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ECOLOGICAL IMPACT ASSESSMENT

At

Plot 3A

Wrexham Industrial Estate
Bryn Lane
Wrexham
LL13 9UT

NGR: SJ 39340 50457

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A handwritten signature in black ink that reads 'K James'.

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EXECUTIVE SUMMARY

United Environmental Services Ltd (UES) was commissioned by FI Real Estate Management Ltd to carry out an Ecological Impact Assessment (EcIA) of a parcel of land at Plot 3A, Wrexham Industrial Estate, Bryn Lane, Wrexham.

The applicant is seeking to obtain planning permission for the construction of three industrial units with associated parking and access roads.

The land parcel has an area of approximately 20.9ha and was formerly used for industrial and agricultural purposes, prior to being left unmanaged for several years. The site contains large semi-improved species-rich grassland fields interspersed with ponds, small stands of woodland, hedgerows and scattered trees. Large areas of the site have succeeded into dense scrub and areas of bare ground and ephemeral / short perennial are present on previously developed land within the south-eastern section of the site. The south-western section of the site contains an area of amenity grassland and a large hardstanding compound used to store vehicles. A shallow stream runs along the northern site boundary and wet ditches are present along the western and part of the eastern site boundaries.

Since the initial walkover survey, the site boundary has been amended to incorporate an additional 4.5ha of adjacent land. This land comprises two agricultural grassland fields that are divided and bordered by hedgerows and trees. A dry and unvegetated ditch runs along part of the eastern boundary a pond surrounded by willow scrub is present within the northernmost field.

The EcIA has identified various impacts up to a county level due to the presence, or potential presence, of protected or species / habitats of principal importance within the site boundary or the surrounding area.

Mitigation and compensation measures are provided within section 7 of this report in order to reduce the impacts to insignificant levels. Furthermore, recommendations for enhancements are provided, which could improve the habitats locally following the development, resulting in a minor positive outcome.

The measures required to protect these ecological receptors from impacts will be fully detailed in an Ecological Design Strategy (EDS) which site staff can work to. Similarly, the landscaping and habitat provisions can be fully detailed in a Landscape and Ecological Management Plan (LEMP), including general site landscaping as well as the designated wildlife area. These documents must also include details of habitat management, timings, responsibilities, monitoring and contingency plans. These documents can be secured through an appropriately worded planning condition.

Provided that the measures within this report are followed, it is considered that the proposed development will be compliant with all relevant legislation and planning policy and that the aforementioned ecological receptors will not be significantly negatively impacted.

This report should be read with appendices 1 to 15, which provide GIS mapping, and key results of the further protected species and habitat surveys. Full details of the phase 2 survey results and methodologies are available within the respective ecological reports (as detailed in Section 1.4).

1 INTRODUCTION

1.1 Author, surveyors, qualifications and scope of study area

This report is written by Tom Kenwright BSc MSc, UES Senior Ecologist. Tom holds a level 5 Botanical Society for Britain and Ireland (BSBI) field identification skills certificate (FISC), which certifies him as competent to undertake phase 1 habitat and national vegetation classification (NVC) surveys. Tom is licensed by Natural Resources Wales to disturb, take and handle great crested newts (GCNs) *Triturus cristatus* under licence number S091022/1. Tom is named as an accredited agent on the Natural Resources Wales bat survey licence of Toby Hart (see below) and has been deemed competent and capable by the licence holder to disturb bats through observation, to handle bats and to undertake tree inspections using a torch and endoscope. Tom is trained in tree climbing and aerial rescue to CS38 Level.

This report has been verified by Toby Hart BSc MCIEEM PIEMA, UES Managing Director. Toby holds a level 6 BSBI FISC, which certifies him as competent to undertake phase 1 habitat and NVC surveys. Toby is licensed by Natural Resources Wales to disturb, take and handle great crested newts under licence number S086784/1. Toby is licensed by Natural Resources Wales to disturb, take and handle all species of bat other than greater horseshoe *Rhinolophus ferrumequinum* or lesser horseshoe *Rhinolophus hipposideros*, under licence number S086508/01. Toby is trained in tree climbing and aerial rescue to CS38 Level.

Additional surveyors discussed within this document and their qualifications include:

- Alasdair Grubb BSc ACIEEM, UES Ecologist. Alasdair holds a level 5 BSBI FISC, which certifies him as competent to undertake phase 1 habitat and NVC surveys. Alasdair is licensed by Natural Resources Wales to disturb, take and handle GCNs under licence number S090926/1. Alasdair is licensed by Natural Resources Wales to survey and monitor barn owl *Tyto alba* nest sites, for the purposes of monitoring the presence of the species and effectiveness of conservation efforts, including surveying sites to inform future development proposals under licence number S091016/1. Alasdair is named as an accredited agent on the Natural Resources Wales bat survey licence of Toby Hart and has been deemed competent and capable by the licence holder to disturb bats through observation, to handle bats and to undertake tree inspections using a torch and endoscope. Alasdair is trained in tree climbing and aerial rescue to CS38 Level.
- Mark Halliwell MBiol, UES Ecologist. Mark holds a level 4 BSBI FISC, which certifies him as competent to undertake phase 1 habitat and NVC surveys. Mark is trained in tree climbing and aerial rescue to CS38 Level. Mark is named as an accredited agent on the Natural Resources Wales GCN survey licence of Toby Hart and has been deemed competent and capable by the licence holder to disturb, take and handle GCNs. Mark is named as an accredited agent on the Natural Resources Wales bat survey licence of Toby Hart and has been deemed competent and capable by the licence holder to disturb bats through observation, to handle bats and to undertake tree inspections using a torch and endoscope
- Daniel Smith BSc MScRes, UES Ecologist. Daniel holds a level 3 BSBI FISC, which certifies him as competent to undertake phase 1 habitat surveys. Daniel is trained in tree climbing and aerial rescue to CS38 Level. Daniel is named as an accredited agent on the Natural Resources Wales bat survey licence of Toby Hart and has been deemed

competent and capable by the licence holder to disturb bats through observation, to handle bats and to undertake tree inspections using a torch and endoscope.

- Noah Fulton BSc, UES Graduate Ecologist. Noah holds a level 3 BSBI FISC, which certifies him as competent to undertake phase 1 habitat surveys.
- Jacob Miller BSc, UES Graduate Ecologist. Jacob holds a level 3 BSBI FISC, which certifies him as competent to undertake phase 1 habitat surveys.
- Robert Mooney MSc, UES Graduate Ecologist. Robert holds a level 3 BSBI FISC, which certifies him as competent to undertake phase 1 habitat surveys. Robert is trained in tree climbing and aerial rescue to CS38 Level.
- Paul Cassidy ACIEEM, UES Sub-contractor. Paul is licensed by Natural Resources Wales to disturb, take and handle all species of bats except greater and lesser horseshoes under licence number S088256/1.
- Lee RFD Knight BSc MCIEEM, UES Sub-contractor: Freshwater Ecology specialist.
- Andy Jukes BSc MCIEEM FRES, UES Sub-contractor: Conops Entomology Ltd.
- Sarah McLaren BSc, UES Sub-contractor.
- James Stubbs BSc, UES Sub-contractor.
- Mark Jeffries, UES Sub-contractor.
- Tilly Edwards, UES Sub-contractor.
- Jenny Gibbs, UES Administrator.

The report provides an assessment of the potential ecological impacts associated with the proposed development of a parcel of land known as Plot 3A at Bryn Lane, Wrexham Industrial Estate, Wrexham. The zone of influence considered within the scope of the survey includes all land within the red line boundary. Where relevant, other ecological resources, receptors and important habitats which are spatially separate from the site are considered.

1.2 Report objectives

UES was commissioned in 2022 to conduct an EclA for the proposed development. This was completed in order to:

- Establish the baseline conditions likely to be present on site at the time of the proposed development, by collecting information on the ecological resources or features which could be affected
- Identify possible impacts to any habitats, species and protected sites, which may arise as a result of implementing the construction and operational phases of the proposed development

- Assess the ecological / nature conservation importance of these resources and features, as well as assessing the significance of the identified impacts on them
- Identify potential requirement for mitigation or compensation, to ensure the safeguarding and / or conservation status of these resources or features
- Assess the importance and significance of residual effects associated with the mitigated and compensated development

1.3 Proposed development

The development proposals are for the construction of three industrial units with associated parking and access roads. The proposals include the retention of a significant area of habitat within the southern section of the site and an additional area within the eastern section of the site, hereby referred to as the ecological compensation area. This ecological compensation area will be subject to enhancement measures and managed as a community nature reserve, with access granted to the public or special interest groups by permit.

1.4 Structure of the report

This report describes the methods used to assess the existing baseline ecological conditions at the site and surroundings, the potential direct and indirect impacts of the development, the mitigation measures required to prevent, reduce or offset the impacts, and the residual impacts after the development.

This report should be read with appendices 1 to 15, which provide GIS mapping, and key results of the further protected species and habitat surveys. Full details of the phase 2 survey results and methodologies are available within the respective ecological reports.

The EcIA should also be read in conjunction with the following reports:

- Preliminary Ecological Appraisal – UES, 30th March 2023 V3, reference: UES03448/01
- Ground Level Tree Assessment – UES, 30th March 2023 V2, reference: UES03448/06
- Great Crested Newt Impact Assessment V2 – UES, 30th March 2023, reference: UES0338/07
- Reptile Presence / Absence Survey – UES, 30th March 2023 V2, reference: UES03448/08
- Great Crested Newt Population Size Class Assessment – UES, 30th March 2023 V2, reference: UES03448/09
- Breeding Bird Survey – UES, 30th March 2023 V2, reference: UES03448/11
- Bat Activity Survey – UES, 30th March 2023 V2, reference: UES03448/12
- National Vegetation Classification Survey – UES, 30th March 2023 V3, reference: UES03448/13
- Pond Assessment: Predictive System for Multimetrics (PSYM) – UES, 30th March 2023 V2, reference: UES03448/14
- Dingy Skipper Survey – UES, 30th September 2022, reference: UES03448/15
- Bat Aerial Tree Assessment & Presence / Absence Survey – UES, 30th March 2023 V2, reference: UES03448/16
- Badger Activity Survey – UES, 30th March 2023 V3, reference: UES03448/17



- Invertebrate Assessment – Conops Ecology Ltd, 29th September 2022, report number 19.22
- Great Crested Newt Method Statement V2 – UES, 30th March 2023, reference: UES03448/23
- Badger Method Statement – UES, 3rd October 2022, reference: UES03448/24

2 LEGISLATION

Of relevance to this ecological impact assessment are the provisions of the following Statutory Instruments and Acts of Parliament:

- Abandonment of Animals Act 1960;
- Countryside and Rights of Way (CROW) Act 2000;
- Environment (Wales) Act 2016
- Habitats Directive 1992;
- Hedgerow Regulations 1997;
- Protection of Animals Act 1911;
- The Conservation of Habitats and Species Regulations 2017;
- The Protection of Badgers Act 1992;
- Wildlife and Countryside Act 1981 (as amended);
- Invasive Alien Species (Enforcement and Permitting) Order 2019

The sections and outcomes of the above articles of legislation are detailed below for each species or habitat that is relevant to the scope of this assessment.

2.1 Habitats and species of principal importance

Section 6 of the Environment (Wales) Act 2016 places a legal obligation on public bodies in Wales to 'maintain and enhance biodiversity' whilst carrying out their functions. Section 7 of the act places a duty on Welsh Ministers to publish, review and revise lists of types of habitats and species in Wales which they consider are of key significance to sustain and improve biodiversity. The Welsh Ministers must also take all reasonable steps to maintain and enhance the habitats published in these lists and encourage others to take such steps.

2.2 Trees

Trees may be protected on an individual or group level through a Tree Preservation Order (TPO). In order to carry out works to trees with a TPO, prior written consent must be obtained from the Local Planning Authority. Trees may also be protected through a condition of planning consent or designated conservation areas.

2.3 Hedgerows

The Hedgerow Regulations 1997 are made under Section 97 of the Environment Act 1995 and came into operation on 1st June 1997. They aim to protect important hedgerows in the countryside by controlling their removal through a system of notification to the Local Planning Authority.

A hedgerow can only be considered for classification as "important" if it, or the hedgerow of which the section belongs to is over 20m in length (or which meets a hedgerow at either end) and has existed for 30 years or more.

2.4 Protected plant species

Schedule 8 of the Wildlife & Countryside Act 1981 (as amended) lists a number of plant species which are protected under Section 13 of the same legislation. As such, it is an offence to:

- Intentionally or recklessly pick, uproot or destroy a plant, or any seeds or spores attached to it, which is listed on Schedule 8
- Keep, transport, sell or exchange, or offer for sale or exchange any live or dead wild plant on Schedule 8, any part of the plant or anything derived from the plant

Penalties for offences include unlimited fines (formerly up to £5000), plus up to six months imprisonment, for each offence committed.

The Conservation of Habitats and Species Regulations 2017 extends European legislative protection to a further subset of plants. It is therefore an offence to pick, collect, cut, uproot, destroy or trade any plant listed in Schedule 4 of these Regulations, unless the appropriate licence is first obtained.

A large number of species of vascular plants, lichens, algae, fungi, mosses, stoneworts and liverworts are also protected through planning policy as species of principal importance, as required under Section 7 of the Environment Act (Wales) 2016.

2.5 Amphibians

2.5.1 Great crested newts

GCNs and their habitat (aquatic and terrestrial) are afforded full protection by the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. If both national and international legislation are taken together, it is an offence to:

- Deliberately, intentionally or recklessly kill, injure or capture GCNs
- Deliberately, intentionally or recklessly disturb GCNs in such a way to be likely to significantly affect:
 - their ability to survive, breed, reproduce, rear or nurture their young
 - their ability to hibernate or migrate
 - their local distribution or abundance
- Deliberately, intentionally or recklessly take or destroy the eggs of GCNs
- Damage or destroy breeding sites or resting places of GCNs
- Intentionally or recklessly disturb sheltering GCNs, or obstruct access to their resting place
- Keep, transport, sell or exchange, or offer for sale or exchange any live or dead GCN, any part of GCN or anything derived from GCNs

Penalties for offences include unlimited fines (formerly up to £5000), plus up to six months imprisonment, for each offence committed.

GCNs are also protected by the Protection of Animals Act 1911, which prohibits cruelty and mistreatment. Releasing a GCN in such a way as to cause undue suffering may be an offence under the Abandonment of Animals Act 1960.

In addition to the above, there are various statutory provisions relating to the transport of animals, designed to ensure their welfare.

GCNs are also listed as a species of principal importance under Section 7 of the Environment (Wales) Act 2016.

2.5.2 Other amphibians

More common British amphibians, such as common frog *Rana temporaria*, common toad *Bufo bufo*, smooth newt *Lissotriton vulgaris* and palmate newt *Lissotriton helveticus* are protected only by Section 9(5) of the Wildlife and Countryside Act 1981 (as amended). This section prohibits sale, barter, exchange, transporting for sale and advertising to sell or to buy.

The above common amphibian species are also listed as UK Species of Conservation Concern. Due to general declines in most British amphibian species in recent years, many local authorities require amphibian surveys as a planning condition, or as part of environmental information submitted as part of a planning application, even where the presence of GCN is ruled out.

Natterjack toad *Epidalea calamita* and pool frog *Pelophylax lessonae* are also offered the same level of protection as GCNs, through the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017.

Natterjack and common toad are also listed as species of principal importance under Section 7 of the Environment (Wales) Act 2016.

Waterbodies that support all five common species of British amphibians in high numbers, may be afforded protection in local plans, as Sites of Importance for Nature Conservation (SINC), or a similar equivalent, for sites of local importance. A site may require statutory protection as a Site of Special Scientific Interest (SSSI).

2.6 Reptiles

Common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix natrix* and adder *Vipera berus* are protected under the Wildlife and Countryside Act 1981 (as amended). They are listed as a Schedule 5 species therefore part of Section 9(1) and section 9(5) apply. The Countryside and Rights of Way Act 2000 also strengthens their protection. It is offence to:

- Intentionally or recklessly kill or injure any of the species listed above
- Sell, offer, advertise or transport for sale a live or dead animal of the species listed above

If a proposed development is likely to have an impact on these reptiles the local statutory nature conservation organisation must be consulted.

Sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca* receive full protection under the Wildlife and Countryside Act 1981 (as amended) and Conservation of Habitats and Species Regulations 2017. Read together, it is an offence to:

- Deliberately, intentionally or recklessly kill, injure or capture any sand lizards or smooth snakes
- Deliberately, intentionally or recklessly disturb sand lizards or smooth snakes in such a way to be likely to significantly affect:
 - their ability to survive, breed, reproduce, rear or nurture their young
 - their ability to hibernate or migrate
 - their local distribution or abundance
- Deliberately, intentionally or recklessly take or destroy the eggs of such an animal
- Damage or destroy breeding sites or resting places of such animals
- Intentionally or recklessly disturb sheltering sand lizards or smooth snakes, or obstruct access to their resting place
- Keep, transport, sell or exchange, or offer for sale or exchange any live or dead sand lizards or smooth snakes, any part of such an animal or anything derived from such an animal

Penalties for offences include fines of up to £5000, plus up to six months imprisonment, for each offence committed.

All reptile species (except for smooth snake) are also listed as species of principal importance under Section 7 of the Environment (Wales) Act 2016.

2.7 Badgers

European badgers *Meles meles* and their habitat are protected under The Protection of Badgers Act 1992 and are also included on Schedule 6 of the Wildlife and Countryside Act 1981, and Appendix III of the Bern Convention. The legislation affords badgers protection against deliberate harm or injury making it an offence to:

- Wilfully kill, injure, take, possess or cruelly ill-treat a badger (or attempt to do so)
- To interfere with a sett by damaging or destroying it
- To obstruct access to, or entrance of, a badger sett
- To disturb a badger whilst it is occupying a sett

Penalties for offences include fines of up to £5000, plus up to six months imprisonment, for each offence committed.

Works that disturb badgers whilst they are occupying a sett are illegal without a licence. Disturbance can occur even without direct interference or damage to the sett in question. In general, the following activities are likely to require a licence:

- Use of heavy machinery or significant earth moving within 30m of a sett
- Use of lighter machinery (usually any wheeled vehicles) within 20m of a sett
- Any digging, chain saw use or scrub clearance within 10m of a sett

2.8 Bats

In the United Kingdom, all species of bat and their roosts are afforded full protection under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (known as the “Habitats Regulations”). If both national and international legislation are taken together, it is an offence to:

- Deliberately, intentionally or recklessly kill, injure or capture a bat
- Deliberately, intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection
- Deliberately, intentionally or recklessly damage, destroy or obstruct access to any place that a bat uses for shelter or protection (even if the bat is not present at the time)
- Keep, transport, sell or exchange, or offer for sale or exchange any live or dead bat, any part of a bat or anything derived from a bat

Under UK law, a bat roost is *any structure or place which any wild [bat] ... uses for shelter or protection*. As bats often reuse the same roosts, legal opinion is that a roost is protected whether or not the bats are present at the time of the activity taking place.

Penalties for offences include unlimited fines, plus up to six months imprisonment, for each offence committed.

The following bat species are listed as species of principal importance under Section 7 of the Environment (Wales) Act 2016:

- Barbastelle *Barbastella barbastellus*
- Bechstein's bat *Myotis bechsteinii*
- Noctule *Nyctalus noctula*
- Common pipistrelle *Pipistrellus pipistrellus*
- Soprano pipistrelle *Pipistrellus pygmaeus*
- Brown long-eared bat *Plecotus auritus*
- Greater horseshoe
- Lesser horseshoe

2.9 Breeding birds

All wild birds, their nests and young are protected throughout England and Wales by the Wildlife & Countryside Act 1981 (as amended). It is illegal to kill, injure or take any wild bird, or damage or destroy the nest or eggs of breeding birds. The legislation applies to all bird species, common and rare.

In addition to the protection afforded to all wild birds, more vulnerable species listed on Schedule 1 of the Act receive enhanced protection when breeding. Schedule 1 species, including their dependent young, are protected from intentional or reckless disturbance whilst at or near the nest, in addition to the protection afforded the more common species.

The Environment (Wales) Act 2006 offers further protection to the nests of some species that regularly re-use their nests, even when the nests are not in use.

The leading governmental and non-governmental conservation organisations in the UK have reviewed the population status of 244 UK bird species. "Birds of Conservation Concern 5: the Red List for Birds" is the most recent publication summarising their findings. Three lists, Red, Amber and Green, have been produced based on the most up-to-date evidence available and criteria include conservation status at global and European levels and, within the UK: historical decline, trends in population and range, rarity, localised distribution and international importance. These lists are a valuable resource when considering conservation priorities.

2.10 Hazel dormouse

Hazel dormice *Muscardinus avellanarius* are offered full protection through the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. If both national and international legislation are taken together, it is an offence to:

- Deliberately, intentionally or recklessly kill, injure or capture dormice
- Deliberately, intentionally or recklessly disturb dormice in such a way to be likely to significantly affect:
 - their ability to survive, breed, reproduce, rear or nurture their young
 - their ability to hibernate or migrate
 - their local distribution or abundance
- Damage or destroy breeding sites or resting places of dormice
- Intentionally or recklessly disturb sheltering dormice, or obstruct access to their resting place
- Keep, transport, sell or exchange, or offer for sale or exchange any live or dead dormouse, any part of a dormouse or anything derived from a dormouse

Penalties for offences include unlimited fines (formerly up to £5000), plus up to six months imprisonment, for each offence committed.

Hazel dormice are also listed as species of principal importance under Section 7 of the Environment (Wales) Act 2016.

2.11 Invasive plant species

A number of invasive, non-native plant species are listed under Schedule 9 (Part II) of the Wildlife and Countryside Act 1981 (as amended). The most commonly encountered listed species in ecological surveys are Japanese knotweed *Fallopia japonica*, Montbretia *Crocsmia x crocosmiiflora* and variegated yellow archangel *Lamiasrum galeobdolon subsp. argentatum*. Section 14(2) of this Act makes it an offence to *plant or otherwise cause to grow in the wild (including as a result of development works)* any plant listed on Schedule 9 (Part II).

A number of invasive, non-native plants species are listed under Schedule 2 (Part II) of the Invasive Alien Species (Enforcement and Permitting) Order 2019. The most commonly encountered listed species in ecological surveys are Himalayan balsam *Impatiens glandulifera* and giant hogweed *Heracleum mantegazzianum*. Section 3 of this Act makes it an offence to *plant or otherwise causes to grow in the wild (including as a result of development works)* any plant which is listed on Schedule 2 (Part II).

Soil or plant material contaminated with non-native and invasive plants can cause ecological damage and may be classified as controlled waste. It is an offence to keep, treat or inappropriately dispose of waste that could harm the environment or human health. If there is any doubt, the local authority or Environment Agency should be contacted to confirm requirements.

2.12 European otter

European otter *Lutra lutra* are offered full protection through the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. If both national and international legislation are taken together, it is an offence to:

- Deliberately, intentionally or recklessly kill, injure or capture otters
- Deliberately, intentionally or recklessly disturb otters in such a way to be likely to significantly affect:
 - their ability to survive, breed, reproduce, rear or nurture their young
 - their ability to migrate
 - their local distribution or abundance
- Damage or destroy breeding sites or resting places of otters
- Intentionally or recklessly disturb sheltering otters, or obstruct access to their resting place
- Keep, transport, sell or exchange, or offer for sale or exchange any live or dead otter, any part of an otter or anything derived from otter

Penalties for offences include unlimited fines (formerly up to £5000), plus up to six months imprisonment, for each offence committed.

Otters are also listed as species of principal importance under Section 7 of the Environment (Wales) Act 2016.

2.13 Water vole

Water voles *Arvicola amphibius* are protected by the provisions of Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:

- Intentionally kill, injure or take water vole
- Possess or control live or dead water vole or any part of a water vole
- Intentionally or recklessly damage destroy or obstruct access to any structure or place which a water vole uses for shelter or protection, or disturb water vole using such a place
- Sell, offer, advertise or transport live or dead water voles for sale

Penalties for offences include unlimited fines (formerly up to £5000), plus up to six months imprisonment, for each offence committed.

Water voles are also listed as species of principal importance under Section 7 of the Environment (Wales) Act 2016.

2.14 White-clawed crayfish

White-clawed crayfish *Austropotamobius pallipes* are protected under the Wildlife and Countryside Act 1981 (as amended). They are listed as a Schedule 5 species therefore part of Section 9(1) and Section 9(5) apply. The Countryside and Rights of Way Act 2000 also strengthens their protection. It is offence to:



- Intentionally or recklessly kill or injure white-clawed crayfish
- Sell, offer, advertise or transport for sale a live or dead white-clawed crayfish

Penalties for offences include unlimited fines (formerly up to £5000), plus up to six months imprisonment, for each offence committed.

Their inclusion on the EC Habitats Directive allows areas to be designated as Special Areas of Conservation (SAC) for the presence of white-clawed crayfish. Such a designation brings legal protection under the Conservation of Habitats Regulations 2017, this includes how the site is managed and what development can occur on and in proximity to these sites.

White-clawed crayfish are also listed as species of principal importance under Section 7 of the Environment (Wales) Act 2016.

3 PLANNING POLICY

3.1 Planning Policy Wales

Guidance on nature conservation and planning policy is provided in Planning Policy Wales (Edition 11) Chapter 6 – Distinctive and Natural Places.

Section 6.5.4 of Planning Policy Wales states that ‘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, in particular the following aspects:

- diversity between and within ecosystems;
- the connections between and within ecosystems;
- the scale of ecosystems;
- the condition of ecosystems including their structure and functioning; and
- the adaptability of ecosystems’.

Section 6.4.6 states that ‘in fulfilling this duty, planning authorities must have regard to:

- the list of habitats and species of principal importance for Wales, published under Section 7 of the Environment (Wales) Act 2016;
- the State of Natural Resources Report (SoNaRR) for Wales 2020, published by Natural Resources Wales; and
- any Area Statement that covers all or part of the area in which the authority exercises its functions.’

Section 6.4.7 states that ‘Planning Authorities should also refer to up to date ecological survey information (where appropriate)’.

Section 6.4.21 states that ‘planning authorities must follow a stepwise approach to maintain and enhance biodiversity and build resilient ecological networks by ensuring that any adverse environmental effects are firstly avoided, then minimized, mitigated, and as a last resort compensated for; enhancement must be secured wherever possible.

1. The first priority for planning authorities is to avoid damage to biodiversity and ecosystem functioning. Where there may be harmful environmental effects, planning authorities will need to be satisfied that any reasonable alternative sites that would result in less harm, no harm or gain have been fully considered.
2. Planning authorities should ensure that features and elements of biodiversity or green infrastructure value are retained on site, and enhanced or created wherever possible, by adopting best practice site design and green infrastructure principles. The provision of up-to-date ecological survey information will assist in this process. Where necessary, planning authorities should seek to modify the development proposal through discussion with the applicant at the earliest possible stage. Biodiversity and green infrastructure modifications should draw on the issues and opportunities identified through the Green Infrastructure Assessment.
3. In some circumstances, it will be appropriate to attach planning conditions, obligations or advisory notes to a permission, to secure biodiversity outcomes. Planning

authorities should take care to ensure that any conditions necessary to implement this policy are, relevant to planning, relevant to the development to be permitted, enforceable, precise, and reasonable in all other respects.

4. When all other options have been exhausted, and where modifications, alternative sites, conditions or obligations are not sufficient to secure biodiversity outcomes, offsite compensation for unavoidable damage must be sought:
 - a. This should normally take the form of habitat creation, or the provision of long-term management arrangements to enhance existing habitats and deliver a net benefit for biodiversity. It should also be informed by a full ecological assessment before habitat creation or restoration starts.
 - b. The Green Infrastructure Assessment should be used to identify suitable locations for securing offsite compensation. Where possible, a landscape-scale approach, focusing on promoting wider ecosystem resilience, should help guide locations for compensation. This exercise will determine whether locations for habitat compensation should be placed close to the development site, or whether new habitat or additional management located further away from the site would best support biodiversity and ecosystem resilience at a wider scale.
 - c. Where compensation for specific species is being sought, the focus should be on maintaining or enhancing the population of the species within its natural range. This approach might also identify locations for providing species-specific compensation further away from the site. Where they exist, Spatial Species Action Plans should be used to help identify suitable locations.
 - d. Any proposed compensation should take account of the Section 6 Duty (Biodiversity and Resilience of Ecosystems Duty), and the five key ecosystem resilience attributes that it outlines. It should also be accompanied by a long-term management plan of agreed and appropriate mitigation and compensation measures.
5. Finally, where the adverse effect on the environment clearly outweighs other material considerations, the development should be refused.'

3.2 Local planning policy

3.2.1 Adopted Unitary Development Plan (UDP) 1996-2005 (adopted February 2005)

Wrexham County Borough Council's local planning policy pertaining to wildlife and biodiversity is set out in policies PS2, PS11 and GDP1, and chapter 5 (Environment and Conservation) of the Unitary Development Plan (UDP) 1996-2005 (adopted February 2005). Ecological policies relevant to the proposed development are summarised in the below subsections.

Policy PS2

'Development must not materially detrimentally affect countryside, landscape/townscape character, open space, or the quality of the natural environment.'

Policy PS11

'Encouragement will be given to proposals which improve the biodiversity value of sites and to the establishment of local nature reserves where the nature conservation and landscape interest of the land will be protected and enhanced.'

Policy GDP1

'All new development should:

...h) Safeguard sites and areas of nature conservation and wildlife interest, and to provide new habitats where there is an unavoidable loss of existing habitats and areas of wildlife interest.'

Policy EC4

'Development proposals should provide for the conservation and management of hedgerows, trees, orchards, woodland, wildlife and other natural landscape and water features, and include new planting in order to enhance the character of the landscape and townscape. Development which results in the loss or significant damage to valuable trees, important hedgerows or ancient woodland sites will not be permitted.'

Policy EC6

'Development either within or close to sites of biodiversity interest will only be permitted where it can be clearly demonstrated that the need for the development outweighs the need to safeguard the intrinsic nature conservation value of the site. Where such development is permitted, damage should be kept to a minimum, and compensatory measures should be provided. Measures to improve the biodiversity value of sites and enhance their natural conservation interest and landscape quality including the establishment of local nature reserves, will be supported.'

3.2.2 Emerging Local Development Plan 2 (LDP2) 2013 to 2028

Ecological policies within Wrexham County Borough Council's emerging Local Development Plan 2 (LDP2) 2013 to 2028, and relevant to the proposed development, are also summarised in the below subsections.

SP10 Wrexham Industrial Estate

'Wrexham Industrial Estate as shown on the proposals map is the County's Key Business Sector Area and will be the primary focus for new employment development over the plan period for Class B1, B2 and B8 employment. Land is also protected on the estate for a strategic ecological network for a number of local, national and internationally protected species and habitat.'

SP15 Natural environment

Development will only be permitted where it protects, conserves and enhances the natural environment including:

- Special Areas of Conservation, Special Protection Areas and Ramsar Sites
- Sites of Special Scientific Interest and National Nature Reserves
- Protected species and their habitats
- The Clywdian Range and Dee Valley Area of Outstanding Natural Beauty
- Local Wildlife Sites
- Local Nature Reserves
- Special Landscape Areas

- Natural landscape features and green infrastructure such as trees, hedges and woodland and the green networks between them which contribute to the quality and diversity of the natural environment and play an important role in mitigating the impact of climate change
- The quality of natural services including water, air and soils
- Habitats and species of principal importance to Wales

SP20 Green infrastructure

Wrexham's distinctive natural heritage provides a network of green and blue infrastructure. Protection, conservation and enhancement of natural heritage networks need to be reconciled with the benefits of development.

Development will be required to maintain the extent, quality and connectivity of multi-functional green infrastructure on or near a site and, where appropriate, to enhance it by:

- i. Creating new interconnected areas of green infrastructure between the proposed site and the existing network
- ii. Filling gaps in the existing network to improve connectivity
- iii. Protecting the features most valuable for both nature and people, and
- iv. In instances where loss of green infrastructure is unavoidable, provide mitigation and compensation for the lost assets on a site-specific basis.

NE1 Internationally and nationally designated nature conservation sites

Development likely to significantly affect any protected habitat, species or site of international importance, either alone or in combination with other plans or projects, will be subject to a Habitat Regulations Assessment (HRA). Development will only be permitted where it is possible to ascertain no adverse effect on the species or integrity of the habitat or site or where there are Imperative Reasons of Overriding Public Interest and compensatory measures are secured.

Permission for development likely to impact the special features of a Nationally Designated Site or protected species or habitat will only be granted in exceptional circumstances where appropriate compensation can be provided.

Development likely to affect any protected species will only be permitted when there is no satisfactory alternative and if there is no detrimental impact to the maintenance of the population concerned at a favourable conservation status in its natural range. The proposals must adequately demonstrate that they are for the purposes of preserving public health or safety or reasons of overriding public interest.

NE2 Locally designated sites of nature conservation and geological importance

Development which adversely impacts on the nature conservation and / or geological importance of locally designated sites, habitats and species will only be permitted in exceptional circumstances where it can be demonstrated that:

- i. There is no satisfactory alternative location for the development which avoids nature conservation impacts, and
- ii. Compensation measures are designed to ensure that there is no reduction in the overall nature or geological conservation value of the site

NE3 Trees, woodlands and hedgerows

Development will only be permitted where it does not cause unacceptable harm to trees, woodlands and hedgerows of significant public amenity, natural or cultural heritage value or those that provide important ecosystem services including mitigating the effects of climate change.



Development affecting all existing and new proposed woodlands should:

- i. Support proposals which assist in the respectful and appropriate use and protection of woodlands and boundary edges
- ii. Promote sustainable management to deliver multiple benefits, and
- iii. Support the relevant aims and objectives of the Wrexham Tree & Woodland Strategy 2016-2026 and all subsequent amendments

Where adverse effects cannot be avoided and sustainable integration is not possible then adequate mitigation will be required. In such cases development should include proposals for the planting of new trees, woodlands, and hedgerows within the site, ensuring connectivity between proposed and existing green infrastructure

4 METHODOLOGY

This section describes the details of the consultation, desk study and field surveys that have been undertaken to inform the baseline conditions and to assess the ecological / nature conservation value of the ecological receptors relevant to this assessment.

4.1 Consultation and review of data

In order to collate ecological information on species and / or habitats of interest that may be present, as well as to determine the geographical scope of the search area, a desk study was undertaken. The following sources were used:

- National – Using the UK Government’s Multi-Agency Geographical Information for the Countryside (MAGIC) website, information relating to statutorily protected sites was obtained. These sites were scoped to a distance of 10km from the proposed development site.
- County – As part of the Natural Resources Wales discretionary advice service, Toby Hart and Tom Kenwright attended two online consultation meetings with Matt Ellis, Senior Species Officer at Natural Resources Wales and Emma Broad, Biodiversity Officer at Wrexham County Borough Council. The purpose of the meetings was to discuss the proposed development and proposed mitigation and compensation measures in relation to planning policy and licensing procedures, with particular reference to GCNs.
- Local – As part of the assessment, a search for protected sites and records of protected or otherwise notable species within a 2km search radius around the proposed development site was obtained from COFNOD – North Wales Environmental Information Service.

4.2 Field surveys (including scoping and reasons for exclusion)

4.2.1 Preliminary Ecological Appraisal

Field survey

As part of a Preliminary Ecological Appraisal, a walkover survey was carried out on 23rd August 2021 by Tom Kenwright and Alasdair Grubb and on 8th September 2021 by Tom Kenwright. On 7th June 2022, Tom Kenwright conducted a walkover survey of an additional parcel of land that was added to the proposed development boundary to form the ecological compensation area. The purpose of the surveys was to identify, record and map dominant habitat types within the development area and highlight any further species surveys that may be required based on the quality of those habitats. When conducting the surveys particular focus was concentrated on the following species and habitat features:

- | | |
|------------------|-------------------------|
| • Amphibians | • Hedgerows |
| • Reptiles | • Plant communities |
| • Badger | • Invasive species |
| • Hazel dormouse | • Otter |
| • Bats | • Water vole |
| • Birds | • White-clawed crayfish |

- Trees

The habitats were assessed by using the phase 1 habitat survey technique, which is a system for environmental audit widely used within the environmental consultancy field. The survey was undertaken in accordance with the methodology in the 'Handbook for phase 1 habitat survey - A technique for environmental audit' (JNCC, 2010) as recommended by Natural Resources Wales, and in the "Guidelines for Preliminary Ecological Appraisal" (CIEEM, 2017).

