

Greenscape Environmental Ltd

GRATTON OAKES

ECOLOGICAL APPRAISAL

**WYNNSTAY PARK
RUABON
WREXHAM
LL14 6EN**

OCTOBER 2019

2298 1911R

Report by Chloe Sheil MZool (Conservation)

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The report should be read in its entirety.

Questions arising from the survey report should be directed to the author of this report who will be pleased to clarify any technical issues raised.

Whilst the surveyors make every reasonable effort, Greenscape Environmental Ltd cannot guarantee that all protected species have been identified and survey results are definitive. Many species are cryptic and transitional in habit.

Reports are considered valid for two years for planning purposes after which time further survey information may be required.

Greenscape Environmental Ltd can provide advice and support for recommendations and planning conditions.

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1 Summary

1.1 Purpose of the Report

Greenscape Environmental Ltd was commissioned by Sean Caddick to undertake a preliminary ecological appraisal (PEA) of land at Wynnstay Park to provide supporting information for a planning application for a residential development.

The survey report has three principal aims:

- to provide an initial appraisal of the ecological value of the site in local context
- to provide details supporting further surveys that may be required
- to identify potential ecological constraints relating to the development and recommend measures to avoid, reduce or manage negative effects and to provide a net ecological gain

1.2 Methodology

The appraisal of the site included a desk study of the area and a phase 1 environmental appraisal undertaken at the site, OS grid reference SJ29204357 on 2nd October 2019 by C Sheil.

1.3 Key Issues

A desktop data search including a search for nearby designated sites, EPS licences and previously recorded protected species was conducted. Of significance for this site is nesting birds, great crested newts and dingy skipper butterflies.

The site extends to 1.9ha and comprises an area of grassland and gravel with trees which is surrounded by fences, an embankment and trees.

The storage container is of negligible value for bats and the trees have no potential roost features for bats visible from ground level. No further surveys for bats are needed.

The trees and storage container offer potential habitat for nesting birds, although no evidence was found. It is recommended that the removal of any trees and the storage container is done outside of the bird nesting season (February to August inclusive).

The terrestrial habitat on site ranges from low to high value for great crested newts. The gravel and grassland offer low value habitat and the embankment with trees offer high value habitat as they offer a place for newts to hibernate in the roots.

One pond was found within 500m of this site. It scored 0.56 – Below Average on the HSI assessment and is separated from the site by a main road. The pond is 410m from the site and it is considered unlikely that newts will be found on site during works. No further surveys for newts are required but work will be done under a method statement to avoid negative impacts.

1.4 Impacts and Mitigation Measures

It is recommended that the biodiversity is enhanced post-construction with the inclusion of bat and bird boxes. It is also recommended that the landscaping be improved with the inclusion of native species hedgerows and trees. The method statements provided in this report will be followed and clearance will be conducted at a suitable time of year to minimise negative impact on birds.

There are no other ecological constraints to the development as proposed.

2 Introduction

This report has been compiled by Chloe Sheil MZool (Conservation) who has 1 year of experience conducting ecological appraisals. It has been reviewed in line with Greenscape's Quality Management System.

For details of surveyors and licences please see Appendix A.

2.1 Project Background

Greenscape Environmental Ltd was commissioned by Sean Caddick Architectural to conduct a survey to determine the presence of protected species and potential for the damage or destruction of habitats of ecological value, as part of the planning application for the development of land at Wynnstay Park, Ruabon.

The project involves a residential development with the construction of 43 dwellings and associated services.

2.2 Purpose of the Report

The aim of this survey is to locate and describe, as far as reasonably practicable, evidence of wildlife, including all protected and UK Post-2010 Biodiversity Framework priority species, which may be disturbed or lost in the event of development.

The purpose of the report is to:

1. Identify the key ecological constraints to the proposed development
2. Inform planning to allow significant ecological effects to be minimised or avoided wherever possible
3. Allow any necessary mitigation or compensation measures to be developed following the Mitigation Hierarchy
4. Identify any additional surveys that may be required to inform the ecological assessment
5. Identify the opportunities offered by a project to deliver ecological enhancement

2.3 Planning Policy and Legislation

This section provides a brief summary of the key national and local planning policies and legislation with an intention to identify those to be of most relevance to ecology and provide context to the surveys conducted. Survey findings were considered in line with the following.

The Conservation of Habitats and Species Regulations (2017) – as listed in:
Schedule 2. European protected species of animals
Schedule 5. European protected species of plants

The Wildlife and Countryside Act (1981) – as listed in:
Schedule 1. Birds protected by special penalties at all times
Schedule 5. Protected animals
Schedule 8. Protected plants

Countryside and Rights of Way Act (2000)

The Protection of Badgers Act 1992

Natural Environment and Rural Communities Act 2006 (NERC 2006)

The Nature Recovery Plan for Wales: Setting the course for 2020 and beyond (2015)

Section 7 of the Environment Act (Wales) 2016

ODPM Circular 06/2005: Biodiversity and Geological Conservation-Statutory obligations and their impact within the Planning System

Wrexham Unitary Development Plan – EC6 Biodiversity Conservation

2.4 Site Context and Location

The site is located to the southwest of Ruabon, OS grid reference SJ29204357. It is set in an urban environment surrounded by a housing estate to the west, open fields and a main road to the north and an industrial estate to the east and south. There is very little connectivity to the surrounding countryside except for a row of trees which may provide foraging or commuting opportunities for bats, nesting birds or great crested newts.

