

**Land At Riverside Stud
Newbridge, Wrexham**

New Proposed Development, December 2022

Initial Habitat and species assessment



View across site

For Mr Sam Sheady



Camlad Ecology Ltd.
Shrewsbury

December 2022

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The author of this report, E J Lomas, holds an MSc in Ecology and Management of the Natural Environment (Bristol) and a Cert HE in British Archeology (Birmingham). He has over 30 years of professional experience and worked for NJL Consultants, Telford, a landscape and ecology consultancy, between 1991 and 2011. Before that his background and main work was in agriculture. He has carried out many surveys for small scale developments and has also acted as the principal ecologist for large scale road building, flood defense, and historical landscape restoration projects.

NOTE – all dimension, boundaries and drawings given in this report are approximate, for illustration only. More definitive details are provided in the architect's drawings.

Initial habitat and species assessment, new site at Riverside Stud, Newbridge, Wrexham

Note that this report relates to a new site and wholly replaces the previous Camlad Ecology report, January 2021, which related to a proposed house site about 30m to the south west

Short-form Summary

1. This report relates to the possible ecological impacts of a proposed development affecting an area of pasture land situated in the grounds of Riverside Stud, Newbridge, near Cefn Mawr, Wrexham. The land is open grazing land, not close to any habitat features except one mature oak tree and a section of open hedgerow. The owner of the property is proposing to build a two storey house. This is to provide a permanent residence on this site, to support the business.
2. A desk study and site survey has been completed by E J Lomas, a suitably qualified and experienced ecologist employed by Camlad Ecology Ltd, during January 2021 and December 2022. This survey sought to determine whether the proposed development was likely to have any impact on protected and priority species, or on valued habitat.
3. There is a main river close to the site, The River Dee, an SSSI and a Special Area for Conservation over most of its length (an SAC). This is an internationally important site. A very high level of pollution control will be required during construction and use.

The survey and study has found that:

4. For reasons of project scale, distance, topography and hydrology, there are no predicted impacts on statutory protected sites or priority habitats, provided significant pollution risks are removed by design and site management. Consideration has been given to the design and layout of a waste water treatment installation, in line with current NRW guidelines. The requirement for a Habitat Risk Assessment by the planning authority may be scoped out.
5. Desk study and soil pits dug on site show that the development site is not over a former tip site, and that a nearby well is disused and infilled.
6. Land and habitat features around the proposed development could be closely examined. There was no evidence of habitat important to bats or fully protected bird species in or close to the site. Notes on suitable precautions and mitigation measures are given in the main text.
7. There are no local ponds shown on maps, or located during survey of the wider area. We are confident that there will be no impact on great crested newt populations.
8. Impacts on other habitat of value to fully protected species are unlikely, given adequate control of pollution and light spill.
9. No further survey for protected species should be needed.
10. There is a low level of risk to nesting birds and to hedgehogs. These risks have to be managed by careful timing and careful working procedures. No other mitigation would be practical or proportionate.
11. There would be little or no impact on distinctive habitat; the only habitat within the site is poor modified grassland. Very little mitigation would be needed.

Notice concerning copyright, assignment and validity

This report has been produced for Mr Sam Sheady by Camlad Ecology Ltd, following surveys carried out in January 2021 and December 2022. Copyright resides with Camlad Ecology. The report may be quoted in part or in full in relation only to the site described in it by those with a legitimate interest in the development or wildlife conservation value of the site. If the report is quoted in part then the relevant and exact context of any quotation must be evident. Where information from this report is misquoted or quoted without full context we will make planning officers aware of this. In relation to this, we must point out that all ecological surveys are 'incomplete' and all findings are conditional: it is impossible to know exactly what species are present where, over any extended period of time.

Camlad Ecology Ltd. have given consent for this report to be assigned by Mr Sam Sheady to any initial purchasers of the site described in this report, or to Mr Sheady's partners in a development, provided that we are notified of the assignee's formal business name and address. The report may not be further assigned without direct agreement between Camlad Ecology and later purchasers of the site.

Intending developers of the site should take note of the fact that ecology surveys are concerned with habitats that change through successional processes and with protected species that are usually mobile and often seek concealment. Therefore the findings of an ecological survey are not perpetual and not completely definite. The condition of the site will change; in particular any buildings and large trees that are not maintained will become increasingly attractive to wildlife, including protected species, as they suffer damage from vandalism, storms and normal decay processes. Ecology survey reports are generally considered to have limited value from two years after the last survey date.

Intending developers should take careful note of the information provided in Annex 3, concerning wildlife protection law, planning policies, and the protected species frequently encountered during development projects in the Welsh border counties and the adjacent English counties.

Survey results as published

If this report is published as part of a planning application it enters the public domain. It is acceptable to Camlad Ecology Ltd. and our clients for a brief summary of the report's findings to be quoted in relation to other local ecology surveys, or in relation to the proposed development, as long as the quotation is accurate, with full context, and attributed. As examples:

"Survey by Camlad Ecology Ltd. during spring 2021 found a small breeding population of great crested newts in the pond at OS grid reference NH 240250. This is about 640m from the site" would be acceptable. "Survey by Camlad Ecology has found great crested newts near to the site. These newts could spread to the proposed development site" is not acceptable.

Use of our raw or numeric data, or tables showing results, assessments and conclusions, or plans and maps drawn by us, would not be acceptable without prior agreement.

**Initial habitat and species assessment, land at Riverside Stud, Newbridge, Wrexham
New Site, December 2022**

Note that this report relates to a new site and wholly replaces the previous Camlad Ecology report, January 2021, which related to a proposed house site about 30m to the south west

1.0 Introduction

1.1 Origins and Objectives

1.1.1 Camlad Ecology Ltd. has been commissioned to carry out a desk study and an ecological survey of land at Riverside Stud, Newbridge, by Mr Sam Sheady, the owner of Riverside Stud.

1.1.2 This report, based on the desk study and survey, provides a Preliminary Ecological Assessment and endeavours to take that process forward by including additional information to support an assessment of likely impacts on habitats or species of recognised importance that could be affected by the proposed development.

1.1.3 The survey was undertaken to establish whether bats, badgers, breeding birds, other protected species and some locally valued species could be present within the site and in the area around the site. The survey sought to determine whether protected or valued species were present and in the absence of direct evidence, whether habitats in and around the site were likely to support any populations of protected or valued species.

1.1.4 Potential impacts on any local sites that have statutory protection for nature conservation or any other designated value for nature conservation have been assessed, and the intended work to the site has been considered in relation to the Wrexham Biodiversity Action Plan, Wrexham Council's Local Planning Guidance 32, Biodiversity, Planning Policy Wales Technical Advice Note 5, and NRW's latest advice on phosphate discharges near sensitive rivers (July 2022). Information has been obtained from the MAGIC website, COFNOD (the ecological data source for North Wales) (for the 2021 report), the NBN Atlas website, Welsh Government and NRW documents relating to the management of the River Dee, and the published Local Plans of Wrexham Council. Previous planning applications on or close to the site have been reviewed.

1.1.5 The results of the study and survey are given and assessed in this report. Assessment tables are given in annex 1; only those issues where there are potential significant impacts or overriding concerns are addressed in detail in the text. Recommendations for a precautionary approach are given in conclusion.