The survey area encompassed all of the land within the development footprint and the land to a distance of 30m outside it where accessible.

The phase 1 habitat survey methodology was extended to record any signs of habitats suitable to support protected / invasive species and any incidental observations of other noteworthy species.

Since undertaking the original PEA walkover survey in 2021, the site has been subject to numerous protected species and habitat survey visits. During these surveys additional information has been gathered where available, including compiling a comprehensive botanical species list for each habitat present on site. Where necessary, the phase 1 habitat plan at Appendix 2 has been updated following detailed botanical surveys.

Limitations

The surveys were at appropriate times of year when most plant species are readily identifiable and sufficient vegetative identification was possible, allowing a robust assessment of habitats to be undertaken. There are considered to be no limitations to the results of the survey.

4.2.2 National Vegetation Classification survey

A detailed NVC survey was undertaken of the areas of grassland on site on 4th August 2022 by Tom Kenwright and Toby Hart.

Sampling of the vegetation was undertaken according to the methodology detailed in the NVC Users' Handbook (Rodwell, 2006) and British Plant Communities Volume 3 (Rodwell, 1992). This involved recording the plant species present within a series of 2m x 2m quadrats, which were placed within what were visually considered to be stands of homogenous vegetation. A minimum of five quadrats were recorded in each area where the vegetation was considered to potentially be representative of a distinct vegetation community. All plants recorded within a quadrat were assigned a DOMIN score, based on the percentage cover. The DOMIN scale is as follows:

Table 1 – The DOMIN scale of cover / abundance

COVER PERCENTAGE (%)	DOMIN SCORE
91 - 100	10
76 – 90	9
51 – 75	8
34 – 50	7
26 – 33	6
11 – 25	5
4 – 10	4
<4 (many individuals)	3

<4 (several individuals)	2
<4 (few individuals)	1

Frequencies were then assigned to each species recorded in each surveyed vegetative community based on how many quadrats the species was present within. The frequencies are as follows:

Table 2 – Species frequency classes and descriptions

PRESENCE OF SPECIES IN QUADRATS (%)	FREQUENCY CLASS	DESCRIPTION
1 – 20 (i.e. 1 stand in 5)	I	Scarce
21 - 40	II	Occasional
41 - 60	III	Frequent
61 - 80	IV	Constant
81 - 100	V	Constant

Analysis of field data

Following the completion of the field work, the plant communities surveyed were then classified according to NVC standards. This analysis was based on the following:

- The largely dichotomous key to vegetative communities within the British Plant Communities Vol. 3
- Computer analysis using the Modular Analysis of Vegetation Information System (MAVIS) software package, created by the Centre for Ecology and Hydrology (CEH)
- Comparison of floristic tables and community descriptions within the British Plant Communities Vol. 3
- Surveyor experience

Comparison with selection criteria for Wildlife Sites in Wales

Within Wales, non-statutory protected sites that have biological designation features (opposed to geological features) are referred to as Wildlife Sites. No specific selection criteria are available for Wildlife Sites within Wrexham County and so the grassland communities on site have been compared with the 'Wildlife Sites Guidance Wales, A Guide to Develop Local Wildlife Systems in Wales' (Wales Biodiversity Partnership, 2008).

Neutral grassland features as a habitat type in the selection guidelines for Wildlife Site Guidance Wales, which makes specific reference to the lowland meadow habitat type. The guidance describes lowland meadows as 'those which have developed on soils which are not strongly of either an acidic or basic nature and are typically of moderate fertility. Key grasses include species such as crested dog's-tail *Cynosurus cristatus*, red fescue *Festuca rubra*, common bent *Agrostis capillaris* and in some cases false oat-grass *Arrhenatherum elatius* and Yorkshire fog *Holcus lanatus*.'

Table 3 within Appendix 1 of the selection criteria document also contains a list of species indicative of unimproved neutral grasslands in South Wales.

The document suggests that the following should be considered for selection as local wildlife sites:

- All examples of:
 - Meadow foxtail - great burnet grasslands (MG4)
 - Crested dog's-tail - common knapweed grasslands (MG5)
 - Crested dog's-tail - marsh marigold grasslands (MG8)
- All relatively species-rich neutral grasslands (which could include MG1, MG6 & MG10 communities) of any significant extent.
- Examples of neutral grasslands that contain uncommon species, such as whorled caraway *Carum verticillatum* or adder's tongue *Ophioglossum vulgatum*.

Comparison with habitats of principal importance

The presence of any Habitats of Principal Importance for the conservation of biodiversity as listed within Section 7 of the Environment (Wales) Act 2016 were determined by comparing the surveyed grasslands against the published criteria for Habitats of Principal Importance (formerly UK BAP Priority Habitats).

The description for lowland meadow Habitat of Principal Importance doesn't have strict selection criteria based on the presence or absence of specific species and instead states the following:

"A wide-ranging approach is adopted in this plan to lowland grasslands treated as lowland meadows. They are taken to include most forms of unimproved neutral grassland across the enclosed lowland landscapes of the UK. In terms of National Vegetation Classification plant communities, they primarily embrace each type of Cynosurus cristatus-Centaurea nigra grassland, Alopecurus pratensis-Sanguisorba officinalis floodplain meadow and Cynosurus cristatus-Caltha palustris flood-pasture. The plan is not restricted to grasslands cut for hay, but also takes into account unimproved neutral pastures where livestock grazing is the main land use."

These National Vegetation Classification (NVC) plant communities are: MG5 Crested Dog's-tail – Common Knapweed; MG4 Meadow Foxtail – Great Burnet; and MG8 Crested Dog's-tail – Marsh marigold. Grasslands representative of these NVC communities should therefore be considered to qualify as the lowland meadow Habitat of Principal Importance.

Limitations

The NVC survey was undertaken on the 4th August 2022, at an appropriate time of year to undertake grassland surveys. In May 2022, some of the grasslands on site were mown. As such, the NVC survey was postponed until later in the year when sufficient growth was present. At the time of the survey, the grassland swards were considered to be representative of the pre-mowing conditions and the same species and associated abundances were observed as during the PEA walkover survey in September 2021, prior to mowing. As such, it is considered that this management intervention is not a significant limitation on the NVC survey or its conclusions.

4.2.3 Predictive System for Multimerics (PSYM) survey

Field survey

Six ponds are present within the site boundary, four of which will be directly affected by the development proposals. The locations of the ponds are shown at Appendix 7 – Pond plan.

The ponds were surveyed on 11th August 2022 by Lee Knight, Toby Hart, Tom Kenwright, Mark Halliwell and Alasdair Grubb.

Environmental data was collected through observation and use of a Hanna Instruments pHep4 pocket pH and temperature meter.

In accordance with PSYM guidelines, the distinct mesohabitats within the ponds were identified and characterised prior to sampling. A 3-minute hand-net sample was then taken, with the total time divided equally between the different mesohabitats present. Each mesohabitat was netted vigorously to collect macroinvertebrates, whilst habitats which require disturbance to capture macroinvertebrates were kick-sampled immediately prior to netting the disturbed area. A further 1-minute search was then carried out searching for animals which may have otherwise been missed in the 3-minute sample. Areas which might be searched include the water surface (e.g., for whirligig beetles, pond skaters etc.) and under stones and logs (for limpets, snails, leeches, flatworms etc.).

The captured invertebrates were then identified to family level for most groups and class level for oligochaetes and recorded on the PSYM survey proformas. Once completed, the proformas were sent to the Freshwater Habitats Trust for comparison to ponds nationally.

Limitations

The surveys were undertaken following a prolonged dry period. As a result, Ponds 3, 5 and 6 were completely dry at the time of the survey, however these ponds are not due to be affected by the development proposals, so were not due to be surveyed anyway. The southern lobe of Pond 4 was dry at the time of the survey, so although a full botanical species survey could be undertaken, invertebrates could only be sampled from the northern section of the pond. This is not considered to be a significant limitation, as the majority of the invertebrates will have moved to the northern lobe as the southern lobe dried up.

4.2.4 Great crested newt impact assessment, eDNA and population size class assessment

Impact assessment

A site visit was undertaken on 16th February 2022 by Noah Fulton, Tom Kenwright, Alasdair Grubb, and Robert Mooney to survey the onsite ponds. A further survey was conducted by Noah Fulton and Tom Kenwright on 23rd February 2022 to survey the offsite ponds and ditches. All accessible ponds, ditches, and aquatic features on site and within 500m of the site boundary were assessed for their potential to support GCNs using the HSI. The HSI is a tool used to provide a numerical indication of the quality of a waterbody in terms of GCN breeding and associated habitat requirements on a scale of 0-1 (0 indicating unsuitable habitat, 1 representing optimal habitat).

HSI scores incorporate ten Suitability Indices (SIs), all of which are factors thought to affect GCNs, namely:

SI 1: Site location	SI 6: Waterfowl presence
SI 2: Size of pond	SI 7: Fish presence
SI 3: Pond permanence	SI 8: Number of ponds within 1km
SI 4: Water quality	SI 9: Terrestrial habitat
SI 5: Perimeter shading	SI 10: Macrophyte cover

In some cases, a net may be used to assess certain SIs, such as water quality. Once a measurement or category has been given for each SI this can then be converted to a figure between 0 and 1 for use in the HSI calculation. This figure is either translated from an assigned category or measurement or read from a graph in the case of a percentage or number.

The HSI is then calculated from the following formula:

$$\text{HSI} = (\text{SI1} \times \text{SI2} \times \text{SI3} \times \text{SI4} \times \text{SI5} \times \text{SI6} \times \text{SI7} \times \text{SI8} \times \text{SI9} \times \text{SI10})^{1/10}$$

This will give a final HSI result between 0 and 1, providing a measure of habitat suitability for GCN.

The information gathered from the survey was used to provide a likelihood of GCNs and other amphibians being present in the area, in both aquatic and terrestrial habitats.

The proposed development, based on the plans provided, was also assessed for the potential to cause harm to GCNs (if present) using the Natural England Rapid Risk Assessment Tool.

All ponds were noted on the pond plan (Appendix 7).

Limitations

Despite the survey being conducted in February, vegetation growth and invertebrate activity were sufficient to provide a robust assessment of aquatic habitats.

Access permission was requested but not granted for thirty ponds and four ditches on third party land and therefore these ponds were not subject to GCN IA. For all ponds that were not accessible, it has been assumed that GCN are present within these ponds and will be assessed as 'worst case scenario'. Therefore, this is not considered to be a significant limitation to this assessment.

Ponds 49 and 50 were mapped after the impact assessment walkover had been undertaken. These ponds were created as part of a compensation strategy for the adjacent development. The ponds are fenced off and are still early in the colonisation of aquatic vegetation, so GCN are unlikely to be present. Therefore, it is not considered as a significant limitation.

Pond 28 had access permission granted however, due to the dense scrub vegetation surrounding the pond it was not possible to carry out an impact assessment.

Due to the presence of dense bramble *Rubus fruticosus agg.* scrub surrounding Pond 3 only one third of the pond was accessible on the north and west aspects. However, an impact assessment was able to be achieved.

GCN eDNA and PSCA

The survey methodology followed that of Natural England's GCN mitigation guidelines (2001). Standard presence / absence surveys require four site visits, however when presence has been confirmed, a further two visits (total of six) are required to assess the size of the population within a pond. Surveyors included Toby Hart, Tom Kenwright, Alsadiar Grubb, Mark Halliwell, Daniel Smith, Robert Mooney, Jacob Miller, Noah Fulton, James Stubbs, Mark Jefferies and Jenny Gibbs.

Surveys used a combination of at least three of the four recommended survey methods (bottle trapping, netting, torching and egg searching), as detailed in the following subsections. All amphibian species observed during the surveys were recorded, along with their gender and life stage, if possible, to determine.

Bottle trapping

Bottle traps are placed around the margins of the pond and are left overnight, before collecting them early the following morning. Where safe to do so, traps should be set all around the pond at a density of one trap per two metres of shoreline. Some studies indicate that bottle trapping is the most reliable method for detecting the presence of GCN, and it is especially useful for surveying turbid or weed-covered ponds. This method also allows the accurate identification of any amphibians caught. Bottle traps should not be used where there is a risk of disturbance by people or animals, or when the overnight air temperature drops below 5°C, or during very hot weather when water temperatures will be high and dissolved oxygen levels low.

Torching

GCNs can be searched for at night using a powerful torch. In clear ponds this can be a very effective way of detecting and counting newts during the breeding season, but this method can be limited in heavily vegetated or turbid ponds. It is recommended that the entire margin of the pond is walked once, slowly checking for newts. Surveys should only take place when the night air temperature is > 5°C and there is no or little wind or rain to disturb the water's surface.

Netting

GCNs can be captured by sampling the area around the pond edge using a long-handled net. There should be at least 15 minutes of netting per 50m of shoreline. Netting should be undertaken with care so as to minimize damage to beds of submerged aquatic vegetation which may contain newt eggs and / or larvae.

Egg search

All native newts lay eggs singly on submerged leaves of aquatic plants and other suitable submerged items. Careful examination of pond vegetation can therefore be used to establish the presence of newts in a pond during the breeding season. GCN eggs can be distinguished from other newt species' eggs, therefore enabling species-specific presence / absence to be determined.

Environmental DNA (eDNA) testing

Where GCN presence had not already been confirmed through the other survey methods prior to 30th June, eDNA samples were also taken to aid in determining the likely presence or absence of GCNs.

eDNA testing provides a GCN presence / absence result from water samples taken from a pond, following specific protocols detailed in Biggs *et al.*, 2014. These protocols have been approved by Natural England as a method to determine GCN presence or absence in a waterbody, within the newt breeding season, from 15th April to 30th June.

Using the sterile kit provided from a laboratory, 20 water samples were taken from intervals around each pond and then mixed together. From there, a 15ml sample was transferred into

each of the 6 sample tubes, which contained a preserving fluid. The samples were sent to the laboratory for analysis as soon as possible. If required, samples were refrigerated until they were sent to the laboratory.

PSCA timings

Table 3 – GCN PSCA survey timings

Date	Site visit number							
	Pond 3	Pond 4	Pond 5	Pond 6	Pond 24	Pond 26	Pond 34	Ditch 1
21-22/03/2022	1	1	1	-	-	-	-	-
23-24/03/2022	-	-	-	-	1	1	-	-
07-08/04/2022	-	-	-	-	-	-	1	-
11-12/04/2022	2	-	2	1	-	-	-	-
19-20/04/2022	-	2	-	2	2	2	-	-
26-27/04/2022	3	3	3	3	3	3	-	1
01-02/05/2022	4	4	4	4	4	4	-	2
06-07/05/2022	5	-	5	-	-	-	-	-
07-08/05/2022	-	-	-	-	-	-	2	3
10-11/05/2022	-	5	-	-	-	-	3	-
21-22/05/2022	-	-	-	5	5	5	4	4
28-29/05/2022	6	6	6	-	-	-	5	5
13-14/06/2022	-	-	-	6	6	6	6	6

All surveys were undertaken during suitable weather conditions.

Survey limitations

Of the forty-seven offsite ponds located within 500m of the proposed development site, seven were granted access. Permission to gain access to undertake surveys of these ponds was sought by FI Real Estate Management through a letter, however access was not granted by the landowners of the other offsite ponds. This limitation has been considered and taken into account within the evaluation and recommendations sections of this report.

Pond 6 was dry during the last survey visit. Five visits were able to fully survey the pond and Visits 4 and 5 found no GCN present. Therefore, it is not considered to be a significant limitation to the survey.

Access to Pond 34 was not granted during the 4th visit due to security issues with the third-party owner. The other five visits found no presence of GCN and the eDNA only had 1 out of 12 replicants which suggests that the pond is used by a low number of GCN or used on a transient basis. Therefore, it is not considered to be a significant limitation to the survey.

A water vole *Arvicola amphibius* was found within one of the bottle traps in Ditch 1 during the 4th visit, therefore, no further bottle trapping was undertaken during visit 5 and 6. However, torching, netting and terrestrial refugia searches were still undertaken which meets the recommendations set out in Natural England's GCN Mitigation Guidelines (2001). This is not considered to be a significant limitation to the survey.

4.2.5 Reptile presence / absence survey

The methodology of the field survey broadly follows that detailed in Froglife Advice Sheet 10: Reptile Survey (1999), which is used as a standard technique for reptile surveys across the UK.

Three standard survey techniques were employed in the search for reptiles: a walkover survey, *in situ* refugia and artificial refugia. To ascertain presence or likely absence of reptiles on a site, seven site visits are required. If reptiles are found to be present, further site visits are required to assess the size classes of any reptile population present.

Walkover survey

Surveyors walked slowly between refugia locations, examining suitable basking places to record any incidental sightings of reptiles.

In situ refugia

Where present, log piles and discarded potential refugia, such as corrugated metal and bitumen sheets, were examined during site visits.

Artificial refugia

Artificial refugia were laid throughout suitable reptile habitats on site and examined on each site visit.

Refugia consisted of bitumen coated corrugated sheets and felt as well as metal corrugated sheets, all of which measured approximately 0.5m x 0.5m. These refugia warm up quickly and retain heat, thus attracting reptiles. A combination of materials were used as each material has different thermal properties. Metal sheets gain and lose heat quicker than bitumen coated sheets, and therefore each can be more suitable to different reptiles in different situations. The refugia were collected upon completion of the survey work.

Froglife (1999) guidance recommends a density of 10 artificial refugia per hectare of suitable habitat, however it is recognised that other guidelines recommend in some instances a higher density is needed to fully assess reptile use of a site. The total site area is approximately 19 hectares, as such 225 artificial refugia were deployed at the site. The resulting refugia density of 11.8 refugia per hectare was deemed sufficient to establish reptile presence or likely absence given that a percentage of the site has low suitability to support reptiles.

The refugia were left to bed down for more than 14 days prior to the first checks. During this time they develop favourable conditions, such as suitable humidity and temperature gradients, and the reptiles become more familiar with them.

Timing and weather conditions

Table 4 – Reptile survey timings and weather conditions

SITE VISIT N ^o	DATE	TEMP. (°C)	CLOUD COVER (%)	WIND	RAIN
Refugia laid	14/03/2022	10	100	Light Breeze	Light Rain
1	04/04/2022	10	100	Light Breeze	Dry

2	08/04/2022	8	50	Very Light Breeze	Dry
3	11/04/2022	8	100	Moderate Breeze	Dry
4	13/04/2022	14	50	Light Breeze	Light Drizzle
5	14/04/2022	14	30	Light Breeze	Dry
Refugia re-laid	30/06/2022	15	60	Calm	Light Rain
6	04/07/2022	14	40	Calm	Dry
7	11/07/2022	28	10	Calm	Dry
8	01/08/2022	21	80	Very Light Breeze	Dry
9	11/08/2022	27	0	Calm	Dry
10	15/08/2022	19	50	Light Breeze	Light Drizzle
11	11-12/09/22	15 to 18	75	Light Breeze	Light Drizzle
12	26/09/2022	14	70	Moderate breeze	Dry - Rain
13	04/10/2022	17	100	Light breeze	Light Drizzle

Survey limitations

A number of the refugia sheets were damaged prior to survey six being conducted. Replacement traps were re-laid on the 30th June 2022 and additional surveys have been undertaken.

The open central sections of the fields were excluded from the survey area due to their poor suitability to support reptiles. Instead, refugia were concentrated along linear features such as woodland borders, hedgerows and areas of scrub, which offer the highest value habitat for reptiles on site.

Since the initial walkover survey, the site boundary has been amended to incorporate an additional 4.5ha of mitigation land. Although the field boundaries have suitability to support reptiles this area was excluded from the survey area as it forms part of the mitigation proposals only and will not be subject to development.

4.2.6 Breeding bird survey

The survey methodology broadly followed the BTO / JNCC / RSPB breeding bird survey technique. This technique records the location and movements of individual birds present within a defined survey area.

Six site visits were undertaken between March and August 2022, in order to undertake population territory mapping of key bird species found on site. All but one of the surveys were started within one hour of sunrise, in order to observe the period of peak bird activity. One survey was undertaken within 1 hour of sunset in order to record species which are more active in the evening and at night. Weather conditions during each survey were recorded and

are presented in the table below. Site visits were not undertaken in heavy rain, very poor visibility or strong wind.

Table 5 – Breeding bird survey timings and weather conditions

SITE VISIT N ^o	DATE	Temp (°C)	CLOUD COVER (%)	RAIN (%)	WIND (0-12)	VISIBILITY
1	18/03/2022	1 – 5	0	0	4	Good
2	13/04/2022	11	100	5	2	Good
3	09/05/2022	8 – 10	90	0	2	Good
4	21/06/2022	10 – 13	15	0	1	Good
5	19/07/2022	22	15	0	2	Good
6	11/08/2022	10 – 19	0	0	1	Good

On each survey visit, a pre-determined transect route was walked throughout the survey area by the surveyor, equipped with binoculars. The surveyor stopped at several points during the transect, where a good vantage point of the site was possible; this was done to enable the surveyor to observe bird behaviours. The starting point and route direction were varied during each survey to reduce survey bias (see Appendix 12).

During the survey visits, the following details were recorded:

- Bird species, numbers, age and sex (where possible)
- Bird behaviour (e.g. singing, calling, feeding, territorial aggression)
- Any associations with particular habitat types or locations

These registrations were recorded on a map using the recognised BTO species codes (see Appendix 12).

The data collected were then assessed and bird species were categorised according to the following definitions:

- **Confirmed breeding:** Includes species for which territories were positively identified as a result of the number of registrations, the location of an active nest and the presence of recently fledged young.
- **Likely breeding:** Includes a pair observed in suitable nesting habitat in the breeding season, agitated behaviour and / or alarm calls from adults suggesting the probable presence of a nest or young nearby. Behaviour observed on an insufficient number of occasions to confirm the presence of a territory.
- **Possible breeding:** Includes species observed in breeding season in suitable nesting habitat with a singing male present or breeding calls heard.
- **Non-breeding:** Fly over species observed but suspected to be still on migration or summering non-breeders.

In addition to the targeted bird surveys, a suite of ecological surveys have been undertaken on the site by UES throughout 2022 and incidental records of key bird sightings were also recorded; these incidental records contribute to the site species list (Appendix 13) and are

included in the discussion of the breeding bird survey report. The field survey data was then analysed in relation to the conservation status of each species recorded on site. Species conservation status is based on the following recognised lists:

- Global IUCN Red List of Threatened Species: Extinct, Critically Endangered, Endangered, Vulnerable or Near Threatened
- Birds of Conservation Concern 5 List (BoCC): Red, Amber or Green
- Population Status of Birds in Wales list (PSBW): Red, Amber or Green

The data were also analysed against the following articles of legislation:

- Wildlife and Countryside Act, 1981 (WCA): Schedule 1 species
- Environment (Wales) Act 2016: Section 7 species
- The EU 'Birds Directive': Annex 1 species
- UK Rare Breeding Birds Panel species

Survey limitations

The surveys were undertaken at an appropriate time of year during optimal weather conditions. Sufficient information was ascertained during the surveys to enable full territorial analysis of key bird species. Therefore, there are considered to be no limitations to the survey.

4.2.7 Ground level assessment of trees for bats

A ground-level assessment was carried out of all trees on site between the 15th February and 4th April 2022, using binoculars and a high-powered torch. Trees were inspected on all aspects and assessed for their potential to contain roosting bats, based on the number and quality of suitable roosting features present, as detailed in BS8596:2015 Surveying for Bats in Trees and Woodland and BCT guidelines (Collins, 2016). Surveyors present included Mark Halliwell, Alasdair Grubb, Daniel Smith, Robert Mooney and Noah Fulton.

Potential roosting features, as described in Bat Roosts in Trees (Bat Tree Habitat Key, 2018) are listed in Table 6 below.

Table 6 – Types of PRFs found in trees

DISEASE & DECAY FEATURES	DAMAGE FEATURES	ASSOCIATION FEATURES	OTHER FEATURES
Woodpecker holes	Lightning strikes	Fluting	Bat boxes
Squirrel holes	Hazard beams	Ivy	Bird boxes
Knot holes	Subsidence cracks		
Pruning cuts	Shearing cracks		
Tear-outs	Transverse snaps		
Wounds	Welds		
Cankers	Lifting bark		
Compression forks	Desiccation fissures		
Butt rots	Frost cracks		

Based on the quality of features present, trees were given a rating of negligible, low, moderate or high suitability for roosting bats.

Where accessible, PRFs at ground level were inspected with an endoscope by the licensed ecologist, in order to identify any roosting bats or field signs of bats and to inspect the internal conditions of the PRF. Field signs of bats include:

- Scratches, staining or droppings around entry points or within a cavity
- Presence of bat-fly cases
- Odour
- Smoothing of surfaces around cavity
- Audible chattering / squeaking at dusk or in warm weather (during the active season)

Survey limitations

The trees were surveyed relatively early in the year when bats are spending large amounts of time in torpor. However, this type of survey can be carried out at any time of year, and bats use different types of tree roosts at different times of year. Moreover, due to a lack of vegetation cover a more detailed ground-level assessment was possible than if the surveys were conducted in the summer months. Therefore, this is not considered to be a significant limitation to the survey.

4.2.8 Aerial assessment and bat presence / absence surveys of trees

Aerial tree assessment

Where the ground-level assessment highlighted suitable PRFs which were not accessible from ground level, the trees were climbed using ropes and harnesses by trained professionals in order to inspect the features more closely using an endoscope. Trees were inspected on all aspects and assessed for their potential to contain roosting bats, based on the number and quality of suitable roosting features present, as detailed in BS8596:2015 Surveying for Bats in Trees and Woodland and BCT guidelines (Collins, 2016). A total of 12 trees were subject to aerial inspections (T3, T6, T7, T8, T9, T10, T11, T12, T14, T15, T34 and T35).

Potential roosting features, as described in Bat Roosts in Trees (Bat Tree Habitat Key, 2018) are listed in Table 6 above.

In addition to assessing the suitability of potential roosting features, the PRFs were inspected in order to identify any roosting bats or field signs of bats and to assess the internal conditions. Field signs of bats can include:

- Scratches, staining or droppings around entry points or within a cavity
- Presence of bat-fly cases
- Odour
- Smoothing of surfaces around cavity
- Audible chattering / squeaking at dusk or in warm weather (during the active season)

Based on the availability of new information from the close inspection of features during the aerial inspection, trees were either kept as the having the same roosting suitability as

assessed during the ground level assessment or were re-classified as negligible, low, moderate or high suitability.

Trees still considered to have moderate or high potential to support roosting bats following the initial aerial inspection, and which contained features which could confidently be fully inspected with an endoscope, were subject to additional aerial inspections (total of two inspections for trees with moderate potential and total of three inspections for trees with high potential). All aerial inspections were carried out between 26th July and 12th September 2022 and at least half of all inspections of each tree were undertaken during the peak bat survey season of May to August inclusive, as per BCT guidelines. The surveys were undertaken by Toby Hart, Mark Halliwell, Alasdair Grubb, Daniel Smith and Noah Fulton.

Bat presence / absence surveys

During the ground-level and aerial tree inspections, a total of six trees (T3, T6, T7, T10, T35 & T45) were found to contain features which could not be fully inspected with an endoscope (e.g. due to the shape or depth of the cavity) or were unsafe to climb. As such, these trees were subject to further bat presence / absence surveys. During these surveys, all potential roosting features within these trees were covered by a surveyor or infrared camera during the dusk emergence or dawn re-entry periods. Surveyors present included Toby Hart, Mark Halliwell, Alasdair Grubb, Daniel Smith, Robert Mooney, Noah Fulton, Jacob Miller, Paul Cassidy, Mark Jeffries and Tilly Edwards.

Bat echolocation, flight and habitat characteristics were recorded where possible, in order to determine the species. The level and type of bat activity was also recorded to establish how bats are using the site.

Equipment

BATLOGGER M bat detectors and recorders were used during the surveys. This device records bat echolocation calls across the full spectrum, with a sensitivity range of 10 – 150 kHz. The integrated heterodyne live monitoring also allows the observer to hear the echolocation calls in real time, with automatic tuning. The recordings are individually time/date, GPS and temperature stamped, and are of high enough quality to produce time expansion quality sonograms.

Anabat Walkabout bat detectors were also used during the surveys. This allowed the observer to hear bat echolocation calls and see the sonograms in real time, aiding identification. All registrations were automatically recorded onto a memory card and time/ date stamped. The device can record and display both zero crossing and full spectrum bat echolocation calls and has a built-in GPS and mapping system.

Anabat Scout bat detectors were also used during the surveys. This allowed the observer to hear bat echolocation calls in real time, with automatic tuning. All registrations were automatically recorded onto a memory card and time/ date stamped. The device can record and display both zero crossing and full spectrum bat echolocation calls and has a built-in GPS and mapping system.

Canon XA11 Professional Video Cameras were used in conjunction with infra-red LED illuminators to monitor PRFs within trees during the surveys. Footage of the survey was recorded and reviewed post-survey. This enabled a more thorough assessment of the use of the trees throughout the entirety of the survey. This ensured that any bats using the trees were identified, even when ambient light levels prohibited surveyors from observing bats.

Weather conditions

Table 7 – Bat presence / absence survey timings and weather conditions

DATE	SURVEY TYPE	TIMINGS	SUNSET / SUNRISE	TEMP.	WIND	RAIN	CLOUD COVER
30/08/22	Re-entry	04:48 – 06:33	06:18	15°C	Light breeze	Dry	20%
14/09/22	Emergence	19:15 – 21:00	19:30	14°C	Light breeze	Light drizzle	100%
26/09/22	Emergence	18:46 – 20:31	19:01	12°C	Intermittent moderate breeze	Moderate rainfall until 19:25	100%

Survey limitations

Moderate rainfall was recorded during the emergence survey carried out of 30th September 2022. However, levels of bat activity recorded were mostly consistent with previous surveys and so this is not considered to be a significant limitation.

4.2.9 Bat activity survey

Bat activity surveys were carried out from April to October 2022 inclusive by the following surveyors: Toby Hart, Mark Halliwell, Alasdair Grubb, Daniel Smith, Noah Fulton, Jacob Miller, Paul Cassidy, Mark Jeffries, Tilly Edwards and James Stubbs. The survey consisted of walked transect surveys and static detector surveys.

Transect survey

One transect route across the site was mapped following the PEA and covered a distance of 3.2km. Care was taken to cover the entire site, especially any habitats considered to be of particular suitability for roosting, foraging or commuting bats. The transect route is provided at Appendix 11 – Bat activity survey plan.

The site is considered to present moderate suitability habitat for bats, therefore one survey visit was carried out each month, from April to October inclusive.

During each survey visit, two surveyors walked slowly along the transect route, equipped with Elekon Batlogger M bat detectors and recorders. This device records bat echolocation calls across the full spectrum, with a sensitivity range of 10 – 150 kHz. The integrated heterodyne live monitoring also allows the observer to hear the echolocation calls in real time, with automatic tuning. The recordings are individually time/date, GPS and temperature stamped, and are of high enough quality to produce time expansion quality sonograms. Any observations of bats were recorded, including time, species, location, number of bats, flight direction, flight height and behaviour, where possible.

The starting point and direction of the transect route was varied throughout the surveys, to reduce survey bias.

The survey dates, timings and weather conditions are provided in the table below.

Table 8 – Bat transect survey dates, timings and weather conditions

MONTH	DATE	SUNSET	SURVEY TIMINGS	TEMP.	WIND	RAIN	CLOUD COVER
April	13/04/22	20:08	19:53 – 21:53	14°C	Still	Dry	0%
May	19/05/22	21:10	20:55 – 23:55	14°C	Still	Dry	20%
June	29/06/22	21:42	21:27 – 23:42	16°C	Still	Light rain	40%
July	13/07/22	21:43	21:28 – 23:43	17°C	Still	Dry	0%
	19/07/22	21:26	21:06 – 23:06	24°C	Still	Dry	0%
August	17/08/22	20:35	20:20 – 22:20	18°C	Light breeze	Dry	50%
September	14/09/22	19:30	19:15 – 21:15	15°C	Light breeze	Dry	60%
October	19/10/22	18:08	17:53 – 19:53	12°C	Light breeze	Dry	70%

Static detector survey

In addition to the transect surveys, static detectors were deployed across the site, fixed to mature trees in discrete locations that were anticipated to record bat activity (e.g. trees in hedgerows). Static detectors were deployed in four locations across the site (see Appendix 11).

The static detectors were set to record for a minimum of five consecutive nights per month in their respective locations, from April to October. Following each recording cycle, each detector's batteries were changed, the data was retrieved, and detectors re-set to record. The following static detectors were used during the survey:

- Two Anabat Swift static bat detectors were used throughout the surveys. This device uses frequency division technology with a frequency range of 5 – 150kHz and records echolocation calls in zero crossing format. It has an integrated GPS receiver which automatically sets the internal clock, calculates sunset and sunrise times and records the location. All registrations are automatically recorded onto an SD card and time, date and temperature stamped.
- Two Anabat Express static bat detector were also used. This device uses frequency division technology with a frequency range of 5 – 150kHz and records echolocation calls in zero crossing format. It has an integrated GPS receiver which automatically sets the internal clock, calculates sunset and sunrise times and records the location. All registrations are automatically recorded onto an SD card and time, date and temperature stamped.

Survey limitations

Static detector 4 failed to record bat activity due to technical / file corruption issues. However, a further three static detectors were deployed onsite exceeding the recommended number of static detectors required for a site with moderate suitability for bats (Table 8.3 of the Bat Survey

Guidelines). The static detector and transect surveys combined ensured that all suitable habitat onsite was surveyed to determine its importance with regards to bats.

Static detector 1 only recorded two days in September, however a minimum of five nights of data was collected during the remaining months. Also, a further two static detectors were deployed onsite which satisfies the survey requirements outlined in Table 8.3 of the Bat Survey Guidelines.

No dawn transect surveys were undertaken during the survey period. However, the static detectors were deployed throughout the night and the results of these surveys are considered to be a good representation of the bat activity and species present within the proposed development site.

Due to the overall amount of data gathered during the transect and static detector surveys, collected over the majority of the active bat season, it is considered that the results present a good representation of the bat activity within the proposed development site. The above limitations are therefore not considered to be significant, as robust conclusions and appropriate recommendations can still be based on the data.

4.2.10 Badger activity survey

Walkover survey

A walkover survey of Sett 1, including the immediate surrounding area, was conducted by Daniel Smith on the 4th, 11th and 19th April 2022. The survey recorded any field signs of badger use, for example:

- Badger setts - main, annexe, subsidiary and outlier
- Bedding at sett entrances (such as grass or leaves)
- Dung pits - small excavated pits in which droppings are deposited
- Latrines - concentrations of dung pits
- “Snuffle holes” - small scrapes where badgers have excavated whilst foraging for food
- Badger hairs around sett entrances or caught on nearby fences or vegetation
- Conspicuous badger paths - channels through vegetation that are well used leading to or from setts
- Scratch marks on trees (predominantly in the local vicinity of sett entrances)
- Day nests - patches of grass or other vegetation where badgers may have spent time above ground
- Footprints

Monitoring survey

Sett entrances, latrines, well-established pathways and other areas of activity were identified during the walkover survey. Motion-triggered, night vision camera traps were then positioned appropriately, in order to give the best coverage of these areas. This also allowed identification of active sett entrances and enabled an estimation of the number of individuals present.

Cameras were set to record between sunset and sunrise for 15 consecutive nights (4th – 19th April 2022). Batteries and memory cards were replaced weekly throughout this period.

Activity levels were then gauged using the information gathered. Setts were classified using the definitions shown in the following table:

Table 9 – Badger sett classifications

SETT TYPE	DEFINITION
Main	Several holes with large spoil heaps and obvious paths emanating from and between sett entrances.
Annexe	Normally less than 150m from a main sett, comprising several holes. May not be in use all of the time, even if the main sett is very active.
Subsidiary	Usually, at least 50m from a main sett, with no obvious paths connecting to other setts. May only be used intermittently.
Outlier	Little spoil outside holes. No obvious paths connecting to other setts and only used sporadically. May be used by foxes and rabbits.