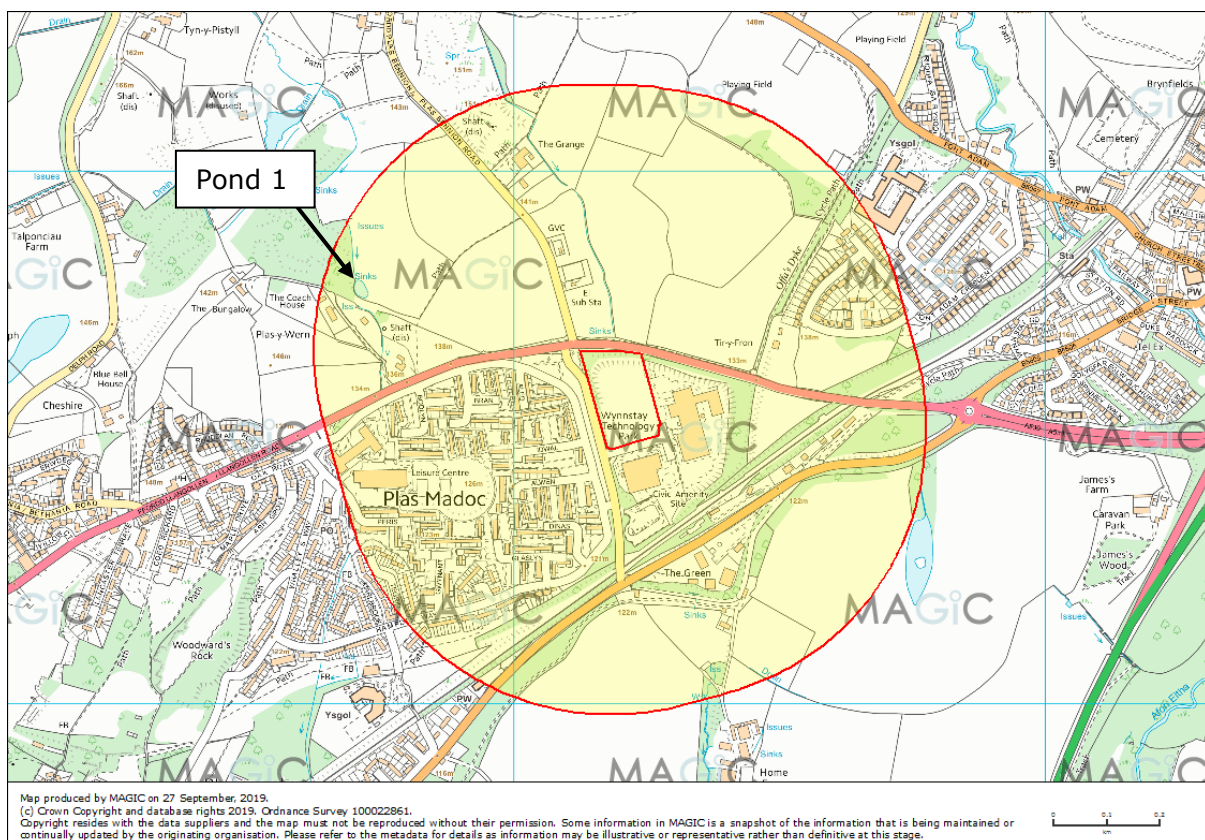


Figure 2.1. An OS map showing the site (centre, highlighted) with a 500m buffer

Scrutiny of the OS map (Fig 2.1) and a walk around the locality showed there is one pond within 500m of the site.

2.4.1 Date and Survey Conditions

The phase 1 ecological appraisal was undertaken at the site on 2nd October 2019 by C Sheil. The conditions on the survey dates were optimal for the type of survey conducted.

3 Methodology

Broad methodologies for data collection and interpretation were informed by guidance outlined in CIEEM (2017) Guidelines for Preliminary Ecological Appraisal.

3.1 Desk Study

The desk study provides contextual information such as the site's proximity to designated areas and known records of protected/notable species. This assists with the evaluation of the ecological value of the site. This was undertaken in October 2019.

This level of desk study is considered adequately proportionate to the development proposals, the low complexity of the site and its surrounding landscape context.

3.2 Field Survey

3.2.1 Habitats

The level of survey is aimed to identify field signs of, or habitats with the potential to support protected species and therefore assist in the determination for detailed phase 2 surveys.

3.3 Species Survey

Trees were assessed for potential for bat roosts, foraging and commuting. This was conducted in accordance with Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition, BCT, Collins (ed.) (2016).

Badgers surveys were conducted using guidance from Scottish Natural Heritage commissioned Report No. 096 (2003).

Trees were assessed for potential for nesting birds.

The assessment of aquatic habitat for great crested newts is based on the Habitat Suitability Index (HSI).

The terrestrial habitats at the application site were surveyed and assessed regarding their suitability and potential value in supporting great crested newts.

3.4 Constraints of the Survey

All areas were accessible for this survey. It was conducted at a suboptimal time of the year for the assessment of flora and fauna but this was not considered a constraint as bats leave evidence of their presence all year round. Standard techniques were followed, as outlined in Appendix B. No specific constraints have been identified. Access to pond 1 could not be gained but it could be seen from a field close by which belongs to a neighbour.

The HSI assessment is based on ponds as they would be during the aquatic phase of a great crested newt, between March and the end of September. Some of the factors involved in the assessment cannot be accurately determined outside of this time period, such as macrophyte cover and water quality assessments. These values are given an educated guess based on the appearance of the pond in conjunction with any local knowledge.

4 Site Description

4.1 Field Survey

The site comprises an area of grassland and gravel covered by trees which is surrounded by fences, a bank and trees.

A map showing phase 1 habitat codes is not considered necessary for this site due to its lack of complexity.

4.1.1 Site

The site is an area of gravel with patches of grassland and trees. The northern and western edges of the site comprise small areas of woodland.

Grassland species include cow parsley (*Anthriscus sylvestris*), red clover (*Trifolium pratense*), dandelion (*Taraxacum officinale* agg.), bramble (*Rubus fruticosus*), broadleaf dock (*Rumex obtusifolius*), ribwort plantain (*Plantago lanceolata*), greater plantain (*Plantago major*), thistle (*Cirsium arvense*), hogweed (*Heracleum sphondylium*) and ragwort (*Senecio jacobaea*). There had been heavy rain prior to the phase 1 survey which made the site wet and, in some places, boggy.

Tree species include silver birch (*Betula pendula*), oak (*Quercus* spp.). Dog-rose (*Rosa canina*) was also found on site.



Figure 4.1. Overview of site

A storage container was found on site near the southern boundary. It is built of metal and is left open to the elements and internally is damp and in a state of disrepair. It offers negligible roost potential for bats but offers low potential habitat for nesting birds, although none were found.



Figure 4.2. Storage container

Several pieces of rubbish were found around the site. A search underneath them found no evidence of protected species.



Figure 4.3. Underside of wooden board

Animal tracks were found leading towards the embankment on the eastern side of the site. The tracks were followed as far as possible and searched for any signs of badger. The embankment could not be searched as it was very overgrown but no evidence of badger was found anywhere on site. The site is accessible by the public and evidence of dog walkers was found onsite. It cannot therefore be concluded that these tracks were created by badgers.



Figure 4.4. Animal track

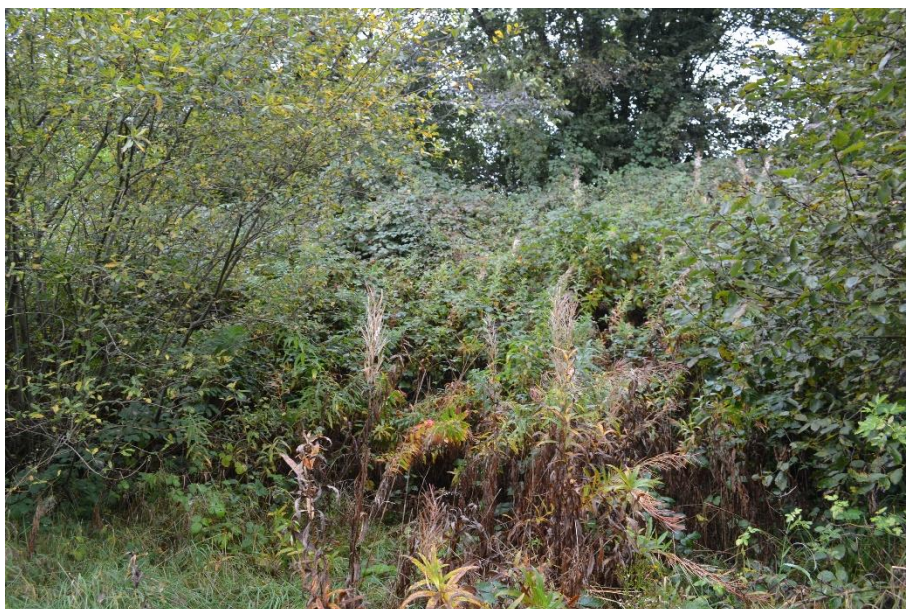


Figure 4.5. Overgrown embankment

Bird species seen on site include robin (*Erithacus rubecula*), pigeon (*Columba* sp.), crow (*Corvus corone*) and blue tit (*Cyanistes caeruleus*).

No species of butterflies or moths were found on site. This is to be expected considering the time of year the survey was conducted.

4.1.2 Woodland

Along the north and west of the site lie small strips of woodland. Tree species include hazel (*Corylus avellana*), oak, ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and hawthorn (*Crataegus monogyna*).



Figure 4.6. Edge of woodland to north

The woodland floor is completely shaded with few herbaceous species including bramble and nettle (*Urtica dioica*). The ground was covered in large amounts of litter. No evidence of protected species were found amongst the litter.



Figure 4.7. Litter in woodland

4.1.3 Boundaries

The northern boundary consists of a metal fence covered by trees including hazel and oak. Post and wire mesh fences lie along the eastern and southern boundaries.