1.1.6 Wildlife conservation in relation to planning policy is effectively covered by the Planning Policy of the Welsh Government and Wrexham County Borough Council, as well as the UK National Planning Policy Framework document: *Conserving and enhancing the natural environment* (DCLG 2019, HMSO, UK), with

recent amendments and case law changes to the Habitat Regulations (now the Conservation of Habitats and Species Regulations 2017, amended 2019). The impact of this is to require assessment of potential impacts on sites of international and national importance, and survey for protected species where there is any likelihood of their presence, before work affecting any habitat that might shelter them is begun. Details about wildlife protection laws, wildlife conservation policy, and the principal protected species found in the Welsh border region are given in Annex 3 of this report. Where there is any doubt or difficulty over these issues, appropriate legal advice should be obtained.

1.1.7 Legal protection for species is from the Wildlife and Countryside Act 1981 as amended (the WCA) and the Protection of Habitats and Species Regulations 2017 (as amended 2019) (The Habitats Regulations). Badgers and their setts are protected under the Protection of Badgers Act 1992 (The Badgers Act).

1.2 General site description

In this report 'the development site' or 'the site' (unqualified) refers to the structures and locations where work may take place, together with ground around it that might be affected. The 'survey area' refers to the accessible landscape and buildings within about 250m of the site, while 'the study area' refers to the wider landscape around the site, for which data has been collected in a desk study. Other 'sites' are referred to with a descriptor, as for example 'the statutory site'

1.2.1 The development site consists principally of about 630m² (0.063ha) of close-grazed pasture. It is located in OS grid square SJ 289 417, site centre approx. 328980, 341790. The post code for the locality is LL14 3JE. This location is east of Newbridge village, off the B5605 road and on the opposite side of the River Dee to the village.

1.2.2 The habitats within the proposed development site are an area of close-grazed pasture in a paddock north of the crest of the hill. The house site and its construction area can avoid the root zone large trees. There are some other trees, a small area of scrub, a disused shed and two hedgerows fairly close to the site; except for one section of hedge these are over 25m from the site boundary.

1.2.3 A large loop of the River Dee encloses the hill that the site stands on, together with some riverside land used by Newbridge Stud, and a large former clay pit that was used between 2005 and 2016 for waste disposal. This clay pit removed the eastern side of the hill; the western side, under the site, is geologically distinct and was not quarried. There is no evidence of waste disposal below the site. The hillsides and the river corridor carry extensive deciduous woodland, mostly of fairly recent origin. The River Dee and its corridor are designated as a Site of Special Scientific Interest (an SSSI) and a Special Area for Conservation (an SAC): both are designations applied to high value sites for nature conservation and they provide considerable legal protection.

1.2.4 Most fields near to the site are small enclosures of improved grassland used for grazing or silage; further away from the neighbouring villages of Newbridge and Cefn Bychan there is mixed improved

grassland and arable cultivation in large fields on relatively level ground, with extensive areas of woodland on steep slopes.



View of the proposed house location



View of the slope below the site.

The proposed waste water treatment facility would be roughly centre left in this picture

1.3 Proposed Works

1.3.1 Our client is seeking planning consent to construct a detached two storey house, as an on-site family residence to support the business. The property will be served by existing stone-surfaced roads. A

limited amount of ground outside the site, probably about 60m² of pasture, will be affected by works to install a waste water treatment plant.

Plans of the site follow.

2.0 Methodology

2.1 Desk study

2.1.1 The proposed development has been considered in relation to the Wrexham Biodiversity Action Plan. Information has been obtained from COFNOD, the source for ecological data for North Wales, the NBN Atlas website, Wrexham Council's website, The Welsh Government website, the NRW website and the MAGIC website.

2.1.2 Ordnance survey maps of the area, including historic large scale maps from 1873 onwards, together with online British Geological Survey maps and Google Earth images, have been used to assess the wider landscape and environment.

2.1.3 None of the records from COFNOD or on the NBN Atlas website related to the site or land around it, strongly indicating that there had been no previous survey effort in the immediate locality. This report retains the 2021 conclusions from COFNOD information.

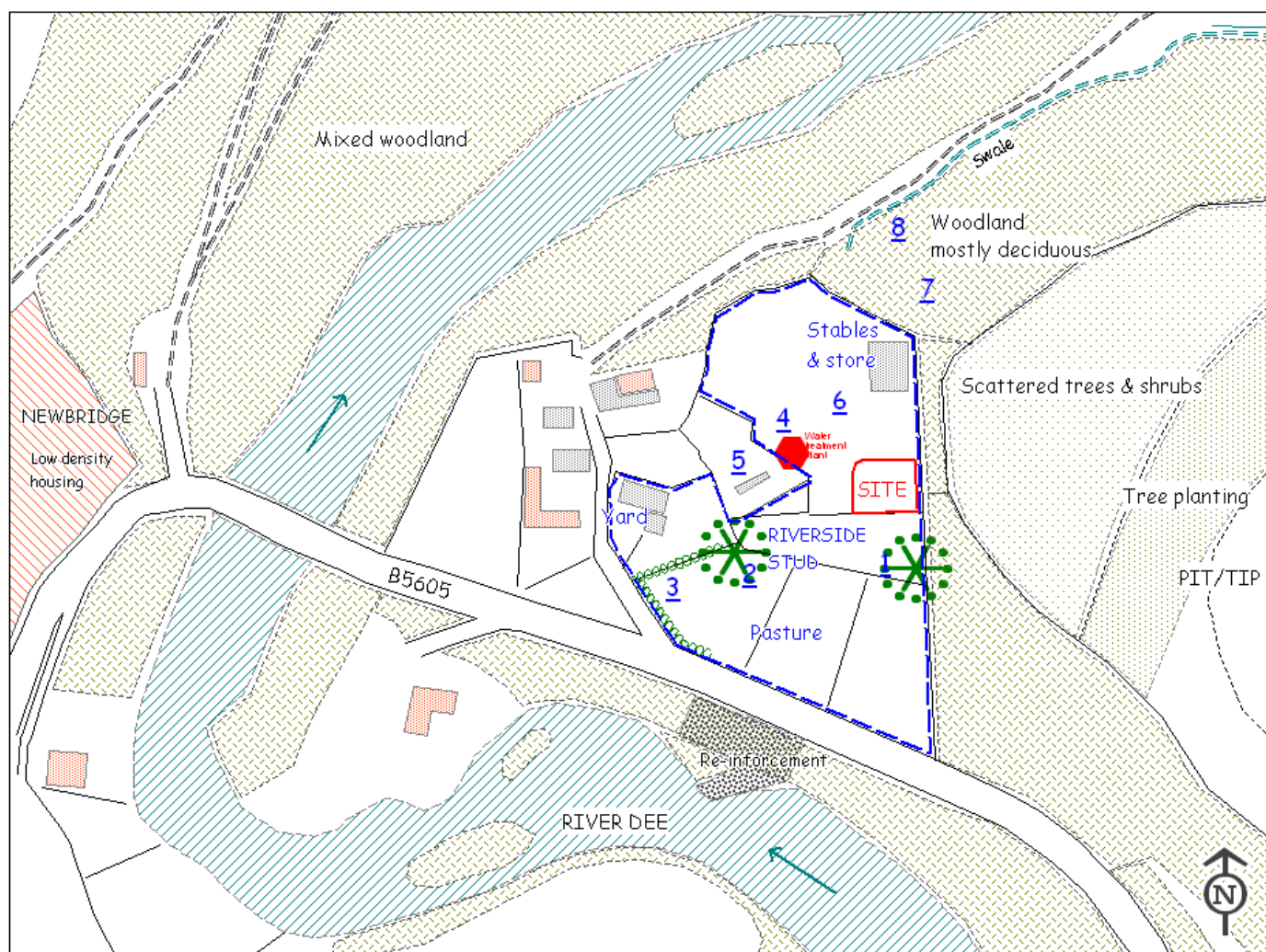
2.2 Habitat survey

2.2.1 Habitats were observed in the course of walkover surveys on 19th January 2021 and 8th December 2022, with the survey methodology based on the JNCC Phase 1 methodology (JNCC 2001) and CIEEM recommendations for Preliminary Ecological Assessment.