Survey limitations

Several video recordings from the camera monitoring sett entrance 1a were corrupted and therefore, could not be fully reviewed. However, no evidence of badgers was observed in the uncorrupted video clips or while during site walkovers within the monitoring period. As no evidence of badgers was found to be associated with this sett during the monitoring period, this limitation is not deemed to have a significant effect on the survey results.

4.2.11 Dingy skipper survey

The methodology of the field survey broadly follows that detailed in Butterfly Conservation's Monitoring Butterflies by Annual Timed Counts. A total of four surveys were conducted over May and June.

Surveyors walked slowly across areas of the site identified as containing suitable dingy skipper habitat, over a period of two hours. All observed butterfly species were recorded.

Timing and weather conditions

Table 10 – Dingy skipper survey timings and weather conditions

SITE VISIT N ^o	DATE	TIMINGS	TEMP. (°C)	CLOUD COVER (%)	WIND	RAIN
1	13/05/22	12:20-14:20	18	30	Light	Dry
2	15/05/22	13:30-15:30	23	80	Moderate	Dry
3	08/06/22	13:45-15:45	18	50	Moderate	Dry
4	21/06/22	09:00-11:00	21	0	Light	Dry

Survey limitations

Moderate wind was recorded during two of the surveys, however as the ground flora was relatively sheltered due to scrub, and as butterflies were recorded, this is not considered to have significantly affected results.

4.2.12 Terrestrial invertebrate survey

Conops Entomology Ltd was engaged by UES, to undertake an invertebrate assessment of Plot 3A, Wrexham Industrial Estate. As part of the survey, the site was visited on five occasions spread throughout the principal flight period of the major groups of invertebrates.

Table 11 – Survey dates and weather conditions

SITE VISIT N ^o	DATE	Temp (°C)	RAIN (%)
1	18/05/2022	18 – 22	0
2	16/06/2022	20 – 24	0
3	11/07/2022	22 – 30	0
4	03/08/2022	21 – 25	0
5	01/09/2022	18 – 23	0

The methods used for the assessment are those recommended in the Natural England guidance document *Surveying Terrestrial and Freshwater Invertebrates for Conservation Evaluation* (Drake *et al.*, 2007). In some instances, a bespoke method has been created for the site assessment but still retains the overall approach to assessing features and habitats for conservation assessment. The bespoke methods relate to the extent of the free-ranging sampling. This prioritized features that showed obvious interest, such as the tufa seepages and short sward and scrub fringe features. The following survey techniques were employed:

Sweep netting

This method provides the main proportion of the survey element and is the most efficient method for cataloguing a site's invertebrate resource. Sweep netting involves the use of a long-handled sweep net being swept over vegetation such as stands of emergent vegetation or flowers, or along scrub fringes in order to gather invertebrate material.

Spot sampling

Spot sampling is employed to collect large, conspicuous invertebrates such as bees and wasps from flowering plants, and to supplement the sweep samples. Spot sampling is often the most effective method for recording species from high-fidelity niches.

Grubbing

Fallen deadwood, piles of rotting timber (for deadwood beetles), and short turf (for surface-running beetles) are fingertip-searched for any hiding or crawling invertebrates, principally beetles.

Beating

Mature trees and scrub were beaten using a long stick. The dislodged invertebrates were collected on a sheet positioned beneath the branch, and the contents retained.

Vacuum sampling

Vacuum sampling was undertaken during spring and summer on the open mosaic areas.

Pitfall trapping

Owing to the area being noted for a great-crested newt population, no pitfall trapping was undertaken at this site.

Data analysis

The data gathered has been analysed and results tabled generated using the Pantheon software package. Pantheon is an analytical tool developed by Natural England and the CEH to assist invertebrate nature conservation. Site data in the form of species lists can be imported into Pantheon, which then analyses the species within the lists, assigning them to habitats and resources. Pantheon also consigns the most up-to-date national status to the species where it is available.

Pantheon is also capable of other outputs such as Specific Assemblage Types (SATs). A SAT is characterized by stenotopic species (those that can withstand only a narrow range of environmental conditions). SATs are therefore more tightly defined than 'habitats' or 'resources' and sit within a parent habitat or Broad Assemblage Type (BAT). More than one SAT can sit within a parent BAT.

BAT: **F2** – grassland and scrub matrix

SAT: **F211** – herb-rich dense sward

F212 – dense scrub

The information obtained from Pantheon can then be used to assign quality to sites and their features, assist in management decisions, and facilitate requirement for further surveys, where required and appropriate.

Pantheon was first made publicly accessible in April 2018 and is the primary analytical tool used by entomologists in site evaluation. It is also the tool recognized and preferred by Natural England. For more information on this new resource, see <http://www.brc.ac.uk/pantheon/>.

Not all species of importance have been included within the results tables, as they do not form part of the Pantheon analysis and/or their specific requirements are not yet fully understood.

Survey limitations

2022 experienced significantly dry weather for a protracted period of time. Little to no rain for many months, coupled with extreme heat events, has anecdotally (personal communication with a number of other invertebrate ecologists) significantly negatively impacted invertebrate abundance across much of England and Wales. As a consequence, detection of species, particularly those that are elusive, specific to niche features or scarce has been difficult.

Results therefore have been on average lower than expected, and species lists dominated by common species. It is still possible to reflect fairly the value of a site though through the analysis and discussion, and by using the experience of the invertebrate ecologist.

4.3 Impacts assessment

This assessment follows the CIEEM guidelines for ecological impact assessment (Version 1.2, 2022) when assessing the significance of impacts.

The significance of an impact is a matter of professional judgement but can be described in general terms as being a product of the ecological / nature conservation importance of a receptor (site habitat or species), and the magnitude of the predicted impact. The more

ecologically important the receptor and the greater the magnitude of the impact, the higher the significance of that impact is likely to be. Other characteristics which affect the significance of an impact include the extent, duration, timing, reversibility and frequency of the impact.

The ecological or nature conservation importance of each ecological receptor relevant to the proposed development and this assessment are detailed within Section 5 – Baseline Conditions, before impacts are described and characterised within Section 6 – Impact Assessment. However, it is recognised that other environmental disciplines in the planning process can follow a different criteria for significance. Therefore, an impact significance matrix has also been produced for each ecological receptor relevant to the proposed development and this assessment.

The categories of ecological or nature conservation importance used in these matrices are as follows:

- International – ecological receptors of importance in a European / global context
- National – ecological receptors of importance in the context of Wales
- County – ecological receptors of importance in the context of Wrexham County
- Local – ecological receptors of importance in the context of Wrexham Industrial Estate and surrounding areas
- Site – habitats and species of less than local importance, but of some value
- Negligible or no conservation value – not significant

Table 12 below provides an indication of the terms in which the significance of ecological impacts is considered.

Table 12 – Generalised impact significance matrix

ECOLOGICAL IMPORTANCE OF SITE OR FEATURE	MAGNITUDE OF POTENTIAL IMPACT			
	HIGH	MEDIUM	LOW	NEGLIGIBLE
International	Critical	Critical	Major	Minor
National	Critical	Major	Moderate	Minor
County	Major	Moderate	Minor	Minor
Local	Moderate	Minor	Minor	Not significant
Site	Minor	Minor	Not significant	Not significant
Negligible	Not significant	Not significant	Not significant	Not significant

5 BASELINE CONDITIONS

This section presents a description of the ecological baseline conditions, based upon the results of the consultation exercise, the PEA and additional species-specific surveys.

5.1 Protected sites

5.1.1 Non-statutorily protected sites

A desk study was conducted for the proposed development site and surrounding area. Non-statutorily protected sites were scoped to a distance of 2km.

There are four non-statutorily protected sites within 2km of the proposed development site:

- **Wrexham Industrial Estate Wildlife Site**

Located approximately 30m south-west of the proposed development site at its closest point, the designated site lies on the other side of Bryn Lane. The designation covers a series of sites within Wrexham Industrial Estate, which includes unmanaged grassland at Bryn Road and on Cefn Park and ancient broadleaved woodland at Erlas Black Wood.

Cefn Park comprises derelict land supporting a complex mosaic of scrub, grassland and tall herb. Species-rich grassland occurs where there is rabbit grazing with cowslip *Primula veris*, restharrow *Ononis repens*, yellow-wort *Blackstonia perfoliata*, common centaury *Centaureum erythraea* and common bird's-foot trefoil *Lotus corniculatus*. Other species of interest include dyer's greenweed *Genista tinctoria* in among scrub and grass vetchling *Lathyrus nissolia* in rank grassland.

A mosaic of woodland and damp grassland occurs adjacent to the River Clywedog. The woodland is dominated by mature hawthorn *Crataegus monogyna*, with alder *Alnus glutinosa* and crack willow *Salix fragilis* along the river. The ground flora is sparse but dog's mercury *Mercurialis perennis*, hart's-tongue fern *Asplenium scolopendrium* and common male fern *Dryopteris filix-mas* are present. Erlas Black Wood is dominated by mature oak *Quercus sp.*

A strip of species-rich grassland beside a ditch on Bryn Road has similar grassland species including the uncommon grass vetchling.

- **Oatlands Meadows Wildlife Site**

Located approximately 1.65km east of the proposed development site, the designation supports damp grassland with abundant perennial ryegrass *Lolium perenne* and a low species diversity.

- **Peter's Dingle Wildlife Site**

Located approximately 2km south of the proposed development site, the designation supports ash *Fraxinus excelsior* / pedunculate oak *Quercus robur* woodland along a brook. The understorey is of wych elm *Ulmus glabra*, elder *Sambucus nigra*, hawthorn, wild privet *Ligustrum vulgare* and hazel *Corylus avellana*, the latter becoming abundant in areas where it has been coppiced. The field layer is often dominated by ivy *Hedera helix*, bramble, and stinging nettle *Urtica dioica*, however dog's mercury, yellow

archangel *Lamium galeobdolon*, giant fescue *Festuca gigantea*, black bryony *Dioscorea communis* and harts'-tongue fern are also present.

- **Cefn Park Wildlife Site**

Located approximately 2km west of the proposed development site, the designation supports a series of broadleaved woodlands within Cefn Park Estate. Big Wood is the largest (8.9ha) and is dominated by ash with oak, sycamore *Acer pseudoplatanus* and occasional mature wych elm. The understorey is continuous with frequent holly *Ilex aquifolium*, young sycamore and wych elm. The woodland has a rich ground flora including dog's mercury, English bluebell *Hyacinthoides non-scripta*, wood anemone *Anemone nemorosa* and ramsons *Allium ursinum*. Rhododendron Spinney is also dominated by ash but with beech *Fagus sylvatica* and sweet chestnut *Castanea sativa* and a locally dense understorey of rhododendron *Rhododendron ponticum*. Alder, crack willow and goat willow *Salix caprea* dominate the poorly drained eastern side where great horsetail *Equisetum telmateia* and greater pond sedge *Carex riparia* occur as well as a fen dominated by common reed *Phragmites australis*.

Despite the Wrexham Industrial Estate Wildlife Site lying within close proximity to the proposed development site, due to the nature of development and the distance, it is considered unlikely that the proposed development will have any direct or indirect impact on this or any other non-statutorily protected sites. The proposed development is purely industrial / commercial and does not have a residential aspect. As such, it is considered that the proposed development will not result in any additional significant recreational pressure upon any of the protected sites within the local area and these sites are not considered further within this assessment.

5.1.2 Statutorily protected sites

A desk study was conducted for the proposed development site and surrounding area. Statutorily protected sites were scoped to a distance of 10km (see Appendix 1).

The proposed development site lies within a SSSI Impact Risk Zone (IRZ) within which Natural England only request that they are consulted on industrial / agricultural developments that could cause air pollution (including industrial processes, livestock and poultry units with floorspace >500m², slurry lagoons & digestate stores > 750m², manure stores > 3500t) and general combustion processes >50MW energy input.

There is a single statutorily protected site within 2km of the proposed development site:

- **Afon Dyfrdwy (River Dee) SSSI**

Located approximately 1.6km east of the proposed development site, the SSSI covers the River Dee and its floodplain. The designation covers much of the same area as the River Dee (England) SSSI and the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC. The site has been designated for its nationally important transition through a range of river types from mesotrophic to eutrophic. The site has also been designated for supporting Atlantic salmon *Salmo salar*, otter, brown trout *Salmo trutta*, bullhead *Cottus gobio*, brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, sea lamprey *Petromyzon marinus* and club-tailed dragonfly *Gomphus vulgatissimus*.

There are sixteen statutorily protected sites (designated for ecological reasons) within 2km of the proposed development site:

- Chwarel Singret SSSI
- Cloy Brook Pastures SSSI
- Dee Cliffs, Farndon SSSI
- Gatewen Marsh SSSI
- Johnston Newt Sites SSSI
- Llay Bog SSSI
- Marford Quarry SSSI
- Midland Meres and Mosses Phase 2 Ramsar
- Old Pulford Brook Meadows SSSI
- River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC
- River Dee (England) SSSI
- Sontley Marsh SSSI
- Strytlas A'r Hafod SSSI
- Vicarage Moss SSSI
- Well Rough and Long Plantation SSSI

Given the distances from site and the nature of development, it is considered unlikely that the proposed development will have any direct or indirect impact on any protected sites. The proposed development is purely industrial / commercial and does not have a residential aspect. As such, it is considered that the proposed development will not result in any additional significant recreational pressure upon any of the protected sites within the local area and these sites are not considered further within this assessment.

5.2 Habitats

The results of the PEA are also shown on the accompanying map at Appendix 2. Habitats are colour-coded in accordance with the phase 1 standard.

The site lies on the edge of the Wrexham Industrial Estate and is surrounded by urban areas to the south and west, and by agricultural fields to the north and east. The following principal habitat types were characterised on site:

- A1.1.1 Broadleaved, semi-natural woodland
- A2.1 Dense scrub
- A2.2 Scattered scrub
- A3.1 Scattered broadleaved trees
- B2.1 Unimproved neutral grassland
- B2.2 Semi-improved neutral grassland
- B5 Marshy grassland
- B6 Species-poor, semi-improved grassland
- C3.1 Tall ruderal
- F1 Swamp
- G1 Standing water
- G2 Running water
- J1.2 Amenity grassland
- J1.3 Ephemeral / short perennial
- J1.4 Introduced shrub
- J2.1.1 Intact, species-rich hedge
- J2.1.2 Intact, species-poor hedge
- J2.2.1 Defunct, species-rich hedge
- J2.2.2 Defunct, species-poor hedge
- J2.3.1 Hedge with trees – species-rich
- J2.4 Fence
- J2.6 Dry ditch
- J3.6 Buildings
- J5 Hardstanding

5.2.1 Woodland and scrub

A1.1.1 Broadleaved, semi-natural woodland

There are three small areas of woodland on site, all of which are isolated from each other and form distinct stands. All areas are relatively young and contain limited mature trees and completely lack veteran trees. The canopy layers are dominated by either silver birch *Betula pendula* or pedunculate oak. Other canopy and understory species include sycamore, grey willow *Salix cinerea*, goat willow, elder, blackthorn *Prunus spinosa*, dog rose *Rosa canina* and hawthorn.

The ground layer within all areas of woodland on site is heavily shaded by the canopy and understory layers and botanical diversity is limited. Species present include bramble, stinging nettle, herb robert *Geranium robertianum*, ivy, creeping buttercup *Ranunculus repens*, wood dock *Rumex sanguineus*, common male fern, wood avens *Geum urbanum*, broad buckler fern *Dryopteris dilatata* and common hogweed *Heracleum sphondylium*.

An additional band of woodland lies offsite but demarcates the northern site boundary. This woodland is more mature and has a greater species diversity, with a canopy and understory of sycamore, ash, pedunculate oak, crack willow, holly, hawthorn, hazel, blackthorn, dog rose and elder. The ground flora layer is more established and diverse and includes additional species such as hart's-tongue fern, honeysuckle *Lonicera periclymenum* and false wood brome *Brachypodium sylvaticum*.

Most areas of woodland on site are likely to have originated from planting, which coupled with their small size, has resulted in vegetative communities that do not fall within a distinct NVC community. The definition for the lowland mixed deciduous woodland Habitat of Principal Importance is vague and lacks specific qualifying criteria. As such, the woodland on site may qualify, however it is considered to represent low quality woodland in poor condition due to the low diversity of native canopy and ground flora species, the proportion of non-native sycamore, the lack of any ancient woodland indicator species, lack of veteran trees, low number of mature trees, and the small size and isolated nature of each stand. Semi-natural woodland within the county of Wrexham is a limited resource, however given the poor quality and small size of the areas of woodland present on site, the woodland is not considered to be of county value. Woodland is also limited within the context of the Wrexham Industrial Estate and so the woodland on site is considered to be of local importance.

A2.1 Dense scrub

There are numerous areas of dense scrub on site, including large continuous areas and smaller stands. These areas of scrub predominantly include stands dominated by grey willow or bramble; however, areas of mixed species scrub are also present. Additional species observed within the scrub include goat willow, hazel, wild cherry *Prunus avium*, hawthorn, dogwood *Cornus sanguinea*, blackthorn, elder, holly, guelder rose *Viburnum opulus*, horse chestnut *Aesculus hippocastanum*, beech, dog rose, pedunculate oak saplings, silver birch, field maple *Acer campestre*, sycamore saplings, perforate St John's-wort *Hypericum perforatum*, wood dock, stinging nettle, wood avens, herb robert, common male fern, cock's-foot *Dactylis glomerata*, common bent, false oat-grass, common couch *Elymus repens*, perennial rye grass, crested dog's-tail, rough meadow grass *Poa trivialis*, Yorkshire fog, Italian ryegrass *Lolium multiflorum*, great willowherb *Epilobium hirsutum*, silverweed *Potentilla anserina*, cow parsley *Anthriscus sylvestris*, common hogweed, common ragwort *Jacobaea vulgaris*, false-fox sedge *Carex otrubae*, black medic *Medicago lupulina*, upright hedge parsley *Torilis japonica*, creeping cinquefoil *Potentilla reptans*, selfheal *Prunella vulgaris*, creeping

buttercup, meadow buttercup *Ranunculus acris*, creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, ivy and germander speedwell *Veronica chamaedrys*.

The areas of dense scrub on site do not qualify as a Habitat of Principal Importance and are not considered to be a habitat of national or county significance given. However, large areas of scrub are present on site, the majority of which is located at the site boundaries and likely acts as habitat corridors and linkages for a variety of species. As such, the dense scrub on site is considered to be of local importance.

5.2.2 A2.1 Scattered scrub

Scattered scrub and tree saplings are beginning to encroach upon the areas of grassland, bare ground and damaged areas of hardstanding across the site. Species predominantly include grey willow, goat willow, silver birch, blackthorn, hawthorn, pedunculate oak and bramble. This habitat is considered to be a component of the broader habitats that it is encroaching e.g. the open mosaic habitat. As such impacts on this habitat are considered for the broader habitat types opposed to treating scattered scrub as an independent ecological feature of importance.

5.2.3 A3.1 Scattered broadleaved trees

Most trees on site are limited to the small areas of woodland or are immature specimens growing within the areas of dense scrub. A number of scattered semi-mature and mature pedunculate oak, ash and sycamore trees are present, predominantly within the western section of the site.

Scattered trees are not a Habitat of Principal Importance, the trees on site are not veteran trees and are they not subject to TPOs. Given the small number of scattered trees present on site and the availability of numerous scattered trees, trees within hedgerows and tree lines within the wider surrounding landscape, the trees on site are considered to be of local importance.

5.2.4 Grassland

The site contains numerous fields and areas of grassland of varying quality and communities. The NVC survey was undertaken to categorise and assess the value of the distinct areas of grassland on site.

B2.1 Unimproved neutral grassland

Grassland 4 is highest value grassland on site and is the only area of grassland on site that is considered to qualify as unimproved grassland. During the initial PEA survey, this grassland was identified as potentially qualifying as unimproved grassland which was confirmed during the NVC survey which found that the grassland matches the MG5 *Cynosurus cristatus* - *Centaurea nigra* community. However, the entire field within which this community lies is not homogenous and the field slopes downwards to the north-east, resulting in impeded drainage and the presence of a different grassland community; Grassland 5 as described below. In addition, some areas of the unimproved grassland are being encroached by tall ruderal species and bramble scrub. A full list of species present is provided at Appendix 5.

As part of the NVC survey, this unimproved grassland was also assessed to determine whether it meets the selection criteria for Local Wildlife Sites within Wales. Eleven unimproved neutral grassland indicator species (from Table 3 in Appendix 1 of the selection criteria) were recorded within the grassland, of which six were constant or frequent within the grassland. The majority of the species present are common and widespread, however quaking grass *Briza media* and grass vetchling are uncommon species that are generally restricted to higher value grasslands. Additionally, the grassland represents a good example of the NVC community MG5 that is recommended for automatic selection. Therefore, the grassland is considered to meet the qualifying criteria for selection as a Local Wildlife Site within Wales.

As the grassland represents the community MG5, it is considered to meet the criteria to qualify as a lowland meadow Habitat of Principal Importance.

B2.2 Semi-improved neutral grassland

In addition to the unimproved grassland, three areas of semi-improved neutral grassland are also present on site. The results of the NVC survey showed that these areas of grassland are considered to all represent the MG9 Yorkshire fog – tufted hair-grass community, the MG1 false oat-grass community or a transitional continuum between the two.

To differentiate between the different semi-improved grassland communities on site, they have been labelled Grasslands 1 to 3 on the accompanying phase 1 habitat plan at Appendix 2.

Grassland 1

Grassland 1 contains some of the same species as Grassland 4, but with a reduced abundance of unimproved indicator species and a greater abundance of competitive grasses and ruderal species that are indicative of agricultural improvement. This grassland is considered to represent the MG9 – *Holcus lanatus* - *Dechampsia cespitosa* community A full list of species present is provided at Appendix 5. A very small section of this grassland that runs down a short steep section of earth bank and borders the drainage ditch at the eastern site boundary has a much higher species diversity, however it is too small an area to map as a separate habitat type and has instead been target noted on the accompanying phase 1 habitat plan at Appendix 2, see Target Note 13. Additional species present within this area include common centaury, black medic, perforate St John's-wort, grass vetchling, common knapweed *Centaurea nigra*, red clover *Trifolium pratense*, glaucous sedge *Carex flacca*, bristly oxtongue *Helminthotheca echioides*, common bird's-foot trefoil and common agrimony *Agrimonia eupatoria*.

As part of the NVC survey, this grassland was also assessed to determine whether it meets the selection criteria for Local Wildlife Sites within Wales. The grassland doesn't represent any of the NVC communities that are recommended for selection (MG4, MG5 and MG8), nor does it represent one of the communities that should be considered when species rich (MG1, MG6 and MG10). Whilst the grassland does show some affinity towards MG1, it is more representative of MG9 and is not considered to be particularly species rich. Whilst six unimproved neutral grassland indicator species were recorded within the grassland these are all relatively common and widespread species and of these, only common knapweed was frequent within the grassland, occurring within 3 of the 7 quadrats. Therefore, the grassland does not meet the qualifying criteria for selection as a Local Wildlife Site within Wales.

As the grassland is relatively species poor and does not represent the communities MG4, MG5 or MG8, it does not meet the criteria to qualify as the lowland meadow Habitat of Principal Importance.

Grassland 2

Grassland 2 has a similar species assemblage to Grassland 1 but lacks the majority of the unimproved indicator species and has a reduced diversity of forbs, a reduced abundance of unimproved indicator species and a greater proportion of competitive grasses and ruderal species indicative of improved conditions. Despite this, the sward remains relatively species-rich, and the grassland is considered to still qualify as semi-improved grassland and is considered to represent the MG1 *Arrhenatherum elatius* community. A full list of species present is provided at Appendix 5.

As part of the NVC survey, this grassland was also assessed to determine whether it meets the selection criteria for Local Wildlife Sites within Wales. The grassland doesn't represent any of the NVC communities that are recommended for selection (MG4, MG5 and MG8). Whilst it is considered to represent the MG1 community, it is not considered to be a particularly species-rich example of this community. The majority of the sward is dominated by a small number of coarse and competitive grass species. Only three unimproved neutral grassland indicator species were recorded within the grassland, all of which are relatively common and widespread species and of these, only hoary ragwort *Jacobaea erucifolia* was constant within the grassland, the other two only being recorded in one of the five quadrats. Therefore, the grassland does not meet the qualifying criteria for selection as a Local Wildlife Site within Wales.

As the grassland is relatively species poor and does not represent the communities MG4, MG5 or MG8, it does not meet the criteria to qualify as the lowland meadow Habitat of Principal Importance

Grassland 3

Grassland 3 also appears to be one of the higher quality semi-improved grasslands on site. Whilst undertaking the NVC survey, this grassland was found to be the same or a very similar community to Grassland 2 within the adjacent field to the west, however Grassland 3 appeared to have a greater botanical diversity and so they were treated as separate communities for the purpose of the survey. The grassland is considered to represent the MG1 *Arrhenatherum elatius* community. A full list of species present is provided at Appendix 5.

As part of the NVC survey, this grassland was also assessed to determine whether it meets the selection criteria for Local Wildlife Sites within Wales. The grassland doesn't represent any of the NVC communities that are recommended for selection (MG4, MG5 and MG8). Whilst it is considered to represent the MG1 community, it is not considered to be a species-rich example of this community. The majority of the sward is dominated by a small number of coarse and competitive grass species. Whilst six unimproved neutral grassland indicator species were recorded within the grassland, all of which are relatively common and widespread species and of these, only hoary ragwort and common knapweed were constant within the grassland, the others only being recorded in one of the five quadrats. Therefore, the grassland does not meet the qualifying criteria for selection as a Local Wildlife Site within Wales.

As the grassland is relatively species poor and does not represent the communities MG4, MG5 or MG8, it does not meet the criteria to qualify as the lowland meadow Habitat of Principal Importance.

Grassland 6

Grassland 6 lies within the ecological enhancement area is currently managed for agricultural purposes for a silage or hay cut. As the grassland is managed for agricultural purposes and was always due to be retained as part of the development, it was not subject to a detailed NVC survey. Despite this, the grassland was surveyed as part of the phase 1 habitat survey to assess its value and condition and to compile a species list.

Whilst forbs are relatively abundant within the sward, the grassland lacks many of the indicators of higher quality that are present within other areas of grassland on site. Species present include: Yorkshire fog, soft brome *Bromus hordeaceus*, meadow foxtail *Alopecurus pratensis*, sweet vernal grass *Anthoxanthum odoratum*, red fescue, rough meadow grass, perennial rye grass, crested dog's-tail, false oatgrass, creeping bent *Agrostis stolonifera*, oval sedge *Carex leporina*, compact rush *Juncus conglomeratus*, field wood-rush *Luzula campestris*, cuckoo flower *Cardamine pratensis*, meadow buttercup, common sorrel *Rumex acetosa*, common mouse-ear *Cerastium fontanum*, common knapweed, red clover, creeping buttercup, creeping thistle, dandelion *Taraxacum officinale* agg., common ragwort, creeping cinquefoil, common bird's-foot trefoil, lesser trefoil *Trifolium dubium*, meadow vetchling *Lathyrus pratensis*, hairy tare *Vicia hirsuta*, tufted vetch *Vicia cracca*, white clover *Trifolium repens* and common vetch *Vicia sativa*. Additional species recorded only at the margins of the grassland include cock's-foot, lesser stitchwort, common hogweed and greater bird's-foot trefoil *Lotus pedunculatus*.

This grassland is not considered to meet the selection criteria to qualify as a Wildlife Site and is not considered to qualify as the lowland meadow Habitat of Principal Importance.

B5 Marshy grassland

Grassland 5

An area of marshy grassland is present within the eastern section of Grassland 4. Whilst completely dry at the time of the walkover surveys, the species present indicate that this area has impeded drainage.

The grassland is locally dominated by either hard rush *Juncus inflexus* or common fleabane *Pulicaria dysenterica*. Species diversity is generally low and additional species present include soft rush *Juncus effusus*, silverweed, tufted hairgrass *Deschampsia cespitosa*, Yorkshire fog, great willowherb, curled dock *Rumex crispus*, creeping buttercup, bramble, tufted vetch, creeping thistle, false fox sedge *Carex otrubae*, common hogweed, creeping bent and marsh thistle *Cirsium palustre*. This grassland is considered to represent the MG10 *Holcus lanatus* – *Juncus effusus* community, specifically the *Juncus inflexus* sub-community.

As part of the NVC survey, this grassland was also assessed to determine whether it meets the selection criteria for Local Wildlife Sites within Wales. The grassland doesn't represent any of the NVC communities that are recommended for selection (MG4, MG5 and MG8). Whilst it is considered to represent the MG10 community, it is not considered to be a particularly species-rich example of this community as the sward is dominated by hard rush and common fleabane. Whilst six unimproved neutral grassland indicator species were recorded within the grassland, only tufted vetch was frequent within the grassland, the others being occasional or

rare and only occurring within 1 or two of the quadrats. Therefore, the grassland does not meet the qualifying criteria for selection as a Local Wildlife Site within Wales.

As the grassland is relatively species poor and does not represent the communities MG4, MG5 or MG8, it does not meet the criteria to qualify as the lowland meadow Habitat of Principal Importance.

B6 Species-poor, semi-improved grassland

In addition to the semi-improved and unimproved grasslands on site, small areas of grassland that have a significantly reduced species-diversity and are considered to be of significantly lower quality are present on site.

The sward within these areas of grassland is dominated by a low number of competitive grass species. Forb species present are very low in abundance and diversity and are mostly indicative of improved conditions. Species present include rough meadow-grass, cock's-foot, common bent, false oat-grass, Yorkshire fog, perennial ryegrass, common couch, tufted hair-grass, meadow foxtail, creeping thistle, bramble, stinging nettle, common ragwort, creeping buttercup, white clover, dandelion, broadleaved dock *Rumex obtusifolius*, curled dock, creeping cinquefoil, common hogweed and field horsetail *Equisetum arvense*.

These areas of grassland are not considered to meet the selection criteria to qualify as local wildlife site and do not meet the criteria to qualify as the lowland meadow Habitat of Principal Importance.

Overall, the combined value of the grasslands on site are considered to be of county significance, however this is solely due to the presence of the unimproved grassland that qualifies as a Habitat of Principal Importance. Unimproved lowland meadow is scarce habitat both at a county and country level, largely due to changes in agricultural practices and urbanisation. When considered without the unimproved lowland meadow grassland, the other areas of marshy and semi-improved grassland on site are considered to be of local significance only.

5.2.5 C3.1 Tall ruderal

Large areas of tall ruderal vegetation are present across the site, in addition to smaller areas at the ecotones between habitats that are too small to map and hence have not been included on the accompanying phase 1 habitat plan at Appendix 2. These areas are species-poor and are mostly dominated by great willowherb, although hedge bindweed *Calystegia sepium*, bramble, stinging nettle, mugwort *Artemisia vulgaris*, creeping thistle, hemlock *Conium maculatum*, silverweed, cock's-foot, common couch, false oat-grass, common hogweed and marsh thistle are also present.

This habitat is considered to be of negligible ecological importance and any impacts as a result of the proposed development are not considered to be significant. As such impacts on this habitat have been scoped out at this point of the assessment.

5.2.6 G1 Ponds and associated vegetation communities

Six ponds are present on site, each of which is in a different successional stage and provides a different aquatic habitat niche. Pond 1 is a large open body of water that is believed to be a

man-made fishing pond (as evidenced by the presence of a liner, anecdotal evidence from previous surveys of the site and from talking to adjacent landowners), however the current presence of fish is uncertain. The pond was over 0.5m deep at the time of the survey and is likely over 1m deep within the centre. The pond is surrounded by dense willow scrub on all aspects and has a ring of emergent greater reedmace *Typha latifolia* at its margins. Aquatic vegetation within the pond also includes a sparse matt of a waterweed *Elodea sp.* and spiked water milfoil *Myriophyllum spicatum*.

Pond 2 is a large body of open water surrounded by woodland. No aquatic vegetation was observed within the pond and marginal vegetation is predominantly limited to the woodland understory and ground flora species. The water was at least 0.5m deep at the time of the survey.

Pond 3 is a large field pond surrounded by dense willow and bramble scrub. The pond has been completely encroached by swamp vegetation and is lacking areas of open water. Species present include greater reedmace, bittersweet *Solanum dulcamara*, cypress sedge *Carex pseudocyperus*, lesser water parsnip *Berula erecta*, water horsetail *Equisetum fluviatile*, wild angelica *Angelica sylvestris* and gypsywort *Lycopus europaeus*. Large areas of the pond were dry at the time of the survey, however pockets of water with a depth of up to 20cm were present. The swamp vegetation is similar to that within Pond 4, however hard rush, fool's watercress *Helosciadium nodiflorum* and water plantain *Alisma plantago-aquatica* were also observed.

Pond 4 is a large field pond that is surrounded by dense goat willow, grey willow, hawthorn, bramble and dog rose scrub. As with Pond 3, Pond 4 is in a late successional stage and is being heavily encroached by swamp vegetation. At the time of the survey, most of the pond was holding standing water to a depth of 0.3 – 0.75m, however only a small area of deeper open water (over 1m deep) was present within the northern section of the pond.

Pond 5 has a steep-sided basin and is located amongst an area of dense scrub. The pond itself is shallow and was holding approximately 30cm of standing water at the time of the walkover surveys. Common duckweed *Lemna minor*, and a stonewort *Chara sp.* are present in addition to small quantities of emergent and marginal fool's watercress, greater reedmace, hard rush and jointed rush *Juncus articulatus*.

Pond 6 is a field pond located within the north-western corner of the agricultural fields that comprise the ecological compensation area. The pond is almost completely shaded by encroaching goat and grey willow scrub. The pond is shallow and has a large drawdown zone of emergent vegetation. The pond was completely damp but lacked any standing water at the time of the walkover survey, however the pond is known to hold standing water in the winter. Emergent species present within the drawdown zone include greater reedmace, bittersweet, redshank *Persicaria maculosa*, gypsywort, cypress sedge, soft rush, marsh bedstraw *Galium palustre* and hard rush. A band of marginal vegetation surrounds the pond, although it is limited where dense willow scrub dominates. Marginal species include great willowherb, silverweed, creeping thistle, tufted vetch, meadow vetchling, false fox sedge, curled dock, floating sweet-grass *Glyceria fluitans*, canary reed grass *Phalaris arundinacea* and stinging nettle.

Ponds 3, 4, 5 and 6 on site are considered to qualify as the pond Habitat of Principal Importance as they support GCNs, a species protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). The three ponds (Ponds 1, 2 and 4) which are due to be removed to facilitate the development proposals were assessed for their ecological

importance via the PSYM method: none of these ponds returned a PYSM score of greater than 75%, and therefore none of the ponds qualify as Priority Ponds for this reason.

Despite the ponds on site all qualifying as habitats of principal importance, the site is located within an area of with a very high pond density. As such, the overall value of the ponds on site are considered to be of local importance.

5.2.7 G2 Running water and ditches

A wet ditch is present along the western and part of the eastern site boundaries. The ditch along the western boundary is entirely shaded by scrub and has very little marginal or aquatic vegetation. The ditch is culverted at the southern site boundary and some marginal vegetation is present at the culvert entrance including wild angelica, yellow iris *Iris pseudacorus*, bittersweet, canary reed grass, hard rush, remote sedge *Carex remota*, fool's watercress, clustered dock *Rumex conglomeratus* and great willowherb. This section of the ditch was not flowing at the time of the survey and contained little water, with a maximum depth of 5cm. The ditch was later observed to contain some pockets of standing water up to 30cm deep.

The section of ditch along part of the eastern boundary also contained little standing water, with a maximum depth of 7cm, however it is heavily vegetated by marginal and emergent vegetation. Species present include clustered dock, water starwort *Callitriche sp.*, fool's watercress, soft rush, bramble, greater reedmace, gypsywort, great willowherb, marsh bedstraw, common fleabane, great willowherb, stinging nettle, hard rush, lesser water parsnip, hemlock water dropwort *Oenanthe crocata*, ragged robin *Silene flos-cuculi*, watercress *Nasturtium officinale* and meadowsweet. Scattered scrub is present along the entire length of the ditch; however, the northern and southern sections are almost entirely encroached by dense scrub and the abundance and diversity of marginal and emergent species is reduced compared to the central section.

