

Parc Hadau Ecological Assessment



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1 Introduction

- 1.1 This document accompanies an outline planning application for the development of housing (the Development) at Parc Hadau, Waunsterw (the Site).
- 1.2 The application is to be submitted to Neath Port Talbot Council (NPT).

Background to Commission and Aims of this Report

- 1.3 BSG Ecology was commissioned by Yr Hadau Ltd (on behalf of Sero Homes Ltd) to provide ecological advice with respect to proposed residential development at the Site.
- 1.4 An initial walk-over survey was completed by Owain Gabb (MIEEM, CEnv), a Partner at BSG Ecology, on 28 September 2018. The purpose of the visit was to gain an early appreciation of the Site and an indication of the scope of ecological study required to support a planning application. Following this visit, consideration of the implications of planning policy in respect of ecology and biodiversity for development at the Site was undertaken.
- 1.5 This report aims to set out the methods, results and any study limitations. It also aims to provide an assessment of the likely ecological effects of the proposed Development, set out measures to offset those effects, and set out enhancement measures.

Site Description

- 1.6 The Site is on land north-east of Waunsterw near Pontardawe, Swansea, centred on National Grid Reference SN 7176 0538 and is approximately 1.45 ha in extent. The Site boundary is shown on Figure 1.
- 1.7 The Site is on damp, slightly sloping ground and supports a mosaic of habitats. An open area of marshy grassland with encroaching scrub occupies the centre and this is bordered by blocks of willow scrub to the west and south, the scrub grading into broadleaved woodland (ancient woodland) to the east, and bracken and an outgrown hedgerow to the north. The Site is bordered by the residential development of Waunsterw to the south and west, an area of ancient woodland to the east and open fields to the north.

Description of Project

1.8 The proposed development is for the construction of 35 zero carbon homes within the developable area, which are intended for private rental. These will be set inside a one-way private access with pedestrian priority. A communal building will be located at the south-eastern side of the access route. An access route will run around the development, and the green corridor in the middle of the Site will be a communal open space. Private gardens will be located between the properties and the public open space.



2 Assessment of Relevant Planning Policy

2.1 Applicable policies and guidance from local (Neath Port Talbot) and national (Welsh) planning documents are set out below.

Neath Port Talbot Local Development Plan (NPT LDP) 2011-2026

- 2.2 The site is allocated for housing in the NPT LDP (site reference H1/27 Waun Sterw / Waun Penlan, Rhydyfro).
- 2.3 The NPT LDP states with regard to the biodiversity interest of the site:

"The southern portion of the site meets the criteria to be designated a Site of Interest for Nature Conservation (SINC), on-site mitigation or off-site compensation will be required; areas of Ancient Woodland (with appropriate buffer) to the site periphery will need to be excluded from developable area."

2.4 The southern portion of the allocation area is the site that Yr Hadau Ltd is looking to take forward.

NPT Supplementary Planning Guidance (SPG) on Biodiversity and Geodiversity

2.5 The SPG was published in May 2018. Policy EN6 states:

"Important Biodiversity and Geodiversity Sites Development proposals that would affect Regionally Important Geodiversity Sites (RIGS), Local Nature Reserves (LNRs), Sites of Importance for Nature Conservation (SINCs), sites meeting SINC criteria or sites supporting Local Biodiversity Action Plan (LBAP) or S42(6) habitats or species will only be permitted where:

- 1. They conserve and where possible enhance the natural heritage importance of the site;
- 2. The development could not reasonably be located elsewhere, and the benefits of the development outweighs the natural heritage importance of the site.

Mitigation and/or compensation measures will need to be agreed where adverse effects are unavoidable."

2.6 Section 5.1.25 of the SPG states:

"... development will not be permitted to proceed, with or without compensation, where ... overriding benefit is not justified. This, in particular, will be applied to schemes where SINCs or LBAP/S7 habitats / species are identified on a development site."

2.7 It is noted in the appendix to the SPG that NPT are currently actively seeking to develop a mechanism to fund biodiversity compensation¹ and have contracted a consultancy company to assist them in this. See Appendix D of the Biodiversity and Geodiversity SPG, May 2018:

Ancient Woodland Guidance

- 2.8 Woodland on the eastern boundary of the site features on Natural Resources Wales's Ancient Woodland Inventory (Coed Cefnllan-isaf).
- 2.9 The Welsh Government's Planning Policy Wales (Edition 9), published in February 2018, states:

"Ancient and semi-natural woodlands are irreplaceable habitats of high biodiversity value which should be protected from development that would result in significant damage."

¹ The Biodiversity and Geodiversity SPG indicates that compensation should focus on the creation or management of similar habitats to those lost.



2.10 It also notes:

"In the case of a site recorded on the inventory of ancient woodland produced by the former Countryside Council for Wales, authorities should consult with Natural Resources Wales before authorising potentially damaging operations."

- 2.11 This national policy is reflected in the commitment in the LDP to exclude the ancient woodland from the development footprint.
- 2.12 For reference, Natural England Standing Advice (for England) recommends a minimum 15 m stand-off between development and ancient woodland. Although not directly applicable to Wales, in the absence of detailed guidance on ancient woodland in Planning Policy Wales or TAN 5, this distance has been adopted as a minimum by some Welsh local planning authorities (for instance, Cardiff) in Supplementary Planning Guidance.

Habitats of Principal Importance

- 2.13 The site contains several habitats: 'Purple Moor Grass Pastures,' 'Wet Woodland' and 'Lowland Mixed Deciduous Woodland' which are on the list of habitats of principal importance in Wales (under Section 7 of the Environment (Wales) Act, 2016).
- 2.14 General principles, set out in the NPT SPG on Biodiversity and Geodiversity, include a commitment to "*Protect designated sites, protected species, priority / S7 habitats and species.*" Further reference is made to Section 7 habitats in 5.1.25 of the SPG.

Environment (Wales) Act 2016

- 2.15 Section 6 of the Act places a duty on public authorities to seek to maintain and enhance biodiversity so far as it is consistent with the proper exercise of their functions. In so doing, public authorities (including local planning authorities) must also seek to 'promote the resilience of ecosystems'.
- 2.16 Public authorities are required to take account of the resilience of ecosystems, in particular the following aspects—
 - (a) diversity between and within ecosystems;
 - (b) the connections between and within ecosystems;
 - (c) the scale of ecosystems;
 - (d) the condition of ecosystems (including their structure and functioning);
 - (e) the adaptability of ecosystems.
- 2.17 In doing so, the public authority should have regard to the presence of Section 7 habitats and species.

Planning Policy Wales 10

- 2.18 PPW 10 seeks to sustain and create places in which...
 - the role which landscapes, the historic environment, habitats and biodiversity, the characteristics of coastal, rural or urban environments play in contributing to Distinctive and Natural places are identified, understood, valued, protected and enhanced;
 - further fragmentation of habitats is avoided, wherever possible, and green networks, corridors and connecting habitat within developed areas is protected, and enhanced;
 - sites designated for their landscape or nature conservation importance are fully considered and their special characteristics and features protected and enhanced, whilst the network of sites should be recognised as being at the heart of improving the resilience of ecosystems;
 [.....]



2.19 Paragraph 6.4.4 states that

"It is important that biodiversity and resilience considerations are taken into account at an early stage in both development plan preparation and when proposing or considering development proposals. [.....] All reasonable steps must be taken to maintain and enhance biodiversity and promote the resilience of ecosystems and these should be balanced with the wider economic and social needs of business and local communities. Where adverse effects on the environment cannot be avoided or mitigated, it will be necessary to refuse planning permission."

2.20 Paragraph 6.4.5 states that

"Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity. In doing so planning authorities must also take account of and promote the resilience of ecosystems......"

TAN 5 Nature Conservation and Planning

- 2.21 Technical Advice Note (TAN) 5 supplements Planning Policy Wales and provides advice about how the land use planning system in Wales 'should contribute to protecting and enhancing biodiversity and geological conservation.'
- 2.22 The TAN provides guidance to local planning authorities on: 'the key principles of positive planning for nature conservation; nature conservation and Local Development Plans; nature conservation in development management procedures; development affecting protected internationally and nationally designated sites and habitats; and, development affecting protected and priority habitats and species.'
- 2.23 In section 2.4 when deciding planning applications that may affect nature conservation, 'local authorities should:
 - contribute to the protection and improvement of the environment...seeking to avoid irreversible harmful effects on the natural environment;
 - ensure that appropriate weight is attached to designated sites of international, national and local importance;
 - protect wildlife and natural features in the wider environment, with appropriate weight attached to priority habitats and species in Biodiversity Action Plans;
 - ensure that all material considerations are taken into account and decisions are informed by adequate information about the potential effects of a development on nature conservation;
 - ensure that the range and population of protected species is sustained;
 - adopt a stepwise approach to avoid harm to nature conservation, minimise unavoidable harm by mitigation measures, offset residual harm by compensation measures and look for new opportunities to enhance nature conservation; where there may be significant harmful effects local planning authorities will need to be satisfied that any reasonable alternative sites that would result in less or no harm have been fully considered.'

3 Summary of Methods

3.1 A summary of methods for each of the desk study, consultation and surveys undertaken are given below. Full survey methods, including a consideration of any limitations to the survey, are presented in Appendices 1-5.

Desk Study

- 3.2 A desk study was undertaken to gather existing ecological data in relation to the Site and the surrounding area, to provide ecological context.
- 3.3 The presence of statutory designated sites for nature conservation interest within 2 km of the Site boundary was established using the UK Government's MAGIC² website. The Welsh geo-portal resource Lle³ was consulted for definitive mapping of the ancient woodland boundary.
- 3.4 A data request was sent to the South East Wales Biodiversity Records Centre (SEWBReC) for non-statutory designated sites and protected or otherwise notable species within 2 km of the Site boundary.
- 3.5 Aerial photographs and mapping⁴ were also reviewed to assess the landscape context of the Site and identify any ponds within 500 m.

Consultation

- 3.6 The following consultations have taken place:
 - On site on 13 November 2018 with the NPT ecologist and planning case officer, as well as the client. At this meeting the scope of survey was discussed and a non-standard approach to the bat surveys was agreed with the LPA ecologist. This involved the omission of transects from the method (given the relatively small size and the difficult terrain of the Site), and an increase in the number of static detectors deployed (to three); as well as an increase in the frequency of deployment (to monthly during for the period April September inclusive).
 - Pre-application meeting on 17 May 2019 at NPT offices.
 - On-site meeting on 14 June with the NPT ecologist. At this meeting it was agreed with the NPT ecologist that targeted survey for invertebrates (including marsh fritillary) would be scoped out following the extended Phase 1 survey. This was on the basis that the larval food plant of marsh fritillary was very scarce on the Site, and that habitats with potential to support a similar range of invertebrates are to be created and managed as part of the development. In particular, open water, marshy grassland, and managed scrub will form part of the design of the development.
 - Telecom on 26 September 2019 between the NPT Ecologist, Yr Hadau, and BSG Ecology to discuss approaches to reptile mitigation and options for habitat compensation.

Extended Phase 1 Habitat Survey

3.7 An extended Phase 1 habitat survey of the Site was carried out on 21 May 2019. The survey was undertaken with reference to industry standard guidelines for Phase 1 Habitat survey (JNCC, 2010). The survey was 'extended' to include an assessment of the Site's potential to support protected or otherwise notable species (including badger *Meles meles*). Where vegetation was judged by the surveyor to have potential to meet the criteria for a Habitat of Principal Importance (HPI) or SINC habitat (see BRIG, 2011) more detailed characterisation was undertaken.

² Multi-Agency Geographic Information for the Countryside <u>https://magic.defra.gov.uk/magicmap.aspx</u> [Accessed March 2019]

³ Lle <u>http://lle.gov.wales/home?lang=en</u> [Accessed March 2019]

⁴ Bing maps <u>https://www.bing.com/maps;</u> OS maps <u>https://osmaps.ordnancesurvey.co.uk/</u> [Both accessed March 2019]



Bat Survey

- 3.8 Three static bat detectors were deployed on Site, for five nights each per month during the period April September inclusive. The detectors were deployed in the same location for each monitoring period, the locations being selected to sample those habitats where foraging and commuting bats were most likely. The location of detectors is shown on Figure 2. The bat calls recorded were analysed using the Analook software to allow identification of the bat species present, and to determine their relative levels of activity.
- 3.9 In addition to the data analysis methods set out above, a review of all pipistrelle *Pipistrellus* species, *Myotis* spp., long-eared bat *Plecotus* species and noctule *Nyctalus noctula* passes for calls characteristic of feeding behaviour was conducted. This was carried out for the May, July and September deployments.
- 3.10 While on Site conducting other surveys, ground-based checks were made of trees that are likely to be felled. The purpose of these checks was to assess the overall suitability of each tree for roosting bats.

Breeding Bird Characterisation

3.11 Three monthly (April – June) breeding bird surveys were conducted. The surveys involved walking a transect route that approached to within 50 m of all parts of the Site (and included a section of the adjacent woodland). The route was consistent between surveys, though the start point and direction of travel were varied between visits. All birds detected were identified and mapped appropriately, with information regarding their breeding status recorded where relevant.