2.2.2 The holding and the woodland immediately adjacent to the wider site were walked over and neighbouring gardens were viewed from boundaries. The margins of the tip site adjacent to the holding were observed from inside the holding and from just within the tip site. Roads and footpaths were followed for about 250m away from the site. The near margins of the River Dee were viewed from the woodland adjacent to the site, and from the fields to the north. There was some observation of habitats beyond this in all directions.

2.2.3 A percolation test hole was dug during the first ecology survey (Jan 2021). This allowed near surface layers to be observed, down to two metres depth.

2.2.4 Two spade pits to about 350mm below soil surface were dug within the development site in December 2022, to examine soil type and formation. See Annex 2.

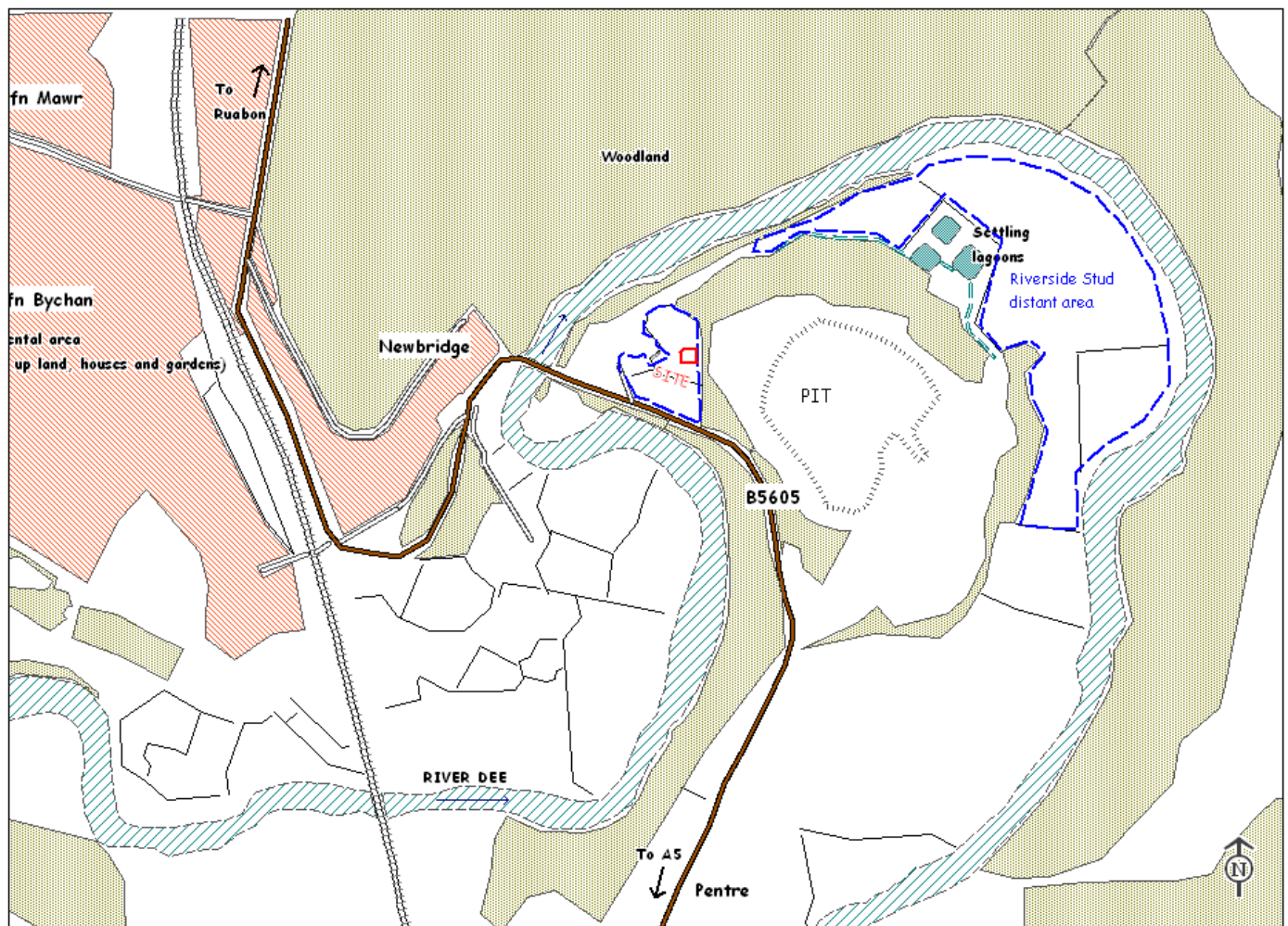


Riverside Stud - Location & Habitat

Scale approx. 1:2,500 @ 18cm frame width

Habitat features (see also main text)

- 1 Oak tree, about 850mm dbh, stem about 22m from proposed house.
- 2 Oak tree, about 900mm dbh, adjacent to partial hedge
- 3 Mixed hedgerow and trees
- 4 Grazed pasture on steep bank.
- 5 Disused shed (pigeon loft) in scrub. Not part of Riverside Stud land.
- 6 Horse-grazed pasture, relatively level, position of number indicates possible location for a filter bed
- 7 Young ash woodland (about 40 years old) with seeps and flushes draining to feature 8
- 8 Interceptor ditch (swale) flowing to treatment lagoons associated with the tip site



Riverside Stud - Wider habitats

Scale approx 1:10,000 at 16cm frame width

Site history

From large scale OS mapping and Google Earth images

The 1873 OS 1:2,500 map shows the site as a farm unit, Pen-y-bont Farm, with cottages and farm buildings but no structures on the Riverside Stud yard or fields. Most fields are medium sized, around 7 acres (about 2.8ha).

The river corridor is similar to today, but there is much less woodland around it and north east of the site. A small clay pit and brickworks is shown about 400m east of the site

By 1899 the clay pit has grown to within 200m of the site and a large works is shown. Woodland has expanded almost to its modern extent and most current field boundaries have established around the farm.

There is some further expansion of the pit by 1912, and more by 1938. It has almost reached its final extent by 1963, but the works had closed in 1960. Recent growth of its boundaries relates to land shaping as a tip site.

There is little change shown on maps to 1993. The eastern boundary of the fields has moved back towards Pen-y-bont Farm, but has not reached its current limit.