Whilst both sections of ditch were not flowing at the time of the survey, they both connect to a stream at the northern section of the site and are considered likely to hold slow flowing water in the winter or following periods of rainfall. The stream along the northern section of the site lies within an area of woodland and is heavily shaded by the canopy and understory. The stream was slow flowing at the time of the walkover survey, with some sections completely dry and others holding shallow pools of water with a maximum depth of 30cm. No aquatic or emergent vegetation is present and marginal vegetation is limited to the woodland understory and ground flora species.

The ditches on site and the watercourse on site are generally poor-quality examples of these habitats and are considered to be of local importance.

5.2.8 J1.2 Amenity grassland

Amenity grassland lawns are present within the south-western section of the site. These lawns have a very short sward and appear to be subject to an intensive mowing regime. There are numerous areas of disturbance within the grassland which provide additional microhabitats and have resulted in a relatively high number of forb species being recorded. Species present include perennial ryegrass, red fescue, Yorkshire fog, annual meadow-grass *Poa annua*, white clover, scarlet pimpernel *Anagallis arvensis*, bristly oxtongue, selfheal, glaucous sedge, cut-leaved crane's-bill *Geranium dissectum*, hoary ragwort, common mouse-ear, creeping

buttercup, common cat's-ear *Hypochaeris radicata*, marsh thistle and common bird's-foot trefoil.

This habitat is considered to be of negligible ecological value and any impacts as a result of the proposed development are not considered to be significant. As such impacts on this habitat have been scoped out at this point of the assessment.

5.2.9 J1.3 Ephemeral / short perennial vegetation – Open mosaic habitat

The areas of hardstanding within the south-eastern section of the site include areas of loose gravel, a large spoil mound of mixed materials and large areas of unbroken concrete. These areas have become encroached by scattered scrub and ephemeral vegetation, with some areas containing sporadic vegetation whilst others contain a dense mat. Grasses are limited and are not dominant within these areas and hence the denser mats of vegetation have not been mapped as grassland. The areas of unbroken concrete are largely uncolonized with the exception of small cracks and areas of damage.

A gravel area with a number of other loose materials has a particularly high botanical diversity and contains a number of uncommon and calcicolous species including blue fleabane *Erigeron acer*, fairy flax *Linum catharticum*, yellow-wort, bee orchids *Ophrys apifera* and lady's bedstraw *Galium verum* (see Appendix 2 – Target Note 12). Other species present include common ragwort, common bird's-foot trefoil, bramble, sweet briar *Rosa rubiginosa*, glaucous sedge, wild strawberry *Fragaria vesca*, creeping cinquefoil, marsh thistle, common centaury, American willowherb *Epilobium ciliatum*, common cat's-ear, scarlet pimpernel, hawthorn saplings, oxeye daisy *Leucanthemum vulgare*, selfheal, common knapweed, red fescue, spear thistle, common figwort *Scrophularia nodosa*, grey speedwell *Veronica polita*, dandelion, meadow vetchling, common field speedwell *Veronica persica*, field maple saplings, black medic, hard rush, teasel *Dipsacus fullonum*, thyme-leaved speedwell *Veronica serpyllifolia*, evening primrose *Oenothera sp.*, tutsan *Hypericum androsaemum*, common fleabane, petty spurge *Euphorbia peplus*, great willowherb, weld *Reseda luteola*, rosebay willowherb *Chamaenerion angustifolium*, common male fern, common mullein *Verbascum thapsus*, perforate St John's wort, annual meadow-grass, greater plantain *Plantago major*, bittersweet, crosswort *Cruciata laevipes*, hart's-tongue fern, white campion *Silene latifolia*, buck's-horn plantain *Plantago coronopus*, Canadian fleabane *Erigeron canadensis*, autumn hawkbit *Scorzoneroide autumnalis*, grey willow saplings, stinging nettle, creeping thistle, annual pearlwort *Sagina apetala*, bristly oxtongue, common daisy *Bellis perennis*, broadleaved dock, curled dock, prickly sow thistle *Sonchus asper*, creeping buttercup and meadow buttercup.

This area of previously developed land is considered to qualify as the 'open mosaic habitat on previously development land' Habitat of Principal Importance. The mosaic of habitats in this area meets all five of the following qualifying criteria:

1. 'The area of open mosaic habitat is at least 0.25ha in size.
2. There is a known history of disturbance at the site or evidence that soil has been removed or severely modified by previous use(s) of the site. Extraneous materials/substrates such as industrial spoil may have been added.
3. The site contains some vegetation. This will comprise early successional communities consisting mainly of stress-tolerant species (e.g. indicative of low nutrient status or drought). Early successional communities are composed of (a) annuals, or (b)

mosses/liverworts, or (c) lichens, or (d) ruderals, or (e) inundation species, or (f) open grassland, or (g) flower-rich grassland, or (h) heathland.

4. The site contains unvegetated, loose bare substrate and pools may be present.
5. The site shows spatial variation, forming a mosaic of one or more of the early successional communities (a)–(h) above (criterion 3) plus bare substrate, within 0.25ha.'

Open mosaic on previously developed land is a limited habitat type within both the county and the country. Open mosaic habitats are primarily of importance for the faunal and floral species that they support, particularly wildflowers, invertebrates and breeding birds. This habitat is considered to be of county importance. The potential impacts of the development on this habitat are discussed further in Section 6.

5.2.10 J1.4 Introduced shrub

A small area of introduced shrub is present at the south-western corner of the site.

This habitat is considered to be of negligible ecological value and any impacts as a result of the proposed development are not considered to be significant. As such impacts on this habitat have been scoped out at this point of the assessment.

5.2.11 Hedgerows

J2.1.1 Intact, species-rich hedge

Hedge 1 demarcates the western site boundary and runs parallel with Bryn Lane. The hedgerow appears to be subject to some, albeit infrequent management and measures 4-5m in height and 1-2m in width. Hawthorn is dominant, however occasional field maple, guelder rose, ash, grey willow and blackthorn are also present.

J2.1.2 Intact, species-poor hedge

Hedge 4 runs east to west through the centre of the site and demarcates the boundary between two grassland fields. The hedgerow is unmanaged and measures approximately 3-4 in height and 2-3m in width. The hedge is dominated by hawthorn, with occasional grey willow, blackthorn and dog rose.

Hedge 5 forms the boundary between the two agricultural fields in the eastern section of the site. The hedge appears to have been unmanaged in recent years but likely received infrequent management in the past. The hedge measures approximately 3m in height and 3.5m in width. Species present include blackthorn, dog rose, hawthorn and pedunculate oak.

Hedge 6 demarcates the northern boundary of the agricultural fields in the eastern section of the site. The hedge appears to be subject to some infrequent management and measures approximately 2.5m in height and 2m in width. Species present include blackthorn, dog rose, hawthorn and field maple.

J2.2.1 Defunct, species-rich hedge

Hedge 3 runs along part of the southern boundary of the hardstanding compound within the south-western section of the site and is separated from Hedge 2 by the entrance to the compound. The hedgerow is very defunct, with numerous gaps and has a height of 2-3m and a width of 1-2m. Species present within the hedgerow include hawthorn, dog rose, field maple, pedunculate oak, guelder rose and blackthorn.

J2.2.2 Defunct, species-poor hedge

Hedge 2 runs along part of the southern boundary the large area of hardstanding within the south-western section of the site. The hedgerow appears to be subject to minimal, management and has grown to a height of 3-4m and a width of 2-3m. The hedge is entirely composed of hawthorn and blackthorn.

Hedge 7 forms part of the eastern boundary of the agricultural fields in the eastern section of the site. The hedge appears to be unmanaged and measures approximately 3.5m in height and 3.5m in width. Species present include blackthorn, dog rose, hawthorn and grey willow.

J2.3.1 Hedge with trees – species-rich

Hedge 8 runs along part of the southern boundary of the agricultural fields that form the eastern section of the site. The hedge appears to unmanaged and measures approximately 3-4m in height and 3-4m in width. A dry ditch lies offsite at the southern base of the hedge. The hedgerow contains hawthorn, blackthorn, dog rose, goat willow and pedunculate oak trees.

Given the low number of component species, even within the species-rich hedgerows, and the lack of additional features (associated ditches, trees, ground flora etc.), it is considered that the hedgerows on site won't qualify as important under the Hedgerow Regulations for ecological reasons, however they may qualify for historical reasons.

To qualify as a hedgerow Habitat of Principal Importance, a hedgerow must predominantly be comprised (i.e. 80% or more cover) of at least one woody UK native species. As such, all hedgerows on site are considered to quality as a Habitat of Principal Importance. Despite this the majority of hedgerows on site are species-poor and lack additional features that would increase their value and distinctiveness such as standard trees or ancient woodland ground flora. Additionally, the local surrounding area to the north, south and east comprises a patchwork of arable and pasture fields, intersected by numerous hedgerows. As such, the hedgerows on site are considered to be local importance only. The potential impacts of the development on this habitat are discussed further in Section 6.

5.2.12 J2.4 Fence

Palisade and metal chain fencing is present on site and demarcates the boundary between fields and the edge of the hardstanding parking area.

This habitat is considered to be of negligible ecological value and any impacts as a result of the proposed development are not considered to be significant. As such impacts on this habitat have been scoped out at this point of the assessment.

5.2.13 J2.6 Dry ditch

The eastern boundary of the northernmost agricultural field in the ecological compensation area is demarcated from the adjacent residential garden by a dry and unvegetated ditch, with a depth of approximately 0.75m. The ditch does not appear to hold standing water at any time of the year.

This habitat is considered to be of negligible ecological value and any impacts as a result of the proposed development are not considered to be significant. As such impacts on this habitat have been scoped out at this point of the assessment.

5.2.14 J3.6 Building

Building 1 is located within the south-western section of the site and lies within the hardstanding compound used for the parking of vehicles. The building is likely used as a shelter or for the temporary storage of materials as no wall is present on the eastern aspect and the internal areas are exposed. The walls are constructed from red brick and a flat metal-lipped roof is present, supported by a central metal pillar. The internal area of the building was visible and could be fully assessed. There are no loft voids or internal cavities, and the building is in a good condition with no cavities or crevices that could be used by roosting bats or nesting birds. The building is considered to have negligible potential to support roosting bats.

Building 2 is a large tin-shed that lies within an area of overgrown willow scrub. The walls and the flat roof have been constructed from single-skinned corrugated metal sheets, with metal support beams and pillars. There are no windows, however some sections of the roof are damaged, and the door is ajar, allowing some light to enter the building. There are no loft voids or internal cavities, and the single-skinned walls ensure that there are no cavities or crevices that could be used by roosting bats. The building is considered to have negligible potential to support roosting bats. The beams, floor and furniture within the building provide some, albeit limited, potential nesting opportunities for birds such as robins *Erithacus rubecula*, wrens *Troglodytes troglodytes* or pigeons *Columba livia domestica*. A large collection of pigeon droppings and a live pigeon were observed within the building; however, no evidence of nesting birds was observed.

This habitat is considered to be of negligible ecological value and any impacts as a result of the proposed development are not considered to be significant. As such impacts on this habitat have been scoped out at this point of the assessment. Impacts on ecological receptors using this habitat e.g. breeding birds are considered and discussed independently.

5.2.15 J5 Hardstanding

Areas of hardstanding on site include areas of gravel within the southern section of the site, a large spoil mound of mixed materials and large areas of concrete within the southern-eastern section and a large gravel area used to store vehicles within the south-western section.

This habitat is considered to be of negligible ecological value and any impacts as a result of the proposed development are not considered to be significant. As such impacts on this habitat have been scoped out at this point of the assessment.

5.3 Protected species or resources

As part of the PEA, specific observations of wildlife were also recorded. Wildlife observations focused on protected species, invasive species or species of conservation concern. Where potential for the presence of protected species was identified, further species or group specific surveys were undertaken. Full details of the results of these surveys are provided below.

5.3.1 Amphibians

Numerous records of GCNs were returned, including records of medium sized populations in the ponds within the proposed development site, the most recent of which dates from 2016. The records returned are not specific to each pond and detail combined results from previous GCN surveys undertaken between 1992 and 2016. However, it can be determined that GCNs have previously been recorded within some of the six onsite ponds and all records show small to medium sized counts, with a maximum count of 48 adults. Records of common frog, common toad and smooth newt were also returned from the proposed development site and records of palmate newt were returned from within 2km.

Following the GCN impact assessment, the six ponds on site were considered to be broadly suitable to support GCNs due to the presence of standing water and sufficient aquatic or emergent vegetation to support egg laying. Parts of the ditch / stream system at the site boundaries were slow flowing or still and appeared broadly suitable to support breeding GCNs at the time of the impact assessment.

An additional forty-seven mapped ponds and nine ditches were identified within 500m of the site, of which seventeen ponds and four ditches were approved for access by third-party landowners to undertake an impact assessment. See Appendix 7 for pond locations.

Following the impact assessment, GCN eDNA surveys and / or presence / absence surveys were undertaken of the six onsite ponds, four onsite ditches, three offsite ditches and seven offsite ponds that were considered suitable to support GCNs and access was available. Where positive eDNA results were returned or GCNs were found to be present, further population size class assessment surveys were undertaken. See Appendices 8 and 9 for the HSI (Habitat Suitability Index) and eDNA results respectively.

The full suite of GCN surveys showed that the site supports a medium-sized population of GCNs with max counts of eight, six, thirteen and six individuals in Ponds 3, 4, 5 and 6, respectively. No GCNs were recorded within onsite Ponds 1 and 2 or within any of the ditches or the stream at the site boundaries.

GCNs were also observed within two offsite ponds; ponds 24 and 26 both support a small-sized population of GCN with a peak count of eight individuals each.

Is it considered that the population of GCNs using the site likely forms part of a wider meta-population within the industrial estate and the surrounding landscape.

In addition to the ponds supporting a moderate breeding population, the terrestrial habitats on site provide foraging, sheltered commuting and hibernating opportunities for GCNs that are using the onsite or offsite ponds for breeding.

In addition to GCNs, the proposed development site was also found to support a large population of common toads (peak count of one hundred and seventy-nine), a medium

population of smooth newts (peak count of seventy), a medium population of common frog (peak count of eleven) and a small population of palmate newts (peak count of four).

GCNs and their habitat (aquatic and terrestrial) are afforded full protection by the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. As such, they can be considered to be a species of both international and national importance. Despite this, the UK is a stronghold for GCNs, and one estimate puts the national population at around 400,000 animals in 18,000 breeding sites (JNCC, undated). Given that the site is only considered to support a medium population with a maximum count of thirty-three individuals using four of the six ponds, it is not considered to be of international or national significance. However, the Wrexham Industrial Estate is known to support an overall large meta-population of GCNs that is of importance at the county level. Given the number of GCNs observed on site and within the immediate vicinity of the site that form part of this meta-population, coupled with the terrestrial habitat, aquatic breeding habitat and the habitat linkages that the site provides for this meta-population, the site and the GCNs it supports are considered to be of county significance.

5.3.2 Reptiles

Records of common lizard, slow worm, adder and grass snake were returned, all of which are located within Wrexham Industrial Estate, between 700m-1.2km west of the proposed development site. The common lizard and grass snake records date from 2020 and 2018 respectively, however the slow worm and adder records date from 'before 2009' and 'before 1999' respectively.

The areas of grassland, woodland edge, hedgerow, scrub and open mosaic habitats on site provide an array of suitable reptile habitats and provide foraging, commuting, basking and hibernating opportunities for slow worm, grass snake and common lizard. The drains and ponds on site further provide suitable foraging habitat for grass snake, which predominantly predate amphibians. The habitats on site are considered to be broadly unsuitable to support adders, which are specialists of heathland, moorland, coastal and woodland edges habitats.

Bryn Lane runs along the western site boundary and has the potential to act as a barrier to reptile movement, however the site is relatively well connected to other areas of suitable habitat within the wider landscape.

Despite the broad suitability of the habitats on site, no reptiles were observed on site during the reptile presence / absence surveys or the other numerous ecological surveys undertaken of the site.

Reptiles are not considered to be present on site or within the immediate vicinity of the site and are very unlikely to be adversely impacted by the development proposals. As such, reptiles have been scoped out at this point of the assessment.

5.3.3 Badger

Numerous records of badger were returned from within 2km of the proposed development site, the closest of which details a single active badger burrow from 2003, located approximately 400m west of the site.

Evidence of badger activity observed on site during the initial walkover survey in September 2021 was limited to a single badger scatt, which wasn't dug into a latrine, and an adjacent faint, short section of mammal path, both of which were recorded in the northernmost field (see Appendix 2, Target Note 4).

In addition to the suspected badger scatt, a fox scatt was observed in the eastern section of the site (see Target Note 5), an unknown species of deer (suspected to be a roe deer *Capreolus capreolus*) was briefly observed within the central section of the site (see Target Note 7) and deer footprints were observed along the eastern boundary of the site (see Target Note 6). A large rabbit warren comprising approximately 10 small burrows and surrounded by numerous rabbit droppings was observed within an area of woodland on site (see Target Note 8).

The habitats on site provide moderate-high quality foraging and commuting habitat for badgers and the areas of dense scrub and woodland on site provide sheltered sett building opportunities.

During minor vegetation clearance works to facilitate access for ecological surveys of the site, a suspected badger sett consisting of four burrows was observed within an area of dense scrub. Three of the burrows showed no signs of activity. This suspected sett was subsequently subject to a badger activity survey including the use of infrared cameras to monitor levels of badger activity and to classify the type of sett. During the monitoring period, a single badger was observed using one of the burrows on a single occasion. No additional evidence of badger activity was recorded on site during the other numerous ecological surveys of the site. Given the levels of badger use, the sett is considered to be in use as an outlier sett on an occasional basis by a single or very low number of individuals.

During GCNs surveys of offsite ponds a suspected main badger sett comprising at least 10 burrows was observed to the south of the site within an area of offsite woodland. It is considered likely that the badger observed using the sett onsite is a transient individual originating from this main sett.

In addition to the sporadic use of the outlier sett by a single or low number of badgers, it is considered that the site is likely used on an occasional basis for foraging and commuting purposes. As such, the site and the badgers that it supports are considered to be of importance at a site level.

5.3.4 Bats

Records of Brandt's *Myotis brandti*, whiskered *Myotis mystacinus*, lesser horseshoe, Daubenton's *Myotis daubentonii*, noctule, Natterer's *Myotis nattereri*, brown-long eared, common pipistrelle and soprano pipistrelle bats were returned. Records of bat roosts include common pipistrelle, brown long-eared and *Myotis sp.* bat roosts. The closest roost record is located approximately 330m west of the site and details approximately 30 suspected *Myotis sp.* droppings in a bat box. Field records of common pipistrelle, soprano pipistrelle, brown long-eared, noctule, Natterer's, whiskered / Brandt's, Daubenton's and lesser horseshoe bats were recorded from a land parcel immediately adjacent to the north-west of the site in 2020.

The majority of the site is composed of dense scrub and semi-improved grassland, which provides moderate quality habitat for foraging and commuting bats. In addition, the site contains pockets of higher quality habitat including unimproved grassland, ponds, hedgerows and woodland. Across the transect and static detector surveys, a minimum of six species of

bat were recorded: common pipistrelle, soprano pipistrelle, BLE, noctule, Daubenton's and *Myotis* sp. Overall, moderate levels of bat activity were recorded during the surveys, with bats exhibiting foraging and commuting behaviours. Soprano pipistrelles were the most abundant species during the transect surveys, accounting for approximately 63% of all transect recordings. Common pipistrelle, soprano pipistrelle and *Myotis* sp bats accounted for 34%, 24% and 37% of all static detector recordings respectively. Noctule, Daubenton's and BLE were recorded to a lesser extent. Bat activity was recorded across the entire site but was generally highest along the woodland, tree lines, hedgerows and lines of scrub along the site and field boundaries. The woodland and tree lines associated with the ponds in the centre of the site also provided a hotspot of activity. The foraging and commuting opportunities on site are considered to be of local importance.

There are no buildings on site which could be used by roosting bats as Buildings 1 and 2 both lack potential roosting features and have been assessed as having negligible bat roosting potential.

A ground level and subsequent aerial tree assessment undertaken of all trees on site with any potential to be removed as part of the development, found a total of 18 trees with potential roosting features for bats. Of these trees, 10 were assessed as having low potential, 5 as having moderate potential and 3 as having high potential. See Appendix 10 for the locations of trees with bat roosting potential.

Table 13 – Summary of bat roosting potential of the trees that have the potential to be adversely impacted by the proposed development

Negligible	Low	Moderate	High
T2, T8, T12, T16, T34	T1, T4, T9, T13, T14, T36, T37, T38 T39, G1	T3, T7, T11, T15, T45	T6, T10, T35

No evidence of roosting bats was observed during the ground level or aerial tree inspections. All trees assessed as having moderate or high potential to support roosting bats were subject to further bat presence / absence surveys (either emergence / return roost surveys or inspection with an endoscope, depending on whether or not the feature could be fully inspected) during which no bats were observed to be using the trees for roosting purposes.

All species of bat and their roosts are afforded full protection under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (known as the "Habitats Regulations"). Additionally, the following bat species are listed as species of principle importance under Section 7 of the Environment (Wales) Act 2016:

- Barbastelle
- Bechstein's bat
- Noctule
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared bat
- Greater horseshoe
- Lesser horseshoe

No bats were found to be roosting within any trees or buildings on site, however bats use trees for roosting purposes on a very sporadic and transient basis and their remains some potential

for bats to use the trees identified as having potential to support roosting bats in the future. Given that no evidence of roosting bats was observed during the surveys, it is considered that the bat roosting features on site are likely to only be used by a low number of bats in the future, if at all, and numerous alternative roosting opportunities are available within the immediate vicinity and the wider landscape within buildings and trees. As such, the roosting opportunities on site are considered to only be of site importance.

5.3.5 Birds

Records returned from within the proposed development site or within the immediate vicinity are limited to an auditory record of a green woodpecker *Picus viridis* from 2019 and a record of a male and female peregrine falcon *Falco peregrinus* from 2016, observed flying over site carrying prey items. Notable bird records from within 500m of the site include barn owl *Tyto alba*, curlew *Numenius arquata*, grasshopper warbler *Locustella naevia*, house martin *Delichon urbicum*, bullfinch *Pyrrhula pyrrhula*, woodcock *Scolopax rusticola* and goshawk *Accipiter gentilis*.

The site was found to support a typical bird assemblage (both diversity and density) for the habitats present. Due to the length of time that the site has been left unmanaged, areas of scrub and rank grassland support a high diversity and abundance of invertebrate prey, which supports a wide range of bird species through the breeding season.

A total of 60 species were recorded during the field surveys, of which, 34 were assessed as confirmed or likely breeding within 100m of the redline boundary. A further 14 species were assessed as possible breeding within 100m of the site. The majority of bird activity was associated with the field boundary features such as hedgerows, woodland and scrub, however the grassland areas are considered to be a valuable foraging resource for breeding birds on site.

Two notable off-site features were identified during the surveys: A large rookery is located immediately adjacent to the northern site boundary, and a breeding gull *Larus* spp. colony is located immediately adjacent to the southern site boundary (large numbers of *Larus* spp. were observed roosting at this location too). Neither of these features will be directly affected by the development proposals.

The following species assessed as confirmed or possible breeding within 100m of the site are species of conservation concern:

- | | |
|----------------------------|--|
| • Mallard | Amber (GB, Wales) |
| • Teal | Amber (GB, Wales) |
| • Stock dove | Amber (GB) |
| • Woodpigeon | Amber (GB) |
| • Moorhen | Amber (GB) |
| • Great black-backed gull | Red; (Wales); Amber (GB) |
| • Herring gull | Red (GB, Wales); Section 7 species |
| • Lesser black-backed gull | Amber (GB, Wales) |
| • Sparrowhawk | Amber (GB) |
| • Tawny owl | Amber (GB) |
| • Green woodpecker | Amber (Wales) |
| • Kestrel | Red (Wales); Amber (GB); Section 7 species |
| • Rook | Amber (Wales) |

- | | |
|-------------------|--|
| • Long-tailed tit | Amber (Wales) |
| • Willow warbler | Red (Wales); Amber (GB) |
| • Sedge warbler | Amber (GB) |
| • Whitethroat | Red (Wales); Amber (GB) |
| • Wren | Amber (GB) |
| • Song thrush | Amber (GB, Wales); Section 7 species |
| • House sparrow | Red (GB); Amber (Wales); Section 7 species |
| • Dunnock | Amber (GB); Section 7 species |
| • Pied wagtail | Amber (GB) |
| • Bullfinch | Red (Wales); Amber (GB); Section 7 species |
| • Greenfinch | Red (GB); Amber (Wales) |
| • Linnet | Red (GB, Wales); Section 7 species |
| • Reed bunting | Amber (GB, Wales); Section 7 species |

Other notable species of conservation concern recorded on site, but are not considered to be breeding include:

- | | |
|--------------|---|
| • Lapwing | Red (GB, Wales); Near Threatened; Section 7 species |
| • Curlew | Red (GB, Wales); Near Threatened; Section 7 species |
| • Woodcock | Red (GB, Wales) |
| • Snipe | Amber (GB, Wales); |
| • Kingfisher | Amber (Wales); Schedule 1 species; Annex 1 species |

Whilst the site supports a moderate number of nationally protected breeding bird species and a high number of species of conservation concern, most are generalist species that will use other habitats present within the local area. Following territory mapping analysis, the population of notable bird species on site is not considered to be significant on a national or regional level. As such, it is considered that the site is of moderate local significance for breeding birds.

5.3.6 Hazel dormouse

No records of hazel dormouse were returned from within 2km of the proposed development site.

The majority of the site is composed of grassland habitats which are broadly unsuitable to support hazel dormice. The large areas of scrub, the smaller areas of woodland and the hedgerows on site provide some suitable habitat, however the majority of these habitats are not particularly species rich and are lacking sufficient quantities of key species such as hazel and honeysuckle. The woodland off site along the northern site boundary is perhaps more suitable in terms of vegetation as hazel and honeysuckle are present, however its relatively small size renders it less suitable.

Additionally, the proposed development site and the adjacent woodland along the northern site boundary are isolated from larger areas of suitable woodland habitat within the wider landscape by large continuous urbanised areas and arable fields.

No evidence of hazel dormice activity was observed during the numerous surveys undertaken of the site.

Hazel dormice are not considered to be present on site or within the immediate vicinity of the site and are very unlikely to be adversely impacted by the development proposals. As such, this species has been scoped out at this point of the assessment.

5.3.7 Invasive species

Single stands of the invasive species Himalayan balsam (see Target Note 9), hollyberry cotoneaster *Cotoneaster bullatus* (see Target Note 11) and an additional unidentified cotoneaster species (see Target Note 10) were observed on site. The cotoneaster species identified is not considered to be one of the species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), however for the purposes of this assessment, it will be considered as an invasive species as most cotoneaster species can exhibit invasive tendencies, particularly within species-rich grasslands and the vegetative communities associated with open mosaic habitats.

Invasive species are of no ecological / invasive conservation value. The potential impacts associated with their disturbance and spread of these species, and the significance of this impact is discussed further in Section 6.

5.3.8 Otter

Numerous records of otter were returned from within 2km of the proposed development site. All records detail either trail camera footage or field signs (spraints and footprints). The closest record is located approximately 500m south-east of the site, however it is historical and dates from 1946. All other records date from 1991-2019 and detail otters along Redwither Brook (1km south-west of the proposed development site), River Clywedog (1.7km south) and on the floodplain of the River Dee (1.6km east).

The entire length of the ditches and stream at the site boundaries were not subject to a comprehensive inspection for evidence of otter activity (due to the density of dense scrub), however all accessible sections were inspected, and no evidence of otter activity was observed. These watercourses are not considered to be suitable to support otters due to the lack of fish on which to forage and a lack of connectivity to the larger watercourses within the wider landscape that would cause them to be used for commuting purposes.

No evidence of otter activity was observed during the numerous surveys undertaken of the site.

Otters are not considered to be present on site or within the immediate vicinity of the site and are very unlikely to be adversely impacted by the development proposals. As such, this species has been scoped out at this point of the assessment.

5.3.9 Water vole

No records of water vole were returned from within 2km of the proposed development site.

The entire length of the ditches and stream at the site boundaries were not subject to a comprehensive inspection for evidence of water vole activity (due to the density of dense scrub), however all accessible sections were inspected, and no evidence of water vole activity was observed.

No evidence of water vole activity was observed during a water vole survey of the stream at the northern site boundary and the ditch at the eastern boundary that was undertaken in 2011 to inform a planning application for the parcel of land immediately adjacent to the northern site boundary. These watercourses were found to be broadly unsuitable to support water vole during the 2011 survey and are in a similar condition now. The section of ditch that runs along the western section of the site and the stream that runs along the northern section of the site are almost entirely shaded by dense scrub or woodland and have predominantly unvegetated banks, lacking sufficient foraging opportunities for water voles. The section of ditch that runs along the eastern site boundary is considered to be broadly unsuitable as it holds very little standing water for the majority of the year and is being encroached by dense scrub, reducing its suitability.

No evidence of water vole activity was observed during the numerous surveys undertaken of the site.

Water voles are not considered to be present on site or within the immediate vicinity of the site and are very unlikely to be adversely impacted by the development proposals. As such, this species has been scoped out at this point of the assessment.

5.3.10 White-clawed crayfish

No records of white-clawed crayfish were returned from within 2km of the proposed development site. The habitats on site are considered to be unsuitable to support this species as the stream and ditches at the site boundary are heavily vegetated or shaded and lack the sufficient substrate to provide refugia, breeding and foraging opportunities.

No evidence of white-clawed crayfish was observed during the numerous surveys undertaken of the site.

White-clawed crayfish are not considered to be present on site or within the immediate vicinity of the site and are very unlikely to be adversely impacted by the development proposals. As such, this species has been scoped out at this point of the assessment.

5.3.11 Lesser silver water beetle

No records of lesser silver water beetle were returned within 2km of the proposed development site. Within the UK, this species is only known to occur in two counties in England: Somerset and Cheshire, and one county in Wales; Wrexham Borough.

The lesser silver water beetle is fully protected under the Wildlife and Countryside Act 1981 and is a Red List species.

Lesser silver water beetles have an extremely restricted habitat requirement and are predominantly only found in ponds with cattle-poached margins and with a raft of floating vegetation. A lesser silver water beetle survey was undertaken of Ponds 1-5 on site (and of the ditch along the eastern boundary) in 2013 by Andy Harmer Ecology Services, to inform an Environmental statement prepared for the Wrexham (Gas Fired Power Station) Order. The survey found all ponds and ditches to be broadly unsuitable to support lesser silver water beetle and indicated further decline in suitability would occur if the ponds remained unmanaged. The ponds have been unmanaged since the survey and many have entered a

late successional stage, being encroached by dense scrub or choked by swamp vegetation, further reducing their suitability to support this species.

No evidence of lesser silver water beetles was observed during the numerous surveys undertaken of the site, which included numerous GCN surveys of the ponds and aquatic invertebrate surveys of the ponds as part of the PSYM surveys.

Lesser silver water beetles are not considered to be present on site or within the immediate vicinity of the site and are very unlikely to be adversely impacted by the development proposals. As such, this species has been scoped out at this point of the assessment.

5.3.12 Butterfly species of principal importance

Numerous records of dingy skipper *Erynnis tages* and grizzled skipper *Pyrgus malvae* butterflies were returned from within 2km of the site, the closest of which are located approximately 100m south-east of the site within the Wrexham Industrial Estate Wildlife Site.

The majority of the site is broadly unsuitable to support dingy and grizzled skipper due to a lack of sufficient quantities of their larval foodplants; common bird's-foot trefoil, greater bird's-foot trefoil and horseshoe vetch *Hippocrepis comosa* (completely absent from the site) for dingy skipper and common agrimony, creeping cinquefoil and wild strawberry for grizzled skipper. However, the southernmost section of the site contains an area of open mosaic habitat that supports an abundance of common bird's-foot trefoil, creeping cinquefoil and wild strawberry. In addition, this area contains exposed areas and banks of bare ground and rubble which will provide basking habitat and supports an array of wildflowers for adults to feed. The adjacent area of lowland meadow also contains bird's-foot trefoil and an abundance of wildflowers to support adults.

All areas of grassland on site have some suitability to support small heath butterflies *Coenonympha pamphilus* due their preferred larval food plants of bent grasses, meadow grasses and fescues being widespread across the site. However, the southern section of the site is considered to be the area of highest value for this species due to the abundance of larval food plants, the abundance and diversity of adult food plants and the availability of basking opportunities.

Butterfly surveys particularly targeting dingy skipper that were undertaken of the southern section of the site observed peak counts of two dingy skipper, four small heath and seven grizzled skipper. All three butterflies were observed using both the unimproved grassland and the open mosaic area; however, all three species showed a greater affinity for the open mosaic habitat. As such, the southern section of the site is considered to support small-moderate size populations of all three species.

Although the survey was not extended to incorporate the entire site due to a general lack of suitability, numerous other ecological surveys undertaken across the site resulted in numerous incidental butterfly sightings. With the exception of a single small heath recorded within the proposed compensation area to the east, none of these incidental sightings were of dingy skipper, grizzled skipper or small heath butterflies using any other sections of the site. Additional species recorded included:

- Common blue *Polyommatus icarus*
- Holly blue *Celastrina argiolus*

- Meadow brown *Maniola jurtina*
- Ringlet *Aphantopus hyperantus*
- Large skipper *Ochlodes sylvanus*
- Red admiral *Vanessa atalanta*
- Small tortoiseshell *Aglaia urticae*
- Peacock *Aglaia io*
- Comma *Polyommatus c-album*
- Painted lady *Vanessa cardui*
- Brimstone *Gonepteryx rhamni*
- Small copper *Lycaena phlaeas*
- Speckled wood *Pararge aegeria*
- Large white *Pieris brassicae*
- Small white *Pieris rapae*
- Gatekeeper *Pyronia tithonus*

Dingy skipper, small heath and grizzled skipper are listed as species of principal importance under Section 7 of the Environment (Wales) Act 2016, indicating that they are species of national importance. Dingy skipper have limited distribution across the UK and Wales due to a reduction in suitable habitat. No detailed population size estimates are available for Wales or the UK, however *The State of the UK's Butterflies 2015* (Butterfly Conservation Trust, 2015) shows population trend data and dingy skipper have shown significant declines in both occurrence (-61%) and abundance (-19%) from 1976-2014, however they are showing some recent increases in occurrence (+21%) and abundance (+69%) from 2005-2014. The site was not seen to support a large population as dingy skipper colonies can contain up to 50 individuals. Additionally, the majority of the site is broadly unsuitable and only the southern section of the site contains suitable habitat for dingy and grizzled skipper. As such, the population present is not considered to be of national importance.

Despite the low number of individuals observed using the site, they may form part of a larger colony which spreads across pockets of suitable habitat within the Wrexham Industrial Estate, encompassing the known population at the Wildlife Site of the same name. Given the low number of dingy and grizzled skipper populations within Wrexham outside of the industrial estate, the populations of these using the site are considered to be of county importance. The potential impacts of the development on these species are discussed further in Section 6.