Dormouse Survey

3.12 The hazel dormouse *Muscardinus avellanarius* surveys were undertaken in accordance with best practice survey guidance (Bright *et al*, 2006; and the Natural England Advice Note "Hazel or common dormice: surveys and mitigation for development projects"⁵). Sixty nest tubes were deployed during April and checked monthly thereafter for indications of use by dormouse. The September survey was supplemented by a nut search. Three areas of ground measuring 10 m by 10 m and containing fruiting hazel *Coryllus avellana*, were thoroughly searched for characteristically gnawed hazelnuts, for 20 minutes each. Dormouse tube / box locations and nut search locations are shown on Figure 4.

Badger Survey

3.13 Checks for signs of badger were conducted during each survey visit in respect of other species. In addition, a targeted search for signs of badger was undertaken as part of the extended Phase 1 habitat survey.

Reptile Survey

3.14 The presence / likely absence of reptiles at the Site was established through the use of artificial refugia in combination with a visual search of the Site. The surveys were undertaken in accordance with good practice guidelines, including those set out in the Herpetofauna Worker's Manual (Gent et al., 2003) and published guidelines for reptile survey (Froglife, 1999). Forty-two refugia (a higher than standard sampling effort for a Site of this size) were deployed 13 days before the first survey. Nine survey visits were conducted during the period June-August. During each survey visit, surveyors walked a fixed transect route through the Site between refugia, carrying out visual searches, to ensure that all areas within the Site were fully considered. The location of refugia is shown on Figure 5.

⁵ Available at <u>https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects</u>. There is no Wales-specific guidance available, and the Natural England guidance is generally followed in Wales.



4 Results and Evaluation

4.1 Summary results are given. Full results are presented in Appendices 1-5.

Protected Sites

Summary Results and Evaluation

- 4.2 Two statutory designated sites of nature conservation interest lie within 2 km of the Site. The Frondeg Site of Special Scientific Interest (SSSI) is approximately 250 m north of the Site boundary, and the Cefn Gwrhyd, Rhydyfro SSSI is approximately 980 m to the north-east. Both are designated for their habitat and botanical interest. All SSSIs are considered to be of conservation importance at the National level.
- 4.3 The Site itself is a non-statutory Site of Importance for Nature Conservation (SINC ref: NPTSINC030), selected for its purple moor grass and rush pasture and wet woodland habitats. In addition, all watercourses and ancient woodland within NPT are designated as SINCs. This includes the two watercourses bordering the northern and eastern boundaries of the Site (ref NPTSINC015) and two small areas of Ancient Semi-Natural Woodland (ASNW) in the north-east and south-east corners. These are contiguous with Coed Cefnllan-isaf, a large block of ASNW extending to the north, south and east (ref: NPTSINC015). A further nine SINCs are located within 2 km of the Site.
- 4.4 SINCs are considered to be of conservation importance at the level of the county borough.

Habitats

Summary Results and Evaluation

- 4.5 Habitats are shown in Figure 1. Photographs of the Site are in Appendix 3. Target Notes with accompanying photographs are in Appendix 8.
- 4.6 Two small areas of semi-natural broadleaved woodland fall within the Site boundary (in the northeastern and south-eastern corners), and have a combined area of approximately 0.17 ha. These are contiguous with the large block of ASNW immediately to the east and are included within the designation.
- 4.7 The broadleaved ancient woodland within the Site is limited in extent but is an irreplaceable habitat and is a component of the Waunsterw SINC. It is assessed as important at the county borough level.
- 4.8 A block of tall willow scrub⁶ (wet woodland) occurs to the west and south of the Site, occupying approximately 0.74 ha (approximately half of the Site). The dominant canopy species here is grey willow *Salix cinerea* with occasional downy birch *Betula pubescens*.
- 4.9 The wet woodland is a component of the SINC but it is a common habitat of importance at the local level.
- 4.10 Two small streams run along the northern and eastern boundaries of the Site in association with the mature hedgerow and woodland respectively. Both are narrow and heavily shaded with no aquatic or marginal vegetation and at the time of survey held very little water with over half the length of each completely dry. Two ditches are located toward the west and south of the Site, both were dry at the time of survey but their flora suggest that they are likely to be frequently inundated.

⁶ Stands of *Salix cinerea* are categorised as scrub even where >5m tall (JNCC, 2010).



- 4.11 The streams are designated SINCs and as a matter of policy should be regarded as being of importance at the level of the county borough. However, their current state should be noted.
- 4.12 Marshy grassland dominated by purple moor-grass Molinia caerulea occupies the centre of the Site, and had an area of approximately 0.35 ha at the time of survey. The rank tussocks (approx. 50 cm high) with accumulated litter and encroachment of bracken and downy birch/willow scrub from the boundaries indicate a lack of recent management across the majority of the Site. Exceptions to this are areas of vehicle disturbance associated with recent ground investigation works - see Target Note 8 (TN8) on Figure 1 - which consisted of bare ground and small areas of standing water, and had a combined area of approximately 0.06 ha at the time of survey. The marshy grassland includes two priority habitats. The M25 corresponds to the JNCC HPI definition of 'purple moor-grass and rush pasture' (M25) described as species-rich types of fen meadow and rush pasture with abundant purple moor-grass and/or sharp-flowered rush. The M6 corresponds to the HPI definition of 'lowland fens' which includes poor-fens characterised by short vegetation with a high proportion of bog mosses (BRIG, 2011). The habitat also meets the Wales SINC criteria for marshy grassland (M25) as a species-rich example of 'purple moor-grass pasture'⁷ and 'lowland fen' which includes all examples of undesignated fen habitat (including M6), providing they are not grossly modified by agricultural improvement.
- 4.13 The marshy grassland habitat is unmanaged but retains species typical of the habitat and although it is limited in extent it is a component of the Waunsterw SINC and is assessed as important at the county borough level.
- 4.14 Other habitats are assessed as important at the level of the Site. Bracken occupies the drier ground to the north and east of the site where it occurs in association with scattered young oak *Quercus* sp. and bramble *Rubus fruticosus* scrub, and has an area of approximately 0.14 ha. A small area of amenity grassland adjacent to existing housing in the southern corner of the Site, has an area of approximately 0.007 ha.
- 4.15 Invasive species including variegated yellow archangel *Lamiastrum galeobdolon subsp. Argentatum* and montbretia *Crocosmia × crocosmiiflora* are present in several locations around the Site boundaries adjacent to the existing residential gardens.

Bats

Summary Results and Evaluation

- 4.16 The data search returned 132 records of bats of at least seven different species, none of which refer directly to the Site. The closest records to the Site relate to evidence of roosting *Pipistrellus* spp. bats in buildings to the west of the Site (in existing buildings in Waunsterw). The closest confirmed roost record concerns a record of common pipistrelles emerging from a house 200 m south-west of the Site.
- 4.17 Although several trees have some splits and damage, no trees that appear to have the potential to be felled have been identified as having more that low potential for roosting bats.

Pipistrelle species

- 4.18 Common pipistrelle was the most frequently recorded species during all months and at each detector location, with a mean total activity of 13.6 bat passes per hour (P/h see footnote⁸. This is the total number of passes divided by total number of recording hours for all three detectors. Overall activity for this species was highest at detector location D3 (19.7 P/h), and peaked during July (28.1 P/h).
- 4.19 Soprano pipistrelle was the second most frequently recorded species during the survey period. Overall activity for this species was highest at D1 (3.9 P/h), and peaked during July (4.5 P/h).

⁷ Defined as supporting at least 12 indicator species from a published list, 17 species recorded on Site.

⁸ A definition of a bat "pass" is given in the bat report in Appendix 1 (paragraph 2.6)



- 4.20 The pipistrelle species together accounted for 91.7% of all bat activity recorded. Over the survey period, 468 pipistrelle species passes (3% of the total 13,604 pipistrelle passes) were recorded in the half hour prior to sunset and activity of both species peaked during the period 20-40 minutes after sunset. The early passes suggest that some pipistrelle species bats roost locally to the Site (as suggested by the data search).
- 4.21 From seasonal samples, 4.6% of pipistrelle species passes included a feeding buzz, evidencing foraging at the Site. From the samples, pipistrelle species foraging activity was highest at the western scrub edge, and during the summer.

Myotis species

- 4.22 *Myotis* spp. activity accounted for 3.1% of all bat activity recorded. Activity for this species group was highest at the ancient woodland edge (D1). *Myotis* spp. activity showed a peak between 20 and 40 minutes after sunset and the presence of a roost in the vicinity cannot be discounted.
- 4.23 From seasonal samples, 5.0% of *Myotis* spp. passes included a feeding buzz, evidencing foraging at the Site. *Myotis* spp. activity was highest at the ancient woodland edge, and during the summer.

Long-eared bat species

- 4.24 Long-eared bat species activity accounted for 0.4% of all bat activity recorded. Activity for this species grouping was highest during the middle of the night, with no activity recorded during the first 40 minutes following sunset. This lack of long-eared bat species activity around sunset suggests that this species grouping does not roost on or locally to the Site. It should be noted that detection of long-eared bats is limited by the relative quietness of their calls and so it is possible that some bats have been missed. Nevertheless the survey method provides a relative indication of activity and the detection rate would be expected to be more or less consistent.
- 4.25 From seasonal samples, 14.3% of long-eared bat species passes included a feeding buzz, but it should be noted that only 21 passes, which is a small sample size, were recorded. No clear distribution could be derived from the sample, given its small size.

Greater and lesser horseshoe bats

4.26 Four lesser horseshoe bat passes (<0.1% of all bat activity) and a single greater horseshoe bat pass (<0.1% of all bat activity) were recorded, suggesting that these species use the Site only very occasionally. The four lesser horseshoe passes were later than 100 minutes after sunset, and the greater horseshoe pass was recorded during the 'middle of the night' period so there is no evidence to suggest that lesser horseshoe bats roost on or locally to the Site.

<u>Noctule</u>

- 4.27 Noctule bat activity accounted for 0.4% of all bat activity recorded. Activity for this species peaked in the first 20 minutes following sunset, although there were only four passes prior to sunset, all of which were within one minute of sunset. Noctule is an earlier emerging species (Collins, 2016), known to commute rapidly following emergence and the presence of passes shortly prior to sunset and the activity peak in the first 20 minutes following sunset do not provide evidence that the species roosts on or locally to the Site.
- 4.28 No feeding buzzes were identified in the seasonal samples of noctule calls, but it should be noted that noctule bats tend to fly higher than most other species and their feeding calls can be more difficult to detect.

Summary Evaluation

4.29 The desk study returned bat records from the locality that are dominated by pipistrelle calls, and there are single desk study records of two species that were not recorded during the 2019 field survey at Parc Hadau. Horseshoe bats were recorded on the Site but no records were returned from the desk study, including roosts. The survey numbers of horseshoe bats were very low, and there is a potentially greater range of *Myotis* species than has been recorded locally.



- 4.30 Feeding calls for most species have been recorded across the whole Site. While it is not possible to infer from the analysis how important the Site is for feeding, or whether one part of the Site is more consistently important for feeding than any other part of the Site, it seems most likely (given the range of habitats and the interface between woodland/scrub and more open grassland) that most of the Site will be used for feeding both by commuting bats and by foraging bats when flying insect numbers are high. While habitat is an important factor in determining how bats use a site for feeding, there are many other factors influencing this, such as prevailing and local weather and insect emergence times.
- 4.31 The diversity of bat species at Waunsterw is slightly different to that of the locality as suggested by the results of the desk study (two local species were not recorded on the Site and the extra species that were recorded on the Site were not frequently recorded). However the domination of activity by pipistrelle bat species is characteristic of the locality. The bat fauna is assessed as being of importance at the level of the Site.

Breeding Birds

Summary Results and Evaluation

- 4.32 The data search returned 348 records concerning thirty bird species, none of which refer directly to the Site. Thirteen records (involving five species) refer to the adjacent woodland. Nine of the species returned by the search within 2 km of the Site are on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).
- 4.33 During the Site surveys, twelve bird species were recorded as holding territories and / or breeding on or close to the Site. All birds on Site were recorded within the willow scrub habitat and boundary scrub / tree lines, and no species of open field / grassland habitats were recorded. All breeding species recorded are relatively widespread and / or common in Wales, though two (garden warbler *Sylvia borin* and long-tailed tit *Aegithalos caudatus*) are on the Welsh Birds of Conservation Concern Amber List, and one (willow warbler *Phylloscopus trochilus*) on the Welsh Birds of Conservation Conservation Concern Red List, indicating that they are in decline.
- 4.34 Within the adjacent ancient woodland, thirteen species were recorded, six of which were not recorded within the Site. Of these, two (song thrush *Turdus turdus* and coal tit *Periparus ater*) are on the Welsh Birds of Conservation Concern Amber List, and one (wood warbler *Phylloscopus sibilatrix*) on the Welsh Birds of Conservation Concern Red List.
- 4.35 The scrub / woodland habitat that supports the breeding interest at the Site is well represented in the locality and it is likely that the range of birds recorded is typical of the avifauna in the locality. The breeding bird population is assessed as important at the level of the Site.