Google Earth images show the tip site operating in 2006 and the current field boundaries are evident. Riverside Stud established here at around that time. Waste disposal into the pit ceased around 2015

2.2.5 A former well, mentioned by planning officers without further information given, was found on an historic map and located on site in the mapped location. Its remaining depth was checked with a tool handle. See Annex 2.

2.3 Species survey

2.3.1 Badger survey followed Mammal Society guidelines, with particular attention to the boundaries of the site, where evidence of foraging animals entering the site would be apparent.

2.3.2 The mature trees near the site were checked externally for bat roost evidence in accordance with Bat Conservation Trust recommendations, using close focussing binoculars, but no climbing survey was carried out.

2.3.3 Nesting birds: bird species and nests were recorded during other survey work. Habitat suitability was noted.

2.3.4 Great crested newts: In the desk study modern and older large scale maps were searched for ponds within 1km of the site. During the walkover survey ground within 250m of the site was checked for unmapped ponds and ditches. None were found.

2.3.5 Other species: the presence or likely absence of other species has generally been inferred from the presence or absence of suitable habitat. Species using scrub, hedgerows and trees may be present in the wooded margins of the tip site and the hedgerow east of the site, but there would be a 3m gap between the development site and these features. The house would face away from the hedge.

3.0 Habitat: findings and assessment

3.1 Protected, listed and other valued habitats

3.1.1 The nearest site with statutory protection for nature conservation is the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC and the coincident Afon Dyfrdwy / River Dee SSSI (Wales). This is a site of international importance as river and river corridor habitat extending from upland sources to its estuary, with high quality habitats throughout. The site is 82m from the SAC boundary at its nearest.

3.1.2 Several species listed in schedule 2 of the Habitats Directive and thus included in the Habitats Regulations 2017 as European Protected Species (amended 2019 to persist after leaving the EU) are found in the river system. These include Atlantic salmon and floating water plantain (*Luronium natans*), all three UK lamprey species, bullhead, and otter. Several other rare or endangered species occur within the SSSI, including two invertebrates, a stone fly (scarce yellow sally, *Isogenus nubecula*) and a sedge (a caddis fly, *Ernodes articularis*) which are of very limited distribution; both have been recorded locally.

3.1.3 The SAC begins 82m from the site boundary and about 14m below the proposed house site. Land below the site is pasture, falling to a shallow hollow that runs north west, towards a steep wooded bank from the pasture to the river.

3.1.4 Soils under the site are clayey organic-rich loams with a high proportion of coarse particles, while the sub-surface layer is of a nodular mixed clayey subsoil material containing a wide range of stones, observed to well over 2m deep in January 2021 on the site of the original development proposal, and to 350mm deep on 8th December 2022. The subsoil in the current site appeared more coherent and more clayey than on the original site. The stones observed in both cases were variously angular, rounded and broken rounded stones ranging from pebbles to cobbles, and to small boulders in the deeper pit. This is typical of glacial till, matching the classification given on the detailed geological mapping shown on the British Geological society website. The BGS site shows the former clay pit / tip site as being over Etruria Marl, with the geological boundary corresponding to the current tip site boundary, which is set about 58m in from its fence. The soils within the development site have a natural form and there is no evidence of disturbance or imported material.

3.1.5 The subsoil matrix appeared to be clayey so only slowly permeable; deeper layers appeared more permeable in the percolation test pit dug in January 2021. The slopes are likely to result in overground flow during heavy rain.

3.1.6 The River Dee system is recognized as being of international importance for nature conservation, and is protected as a SSSI under the WCA, and as an SAC, The Bala Lake and River Dee SAC, from its sources to the tidal Dee Estuary, which has a separate designation as an SAC. A major tributary, the River Ceiriog, and three smaller headwater tributaries are included in the River Dee SAC. The SAC designation and the associated management plans are outlined in Hatcher and Garret / NRW 2008, and in the Dee Basin River Management Plan 2015-2021. (NRW 2015). Because the site is a small single dwelling development with suitable waste water treatment, the need for a Habitat Risk Assessment by the local planning authority may be scoped out; see 5.5 following.

3.1.7 The river habitat is also protected from pollution under the Water Resources Act 1991 and the Salmon and Freshwater Fisheries Act 1975. Reference is made to this in the Dee Water Protection Zone document (NRW 2008), and the Dee Basin River Management Plan (NRW 2015). Any pollution spill could quickly become unmanageable, so a high level of precaution over pollution will be needed. Recommendations are given in section 5.4 & 5.5.

3.1.8 In addition to concerns about pollution spills during construction, there has to be concern about the management of domestic waste water. The treated waste from one household would not be significant in relation to the volume and flow rate of the river, but the incremental accumulation of such discharges from widespread development in the Dee catchment has to be taken into account. This is referenced in NRW 2015 and NRW 2022. The development would include a treatment plant, probably a Clenviro Matrix system, which can provide effective secondary treatment to remove the solutes such as phosphates and nitrates that can contribute to eutrophication.

3.1.9 In this location we suggest additional safeguards, 'downstream' of the treatment plant, such as a reedbed filter that can be isolated over a sealed bed, allowing for any failure of the treatment plant and delay in repair. The discharge from the reedbed could be to a soak-away. Given the local topography, we suggest that this is placed to the north of the treatment plant, giving a longer and slower route to the river and taking advantage, as a final precaution, of the wooded banks to the north of the site. See also section 5.5 following.

3.1.10 There are a number of other sites with statutory protection within 5km of the site. The nearest such sites is Nant-y-Belan and Prynella Woods SSSI, a 35ha block of ancient woodland that runs down to the banks of the River Dee. This is about 1km south east of the site, and 3.3km downstream (corridor length). Chirk Castle and Parkland SSSI, is 3.2 km south west of the site. For reasons of the small scale of the proposed development, distance and geographical factors, no impacts on these statutory sites are likely. The measures that must be taken to protect the River Dee will be effective in protecting other sites adjacent to the river. The sites with statutory protection around the development site are listed in Annex 1 of this report.

3.1.11 The COFNOD report listed one county level Wildlife Site, Ty Mawr and Tan y Cut Woodland, a country park with diverse grassland and a block of ancient woodland beginning a little over 600m south west of the site, on the far side of the river and the railway. There are also a number of ancient woodland sites, with the nearest confirmed ASNW site being about 90m from the development site. Almost all of the woodland within the loop of the river is listed as young woodland, the rest as general deciduous woodland. For reasons of the small scale of the proposed development, distance and geographical factors, no impacts on these locally designated and listed sites are likely.

3.2 General habitat in and around the site

Underlined number references below are for features marked on the location and habitat plan following section 1, above. Photographs of some features are in Annex 3

3.2.1 The pasture within the proposed development site is all closely grazed by horses. It appeared to be of very low diversity, with a limited range of grass species and few other herbs (forbs). On close grazed pasture in winter it is hard to distinguish grasses, but the main constituents seemed to be rough meadow-grass and fescues; there was relatively little ryegrass in the sward. This is likely to be a consequence of management for horses, as fertiliser inputs, especially of nitrates, will be kept low to avoid problems such as laminitis.