5.3.13 General terrestrial invertebrate communities

A total of 261 species were recorded on site during the invertebrate surveys, of which only 8 (3.01%) are regarded as species of importance based on national or local status and rarity. Of these eight species, it is recognized by many of the national recording schemes that a number of these no longer warrant their current status and that they may need revising. Table 14 below shows a summary of important species observed on site:

Table 14 – Protected or otherwise notable species observed

SCIENTIFIC NAME	COMMON NAME	STATUS	HABITAT PREFERENCES AND SPECIES NOTES
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<i>Agelastica alni</i>	Alder leaf beetle	Data Deficient; Nationally Rare*	Foliage feeder on alders (<i>Alnus</i> spp.). Owing to a significant range expansion, it now no longer warrants a nationally significant status.
<i>Coenonympha pamphilus</i>	Small heath butterfly	Section 42; Vulnerable	Prefers structurally varied grass swards with fine-leaved grasses such as bents (<i>Agrostis</i> spp.) and fescues (<i>Festuca</i> spp.).
<i>Crossocerus distinguendus</i>	A solitary wasp	Notable a	Associated with structurally complex mosaics including brownfield sites.
<i>Erynnis tages</i>	Dingy skipper	Section 42	Larvae feed on prostrate bird's-foot trefoil when small and potentially taller stands when older. The species appears to require a mosaic of features and habitats from patchy bare ground through to tall swards.
<i>Hippodamia variegata</i>	Adonis ladybird	Notable b*	Open mosaics, parched grasslands.
<i>Libellula fulva</i>	Scarce chaser dragonfly	Near Threatened	Slow meandering rivers and large dykes and rhynes. Requires good-quality water and abundant submerged and floating vegetation. Although still a scarcity, the species is spreading and may not be as scarce as its current status suggests. Not thought to be breeding on the site.
<i>Merzomyia westermanni</i>	A fruit fly	Notable*	Associated exclusively with ragwort species.
<i>Pyrgus malvae</i>	Grizzled skipper	Section 42; Vulnerable	Larvae feed on the prostrate-growing forms of a range of Rosaceae plants including creeping cinquefoil, agrimony, and wild strawberry.

*Accepted as being more common than this status suggests; likely to be downgraded.

The overall number of species recorded is not particularly high, but it does reflect well the habitats and species present on the site. The scarce species percentage is also not high but does include three key species to the local area; small heath, dingy skipper and grizzled skipper butterflies.

Although there is no single species or species group of greatest value to the site, the populations of scarce and declining butterflies are of particular note, as they are demanding species requiring significant compensation to allow them to persist on the site. Coupled with these, there are other specialized and demanding groups such as the bees and wasps, both the ground-nesting and also aerial (deadwood)-nesting assemblages that will require optimal and complex habitat mosaics in order to survive on the site alongside a proposed development.

The site is thought to comprise a moderately rich invertebrate fauna that includes a number of localized and specialized species.

The valuation of the site takes into consideration the range of species recorded, including the scarce species, the overall assemblages, and the importance of the habitats to the species. It also considers the context of the year's weather, the site and/or its species in relation to the local area and further afield.

From considering the above summary information and data collected from the surveys, it is suggested that any impact on the site's key features and species should be considered to be of at least local / county significance.

The site is considered to be of local / county importance and not one of a higher status, owing to the site not holding significant populations of NERC Act Section 42 species or other species with a nationally significant status. The site also does not hold, or is not thought to hold, a high diversity of species.

However, it should be noted that this site's invertebrate resources are likely to support other populations across a wider resource of small sites on and around the Industrial Estate that includes scarce and increasingly threatened invertebrates such as the 'brownfield' butterflies and solitary bees and wasps.

5.3.14 Summary of ecological importance

Table 15 – Summary of ecological importance of receptors

ECOLOGICAL FEATURE	ECOLOGICAL IMPORTANCE OF FEATURE
Statutorily protected sites	Scoped out
Non-statutorily protected sites	Scoped out
Woodland and dense scrub	Local
Scattered scrub	Negligible
Trees	Local
Grassland	County
Tall ruderal	Negligible
Ponds	Local
Watercourse and ditches	Local
Amenity grassland	Negligible
Open mosaic habitat	County
Introduced shrub	Negligible
Hedgerows	Local
Fences	Negligible
Dry ditch	Negligible
Buildings	Negligible
Hardstanding	Negligible
Amphibians	County



Reptiles	Scoped out
Badgers	Site
Bats	Local
Birds	Local
Hazel dormice	Scoped out
Invasive species	N/A
Otter	Scoped out
Water vole	Scoped out
White-clawed crayfish	Scoped out
Lesser silver water beetle	Scoped out
Butterfly species of principal importance	County
General terrestrial invertebrate communities	Local / county

6 IMPACT ASSESSMENT

This section provides an assessment of the significance of predicted impacts on the valued ecological habitats and species with specific reference to the proposed development. The predicted impacts are described in the absence of mitigation in relation to the construction phase of the development.

6.1 Construction

Construction activities that have the potential to impact ecological receptors include land take, vegetation removal, material storage, excavations, soil movements or ground works and use of vehicles, machinery or plant.

6.1.1 Woodland and scrub

Removal or damage

The proposed development will result in the loss of 0.24ha of the 0.53ha of woodland on site, in addition to the loss of areas of dense scrub. Additionally, construction activities too close to the root protection areas (RPAs) of retained areas of woodland could also cause permanent damage. Given the proportions of vegetation that are due to be retained on site, the loss of woodland and dense scrub on site is considered to be a **medium magnitude impact at local level, therefore it is considered to be of minor significance.**

6.1.2 Trees

Removal or damage

The development proposals will include the removal of a number of semi-mature and mature trees and construction activities too close to the RPAs of retained trees could also cause permanent damage. Given that a proportion of the trees on site are to be retained as part of the development, this is considered to be a **medium magnitude impact at local level, therefore it is considered to be of minor significance.**

6.1.3 Grassland

Direct loss

The proposed development has been designed to retain almost all areas of the unimproved lowland meadow Habitat of Principal Importance on site. With the exception of Grassland 6 within the ecological compensation area and Grasslands 4 and 5, all other areas of grassland on site will be removed to facilitate the proposals. Given the proposed retention of almost all of the unimproved grassland and that the other areas of grassland on site are only considered to be of local importance, this is considered to be a **high magnitude impact at local level, therefore it is considered to be of moderate significance.**

Habitat loss or degradation through succession

Whilst suitable habitat will be retained on site, this habitat has the potential to degrade during the operational phase of the development. If left unmanaged in perpetuity, this habitat is likely to become increasingly occupied by competitive grass species, tall ruderal species and scrub, which will reduce the habitats overall value. This is considered to be a moderate magnitude impact at a county level, however given that the succession and associated degradation of this habitat is a natural process and would continue to occur regardless of the proposals, it is not an impact of the development.

Overall, it is considered that the loss of grassland on site will be a high magnitude impact at local level, therefore it is considered to be of moderate significance.

6.1.4 Ponds

Removal and pollution

Of the six ponds present on site, only Ponds 1, 2 and 4 are due to be removed to facilitate the development proposals, with Ponds 3, 5 and 6 being retained in their entirety. Site clearance and construction works within close proximity to retained ponds may result in the disturbance and / or pollution of retained ponds. Given that half the ponds on site are due to be retained and the landscape surrounding the site contains a high density of ponds, the proposed loss and potential disturbance and pollution impacts of retained ponds is considered to be a **high magnitude impact at local level, therefore it is considered to be of moderate significance.**

6.1.5 Watercourses and ditches

Habitat loss

In order to facilitate the creation of a roundabout at the proposed access point onto site, approximately 40m of the ditch at the western site boundary will need to be culverted. This ditch is already culverted under a road at the point it joins the site and so the proposed culvert would be an extension of the existing culvert. The ditch along the eastern site boundary will be retained as part of the proposals, however a bridge will be constructed over the ditch to facilitate access to the ecological compensation area for initial habitat creation and ongoing management works. The watercourse along the northern boundary will be retained in its entirety. As such, this is considered to be a **low magnitude impact at a local level therefore it is considered to be of minor significance.**

Pollution and disturbance

Construction activities within close proximity to the watercourse or ditches at the site boundaries could result in the disturbance or pollution of these aquatic features. This impact could occur in a single event or over a long period during construction and could be extremely difficult to reverse. It could have wide-ranging effects, with pollutants potentially flowing downstream and affecting species reliant on the watercourse. **This is considered to be a high magnitude impact at a local level; therefore, it is of moderate significance.**

6.1.6 Open mosaic habitat

Direct loss

The proposed development has been designed to retain almost all areas of the open mosaic Habitat of Principal Importance on site, with only a small section removed to facilitate the proposals. As such, this is considered to be a **low magnitude impact at county level, therefore it is considered to be of minor significance.**

Habitat loss or degradation through succession

Whilst suitable habitat will be retained on site, this habitat has the potential to degrade during the operational phase of the development. Open mosaic habitat is generally resilient to natural degradation as this habitat type is characterised by a lack of management following an initial significant disturbance event. Despite this, if left unmanaged in perpetuity, this habitat is likely to become increasingly occupied by scrub which will reduce the habitats overall value with regards to the botanical and invertebrate species that it supports, which is one of the key values of open mosaic habitat. This is considered to be a moderate magnitude impact at a county level, however given that the succession and associated degradation of this habitat is a natural process and would continue to occur regardless of the proposals, it is not an impact of the development.

Overall, it is considered that there won't be a significant adverse impact on open mosaic Habitat of Principal Importance as a result of the proposed development.

6.1.7 Hedgerows

Removal or damage

The development proposals will result in the removal of Hedgerows 2, 3 and 4 on site, constituting a loss of approximately 63m of defunct species-poor hedgerow, 35m of defunct species-rich hedgerow, and 365m of intact species-poor hedgerow. Construction activities too close to the RPAs of retained hedgerows could also cause permanent damage. Given that these hedgerows are largely species poor and a significant proportion of the hedgerows on site will be retained, this is considered to be a **medium magnitude impact at local level, therefore it is considered to be of minor significance.**

6.1.8 Amphibians

Risk of harm during the construction phase

Amphibians using the site during the construction phase of the development would be at risk of direct harm (e.g. through excavation work or vegetation clearance) or indirect harm (e.g. through becoming trapped in open excavations). This impact would be negative, could last for the duration of the construction period and is of a high magnitude as it could result in death of numerous individuals. Given that the site is known to support a medium sized population of GCNs, this is considered to be a **high magnitude impact at a county level, therefore it is of major significance.**

Habitat loss

The proposed development will result in the loss of areas of suitable foraging and commuting habitat for great crested newts, namely dense scrub and grassland. Despite this, the layout for the site has been designed to incorporate significant habitat retention, including the retention of habitats at the site boundaries, which will continue to act as ecological corridors and commuting routes for amphibians. Ponds 1, 2 and 4 will be removed as part of the development, however only Pond 4 was found to be in use by GCNs, the other two only being used by common amphibian species. Given the level of habitat retention, specifically maintaining habitat linkages through ecological corridors at the site boundaries and the retention of three of the four on site ponds used by GCNs, the proposed loss of habitats on site is considered to be **a moderate magnitude impact at a county level, therefore it is of major significance.**

Risk of entrapment during the operation phase of the development

GCNs and other amphibians using the site during the operational phase of the development have the potential to fall and become trapped within gully pots installed on site. The potential for this impact is reduced given that ecological corridors containing suitable sheltered commuting habitat will be retained at all site boundaries and will continue to provide connectivity between the site and the surrounding landscape, reducing the need and likelihood of amphibians commuting across the developed areas. Therefore, this is considered to be **a low magnitude impact at a county level, therefore it is of minor significance.**

6.1.9 Badgers

Sett loss and risk of harm to individuals within setts

The outlier badger sett observed on site lies within the construction zone of the proposed development and will need to be closed in order to facilitate the proposals. This sett was used on a single basis by an individual badger during the monitoring period and whilst the closure will have an impact to individuals, it is not considered to be significant to the local population.

If badgers are present within the sett at the time of the works, or new badger setts have been established prior to the start of works, they may be at risk of harm or death. The magnitude of this impact would be dependent on the number of badgers present, which given the observed level of badger use of the site, would likely be a single or low number of individuals using the sett as an outlier and not for breeding purposes. The harm or death of an individual or small number of badgers would be a **high magnitude impact at a site level, therefore it is of minor significance.**

Risk of harm to transient individuals

If badgers are using the site for foraging or commuting purposes during the construction phase of the development, they are at risk of direct harm through becoming trapped in excavations. This impact is of a high magnitude as it could result in the harm or death of badgers, however given the observed level of use of the site, it would likely be limited to an individual or small number of badgers and hence is considered to be a **high magnitude impact at a site level, therefore it is of minor significance.**

Habitat loss

The proposed development will result in the loss of areas of suitable foraging and commuting habitat namely dense scrub and grassland. Given the low level of badger use observed on site, the retention of suitable areas of habitat and the quantity of suitable habitat within the surrounding landscape, this is considered to be a **low magnitude impact at a site level, therefore it is not of significance.**

Inappropriate lighting

Inappropriate external lighting in use during the operational phase of the development could deter badgers from using the retained areas of habitat on site and at the site boundaries for foraging, commuting and sett building. Badgers can be tolerant of light pollution and are known to occupy urban environments subject to high levels of light exposure. As such, this is considered to be a **low magnitude impact at a site level, therefore it is not of significance.**

6.1.10 Bats

Risk of harm

If bats are present within trees which are scheduled for felling, they could potentially be harmed or killed during the works. The potential for this impact is very low given the relatively low number of trees that are due to be felled and lack of evidence of roosting bats observed during the ground level and aerial inspections and bat presence / absence surveys undertaken of these trees. Bats use tree roosts in a very transient capacity and there only remains the residual risk that bats could be using potential roosting features within the trees at the time of the felling. The absence of evidence of roosting and the level of bat activity observed on site during the surveys suggest that the trees would likely only be used by a single or low number of common species of bat, if at all. As such, this is considered to be a **low magnitude impact at the local level and is therefore of minor significance.**

Loss of roosting opportunities

Given that no bats have been observed to be roosting on site, despite comprehensive surveys of any trees that are due to be removed on site, the impacts on bats associated with the loss of roosting opportunities is very limited. Bats use tree roosts in a very transient capacity and there remains some potential for bats to use potential roosting features within trees on site in the future. The absence of evidence of roosting and the level of bat activity observed on site during the surveys suggest that the trees would likely only be used by a single or low number of common species of bat, if at all. Numerous alternative roosting opportunities are available for bats in the local area including within retained trees onsite and offsite trees and buildings. As such, the loss of these potential roosting opportunities as a result of the development is considered to be a **low magnitude impact at the site level and is therefore of minor significance.**

Loss of foraging habitat or severance of commuting corridors

The loss of dense scrub, hedgerows, ponds, small areas of woodland and semi-improved grassland on site will result in a reduction of foraging opportunities for bats. This impact is reduced however due to the proposed retention of large areas of high-quality habitat on site including the unimproved grassland, areas of woodland, ponds, ditches, dense scrub, open mosaic habitat and hedgerows. The impact on commuting routes is limited as all linear

features such as trees, watercourses, vegetated ditches and hedgerows at the site boundaries are being retained, in addition to a 10m buffer zone to provide an ecological corridor. As such, this is considered to be a **medium magnitude impact at local level, therefore it is of minor significance.**

Inappropriate lighting

Inappropriate external lighting in use during the operational phase of the development could deter bats from using the retained areas of habitat on site and at the site boundaries for foraging and could sever commuting corridors. As such, this is considered to be a **medium magnitude impact at a local level and is therefore of minor significance.**

6.1.11 Breeding birds

Risk of harm

Vegetation removal, tree felling, arboricultural works and the demolition of Building 2 could result in the direct loss of nests, any individuals within the nests and of available nesting territories if conducted during the breeding season. This impact would be of a high magnitude as it could result in the harm or death of birds and their young or eggs.

Given the number, range and importance of species that the site supports, this is considered to be a **high magnitude at a local level, therefore it is of moderate significance.**

Habitat loss

The loss of dense scrub, hedgerows, ponds, trees, small areas of woodland and semi-improved grassland on site will result in a reduction of foraging and nesting opportunities for birds. This impact is reduced however due to the proposed retention of large areas of high-quality habitat on site including the unimproved grassland, areas of woodland, ponds, ditches, dense scrub, open mosaic habitat and hedgerow. As such, this is considered to be a **medium magnitude impact at local level, therefore it is of minor significance.**

6.1.12 Invasive species

Risk of dispersal

Whilst cotoneaster species are invasive, they are not as harmful to habitats and ecosystems, human health or infrastructure as other invasive plants, such as Japanese knotweed, or giant hogweed. Himalayan balsam can have significant adverse impacts for native habitats, however the most severe impacts are associated with watercourses. Additionally, only a single plant of Himalayan balsam has been observed on site. Whilst a single plant can produce numerous seeds, the magnitude of any potential impact is reduced.

Given this and the habitats present on site and within the immediate vicinity of the site, the spread of invasive species as a result of the proposed development is very unlikely to have a significant adverse effect on any nearby habitats or protected sites of county significance. As such, this is considered to be a **medium magnitude impact at a local level, therefore it is of minor significance.**

6.1.13 Butterfly species of principal importance

Habitat loss

The layout for the proposed development has been designed to avoid and reduce impacts on dingy and grizzled skipper by retaining almost all areas of lowland meadow unimproved grassland and open mosaic habitat. As such, direct habitat loss for these species will be negligible as a result of the proposals. The grassland areas on site that are due to be lost to facilitate the development have some limited suitability to support small heath butterflies, however the highest quality section of the site for this species is also due to be retained and they were not observed using any other sections of the site that are due to be lost. This species is more common and widespread than both dingy and grizzled skipper and does not have as specific habitat requirements. As such, the loss of habitat that is proposed **is not considered to be a significant impact**.

Habitat loss or degradation through succession

Whilst suitable habitat will be retained on site, these habitats have the potential to degrade during the operational phase of the development, reducing their suitability to support these species. Open mosaic habitat is generally resilient to natural degradation as the habitat type is characterised by a lack of management following an initial significant disturbance event. Despite this, if left unmanaged in perpetuity, this habitat is likely to become increasingly occupied by scrub which will reduce the areas bare ground for basking and will outcompete the larval foodplants required to support these species. Additionally, the unimproved grassland habitat is already beginning to become encouraged by scrub and tall ruderal species due to a lack of management in recent years. This encroachment and natural succession of the grassland is likely to continue if left unmanaged.

The degradation of the unimproved grassland and open mosaic habitats on site would reduce the suitability of the site to support these species and would lead to a reduction on the population size that the industrial estate supports. This is considered to be a moderate magnitude impact at a county level, however given that the succession and associated degradation of these habitats is a natural process and would continue to occur regardless of the proposals, it is not an impact of the development.

Overall, it is considered that there won't be a significant adverse impact on butterfly species of principal importance as a result of the proposed development.

6.1.14 General terrestrial invertebrate communities

Impacts on dingy skipper, grizzled and small heath butterflies are discussed separately in section 6.1.13 above. This section relates to the remaining general invertebrate assemblage observed on site.

Habitat loss and degradation

The loss of scrub, trees, ponds and grassland habitats on site to facilitate the proposed development will reduce the availability of resources for general invertebrates and will impact on the range of species that the site can support. Despite this, the magnitude of the impact is reduced as areas of each habitat type are being retained across the site, including the majority of the unimproved grassland and open mosaic habitats, which support almost all notable species observed during the surveys.

This is considered to be a low magnitude impact at a local / county level, therefore it is of minor significance.

6.1.15 Summary

Table 16 – Summary of construction impacts

ECOLOGICAL FEATURE	ECOLOGICAL IMPORTANCE OF FEATURE	MAGNITUDE OF POTENTIAL IMPACT	SIGNIFICANCE
Woodland and dense scrub	Local	Medium	Minor
Trees	Local	Medium	Minor
Grassland	Local (due to lack of impacts to the unimproved grassland)	High	Moderate
Ponds	Local	High	Moderate
Watercourse and ditches	Local	High	Moderate
Open mosaic habitat	County	Low	Minor
Hedgerows	Local	Medium	Minor
Amphibians	County	High	Major
Badgers	Site	High	Minor
Bats	Local	Medium	Minor
Breeding birds	Local	High	Moderate
Invasive species	Local	Medium	Minor
Butterfly species of principal importance	County	Negligible	Not significant
General terrestrial invertebrate communities	Local / county	Low	Minor

7 MITIGATION, COMPENSATION & ENHANCEMENT

This section describes the measures which are required to mitigate or compensate for any significant environmental impacts. It also includes any proposed enhancement measures, where applicable.

7.1 Construction

7.1.1 Woodland and scrub

Removal or damage

To compensate for the loss of approximately 0.24ha of woodland on site, approximately 0.53ha of native woodland will be planted within the ecological compensation area, along with an additional 0.03ha within the open mosaic habitat to the south of site. This woodland planting will comprise a native species-rich mix of tree and understory species. Whilst it will take a significant period of time for the planted woodland to mature, the woodland due to be removed on site is relatively young and lacks mature trees and any ground flora species indicative of ancient woodland. As such, this compensatory planting is considered to be sufficient. Areas of dense scrub on site, comprising both mixed scrub and bramble scrub will be lost as part of the development. The additional woodland planting beyond the 0.24ha that will be lost will compensate for some of this loss.

Where possible, RPAs will be established and implemented around any the areas that are to be retained. Where necessary, these areas will be adequately protected by appropriately designed protective barriers and ground protection throughout the entire development process. However, some of the RPAs of the woodland that will be retained within close proximity to the proposed development will likely be encroached.

7.1.2 Trees

Removal or damage

A number of mature and semi-mature scattered trees on site will be removed to facilitate the development proposals. However, the majority of trees will be retained. To compensate for the proposed tree removal, 15 fruit trees comprising wild plum, apple and pear will be planted as part of a small orchard within the offsite compensation area. Additionally, numerous native tree species, comprising field maple, pedunculate oak, beech, rowan, silver birch and hornbeam will be planted as extra heavy standards within the proposed hedgerow within the ecological compensation area and along the southern site boundary.

RPAs will be established and implemented around any semi-mature or mature trees that are to be retained and are in close proximity to proposed development works, particularly excavation works. Where necessary, these areas will be adequately protected by appropriately designed protective barriers and ground protection throughout the entire development process.

7.1.3 Grassland

Direct loss

Due to the retention of almost all areas of unimproved lowland meadow on site, it is considered that the proposed development will not result in a significant adverse impact upon this habitat. Compensation for this small loss will be implemented through the enhancement and ongoing management of the retained areas, as discussed below. Some compensation for the loss of other areas of grassland on site will be provided through the enhancement of the existing agricultural grassland within the ecological compensation area. This grassland will be enhanced to provide both rough tussocky grassland and wildflower rich meadow grassland.

Habitat loss or degradation through succession

Regardless of whether the proposed development is implemented, the unimproved lowland meadow grassland on site would see a natural long-term reduction in value as a result of natural processes of succession e.g. scrub encroachment. However, the proposed development presents a mechanism to ensure the long-term retention and management of this habitat to maximise its value and benefits to biodiversity. Proposed long-term management includes an annual hay cut of the grassland to halt the encroachment of scrub and to impede the growth of coarse grasses and tall ruderal species.

7.1.4 Ponds

Removal and pollution

To compensate for the loss of Ponds 1, 2 and 4, an additional 13 ponds of varying shape, size and depth will be created within the ecological compensation area. Newly created ponds will be designed and managed to provide a range of ecological niches, from shallow ponds that dry out on occasion to deep ponds that retain water all year round. An additional two ponds / shallow ephemeral scrapes will also be created within the open mosaic habitat within the southern section of the site. This will result in the replacement of ponds being lost on a 5:1 ratio. Given the numbers of GCNs present on site and within the local area, it is considered highly likely that the newly created ponds will support this species and will hence qualify as habitats of principal importance under the same qualifying criteria as Ponds 1, 2 and 4.

Specific pollution prevention measures will need to be implemented to ensure that the retained and any newly created ponds are protected during the consultation phase of the development. Where possible, this will include a 'no-works' buffer zone of at least 5m around each pond.

7.1.5 Watercourse and ditches

Habitat loss and enhancements

To compensate for the loss of the 40m section of ditch being culverted at the western site boundary to facilitate the creation of an access roundabout, approximately 275m of ditches will be created within the ecological compensation area. This proposed ditch creation constitutes significantly more than would be required to compensate for the culverted section and is considered to be a significant ecological enhancement with regards to this habitat type. In addition to the additional ditch creation, sections of the retained ditches at the eastern and western boundaries will be enhanced by undertaking selective scrub clearance to open

sections up and encourage the growth of a greater diversity of marginal and emergent plant species, increasing the ecological value of the ditches.

Pollution and disturbance

Specific procedures and control measures will be implemented to ensure that there is no risk of input into the watercourse or ditches, such as those listed in pollution prevention guidance issued by the Environment Agency. These measures should conform to best practice guidance and include the cleaning of all machinery and equipment before use on site to prevent contamination of the waterbodies with foreign abiotic and biotic materials. The measures will be set out by the contractors prior to the commencement of works.

A buffer zone of 10m will be retained along the length of the entire watercourse at the northern site boundary and along the majority of the ditches at the eastern and southern boundary of the working area. The exceptions to this buffer zone will be for culverting a small section of the ditch at the western boundary to facilitate the construction of the access roundabout and creating an access bridge over the ditch at the eastern boundary of the working area, to facilitate access to the ecological compensation area for initial habitat creation and ongoing management works.

During the construction phase of the development, the buffer zones will be fenced off and no vegetation clearance or other construction activities will take place within, unless for the exceptions detailed above or for habitat enhancement works.

7.1.6 Open mosaic habitat

Direct loss

Due to the retention of almost all areas of open mosaic habitat on site, it is considered that the proposed development will not result in a significant adverse impact upon this habitat. To compensate for the small area lost, the remaining areas will be subject to significant enhancement measures to improve their quality, as discussed below.

Habitat loss or degradation through succession

Regardless of whether the proposed development is implemented, the open mosaic habitat on site would see a natural long-term reduction in value as a result of natural processes of succession e.g. scrub encroachment. However, the proposed development presents a mechanism to ensure the long-term retention and management of this habitat to maximise its value and benefits to biodiversity. Proposed long-term management includes monitoring, infrequent scrub clearance, and ground disturbance in order to create a dynamic and heterogenous landscape.

Enhancements

In addition to the enhancement of the retained open mosaic habitat through ongoing management to remove and impede scrub encroachment, the areas of open mosaic will be enhanced as part of the development. Currently, the open mosaic contains areas of loose substrate that has been colonised by a range of ephemeral / short, perennial species and supports the greatest botanical and invertebrate diversity, including some unusual species characteristically associated with this habitat type e.g. dingy skipper, grizzled skipper and small heath butterflies and bird's-foot trefoil, fairy flax, yellow-wort and bee orchids. However,

large areas of this habitat also comprise sealed concrete which cannot be colonised by plants and provide little ecological value. To further enhance the open mosaic habitat, the majority of these areas will be broken up and left as a loose substrate for natural colonisation by wildflowers and shrubs.

Open mosaic habitat is most ecologically valuable when it has structural diversity, supports an array of substrates and has areas of standing water. As such, the retained areas will be further enhanced through the creation of two scrapes / shallow ponds and the creation of four sandy banks, which will specifically target invertebrates such as ground beetles, solitary bees and digger wasps. As a final enhancement, four amphibian hibernacula will be created. Whilst these are predominantly being created to benefit great crested newts and other amphibians; they will also add to the availability of habitat niches for other species within the open mosaic habitat.

7.1.7 Hedgerows

Removal or damage

Of the 410m of species rich hedgerows and 970m of species-poor hedgerows currently present on site, only 35m of species-rich hedgerow and 428m of species-poor hedgerow will be removed. All other hedgerows, including all hedgerows at the site boundaries will be retained. To compensate for the proposed hedgerow removal, approximately 1772m of native species-rich hedgerow planting will be incorporated into the landscaping scheme for the site, of which approximately 725m is located within the ecological compensation area and along the southern site boundary. The retained hedgerow along the western site boundary will also be infilled with native planting.

RPAs will be established and implemented around any hedgerows which are to be retained and are in close proximity to proposed development works, particularly excavation. Where necessary, these areas will be adequately protected by appropriately designed protective barriers and ground protection throughout the entire development process.

7.1.8 Amphibians

Risk of harm during construction phase

As GCNs are known to be present on site, a European protected species (EPS) mitigation licence will need to be granted by Natural Resources Wales to allow the works to commence. This EPS licence can only be granted once planning permission has been secured and will need to be in place prior to the start of any works on site.

As part of a licence, the proposed working area will need to be fenced with temporary amphibian fencing prior to the start of any works on site and the fencing will be maintained throughout the development. The fencing will prevent amphibians from entering the construction area during the development. A newt grid will be required at any points of site access which will enable vehicular access whilst preventing amphibians from accessing the site.

Drift fencing will also be used to compartmentalise the site and therefore maximise the capture probability of amphibians on the site. Pitfall traps will be installed along the fence lines. The pitfall traps will be open for a period of 60 nights (based on a medium sized population of

GCNs) where temperatures and weather conditions are suitable for GCN trapping (i.e. above 5°C and without frost). Trapping will only be undertaken when newts are active and will not be undertaken when newts are potentially hibernating, during November – mid February. The traps will be checked daily by a suitably licensed and experienced ecologist. Any GCNs or other amphibians found in the traps will be released into suitable areas of cover within the ecological compensation area within the eastern section of the site, which will act as a GCN receptor site.

Following the completion of the trapping and translocation period, but prior to any vehicle or plant access, or the commencement of any works on the site, a toolbox talk will be given to all staff and contractors. The talk will include species identification, ecology and legal protection of UK amphibians. Site staff and contractors will be instructed not to interfere or access the ecological compensation area of the retained habitats within the southern section of the site, unless with the permission of the site manager or ecologist, or to undertake habitat enhancement works. Additionally, a final destructive search of any features which could shelter GCNs will be undertaken to ensure that no amphibians are present within the fenced area. The drift fencing in the centre of site will then be removed in suitable weather conditions (i.e. outside of the winter hibernation period which runs from November to Mid-February inclusive and when night-time temperatures exceed 5°C) under ecological supervision.

During the construction phase of the development, the following RAMs will be implemented to protect any GCNs which may still be present within the working area:

- The amphibian ring fencing at the perimeter of the site will be left in place until the works on site are complete, and it will be checked daily by the site manager, with monthly checks by the project ecologist.
- Prior to the start of works on site, the areas of grassland within the working area will be mown or otherwise managed to maintain a sward height of less than 100mm. The mown / cleared areas will then be maintained with a short sward until the works on site have been completed.
- During the construction phase, no excavations are to be left open overnight. If this is not feasible, a plank should be left within the excavation at a 45° angle as a precaution to allow amphibians to escape. Any open excavations should be checked for trapped amphibians (and any other wildlife) in the morning prior to the start of works on site.
- Materials will be stored on pallets off the ground in order to reduce the risk of amphibians sheltering underneath them.
- A site walkover will be undertaken by the site manager prior to commencement of work each day to check that all avoidance measures are being applied and adhered to.
- If any amphibians are found within the construction area during the works, they will be moved to the GCN receptor site within the offsite compensation area.

The above measures will also ensure the protection of all common amphibian species using the site.

Habitat loss

To compensate for the loss of Pond 4 which is used as a GCN breeding pond, and Ponds 1 and 2 that are used by other common amphibian species, an additional 13 ponds of varying shape, size and depth will be created within the ecological compensation area. These ponds will be designed and managed to provide a range of ecological niches, from shallow ponds that dry out on occasion to deep ponds that retain water all year round. Through a mix of initial planting and natural colonisation, it is anticipated that the ponds will support a range of botanical communities, ensuring an abundance and diversity of egg laying opportunities and invertebrate prey on which GCNs and other amphibians can forage.

In addition to these ponds, two ponds / shallow ephemeral scrapes and three swales will also be created within the open mosaic habitat within the southern section of the site. The swales are part of the development's sustainable drainage plan and will be connected to the surface-water draining system. Although these aquatic features aren't being designed solely for amphibians, it is expected that they will provide some foraging and breeding opportunities.

The linear features at the site boundaries and a 10m buffer are to be retained as part of the site layout in order to provide ecological linkages for GCNs and other amphibian species to continue commuting between the site and offsite habitats within the wider landscape. Whilst areas of suitable GCN and amphibian terrestrial habitat will be lost in the form of semi-improved grassland, dense scrub, hedgerows and small sections of woodland, large areas of suitable habitat within the southern section of the site will be retained and enhanced and the eastern section of the site is being subject to significant habitat creation and enhancement to create an ecological compensation area that will be managed long term with an emphasis on its suitability to support GCNs. Of the 25.4ha development boundary, approximately 11.4ha (45%) of the site will be retained or subject to habitat creation and enhancement. This includes the creation or planting of wildflower grassland, marshy grassland, tussocky rough grassland, scrub, hedgerows, an orchard, marginal planting, ditches and ponds. Additionally, the retained area of open mosaic grassland and unimproved lowland meadow within the southern section of the site will be retained and enhanced. All of the proposed habitat creation and enhancement will provide high-quality terrestrial habitat for GCNs and other amphibians.

As an additional ecological enhancement targeting GCNs, ten amphibian hibernacula will be created on site, six of which will be located within the ecological compensation area and the other four within the retained open mosaic habitat within the southern section of the site.

Risk of entrapment during the operation phase of the development

Gully pots installed on site will either be set back, covered with a mesh to prevent amphibians from falling within or will be fitted with a means of escape such as an amphibian ladder. The exact location details to be confirmed in an EPS mitigation licence application and will therefore be agreed with Natural Resources Wales.

7.1.9 Badgers

Sett loss

The outlier badger sett that has been identified within the construction area and will be closed on site will need to be subject to a licence granted by Natural Resources Wales to allow its closure. This licence must be in place prior to the start of any works within 30m of the sett that has the potential to cause disturbance or damage to the sett. In order to ensure that no

badgers are present within the sett prior to destruction, all potential burrows to the sett will be fitted with one way exclusion gates and will be monitored with infra-red motion-triggered cameras to ensure that no badgers enter the sett for a 21-day period. The sett will be destroyed using machinery immediately following the 21-day monitoring period. If a badger forces entry into the sett or excavates an alternative entrance burrow during the 21-day monitoring period or prior to the destructive works, this procedure will be repeated until 21 days of successful badger exclusion are achieved.

Immediately prior to the start of any works on site and the access of machinery, a pre-commencement badger check will be undertaken by a suitably qualified ecologist to search for signs of any new or additional badger setts, if a potential badger sett is discovered a 30m buffer zone will be implemented around the sett and the procedure detailed above will be followed to close the sett. If any areas of dense vegetation cannot be confidently searched, the vegetation should be removed by cutting / strimming prior to heavy machinery accessing the site, as directed and overseen by an ecological clerk of works.

Risk of harm to transient individuals

The following reasonable avoidance measures will be implemented to protect badgers that may be using the site on an occasional basis for foraging or commuting purposes during the construction phase of the development:

- Regular site checks must be undertaken during construction to ensure that no new setts have been created.
- No trenches or excavations will be left open overnight. They will be backfilled or covered with board, or alternatively fitted with a means of escape for any badger (or other animal) which may become trapped within, such as a plank or slope leading out of the bottom of the excavation at an angle of 45°.
- Any pipes will be stored with caps on to prevent entry by badgers and other animals, and materials such as barbed wire will be stored so that animals cannot become entangled in them.
- Any chemicals or harmful materials will be stored so that they cannot be accessed by badgers or other animals.
- Excavations will be checked before they are backfilled to ensure that no animals have become trapped.

Habitat loss

A 10m strip of dense scrub or grassland will be retained along the boundaries of the site and will ensure that connectivity of habitats and foraging opportunities are maintained. Additionally, the retained areas of unimproved grassland, woodland, dense scrub and open mosaic habitat will continue to provide foraging opportunities for badgers.

To compensate for the loss of areas of grassland and scrub, the ecology area within the eastern section of the site will be enhanced to provide higher quality foraging habitat and sett building opportunities through scrub planting, pond creation, conversion of agricultural grassland to both species-rich wildflower grassland and tussocky rough grassland and the creation of a small orchard area. Connectivity between the ecological compensation area and offsite habitats, including the suspected offsite main sett that lies to the south of the site, will

be retained through the habitat corridors at the site boundaries and the retention of habitats within the southern section of the site.

Inappropriate lighting

No detailed lighting proposals have been provided to UES at this stage, however a wildlife friendly external lighting scheme should be designed for the operational phase of the development. The scheme should be designed to avoid overspill onto the ecological corridors at the site boundaries and any retained areas of high-quality badger habitat including the entire ecological compensation area, ponds, woodland, dense scrub, the unimproved grassland and hedgerows.

7.1.10 Bats

Risk of harm

In accordance with BCT guidelines, no further survey work is required for trees that have been assessed as having low potential (or negligible potential) to support roosting bats. However, as a precautionary measure, any trees that are to be felled and have been assessed as having low potential to support roosting bats will be subject to soft-felling techniques to minimise any incidental risk of harm to bats. Soft-felling techniques involve cutting the tree in sections and lowering any section containing potential roosting features to the ground. Once lowered to the ground, the potential roosting features should be left facing upwards overnight, before being removed from the site a minimum of 24 hours later. Alternatively, the features associated with these trees could also be inspected by a suitably experienced and licenced ecologist immediately prior to the felling of the tree to confirm that no roosting bats are present.