Dormouse

Summary Results and Evaluation

- 4.36 The data search returned two records of hazel dormouse, both from the same location approximately 1 km east of the Site, one from 2002 and the other from 2005. Aerial imagery suggests that habitat connectivity between this location and the Site is good.
- 4.37 No dormice or evidence of their presence were found during the surveys, and the species is scoped out of further consideration.

Badger

Summary Results and Evaluation

4.38 There are five records of badger within 2 km of the Site associated with farmland and woodland.



4.39 The extended Phase 1 survey recorded no setts or field signs indicating badger presence on the Site. During the course of all other survey visits, no signs of badger were recorded.

Reptiles

Summary Results and Evaluation

- 4.40 The data search returned 11 records of reptiles, of three species; common lizard *Zootoca vivipara*, slow worm *Anguis fragilis* and grass snake *Natrix helvetica*. These included three common lizard records for the Site, involving two adults and a juvenile, on 01 August 2018.
- 4.41 During the refugia surveys of the Site, two common reptile species were recorded: common lizard and slow worm. Both species were recorded during all surveys, with peak counts of three adult common lizard and three adult slow worm. These results suggest that the Site supports low populations of both species (Froglife, 1999).
- 4.42 Of the total 52 reptile survey records from 2019, 46 occurred within the marshy grassland, with the remaining 6 (involving both common lizard and slow worm) recorded in the adjacent bracken. No reptiles were recorded within the tall willow scrub or semi-natural woodland. Figure 5 shows the distribution of records across the Site.
- 4.43 The presence of common lizards and slow worms reflects the results of the desk study, and the population of both species is likely to be typical of the local urban-fringe landscape, with abundant gardens, hedgerow headlands, rough grassland and woodland fringe. The population of reptiles is assessed as important at the level of the Site.

Invertebrates

- 4.44 The data search returned 17 records of the marsh fritillary *Euphydryas aurinia* butterfly within 2 km of the Site. The majority are associated with the area around Rhyd-y-fro, 300-400 m north of the Site and date from the 1990s. The only other invertebrate records returned within the data search are for small pearl-bordered fritillary *Boloria selene* butterfly and grayling *Hipparchia semele* butterfly, and none of these records refer to the Site.
- 4.45 Whilst the food plant of marsh fritillary, devil's-bit scabious *Succisa pratensis*, is present within the marshy grassland it occurs at very low frequency. The marshy grassland is considered unlikely to support the species without restoration management.
- 4.46 It is not possible to evaluate the Site in respect of invertebrates. However, there will be a range of habitats within the final developed scheme that will be capable of supporting a similar diversity of invertebrates. These include open water, marshy grassland, wetland marginal vegetation, grassland, scrub and woodland edges. In addition, management of the eastern buffer vegetation will take place and this will maintain structural diversity and create open glades on rough grassland. For this reason, although the assemblage of the Site may change, a significant effect on the local invertebrate population is not expected to arise. Invertebrates are scoped out of further consideration.

5 Impacts, Mitigation and other Measures

Protected Sites

Impacts

- 5.1 No effects on Cefn Gwrhyd, Rhydyfro SSSI (approximately 980 m to the north-east) are anticipated by virtue of the distance between the Site and the designated sites. Frondeg SSSI is approximately 250 m north of the Site. A footpath runs north in the woodland to the SSSI, and this forms part of the St Illtyd's Walk (a recognised long-distance route). There is an indirect connection between the two sites (through the ancient woodland) and some extra use by the public of Frondeg SSSI may occur. However, the development of a relatively small number of houses at Parc Hadau is considered unlikely to add significantly to trampling or other disturbance impacts on Frondeg SSSI. SSSIs are not considered further.
- 5.2 Impacts on non-statutory designated sites arise in respect of:
 - Coed-Cefnllan-isaf SINC (the ASNW)
 - Waunsterw SINC which occupies the whole of the Site proposed for development
 - The two watercourses.

Coed-Cefnllan-isaf ASNW / SINC

Coed-Cefnllan-isaf ASNW / SINC will be retained as part of the development, and a vegetated 5.3 buffer of 10-15 m will be retained and managed between the eastern edge of the Development and the woodland. As a result, no direct habitat loss impacts will arise and the risk of non-native garden plant species spreading into the ancient woodland should not be significantly increased by the proposals. Light-spill effects into the woodland are unlikely given the distance from the Development and the presence of the vegetated buffer. There is potential for trampling and general disturbance effects arising from movement of an increased number of local residents, and while these will be difficult to avoid completely, regular access significantly beyond existing levels (from local residents and users of the long-distance footpath) is unlikely if the buffer is managed and planted appropriately to discourage access directly from the Development. In addition the active management of the Site and the planned level of engagement with residents over the environmental sensitivities of the local surrounds, means that it will be possible to discourage excessive access into the woodland. The net effect on the woodland is difficult to judge with certainty, but it is unlikely to be significant at the county borough, or significant in a local (Pontardawe) context. The effect is assessed as likely to be significant at the level of the Site and its immediate surrounds.

Waunsterw SINC

- 5.4 The proposed development will give rise to the loss of approximately 0.35 ha of marshy grassland, and approximately 0.74 ha of willow scrub (wet woodland), both of which are priority habitats, referred to under Section 7 of the Environment (Wales) Act 2016. This amounts to approximately 1.1 ha of Section 7 habitat that will be lost.
- 5.5 The ancient woodland habitat within the SINC, as well as a strip of scrub approximately 10-15 m wide between the eastern extent of Development and the adjacent ASNW, and the two watercourses, will be retained. In addition the drainage design includes creation of a number of retention ponds with marshy grassland surrounds and other wetland vegetation, open water, grassland and native scrub planting around and within the developed land.
- 5.6 In absence of further mitigation, the effect on Waunsterw SINC is assessed as adverse and significant at the level of the county borough.



The two watercourses (SINC ref NPTSINC015)

5.7 These border the northern and eastern boundaries of the Site and will remain largely unaffected. Some disturbance effects on the northern stream could arise during construction, although normal good practice site management (which will be governed through a Construction Environmental Management Plan or CEMP) should provide safeguards against significant effects. Disturbance during the occupied phase of development by residents could also arise. In the absence of mitigation, effects on the streams are assessed as adverse and significant at the level of the Site.

Mitigation and Other Measures

- 5.8 Policy EN6 of the NPT Local Development Plan (2011-2026) requires that, if permitted, development of SINCs should conserve and where possible enhance the biodiversity value of the site. Given the scale of the Site and development, opportunities for retention or recreation of priority marshy grassland habitat within the development layout are limited. The ASNW buffer will be subject to enhancement with the aim of creating a diversity of habitat structures within the buffer, as well as planting to minimise public access to the buffer and ancient woodland. Note: there is provision within the design for a future footpath link. Any future link is intended to be unlit, and will be designed, sited and developed carefully following consultation with all relevant stakeholders to ensure that it is provided in such a way as to ensure its use does not compromise the biodiversity interest of the buffer zone or the ancient woodland. The long-term management and maintenance requirements of any link will be agreed through this process and linked to the overall biodiversity management of the Site.
- 5.9 Yr Hadau has made a long-term commitment to positive biodiversity management of the retained part of the Site. However, the development will give rise to the loss of more Section 7 habitat (marshy grassland and willow scrub) than can be physically or practically accommodated through their replacement within the Development Site boundary. For this reason, two options are being pursued to ensure that the proposals give rise to an appropriate amount of biodiversity compensation to account for the lost habitat.
- 5.10 The two options proposed to offset habitat loss include:
 - a. Management of habitat at a nearby site at Godre'r Graig, to encourage marshy grassland and other important habitats such as scrub and neutral grassland, with the implementation of initial works and the establishment of a fund to help secure future management, along with the preparation of a management plan; or
 - b. A contribution to NPT to support biodiversity enhancement work elsewhere in the county borough.
- 5.11 Option (a) is the preferred option but it is dependent on Yr Hadau gaining agreement with NPT as landowners of the nearby site. If the first option does not gain agreement from the necessary parties, then the second option would be put in place.
- 5.12 Appendix 9 sets out draft principles of off-site management under option (a), primarily for management to favour marshy grassland, the improvement of neutral grassland and diversification of rush pasture, scrub management. It is based on a set of broad objectives that are capable of being developed as a detailed management plan for new and retained habitats and can be implemented to compensate the loss of SINC habitat.
- 5.13 Once a management plan has been developed in detail it can be costed and this can be used to identify the resources required to provide for the management of the Godre'r Graig site in the long-term.
- 5.14 If the Godre'r Graig site does not become available, a contribution would be offered to NPT to support biodiversity enhancement work elsewhere in the county borough in order to compensate for residual adverse ecological effects.



Habitats

Impacts, Mitigation and Other Measures

5.15 Impacts, mitigation and compensation in respect of habitats are dealt with under the sections above on SINCs

Bats

Impacts

- 5.16 No trees that appear to have potential to be felled have been identified as having more than low roosting potential.
- 5.17 The primary use of the Site by bats is by pipistrelle species (91.7% of calls from all detectors combined). Their use of the Site is for commuting and feeding, which takes place across the Site, most likely in response to conditions such as weather, time of year, and the presence of insect emergence events.
- 5.18 The Site is used by a range of bats (primarily pipistrelle species) for commuting and feeding and all of the habitats on the Site are suitable for this by the assemblage of bats taken as a whole. The reduction in marshy grassland and willow scrub habitat (primarily) will result in a loss of habitat for invertebrates and a localised lowering of the food resource available to bats. This will be offset in part by the creation of green spaces within the development, the planting of individual gardens, and the planned wetland habitat creation associated with the drainage design.
- 5.19 Lighting within and immediately around the developed land will increase and this is likely to provide a deterrent effect in the case of more light-sensitive species, such as lesser and greater horseshoe bats and some *Myotis* species and will tend to push these species to the edges of the Site. However, as the eastern vegetated buffer land between the development and the ancient woodland is to be retained as a dark vegetated corridor, the local effect on more-sensitive species (which have been recorded in very low numbers) is likely to be significant at no greater than the level of the Site.
- 5.20 Pipistrelle bats, which make up the vast bulk of the Site's bat interest, are more adaptable to lighter conditions and are likely to exploit the invertebrate population that develops within and around development and continue to commute over much of the developed Site.
- 5.21 In the absence of any mitigation, the expected effect on the local bat population as a whole would be a lowering of the range of species using more brightly lit parts of the Site, significant at the level of the Site.

Mitigation and other measures

- 5.22 In order to minimise effects on bats, measures have been incorporated into the design to ensure continued connectivity across the local landscape for commuting and feeding bats. The primary measures are (a) retention of the dark corridor of vegetation in the eastern buffer strip; and (b) planting of a range of native species that are more likely to attract a range of invertebrates in the green spaces and wetland habitats within and around the new development. In addition, roosting opportunities will be incorporated at appropriate locations, through the installation of bat boxes for a wide range of bats.
- 5.23 The eastern vegetated buffer will be managed in the long-term to provide increased structural diversity including the creation of small open "glades", new planting, and woodland cover. Maintenance of well-structured, variably dense and open vegetation with a continuous strip along the development side will create an enhanced feeding resource and will act as a buffer to light-spill from the development.



- 5.24 In addition to the light-protected buffer, it is the intention to use low level (bollard) lighting throughout the developed area. In the central green corridor of the development, lighting will be designed to minimise illumination as far as is possible, consistent with security requirements, through measures such as timers and movement sensors to maximise the amount time spent unlit. The detail of these measures can be agreed in detail through an appropriately worded condition..
- 5.25 The pattern of use of the Site by bats is likely to be modified by the Development, but with the above measures in place, no significant residual effect on the local population of bats is considered likely to arise.

Breeding Birds

Impacts

- 5.26 The Site supports a number of widespread and / or common breeding species. Within the Site, these species use the willow scrub, semi-natural woodland and boundary tree-line habitats for breeding, and the removal of part of these habitats will lead to a reduction in the area of suitable breeding habitat for these species.
- 5.27 A development of around 35 houses that incorporates planting of a woodland / scrub buffer around its margin, as well as the creation of gardens and planted communal areas, will create nesting and foraging opportunities across the Site.
- 5.28 It is likely that the assemblage of birds using the Site will change but it is difficult to predict how the total number of breeding birds will change, and whether they will decline or increase. The magnitude of the impact on breeding birds is therefore difficult to assess accurately. However, it is unlikely to give rise to a significant adverse effect, given the abundance of woodland, scrub, hedges, gardens and other nesting habitats in the local area. Therefore no specific mitigation for breeding birds (beyond the design measures that are part of the landscape design of the proposed Development) is proposed.

Mitigation and other measures

- 5.29 Notwithstanding the above, the management of the retained buffer to the east of the development will aim to maximise its use as a breeding bird resource.
- 5.30 It will be necessary to time the removal of vegetation to avoid the bird breeding season unless a check beforehand confirms that no nesting activity is taking place in a particular location.