Figure 4.8. Metal fence and trees on northern boundary



Figure 4.9. Mesh fence with trees along eastern boundary



Figure 4.10. Mesh fence with trees along southern boundary

There is no formal boundary along the west of the site. The edge of the treeline along the embankment marks the boundary. Species include silver birch and ash.



Figure 4.11. Trees along western boundary

4.1.4 Surrounds

The site is surrounded by a busy main road to the north, a housing estate to the west and a small industrial estate to the south and east.



Figure 4.12. Main road to north



Figure 4.13. Industrial building to east

4.1.5 Open Water

Ponds within 500m have been taken into consideration. One pond was found within 500m of the site, approximately 410m to the northwest. The pond was assessed using the HSI, the results from this and justifications for each value can be seen in Table 4.1. The pond is considered to offer below average suitability for great crested newts.



Figure 4.14 .Overview of pond 1

Pond 1 could not be accessed to be netted, the owner of the neighbouring field gave permission to access their land, allowing the pond to be assessed from a short distance. The values for the HSI are based on the surveyors' experience with similar ponds. The pond was found to be heavily choked with terrestrial plant species and aquatic vegetation, indicating that the pond levels are typically much lower than were seen. No fowl were seen and fish are not likely to have been introduced to a pond like this. The lack of open water reduces its suitability for great crested newts.

Table 4.1. Details of HSI score for Pond 1

Pond 1 Grid reference: SJ28714377		
Geographic Location	1	Zone A
Pond Area	1	The pond was approximately 600m ²
Permanence	0.5	Dries between three years in ten to most years
Water Quality	0.33	Unknown invertebrate diversity, estimated low
Shade	1	There was estimated to be 50% shading of the area within 1m of the perimeter
Waterfowl	1	No waterfowl were observed on the pond
Fish	1	No evidence of fish
Pond Count	0.1	There were no ponds within a 1km radius, that were not blocked by barriers.
Terrestrial Habitat	0.33	The immediate surrounding land to the northwest is a woodland area, however this made up marginally less than 25% of the 250m radius area. The rest is hardstanding, grazed or arable fields.
Macrophytes	0.8	There was a lot of floating or emergent vegetation in this pond, cover was estimated to be >95%
HSI Score	0.58 – Below Average	

5 Evaluation of Results

5.1 Potential Impacts on Designated Sites and Recorded Species

5.1.1 Designated Area or Priority Habitat

Figure C.1 shows that there are no SSSIs within 1km. The nearest designated site is approximately 1.4km to the south. This is the Afon Dyfrdwy SSSI.

5.1.2 Habitats on Site

Table 5.1. Summary of habitats on site

Habitat type	Is the habitat capable of supporting protected species	Impact without consideration
Hardstanding	Gravel, no value for protected species	No negative impact
Buildings	Storage container of negligible roost potential for bats. Low potential for nesting birds, although no evidence found. Potential for small mammals and amphibians to shelter underneath	Potential negative impact on nesting birds
Trees	Native and non-native trees on site. Areas along north and west to be retained. Others to be removed. Potential habitat for nesting birds although no evidence found. Foraging habitat only for bats.	Potential negative impact
Grassland	Patchy areas ranging from low sward to bramble dominated areas.	Low negative impact

The main habitat of value on site were the trees. These offer potential habitat for nesting birds, although no evidence was found. They offer only foraging habitat for bats. The container also offered potential habitat for nesting birds but offered negligible roost potential for bats.

5.2 Ecologically Important Species

The following species of relevance to the proposed development area were identified in the data search (full details in Appendix C): Daubenton's bats, Natterer's bats, noctule, soprano pipistrelle, common pipistrelle and brown long-eared bats within 300m, hedgehogs within 500m, badger within 1km, starling within 300m, barn owl within 500m, great crested newt within 600m, dingy skipper within 100m and Japanese knotweed within 300m.

The potential for the site to support bats, nesting birds and great crested newt was therefore taken into consideration.

Table 5.2. Summary of protected species on site with recommendations

Species	Observations	Impact without consideration	Recommendations
<i>Mammals</i>			
Bats	No suitable roosting habitat on site. Foraging habitat only around trees	No negative impact	No action required. Site to be enhanced post-construction with the erection of bat boxes.
Badgers	No evidence found around site	No negative impact	No action required
<i>Birds</i>			
Barn Owl	No evidence in trees on site	No negative impact	No action required
Nesting birds	Some suitable habitat around site, no evidence seen	Low negative impact	All clearance to be undertaken outside nesting period Feb-Aug inclusive. New nest box provision
<i>Herpetofauna</i>			
Great Crested Newts	One pond within 500m, separated by main road, scored 0.56 – Below average on HSI assessment. Poor to high value terrestrial habitat on site.	Potential negative impact	Work to be done under method statement
<i>Invasive species</i>			
Japanese knotweed	None found on or around site	No negative impact	No action required
Himalayan balsam	None found on or around site	No negative impact	No action required

5.2.1 Bats

All bat species are protected under the Conservation of Habitats and Species Regulations 2017 which implements the EC Directive 92/43/EEC in the United Kingdom. It is an offence, with certain exceptions, to:

- deliberately capture or kill any wild animal of a European Protected Species.
- deliberately disturb any such animal.
- damage or destroy a breeding site or resting place of such a wild animal.
- keep (possess), transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal or plant of a European Protected Species, or any part of, or anything derived from such a wild animal or plant.

A person found guilty of an offence is liable on summary conviction to imprisonment for a term not exceeding six months or to an unlimited fine or to both.

The storage container offered negligible roost potential for bats as it is open to the elements, damp and constructed of suboptimal materials. The trees on site offer only foraging habitat for bats as none of them had any visible PRFs. No further surveys are needed for bats. The site is to be enhanced with the erection of bat boxes.

5.2.2 Other Mammals

Badgers

Badgers and their setts are specifically protected under the Protection of Badgers Act 1992. The act was primarily brought into force to prevent the deliberate injury to or death of badgers. Some aspects of the act affect developers. It is important that developers are aware of any badger setts located on the land they intend to develop.

All personnel working on sites where there are badgers should be aware of the Protection of Badgers Act 1992. Under this legislation it is an offence to:

- Damage a badger sett or any part of it.
- Destroy a badger sett.
- Obstruct access to, or any entrance of a badger sett.
- Causing a dog to enter a badger sett.
- Disturbing a badger when it is occupying a badger sett.

A badger sett is defined by the Act as "any structure or place, which displays signs indicating current (within the last 12 months) use by a badger".

There was no evidence of badger on or around the site. No negative impact is expected from the development.

5.2.3 Birds

Under Section 1 of the Wildlife and Countryside Act 1981 (as amended), birds, their nests and young are all protected from damage, particularly during the breeding season. The Act allows for fines or prison sentences for every bird, egg or nest destroyed. It makes it an offence to:

- Intentionally kill, injure or take any wild bird.
- Take, damage or destroy the nest of any wild bird whilst it is in use or being built.
- Take damage or destroy the egg of any wild bird.
- To have in one's possession or control any wild bird, dead or alive or egg or any part of a wild bird or egg.

Work at this site will include the removal of the storage container and trees which may have a negative impact on nesting birds. It will therefore be recommended that the clearance of significantly sized plants will be conducted out of the bird nesting season (February to August inclusive). It will be recommended that nesting boxes are erected post-construction to provide a minor enhancement.

5.2.4 Amphibian and Reptiles

All species of amphibians receive a measure of protection under legislation.

The Wildlife and Countryside Act 1981 has been amended by the Countryside and Rights of Way Act (CRoW) 2000. This applies to England and Wales only. The key relevant fact is:

- Section 9(4) is amended to create an additional offence of reckless damage to, destruction of, or obstruction of access to, any structure or place used for shelter or protection; and reckless disturbance while occupying such a structure or place.