Due to the transient nature within which bats use trees for roosting and the residual risk of bats being present at the time of the works, the trees assessed as having moderate or high potential to support roosting bats will also be subject to soft-felling techniques (as described above) if they are to be removed or subject to arboricultural work.

Loss of roosting opportunities

No bats or evidence of roosting bats has been observed within the trees that are due to be felled as part of the development, despite undertaking comprehensive ground level and aerial tree inspections and bat presence / absence surveys. As such, it is considered that no specific compensation for the loss of roosting features is required, however there remains some potential for bats to roost within trees on site in the future. As such, a suite of bat boxes will be provided as part of the development. Given that bats aren't currently using the site for roosting purposes, the provision of numerous boxes, comprising a range of roosting opportunities, will provide an enhancement in the availability of roosting opportunities.

Examples of bat boxes that could be used on site include:

- Schwegler 1FF box
- Schwegler 2F box
- Schwegler 1FW hibernation box

Correct siting of bat boxes should be conducted with the aid of the project ecologist.

Loss of foraging habitat or severance of commuting corridors

To compensate for the loss of areas of foraging habitat, the ecological compensation area within the eastern section of the site will be enhanced to provide higher quality foraging opportunities through native scrub planting, pond creation, conversion of agricultural grassland to both species-rich wildflower grassland and tussocky rough grassland, and the creation of a small orchard area. Connectivity between retained habitats on site, the ecological compensation area and offsite habitats will be retained through the retention of habitat corridors at the site boundaries, including the retention of all ditches, the watercourse and a 10m buffer zone of dense scrub or wildflower grassland.

Inappropriate lighting

No detailed lighting proposals have been provided to UES at this stage, however a wildlife friendly external lighting scheme should be designed for the operational phase of the development. The scheme should be designed to avoid overspill onto the ecological corridors at the site boundaries and any retained areas of high-quality bat foraging or commuting habitat including the entire ecological compensation area and retained ponds, woodland, dense scrub, the unimproved grassland and hedgerows.

7.1.11 Breeding birds

Risk of harm

Site clearance, tree felling, arboricultural works and vegetation removal (including enabling works) should be carried out outside of the breeding bird season and should not be undertaken from March to August inclusive. If this is not possible and works need to take place during this period, a targeted breeding bird nest scoping survey should be conducted prior to the start on site and an ecological clerk of works appointed to oversee works where considered necessary e.g. due to the density of vegetation. If any nesting birds are found, a no works exclusion zone of at least 5m (potentially larger depending on the species) will be implemented around the nest until it has been confirmed by a suitability qualified ecologist that the nest is no longer in use.

Risk of disturbance

Consideration should be given to reducing the impact of disturbance to the off-site rookery, adjacent to the northern site boundary. Initial site clearance and construction works adjacent to the northern boundary should commence outside of the key breeding months for rooks (March -- June inclusive), to reduce the impact on ongoing nesting attempts. The potential disturbance impact to the gull *Larus spp.* colony to the south of the site has been mitigated for through adjustment of the site layout, to exclude the southern section from major construction works.

Habitat loss

Suitable foraging and nesting habitats such as trees, hedgerows, scrub, grassland, ponds and small areas of woodland are to be removed to facilitate the development. To compensate for this loss, replacement habitats for foraging and nesting birds will be provided including native scrub planting, an orchard, rough tussocky grassland, wildflower grassland, wet ditches, ponds, trees and hedgerows, in addition to the enhancement of retained areas of habitat including the open mosaic and unimproved grassland habitats.

A suite of bird boxes will be installed on site as further compensation for the loss of nesting opportunities and to provide an enhancement in the availability of nesting opportunities for species that currently aren't using the site for this purpose due to a lack of suitable opportunities. Examples of bird boxes that could be used on site include:

- Schwegler 1B nest boxes (28mm and 32mm entrance holes)
- Schwegler 1MR Avianex
- Schwegler 1SP house sparrow terrace
- Schwegler No.10 Swallow nest cups
- Eco Barn owl box
- Eco Tawny owl box (also suitable for stock doves and jackdaws)
- Kestrel box

Correct siting of bird nest boxes should be conducted with the aid of the project ecologist.

7.1.12 Invasive species

Risk of dispersal

Prior to the commencement of any works on site or access by machinery, all stands of invasive species will be demarcated and contractors made aware of their location. A pre-commencement walkover survey of the entire site will be undertaken to identify any additional encroachment or spread of invasives.

Prior to the commencement of any works within close proximity of the areas containing invasive species, the invasive species will be subject to eradication measures. All invasive species will be eradicated as part of the development works. It is essential that a competent and qualified person carries out any herbicide treatment. An invasive species method statement should be prepared to detail how these species will be controlled and eradicated.

7.1.13 Butterfly species of principal importance

Habitat loss

Due to the retention and a lack of impacts upon suitable habitat, it is considered that the proposed development will not result in a significant adverse impact upon dingy skipper, grizzled skipper or small heath butterflies. As such, no mitigation or compensatory habitat creation is required.

Habitat loss or degradation through succession

Regardless of whether the proposed development is implemented, the unimproved grassland and the open mosaic habitats on site would see a natural long-term reduction in suitability as a result of natural processes of succession. However, the proposed development presents a mechanism to ensure the long-term retention and management of these habitats, to ensure they retain suitable to support these species. Proposed long-term management includes an annual hay cut of the improved grassland to halt the encroachment of scrub and to impede the growth of coarse grasses and tall ruderal species. In addition, monitoring, infrequent scrub clearance, and ground disturbance within the open mosaic habitat, will create a dynamic and heterogenous landscape. These proposed management measures will ensure that these

habitats continue to support the larval foodplants for these species and will provide an abundance of nectar resources for foraging adults.

Enhancements

In addition to the enhancement of the retained areas of unimproved grassland and open mosaic habitat through ongoing management to remove and impede scrub encroachment, the areas of open mosaic will be enhanced as part of the development. Currently, the open mosaic contains areas of loose substrate that has been colonised by a range of ephemeral / short, perennial species, including large quantities of common bird's-foot trefoil, wild strawberry and creeping cinquefoil. However, large areas of this habitat also comprise sealed concrete which cannot be colonised by these or any other plant species. To further enhance the open mosaic habitat, the majority of these areas will be broken up and left as a loose substrate for natural colonisation by wildflowers and shrubs. This will result in an increase in both larval foodplants and adult nectar resources for all three species.

To provide a further ecological enhancement, the proposed ecological compensation area will be subject to signification habitat creation and enhancement. Measures that will directly benefit these butterfly species include the enhancement of the current agricultural grassland to a species rich grassland and the creation of a series of beetle and butterfly banks that will be sown with a seed mix containing common bird's-foot trefoil.

7.1.14 General terrestrial invertebrate communities

Habitat loss and degradation

To compensate for the loss of habitats, the proposals include significant habitat creation including native scrub planting, hedgerow, orchard and scattered tree planting and pond, butterfly / beetle banks, wildflower grassland, tussocky grassland and marshy grassland creation. In addition, the retained areas of unimproved grassland and open mosaic habitat will be subject to subject to enhancements and long-term management to maximise their value for invertebrates.

The proposed habitat retention, creation and enhancement, coupled with the long-term management of all habitats on site post development, will ensure that the site continues to support a variety of habitats, suitable to support an abundant and diverse community of invertebrate species.

8 RESIDUAL IMPACTS

8.1 Woodland and scrub

Approximately 0.24ha of woodland will be removed to facilitate the development, however sufficient compensatory planting (0.53ha) will be provided within the ecological compensation area, along with an additional 0.03ha within the open mosaic habitat to the south of site. The RPAs of some of the retained areas of woodland will be compromised due to the close proximity of the development, however this is not considered to be a significant impact given the low value of the woodland and the low number of mature trees.

The development proposals will result in the loss of large areas of dense scrub, some of which will be compensated for through the additional native woodland planting. Given the proposed level of woodland planting beyond what is being removed and the amount of scrub retention, the overall residual impact of the completed and operational development on dense scrub and woodland habitats is anticipated to be a **minor negative change at a local level**.

8.2 Trees

Whilst a number of mature and semi-mature trees are due to be removed to facilitate the proposals, the landscaping scheme has been designed to incorporate the compensatory planting of approximately 15 fruit trees within a small orchard area and numerous native trees within newly planted hedgerows. The trees will take 20-50 years depending on species to reach maturity, however once mature the number and range of trees planted will provide sufficient compensation for the trees that are to be removed.

Therefore, it is considered that there won't be a significant residual impact on trees as a result of the completed and operational development.

8.3 Grassland

Through the retention of almost all areas of unimproved lowland meadow on site, it is considered that the proposed development won't result in a significant adverse impact on this Habitat of Principal Importance.

The development will result in the loss of some areas semi-improved grassland; however, these habitats are not of national or county significance as they do not meet the criteria to qualify as Wildlife Site quality grassland or a Habitat of Principal Importance.

The development provides a mechanism to secure the retention of the unimproved grassland and its long-term management to maximise its ecological value. Additional enhancement of the retained area of semi-improved grassland within the ecological compensation area will also be provided.

Overall, the residual impact of the completed and operational development on grassland habitats is anticipated to be a **minor negative change at a local level**.

8.4 Ponds

The development proposals will result in the loss of Ponds 1, 2 and 4 on site, however this will be compensated for through the creation of 15 ponds, a ratio of five ponds created for every pond that is to be lost.

All retained and newly created ponds on site will be protected from disturbance and pollution during the construction phase of the development through the implementation of specific pollution prevention measures, including a 'no-works' buffer zone of at least 5m around each pond where possible. These measures can be detailed within a Construction Environmental Management Plan (CEMP) and can be secured through a suitability qualified planning condition.

Given the ratio of ponds that are to be created compared to the number that are to be lost, this is considered to be a significant ecological enhancement and it is considered that the proposed development will result in a **moderate positive change at a local level**.

8.5 Watercourse and ditches

With the exception of a 40m section of the ditch along the western boundary that is to be culverted to allow the creation of a roundabout at the proposed access point to the site, the majority of the ditches and the entire watercourse along the northern site boundary will be retained as part of the development. The retention of a minimum 10m buffer zone along the boundaries of the site and hence the ditches and watercourse, coupled with the implementation of best practice pollution prevention measures will ensure that potential pollution and disturbance of these features will be reduced to their lowest practicable level.

The retained ditches at the site boundaries will be enhanced through scrub removal and ongoing management and the proposals will result in the overall increase of ditch habitat through the proposed creation of approximately 275m of ditches within the ecological compensation area.

Therefore, the residual impact of the completed and operational development on ditches is anticipated to be a **minor positive change at a local level**.

8.6 Open mosaic habitat

Through the retention of almost all areas of open mosaic habitat on site, it is considered that the proposed development won't result in a significant adverse impact on this Habitat of Principal Importance.

The development provides a mechanism to secure the retention of the open mosaic habitat and its long-term management to maximise its ecological value. Additional enhancement of the retained open mosaic habitat will also be provided as a result of the proposals and will include the creation of new exposed areas through breaking up large existing areas of unvegetated concrete, the excavation of two ponds / shallow scrapes and the creation of four sandy banks and four hibernacula. Full details of the proposed habitat creation and management can be detailed within an LEMP, which can be secured through a suitability worded planning condition.

The proposals won't result in a loss or gain of open mosaic habitat; however, the proposed enhancements and long-term management will increase the ecological value of this habitat, of which very little is present within the local area and the wider county of Wrexham. Therefore, the residual impact of the completed and operational development on the open mosaic Habitat of Principal Importance is anticipated to be a **minor positive change at a county level**.

8.7 Hedgerows

Whilst approximately 35m of species-rich hedgerow and 428m of species-poor hedgerow will be removed to facilitate the proposals, the landscaping scheme has been designed to incorporate the compensatory planting of approximately 1772m of native species-rich hedgerows. Approximately 725m of this is located within the ecological compensation area and along the southern site boundary, including approximately 568m of native species-rich hedgerows with trees. The retained hedgerow along the western site boundary will also be infilled with native planting.

This will result in an overall net gain of 1309m of hedgerow, including a net gain of 1737m of native species-rich hedgerows and a net loss of 428m of species-poor hedgerow. Therefore, the residual impact of the completed and operational development on hedgerows is anticipated to be a **moderate positive change at a local level**.

8.8 Amphibians

Amphibians will be protected throughout the construction phase through the mitigation measures listed in this document and secured through an EPS mitigation licence as issued by Natural Resources Wales. Measures will also be implemented to ensure that amphibians do not become trapped within the gully pots during the operational phase of the development.

A single pond that is due to be removed as part of the development proposals is currently used by GCNs for breeding purposes (Pond 4). Through compensatory pond creation on a 5:1 ratio, it is considered that the proposals will result in an overall increase in the availability and quality of breeding habitat for GCNs and other amphibians.

Whilst some areas of suitable amphibian habitat are due to be removed, significant habitat retention is being incorporated into the proposals with approximately 45% of the site being retained for ecology. During pre-consultation screening discussions, it was suggested by Natural Resources Wales and the Ecology Officer for Wrexham Council that they would be looking to see the retention of 50% of the site. Whilst the proposed 45% falls slightly short of this, it is considered that the specific retention of the highest quality habitats (three of the four GCN breeding ponds on site, unimproved grassland and open mosaic habitats of principal importance) and the proposed habitat enhancement works to retained areas ensure that the proposed compensation is sufficient to address the proposed habitat loss on site.

Given the proposed mitigation measures and significant levels of habitat retention, creation and enhancement, particularly relating to retention of habitat corridors and pond creation, the residual impact of the completed and operational development on amphibians is anticipated to be a **minor positive change at a local level**.

8.9 Badgers

A pre-commencement check and closure of the outlier badger sett, and any other badger setts observed on site, under licence and following a 21-day exclusion and monitoring period, coupled with the implementation of reasonable avoidance measures will ensure that the risk of harm or death of badgers is reduced to negligible levels.

The proposed level of habitat retention, creation and enhancement including the retention of wildlife corridors at the site boundaries will ensure that connectivity to offsite habitats and sufficient foraging opportunities will remain available for the badger population present with the local area. The implementation of a wildlife friendly lighting plan will reduce the potential operational impacts of the development on badgers to the lowest practicable level.

Therefore, it is considered that there won't be a significant residual impact on badgers as a result of the completed and operational development.

8.10 Bats

The implementation of reasonable avoidance measures will ensure that bats are protected from harm during the development.

The proposed level of habitat retention, creation and enhancement including the retention of wildlife corridors at the site boundaries will ensure that connectivity to offsite habitats and sufficient foraging opportunities will remain available for bats currently using the site. Compensation for the loss of roosting opportunities and further enhancement of roosting opportunities for bats on site will be incorporated through the provision of a suite of bat boxes.

The implementation of a wildlife friendly lighting plan will reduce the potential operational impacts of the development on bats to the lowest practicable level and will ensure that suitable foraging habitats and commuting corridors across the site will remain undisturbed and functional.

Therefore, it is considered that there won't be a significant residual impact on bats as a result of the completed and operational development.

8.11 Breeding birds

Timing sensitive works to outside of the nesting bird season or undertaking a pre-commencement nesting bird check will ensure risk of harm is minimised to the lowest practicable level.

The proposed level of habitat retention, creation and enhancement including the retention of wildlife corridors at the site boundaries will ensure that connectivity to offsite habitats and sufficient foraging and nesting opportunities will remain available for the bird species currently using the site. Further compensation for the loss of nesting opportunities and the enhancement of nesting opportunities for species that are currently not breeding on site will be incorporated through the provision of a suite of bird boxes.

Therefore, the overall residual impact of the completed and operational development on breeding birds is anticipated to be a **minor negative change at the site level, however some**

species will experience a minor positive change with regards to the availability of nesting opportunities.

8.12 Invasive species

A pre-commencement survey will be undertaken to search for any new encroachment or spread of invasive species, and invasive species on site will be subject to control measures prior to the start of works on site. All invasive species will be eradicated prior to the start of works within infected areas. Full details of the proposed control and mitigation measures will be detailed within an invasive species method statement that can be secured through a suitability worded planning condition. As such, it is considered that there will be no risk of invasive species being spread as a result of the proposals. The eradication of all invasive species currently present on site will result in a residual **minor positive change at a site level.**

8.13 Butterfly species of principal importance

Through the retention of all areas of suitable habitat for dingy skipper and grizzled skipper and the retention of the highest quality habitat for small heath butterflies, it is considered that the proposed development won't result in a significant adverse impact upon these three species.

The development provides a mechanism to secure the retention of the unimproved grassland and open mosaic habitats on site and their long-term management to maximise their benefits and suitability for these species. Additional habitat provision through the enhancement of the agricultural grassland within the ecological compensation area, coupled with the proposed creation of beetle and butterfly banks, will result in a greater availability of larval food plants and nectar resources for adults and will aid in maintaining and potentially increasing the existing population within the industrial estate. Full details of the proposed habitat creation and management can be detailed within an LEMP, which can be secured through a suitability worded planning condition.

Therefore, the residual impact of the completed and operational development on butterflies of principal importance is anticipated to be a **minor positive change at a local level.**

8.14 General terrestrial invertebrate communities

To compensate for the loss of habitats, the proposals include significant habitat creation including native shrub planting, hedgerow, orchard and scattered tree planting and pond, butterfly / beetle banks, wildflower grassland, tussocky grassland and marshy grassland creation. In addition, the retained areas of unimproved grassland and open mosaic habitat will be subject to subject to enhancements and long-term management to maximise their value for invertebrates.

The proposed habitat retention, creation and enhancement, coupled with the long-term management of all habitats on site post development, will ensure that the site continues to support a variety of habitats, suitable to support an abundant and diverse community of invertebrate species.

Therefore, the residual impact of the completed and operational development on invertebrates is considered to be **no significant change.**

8.15 Summary

Table 17 – Summary of residual impacts

ECOLOGICAL FEATURE	RESIDUAL IMPACT
Woodland and scrub	Minor negative
Trees	Neutral
Grassland	Minor negative
Ponds	Moderate positive
Watercourse and ditches	Minor positive
Open mosaic habitat	Minor positive
Hedgerows	Moderate positive
Amphibians	Minor positive
Badger	Neutral
Bats	Neutral
Breeding birds	Minor negative
Invasive species	Minor positive
Butterfly species of principal importance	Minor positive
General terrestrial invertebrate communities	Neutral

9 CONCLUSION

The EcIA has identified various impacts up to a county level due to the presence, or potential presence, of protected or species / habitats of principal importance within the site boundary or the surrounding area.

Mitigation and compensation measures are provided within section 7 of this report in order to reduce the impacts to insignificant levels. Furthermore, recommendations for enhancements are provided, which could improve the availability of some habitats and the opportunities for some species locally following the development, resulting in a minor positive outcome.

All proposed mitigation, compensation and enhancement measures can be further detailed within an LEMP, CEMP, EDS and invasive species method statement as required, and can be secured through suitability worded planning conditions.

Provided the proposed measures within this report are followed, it is considered that the proposed development will be compliant with all relevant legislation and both national and local planning policy, and that the aforementioned ecological receptors will not be significantly negatively impacted.

10 REFERENCES

Butterfly Conservation Trust (2015). *The State of the UK's Butterflies 2015*.

CIEEM (2022). *Guidelines for Ecological Impact Assessment in the UK and Ireland*. Version 1.2.

CIEEM (2017). *Guidelines for Preliminary Ecological Appraisal* (Second Edition).

DEFRA (2022). *MAGIC* [online]. Available at: <http://magic.defra.gov.uk/>.

JNCC (2010). *Handbook for Phase 1 habitat survey: A technique for environmental audit*.

JNCC (undated). [online] '*1166 Great Crested Newt Triturus cristatus*'. Available at: jncc.gov.uk

Rodwell, J.S. (2006). *NVC Users' Handbook*. JNCC.

Rodwell, J.S. (ed.) (1992). *British Plant Communities. Volume 3: Grasslands and montane communities*. Cambridge University Press.

Wales Biodiversity Partnership (2008). '*Wildlife Sites Guidance Wales, A Guide to Develop Local Wildlife Systems in Wales*'

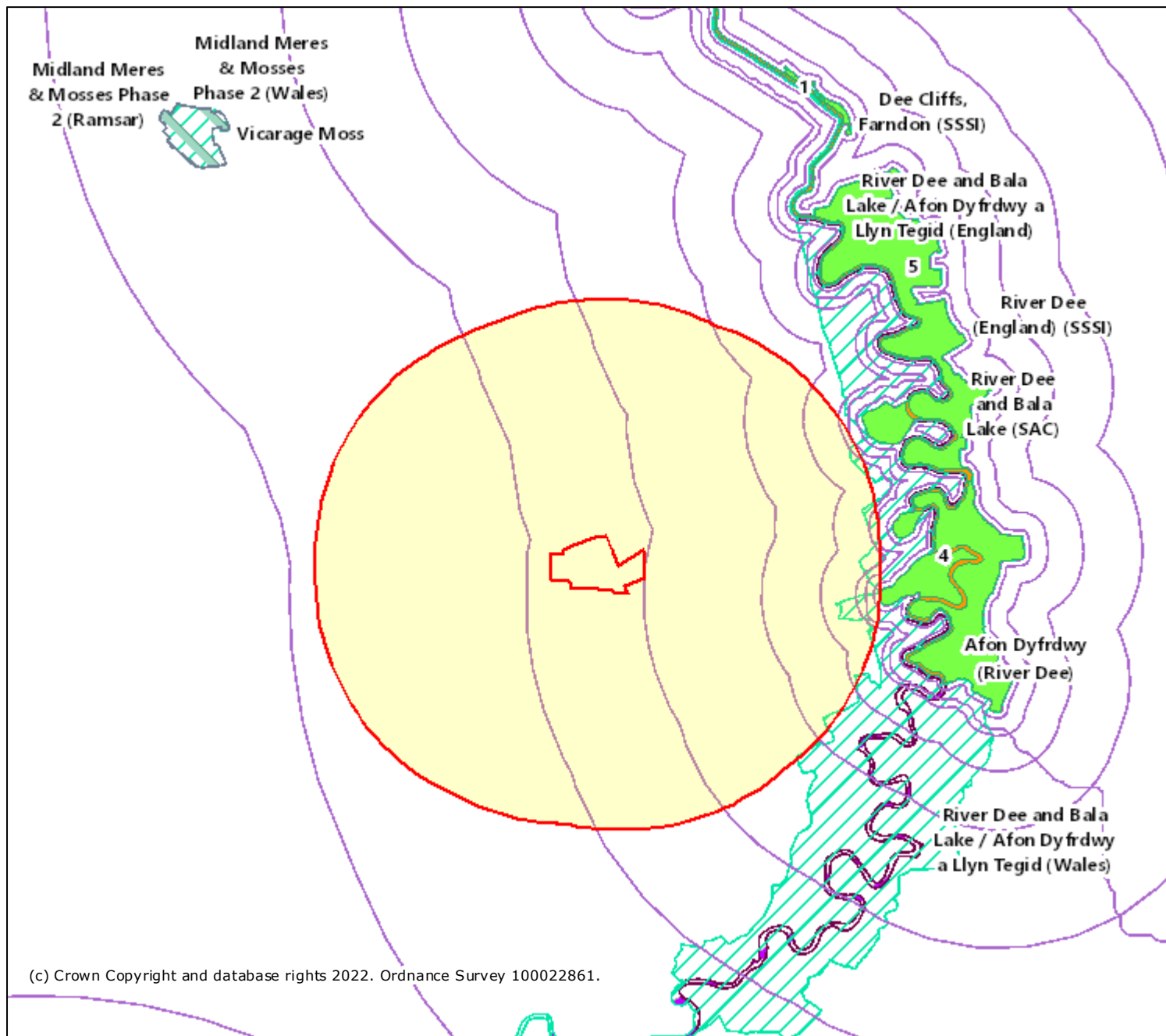
Welsh Government (2016). *Planning Policy Wales*. 11th Edition.



APPENDICES

Appendix 1 – Statutorily protected sites

Statutorily protected sites - 2km



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Legend

- | | |
|------------------------------------|---|
| Local Nature Reserves (England) | Not Assessed |
| National Nature Reserves (England) | Sites of Special Scientific Interest (England) |
| National Nature Reserves (Wales) | SSSI Impact Risk Zones - to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites (England) |
| Ramsar Sites (England) | Sites of Special Scientific Interest (Wales) |
| Proposed Ramsar Sites (England) | Special Areas of Conservation (England) |
| Ramsar Sites (Wales) | Possible Special Areas of Conservation (England) |
| | Special Areas of Conservation (Wales) |
| Favourable Condition | Special Protection Areas (England) |
| Unfavourable Recovering | Potential Special Protection Areas (England) |
| Unfavourable no change | Special Protection Areas (Wales) |
| Unfavourable Declining | |
| Part Destroyed | |
| Destroyed | |

Projection = OSGB36

xmin = 331000

ymin = 346700

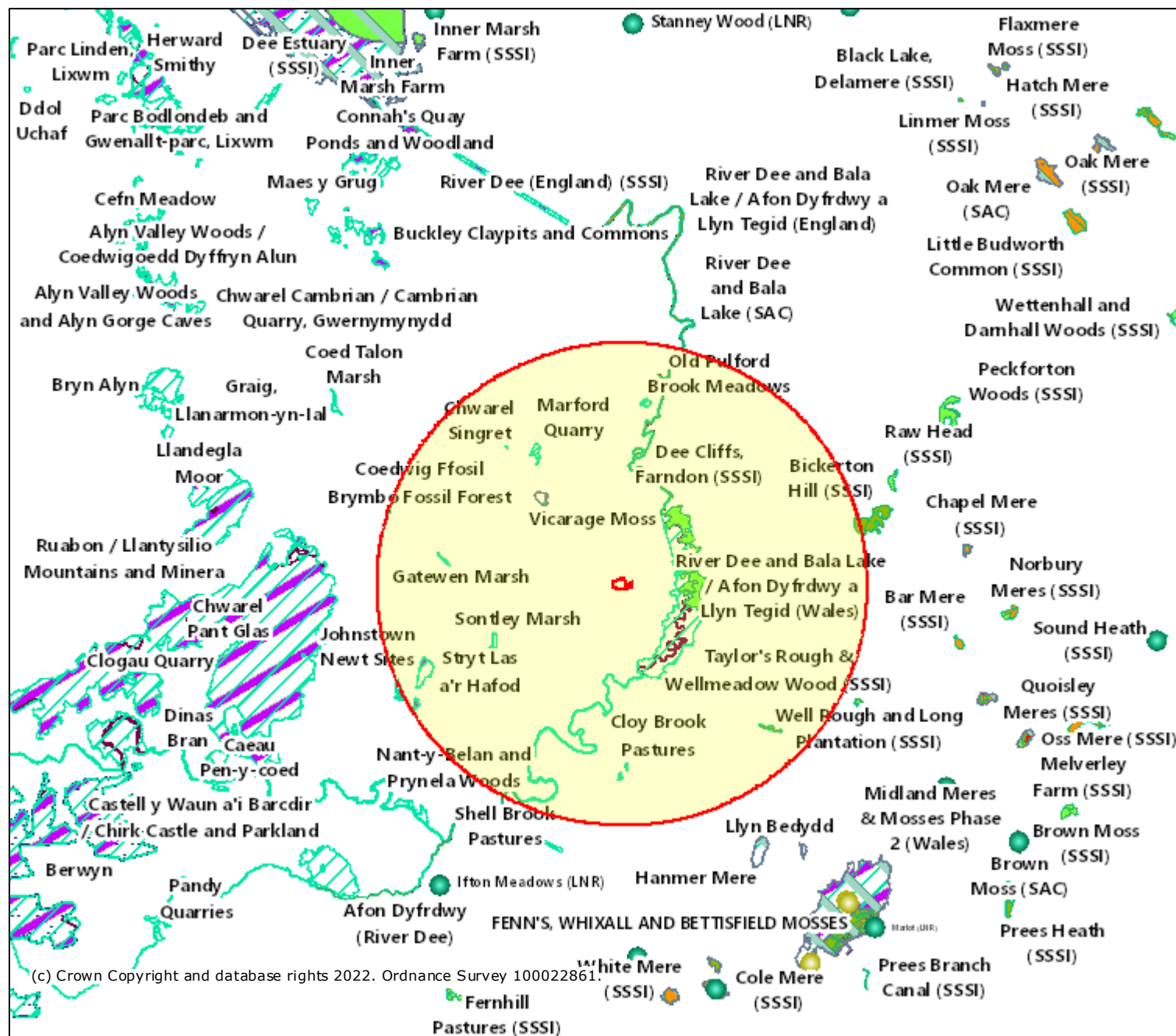
xmax = 347700

ymax = 354800



Map produced by MAGiC on 15 September, 2022.
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Statutorily protected sites - 10km



Legend

- | | | | |
|---|---|---|--|
|  | Local Nature Reserves (England) - points |  | Part Destroyed |
|  | National Nature Reserves (England) - points |  | Destroyed |
|  | National Nature Reserves (Wales) - points |  | Not Assessed |
|  | Ramsar Sites (England) |  | Sites of Special Scientific Interest (England) |
|  | Proposed Ramsar Sites (England) |  | Sites of Special Scientific Interest (Wales) |
|  | Ramsar Sites (Wales) |  | Special Areas of Conservation (England) |
| Sites of Special Scientific Interest Units (England) | |  | Possible Special Areas of Conservation (England) |
|  | Favourable Condition |  | Special Areas of Conservation (Wales) |
|  | Unfavourable Recovering |  | Special Protection Areas (England) |
|  | Unfavourable no change |  | Potential Special Protection Areas (England) |
|  | Unfavourable Declining |  | Special Protection Areas (Wales) |

Projection = OSGB36

```
xmin = 296500
```

```

xmin = 298900
ymin = 332700

```

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xmax = 380000
```

```
xmax = 500000
ymax = 373000
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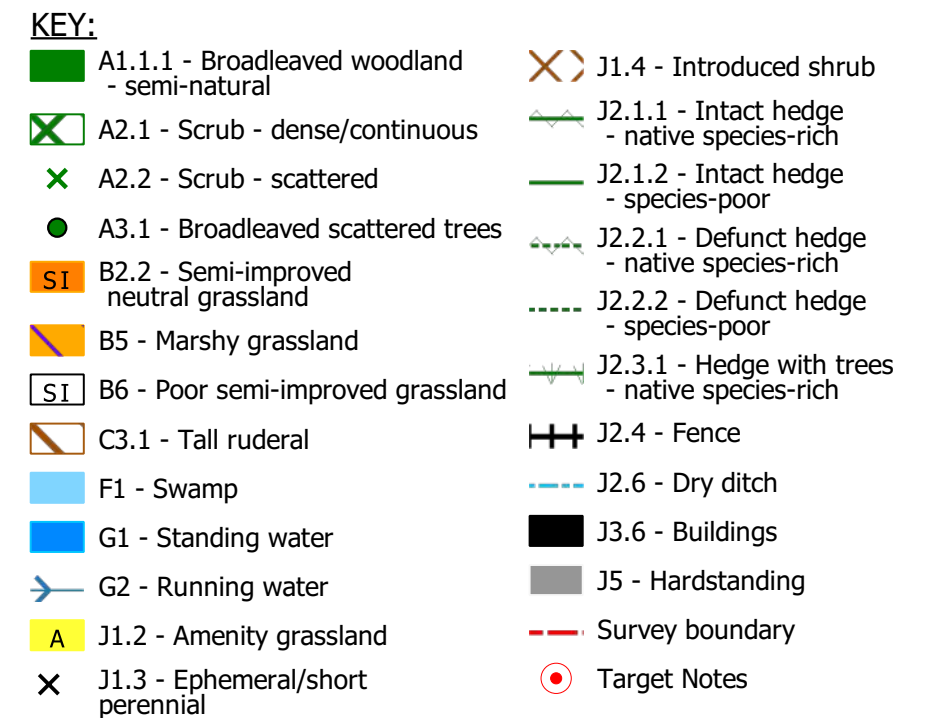
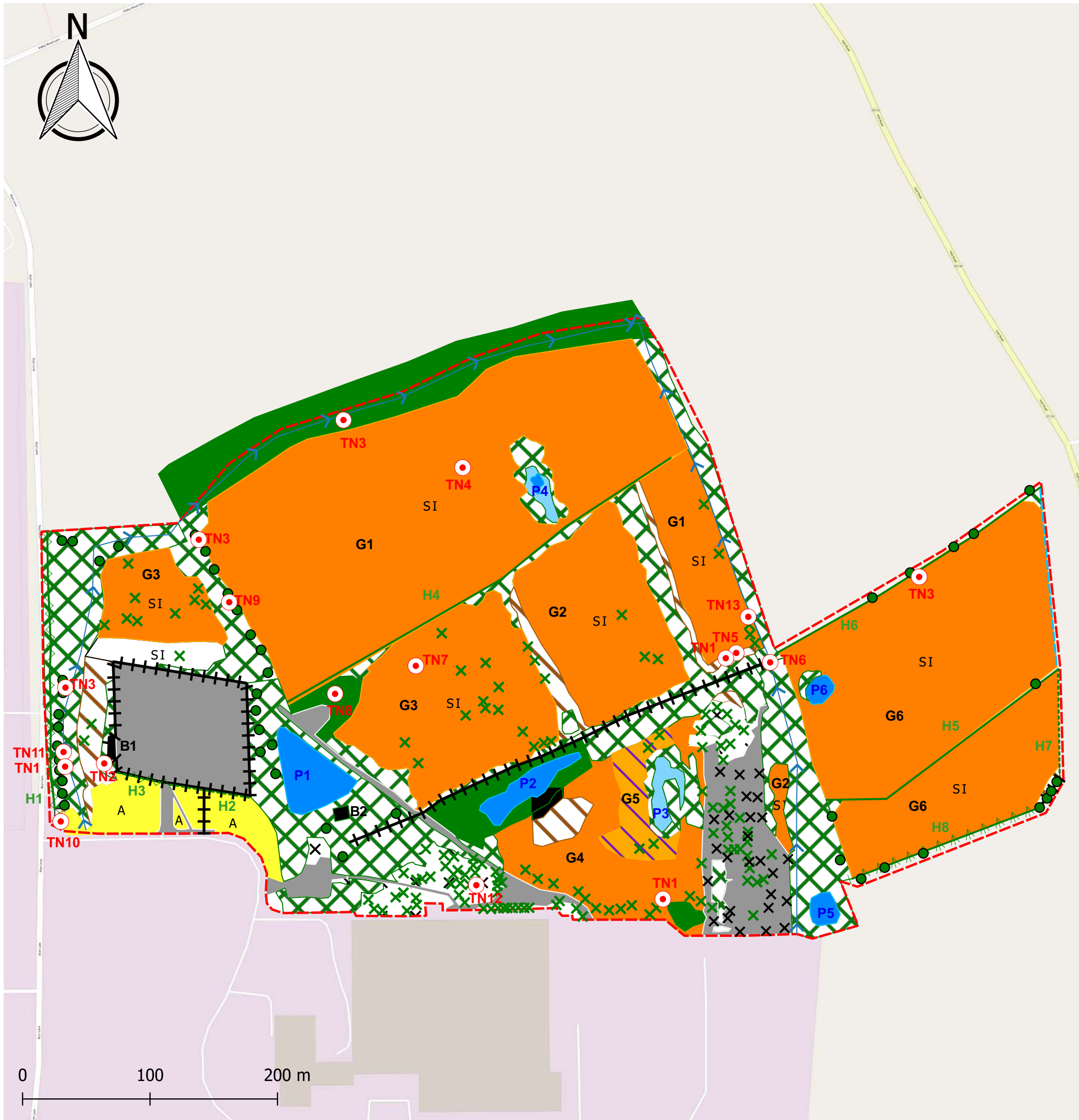
Map produced by MAGIC on 14 September, 2022.