Badger

Impacts

5.31 Given that no setts or evidence of badger were found on the site an offence under the Protection of Badgers Act (1992) is unlikely and licencing is not required at this stage of the development.

Mitigation and Other Measures

5.32 No mitigation is required, but as badgers are a mobile species, and are known to be present in the surrounding land, a further check for evidence of badgers will take place prior to development to ensure that they are safeguarded in the long-term. Measures to protect badgers appropriately will be put in place if required.



Reptiles

Impacts

5.33 All the reptile records from the 2019 survey were from the marshy grassland in the middle of the Site, which will be lost. This loss of habitat will be entire, or close to entire, and this will give rise to an impact of significance at the level of the Site.

Mitigation and Other Measures

- 5.34 The reptile population will be re-located to the retained buffer which will be managed to ensure its suitability in the long-term for reptiles.
- 5.35 The buffer vegetation to the east of the development will be cut back in places to create open "glades" in close association with scrub of varying density. Some areas of the buffer are already partly open in nature, and these will be retained (but planted along their boundary with the development to dissuade public access). These glades will form suitable habitat for basking reptiles. Cut woody material, along with stony material of appropriate sizes, will be used to form a number of small hibernacula for reptiles within the eastern buffer zone. In addition, cut wood will be piled to create small deadwood piles.
- 5.36 During the active season, reptile re-location will take place, following standard methods. This will include the installation of appropriate reptile-proof fencing, deployment of reptile refugia across the marshy grassland, reptile trapping and re-location to the prepared buffer zone (over an agreed period until the numbers of reptiles being captured have been depleted to a negligible level), and destructive searching of the marshy grassland and willow scrub edges. The precise methods and sequence will depend on the timing and phasing of construction.
- 5.37 The buffer vegetation will be managed in the long-term to ensure the retention of a suitable range of habitats, from open and sunny to densely vegetated cover.
- 5.38 Once reptiles have been relocated appropriately, the working construction site will be subject to the provisions of a CEMP. This will include good practice measures to be put in place to avoid the risk of incidental killing / injuring individual animals (if any are present). This will include regular checks of reptile-proof fencing and repairs as necessary and minimisation of opportunities for reptiles to colonise loosely stored material in the event that they became located within the construction zone.
- 5.39 With these measures, the residual effects on reptiles are assessed as negligible in the long term.

Further Measures

- 5.40 Habitat piles and structures for hedgehogs, invertebrates and roosting bats will be incorporated into the development. Bat boxes will be installed in appropriate locations where they are unlit and where they can be maintained safely, and they will be selected to accommodate a wide range of bat species.
- 5.41 It is recommended that the detail of these measures is made the subject of an appropriately worded planning condition.



6 Policy and Legislation

- 6.1 This section addresses key biodiversity policy and legislation that will need to be considered in assessing the residual ecological effects of the proposed development.
- 6.2 <u>Effects on statutory designated sites</u>. No significant effects on statutory designated sites are predicted.
- 6.3 Effects on non-statutory designated sites. Waunsterw SINC will be partly developed and the effect of this has been assessed as significant at the level of the county borough. As well as being designated as a SINC, the Site is allocated for housing in the NPT LDP (H1/27 Waun Sterw / Waun Penlan, Rhydyfro). This requires on-site mitigation or off-site compensation and exclusion of the Ancient Woodland from development, with an appropriate buffer. The requirements of policy EN6 of the SPG on biodiversity and geodiversity similarly require mitigation / compensation.
- 6.4 It is concluded that these policy requirements will be met, and long-term provision for on-site mitigation and habitat enhancement through targeted management will take place. Compensatory measures and provision for long-term management off-site will be provided, either at the local Godre'r Graig site (this Site is approximately 3.5 ha) or else through an appropriate contribution to NPT to undertake such work elsewhere. This would also be in line with the requirements of PPW 10 and TAN 5.
- 6.5 <u>Effects on protected species</u>. It is concluded that no significant residual adverse effects on bats and reptiles are likely to arise. Precautionary measures are proposed to ensure the safeguarding of nesting birds and badgers (should they become present). Residual effects on protected and important species are in line with the requirements of TAN 5.
- 6.6 Effects on habitats and species and consideration of the Environment (Wales) Act. Woodland and scrub connectivity along the eastern side of the Site will be retained and managed in the long-term to ensure that it is structurally enhanced. Marshy grassland and willow scrub (wet woodland), both Section 7 habitats, will be lost at the Site. Proposals for the management of a larger Site nearby to encourage the development of marshy and neutral grassland are set out in Appendix 9. This includes draft objectives for long-term management to develop a larger extent of important habitats, with appropriate resource to manage them for biodiversity as a priority in the long-term. If it is not possible to implement the offsite proposals then an appropriate contribution to NPT to deliver off-site compensation elsewhere will be made.
- 6.7 Careful retention and management of scrub and woodland on the Parc Hadau site is also proposed; along with smaller areas of marshy grassland, open water and other marginal habitats; and retention of the reptile population on the Site.
- 6.8 The on-site proposals will maintain local habitat connectivity. Native planting will be used throughout the landscaping of the development, as well as creation of wetland and marshy grassland habitat, and scrub / woodland buffer habitat. These measures, and the provision for long-term management of these habitats for biodiversity, will provide local ecosystem diversity, connectivity, function and resilience. On-going management (on-site and off-site) will provide ecosystem adaptability and continued resilience, addressing the requirements of the Environment (Wales) Act, Sections 6/7.



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8 Appendix 1: Extended Phase 1 Report and Desk Study

Field Survey Methods

- 8.1 An extended Phase 1 habitat survey of the Site was carried out on 21 May 2019. The survey was undertaken with reference to industry standard guidelines for Phase 1 Habitat survey (JNCC, 2010). During the survey all habitats present on Site were identified and mapped, and the presence of any invasive species was noted. The survey was 'extended' to include an assessment of the Site's potential to support protected or otherwise notable species (including badger).
- 8.2 Where vegetation was judged by the surveyor to have potential to meet the criteria for a Habitat of Principal Importance (HPI) or SINC habitat more detailed characterisation was undertaken. The National Vegetation Classification (NVC) vegetation community identification keys in Rodwell *et al.* (1991 a&b) were used to identify plant communities in the field and lists of indicator species were recorded to allow an assessment against published HPI descriptions (BRIG, 2011) and regional SINC selection criteria⁹.

Desk Study Methods

- 8.3 A desk study was undertaken to gather existing ecological data in relation to the Site and the surrounding area, to provide ecological context.
- 8.4 The presence of statutory designated sites for nature conservation interest within 2 km of the Site boundary was established using the UK Government's MAGIC¹⁰ website. The Welsh geo-portal resource Lle¹¹ was consulted for definitive mapping of the ancient woodland boundary.
- 8.5 A data request was sent to the South East Wales Biodiversity Records Centre (SEWBReC) for non-statutory designated sites and protected or otherwise notable species within 2 km of the Site boundary.
- 8.6 Aerial photographs and mapping¹² were also reviewed to assess the landscape context of the Site and identify any ponds within 500 m.

Limitations to methods

8.7 The Phase 1 survey was conducted within the optimum period for botanical survey and all parts of the Site were accessed, and there are not considered to have been any constraints on this survey.

Results

Protected sites

Statutory sites

8.8 Two statutory designated sites of nature conservation interest lie within 2 km of the Site. The closest of these is Frondeg Site of Special Scientific Interest (SSSI) approximately 250 m north of the Site. This SSSI is notified for its habitats including neutral grasslands, fen meadows and wet grassland, which support several notable plant species including the nationally scarce soft-leaved sedge *Carex montana*.

⁹ Wales Biodiversity partnership 2008 guidelines and local amendments to the criteria as agreed by 'Neath Port Talbot Nature Partnership' Panel (NPT, 2018).

¹⁰ Multi-Agency Geographic Information for the Countryside https://magic.defra.gov.uk/magicmap.aspx [Accessed March 2019]

¹¹ Lle <u>http://lle.gov.wales/home?lang=en</u> [Accessed March 2019]

¹² Bing maps <u>https://www.bing.com/maps</u>; OS maps <u>https://osmaps.ordnancesurvey.co.uk/</u> [Both accessed March 2019]



8.9 Cefn Gwrhyd, Rhydyfro SSSI is approximately 980 m to the north-east. This SSSI is notified for wetland habitats including species-rich valley mire, quaking bog and soligenous mire.

Non-statutory sites

- 8.10 The Site itself is designated as a Site of Importance for Nature Conservation (SINC ref: NPTSINC030), selected for its purple moor grass and rush pasture and wet woodland habitats.
- 8.11 In addition, all watercourses and ancient woodland within NPT are designated as SINCs. This includes the two watercourses bordering the northern and eastern boundaries of the Site (ref NPTSINC015) and two small areas of Ancient Semi-Natural Woodland (ASNW) in the north-east and south-east corners. These are contiguous with Coed Cefnllan-isaf, a large block of ASNW extending to the north, south and east (ref: NPTSINC015).
- 8.12 A further nine SINCs are located within 2 km of the Site, seven in the Neath Port Talbot administrative area and two in Swansea. The closest of these is Cwm Du Glen & Glanrhyd Plantation 300 m to the south-west and is of importance for its broadleaved woodland including some ancient woodland. The SINC is separated from the Site by existing residential housing and direct impacts resulting from the proposed development are not anticipated. Similarly, on the remaining SINCs are very unlikely to be affected given that all are over 1 km from the Site.

Habitats

8.13 Habitats on Site are shown in Figure 1 with associated target notes in Appendix 8.

Woodland

- 8.1 Two small areas of semi-natural broadleaved woodland fall within the Site boundary. These are contiguous with the large block of ASNW immediately to the east and are included within the ASNW boundary. Whilst these areas do not contain any mature trees, a remnant woodland ground flora of frequent bluebells *Hyacinthoides non-scripta* and ferns is present including scaly male fern *Dryopteris affinis* ssp. *Affinis*, lady fern *Athyrium filix-femina*, hard fern *Blechnum spicant* and broad buckler fern *Dryopteris dilatata*.
- 8.2 In the north-western corner the woodland is relatively open and comprises scattered young oak *Quercus petraea* with occasional rowan *Sorbus aucuparia* establishing over bracken *Pteridium aquilinum* and bramble *Rubus fruticosus* agg. A few more mature oak trees are present along the the northern boundary and the raised stream bank to the east with occasional hazel *Corylus avellana*, holly *Ilex aquifolium* and bilberry *Vaccinium myrtillus,* marking a transition to the main woodland block.
- 8.3 Woodland in the south-eastern corner of the Site occurs on damper ground and is more established, although lacking mature trees. Here the canopy is mainly made up of grey willow *Salix cinerea* with occasional ash *Fraxinus excelsior*. The understorey is patchy with some areas of dense bramble and young rowan, oak, ash, holly, guelder rose *Viburnum opulus* and hazel scattered throughout becoming more diverse with proximity to the ASNW. The ground flora is dominated by low growing bramble but contains frequent bluebells, honeysuckle *Lonicera periclymenum* and ferns.
- 8.4 The main block of ASNW, east of the stream (off-Site), is more established than the sections within the Site boundary. The canopy is mainly mature and semi-mature sessile oak with some common oak *Quercus robur* and a dense understorey of hazel, holly and bramble with occasional honeysuckle, bilberry and a variety of ferns. Native bluebells are abundant throughout.
- 8.5 Both the main ASNW block and the younger woodland sections within the Site conform to the JNCC HPI definition of Lowland Mixed Deciduous Woodland, which includes the majority of semi natural woodlands in the lowlands (BRIG, 2011). All ancient woodlands within NPT are designated as SINCs.



Scrub

- 8.6 A large block of tall willow scrub¹³ occurs in the west and south of the Site, occupying approximately one third of the site's total area. The dominant canopy species here is grey willow with occasional downy birch *Betula pubescens*.
- 8.7 The understorey is open in structure, consisting primarily of low-growing bramble *Rubus fruticosus* agg. Saplings of ash, sycamore *Acer pseudoplatanus*, holly, rowan and hazel *Corylus avellana* are occasional in localised drier areas, particularly towards the north. Guelder rose and hawthorn *Crataegus monogyna* are rare. Several non-native and naturalised species are also present along the boundaries with existing residential housing, along with several areas of fly tipped rubbish. These include box-leaved honeysuckle *Lonicera nitida, Cotoneaster* sp., Montbretia *Crocosmia x crocosmiiflora* and pendulous sedge *Carex pendula*.
- 8.8 To the south and west the ground flora is patchy, characterised by areas of bare ground and a limited number of species tolerant of damp conditions. These include tufted hair grass *Deschampsia cespitosa,* soft rush *Juncus effusus,* creeping bent *Agrostis stolonifera* and rough meadow grass *Poa trivialis.* Drier areas, particularly to the north and around the drainage ditch on the western boundary, support a patchy layer of low-growing bramble with occasional scattered bracken, field horsetail *Equisetum arvense,* scaly male fern *Dryopteris affinis* ssp. *affinis,* broad buckler fern *D. dilatata* and a small amount of enchanter's nightshade *Circaea lutetiana.*
- 8.9 To the east conditions are drier and the ground flora subsequently has a more consistent layer of bramble, frequent ivy *Hedera helix* and occasional scattered bracken. The presence of a small number of woodland indicators reflects the influence of the adjacent ASNW and increases to the east with occasional bluebells, honeysuckle, field rose and broad buckler fern.
- 8.10 Comparison with the key to woodlands and scrub and floristic tables in Rodwell et al (1991a) places the tall willow scrub in the W1 *Salix cinerea Galium palustre* woodland community, being dominated by grey willow but lacking bay willow *Salix pentandra* and frequent common reed *Phragmites australis.*
- 8.11 The large block of willow corresponds to the JNCC priority habitat definition of 'wet woodland' (BRIG, 2011) which includes W1 and also meets the Wales SINC criteria for this habitat type, which includes all undesignated semi-natural woodlands with a wet woodland component.
- 8.12 Areas of more scattered scrub are common across the Site. Young downy birch and grey willow are the most frequent species, encroaching into the open areas of marshy grassland and bracken. Sessile oak and bramble become more frequent on drier ground to the north and east with a little rowan. These areas do not correspond to JNCC priority habitat definitions or SINC criteria.