3.2.2 There is a mature pedunculate oak tree (1) close to the site, to the south. This is about 850mm dbh (diameter at about 1.2m above ground) and about 15m high. It lies on the boundary between Riverside Stud and the former tip site, with scrub and landscape woodland planting beyond it. Its stem is 21m from the boundary of the site and its crown extends to 12m from the site, with no projection into it. The tree appears healthy, with no hollows or flaws apart from some dead branches in the canopy (see also 4.4.2, bats). The tip site occupies about 8.5ha of ground to the east, now out of use and being landscaped; most tree growth on this is very young. There is a strong chain link fence on the boundary,

with enough well grown shrubs and small trees behind it to form a discontinuous hedgerow; this is outside the site and about 9m from the proposed house.

3.2.3 A second larger oak tree (2) is well to the west. The stem is about 900mm dbh, and it is about 44m from the development site boundary, 51m from the foundations of the proposed house. The tree appears healthy, with no hollows or flaws apart from a few dead small branches in the canopy.

3.2.4 Separating the paddocks from the yard around the entrance to Riverside Stud there is in effect a hedgerow (3) formed of mixed native trees and shrubs on a bank. This begins about 40m from the site and it does not link into other hedges.

3.2.5 The site for the proposed house is on a slight slope and the bank below it falls to a shallow hollow carrying the same close-grazed pasture (4), leading north west to a steep wooded bank. The boundary between the bank and the woodland is as a post and rail fence, with post, rail and wire fences dividing the field into paddocks.

3.2.6 Land falls away from the site to the west and north, but not steeply, mostly under pasture, with an adjacent area of about 600m² of bramble and tall herb scrub around a disused pigeon loft (5). This is outside the boundary of Riverside, and appears to have fallen out of use over the last 12 years (Google Earth images).

3.2.7 The largest part of the land just to the north of the site is another area of close grazed pasture (6). This is within the holding and could provide a suitable location for waste water treatment facilities, possibly with an added reedbed. The land then falls as a steep wooded bank towards the River Dee, beginning about 40m north west of the development site. Planning officers have referred to a well close to the proposed waste water treatment facility; this appears on the 1963 1:10,000 OS map and has been located on site. The well is disused and infilled to near the surface. See photograph, Annex 2.

3.2.8 Woodland on this bank (7) covers about 2.3ha and although it is shown as wooded on historic maps from about 1899 onwards, later maps and the general growth of the trees indicate that the bank was heavily disturbed between 1930 and 1980. Within this woodland there are seeps and flushes, below the level of the tip site. These flushes show signs of high pH, high calcium, and some ferrous discharge. Water from them runs down the bank, almost to the trackway at the base of the bank, where it is captured by an interceptor ditch (8) that carries the discharge to a series of lagoons constructed about 20 years ago.

3.2.9 At this point the development site is about 350m to the south west of the lagoons. The River Dee begins to turn south, forming a loop around the site, the hill that was exploited for clay deposits (the tip site), and some level meadows distant from the Riverside Stud buildings, which are also used by the horse rearing and training business.

3.2.10 East of the site the former tip is now capped and sealed, with landscaping extending to the boundary. A shallow slope runs down from the site boundary and is planted with young trees. The outer limit of the original marl pit and thus the waste disposal site is evident on the ground, on Google Earth aerial photographs from 2006 onwards, and on a 1963 1:10,000 Ordnance Survey map. This last allows an accurate measurement of the distance from the site to the edge of the marl pit at its maximum extent, as extraction ceased in 1960; this is 58m east of the site.

3.2.11 West of Riverside there is a group of cottages, converted barns, and the former Pen-y-Bont Farm buildings, with mature gardens.

4.0 Protected, listed and priority species

Details about species protection and formal titles of Acts and Regulations are given in Annex 3.

Ecological record references that follow are from the COFNOD and NBN Atlas records. They indicate the presence of the various species in the wider area.

4.1 The majority of protected, listed and priority species that are found in the Welsh border region are highly unlikely to be present in or around the development site.

4.2 Badgers: There are five badger records from the 1km radius study area, from widely scattered locations; most of these appear to be from systematic survey by the Clwyd Badger Group. Badgers are protected from harm and disturbance under the Badgers Act; work close to a badger sett may require licensing. There was no evidence of badger activity within 50m of the site and no burrows were found in the adjacent fields and hedgerows, but there were definite signs of activity within the wider survey area. Precautions must be maintained during all work on site.

4.4 Bats

4.4.1 There are 13 bat records for the 1km radius study area: these records include common pipistrelle, soprano pipistrelle, brown long-eared bat and Daubenton's bat, but about half of the records are for 'unknown bat'. This is a relatively low level of bat records for high quality mixed habitat around a large river and probably under represents bat presence in the area. Bats are fully protected under the WCA and the Habitats Regulations.

4.4.2 The development site itself contains no shelter habitat for bats. The nearby oak tree is in generally good condition, with some minor flaws that could shelter small numbers of bats, although for a large tree this is never definite. The core of the tree is over 20m from the site boundary and its canopy would shelter the potential roost sites from disturbance. This tree would not be affected by the development. The site does not lie across any evident flight lines; field boundaries within and close to the site are open post and rail fences. The continuous tree and shrub margins to the tip site are about 3m

from the proposed development site boundary, with the house facing away from the hedge and 9m in from the hedge.

4.4.3 The proposed development should not result in any significant decrease in foraging habitat. There will be no routine night time lighting of the site. Impacts on bats are unlikely and further survey is considered necessary.

4.5 Other mammal species

4.5.1 There are four hedgehog records for the study area, including one from a location in the residential area of Newbridge. Hedgehogs have a species action plan under the UK BAP; there is evidence that numbers are declining nationally. The wider site and adjoining gardens could support hedgehogs. To avoid harm to hedgehogs any potential hibernation sites should be removed from the working area before late autumn, or left until spring.

4.5.2 Polecats, a UK BAP species, have been recorded in the wider area around the site. These are very active animals, and highly unlikely to be affected by small scale works.

4.5.3 There is one otter record from the Newbridge area; otters are likely to be present and active along the whole length of the river Dee in the locality; because of the distance from the river and the amount of cover along the river, the proposed work on the site should not impact them and should not result in any increased risk to them on local roads.

4.6 Protected bird species

4.6.1 Protected bird species are those listed in Schedule 1 of the WCA; they are fully protected from disturbance or harm at all times. There are barn owl records from 2 locations within 1km of the site. Seven other protected species have been recorded within 1km of the site, including kingfisher, osprey, red kite. Many of these will have been recorded around the river, in passage. There is no suitable nesting habitat for protected species in or immediately adjacent to the site. No further survey is considered necessary.

4.6.2 A normal level of precaution should be sufficient to avoid any impact on protected birds.

4.7 Breeding birds

4.7.1 All birds are protected while breeding, under the WCA, this protection includes all related activity and all life stages. There are records for 107 bird species and several thousand separate occurrences within the 2km radius study area. The great majority of these are from systematic surveys such as BTO winter surveys and semi-systematic surveys such as the RSPB Big Garden Bird Watch, and are at 1km precision. Newbridge village and its surroundings are strongly recorded. The shrubs and mature trees

near to the site may be used by a number of species, but there was no sign of any bird nesting activity in the adjacent oak tree; there are no evident hollows or other voids in this tree.