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Appendix 2 – Phase 1 habitat plan

Target Note 1 -	Common frog
Target Note 2 -	Dead tree with bat roosting potential
Target Note 3 -	Oak tree with bat roosting potential
Target Note 4 -	Badger scat and small mammal path
Target Note 5 -	Fox scat
Target Note 6 -	Deer footprints
Target Note 7 -	Adult deer
Target Note 8 -	Rabbit warren with multiple burrows and droppings
Target Note 9 -	Himalayan balsam
Target Note 10 -	Cotoneaster
Target Note 11 -	Hollyberry cotoneaster
Target Note 12 -	Area of ephemeral / short perennial vegetation with increased botanical diversity and calcicolous species
Target Note 13 -	Small area of grassland with increased botanical diversity



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Appendix 3 – Aerial photographs



Plot 3a – Wrexham Industrial Estate

Close aerial photograph

— Survey boundary



Plot 3a – Wrexham Industrial Estate

Wide aerial photograph

 Site location



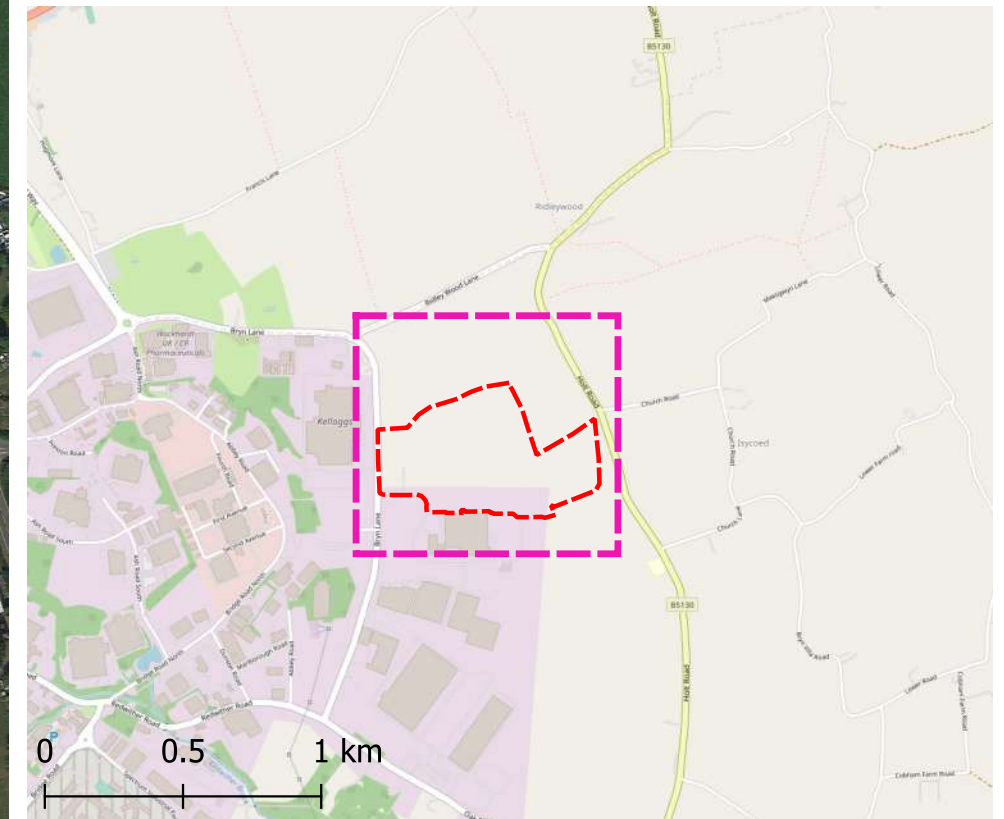


Appendix 4 – NVC survey plan



NVC Survey

**Site: Plot 3a, Wrexham
Industrial Estate**
NGR: SJ 39340 50457
Author: Tom Kenwright
Date: 04/08/2022



KEY:

- NVC quadrats
- Site boundary

Map data © 2022 Google, Imagery © 2022 Google

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Appendix 5 – NVC survey results

Grassland 1

[illegible]

Grassland 2

Latin name	Common name	DOMIN score					Frequency (%)	Frequency (score)	Frequency (description)
		8	9	10	11	12			
<i>Agrostis stolonifera</i>	Creeping bent	4	2	4	2	4	100.0	V	Constant
<i>Jacobaea erucifolia</i>	Hoary ragwort	3	2	4	2	4	100.0	V	Constant
<i>Anthoxanthum odoratum</i>	Sweet vernal grass		4	4	7	4	80.0	IV	Constant
<i>Ranunculus repens</i>	Creeping buttercup	4	3	5	4		80.0	IV	Constant
<i>Arrhenatherum elatius</i>	False oat-grass	5	4		4	7	80.0	IV	Constant
<i>Potentilla reptans</i>	Creeping cinquefoil	2		5		5	60.0	III	Frequent
<i>Alopecurus pratensis</i>	Meadow foxtail		8	4	4		60.0	III	Frequent
<i>Ranunculus acris</i>	Meadow buttercup	1		3		4	60.0	III	Frequent
<i>Cirsium arvense</i>	Creeping thistle	7	4		6		60.0	III	Frequent
<i>Rumex acetosa</i>	Common sorrel	2		1		4	60.0	III	Frequent
<i>Holcus lanatus</i>	Yorkshire fog	4		2			40.0	II	Occasional
<i>Vicia sativa</i>	Common vetch	2				2	40.0	II	Occasional
<i>Rumex crispus</i>	Curled dock	2			2		40.0	II	Occasional
<i>Elymus repens</i>	Common couch	4		5			40.0	II	Occasional
<i>Vicia cracca</i>	Tufted vetch			2		1	40.0	II	Occasional
<i>Heracleum sphondylium</i>	Common hogweed			1		2	40.0	II	Occasional
<i>Equisetum arvense</i>	Field horsetail				1	2	40.0	II	Occasional
<i>Cirsium vulgare</i>	Spear thistle	2					20.0	I	Scarce
<i>Festuca rubra</i>	Red fescue				2		20.0	I	Scarce
<i>Centaurea nigra</i>	Common knapweed				3		20.0	I	Scarce
<i>Cerastium fontanum</i>	Common mouse-ear			1			20.0	I	Scarce
<i>Agrostis capillaris</i>	Common bent	3					20.0	I	Scarce
<i>Epilobium hirsutum</i>	Great willowherb					3	20.0	I	Scarce
<i>Vicia tetrasperma</i>	Smooth tare	4					20.0	I	Scarce
<i>Rubus fruticosus</i> agg.	Bramble	5					20.0	I	Scarce
<i>Quercus robur</i>	Pedunculate oak (sapling)	1					20.0	I	Scarce
<i>Cirsium palustre</i>	Marsh thislte	1					20.0	I	Scarce
<i>Pulicaria dysenterica</i>	Common fleabane				2		20.0	I	Scarce
<i>Dactylorhiza fuchsii</i>	Common spotted orchid				2		20.0	I	Scarce
<i>Poa trivialis</i>	Rough meadow-grass				2		20.0	I	Scarce
Additional species noted within the grassland but not within the sample quadrats									Abundance (DOMIN)
<i>Filipendula ulmaria</i>	Meadowsweet	-	-	-	-	-	-	-	Rare
<i>Urtica dioica</i>	Stinging nettle	-	-	-	-	-	-	-	Rare
<i>Rumex obtusifolius</i>	Broadleaved dock	-	-	-	-	-	-	-	Rare
<i>Juncus effusus</i>	Soft rush	-	-	-	-	-	-	-	Rare
<i>Juncus inflexus</i>	Hard rush	-	-	-	-	-	-	-	Rare
<i>Deschampsia cespitosa</i>	Tufted hair-grass	-	-	-	-	-	-	-	Rare

Grassland 3

Latin name	Common name	DOMIN score							Frequency (%)	Frequency (score)	Frequency (description)
		13	14	15	16	17	18	19			
<i>Ranunculus acris</i>	Meadow buttercup	4	4	5	2	6	3	1	100.0	V	Constant
<i>Jacobaea erucifolia</i>	Hoary ragwort	2	3	3	1	4	2		85.7	V	Constant
<i>Centaurea nigra</i>	Common knapweed	5		4	2	1	4	2	85.7	V	Constant
<i>Rumex acetosa</i>	Common sorrel	2	4	2	1		2	1	85.7	V	Constant
<i>Ranunculus repens</i>	Creeping buttercup	2	4	5	3		4	3	85.7	V	Constant
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	5		5	6	7	3	5	85.7	V	Constant
<i>Agrostis stolonifera</i>	Creeping bent		6	4	3	5	3	2	85.7	V	Constant
<i>Rumex crispus</i>	Curled dock		1	2	2	2		1	71.4	IV	Constant
<i>Arrhenatherum elatius</i>	False oat-grass	5	4		4		5	4	71.4	IV	Constant
<i>Alopecurus pratensis</i>	Meadow foxtail		4	5	6		5	6	71.4	IV	Constant
<i>Festuca rubra</i>	Red fescue	4			4			4	42.9	III	Frequent
<i>Potentilla reptans</i>	Creeping cinquefoil		5		4		2		42.9	III	Frequent
<i>Cirsium palustre</i>	Marsh thistle			3		4		1	42.9	III	Frequent
<i>Vicia tetrasperma</i>	Smooth tare	3			1		1		42.9	III	Frequent
<i>Holcus lanatus</i>	Yorkshire fog			2	4		3	2	57.1	III	Frequent
<i>Lathyrus pratensis</i>	Meadow vetchling	4						1	28.6	II	Occasional
<i>Pulicaria dysenterica</i>	Common fleabane	1					1		28.6	II	Occasional
<i>Quercus robur</i>	Pedunculate oak (sapling)	1							14.3	I	Scarce
<i>Festuca arundinacea</i>	Tall fescue			4					14.3	I	Scarce
<i>Galium palustre</i>	Marsh bedstraw			1					14.3	I	Scarce
<i>Angelica sylvestris</i>	Wild angelica				2				14.3	I	Scarce
<i>Juncus conglomeratus</i>	Compact rush				2				14.3	I	Scarce
<i>Elymus repens</i>	Common couch				1				14.3	I	Scarce
<i>Epilobium hirsutum</i>	Great willowherb				1				14.3	I	Scarce
<i>Phleum pratense</i>	Timothy				5				14.3	I	Scarce
<i>Dactylorhiza fuchsii</i>	Common spotted orchid				1				14.3	I	Scarce
<i>Poa trivialis</i>	Rough meadow-grass				2				14.3	I	Scarce
Additional species noted within the grassland but not within the sample quadrats											Abundance (DOMIN)
<i>Aegopodium podagraria</i>	Ground elder	-	-	-	-	-			-	-	Rare
<i>Vicia hirsuta</i>	Hairy tare	-	-	-	-	-			-	-	Rare
<i>Filipendula ulmaria</i>	Meadowseet	-	-	-	-	-			-	-	Rare
<i>Urtica dioica</i>	Stinging nettle	-	-	-	-	-			-	-	Rare
<i>Rumex obtusifolius</i>	Broadleaved dock	-	-	-	-	-			-	-	Rare
<i>Stellaria graminea</i>	Lesser stitchwort	-	-	-	-	-			-	-	Rare
<i>Geranium dissectum</i>	Cut-leaved crane's-bill	-	-	-	-	-			-	-	Rare
<i>Juncus effusus</i>	Soft rush	-	-	-	-	-			-	-	Rare
<i>Juncus inflexus</i>	Hard rush	-	-	-	-	-			-	-	Rare
<i>Equisetum arvense</i>	Field horsetail	-	-	-	-	-			-	-	Rare

Grassland 4

Latin name	Common name	DOMIN score					Frequency (%)	Frequency (score)	Frequency (description)
		20	21	22	23	24			
<i>Centaurea nigra</i>	Common knapweed	7	7	5	7	5	100.0	V	Constant
<i>Galium verum</i>	Ladies bedstraw	7	7	7	5	5	100.0	V	Constant
<i>Lotus corniculatus</i>	Common bird's-foot trefoil	4	4	5	4	5	100.0	V	Constant
<i>Holcus lanatus</i>	Yorkshire fog	1	2	4	4	4	100.0	V	Constant
<i>Cirsium arvense</i>	Creeping thistle		1	2		1	60.0	III	Frequent
<i>Plantago lanceolata</i>	Ribwort plantain	3	3			4	60.0	III	Frequent
<i>Medicago lupulina</i>	Black medick	3	2		5		60.0	III	Frequent
<i>Festuca rubra</i>	Red fescue		1	4		4	60.0	III	Frequent
<i>Briza media</i>	Quaking grass			2	5	5	60.0	III	Frequent
<i>Anthoxanthum odoratum</i>	Sweet vernal grass			4	4	4	60.0	III	Frequent
<i>Jacobaea erucifolia</i>	Hoary ragwort	2		1		2	60.0	III	Frequent
<i>Lathyrus pratensis</i>	Meadow vetchling	2			1	1	60.0	III	Frequent
<i>Leucanthemum vulgare</i>	Oxeye daisy	2	4				40.0	II	Occasional
<i>Rumex crispus</i>	Curled dock			2		1	40.0	II	Occasional
<i>Trifolium repens</i>	White clover			2	3		40.0	II	Occasional
<i>Prunella vulgaris</i>	Self heal			1	1		40.0	II	Occasional
<i>Ranunculus repens</i>	Creeping buttercup			2	1		40.0	II	Occasional
<i>Vicia sativa</i>	Common vetch			2	2		40.0	II	Occasional
<i>Cynosurus cristatus</i>	Crested dog's-tail				4	1	40.0	II	Occasional
<i>Potentilla reptans</i>	Creeping cinquefoil				2		20.0	I	Scarce
<i>Jacobaea vulgaris</i>	Common ragwort				1		20.0	I	Scarce
<i>Rubus fruticosus</i> agg.	Bramble					2	20.0	I	Scarce
<i>Vicia cracca</i>	Tufted vetch					1	20.0	I	Scarce
<i>Dactylis glomerata</i>	Cock's-foot					1	20.0	I	Scarce
<i>Rosa</i> sp.	Rose					1	20.0	I	Scarce
<i>Agrostis capillaris</i>	Common bent					1	20.0	I	Scarce
<i>Geranium pusillum</i>	Small-flowered crane's-bill	1					20.0	I	Scarce
<i>Hypericum hirsutum</i>	Hairy St John's-wort	2					20.0	I	Scarce
<i>Primula vulgaris</i>	Primrose	2					20.0	I	Scarce
<i>Achillea millefolium</i>	Yarrow	4					20.0	I	Scarce
Additional species noted within the grassland but not within the sample quadrats									Abundance (DOMIN)
<i>Ophrys apifera</i>	Bee orchid	-	-	-	-	-	-	-	Rare
<i>Lathyrus nissolia</i>	Grass vetchling	-	-	-	-	-	-	-	Rare
<i>Dactylorhiza fuchsii</i>	Common spotted orchid	-	-	-	-	-	-	-	Rare
<i>Deschampsia cespitosa</i>	Tufted hair-grass	-	-	-	-	-	-	-	Rare
<i>Potentilla anserina</i>	Silverweed	-	-	-	-	-	-	-	Rare
<i>Urtica dioica</i>	Stinging nettle	-	-	-	-	-	-	-	Rare
<i>Rumex obtusifolius</i>	Broadleaved dock	-	-	-	-	-	-	-	Rare
<i>Heracleum sphondylium</i>	Common hogweed	-	-	-	-	-	-	-	Rare
<i>Cirsium vulgare</i>	Spear thistle	-	-	-	-	-	-	-	Rare

Grassland 5

Latin name	Common name	DOMIN score					Frequency (%)	Frequency (score)	Frequency (description)
		25	26	27	28	29			
<i>Pulicaria dysenterica</i>	Common fleabane	7	9	9	8	9	100.0	V	Constant
<i>Juncus inflexus</i>	Hard rush	6	4	4	7	5	100.0	V	Constant
<i>Epilobium hirsutum</i>	Great willowherb	4	3	1	1	4	100.0	V	Constant
<i>Carex otrubae</i>	False fox sedge	4		2		4	60.0	III	Frequent
<i>Vicia cracca</i>	Tufted vetch	1		3		2	60.0	III	Frequent
<i>Rumex conglomeratus</i>	Clustered dock	3	4	1			60.0	III	Frequent
<i>Cirsium palustre</i>	Marsh thistle	1			1	1	60.0	III	Frequent
<i>Agrostis stolonifera</i>	Creeping bent		1	1		2	60.0	III	Frequent
<i>Urtica dioica</i>	Stinging nettle	1			1		40.0	II	Occasional
<i>Ranunculus repens</i>	Creeping buttercup	2	1				40.0	II	Occasional
<i>Rumex crispus</i>	Curled dock	3	1				40.0	II	Occasional
<i>Juncus effusus</i>	Soft rush		2			2	40.0	II	Occasional
<i>Rubus fruticosus</i> agg.	Bramble			4		3	40.0	II	Occasional
<i>Heracleum sphondylium</i>	Common hogweed			1	2		40.0	II	Occasional
<i>Carex flacca</i>	Glaucous sedge				3	2	40.0	II	Occasional
<i>Centaurea nigra</i>	Common knapweed				1	1	40.0	II	Occasional
<i>Jacobaea erucifolia</i>	Hoary ragwort				2	1	40.0	II	Occasional
<i>Lathyrus pratensis</i>	Meadow vetchling				1	2	40.0	II	Occasional
<i>Juncus conglomeratus</i>	Compact rush	2					20.0	I	Scarce
<i>Helminthotheca echioides</i>	Bristly oxtongue	1					20.0	I	Scarce
<i>Solanum dulcamara</i>	Bittersweet	1					20.0	I	Scarce
<i>Epilobium tetragonum</i>	Square-stalked willowherb	1					20.0	I	Scarce
<i>Hypericum hirsutum</i>	Hairy St John's-wort	1					20.0	I	Scarce
<i>Prunella vulgaris</i>	Self heal	1					20.0	I	Scarce
<i>Cirsium arvense</i>	Creeping thistle	4					20.0	I	Scarce
<i>Holcus lanatus</i>	Yorkshire fog		1				20.0	I	Scarce
<i>Anagallis arvensis</i>	Scarlet pimpernel				1		20.0	I	Scarce
<i>Festuca rubra</i>	Red fescue					3	20.0	I	Scarce
Additional species noted within the grassland but not within the sample quadrats									Abundance (DOMIN)
<i>Deschampsia cespitosa</i>	Tufted hair-grass	-	-	-	-	-	-	-	Rare
<i>Potentilla anserina</i>	Silverweed	-	-	-	-	-	-	-	Rare



Appendix 6 – PSYM survey results

PSYM PARAMETER SUMMARY (generated from pages 1 and 2)

Site details			
Site name	Pond 1	Pond 2	Pond 4
Survey date	11th August	11th August	11th August
Grid reference (e.g. SP123456 or higher precision)	SJ 39173 50306	SJ 39340 50291	SJ 39359 50533
Plant metrics			
No. of submerged + marginal plant species (not including	8	3	13
Number of uncommon plant species	2	0	2
Trophic Ranking Score (TRS)	9.25	8.5	8.966666667
Invertebrates metrics			
ASPT	4.615384615	3.909090909	3.8
Odonata + Megaloptera (OM) families	3	1	0
Coleoptera families	2	1	3
Environmental variables			
Altitude (m)	31	29	28
Easting	3391	3393	3393
Northing	3503	3502	3505
Shade (%)	10	70	60
Inflow (0/1)	0	0	0
Grazing (%)	0	0	0
pH	7.3	7.3	7.3
Emergent plant cover (%)	10	0	60
Base clay (1-3)	3	3	2
Base sand, gravel, cobbles (1-3)	1	1	1
Base peat (1-3)	1	1	2
Base rock (1-3)	1	1	1
Area (m ²)	2600	2050	1100

Results

Submerged + marginal plant species			
Predicted (SM)	20.1	24.5	18.3
Actual (SM)	8.0	3.0	13.0
EQI (SM)	0.4	0.1	0.7
IBI (SM)	1	0	2
Uncommon plant species			
Predicted (U)	3.9	4.3	3.3
Actual (U)	2.0	0.0	2.0
EQI (U)	0.5	0.0	0.6
IBI (U)	2	0	2
Trophic Ranking Score (TRS)			
Predicted (TRS)	7.14	8.55	8.47
Actual (TRS)	9.25	8.50	8.97
EQI (TRS)	1.30	0.99	1.06
IBI (TRS)	0	3	2
ASPT			
Predicted (ASPT)	5.11	5.11	5.10
Actual (ASPT)	4.62	3.91	3.80
EQI (ASPT)	0.90	0.77	0.74
IBI (ASPT)	3	2	2
Odonata + Megaloptera (OM) families			
Predicted (OM)	3.11	3.25	3.28
Actual (OM)	3.00	1.00	0.00
EQI (OM)	0.96	0.31	0.00
IBI (OM)	3	1	0
Coleoptera families			
Predicted (CO)	3.76	3.79	3.81
Actual (CO)	2.00	1.00	3.00
EQI (CO)	0.53	0.26	0.79
IBI (CO)	2	1	3
Sum of Individual Metrics	11	7	11
Index of Biotic Integrity (%)	61%	39%	61%
PSYM quality category (IBI >75%=Good, 51-75%= Moderate, 25-50%=Poor, <25%=V Poor)	Moderate	Poor	Moderate
Is this a Priority Pond? (Good quality category)	No	No	No



Appendix 7 – Pond plan



Pond Plan - 500m

Site: Plot 3a, Wrexham Industrial Estate
 Author: Tom Kenwright
 Date: 24/02/2022



KEY:
 [Blue fill] Pond
 [Blue dashed line] Ditch
 [Red dashed line] Survey boundary
 [Yellow dashed line] 500m buffer

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Appendix 8 – GCN HSI results

GCN HSI Calculations

ONSITE PONDS & DITCHES

	Pond number	P1	P2	P3	P4	P5	P6	D1
	Grid reference	SJ 39177 50299	SJ 39346 50292	SJ 39458 50286	SJ 39362 50525	SJ 39582 50191	SJ 39574 50368	SJ 38995 50382
SI number	SI description	SI values						
1	Geographic location	1	1	1	1	1	1	1
2	Pond area	0.8	0.86	0.86	0.95	1	0.7	0.4
3	Pond permanence	0.9	0.9	0.9	0.9	0.9	1	1
4	Water quality	0.67	0.67	1	0.67	1	0.67	0.33
5	Shade	1	0.4	0.8	1	1	0.6	0.4
6	Water fowl	0.67	0.67	1	0.67	1	1	1
7	Fish	0.67	0.67	1	0.67	1	1	0.67
8	Pond density	1	1	1	1	1	1	1
9	Terrestrial habitat	0.67	1	1	1	1	1	0.67
10	Macrophyte cover	0.55	0.3	1	1	0.6	0.9	0.35
HSI score:		0.78	0.70	0.95	0.87	0.94	0.87	0.62
Pond suitability:		Good	Good	Excellent	Excellent	Excellent	Excellent	Average

HSI Score	Pond Suitability
< 0.50	Poor
0.50 - 0.59	Below average
0.60 - 0.69	Average
0.70 - 0.79	Good
> 0.80	Excellent

OFFSITE PONDS & DITCHES

	Pond number	P9	P24	P25	P26	P28	P29	P30	P31
	Grid reference	SJ 38950 50418	SJ 39907 50094	SJ 39622 50029	SJ 39731 49881	SJ 39459 49928	SJ 39330 49953	SJ 39254 49951	SJ 39117 50074
SI number	SI description								
1	Geographic location	1	1	1	1	N/A	1	1	1
2	Pond area	0.97	0.6	0.98	1	N/A	1	1	0.87
3	Pond permanence	0.9	0.9	0.9	0.9	N/A	0.9	0.9	0.9
4	Water quality	0.33	0.67	0.67	0.67	N/A	0.67	0.67	0.67
5	Shade	1	1	1	1	N/A	0.8	0.8	1
6	Water fowl	1	1	0.67	0.67	N/A	1	1	0.67
7	Fish	1	1	1	1	N/A	1	1	0.01
8	Pond density	1	1	1	1	N/A	1	1	1
9	Terrestrial habitat	0.01	0.67	1	1	N/A	0.67	0.67	0.67
10	Macrophyte cover	0.3	0.35	0.35	0.55	N/A	0.4	0.9	0.4
HSI score:		0.49	0.78	0.82	0.86	N/A	0.81	0.88	0.50
Pond suitability:		Below average	Good	Excellent	Excellent	N/A	Excellent	Excellent	Below average

	Pond number	P32 a	P32 b	P32 c	P33a	P33b	P34	P45/46	P47
	Grid reference	SJ 39109 50219	SJ 38993 50245	SJ 38987 50244	SJ 38865 49774	SJ 38899 49844	SJ 38944 49896	SJ 38560 50195	SJ 38539 50205
SI number	SI description								
1	Geographic location	1	1	1	1	1	1	1	1
2	Pond area	0.95	0.05	0.05	1	0.05	1	0.94	0.3
3	Pond permanence	0.9	1	0.1	0.9	1	0.9	0.9	0.9
4	Water quality	0.33	0.33	0.33	0.67	0.33	0.67	0.67	0.67
5	Shade	0.9	0.4	1	1	1	1	1	1
6	Water fowl	1	1	1	1	1	1	1	1
7	Fish	1	1	1	1	1	1	1	1
8	Pond density	1	1	1	1	1	1	1	1
9	Terrestrial habitat	1	0.67	0.67	0.67	0.33	0.33	0.67	0.67
10	Macrophyte cover	0.9	0.45	1	0.3	1	0.6	0.6	0.45
HSI score:		0.86	0.54	0.51	0.81	0.59	0.81	0.86	0.75
Pond suitability:		Excellent	Below average	Below average	Excellent	Below average	Excellent	Excellent	Good



Appendix 9 – GCN eDNA survey results

Folio No: E12803
 Report No: 1
 Purchase Order: UES 03448
 Client: UNITED ENVIRONMENTAL
 SERVICES LTD
 Contact: Jenny Gibbs

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 21/04/2022
Date Reported: 25/04/2022
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1986	Ditch 8	SJ 39786 49980	Pass	Pass	Pass	Negative	0
1988	D 7A	SJ 39757 49979	Pass	Pass	Pass	Negative	0
1989	Ditch 7B	SJ 39669 50042	Pass	Pass	Pass	Negative	0
1990	Pond 25	SJ 39640 50008	Pass	Pass	Pass	Negative	0
1991	Pond 34	SJ 38954 49925	Pass	Pass	Pass	Positive	12
1992	Pond 2	SJ 3939150316	Pass	Pass	Pass	Negative	0
1993	D6	SJ 39762 50181	Pass	Pass	Pass	Negative	0



1994	Ditch 1	SJ 39042 50490	Pass	Pass	Pass	Positive	1
1995	Pond 29	SJ 39317 49940	Pass	Pass	Pass	Negative	0
1996	68-69 Clywedog Road	SJ 37292 49566	Pass	Pass	Pass	Positive	1
1997	Pond 31	SJ 39104 50073	Pass	Pass	Pass	Negative	0
1998	Ditch 3	SJ 39115 50529	Pass	Pass	Pass	Negative	0
1999	Pond 30	SJ 39260 49935	Pass	Pass	Pass	Negative	0
2000	D2		Pass	Pass	Pass	Negative	0
2001	Pond 1	SJ 39215 50299	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth

Approved by: Esther Strafford

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS



SIC: Sample Integrity Check [Pass/Fail]

When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: Degradation Check [Pass/Fail]

Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: Inhibition Check [Pass/Fail]

The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: Presence of GCN eDNA [Positive/Negative/Inconclusive]

Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.

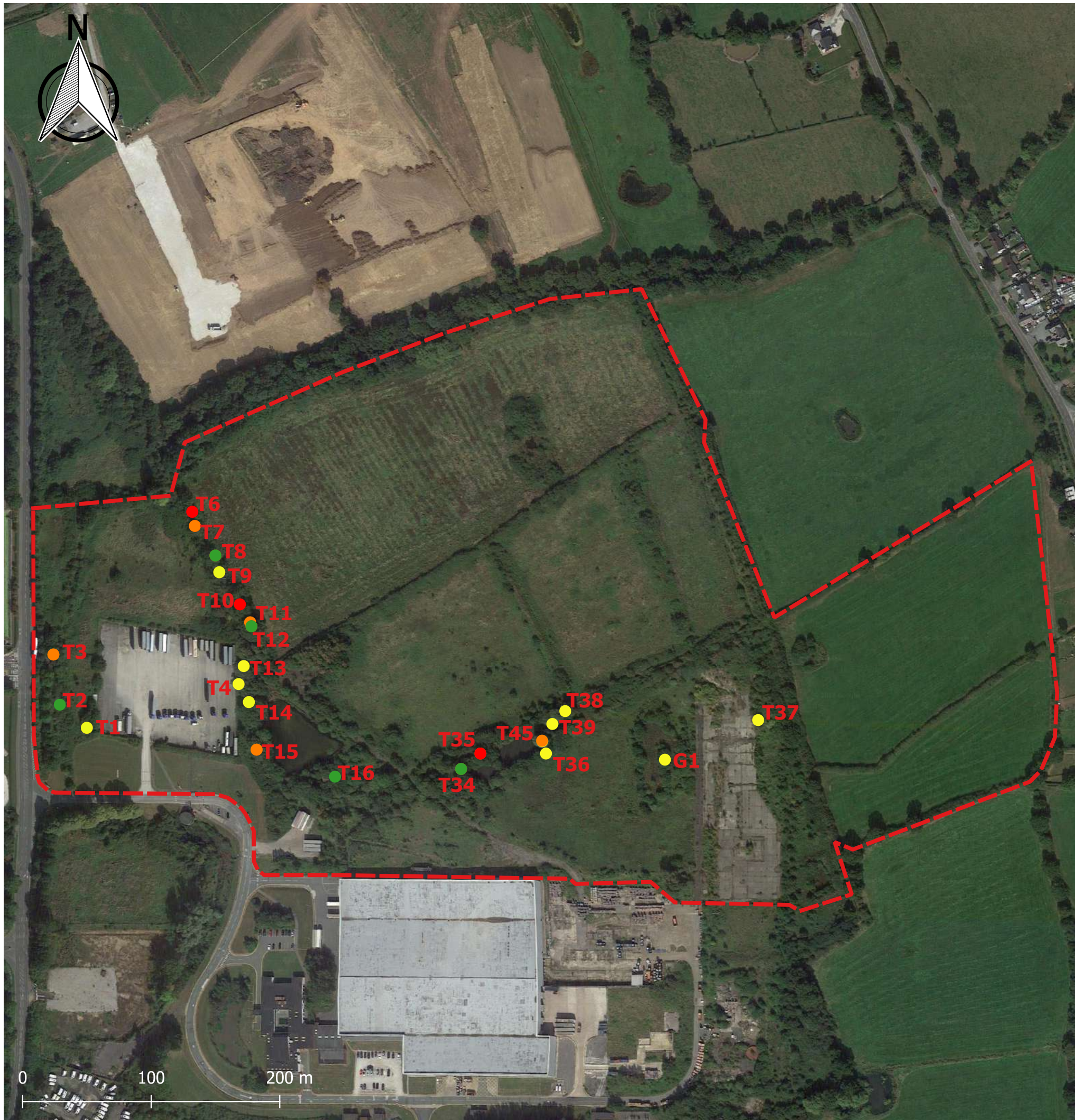
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.

Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.