Streams and ditches

- 8.13 Two small streams run along the northern and eastern boundaries of the Site in association with the mature hedgerow and woodland respectively. Both are narrow and heavily shaded with no aquatic or marginal vegetation and at the time of survey held very little water with over half the length of each completely dry. Fly tipping was noted towards the south of the eastern stream.
- 8.14 A shallow drainage grip is present at the edge of willow scrub (TN7). This was dry at the time of survey but supports a small amount of *S. denticulatum,* common sedge *Carex nigra,* water starwort *Callitriche* sp. and bog beacon *Mitrula paludosa,* indicating it is likely to be frequently inundated.
- 8.15 A second ditch runs along the length of the western Site boundary. This was also dry at the time of survey with no aquatic or marginal vegetation present.

¹³ Stands of *Salix cinerea* are categorised as scrub even where >5m tall (JNCC, 2010).



Marshy grassland

- 8.16 Marshy grassland dominated by purple moor-grass *Molinia caerulea* occupies the centre of the Site. The rank tussocks (approx. 50 cm high) with accumulated litter and encroachment of bracken and downy birch/willow scrub from the boundaries indicate a lack of recent management across the majority of the Site. Exceptions to this are areas of vehicle disturbance associated with recent ground investigation works (TN8) which consisted at bare ground and small areas of standing water at the time of survey.
- 8.17 Associated species include occasional heather *Calluna vulgaris* and common haircap moss *Polytrichum commune* on slightly drier ground to the north along with cross-leaved heath *Erica tetralix*, tormentill *Potentilla erecta* and sharp flowered and soft rushes *Juncus acutiflorus* and *J. effusus*. Other associates occur rarely and in small amounts, most likely as a result of suppression by the accumulated purple moor-grass litter. These rarely occurring species include devils-bit scabious *Succisa pratensis*, bog asphodel *Narthecium ossifragum*, compact rush *Juncus conglomeratus*, jointed rush *J. articulatus*, heath rush *J. squarrosus*, narrow buckler fern *Dryopteris carthusiana*, heath spotted orchid *Dactylorhiza maculata* and royal fern *Osmunda regalis*.
- 8.18 Bog mosses are present with frequent small patches of *Sphagnum palustre*, *S. fimbriatum* and *S. fallax* throughout most of the sward, becoming abundant in small areas of localised flushing at TNs 1, 2 and 3 with the addition of occasional *S. capillifolium, Aulacomnium palustre* and sharp flowered rush.
- 8.19 Comparison with the key to mires and floristic tables in Rodwell et al (1991b) places the majority of the vegetation within the M25 *Molinia caerulea Potentilla erecta* mire community given the abundance of purple-moor grass, limited associates, low cover of ericoids and patchy bog mosses. The localised flushed areas (TNs 1-3) do not key out well but most closely resemble the M6 *Carex echinata Sphagnum recurvum/auriculatum* mire community being dominated by *Sphagnum palustre* with sparse rushes, although sedges including the community constant star sedge *Carex echinata* are rare.
- 8.20 The marshy grassland includes two priority habitats. The M25 corresponds to the JNCC HPI definition of 'purple moor-grass and rush pasture' (M25) described as species-rich types of fen meadow and rush pasture with abundant purple moor-grass and/or sharp-flowered rush. The M6 corresponds to the HPI definition of 'lowland fens' which includes poor-fens characterised by short vegetation with a high proportion of bog mosses (BRIG, 2011).
- 8.21 The habitat also meets the Wales SINC criteria for marshy grassland (M25) as a species-rich example of 'purple moor-grass pasture'¹⁴ and 'lowland fen' which includes all examples of undesignated fen habitat (including M6), providing they are not grossly modified by agricultural improvement.

Bracken

8.22 Bracken occupies the drier ground to the north and east of the Site where it occurs in association with scattered young oak and bramble scrub. Bluebells are scattered throughout, becoming more frequent close to the adjacent woodland where bilberry *Vaccinium myrtillus*, lady fern *Athyrium filix-femina* and broad buckler fern *Dryopteris dilatata* are occasional. Part of the vegetation has been cut to ground level to allow vehicle access for the recent ground investigation works (TN4).

Invasive species

8.23 Invasive species are present in several locations around the Site boundaries adjacent to the existing residential gardens. These include extensive variegated yellow archangel *Lamiastrum galeobdolon* subsp. *Argentatum* in the north-west of the Site (TN6) and small stands of Montbretia

¹⁴ Defined as supporting at least 12 indicator species from a published list, 17 species recorded on Site.



Crocosmia \times *crocosmiiflora* to the south and west (TN5). Both of these species are listed under Schedule 9¹⁵.

Badger

- 8.24 There are five records of badger *Meles meles* within 2 km of the Site associated with farmland and woodland.
- 8.25 Opportunities for sett building are likely to be limited to the better drained areas on the northern and eastern fringes, although habitat across the Site is suitable foraging habitat for badger. However, the extended Phase 1 survey recorded no setts or field signs indicating badger presence on the Site. During the course of all other survey visits, no signs of badger were recorded.

Marsh fritillary

- 8.26 There are 17 records of the marsh fritillary butterfly within 2km of the Site. The majority are associated with the area around Rhyd-y-fro, 300-400 m north of the Site and date from the 1990s.
- 8.27 Whilst the butterfly's food plant, devil's-bit scabious *Succisa pratensis,* is present within the marshy grassland it occurs at very low frequency. Based on this, the lack of management and the average sward height (>25cm), the habitat quality for marsh fritillary can be classified as 'Potential (Rank)' (Fowles, 2006) and the marshy grassland is considered unlikely to support the species without extensive restoration management.

¹⁵ Schedule 1 of the WCA 1981 (as amended).



9 Appendix 2: Bat Report

Field Survey Methods

Static Detector Surveys

- 9.1 Three static bat detectors (D1 D3) were deployed on Site, for five nights each per month during the period April September inclusive. The detectors were deployed in the same location for each monitoring period, the locations being selected to sample those habitats where foraging and commuting bats were most likely. Locations of the detectors are shown on Figure 2.
 - D1 Detector on the edge of willow scrub on the interface between the marshy grassland and willow scrub and ancient woodland at the south-eastern edge of the Site. Grid reference SN 71792 05344.
 - D2 Detector on mature birch at the ancient woodland edge at the north-east of the Site. Grid reference SN 71799 05429.
 - D3 Detector on young oak at willow scrub interface onto the marshy grassland, towards the west of the Site. Grid reference SN 71722 05391.
- 9.2 Song Meter 2+ (SM2+) bat detectors with external microphones were used. The detectors were configured to record above the level of ambient noise, such as from wind or rain, using an adaptive trigger set to 6 decibels (dB). They were set to define a bat pass as a call note of >2 milliseconds (ms) separated from another by more than one second. Each bat detector was housed in a waterproof Peli-case. An external microphone was connected via a cable to the logger, and attached to a suitable tree approximately 2 m above ground level.
- 9.3 The static detectors were each set to record for a minimum of five nights per month from half an hour before sunset to half an hour after sunrise, the period during which bats are usually active away from their roosts. The duration of recording per night varied throughout the survey period according to day/night length. Deployment dates for each detector are provided in Table 1 (below).

	Location					
Month	D1	D2	D3			
April	09-13 April	09-13 April	09-13 April			
Мау	08-12 May	08-12 May	08-12 May			
June	12-13 & 18-20 June	12-13 & 18-20 June	12-14 & 18-19 June			
July	11-15 July	11-15 July	11-15 July			
August	15-19 August	15-18 & 20 August	15-19 August			
September	12-16 September	12-16 September	12-16 September			

Table 1: Static detector deployment dates.

Bat Call Identification

- 9.4 Bat calls were analysed using AnalookW software (Titley Scientific, 2015) to allow identification of the bat species present.
- 9.5 Where possible, bats were identified to species level, following the call parameters as described in Russ (Russ, 2012). Species of the genus *Myotis* were grouped together as overlapping call parameters make species identification problematic (Collins, 2016). For pipistrelle species the following criteria, based on measurements of peak frequency, were used to classify calls:
 - Common pipistrelle *Pipistrellus pipistrellus* ≥42 and <49 kHz
 - Soprano pipistrelle *Pipistrellus pygmaeus* ≥51 kHz



- Nathusius' pipistrelle *Pipistrellus nathusii* <39 kHz
- Common pipistrelle/soprano pipistrelle ≥49 and <51 kHz
- Common pipistrelle/Nathusius' pipistrelle ≥39 and <42 kHz
- 9.6 For the purpose of the analysis a bat pass is defined as a single, uninterrupted sequence of echolocation calls lasting a maximum of 15 seconds. More than one pass of the same species was counted within a sound file if multiple bats were recorded calling simultaneously.
- 9.7 Analysis of the relative activity (referred to as 'activity' in the text below) of different species of bats was conducted by counting the number of bat passes (P) recorded within a unit of time hour (h). During analysis of sound files, it was possible to estimate the minimum number of bats recorded on an individual sound file but not whether consecutive sound files had recorded, for example, a number of individual bats passing as they commute to a feeding habitat, or one bat calling repeatedly as it flies up and down the hedge. Although relative abundance cannot therefore be estimated from this analysis, the number of bat passes does provide an indication of the importance of features/habitats to bats by assigning a level of bat activity that is associated with that feature, regardless of the type of activity.
- 9.8 As part of the analysis of nocturnal patterns of behaviour for bats the data were split into discrete time periods relating to their proximity to sunset or sunrise. The time categories (time codes: TC) were as follows:
 - TC 0 = before sunset
 - TC 1 = 0-20 min after sunset
 - TC 2 = 20-40 min after sunset
 - TC 3 = 40-60 min after sunset
 - TC 4 = 60-80 min after sunset
 - TC 5 = 80-100 min after sunset
 - TC 6 = 100-120 min after sunset
 - TC 7 = Middle of night (varies across seasons)
 - TC 8 = 120-100 min before sunrise
 - TC 9 = 100-80 min before sunrise
 - TC 10 = 80-60 min before sunrise
 - TC 11 = 60-40 min before sunrise
 - TC 12 = 40-20 min before sunrise
 - TC 13 = 20-0 min before sunrise
- 9.9 For each of these categories bat passes per hour (P/h) was calculated to allow a comparison between the activity level recorded in different time periods, and a correction factor was applied to TC7 data to allow for variation in night length throughout the survey season.
- 9.10 In addition to the data analysis methods set out above, a review of all pipistrelle species, *Myotis* spp., long-eared bat species and noctule passes for calls characteristic of feeding behaviour was conducted. This was carried out for the May, July and September deployments. The proportion of passes in which a feeding buzz (indicative of foraging) was visible was calculated. This analysis did not include horseshoe bat species passes due to difficulties detecting feeding activity on sonograms produced by that genera, and because horseshoe bats were detected on only five occasions.



Tree inspection for potential roosting features

9.11 While on Site conducting other surveys, ground-based checks were made with binoculars of trees that appear likely to be felled. The purpose of these checks was to assess the overall suitability of trees for roosting bats.

Limitations to methods

- 9.12 On four occasions during the June and August deployments, detectors recorded large volumes of noise caused by stridulating¹⁶ crickets. This resulted in the detector SD cards filling in fewer than five nights. Where this occurred, the detectors were redeployed and the remaining data recorded to achieve the required total of five nights per detector for that month. Therefore, this is not considered to have limited the results of the survey.
- 9.13 Walked transect surveys were not undertaken alongside the static detector surveys. The decision not to undertake walked transect surveys was made following a review of conditions underfoot, which were not considered to be appropriate for walking around in the dark, and taking into account the practically accessible extent of the Site (which was limited by very dense vegetation in places) and the small size of the Site. In recognition of this, the number of static bat detectors was increased from one (which would have been in line with guidance in Collins (2016) when used to complement walked transects) to three, deployed across the Site. This measure allowed the gathering of a more comprehensive baseline of data gathered consistently across an increased number of survey hours when compared to transect data. In addition, the data gathered was subject to a high-level review of calls indicating feeding activity. This allowed a broad characterisation of the use of the site in respect of feeding and commuting. For these reasons, the survey methods are not considered to be significantly limited.