This means that any application for planning permission has to offer mitigation to the planners to alleviate any potential damage (i.e. provide reasonable avoidance).

Great Crested Newts

Great crested newts are protected under the Conservation of Habitats and Species Regulations 2017 which implements the EC Directive 92/43/EEC in the United Kingdom. It is an offence, with certain exceptions, to:

- Deliberately capture or kill any wild animal of a European Protected Species.
- Deliberately disturb any such animal.
- Deliberately take or destroy eggs of any such wild animal.
- Damage or destroy a breeding site or resting place of such a wild animal.
- Keep (possess), transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal or plant of an European Protected Species, or any part of, or anything derived from such a wild animal or plant.

Great crested newts are listed as a priority species on the UK BAP and Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

A person found guilty of an offence is liable on summary conviction to imprisonment for a term not exceeding six months or to an unlimited fine, or to both.

Work can be conducted under derogation licence from Natural Resources Wales providing suitable compensation and mitigation is provided and the "three tests" can be met. These are:

1. Regulation 55(2)(e) states: a licence can be granted for the purposes of "preserving public health or public safety" or other imperative reason of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.
2. Regulation 55(9)(a) States: the appropriate authority (Natural Resources Wales) shall not grant a licence unless they are satisfied "that there is no satisfactory alternative"
3. Regulation 55(9)(b) states that the appropriate authority shall not grant a licence unless they are satisfied "that the action licensed will not be detrimental to the maintenance of the population of the species concerned at favourable conservation status in its natural range."

The terrestrial habitat on site ranges from low to high value for great crested newts. The gravel and grassland offer low value habitat as it offers nowhere to forage or shelter. The overgrown embankment offers high value habitat as they may offer suitable hibernation potential.

One pond was found within 500m of this site. It scored 0.56 – Below Average on the HSI assessment and is separated from the site by a busy main road with drains and curbs. The pond is approximately 410m from the site. This area is not very sensitive to newts as they are unlikely to travel this distance in search of foraging or shelter. The pond also lies adjacent to a woodland which is to the northwest of the pond. If any newts use this pond they are more likely to forage and shelter in this woodland.

No further surveys for newts are required but work will be done under a method statement for newts. Work will not need to be done under a licence from Natural Resources Wales. The method statement will create a scenario within which the risk to newts is negated and the chance of a wildlife offence is negligible.

5.2.5 Invasive Species

Himalayan Balsam

Himalayan Balsam is identified as an invasive non-native plant. It is listed under Section 9 schedule 14 of The Wildlife and Countryside Act. It is illegal to plant or otherwise cause Himalayan Balsam to grow in the wild in the UK.

No evidence of any Himalayan balsam was found on the site, so no impact is expected.

Japanese Knotweed

The management of Japanese knotweed (*Fallopia japonica*) is regulated by several pieces of legislation

- The Wildlife and Countryside Act (as amended) 1981
- The Environment Protection Act 1990
- The Waste (England & Wales) Regulations 2011
- Third party litigation where damages may be sought for allowing Japanese knotweed to spread onto other properties.

Japanese Knotweed is listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to plant, cause the plant, or allow the plant to grow in the wild.

No evidence of any Japanese knotweed was found on the site, so no impact is expected.

6 Impacts and Mitigation Measures

To reduce or minimise negative impact on biodiversity, the following recommendations have been made. An area to the north of the site is to be provided for butterflies.

6.1 General Landscaping

It is recommended that the landscaping around the new buildings will include some hedging and tree planting to enhance the area for biodiversity, including butterflies such as the Dingy Skipper.

Plants to use for landscaping will include locally sourced native species. These will be planted in accordance with BS3936 (part 1, 1992, Nursery Stock, Specifications for trees and shrubs). Planting will occur between November and April of the following year depending on timing of development.

Table 6.1. Recommended plants for landscaping

Species	Latin Name	Percentage
Hawthorn	<i>Crataegus monogyna</i>	35
Blackthorn	<i>Prunus spinosa</i>	35
Hazel	<i>Corylus avellana</i>	10
Holly	<i>Ilex aquifolium</i>	10
Wild service tree	<i>Sorbus torminalis</i>	10

1. Trees to be used should be from the list below. Oak should particularly be encouraged as it is the dominant species in the vicinity and it supports a large diversity of invertebrates.

Table 6.2. Recommended trees for landscaping

Common Name	Latin Name
English oak	<i>Quercus robur</i>
Sessile oak	<i>Quercus petraea</i>
Lime	<i>Tilia cordata</i>
Rowan	<i>Sorbus aucuparia</i>
Silver birch	<i>Betula pendula</i>

6.2 Area for Butterflies

The area to the north of the site which is currently woodland is to be set aside for butterfly species such as the Dingy Skipper which has previously been recorded on site. It is recommended that the landscaping in this area include the following species and is managed as follows.

Table 6.3. Herbaceous foodplant species

Common name	Latin name	Flowering period	Butterfly life stage
Common bird's-foot-trefoil*	<i>Lotus corniculatus</i>	May - Sept	Larvae and adult
Greater birds-foot-trefoil*	<i>L. pedunculatus</i>	Jun - Aug	Larvae and adult
Nettle	<i>Urtica dioica</i>	-	Larvae
Garlic mustard	<i>Alliaria petiolata</i>	Apr - Jun	Larvae
Buddleja	<i>Buddleja davidii</i>	Jul - Aug	Adult
Purple top	<i>Verbena bonariensis</i>	Aug - Oct	Adult
Marjoram	<i>Origanum majorana</i>	Jun - Sept	Adult
Thistle	<i>Rubus fruticosus</i>	Jul - Nov	Adult
Bramble	<i>Cardus & Cirsium spp.</i>	Jul - Nov	Adult

*Used by Dingy Skippers

Table 6.4. Woody foodplant species

Common name	Latin name	Flowering period	Butterfly life stage
Plum	<i>Prunus domestica</i>	Mar - Apr	Adult
Pear	<i>Pyrus spp.</i>	Mar - Apr	Adult
Cherry	<i>Prunus spp.</i>	Mar - Apr	Adult
Apple	<i>Malus domestica</i>	Mar - Apr	Adult
Rose	<i>Rosa spp.</i>	May - Jun	Adult
Hawthorn	<i>Crataegus monogyna</i>	May - Jun	Adult
Blackthorn	<i>Prunus spinosa</i>	-	Larvae
Oak	<i>Quercus robur</i>	-	Larvae
Holly	<i>Ilex aquifolium</i>	-	Larvae

A range of foodplants which flower at varying times are to be planted to ensure that flowers can be found on site most of the year for butterflies. At least one of the species listed above which is used by Dingy Skippers is to be planted to provide an enhancement for them. A mix of both herbaceous and woody plants is recommended.

Grassland & Wildflowers

A wildflower mix will be used in the more open spaces of the area. This is suitable for the neutral soil conditions. A suitable mix is BFS 9 Country Meadow Wildflower mix from British Flora. This comprises the following mix of seeds:

Table 6.5. Wildflower mix recommendation

20% of the following Flora blend:	
4% Bird's-foot Trefoil	4% Perforate St John's Wort
6% Black Medick	8% Ribwort Plantain
6% Black Knapweed	12% Salad Burnet
8% Common Vetch	8% Selfheal
12% Lady's Bedstraw	4% White Campion
9% Meadow Buttercup	4% Wild Carrot
4% Musk Mallow	4% Yarrow
7% Oxeye Daisy	
80% Low Maintenance Grasses:	
25% Chewings Fescue	30% Sheep's Fescue
5% Common Bent	25% Slender CRF
15% Crested Dogstail	

1. Seed planting will be undertaken between November and March. No planting is to be undertaken if the conditions are waterlogged or frozen.
2. The area proposed for planting of the seed mixture will need to be cleared of all existing plants and weeds prior to the seeds being sown.
3. Ensure the excavated ground is tread/rolled so that it's firm enough to stand on without leaving indentations.
4. Distribute seed with a handheld or pedestrian spreader, at the recommended sowing rate of 3g/sqm.
5. Mix the wildflower seeds with an inert carrier (such as sharp sand), at a ratio of four parts sand to one part seed (by weight) to provide an even distribution.
6. All seedbeds should be thoroughly watered once planting is complete.

