



Photograph 12: Burrows on central island of waterbody 5. Unable to access to investigate further



Photograph 13: Potential water vole dropping



Photograph 14: Bank vole droppings



Photograph 16: Mink scat



Photograph 15: Old otter spraint



Photograph 17: Mink footprint



Photograph 18: Bank vole feeding station



Photograph 19: Potential water vole burrow



Photograph 20: Showing Japanese rose on site



Photograph 21: Showing broadleaved tree line



Photograph 22: Showing the grassland and woodland



Photograph 23: Showing dense scrub and Japanese knotweed



Photograph 24: Showing the plantation woodland



Photograph 25: Showing the grassland and scrub



Photograph 26: Potential badger dung



Photograph 27: Broken cockle shell – possible otter feeding sign



Photograph 28: Fox hole on waterbody 1



Photograph 29: Showing montbretia on site



Photograph 30: Showing Japanese knotweed on site

Appendix A

Legislation

A1 Legislation

A framework of international, European, national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. This is described in the following sections. The reader will refer to the original legislation for the definitive interpretation.

A1.1 Statutory Designated Sites

A network of nationally designated sites has been established through the designation of Sites of Species Scientific Interest (SSSI) under the Wildlife and Countryside Act 1981 (as amended). The protection afforded by the Act means it is an offence to carry out or permit to be carried out any operation listed within the notification without the consent of the Statutory Nature Conservation Organisation³¹ (Natural Resources Wales).

The protection afforded to SSSIs is used to underpin the designation of areas at a European Level. European Sites comprise:

- Special Areas of Conservation (SAC) designated under the Conservation of Habitats and Species Regulations 2019 (Amendment) (EU Exit) (known as the Habitats Regulations);
- Special Protection Areas (SPA) designated under the Wildlife and Countryside Act.

Wetlands of International Importance (Ramsar sites) declared under the Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 are normally also notified as SSSIs but are only considered European Sites as a matter of UK and Local Government Policy.

The Habitats Regulations transpose the requirements of Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) in to law within England and Wales, while the Wildlife and Countryside Act transposes Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive) in the law within England and Wales. Equivalent legislation exists to transpose these directives in the law within Scotland and Northern Ireland.

The Habitats Regulations require that consideration is given to the implications of plans and projects (developments) on European Sites are considered. Specifically, Regulation 61(1) states:

“A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which –

³¹ Section 28 of the Wildlife and Countryside Act 1981 (as substituted by Schedule 9 of the Countryside and Rights of Way Act 2000).

(a) is likely to have a significant effect on a European site or European marine site (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of that site, must make an appropriate assessment of the implications for that site in view of that site's conservation objectives.”

The formal consideration of effects on European Sites is therefore undertaken by the determining authority such as the Local Planning Authority.

Local Nature Reserves can be given protection against damaging operations through powers within the National Parks and Access to the Countryside Act 1949 (as amended). However, this protection is usually conveyed through inclusion of protection within local planning policy relating to these sites and other non-statutory sites such as sites of Importance for Nature Conservation.

A1.2 European Protected Species

The Habitats Regulations convey special protection to a number of species which are listed in schedule 2 of the Regulations and are referred to as European Protected Species (EPS):

- All UK resident bat species;
- All whale and dolphin species;
- Large blue butterfly (*Maculinea arion*);
- Common dormouse (*Muscardinus avellanarius*);
- Pool frog (*Rana lessonae*);
- Sand lizard (*Lacerta agilis*);
- Fisher's estuarine moth (*Gortyna borelii lunata*);
- Great crested newt (*Triturus cristatus*)
- European otter (*Lutra lutra*)
- Wild cat (*Felis silvestris*);
- Lesser Whirlpool Ram's-horn Snail (*Anisus vorticulus*)
- Smooth snake (*Coronella austriaca*);
- Sturgeon (*Acipenser sturio*);
- Natterjack toad (*Bufo calamita*); and
- All marine turtles.

Regulation 41 makes it an offence to:

- a) Deliberately capture, injure or kill any wild animal of a EPS;
- b) Deliberately disturb wild animals of such a species;
- c) Deliberately takes or destroys the eggs of such a species;

d) Damages or destroys a breeding site or resting place of such an animal.