Results

Desk Study

- 9.14 The data search returned 132 records of bats. Approximately half of these were of soprano and common pipistrelle, and unidentified pipistrelles. Other bats recorded locally include Nathusius' pipistrelle (single record), noctule *Nyctalus noctula*, long-eared bat and whiskered bat (single record); as well as several unidentified "bat" records.
- 9.15 This represents at least six different species, one of which relates directly to the Site (an overflying noctule). The closest roosting record to the Site is of pipistrelle species bats in buildings in Waunsterw to the west. No records of horseshoe bat species were returned in the data search.

Field Survey

- 9.16 A minimum of seven bat species were recorded during the static detector surveys: common pipistrelle, soprano pipistrelle, *Myotis* spp., long-eared bat species, noctule, lesser horseshoe bat *Rhinolophus hipposideros*, and greater horseshoe bat *Rhinolophus ferrumequinum*.
- 9.17 Table 2 (below) shows the bat activity recorded during each month throughout the survey period, as well as total activity recorded (for each species and in total). Detector locations and a graphical summary of the static detector survey results are shown on Figure 2.

¹⁶ Stridulation is the act of producing sound by rubbing two body parts together. It is commonly exhibited by displaying male crickets and grasshoppers *Orthoptera*.



Table 2: Activity (P/h) per month and in total for each species/species grouping recorded during static surveys.

Note: the 'unidentified bat species' row refers to bat activity that could not be identified to species group/species level.

	Bat Passes per Hour (P/h) by Month						
Species	April	Мау	June	July	August	September	Total Activity
Common / Nathusius' pipistrelle	0.1	0.2	0.8	0.3	0.1	0.0	0.2
Common pipistrelle	5.4	11.0	14.6	28.1	16.6	9.9	13.6
Common / soprano pipistrelle	0.1	0.8	0.9	1.4	0.2	<0.05	0.5
Soprano pipistrelle	1.1	1.7	3.5	4.5	1.9	1.7	2.3
<i>Myotis</i> spp.	0.1	0.8	0.6	1.6	0.4	0.2	0.6
Myotis / Long-eared bat spp.	0.0	0.0	<0.05	<0.05	0.1	0.0	<0.05
Long-eared bat spp.	<0.05	<0.05	<0.05	0.1	0.2	0.1	0.1
Lesser horseshoe bat	<0.05	<0.05	0.0	0.0	0.0	0.0	<0.05
Greater horseshoe bat	0.0	0.0	<0.05	0.0	0.0	0.0	<0.05
Noctule	0.0	0.1	0.1	<0.05	0.2	<0.05	0.1
Noctule / Leisler's bat	0.0	<0.05	<0.05	0.1	<0.05	0.0	<0.05
Serotine / Nyctalus spp.	0.0	0.0	<0.05	<0.05	0.0	0.0	<0.05
Unidentified bat species	<0.05	0.2	0.5	0.6	1.7	1.3	0.8
Monthly Total Activity	6.9	14.8	21.1	36.7	21.4	13.3	18.1

- 9.18 For the whole recording period, total bat activity at the Site was recorded as 18.1 P/h (14,841 passes in total). The highest activity rates were recorded for common and soprano pipistrelles. Overall bat activity peaked in July, caused primarily by an increase in pipistrelle species activity.
- 9.19 Graph 1 (below) is made up of two graphs. They show the activity of bats throughout the night. Overall, the highest levels of bat activity were recorded 20-40 minutes after sunset.



Graph 1: Activity (P/h) of bat species throughout the night.

Note only data for species with activity >0.05 P/h (in table 2) are presented.



- 9.20 Noctule activity peaked in the first 20 minutes following sunset, though there were only four passes prior to sunset, all of which were within one minute of sunset.
- 9.21 Activity of both common and soprano pipistrelle peaked between 20-40 minutes after sunset, although 468 pipistrelle passes (3% of the total 13,604 passes) were recorded in the half hour prior to sunset.
- 9.22 *Myotis* spp. activity peaked during the same period, and also showed a higher peak between 120-80 minutes before sunrise.
- 9.23 Graph 2 (below) shows the total activity at the three detectors across the Site. Total activity was lowest at D2 (at the ancient woodland edge) and highest at D3 (at the western scrub edge).





Graph 2: Activity at each detector over the whole recording period.

- 9.24 Common pipistrelle activity was highest at D3 (the western scrub edge), whilst soprano pipistrelle activity was highest at D1 (the south-eastern scrub edge). *Myotis* spp. activity was highest at D2 (along the ancient woodland edge).
- 9.25 Four lesser horseshoe bat passes were recorded three at D3 in April (all during the 'middle of the night' period) and one at D2 in May (100-120 minutes after sunset). A single greater horseshoe bat pass was recorded at D3 in June (during the 'middle of the night' period).
- 9.26 The review of pipistrelle species foraging activity found that in total, 4.6% of all pipistrelle species passes in the data included a feeding buzz. Foraging activity varied across the Site, with 6.6% of passes at D1 (the south-eastern scrub edge) including a feeding buzz, compared to 3.5% and 3.4% at D2 and D3 respectively. Foraging activity also varied between seasons, with 5.6% of passes during July including a feeding buzz, compared to 3.4% in May and 3.3% in September.
- 9.27 For *Myotis* spp., a feeding buzz was evident on 5.0% of passes, with 9.1% of foraging activity at D2 (the ancient woodland edge) compared to 0.7% and 3.4% at D1 and D3 respectively.
- 9.28 For long-eared bat species a feeding buzz was evident on 3 of the total 21 passes recorded during the selected period. For noctule, no feeding buzzes were recorded (out of the 16 passes) during the selected period.



10 Appendix 3: Breeding Bird Report

Field Survey Methods

- 10.1 Breeding birds were surveyed by walking at a slow pace along a transect route which approached to within 50 m of all parts of the Site, and was extended to include a section of approximately 280 m through the adjacent ancient woodland. This route was consistent between surveys, though the start point and direction of travel was varied between visits. This allowed all birds detected to be located, identified and recorded. Frequent stops were made to listen and scan for singing and calling birds. All habitat features were approached to within approximately 50 m.
- 10.2 Bird locations were mapped using standard two-letter British Trust for Ornithology (BTO) codes, and bird activity was recorded using standard BTO behaviour codes (Marchant, 1983).
- 10.3 The breeding status of birds recorded was categorised as either 'holding territory' or 'showing other evidence of breeding'. Birds presumed to be holding territory were those recorded in song. Other evidence of breeding included observations of: Distraction display or injury feigning
 - Distraction display or injury feigning
 - Used nests or eggshells found (occupied or laid within the survey period)
 - Adults entering or leaving a nest site in circumstances indicating an occupied nest or an adult sitting on a nest
 - Adults carrying food for young or faecal sacs
 - Nest containing eggs
 - Nest with young seen or heard
- 10.4 Three survey visits were made. Date, time and weather data for each visit can be found in Table 3.

Date	Time	Weather			
		Wind	Cloud (Oktas)	Precipitation	Temperature
09/04/2019	07:05 – 08:30	0-1	8	Light drizzle to Nil	11 - 16 °C
16/05/2019	06:50 – 08:15	0-1	4-5	Nil	12 °C
05/06/2019	06:40 – 08:05	0-2	7	Nil	11 - 12 °C

Table 3. Details of breeding bird surveys.

10.5 The results of the three breeding bird surveys were combined to create a single map showing all birds considered to be holding territory (Figure 3). BTO codes for each species illustrated in Figure 2 are provided in Table 4. Where a bird was observed in the same location during more than one survey visit, and this is judged to have been the same individual bird, only one registration of that bird is shown on the map. Where more than one individual of the same species is shown in close proximity, this represents individual birds seen simultaneously during a single survey. Note the locations of presumed territories do not represent specific nest locations. For species where definitive evidence of breeding was not obtained, professional judgement (based on a range of factors including knowledge of habitat requirements, local status and/or repeat sightings) was used to conclude whether breeding was likely. A precautionary approach was taken, with species suspected to have bred being plotted as having done so.



Limitations to methods

- 10.6 The survey visits were undertaken during the peak breeding period under suitable weather conditions, and access was available to the entire Site. The results are therefore considered sufficient to provide a representative overview of breeding bird activity within the Site.
- 10.7 As with all breeding bird surveys following this technique, the process is open to some subjectivity in interpretation except where active nests are located. Therefore, these territories are classed as putative and their mapped locations indicate the 'centre' of a territory and not necessarily the breeding location.

Results

Desk Study

10.8 The data search returned 348 records concerning thirty bird species, none of which refer directly to the Site. Thirteen refer to the adjacent woodland and involve the following species: wood warbler *Phylloscopus sibilatrix*, dunnock *Prunella modularis*, bullfinch *Pyrrhula pyrrhula*, redwing *Turdus iliacus* and song thrush *Turdus philomelos*. Nine of the species returned by the search within 2 km of the Site are on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Those are: goshawk *Accipiter gentilis*, barn owl *Tyto alba*, crossbill *Loxia curvirostra*, kingfisher *Alcedo atthis*, red kite *Milvus milvus*, wryneck *Jynx torquilla*, brambling *Fringilla montifringilla*, fieldfare *Turdus pilaris* and redwing. The latter three species are regular winter visitors in the UK, and all records of these species returned by the search were during winter. The three records of wryneck involve a single vagrant bird, recorded in September 2011.

Field Survey

Species Numbers and Distribution

10.9 A total of twenty-six bird species were recorded during the breeding bird surveys, twelve of which were recorded as holding territories and/or breeding on Site. The bird community was passerine dominated, with twenty-five of the twenty-six species recorded being passerine (and near-passerine) species. Table 4 (below) lists all species recorded during the surveys, and gives information on their conservation status, breeding status at the Site and number of territories located. All territories recorded during the surveys are mapped on Figure 3.



Table 4: Breeding bird survey results

Note: B signifies that the species was considered to be breeding on Site; NB signifies that the species was not considered to be breeding on or adjacent to the Site; NB* signifies that the species was not considered to be breeding on the Site, but was considered to be breeding in the adjacent woodland (off-Site).

Species			Conservation Status			Survey	
Common Name	Scientific Name	BTO Species Code	Section 7 ¹⁷	Local Biodiversit y Action Plan (BAP)	BOCC Status	Site Breeding Status	Site Territories
Long-tailed tit	Aegithalos caudatus	LT			Amber	В	1
Goldfinch	Carduelis carduelis	GO			Green	NB	
Wood pigeon	Columba palumbus	WP			Green	NB	
Blue tit	Cyanistes caeruleus	ВТ			Green	В	4
Great-spotted woodpecker	Dendrocops major	GS			Green	NB*	
Robin	Erithacus rubecula	R.			Green	В	6
Chaffinch	Fringilla coelebs	СН			Green	NB*	
Jay	Garrulus glandarius	J.			Green	NB	
Red Kite	Milvus milvus	кт		Yes	Amber	NB	
Great tit	Parus major	GT			Green	В	4
House sparrow	Passer domesticus	HS	Yes	Yes	Amber	NB*	
Coal tit	Periparus ater	СТ			Amber	NB*	
Chiffchaff	Phylloscopus collybita	СС			Green	NB*	
Wood warbler	Phylloscopus sibilatrix	WO	Yes	Yes	Red	NB*	
Willow warbler	Phylloscopus trochilus	WW			Red	В	2
Magpie	Pica pica	MG			Green	NB	
Dunnock	Prunella modularis	D.	Yes	Yes	Green	В	3
Nuthatch	Sitta europaea	NH			Green	NB*	
Siskin	Spinus spinus	SK			Green	В	1
Collared dove	Streptopelia decaocto	CD			Green	NB*	
Starling	Sturnus vulgaris	SG	Yes	Yes	Red	В	1
Blackcap	Sylvia atricapilla	BC			Green	В	2
Garden Warbler	Sylvia borin	GW			Amber	В	1
Wren	Troglodytes trogolodytes	WR			Green	В	4
Blackbird	Turdus merula	В.			Green	В	1
Song thrush	Turdus philomelos	ST	Yes		Amber	NB*	

None of the species considered to be breeding on Site are listed under Schedule 1¹⁸/ Annex 1¹⁹. 10.10

Five of the species recorded are listed under Section 7 (Environment (Wales) Act), and five are 10.11 local BAP species. Of these, two (dunnock and starling) were considered to be breeding on Site.

¹⁷ Of the Environment (Wales) Act 2016.
¹⁸ Schedule 1 of the WCA 1981 (as amended).
¹⁹ Annex 1 Directive 2009/147/EC, often referred to as The Birds Directive.