4.7.2 Birds will nest in any available habitat that meets the particular needs of their species, including hedgerows, piles of brash, stacks of construction material and inactive construction plant, which can present a serious constraint on development. This is normally avoided by site clearance during autumn or early spring and good site management practices. Clearance in winter should be avoided if possible, because of the risks to dormant or hibernating wildlife.

4.8 Reptiles

4.8.1 There is one reptile record for the surrounding area, a record for slow worm from a railway corridor on the far side of the river. The habitat in the site itself is limited and not particularly suitable due to the lack of shelter. The risk to reptiles is assessed as low. Survey for reptiles is difficult, and it is possible for populations to remain undetected. A precautionary approach should be maintained during development. No further survey should be necessary.

4.9 Great crested newts

4.9.1 Great crested newts are fully protected under the WCA and the Habitats Regulations. There are no records within 1km of the site (COFNOD) while the NBN Atlas shows few in the wider area, out to about 3km, with clusters appearing around Ruabon.

4.9.2 Overall, the nature of the terrain around the site and the lack of ponds near to the site indicates that great crested newts are very unlikely to be present around the site. Normal precautions should be sufficient and no further survey should be necessary.

4.10 Other amphibians

4.10.1 Common frogs, common toads and smooth newts may be present around wetland habitat in the wider area. A precautionary approach is recommended. These species are partially protected under the WCA.

4.11 Invertebrates

4.11.1 The site consists of short grass sward, with only commonplace and relatively recently established plant communities around it. There are no veteran trees or old orchards nearby. Rare or endangered invertebrates are unlikely to be present around the site, but several have been recorded from the river. This is discussed in terms of the river habitat, section 3.1.2 above.

4.12 Plant species

4.12.1 Habitats around the site are typical pasture fields with some hedgerows, recently established oak-birch woodland and associated shrubs, fairly young ash woodland and gardens, all highly unlikely to support rare plants or uncommon plant communities. The nearest record for a protected or listed species is for native bluebell, about 1.5km south west of the site. There are some records for rare or ecologically significant plants within the nearby river corridor (such as river crowfoot, *Ranunculus fluitans*). This again emphasises the need to protect the river.

4.13 Mature Trees

4.13.1 There are a number of mature trees on the margins of the adjacent fields. Care should be taken not to damage these; they are well outside the range of any likely works. The one tree close to the site does not have any part of its canopy over or adjacent to the site. This tree has a stem of about 900mm diameter, and a Root Protection Area of over 12m can easily be achieved. The stem of the tree is about 20m away from the probable construction zone around the proposed house. Fencing should be used to protect this area, working in accordance with BS 5387/2012.

4.14 Invasive species

4.14.1 No non-native invasive species (INNS) such as Japanese knotweed were found in or near the site. There are many records for Japanese knotweed and Indian balsam within 2km of the site, in most cases along the river banks. There did not appear to be any cotoneaster species or other plants previously used for landscaping and now listed as invasive (Schedule 9, WCA) in or near the site, which is under a close grazed sward. Given the nearby populations of some INNS, care must be taken not to import any material from invasive plants.

5.0 Conclusions and recommendations

5.1 Conclusions

5.1.1 Based on our survey findings, there would be no direct risk to protected and valued species from the proposed work on this site, provided that care is taken to avoid disturbance of hedgehogs and nesting birds.

5.1.2 As this small site consists of close grazed pasture with fences and one nearby tree, further species survey is not considered necessary.

5.1.3 Work to the site should not impact on the surrounding landscape if care is taken over pollution.

5.1.4 There is a pollution risk to the nearby River Dee SAC / SSSI from both overground flow down steep slopes during rainstorms and potentially through short-period groundwater flows and discharge to the river. Potential pollution sources during construction could include fuel and oil spillage, cement or raw concrete spillage, and suspended fine particles from soil. Strict pollution control measures must be in

place, including designated areas for refueling and storage, sediment traps such as swales, and spill procedures.

5.1.5 Long term cumulative pollution from domestic waste water, particularly dissolved nitrates and phosphates would be mitigated by the installation of a treatment unit, which should reduce nitrates, phosphates, and Biological Oxygen Demand by well over 90%. Additional storage and treatment is recommended. Details are given in 5.5 following.

5.1.6 Because ecological survey can only show presence or likely absence, rather than certain absence, and because species may move into a site before the start of development work, a precautionary approach over badgers and other species is also advised.

5.2 General Precautions during construction work

5.2.1 All site workers should be made aware of protected species issues and the need for care over spillages and water borne pollution. Former Environment Agency pollution protection guidelines, particularly the recent NRW pollution prevention guidelines such as GPP5, GPP13, GPP19, GPP21 and GPP22 should be followed. Special care must be taken over re-fuelling operations.

5.2.2 The developers, site managers and workers should be aware that the contents of this report do not remove individual responsibility under the Wildlife and Countryside Act 1981 as amended.

5.2.3 Clearance of any shrubs, undergrowth and tall herb and grass growth around access routes and the fringes of working areas before mid March will reduce the possibility of harmful impacts on wildlife. Site clearance during cold winter weather should be avoided. The best period is mid autumn.

5.2.4 Any trenches left open overnight should have wood or earth ramps to allow trapped animals to escape. All open pipe runs should be blocked off when not being worked on, to avoid trapping animals.

5.2.5 There are populations of Japanese knotweed and other invasive plants near the site. Machinery and tools should be carefully cleaned before being brought to the site. A watch should be maintained for any growth of INNS species in or near the site.

5.3 Protected and listed species:

5.3.1 If any bats or other fully protected species are discovered, works should cease immediately and Natural Resources Wales or suitable ecological consultants should be contacted for advice. **(Natural Resources Wales tel: 0300 065 3000, state protected species, development type and that the site is in the Wrexham area, grid reference SJ 289 417)** Contact with NRW is important for the protection of both the species involved and everyone connected with the project; delay over this can open the risk of prosecution.

5.3.2 Bats: If any bat is found on the ground, then it must not be handled but should be covered with an open and inverted cardboard box and left for collection by a licensed bat worker. As above, NRW must be notified. There is a risk of infection with a very rare but extremely dangerous disease from handling bats.

5.3.3 No evidence of bat activity or suitable roost habitat has been found in or around the site, but the presence of small numbers of hibernating bats in tree hollows and buildings in winter cannot be predicted or reliably detected. Work to trees and roofs in cold weather should be avoided.

5.3.4 Badgers: Throughout development work, maintain a watch for signs of badger activity and ensure that any observations or signs of badger activity including fresh excavations, dung pits etc. close to working areas are immediately reported to Camlad Ecology, or other suitable specialists, or appropriate officers at Wrexham Council. In general, no works with hand tools should take place within 10m of a badger sett entrance, no works with JCB 3C or smaller sized machinery within 20m of a sett, or within 30m for larger machinery.

5.3.5 Hedgehogs: Any piles of brush, deadwood and other potential hibernation sites should be removed from the possible working area before late October or left until spring. No material should be stacked in the area before then unless it is raised up on pallets or similar, to avoid creating hibernation habitat. If hibernating hedgehogs are found on site they should be covered over with a cardboard box in the first place, and specialist advice should be obtained.

5.3.6 Nesting Birds: The risk of harming birds nesting in shrubs and trees can be avoided by not working in or close to these features or by clearing them outside the breeding season. Work commencing after mid August and before mid March is unlikely to affect nesting birds. During any construction work care should be taken to avoid birds building nests in stacks of waste and construction materials.