Soil Quality

Where any new soil will be imported to site, it will be to BS 3882: 2015 *Specification for topsoil*. It will be free from subsoil, litter, roots of weeds (especially invasives) and other debris that may be injurious to plant growth.

Soil will be handled in accordance with the Good Practice Guidelines for Handling Soils. It will only be handled at the driest time of year in order to prevent compaction.

Topsoil will only be re-spread once all hardstanding building works are completed, such as roads, pathways and structures. All building rubble and waste will be removed before topsoil respreads as this may contaminate the soil.

Planting Schedule

As butterflies prefer warm environments it is important to plant vegetation in such a way as to let in a lot of sunlight. The area to be designated is situated at the top of a bank with the bank towards the south. Therefore, plants which provide nectar should be planted towards the bank to the south where they can get more sunlight and will not block too much light from the rest of the area.

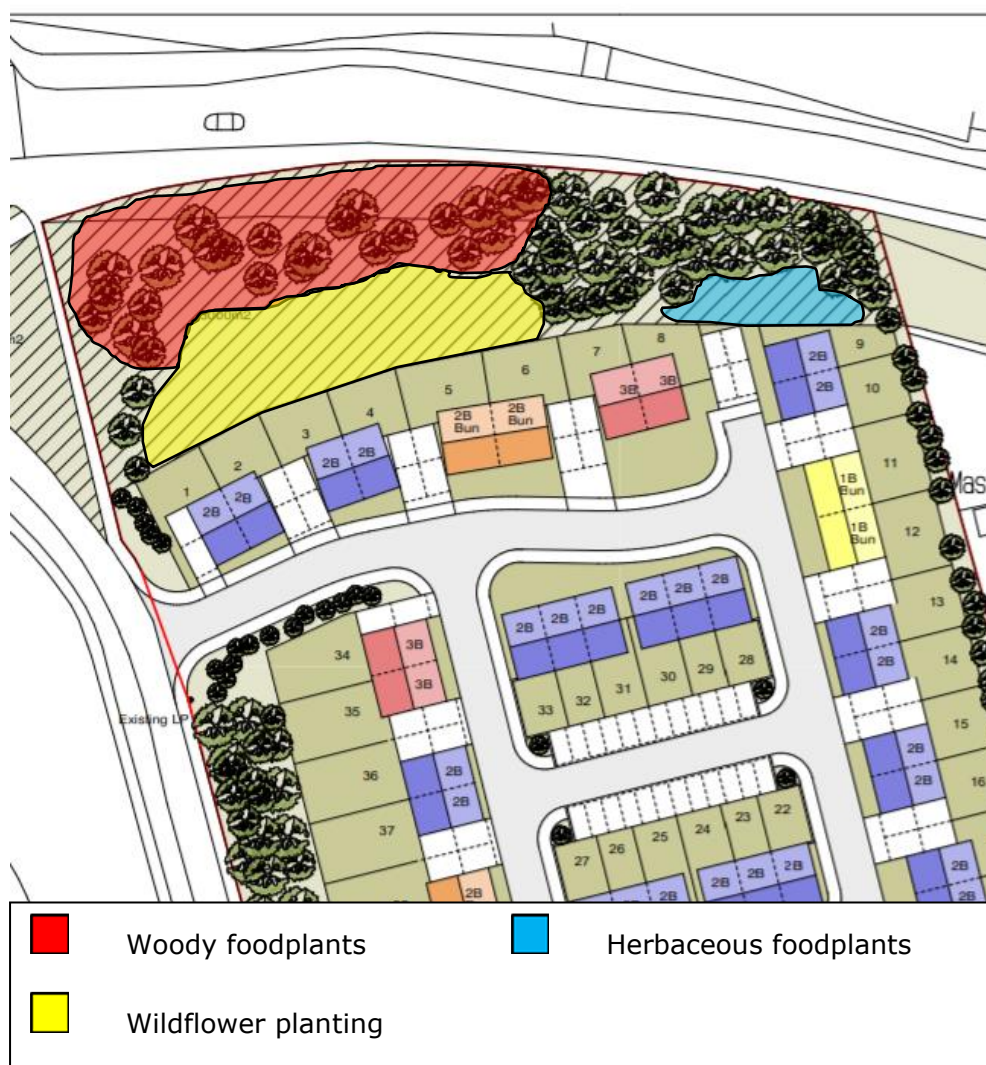


Figure 6.1. Planting locations

The planting season for the site; including all trees, hedgerows, wildflower planting and amenity grasslands, will be between 1st October and 31st March. Note that this is subject to weather conditions, and plants should not be set during adverse conditions such as frost, drought or flooding.

The planting will occur in the first available period, as stated above, after completion of the hardstanding and structures.

6.3 Bats

Work can be conducted immediately once planning permission has been granted.

6.3.1 Enhancements for Bats

1. It is recommended that permanent provision will be made for roosting opportunities for bats with the inclusion of an integral bat box in at least two of the new buildings. This will be erected at a height of 3-4m and in a southerly, westerly or easterly facing direction.



Figure 6.2. Example integral bat box

6.3.2 Lighting

1. A lighting scheme will be drawn up in line with ILP and BCT Guidance Note 08/18.
2. All of the newly proposed external lighting will be directed away from any vegetated boundary features to retain dark corridors for commuting bats across the site.
3. There will be no direct illumination of any of the enhancements erected for bats.
4. All domestic external lighting will be below 10 lux, orientated towards the ground and set on a short timer, controlled by PIR (Passive Infra-Red).

6.4 Birds

6.4.1 Reasonable Avoidance Measures

1. Any tree or building removal will occur out of the bird nesting season, which is February to August inclusive. If this is not possible, a suitably experienced ecologist will conduct a check within the 24 hours prior to work commencement to ensure no nesting birds will be affected.
2. All nesting birds will be left undisturbed until young have fledged. A 4m buffer will be left.

6.4.2 Enhancements for Birds

1. It is recommended that a range of artificial woodcrete boxes are erected around the site to provide an enhancement for passerine birds. A selection of the following nest boxes is recommended.



Cedarwood Sparrow Terrace



House Martin Nest Box

Eco Habitats for swifts



Schwegler 1b Bird Box



Swift Box

Size (Width x Depth x Height) (mm)

327 x 140 x 140

Figure 6.3. Provision for bird boxes

6.5 Great Crested Newts

6.5.1 Reasonable Avoidance Measures

Pre-construction Phase

1. The site will be kept under management prior to construction. This will reduce the potential for newts to cross the land and reduce the potential for the terrestrial features to improve. All plants will be kept short (<10cm) to ensure there is no shelter for great crested newts on the site.

Site set up

2. Soil and vegetation will be stripped prior to setting up the site compound to ensure the compound contains no vegetation which could potentially attract great crested newts.
3. All cabins and equipment will be located on firm compacted ground, preferably a stone or concrete base.
4. Contractors are advised not to handle newts at any time.