- 10.12 For the twelve species recorded as holding territories and/or breeding on Site. All territories on Site were located in the willow scrub, semi-natural woodland and boundary tree-lines. No species of open field habitats/farmland species (such as skylark *Alauda arvensis*) were recorded. Numerous territories for a range of species were recorded in adjacent gardens and the adjacent ancient woodland, all of which are relatively widespread and/or common in Wales.
- 10.13 The colour of point for each species, shown by Figure 3, indicates it's 'Welsh Birds of Conservation Concern (BoCC)' status (Bladwell et al., 2018). The BoCC listing assesses bird species on the basis of their population status, reflecting changes in their abundance and range.
- 10.14 Red List species are of high nature conservation concern and are those that:
 - are Globally Threatened according to international (IUCN) criteria;
 - whose population or range has declined rapidly in recent years;
 - have declined historically and not shown a substantial recent recovery.
- 10.15 Amber List species are of medium conservation concern, and are those:
 - with an unfavourable conservation status in Europe;
 - whose population or range has declined moderately in recent years;
 - whose population has declined historically but made a substantial recent recovery;
 - that are rare breeders;

with internationally important or localised populations.

Red List BoCC

10.16 Of the twenty-six species recorded during the surveys, three are on the Red List, and two of these were considered to be breeding on Site: starling and willow warbler. The single starling territory recorded on Site involved a bird singing from the top of an oak along the northern tree-line on 16 May 2019. Two willow warbler territories were recorded during the surveys, involving singing birds in the scrub and along the northern tree-line, on 16 May 2019 and 05 June 2019.

Amber List BOCC

10.17 Of the twenty-six species recorded during the surveys, five are on the Amber List, and two were considered to be breeding on Site: long-tailed tit and garden warbler. Adult long-tailed tits were recorded carrying food and alarm calling within the south-western willow scrub on 05 June 2019. A garden warbler was recorded in song within the northern tree-line during the surveys of both 16 May 2019 and 05 June 2019.

Green List BOCC

10.18 A total of nine Green Listed species were considered to be breeding within the Site. These are relatively widespread and /or common species in Wales (though dunnock is listed under Section 7).

Incidental (non-breeding) Records

- 10.19 Red kite was recorded overflying the Site during the survey of 05 June 2019, and is listed as both Schedule 1 and Annex 1.
- 10.20 In addition, a bullfinch was heard flying overhead during the 14 June site visit meeting with the NPT ecologist.



11 Appendix 4: Dormouse Report

Field Survey Methods

Nest tube/box survey

- 11.1 Dormouse survey work was undertaken in accordance with best practice survey guidance (Bright *et al*, 2006; and the Natural England Advice Note "Hazel or common dormice: surveys and mitigation for development projects"²⁰). Under this guidance it is recommended that to determine presence/absence within a site a minimum of 50 nest tubes at a spacing of 15-20 m intervals need to be put out in suitable habitats for several months, and these tubes then need to be checked periodically for indications of use by dormouse. Indications of use include finding animals in residence within the tube during the survey or finding a nest characteristic of the species. Dormice typically make neat nests comprising tightly woven honeysuckle bark (or similar), along with green leaves, normally hazel, though other species are used. This differs from the nests of other small mammals which are typically much messier and lack a distinct structure.
- 11.2 Each month is assigned a "score" based on the probability of dormouse occupying tubes in that month. For a survey to be considered valid, normally a total score of 20 or more points are required. The score per month is illustrated in Table 5 below.

Month	Index of Probability
April	1
• •	
Мау	4
June	2
July	2
August	5
September	7
October	2
November	2

Table 5: Monthly index of probability for tube occupation.

11.3 A total of 60 tubes were deployed in scrub, woodland and woodland edge habitats within the Site on 09 April 2019, and these were left in place until the end of September 2019²¹, thereby achieving the 20 points required for a valid survey. Five additional boxes were deployed during the first survey (on 21 May 2019) to supplement the June – September surveys. The tube and box locations are presented in Figure 4. The tubes have been inspected once every month.

Supplementary Nut search

- 11.4 The September survey was supplemented by a nut search. The Site and adjacent woodland edge were systematically searched for fruiting hazel: three areas were located (shown on Figure 4) and beneath each, an area of ground measuring 10 m x 10 m was thoroughly searched for 20 minutes,
- ²⁰ Available at <u>https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects</u>. There is no Wales-specific guidance available, and the Natural England guidance is generally followed in Wales.

²¹ The tubes will be collected during October 2019.



for characteristically gnawed hazelnuts. The survey was conducted by an ecologist experienced in this survey method.

Limitations to methods

- 11.5 On a few occasions, dormouse tubes were found to have been vandalised between surveys. Given the level of public use of the Site, this was anticipated and more than the minimum number of tubes was deployed. Any damaged tubes were repaired and replaced. Therefore, this is not considered to have limited the results of the survey.
- 11.6 A minimum of five 10 m x 10 m areas are to be surveyed for a valid nut search in accordance with industry standard guidance (Bright *et al*, 2006). Only three areas on or close to the Site could be found to contain fruiting hazel (these were in the adjoining ancient woodland) and as such the search did not directly meet industry standard guidance. However, the intention of the search was to provide supplementary information about the only three nearby hazel-supporting areas, and this aim was achieved.

Results

Desk Study

11.7 The data search returned two records of hazel dormouse, both from the same location approximately 1 km east of the Site, one from 2002 and the other from 2005. Aerial imagery suggests that habitat connectivity between this location and the Site is continuous, consisting of hedgerows and uninterrupted mature broad-leaved woodland.

Field Survey

11.8 No dormice or evidence of their presence was recorded during the Site surveys.

12 Appendix 5: Reptile Report

Methods

12.1 The presence/likely absence of reptiles at the Site was established through the use of artificial refugia in combination with a visual search of the Site, as described below. Reptile surveys were undertaken in accordance with good practice guidelines, including that set out in the Herpetofauna Worker's Manual (Gent et al., 2003) and published guidelines for reptile survey (Froglife, 1999).

Directed visual search

- 12.2 Nine survey visits were conducted during the period June-August. During each survey visit, surveyors walked a transect through the Site between refugia and carried out visual searches for reptiles. This ensured that all areas within the Site were fully considered in the survey, sampling a range of suitable reptile habitats, including potential basking spots. This helped to eliminate a bias towards those reptiles more likely to use refugia, such as slow worm *Anguis fragilis* (Sewell et al. 2013).
- 12.3 The direction of travel along the transect route was varied between visits so that different areas of the site were sampled at different times of day. This ensured that areas which are only exposed to sun for part of the day were surveyed during optimum conditions. The transect route is shown on Figure 5.

Use of artificial refugia

- 12.4 Surveys were carried out to establish the presence/likely absence of reptiles and, if present, to gain an indication of their distribution through the relevant habitats. Thirty-two bitumen felt mats were deployed throughout the different habitats to sample all areas, with a higher density in the more suitable habitat (the marshy grassland) (see Figure 5). Ten corrugated metal tins (50 x 100 cm) were also used in the area of grassland considered most suitable for adder *Vipera berus*, as snakes are more likely to be recorded under tins than felts (Sewell et al. 2013). This gives a total of 42 refugia deployed. The guideline density for refugia is 5-10 per hectare of suitable reptile habitat (Froglife, 1999). The Site is 1.4 hectares and the density used was thirty mats per hectare. This gave a higher than standard sampling effort throughout the more suitable area of marshy grassland, including effort to sample for adder.
- 12.5 The refugia mats were deployed on Site on 23 May 2019, thirteen days before the commencement of survey. The time allowed between deployment and survey enables the refugia mats to develop more favourable conditions i.e. suitable humidity and temperature gradient, and for the reptiles to become more familiar with them.
- 12.6 During each survey the refugia mats were carefully lifted and checked underneath for reptiles. The Site was visited nine times, in appropriate weather conditions, during June and July 2019. In most cases, surveys were conducted during optimum weather conditions: generally dry, with little wind, lightly overcast or hazy sunshine, and a temperature range of 9-18°C (Froglife, 1999; Gent & Gibson, 2003). Two surveys fell outside of the temperature parameters (see limitations) but the number of survey visits was extended to nine to account for this. Details of survey timings and weather conditions are provided in Table 6 (below).



Survey Number	Date	Surveyors*	Air Temperature (°C)	Wind Speed (Beaufort)	Cloud Cover (Oktas)
1	05/06/2019	JAG	13-15	0-1	5-6
2	18/06/2019	CA, HD	14-16	1-2	8-7
3	21/06/2019	CA	15-16	1	5-4
4	26/06/2019	СА	16-18	0-1	5-3
5	03/07/2019	СА	13-15	0	0
6	11/07/2019	CA	19	2-1	8
7	17/07/2019	CA	19	3-2	8
8	12/08/2019	JG	18	0	8
9	15/08/2019	JAG	16-18	1-0	6-2

Table 6: Reptile survey timings and weather details.

*James Garside (JAG), Charlotte Alsop (CA), Hannah Daniels (HD), Jim Gillespie (JG)

Limitations to methods

- 12.7 On a few occasions, reptile mats had been vandalised/moved between surveys. In anticipation of this, more than the minimum number of mats required by industry standard guidance were used during the surveys. In all instances apart from the penultimate visit any destroyed mats were replaced during the subsequent survey.
- 12.8 Two of the initial seven surveys were conducted when the temperature was 19°C, marginally above the optimum temperature range for reptile survey. For this reason, a further two surveys were conducted under optimum weather conditions.

Results

Desk Study

12.9 The data search returned 11 records of reptiles, of three species: common lizard *Zootoca vivpara*, slow worm and grass snake *Natrix helvetica*. These included three common lizard records for the Site, involving two adults and a juvenile, on 01 August 2018.

Field Survey

12.10 During each of the refugia surveys of the Site, at least one individual of each of two common species (common lizard and slow worm), was recorded. Details of the number and age of individuals recorded are given in Table 7 (below). No other reptile species were recorded, and no reptiles were recorded away from refugia during visual searches.

Survey	Date	Common lizard		Total	Slow wor	m	Total	
Number		Adult	Juvenile (and sub- adult)	Un- known		Adult	Juvenile (and sub- adult)	
1	05/06/2019	3	1	0	4	2	0	2
2	18/06/2019	2	1	0	3	2	2	4
3	21/06/2019	1	2	2	5	2	0	2
4	26/06/2019	2	1	0	3	0	1	1
5	03/07/2019	1	0	0	1	1	2	3
6	11/07/2019	3	0	0	3	3	0	3
7	17/07/2019	1	0	1	2	0	1	1
8	12/08/2019	1	3	1	5	0	2	2
9	15/08/2019	2	5	0	7	1	0	1

Table 7: Number and age of reptiles recorded.

- 12.11 The peak adult counts recorded by the survey were three common lizard and three slow worm. These results suggest that the Site supports low populations of both species (Froglife, 1999).
- 12.12 Of the total 52 reptile records, 46 occurred within the marshy grassland, with the remaining 6 (involving both common lizard and slow worm) recorded in the adjacent bracken. No reptiles were recorded within the tall willow scrub or semi-natural woodland. Figure 5 shows the distribution of records across the Site.

Amphibians

12.13 Two amphibian species were also recorded under refugia during the reptile searches: common toad *Bufo bufo* and smooth newt *Lissotriton vulgaris*. Toads were recorded during seven of the nine surveys, with a peak count of six on 15 August 2019. Single smooth newts were recorded during the first survey on 05 June 2019 and final survey on 15 August 2019.