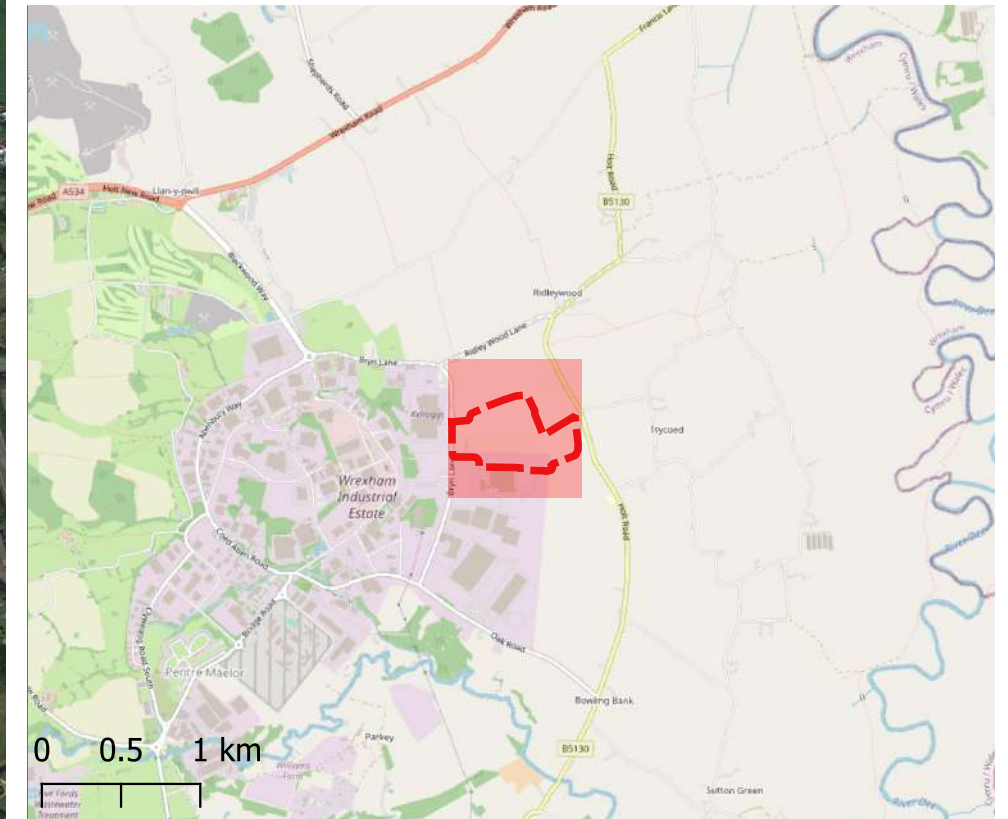


Appendix 10 – Bat tree assessment plan



Aerial Tree Assessment

Site: Plot 3A, Wrexham
NGR: SJ 39272 50416
Author: Robert Mooney
Date: 10/10/2022



KEY:

--- Development Boundary
 Bat Roosting Potential

- High
- Moderate
- Low
- Negligible

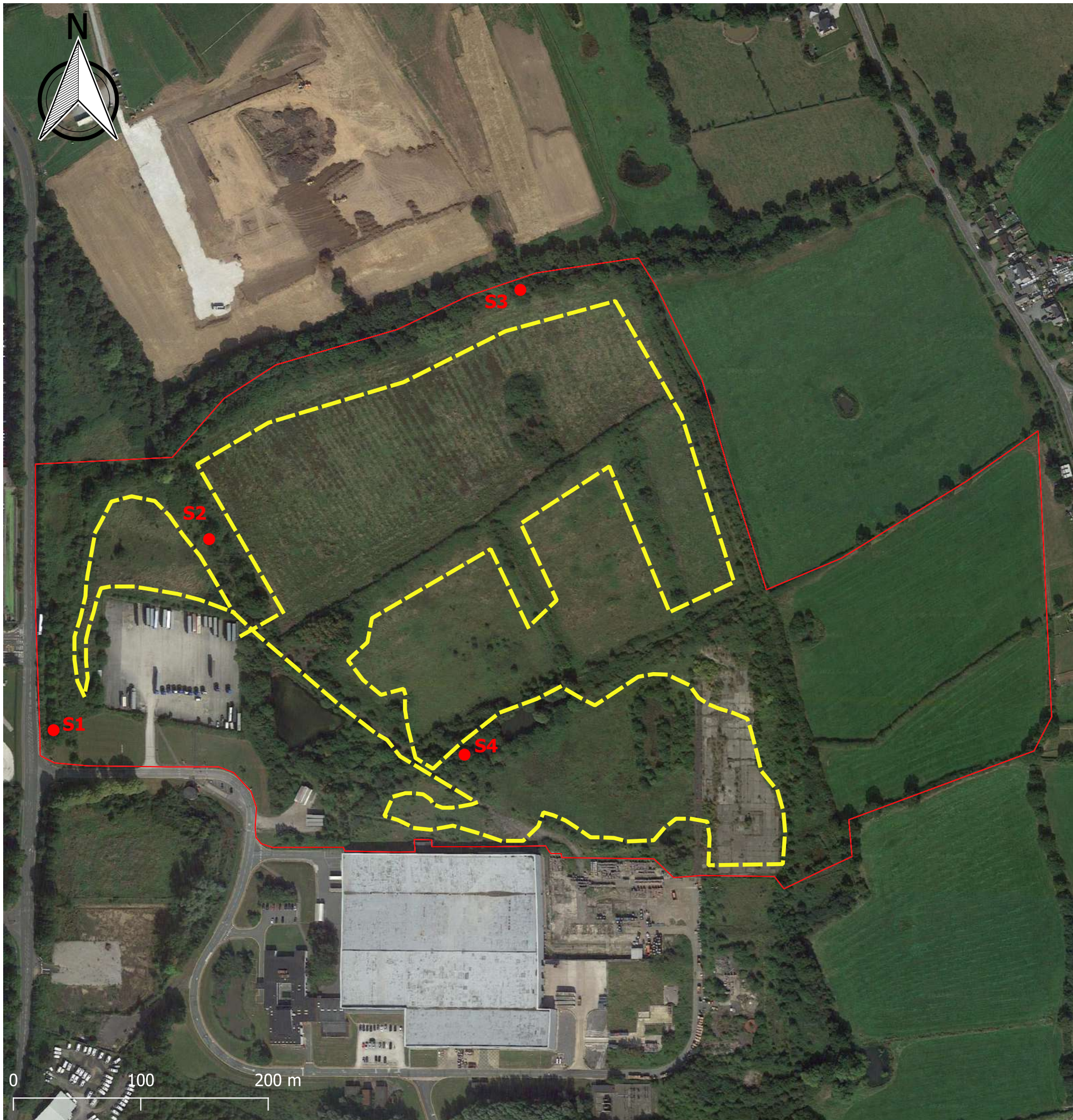
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Appendix 11 – Bat activity survey plan



Preliminary Ecological Appraisal

**Site: Plot 3A, Wrexham
Industrial Estate
NGR: SJ 39272 50416
Author: Robert Mooney
Date: 17/02/2023**



KEY:

- Site Boundary
- - - Transect route
- Static detector

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Appendix 12 – Breeding bird survey results



Bird Survey Map 1

Surveyors: AG

Date: 18.03.2022

Start: 06:00

Finish: 10:30

Temp: 1 to 5

*C

Wind: 1

BFS

Rain: 0

%

CC: 0

%

Notes:

Rookery off site to N Boundary

Regular HG and LB flyovers

0 50 100 m

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Bird Survey Map 2

Surveyors: AG, RM

Date: 13.04.2022

Start: 06:00

Finish: 10:30

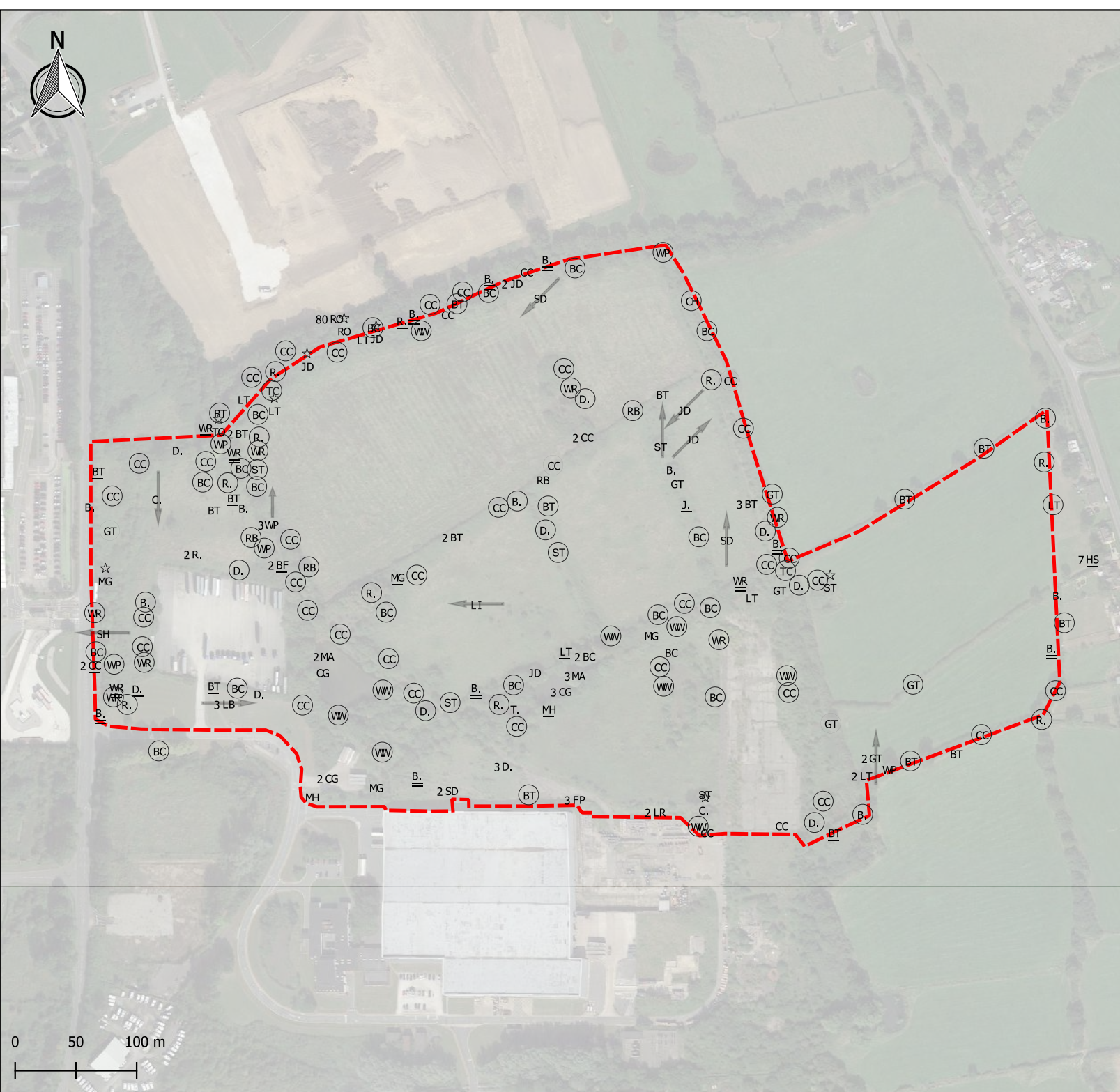
Temp:	11	*C
Wind:	2	BFS
Rain:	5	%
CC:	100	%

Notes:

39 Rook nests counted in rookery on N boundary
Numerous gulls (LB and HG mainly) flying over

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Bird Survey Map 3

Surveyors: AG, JM

Date: 09/05/2022

Start: 0500

Finish: 0930

Temp: 8 - 10

*C

Wind: 2

BFS

Rain: 0

%

CC: 90

%

Notes:

Much of the site has been mown (including some areas of scrub) within the past week. Bird activity is lower than in previous visits as a result (particularly in grassland areas).

0 50 100 m

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Bird Survey Map 4

Surveyors: AG

Date: 21/06/2022

Start: 0500

Finish: 0930

Temp: 10 - 13

*C

Wind: 1

BFS

Rain: 0

%

CC: 15

%

Notes:

Fledged young of BF and LT visible.

0 50 100 m

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Bird Survey Map 5

Surveyors: AG

Date: 19/07/2022

Start: 20:30

Finish: 23:30

Temp: 22

*C

Wind: 2

BFS

Rain: 0

%

CC: 15

%

Notes:

PM survey

Agressive encounter between SH and TO on N boundary. SH was particularly aggitated, indicating potential predation of SH nest by TO

Kingfisher noted calling around pond

Large gull assemblage on the roof of warehouse on the S boundary. High number flew over site towards this area during the survey.

Large RO and JD roost on the roof of the warehouse off site to the N.

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0 50 100 m



Bird Survey Map 6

Surveyors: AG

Date: 11/08/2022

Start: 0530

Finish: 0930

Temp: 10 - 19

*C

Wind: 1

BFS

Rain: 0

%

CC: 0

%

Notes:

Heavy dew early mornig and cold start. Bird activity decreased after 0800

Woodcock flushed from N ditch.

MAs in eclipse plumage

0 50 100 m

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Appendix 13 – Breeding bird survey summary

BTO Code	Common name	Scientific Name	Cymraeg	Conservation Status	Notes (Status on / within 100m of the proposed development site)
CG	Canada Goose	Branta canadensis	Gŵydd Canada		Confirmed breeding
MA	Mallard	Anas platyrhynchos	Hwyaden Wyllt	Amber (GB, Wales)	Confirmed breeding
T.	Teal	Anas crecca	Corhwyaden	Amber (GB, Wales)	Possible breeding
PH	Pheasant	Phasianus colchicus	Ffesant		Possible breeding
FP	Feral Pigeon	Columba livia	Colomen Ddof	Green (GB)	Confirmed breeding
SD	Stock Dove	Columba oenas	Colomen Wyllt	Amber (GB)	Confirmed breeding
WP	Woodpigeon	Columba palumbus	Ysguthan	Amber (GB)	Confirmed breeding
MH	Moorhen	Gallinula chloropus	Iâr Ddŵr	Amber(GB)	Confirmed breeding
L.	Lapwing	Vanellus vanellus	Cornchwiglen	NT; Red (GB, Wales); Sec7	Non-breeding. Flyover. Possible foraging
CU	Curlew	Numenius arquata	Gylfinir	NT; Red (GB, Wales); Sec7	Non-breeding. Flyover. Possible foraging
WK	Woodcock	Scolopax rusticola	Cyffyllog	Red (GB, Wales)	Non-breeding. Overwintering species.
SN	Snipe	Gallinago gallinago	Giach	Amber (GB, Wales)	Non-breeding. Overwintering species.
BH	Black-headed Gull	Chroicocephalus ridibundus	Gwylan Benddu	Amber (GB); Red (Wales); Sec7	Non-breeding. Flyover
GB	Great Black-backed Gull	Larus marinus	Gwylan Gefnddu Fwyaf	Red (Wales); Amber (GB)	Possible breeding
HG	Herring Gull	Larus argentatus	Gwylan y Penwaig	Red (GB, Wales); Sec7	Confirmed breeding
LB	Lesser Black-backed Gull	Larus fuscus	Gwylan Gefnddu Leiaf	Amber (GB, Wales)	Confirmed breeding
H.	Grey Heron	Ardea cinerea	Crêyr Glas	Green (GB), Amber (Wales)	Non-breeding. Flyover. Possible foraging
SH	Sparrowhawk	Accipiter nisus	Gwalch Glas	Amber (GB)	Possible breeding
BZ	Buzzard	Buteo buteo	Bwncath	Green (GB)	Confirmed breeding
LO	Little Owl	Athene noctua	Tylluan Fach		Possible breeding
TO	Tawny Owl	Strix aluco	Tylluan Frech	Amber (GB)	Confirmed breeding
KF	Kingfisher	Alcedo atthis	Glas y Dorlan	Green (GB), Amber (Wales); Sch1.1; Ann	Non-breeding. Foraging.
GS	Great Spotted Woodpecker	Dendrocopos major	Cnocell Fraith Fwyaf	Green (GB)	Likely breeding
G.	Green Woodpecker	Picus viridis	Cnocell Werdd	Amber (Wales); Green (GB)	Possible breeding
K.	Kestrel	Falco tinnunculus	Cudyll Coch	Red (Wales); Amber (GB); Sec7	Possible breeding
J.	Jay	Garrulus glandarius	Sgrech y Coed	Green (GB)	Likely breeding
MG	Magpie	Pica pica	Pioden	Green (GB)	Confirmed breeding
JD	Jackdaw	Coloeus monedula	Jac-y-do	Green (GB)	Confirmed breeding
RO	Rook	Corvus frugilegus	Ydfran	Amber (GB)	Confirmed breeding
C.	Carrion Crow	Corvus corone	Brân Dyddyn	Green (GB)	Confirmed breeding
RN	Raven	Corvus corax	Cigfran	Green (GB)	Non-breeding. Flyover
CT	Coal Tit	Parus ater	Titw Penddu	Green (GB)	Possible breeding
BT	Blue Tit	Cyanistes caeruleus	Titw Tomos Las	Green (GB)	Confirmed breeding
GT	Great Tit	Parus major	Titw Mawr	Green (GB)	Confirmed breeding
SM	Sand Martin	Riparia riparia	Gwennol y Glennydd	Green (GB)	Non-breeding. Flyover
SL	Swallow	Hirundo rustica	Gwennol	Green (GB)	Non-breeding. Flyover
LT	Long-tailed Tit	Aegithalos caudatus	Titw Cynffon-hir	Amber (Wales); Green (GB)	Confirmed breeding
WW	Willow Warbler	Phylloscopus trochilus	Telwr yr Helyg	Red (Wales); Amber (GB)	Confirmed breeding
CC	Chiffchaff	Phylloscopus collybita	Siff-siaff	Green (GB)	Confirmed breeding
SW	Sedge Warbler	Acrocephalus schoenobaenus	Telwr yr Hesg	Amber (GB)	Possible breeding
BC	Blackcap	Sylvia atricapilla	Telwr Penddu	Green (GB)	Confirmed breeding
LW	Lesser Whitethroat	Curruca curruca	Llwydfron Fach	Green (GB)	Likely breeding
WH	Whitethroat	Curruca communis	Llwydfron	Red (Wales); Amber (GB)	Confirmed breeding
WR	Wren	Troglodytes troglodytes	Dryw	Amber (GB)	Confirmed breeding
TC	Treecreeper	Certhia familiaris	Dringwr Bach	Green (GB)	Likely breeding
ST	Song Thrush	Turdus philomelos	Bronfraith	Amber (GB, Wales); Sec7	Confirmed breeding
B.	Blackbird	Turdus merula	Mwyalchen	Green (GB)	Confirmed breeding
R.	Robin	Erithacus rubecula	Robin Goch	Green (GB)	Confirmed breeding

BTO Code	Common name	Scientific Name	Cymraeg	Conservation Status	Notes (Status on / within 100m of the proposed development site)
W.	Wheatear	Oenanthe oenanthe	Tinwen y Garn	Amber (GB)	Non-breeding. Flyover
HS	House Sparrow	Passer domesticus	Aderyn y Tô	Red (GB); Amber (Wales); Sec7	Confirmed breeding
D.	Dunnock	Prunella modularis	Llwyd y Gwrych	Amber (GB); Sec7	Confirmed breeding
PW	Pied Wagtail	Motacilla alba yarellii	Siglen Fraith	Amber (GB)	Likely breeding
MP	Meadow Pipit	Anthus pratensis	Corhedydd y Waun	NT; Amber (GB, Wales)	Non-breeding. Overwintering species.
CH	Chaffinch	Fringilla coelebs	Ji-binc	Green (GB)	Likely breeding
BF	Bullfinch	Pyrrhula pyrrhula	Coch y Berllan	Amber (GB); Red (Wales); Sec7	Confirmed breeding
GR	Greenfinch	Chloris chloris	Llinos Werdd	Red (GB); Amber (Wales)	Possible breeding
LI	Linnet	Linaria cannabina	Llinos	Red (GB, Wales); Sec7	Possible breeding
LR	Lesser Redpoll	Acanthis cabaret	Llinos Bengoch Leiaf	Red (GB); Amber (Wales); Sec7	Non-breeding. Flyover. Possible overwintering
GO	Goldfinch	Carduelis carduelis	Nico	Green (GB)	Confirmed breeding
RB	Reed Bunting	Emberiza schoeniclus	Bras y Cyrs	Amber (GB, Wales); Sec7	Confirmed breeding

Key:	
EX/CR/EN/VU/NT	Extinct, Critically Endangered, Endangered, Vulnerable or Near Threatened on the Global IUCN Red List of Threatened Species
Red/Amber/Green (GB)	Red, Amber or Green listed on the Birds of Conservation Concern 5 List
Red/Amber/Green (Wales)	Red, Amber or Green listed on the Population Status of Birds in Wales list
Sch1.1/1.1A/A1/1.2	Schedule 1 part 1, 1 part 1A, A1 or 1 part 2 of the Wildlife and Countryside Act 1981 (as amended)
Sec7	Section 7 of the Environment (Wales) Act 2016
Ann1	Listed on Annex I of The Birds Directive
RBBP	Listed as one of the species that the UK Rare Breeding Bird Panel reports on; breeding records of these species should be shared with the relevant county recorder



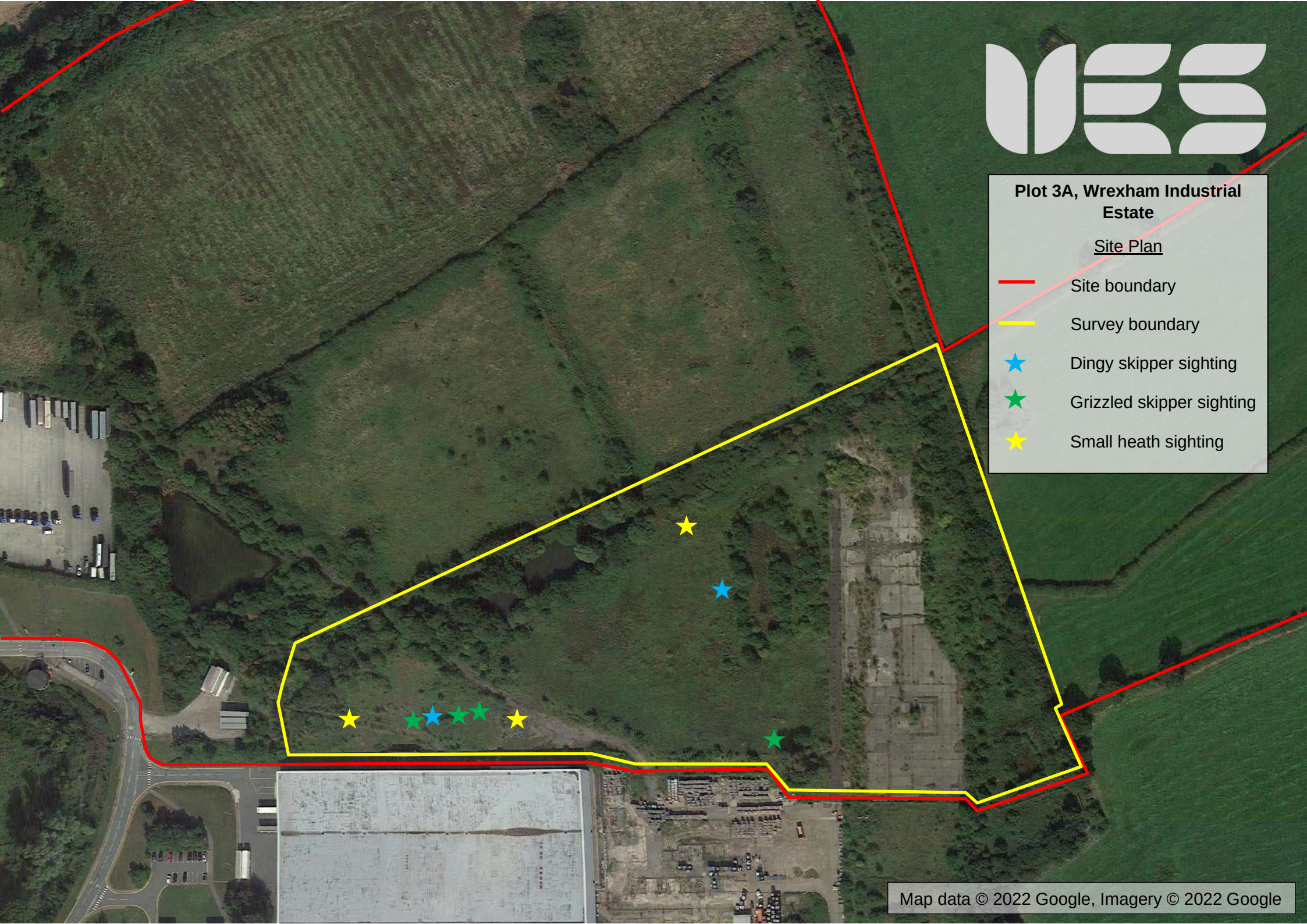
Appendix 14 – Dingy skipper survey plan



Plot 3A, Wrexham Industrial Estate

Site Plan

-  Site boundary
-  Survey boundary
-  Dingy skipper sighting
-  Grizzled skipper sighting
-  Small heath sighting





Appendix 15 – Invertebrate survey results

Appendix II: Survey results

Only species with a national status have been annotated. All others are common or local species.

Scientific name	Taxonomic group	National status
<i>Acanthosoma haemorrhoidale</i>	Hemiptera	
<i>Acetropis (Acetropis) gimmerthalii</i>	Hemiptera	
<i>Adalia bipunctata</i>	Coleoptera	
<i>Adelphocoris lineolatus</i>	Hemiptera	
<i>Aeshna cyanea</i>	Odonata	
<i>Aeshna grandis</i>	Odonata	
<i>Agelastica alni</i>	Coleoptera	Data Deficient; Nationally Rare*
<i>Agriotes sputator</i>	Coleoptera	
<i>Altica lythri</i>	Coleoptera	
<i>Amara aenea</i>	Coleoptera	
<i>Anasimyia contracta</i>	Diptera	
<i>Anasimyia lineata</i>	Diptera	
<i>Anaspis frontalis</i>	Coleoptera	
<i>Anaspis maculata</i>	Coleoptera	
<i>Anax imperator</i>	Odonata	
<i>Andrena bicolor</i>	Hymenoptera	
<i>Andrena minutula</i>	Hymenoptera	
<i>Andrena nitida</i>	Hymenoptera	
<i>Anisosticta novemdecimpunctata</i>	Coleoptera	
<i>Anomoia purmunda</i>	Diptera	
<i>Anthidium manicatum</i>	Hymenoptera	
<i>Anthocoris limbatus</i>	Hemiptera	
<i>Anthocoris nemorum</i>	Hemiptera	
<i>Aphantopus hyperantus</i>	Lepidoptera	
<i>Apolygus lucorum</i>	Hemiptera	
<i>Argyra leucocephala</i>	Diptera	
<i>Bembecia ichneumoniformis</i>	Lepidoptera	
<i>Bembidion dentellum</i>	Coleoptera	
<i>Bembidion lunulatum</i>	Coleoptera	
<i>Beris chalybata</i>	Diptera	
<i>Beris vallata</i>	Diptera	
<i>Bibio marci</i>	Diptera	
<i>Bombus hypnorum</i>	Hymenoptera	
<i>Bombus lapidarius</i>	Hymenoptera	
<i>Bombus pascuorum</i>	Hymenoptera	
<i>Brachypterus urticae</i>	Coleoptera	
<i>Calliopum aeneum</i>	Diptera	
<i>Cantharis decipiens</i>	Coleoptera	
<i>Cantharis lateralis</i>	Coleoptera	

Scientific name	Taxonomic group	National status
<i>Cantharis nigricans</i>	Coleoptera	
<i>Cantharis rufa</i>	Coleoptera	
<i>Capsus ater</i>	Hemiptera	
<i>Cercopis vulnerata</i>	Hemiptera	
<i>Chaetostomella cylindrica</i>	Diptera	
<i>Chamaepsila rosae preocc.</i>	Diptera	
<i>Cheilosia albitarsis</i>	Diptera	
<i>Cheilosia latifrons</i>	Diptera	
<i>Chloromyia formosa</i>	Diptera	
<i>Chorisops tibialis</i>	Diptera	
<i>Chorthippus brunneus</i>	Orthoptera	
<i>Chorthippus parallelus</i>	Orthoptera	
<i>Chrysopilus cristatus</i>	Diptera	
<i>Closterotomus norwegicus</i>	Hemiptera	
<i>Coccinella septempunctata</i>	Coleoptera	
<i>Coenagrion puella</i>	Odonata	
<i>Coenonympha pamphilus</i>	Lepidoptera	Section 42 Priority Species; Vulnerable
<i>Conocephalus fuscus</i>	Orthoptera	
<i>Cordilura albipes</i>	Diptera	
<i>Coremacera marginata</i>	Diptera	
<i>Coreus marginatus</i>	Hemiptera	
<i>Corizus hyoscyami</i>	Hemiptera	
<i>Crepidodera aurata</i>	Coleoptera	
<i>Crepidodera fulvicornis</i>	Coleoptera	
<i>Crossocerus distinguendus</i>	Hymenoptera	Notable a
<i>Crossocerus megacephalus</i>	Hymenoptera	
<i>Crossocerus podagricus</i>	Hymenoptera	
<i>Cryptocephalus pusillus</i>	Coleoptera	
<i>Curculio glandium</i>	Coleoptera	
<i>Dasysyrphus albostrigatus</i>	Diptera	
<i>Dasytes aeratus</i>	Coleoptera	
<i>Demetrius atricapillus</i>	Coleoptera	
<i>Deraeocoris (Knightocapsus) lutescens</i>	Hemiptera	
<i>Dicyphus (Dicyphus) epilobii</i>	Hemiptera	
<i>Dilophus febrilis</i>	Diptera	
<i>Discomyza incurva</i>	Diptera	
<i>Dolichopus festinus</i>	Diptera	
<i>Dolichopus griseipennis</i>	Diptera	
<i>Dolichopus plumipes</i>	Diptera	
<i>Dolichopus wahlbergi</i>	Diptera	
<i>Dolycoris baccarum</i>	Hemiptera	

Scientific name	Taxonomic group	National status
<i>Dryophilocoris (Dryophilocoris) flavoquadrimaculatus</i>	Hemiptera	
<i>Ectemnius continuus</i>	Hymenoptera	
<i>Ectemnius rubicola</i>	Hymenoptera	
<i>Elasmotethus interstinctus</i>	Hemiptera	
<i>Empis grisea</i>	Diptera	
<i>Empis livida</i>	Diptera	
<i>Empis picipes</i>	Diptera	
<i>Empis tessellata</i>	Diptera	
<i>Epistrophe eligans</i>	Diptera	
<i>Episyrphus balteatus</i>	Diptera	
<i>Eriothrix rufomaculata</i>	Diptera	
<i>Eristalinus sepulchralis</i>	Diptera	
<i>Eristalis arbustorum</i>	Diptera	
<i>Eristalis intricarius</i>	Diptera	
<i>Eristalis nemorum</i>	Diptera	
<i>Erynnis tages</i>	Lepidoptera	Section 42 Priority Species
<i>Euclidia glyphica</i>	Lepidoptera	
<i>Euclidia mi</i>	Lepidoptera	
<i>Eupeodes latifasciatus</i>	Diptera	
<i>Eupeodes luniger</i>	Diptera	
<i>Euproctis similis</i>	Lepidoptera	
<i>Euthrix potatoria</i>	Lepidoptera	
<i>Eutrichapion ervi</i>	Coleoptera	
<i>Eysarcoris venustissimus</i>	Hemiptera	
<i>Favonius quercus</i>	Lepidoptera	
<i>Forficula auricularia</i>	Dermaptera	
<i>Grammoptera ruficornis</i>	Coleoptera	
<i>Graphomya maculata</i>	Diptera	
<i>Grypocoris (Lophyromiris) stysi</i>	Hemiptera	
<i>Gymnomerus laevipes</i>	Hymenoptera	
<i>Haematopota pluvialis</i>	Diptera	
<i>Halictus tumulorum</i>	Hymenoptera	
<i>Helius longirostris</i>	Diptera	
<i>Helophilus pendulus</i>	Diptera	
<i>Herina lugubris</i>	Diptera	
<i>Herina nigrina</i>	Diptera	
<i>Heterogaster urticae</i>	Hemiptera	
<i>Hilara discoidalis</i>	Diptera	
<i>Himacerus (Himacerus) apterus</i>	Hemiptera	
<i>Hippodamia variegata</i>	Coleoptera	Notable b*
<i>Hoplitis claviventris</i>	Hymenoptera	
<i>Hylaeus brevicornis</i>	Hymenoptera	

Scientific name	Taxonomic group	National status
<i>Hylaeus communis</i>	Hymenoptera	
<i>Hylaeus hyalinatus</i>	Hymenoptera	
<i>Iassus lanio</i>	Hemiptera	
<i>Ischnopterapion loti</i>	Coleoptera	
<i>Ischnura elegans</i>	Odonata	
<i>Lasioglossum albipes</i>	Hymenoptera	
<i>Lasioglossum morio</i>	Hymenoptera	
<i>Lejogaster metallina</i>	Diptera	
<i>Leptogaster cylindrica</i>	Diptera	
<i>Leptopterna dolabrata</i>	Hemiptera	
<i>Leucozona lucorum</i>	Diptera	
<i>Libellula fulva</i>	Odonata	Near Threatened
<i>Libellula quadrimaculata</i>	Odonata	
<i>Limnia unguicornis</i>	Diptera	
<i>Liocoris tripustulatus</i>	Hemiptera	
<i>Loxocera aristata</i>	Diptera	
<i>Lycaena phlaeas</i>	Lepidoptera	
<i>Lygus rugulipennis</i>	Hemiptera	
<i>Malachius bipustulatus</i>	Coleoptera	
<i>Maniola jurtina</i>	Lepidoptera	
<i>Meconema thalassinum</i>	Orthoptera	
<i>Megachile willughbiella</i>	Hymenoptera	
<i>Melanogaster hirtella</i>	Diptera	
<i>Melanostoma mellinum</i>	Diptera	
<i>Melanostoma scalare</i>	Diptera	
<i>Meligethes aeneus</i>	Coleoptera	
<i>Meligethes atratus</i>	Coleoptera	
<i>Merodon equestris</i>	Diptera	
<i>Merzomyia westermanni</i>	Diptera	Notable*; Notable
<i>Mesembrina meridiana</i>	Diptera	
<i>Microchrysa flavicornis</i>	Diptera	
<i>Microgaster polita</i>	Hymenoptera	
<i>Minettia fasciata</i>	Diptera	
<i>Minettia longipennis</i>	Diptera	
<i>Minettia tubifer</i>	Diptera	
<i>Miris striatus</i>	Hemiptera	
<i>Musca autumnalis</i>	Diptera	
<i>Nabis (Nabicula) flavomarginatus</i>	Hemiptera	
<i>Neoascia meticulosa</i>	Diptera	
<i>Neoascia tenur</i>	Diptera	
<i>Neocrepidodera transversa</i>	Coleoptera	
<i>Nomada fabriciana</i>	Hymenoptera	

Scientific name	Taxonomic group	National status
<i>Nomada flava</i>	Hymenoptera	
<i>Notiophilus substriatus</i>	Coleoptera	
<i>Ochlodes sylvanus</i>	Lepidoptera	
<i>Oedemera lurida</i>	Coleoptera	
<i>Oedemera nobilis</i>	Coleoptera	
<i>Oncotylus (Oncotylus) viridiflavus</i>	Hemiptera	
<i>Opomyza florum</i>	Diptera	
<i>Opomyza germinationis</i>	Diptera	
<i>Osmia caerulea</i>	Hymenoptera	
<i>Osmia spinulosa</i>	Hymenoptera	
<i>Pachygaster leachii</i>	Diptera	
<i>Palomena prasina</i>	Hemiptera	
<i>Panorpa communis</i>	Mecoptera	
<i>Paragus haemorrhous</i>	Diptera	
<i>Pararge aegeria</i>	Lepidoptera	
<i>Pentatoma rufipes</i>	Hemiptera	
<i>Phratora vitellinae</i>	Coleoptera	
<i>Phylidorea ferruginea</i>	Diptera	
<i>Physocephala rufipes</i>	Diptera	
<i>Phytocoris (Ktenocoris) varipes</i>	Hemiptera	
<i>Pieris brassicae</i>	Lepidoptera	
<i>Pieris napi</i>	Lepidoptera	
<i>Pieris rapae</i>	Lepidoptera	
<i>Pipiza fasciata</i>	Diptera	
<i>Pipizella viduata</i>	Diptera	
<i>Plagiognathus (Plagiognathus) arbustorum</i>	Hemiptera	
<i>Plagiognathus (Plagiognathus) chrysanthemi</i>	Hemiptera	
<i>Plateumaris sericea</i>	Coleoptera	
<i>Platycheirus albimanus</i>	Diptera	
<i>Platycheirus aurolateralis</i>	Diptera	
<i>Platycheirus granditarsus</i>	Diptera	
<i>Platycheirus podagratus</i>	Diptera	
<i>Platycheirus rosarum</i>	Diptera	
<i>Poecilobothrus nobilitatus</i>	Diptera	
<i>Polydrusus cervinus</i>	Coleoptera	
<i>Polyommatus icarus</i>	Lepidoptera	
<i>Propylea quattuordecimpunctata</i>	Coleoptera	
<i>Psallus (Hylopsallus) perrisi</i>	Hemiptera	
<i>Psyllobora vigintiduopunctata</i>	Coleoptera	
<i>Ptilinus pectinicornis</i>	Coleoptera	
<i>Pyrgus malvae</i>	Lepidoptera	Section 42 Priority Species;

Scientific name	Taxonomic group	National status
		Vulnerable
<i>Pyronia tithonus</i>	Lepidoptera	
<i>Pyrrhosoma nymphula</i>	Odonata	
<i>Rhabdomiris striatellus</i>	Hemiptera	
<i>Rhagio scolopaceus</i>	Diptera	
<i>Rhagonycha fulva</i>	Coleoptera	
<i>Rhagonycha lignosa</i>	Coleoptera	
<i>Rhamphomyia crassirostris</i>	Diptera	
<i>Rhingia campestris</i>	Diptera	
<i>Rhopalum coarctatum</i>	Hymenoptera	
<i>Rhyzobius litura</i>	Coleoptera	
<i>Riponnensia splendens</i>	Diptera	
<i>Roeseliana roeselii</i>	Orthoptera	
<i>Scaeva pyrastris</i>	Diptera	
<i>Scathophaga stercoraria</i>	Diptera	
<i>Scirtes hemisphaericus</i>	Coleoptera	
<i>Seioptera vibrans</i>	Diptera	
<i>Sepedon sphegea</i>	Diptera	
<i>Sicus ferrugineus</i>	Diptera	
<i>Siphona geniculata</i>	Diptera	
<i>Sitona lineatus</i>	Coleoptera	
<i>Sphaerophoria interrupta</i>	Diptera	
<i>Sphaerophoria scripta</i>	Diptera	
<i>Sphenella marginata</i>	Diptera	
<i>Stenodema (Stenodema) laevigata</i>	Hemiptera	
<i>Stenus aceris</i>	Coleoptera	
<i>Stenus boops</i>	Coleoptera	
<i>Sympetrum striolatum</i>	Odonata	
<i>Syrpitta pipiens</i>	Diptera	
<i>Syrphus torvus</i>	Diptera	
<i>Tabanus bromius</i>	Diptera	
<i>Tachyporus dispar</i>	Coleoptera	
<i>Tachyporus hypnorum</i>	Coleoptera	
<i>Temnostethus gracilis</i>	Hemiptera	
<i>Tephritis formosa</i>	Diptera	
<i>Tephritis leontodontis</i>	Diptera	
<i>Tephritis neesii</i>	Diptera	
<i>Tetanocera elata</i>	Diptera	
<i>Tetanocera ferruginea</i>	Diptera	
<i>Tetanocera hyalipennis</i>	Diptera	
<i>Thymelicus sylvestris</i>	Lepidoptera	
<i>Tipula oleracea</i>	Diptera	

Scientific name	Taxonomic group	National status
<i>Tipula paludosa</i>	Diptera	
<i>Tipula vernalis</i>	Diptera	
<i>Tortrix viridana</i>	Lepidoptera	
<i>Trypoxylon attenuatum</i>	Hymenoptera	
<i>Tyria jacobaeae</i>	Lepidoptera	
<i>Urophora quadrifasciata</i>	Diptera	
<i>Vanessa atalanta</i>	Lepidoptera	
<i>Vanessa cardui</i>	Lepidoptera	
<i>Xanthogramma pedissequum</i>	Diptera	
<i>Xantholinus linearis</i>	Coleoptera	
<i>Xylota segnis</i>	Diptera	
<i>Xyphosia miliaria</i>	Diptera	
<i>Zygaena filipendulae</i>	Lepidoptera	

*Widely accepted as being much more common than this status suggests; likely to be downgraded.