Construction phase

5. The Site Foreman will be responsible for ensuring all contractors are aware of the potential to find newts and that they are familiar with the appearance of newts. If in doubt the ecologist will be contacted.
6. Contractors are advised not to handle newts at any time.
7. Stored subsoil must not be tipped onto any tall vegetation.
8. Any plants around the site will be kept short to stop the development of a long sward suitable for the terrestrial habitat for newts.
9. All work will be conducted during daylight hours as newts are least likely to move during this time.
10. Trenches will be dug and filled in on the day created or will be covered over with close fitting boards at the end of each working day and checked the following morning. This is particularly important when newts are most active, between March and November.
11. If necessary, a ramp will be placed in trenches to allow newts and small mammals to escape.
12. Any heavy machinery will be stored on an area of hardstanding to avoid refugia being created.
13. Stored material will be raised on pallets to reduce the potential they might act as a temporary resting place. This reduces the potential for damage or destruction of individual newts
14. All waste will be placed straight into skips to reduce the potential of creating refugia.
15. If a newt is found, then work WILL stop immediately and the ecologist contacted for advice.
16. Great crested newts will not be handled or moved without express permission from

Natural Resources Wales as this would constitute an offence.

Personnel awareness and emergency procedures

17. It will be ensured all construction workers and personnel are aware of great crested newts legal protection. This will be by a toolbox talk and the ongoing briefing of contractors by the site foreman.
18. A copy of this document will be on site at all times during construction work.
19. If any great crested newts are found on site at any time, the consultant will be contacted immediately for advice.
20. If a great crested newt is found on site, all construction activities should be stopped immediately until the consultant has advised how to proceed.
21. If a great crested newt is found on site, the animal should not be handled or moved from its resting place and any sheltering material should be carefully replaced. If there is immediate danger of injury (e.g. if the newt is found on a road) then the animal will be placed in a clean lidded bucket and stored in a cool but frost-free place for the ecologist to attend to.

6.6 Invertebrates

1. Invertebrate bricks or (bug houses) will be erected in new gardens to enhance the area for nesting bees.



Figure 6.4. Invertebrate brick and bug house

6.7 Monitoring and Maintenance

All vegetation included in this development will be subject to a thorough monitoring and maintenance scheme, with work being conducted by a competent landscape contractor to be appointed by the development project manager.

Failure Replacements

Within the first five years, any plants that are seen to be failing will be replaced to the cost of the developer. This will include, for example, removal of the failing plants, re-digging and preparation of a tree pit, acquisition of fresh topsoil to the same standard as outlined above and subsequent planting of a new plant.

Grassland and Wildflower Planting

The wildflower area must be managed appropriately to allow the flowers to develop by implementing a cut and collect scheme. Within the first year after planting, the sward must be mechanically cut every 2 months to a height of 50-100mm and all trimmings removed. The removal of clippings has a two-fold benefit:

1. It prevents the grasses dominating and overshadowing the flowers which are slower growing.
2. It keeps nutrient levels relatively low in the first year to avoid weed takeover.

After the first year, when all flowers will have sufficiently set and developed, the sward must be mechanically mowed twice a year, once in March and then again in October, with the clippings being removed to keep soil fertility low. This will be conducted only in appropriate weather conditions.

It should be noted that in the first season the display of flowers may not be as expected. This is not problematic, as root development is more important in the first year.

Trees

Trees will be monitored and managed to BS 3998: 2010. This will involve checking to see if accesses or infrastructure are being blocked or damaged by growth, and the trees pruned accordingly. This will be conducted by a licenced and experienced arboriculturalist. Any clippings are to be removed to prevent any nutrients raising the soil fertility. The soil fertility is to be kept low.

Artificial enhancements

The bat and bird boxes will remain in situ for at least 5 years. The bat boxes allow for waste to drop out, so no clearing out will be necessary. The bird boxes will be checked, and any old nests removed and the box cleaned out between 1st September and 31st January, as recommended by the BTO.

If the bat or bird boxes become damaged or lost at any point within the first 5 years after development, they will be replaced at the cost of the developer.

6.8 Summary



Figure 6.5. Recommended locations for enhancements

Note that the location of the boxes above are suggestions and can be modified at any time. The boxes will be erected by a suitably experienced ecologist and the location will be discussed with the site manager at the time of the installation. The integral bat box will be discussed prior to commencement so that any necessary amendments to plans can be made.

By erecting artificial enhancements around the site, including those listed above, should not only compensate for any habitat lost but will provide a net habitat gain for nesting birds, bats and invertebrates. The habitat for butterflies in particular will be enhanced by cleaning up the litter in the area to the north of the site and designating it for butterflies.

7 Concluding Remarks

The survey has focused on habitats to be damaged or destroyed as part of this development and the potential for disturbance or damage of protected species.

The storage container offers negligible roost potential for bats as it is built of metal, open to the elements and very damp. The trees on site have no visible PRFs and only offer foraging habitat for bats. No further surveys for bats are needed and it is recommended that the site is enhanced post-construction with the erection of bat boxes.

The trees and storage container offer potential habitat for nesting birds, although no evidence was found. It is recommended that the removal of any trees and the storage container is done outside of the bird nesting season. It is also recommended that the site is enhanced post-construction with the erection of bird boxes.

The terrestrial habitat on site ranges from low to high value for great crested newts. The gravel and grassland offer low value habitat and the overgrown embankment offers high value habitat as they offer a place for newts to hibernate in the roots.

One pond was found within 500m of this site. It scored 0.56 – Below Average on the HSI assessment and is separated from the site by a main road. The pond is approximately 410m from the site and it is considered unlikely that newts will be found on site during works. No further surveys for newts are required but work will be done under a method statement for newts. This will create a scenario within which the risk to newts is negated and the chance of a wildlife offence is negligible.

The method statements provided in this report will be followed, and works will be done at a suitable time of year. This will result in there being no further ecological constraints to the development.

Appendices

- A** **Details of Surveyors**
 Sheet(s): 1
- B** **Detailed Methodology**
 Sheet(s): 2
- C** **Desktop Study**
 Sheet(s): 3
- D** **Site Plans**
 Sheet(s): 1
- E** **Bibliography**
 Sheet(s): 1

A Details of Surveyors

Table A.1: Surveyor experience and licences

Name	Membership of associations/ experience	Licenses
Peta Marshall BSc(hons)MA	Principal Consultant MCIEEM PIEMA Peta has a degree in Applied Biology and has been working in commercial environmental assessment for over 10 years. She has 10+ years' experience surveying for protected species. As a member of the CIEEM she is bound by professional conduct.	Holder of survey licenses for bats and newts in England and Wales. Registered Consultant for Low Impact Class Licence for Bats <u>England:</u> Bats - 2015-12200-CLS-CLS BMCL - RC084 GCN - 2015-18939-CLS-CLS Dormice - 2017-29225-CLS-CLS <u>Wales:</u> Bats - 77554:OTH:CSAB:2017 GCN - 77574:OTH:SA:2017
Logan Maggs BSc(hons)	Lead Consultant Logan has a degree in Conservation and Land Management. He has 10 years' experience conducting environmental appraisals and phase 2 surveys for bats and newts in England and Wales.	Holder of survey licenses for bats and newts in England and Wales. <u>England:</u> Bats - 2016-24901-CLS-CLS GCN - 2017-29218-CLS-CLS <u>Wales:</u> Bats - S086874/1 Newts - 79665:OTH:SA:2018
Ben Jones BSc(hons) MSc	Lead Consultant Ben has a degree in Marine and Freshwater biology and a Master's degree in "Managing the Environment". He has 4 years' experience conducting environmental appraisals and phase 2 surveys for bats and newts in England and Wales.	Holder of survey licenses for bats and newts in England and Wales. <u>England:</u> Bats - 2017-29112-CLS-CLS GCN - 2016-25209-CLS-CLS <u>Wales:</u> Bats - S085098/1 GCN - 78716:OTH:SA:2018
Brian Marshall	Technical Director FIEMA CEnv PEA Consultant with over 35 years in the Environmental Sector	
Chloe Sheil MZool (Conservation)	Chloe has a master's degree in Zoology with Conservation from Bangor University. She has one years' experience assisting with surveys.	