5.3.7 Amphibians and Reptiles: Site workers should be made aware that any deliberate or reckless harm to reptiles is illegal. Careful site clearance can minimize the risk to reptiles and amphibians; waste material, cut vegetation etc. should not be stacked on site close to any likely working areas. Any reptiles and amphibians should be moved to suitable habitat; advice should be sought from ecological consultants and snakes should not be handled without suitable experience.

5.4 Habitat features

5.4.1 Water bodies and ground water: The site is over slowly draining clayey soils, deep mixed subsoil and glacial till; most drainage will be to surface watercourses in wet weather, and to groundwater in dry weather. Pollution control procedures and spillage action plans and materials must be in place and known to all workers. It must be made clear that simple assertion and practice of 'skill and care' is not sufficient in this location.

5.4.2 Former Environment Agency pollution protection guidelines, and the recent pollution prevention guidelines should be followed; the new GPP5, GPP13, GPP19, GPP21 and GPP22 guidance documents will be particularly relevant. Special care must be taken over re-fuelling operations, waste storage and storage of chemicals, cement etc. These must take place in designated areas where the movement of any spillages over the ground or into the ground will be slow, and capable of being intercepted and the spillage removed. Sediment traps downslope of the site could protect the river during rainstorms.

5.4.3 Mature Trees: The design, layout and implementation of the scheme should avoid any impact on mature trees. There is always some likelihood of damage to the root systems of trees near to excavations; adhering to guidance given in British Standard BS5837:2012 is advised. Root protection areas should be fenced off.

5.5 Suggested long-term pollution control

5.5.1 The following suggestions are based on experience of similar schemes, examination of published documents, and ecological consultancy work for the Environment Agency. The author is not a hydro-geologist or a drainage engineer.

5.5.2 Small scale treatment plants are very effective at providing primary and secondary treatment of waste water. The recommended unit, a Clenviro Topas Plus Matrix, also provides tertiary treatment through recirculation and dosing to precipitate phosphates. Discharges should be less than 2m³ (2,000litres) per day (national average waste water discharge is 45l per day per person) The unit has been designed and tested to meet British Standard 6297 + A1:2008, and it will be over 50m distant from the SAC boundary, which all means that it should not have a significant effect on the SAC, allowing the need for a Habitat Risk Assessment to be scoped out. We suggest that there is some downstream storage with additional tertiary treatment, before any discharge to ground infiltration. These facilities should be in a location where there would only be a slow groundwater movement towards the River Dee, or to deeper groundwater.

5.5.3 A suitable arrangement might be a reedbed in an almost sealed basin, with slow discharge to an infiltration pond. The field just north west of the development site is lower than the site and falls towards woodland, which could serve to absorb nutrients in the unlikely event of a major failure during extreme weather.

5.6 Habitat mitigation and enhancement

5.6.1 The proposed works should have very little impact on habitat for wildlife. As there should be very little biodiversity impact from this scheme, a gain in habitat value can be easily achieved.

5.6.2 Options for habitat improvement include hedgerow planting around the house site, replacement of non-native shrubs with native species, new tree planting, and provision of bird or bat boxes on the mature trees. Planting schemes should take into account the browsing habits and long necks of the horses.

5.6.3 There is little benefit in planting advanced stock such as standard trees, since saplings will make fast early growth if planted carefully, whereas larger trees will be set back by transplanting. Any tree and shrub planting for biodiversity should be with locally appropriate native species, of British origin, rather than simply 'British provenance', and preferably with stock of local origin.

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Natural England: the Natural England website www.naturalengland.org.uk

This gives access to summaries of wildlife legislation, licensing forms and procedures, etc. and the current mitigation manuals for protected species.

NBN Atlas (National Biodiversity Network) www.nbnatlas.org

For the national database of records for protected and BAP species

Natural Resources Wales: the NRW website, www.naturalresources.wales This gives access to summaries of wildlife legislation, licensing forms and procedures, etc. In particular, advice concerning phosphorous sensitive rivers.

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Ordnance Survey current and historic mapping at 1:2,500 and smaller

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Annex 1: Habitat designations

Source	Information	Summary	Distance, direction & separation (nearest boundaries)	Potential Impact
COFNOD & MAGIC Designations	Statutory site designations	River Dee and Bala Lake SAC Site of international importance, Several EPS species	82m west, steep fall to river	Indicates significant risks from pollution during construction and operation, potential risks to EPS
		River Dee (Wales) SSSI, All of the river in Wales, site of national importance	82m west, river is 110m west and north, steep fall to river	Indicates significant risks from pollution during construction and operation
		Nant-y-Belan and Prynela Woods, 35ha. Ancient woodland, site of national importance	1km SE, lower than site, to river banks, 3.3km downstream, main area on opposite bank to site	Risk from pollution to margins of SSSI, rest is well separate
		Chirk Castle and Parkland SSSI, 308ha. Woodland and parkland, site of national importance	3.2km south west, on opposite side of river, near edge approx. 35m above site	Little likelihood of impact
		Ruabon / Llantysilio Mountains & Minera SSSI. About 4,800ha of upland habitat, site of national importance	4.7km NW, nearest side 100m above site	Little likelihood of impact
		River Dee (England) SSSI	3.6km SE, 5.8km downstream	Indicates significant risks from pollution during construction, additive risk during operation
		Dinas Bran SSSI, 40ha upland, site of national importance	6.5km W, 130m above site	Little likelihood of impact
		Nitrate vulnerable zones	Extensive, all round site	Indicates risks from incidental pollution during construction
COFNOD, Safleol	County level Wildlife Site	Ty Mawr & Tan y Cut Woodland, about 33ha, parkland, diverse grassland, ancient woodland	About 600m west of site, mostly on opposite side of the river, all upstream	Little likelihood of impact
	Listed habitat	26 ancient woodland sites, most restored or plantation, two ASNW		
BGS mapping	Soil types, geology	Slow draining slightly acid loamy soils on steep slope over glacial till	River Dee SAC close to site	Indicates pollution risks
OS mapping	Hydrology	River DEE SAC about 80m from site	80m W of site, river is at 110m, probably fed by ground and surface water	Indicates pollution risks

Annex 2 – Additional photographs



Bank to roadside & river, Newbridge beyond



Large oak near to site



Oak tree in hedgeline to east, tip beyond



Pigeon loft, scrub & tall herb (outside site & ownership)



Seep / flush in woodland to north, below tip site



Percolation test pit, January 2021



Woodland below road, to river



Spade pit, within new site



Former well, infilled

Annex 3

Notes on wildlife legislation, planning policy and protected species

SPECIES PROTECTION IN RELATION TO DEVELOPMENT

Survey for protected species can be lengthy, and may require site visits at particular times of the year. Survey may not be fully effective unless commissioned well before submission of a planning application. Large or complex sites, and sites likely to include the most important bat roosts, ideally need a survey period of 12 months or more.

Notes below refer to sites in Wales, while the species notes reflect the current situation in the English Midlands region, inland areas of Cheshire and eastern parts of the Welsh Border Counties.

These notes are not formal legal advice, which should be sought from members of the legal profession with specialist knowledge of wildlife law.