Disturbance in the context of the offences above is disturbance which is likely to impair the ability of the animals to survive, to breed or reproduce, to nurture their young, to hibernate, to migrate; or to affect significantly the local distribution of the species.

Licences can be granted by the relevant SNCO for developments (sometime referred to as EPS Licences or Derogation Licences) providing the purposes of the licence is for “*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 for the environment*”.

A1.3 UK Protected Species

The Wildlife and Countryside Act 1981 provide protection to both EPSs and other species including wild birds, water voles and reptiles.

All wild birds, their nests and eggs are protected with some rare species afforded extra protection from disturbance during the breeding season (these species are listed in Schedule 1 of the Act). It is illegal to take any wild bird or damage or destroy the nests and eggs of breeding birds. There are certain exceptions to this in respect of wildfowl, game birds and certain species that may cause damage.

Water vole receive protection under the Wildlife and Countryside Act 1981 which prohibits the killing, injuring or taking by any method.

All native reptile species in the UK are subject to partial protection from intentional or reckless killing or injury only.

Badger and their setts are protected under the Protection of Badgers Act 1992 which makes it an offence to kill, injure or take a badger, or interfere with a sett.

The Salmon and Freshwater Fisheries Act 1975 and The Eels (England and Wales) Regulations 2009 list provisions such as maintaining fish passes where rivers may be obstructed by dams or weirs and the provision of screens on outlets to avoid entrapment of fish.

A1.4 Other Legislation Relating to Species

Section 6 of the Environment (Wales) Act 2016 includes a duty on all 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”. This duty applies to government bodies, local authorities and statutory undertakers.

To assist in complying with this duty, public authorities must have regard to relevant evidence provided in the State of Natural Resources Report and any relevant area statement for an area in which the authority exercises functions, as well as having regard to the list of living organisms and habitats published under Section 7 of the Act. Species and habitats listed on Section 7 are considered to be of Principal Importance for the conservation of biological diversity.

The Environment (Wales) Act 2016 replaces the NERC Act 2006; Section 6 replaces Section 40 of the NERC Act and Section 7 replaces the Section 42 list.

A1.2 Invasive Species

Schedule 9 of the Wildlife & Countryside Act 1981 (as amended) lists certain plants and animals that are not native to Great Britain and could pose a threat to our native species and habitats.

Under this legislation it is an offence to plant or otherwise causes to grow in the wild any plant which is included in Part II of Schedule 9. It is also an offence to sell or to release into the wild any plants or animals on the Schedule.

The Invasive Alien Species (Enforcement and Permitting) Order 2019 allows for the enforcement of the EU Invasive Alien Species Regulation 1143/2014 on the prevention and management of invasive alien plant and animal species in England and Wales, including the relevant licenses, permits and rules for keeping invasive alien species. Species on this list are no longer listed on Schedule 9 of the Wildlife & Countryside Act 1981 (as amended).

Appendix B

Weather Conditions

B1 Weather Conditions

Table 6: Weather conditions during surveys

Date	Survey	Temp. (°C)	Wind Speed (Beaufort Scale) and Direction	Cloud Cover (%)	Conditions
06/08/2020	Extended Phase 1 Habitat Survey and Water Vole Visit 1	14	1, S	100	Light drizzle
15/09/2020	Water Vole Visit 2	19	1, W	10	Sunny

Appendix C

Target Notes

C1 Target Notes

Table 7: Target notes

Ref.	Target Note
TN1	Potential otter pathway down to waterbody 2.
TN2	Old otter spraints on rock by waterbody 2.
TN3	Cockle shells at waterbody 1 – potential otter feeding remains.
TN4	Swan droppings.
TN5	Potential badger dung. Large stand of Japanese knotweed.
TN6	Fox hole in bank of waterbody 1.
TN7	Adult common lizard basking on coltsfoot leaf.
TN8	Ant hills on mound.
TN9	Ant hill.
TN10	5m x 2m stand of Japanese knotweed.
TN11	Japanese knotweed stand on edge of woodland.
TN12	One stand of Japanese knotweed.
TN13	4m x 2m stand of Japanese knotweed on edge of waterbody 2.
TN14	5m x 2m stand of Japanese knotweed which looks as though it has been sprayed.
TN15	Montbretia.
TN16	Montbretia.
TN17	Montbretia all along edge of waterbody 5.
TN18	Two bushes of Japanese rose.