B Detailed Methodology

Desk Study

Table A: Data sources

Organisation/Resource	Information Assessed
Cofnod	Protected/UK BAP Species records (2km)
MAGIC website	International statutory designations (1km) • Special Protection areas (SPA) • Special Areas of Conservation (SAC) • RAMSAR sites National statutory designations (1km) • Sites of Special Scientific Interest (SSSI) • National Nature Reserves (NNR) EPS Licenses for protected species (2km)

A data search was purchased from Cofnod on the 3rd October 2019.

A search on Multi Agency Geographic Information for the Countryside (Magic Maps) determined nearby designated areas. The map is presented in Appendix C.

Field Survey

The level of survey is aimed to identify field signs of or habitats with the potential to support protected species and therefore assist in the determination for detailed phase 2 surveys.

Determination of Ecological Value is based on the general criteria provided by IEEM (IEEM 2006).

Table B.1 Criteria of ecological values

Ecological Value	Description and Examples
High	Habitats or features that have high importance for nature conservation, such as statutory designated nature conservation sites of international or national importance or sites maintaining viable populations of species of international or national importance (e.g. Red Data Book species; European protected species).
Medium	Sites designated at a county or district level, e.g. Local Wildlife Site (LWS), ancient woodland site, ecologically 'important' hedgerows or ecological features that are notable within the context of a region, county or district (e.g. a viable area of a Priority Habitat on the county BAP or a site that supports a viable population of a county BAP species).
Low	Sites of nature conservation value within the context of a parish or neighbourhood, low-grade common habitats, such as arable fields and improved grasslands and sites supporting common, widespread species.

Species Surveys

Bats

Trees were assessed for potential for bat roosts, foraging and commuting.

All trees examined were categorised on their potential roost features. These features include cracks, splits in limbs, cavities, loose bark and thick stemmed ivy. Where appropriate these features were assessed using binoculars and/or endoscopes.

Daytime surveys were conducted with the aid of a strong torch and a pair of Pentax Papilio 8.5x21 close focus binoculars. Bat species may leave little evidence of their presence. Evidence for the presence of bats includes:

- Holes, cracks and rot holes used as roosts, marked by streaks of urine and faeces.
- Smoothed, darkened edges where bats have rubbed and left natural body oils when entering and exiting a space.
- Faeces under a well-used feeding point or a resting spot.
- Feeding signs such as discarded insect wings under a feeding point.
- Presence of roosting or dead bats in or behind any object.

Methodology used is in accordance with recommendations by BCT, Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition, Collins (2016).

Badgers

Surveys were conducted using guidance from Scottish Natural Heritage commissioned Report No 096 (2003).

Daytime surveys for badgers involved looking for:

- Scrapings where badgers have dug for food or used as latrines.
- Signs of a sett, including signs of use such as presence of badger hair
- Tracks and prints.

Birds

Evidence of nesting birds, including barn owls using a tree involved looking for:

- Presence of nests
- Collections of droppings and/or feathers
- Highly distinctive droppings or splats under roosting points.
- Presence of owl pellets/feathers
- Listening for bird song
- Recording bird activity

Amphibians and Reptiles

The assessment of aquatic habitat is based on the Habitat Suitability Index (HSI) and is applied according to guidance set out by the Oldham 2000, superseded by ARG in 2010, ARG UK Advice note 5. The HSI is a quantitative method of assessing the potential quality of a body of water in terms of its ability to sustain a population of great crested newts.

The terrestrial habitats at the application site were surveyed and assessed for their suitability and potential value for the support of GCN. The general topography, ground conditions and presence or absence of vegetation were recorded. A refugia search was conducted for amphibians and reptiles by looking under any logs, large stones and other debris.

C Desktop Study

Designated Sites

MAGiC

Wynnstay Park

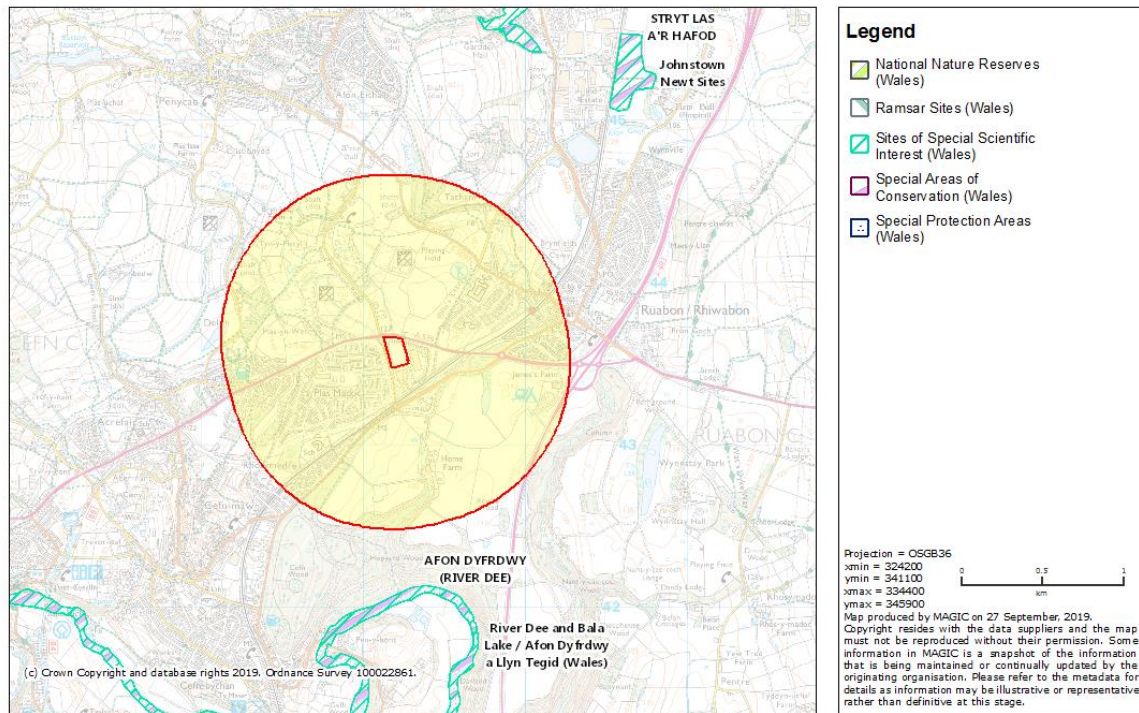


Figure C.1: Designated sites within 1km of Wynnstay Park, Ruabon

The map from Natural England presented in Figure C.1 indicates that the site is not within 1km of a designated area.

The nearest SSSI is approximately 1.4km south of the site. This is the Afon Dyfrdwy and is a section of the River Dee designated for biological and geological reasons.

Records

A desk search was conducted focussing on the area within 2km of the site. Unless stated otherwise, all records were provided to the NBN Atlas under the Creative Commons licence: CC-BY. The following species have official records in that area:

Bat species:

- Daubenton's (*Myotis daubentonii*)
- Whiskered (*Myotis mystacinus*)
- Natterer's (*Myotis nattereri*)
- Unknown myotis bat (*Myotis* sp.)
- Noctule (*Nyctalus noctula*)
- Common pipistrelle (*Pipistrellus pipistrellus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Unknown pipistrelle (*Pipistrellus* spp.)
- Brown long-eared (*Plecotus auritus*)
- Unknown bat (Chiroptera spp.)