13 Appendix 6: Figures

Overleaf:

Figure 1: Phase 1 habitats (including Site boundary)

- Figure 2: Bat static detector results
- Figure 3: Breeding bird territories
- Figure 4: Dormouse tube/box and nut search locations
- Figure 5: Reptile survey results









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LEGEND

Site boundary

Bird of Conservation Concern (BoCC) status



Green

BTO Code	Species	Scientific Name	Count
В.	Blackbird	Turdus merula	8
BC	Blackcap	Sylvia atricapilla	7
BT	Blue Tit	Cyanistes caeruleus	7
CC	Chiffchaff	Phylloscopus collybita	8
CD	Collared Dove	Streptopelia decaocto	1
СН	Chaffinch	Fringilla coelebs	3
СТ	Coal Tit	Periparus ater	4
D.	Dunnock	Prunella modularis	4
GS	Great Spotted Woodpecker	Dendrocopos major	2
GT	Great Tit	Parus major	6
GW	Garden Warbler	Sylvia borin	1
HS	House Sparrow	Passer domesticus	3
LT	Long-tailed Tit	Aegithalos caudatus	1
NH	Nuthatch	Sitta europaea	2
R.	Robin	Erithacus rubecula	19
SG	Starling	Sturnus vulgaris	2
SK	Siskin	Spinus spinus	2
ST	Song Thrush	Turdus philomelos	3
WO	Wood Warbler	Phylloscopus sibilatrix	1
WR	Wren	Troglodytes troglodytes	15
WW	Willow Warbler	Phylloscopus trochilus	2

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PROJECT TITLE WAUNSTERW (PARC HADAU), PON TARDAW

DRAWING TITLE Figure 3: Breeding bird territories

DATE: 15/10/2019 DRAWN: KW

CHECKED: JGa APPROVED: JG SCALE: 1:1,250 VERSION: 1.2

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OFFICE: Newport T: 01633 509 000

JOB REF: P18-859

PROJECT TITLE WAUNSTERW (PARC HADAU), PONTARDAWE

DRAWING TITLE Figure 4: Dormouse tubes / boxes and nut search locations

DATE: 16/10/2019 CHECKED: JaG SCALE: 1:750 DRAWN: COH APPROVED: JG VERSION: 1.3 LEGEND Site boundary Location of dormouse tube Dormouse boxes Nut search areas (10 x 10 m)

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PROJECT TITLE WAUNSTERW (PARC HADAU), PONTARDAWE

DRAWING TITLE Figure 5: Reptile survey results

DATE: 15.10.2019	CHECKED: HD	SCALE: 1:750
DRAWN: COH	APPROVED: JG	VERSION: 1.4

LEGEND	
	Site boundary
	Transect route walked
	Reptile
$\boldsymbol{\bigtriangleup}$	Amphibian
$\textcircled{\bullet}$	Reptile and amphibian
0	No species recorded

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14 Appendix 7: Photographs

Marshy grassland



Localised flushing with Sphagnum





Broadleaved woodland in the north-east of the Site



Willow scrub/wet woodland in the west of the Site





Woodland in the south-east of the Site



Bracken, scrub and species rich hedge with mature trees to northern boundary



Target Note	Description	Photograph
1	Area of localised flushing with <i>Sphagnum</i> <i>capillifolium</i> and <i>S.</i> <i>palustre.</i>	<image/>
2	Area of localised flushing with <i>Sphagnum</i> <i>palustre, S.</i> <i>fallax</i> and <i>S.</i> <i>fimbriatum</i> with encroaching scrub.	<image/>
3	Area of localised flushing with <i>Sphagnum</i> <i>capillifolium</i> and <i>S.</i> <i>palustre.</i>	

15 Appendix 8: Target Notes





4	Area of bare ground at north of site (access route from the recent GI works), formerly bracken and bramble.	
5	Montbretia along southern site boundary, adjacent to residential gardens.	<image/>
6	Extensive area of variegated yellow archangel on north- western corner.	<image/>



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7	Shallow grip at edge of scrub. Contains a little bog beacon, water starwort and <i>Sphagnum</i> <i>denticulatum</i> indicating regular inundation.	
8	Bare ground with regenerating purple moor- grass along GI access route.	<image/>



16 Appendix 9: Draft Principles of Management (off-site Compensation Site)

Background and Purpose of this Document

- 16.1 Development is planned by Yr Hadau Ltd at the site known as Parc Hadau, Waunsterw (the Development Site). The proposed development site forms part of a non-statutory designated Site of Importance for Nature Conservation (SINC ref: NPTSINC030), selected for its purple moor grass and rush pasture and wet woodland habitats. In addition, all watercourses and ancient woodland within NPT are designated as SINCs. This includes the two watercourses bordering the northern and eastern boundaries of the Site (ref NPTSINC015) and two small areas of Ancient Semi-Natural Woodland (ASNW) in the north-east and south-east corners. These are contiguous with Coed Cefnllan-isaf, a large block of ASNW extending to the north, south and east (ref: NPTSINC015).
- 16.2 The Site's ecological interest is described in the Ecological Appraisal that accompanies the planning application. The proposed development will give rise to the loss of approximately 0.35 ha of marshy grassland, and approximately 0.74 ha of willow scrub (wet woodland), both of which are priority habitats, referred to under Section 7 of the Environment (Wales) Act 2016. This amounts to approximately 1.1 ha of Section 7 habitat that will be lost.
- 16.3 Yr Hadau has made a long-term commitment to positive biodiversity management of the retained part of the Site. However, the development will give rise to the loss of more Section 7 habitat (marshy grassland and willow scrub) than can be physically or practically re-created and accommodated through their replacement within the Development Site boundary. For this reason, two options are being pursued to ensure that the proposals give rise to an appropriate amount of biodiversity compensation to account for the lost habitat.
- 16.4 The two options proposed to offset the habitat loss include:
 - a. Management of habitat at a nearby site, to encourage marshy grassland and other important habitats, with the establishment of a fund to help secure future management, along with the preparation of a management plan; or
 - b. A contribution to NPT to support biodiversity enhancement work elsewhere in the county borough.
- 16.5 Option (a) is the preferred option but it is dependent on Yr Hadau gaining agreement with NPT as landowners of the nearby site. If the first option does not gain agreement from all necessary parties, then the second option would be put in place.
- 16.6 This document sets out the principles of off-site management under option (a), above.
- 16.7 The nearby site, made up of two fields, is situated off the A4067 at Godre'r Graig and is currently in the ownership of Neath Port Talbot Council (NPT). The fields are referred to in this document as the Compensation Site and they cover a total estimated area of 3.5 ha.
- 16.8 It is intended that Yr Hadau will undertake or fund the undertaking of preparatory habitat management work at the Compensation Site, and contribute funds to NPT to enable long-term management for biodiversity of the Compensation Site. It is envisaged that ownership of the Compensation Site will remain with NPT.
- 16.9 This document sets out the principles of management of the Compensation Site. Once agreed, these can be developed into a detailed management plan.
- 16.10 The principles of management of retained land at the Development Site are set out in the Ecological Appraisal that accompanies the planning application for the proposed development. They are not considered in this document.



Ecological Interest of the Compensation Site

- 16.11 The Compensation Site was visited on 01 August by James Gillespie of BSG Ecology. The two fields were walked over to characterise them broadly in terms of their habitats, as well as to assess their potential for habitat creation / manipulation / management, as a means of providing habitat to compensate for the loss of habitat at the Development Site.
- 16.12 The habitats on the Compensation Site are broadly drier in the south-west field and wetter across most of the north-east field. There is an unmanaged overgrown hedge (now dense scrub) between the two fields, hedges along the A4067 (northern boundary) and the eastern boundary, and riverside woodland along the southern boundary, which borders the River Tawe.
- 16.13 The south-west field supports a patchy semi-improved neutral grassland which is generally fairly open and dry, supporting a moderate range of herb species, with encroaching scrub, some mature scrub, and patches of tall nitrophillous vegetation.
- 16.14 The north-east field is wetter towards the river where rush-dominated (mostly hard rush) vegetation dominates. This is generally flanked by dense and scattered scrub of (mostly) goat willow, with some patches of scrub being very dense and developing into small stands of woodland. Woody species are colonising parts of the rush-dominated habitat. The habitat retains patches with a more damp to marshy grassland characteristic (species such as gypsywort, angelica, marsh thistle and greater bird's-foot trefoil are present in patches. Occasional great burnet, meadowsweet and water mint were also noted. Himalayan balsam is also present in some locations).
- 16.15 Towards to north, the north-east field supports a drier semi-improved grassland which is heavily encroached by scrub, brambles and patches of nitrophilous tall herb vegetation in places.
- 16.16 The most recent form of management of the Compensation Site was, until recently, grazing by horses. The Compensation Site may have been 'topped' as part of this, and it may have been cattle-grazed in the past. Horse grazing ceased recently, in advance of work at the Compensation Site by NPT to create a hibernaculum to receive reptiles relocated from a nearby development project. The vegetation of the two fields appears to have been inappropriately managed for some time, with the result that there is potential to:
 - a. Remove excessive scrub and manage the vegetation to retain it at optimal levels across the Compensation Site.
 - b. Cut a proportion of the rush-dominated vegetation year-on-year, in order to develop a more herb and grass-rich damp to marshy grassland sward, including removal of arisings.
 - c. Clear small patches of rush habitat to create shallow scrapes and potentially shallow ditches that will be seasonally wet, in order to diversify this area further.
 - d. Retain a proportion of the rush pasture and create open water / wetter areas within this.
 - e. Cut the grassland annually to encourage a more species-rich dry grassland sward, including removal of all arisings..
 - f. Control invasive Himalayan balsam by pulling plants at the growth stage of flowering but before they set seed.
 - g. Secure and maintain the boundaries of the fields to maximise their attractiveness as a grazing unit. If grazing by appropriate livestock can be secured at appropriate levels, then this could replace mowing of grassland and rush pasture vegetation and be undertaken at lower cost.
- 16.17 There is no public right of way onto or across the Compensation Site.



Overarching Aim

16.18 The overarching aim is to compensate for the loss of marshy grassland and willow scrub at the Development Site and to make for the long-term provision management of the Compensation Site.

Aims and general management principles

- 16.19 Several key habitats and species groups will be targeted in the management of the Compensation Site. These are:
 - a. Marshy grassland.
 - b. Semi-improved neutral grassland.
 - c. Rush pasture with, where conditions permit, open water in a mosaic.
 - d. Scrub, mature trees and dead wood.
- 16.20 The aims of management, a rationale for the inclusion of the key habitats / species groups and for the aims, general management principles, and indicators of success are as follows:

A. Create marshy grassland

Rationale

Creation of conditions suitable for the development of marshy grassland is the key reason for the consideration of off-site compensation measures arising from the proposed development at Waunsterw. Marshy grassland will only form where perennially wet soils are present, as at the Compensation Site, which provides this opportunity. Marshy grassland is also an important habitat for foraging birds, as well as for small mammals, invertebrates and flowering plants. It is a key component of the eastern end of the Waunsterw SINC and, as such, the provision of marshy grassland local to the Development Site is a the priority.

Current resource (at the Compensation Site)

There are no significant patches of marshy grassland at the Compensation Site. It is present to a very limited extent in places around damper, more open patches within the generally rushdominated areas, but as a whole the Compensation Site appears to have been under-managed (under-grazed) in the past. This is indicated by the dense and relatively uniform stands of rushes and the development of ranker areas of drier grassland with encroaching scrub and brambles.

Proposed measures and indicators of success

Cutting of rush pasture to open the sward and allow colonisation by more herbaceous and grassy species. Cut material could be collected and composted on site to provide localised habitat additions for the relocated population of slow worms.

The success of management should be judged over a 2-3 year timeframe, aiming for an agreed proportion of the current extent of dense rush habitat supporting developing a damp-marshy grassland habitat with a reasonable flowering plant content, and with a low percentage cover of rush species.

B. Enhance the interest of the grassland

Rationale

Neutral grassland is a Section 7 habitat that, in most cases, requires continuous and appropriate levels of management. Low-intensity interventions will encourage reversion to a flower-rich sward and increase the coverage and quality of neutral grassland locally. As such, the grassland interest should be maintained and enhanced.



Current resource (at the Compensation Site)

The grassland at the Compensation Site is moderately species-rich but appears under-managed and it is likely to be diminishing in interest and extent over time whilst inappropriate management prevails.

Proposed measures and indicators of success

Maintenance and enhancement of the grassland's interest and value will rely on timely and continued mowing or grazing at appropriate levels. At the current time, mowing is likely to be the most practical option, but the site should be capable of accommodating livestock if the opportunity arises, with cattle being the preferred type. The extent of grassland across the two fields should be maximised (subject to the presence of other target habitats) targeting the achievement of an open, moderately species-rich sward throughout. A more detailed survey and characterisation of the grassland will enable the identification of target / indicator species and success can then be judged against the occurrence of the target species across the Site.

C. Reduce the extent of the rush pasture habitat and maintain the remaining habitat in a mosaic with open water where conditions permit

Rationale

Dense rush pasture is a generally species-poor and uniform habitat, but in a mosaic with shallow open water and bare ground it is a valuable marginal wetland habitat, potentially of botanical and entomological interest.

Current resource (at the Compensation Site)

The habitat is dense and in places almost monocultural. Remnant interest remains where the habitat is more open.

Proposed measures and indicators of success

Create and periodically maintain shallow scrapes - and potentially narrow disconnected ditches - at the lowest points of the field (this should require minimal groundwork). Long-term success will be judged by the maintenance of around (say) 15% open water within the rush habitat, and up to 25-30% open water over winter (these proportions should take account of the prevailing weather conditions at the time).

D. Maintain scrub and other woody habitat at appropriate levels

Rationale

Scrub is a valuable habitat that adds structure and shelter, particularly for birds and invertebrates. However, the development of excessive scrub compromises the potential value of other habitats and can give rise to the loss of grassland and rush pasture. Excessive scrub and woodland will also tend to dry out the wetter areas of the Site.

Current resource (at the Compensation Site)

Scrub is currently present at less approximately [XXX]% coverage of the grassland [TO BE DETERMINED FOLLOWING CONSULTATION WITH NPT]. It is also encroaching around the rush pasture areas. In places mature trees are present and some patches of scrub are developing into woodland.

Proposed measures and indicators of success

Scrub should be maintained at levels to be agreed and, as these levels are established, the remaining scrub should be managed on a long rotation to maintain structural diversity. It may be appropriate to apply an appropriate herbicide to a proportion of cut stumps at the outset in order to get scrub levels to appropriate levels. Cut material can be placed in habitat piles to benefit reptiles and invertebrates, and chipped material can be used to create habitat piles or spread over scrub areas on site. Success will be judged through estimation of total scrub cover.