The nearest records are of Daubenton's bats, Natterer's bats, noctule, soprano pipistrelle, common pipistrelle and brown long-eared bat approximately 300m away, from 2017. The nearest records of the unknown myotis bat are approximately 700m away and are from 2000. The nearest records of the unknown bat are approximately 800m away and are from 1996.

Other mammals:

- Hedgehog (*Erinaceus europaeus*)
- Hare (*Lepus europaeus*)
- Otter (*Lutra lutra*)
- Badgers (*Meles meles*)
- Polecat (*Mustela putorius*)

The nearest recent records are of hedgehogs approximately 500m to the east, from 2014. The nearest records of badger are within 1km, from 2004. The nearest records of hare are approximately 1.3km to the west, from 2005.

Birds

- Goshawk (*Accipiter gentilis*)
- Merlin (*Falco columbarius*)
- Peregrine (*Falco peregrinus*)
- Kestrel (*Falco tinnunculus*)
- Red kite (*Milvus milvus*)
- Starling (*Sturnus vulgaris*)
- Barn owl (*Tyto alba*)

The nearest records are of starling approximately 300m away, from 2008. The nearest records of barn owl are within 500m and are from 2010. The nearest records of kestrel are within 600m and are from 2012. The nearest records of goshawk are within 800m and are from 2016.

Amphibians and Reptiles

Slow-worm (*Anguis fragilis*)
Common toad (*Bufo bufo*)
Smooth newt (*Lissotriton vulgaris*)
Grass snake (*Natrix helvetica*)
Great crested newt (*Triturus cristatus*)

The nearest records of smooth newt and great crested newt are approximately 600m to the southeast but these are historic and are from 1988. The nearest records of grass snake are approximately 1km away and from 2016. The nearest records of slow worm are approximately 1.3km to the west and are from 2008.

Plants

Bluebells (*Hyacinthoides non-scripta*)

The nearest records of bluebell are approximately 1km away and are from 2014.

Invasive species

Japanese knotweed (*Fallopia japonica*)
Himalayan balsam (*Impatiens glandulifera*)
American mink (*Neovison vison*)

The nearest records of Japanese knotweed are approximately 300m away and are from 2014. The nearest records of Himalayan balsam are approximately 400m to the southwest and are from 2013. The nearest records of American mink are approximately 1km to the northeast but these are historic and are from 1997.

D Site Plans

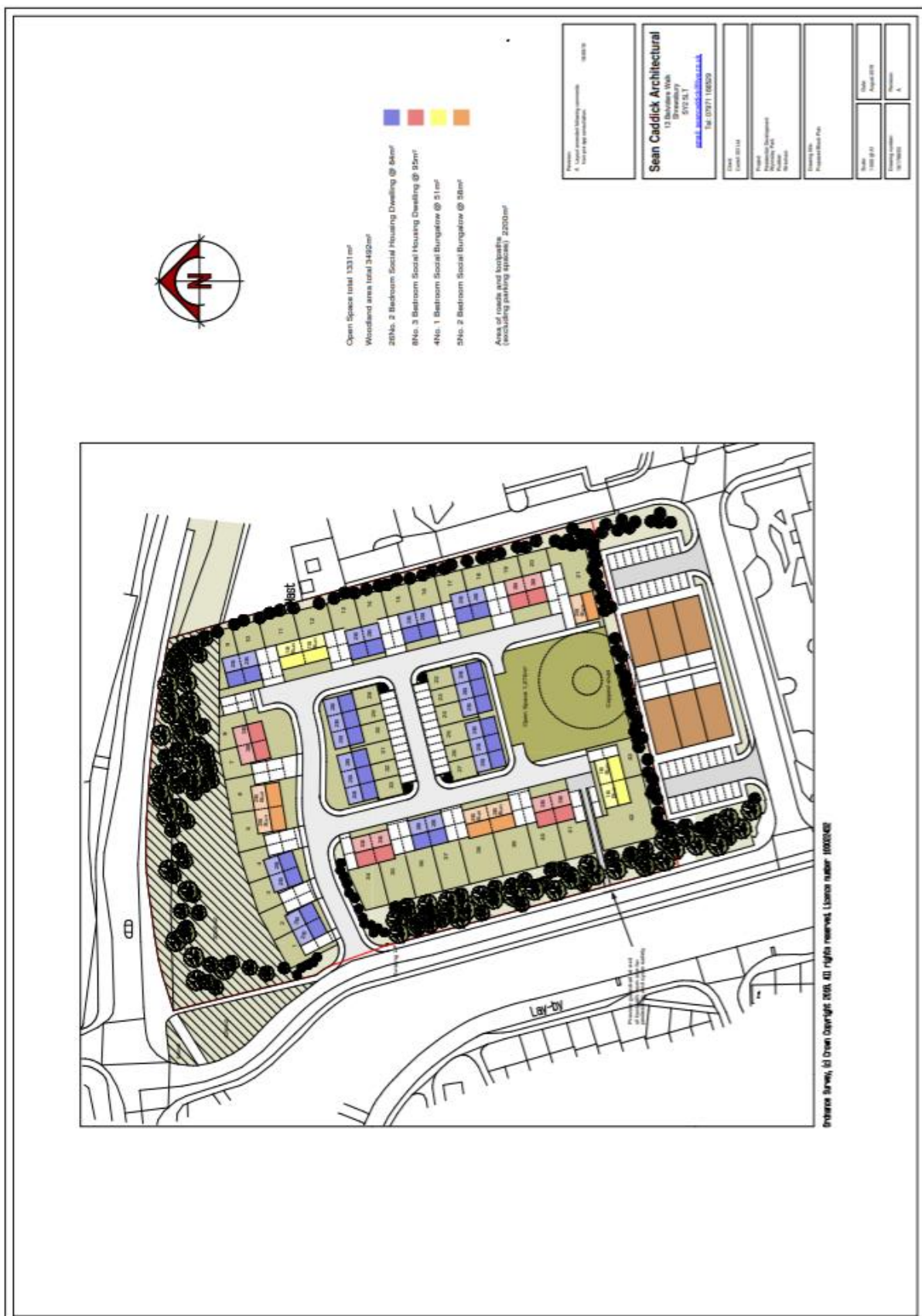


Figure D.1: Proposed plans

E Bibliography

ARG UK (2010). ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom.

Barn Owl Trust (2012) *Barn Owl Conservation Handbook*, Pelagic Publishing, Exeter

Chartered Institute of Ecology and Environmental Management (CIEEM), (2006). EcIA Guidance (Terrestrial, Freshwater and Coastal 2006).

Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn).

Bat Conservation Trust

Conservation of Habitats and Species Regulations 2017:

http://www.legislation.gov.uk/ukxi/2017/1012/pdfs/ukxi_20171012_en.pdf

English Nature (2001) *Great crested newt mitigation guidelines*

English Nature

HMSO (2000) *Countryside and Rights of Way Act 2000*

HMSO, London

<http://www.legislation.gov.uk/ukpga/2000/37/contents>

HMSO (1981) *Wildlife and Countryside Act 1981*

HMSO, London

<http://www.legislation.gov.uk/ukpga/1981/69>

HMSO (1992) *The Protection of Badgers Act*

HMSO, London

<http://www.legislation.gov.uk/ukpga/1992/51/contents>

ILP (2018) Guidance Note 08/18 Bats and artificial lighting in the UK, The Institute of Lighting Professionals

Mitchell-Jones A.J. (2004) Bat Mitigation guidelines, English Nature

National Planning Policy Framework 2018:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/728643/Revised_NPPF_2018.pdf

Natural England – Nature on the Map, Magic Maps. Copyright Natural England, containing Ordnance Survey data, crown copyright and database right 2018:

<http://magic.defra.gov.uk/magicmap.aspx>

Natural Environment and Rural Communities Act 2006:

<http://www.legislation.gov.uk/ukpga/2006/16/contents>