LEGAL CONSTRAINTS

There are three principal sources of legal protection for wildlife in the UK. The new Environment Act 2021 will have some impact on these, but is principally concerned with wider environment protection issues. The three sources are:

The Wildlife and Countryside Act 1981 (the WCA) with its amendments under statutory review every 5 years and by later Acts, particularly the Environmental Protection Act 1990, the Countryside and Rights of Way Act 2000 (the CROW Act) and the Natural Environment and Rural Communities Act 2006 (the NERC Act).

The WCA as amended gives protection to plant and animal species listed under its schedules 1, 5 & 8, and to designated sites, typically Sites of Special Scientific Interest (SSSI). Section 9 of the WCA lists offences including killing or injuring, uprooting, capturing, possession, disturbance, destruction of places of shelter, sale and associated activities. A species that is protected from all of the offences that might apply to it is described as 'fully protected', but if only some of the possible offences are applied then it is 'partially protected'. The level of protection given to a fully protected species is here described in relation to water voles (see below, in species notes). Schedule 9 (not Section 9) lists some invasive non-native plants such as Japanese knotweed; it may be an offence to cause these species to spread. Further details are given at the end of the species notes following this section.

The CROW Act makes most WCA offences into arrestable criminal offences, and includes offences committed 'recklessly' as well as deliberately. The concept of recklessness can relate to the level of responsibility due from an individual or organisation. It might be considered reckless if a developer, architect or other professional failed to seek specialist ecological advice.

Developers, development professionals, contractors and site workers all need to be aware that individual responsibility under the WCA always applies, and is not removed by any decision by a planning authority, nor by any advice from an ecological consultant, nor by any EPS mitigation licence.

The Conservation of Habitats and Species Regulations 2017 (as amended 2019), (the Habitats Regulations 2017) which consolidate The Conservation of Habitats and Species Regulations 2010 and later amendments, and prepare for EU exit.

The Habitat Regulations are similar in some aspects to the WCA, but put into UK law the European Habitats Directive. The Regulations include annexes that list species for protection, including but not limited to all bats, otters, dormice and great crested newts. All these species are currently known as European Protected Species (EPS). The main overall impact of the Regulations on development has been to require developers to commission ecological and protected species survey well in advance of planning decisions, and to establish a rigorous licensing process. Licenses may be granted to permit developments that would otherwise breach the Habitat Regulations.

The Habitat Regulations do provide the means of prosecuting individuals and organisations that commit offences against scheduled species and habitats, but their main effect is to place a duty on national and local government to ensure the survival of populations of these species and their habitats, through policy, legislation and the planning process. A judicial review has provided a judgement that planning authorities are expected to ensure that a development meets the requirements of the Habitats Regulations before granting planning consent. This applies whenever the likely presence of an EPS is a material consideration. (*Wooley vs Cheshire East Borough Council and Millennium Estates Ltd*, June 2009, see Natural England Statement)

The 2017 Regulations carry forward the amendments that led to the 2010 Regulations, which modified the definition of an 'offence' to make the Regulations consistent with the equivalent offence in the WCA 1981, and broadened the scope for proceeding without a licence. The 2010 Regulations did not allow the defence that harm was caused 'as an incidental result of a lawful operation and could not reasonably have been avoided', but did allow for legal low level disturbance provided that it does not '*Deliberately disturb animals of an EPS in such a way as to be likely to significantly*

affect 1) the ability of a population of that species to survive, breed or rear or nurture their young, or 2) the local distribution of the species.' The Regulations include protection for habitats that are important for hibernation and migration. They establish a requirement for ministerial approved guidance to clarify the scope of offences and to help developers consider whether their operations are likely to breach regulations & require licensing. Most importantly, the current DEFRA guidance (relating to the 2009 amendments) states that *'current changes retain the requirement that for the offence to be committed, the result of disturbance must affect important life cycle processes and so low level or inconsequential disturbance that does not have these impacts is not captured by the offence in these Regulations,'* and that *'in most cases it is not expected that an action which disturbed a single animal or a small number of animals would have sufficient impact to be caught by the offence'* unless that EPS were to become *'particularly rare'*. Updates to this guidance are likely to appear after 2019, in response to the new regulations and the emerging Environment Act.

The Protection of Badgers Act 1992 (The Badgers Act): The Badgers Act is intended to prevent deliberate cruelty and other actions that cause suffering to badgers, rather than to meet a conservation purpose. Badgers are common and widespread, with no apparent threat to the UK population as a whole. Potential causes of harm, disturbance or suffering are from construction work in the vicinity of their holes and loss of foraging area within the territory of a social group.

PLANNING POLICY

The Local Plan for a planning authority area is based on local needs and conditions, in relation to government policy expressed in Planning Policy Statements such as the National Planning Policy Framework 2019 document, Chapter 15, *Conserving and enhancing the natural environment*, Ministry of Housing Communities and Local Government 2019. In response to local values, the national policy documents, and other expressions of concern for nature conservation, local plans contain policies to protect biodiversity and habitat features of local and national importance. Local Plans are sometimes replaced by Local Development Framework document sets, which comprise a Core Strategy, Site Allocations or Area Plans, and Supplementary/Local Planning Documents. There is usually a separate SPD or LPG for Nature Conservation, stating policies and the level of mitigation expected.

The government has also provided a circular advising on statutory obligations to conserve biodiversity and geological features within the planning system, DCLG Circular 06/2005. Paragraph 99 of this states that *'It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted ...'*. Paragraph 99 goes on to affirm that survey and planning requirements must be proportionate to likelihood and risk.

The Natural Environment and Rural Communities Act 2006 and the Environment (Wales) Act place a duty to conserve biodiversity on all public authorities. The Environment Act 2021 strengthens this. Local planning authorities will respond to this through the implementation of policies and procedures. The NPPF includes a requirement for local authorities to seek benefits to local biodiversity as a planning gain from any planning consents.

National and local organisations, including local government, have developed national and local Biodiversity Action Plans (BAP). These include action plans to conserve named species, which may or may not receive statutory protection. The UK BAP is no longer current, replaced by the UK Habitats Framework 2010. The present focus of UK policy is on landscape scale habitat improvement. National (England, Scotland & Wales) policies are in place, these reference Priority Species and Habitats. Paragraph 84 of the DCLG Circular and the NERC Act makes it clear that, in addition to legal provisions, UK and Local Biodiversity Action Plan habitats and species or their equivalents are a material consideration in planning decisions and therefore require the same scrutiny.

As a consequence of the Wooley vs Cheshire East decision, planning authorities now seek a higher level of survey information and mitigation detail, approaching that required for an EPS licence application, before planning consent is granted. This means that it is even more important to start the ecological survey process at the very beginning of a project, which will allow the likely costs of full survey and mitigation to be determined, and can allow enough time to gather complete survey data in the appropriate season.

Planning authorities may now expect to be provided with evidence that ecological survey work has made significant progress before they will validate a planning application. This may take the form of a scoping report or an initial survey report.

LICENSING

Licences from Natural England are needed where a development will have a direct adverse impact on EPS and some other species, or where there is potential for significant impact on a local population. Licences in effect permit some otherwise illegal actions under strict conditions. The licensing process is lengthy and demanding in the case of

European Protected Species, and is not part of planning consent. Licences may be needed for other work that does not require planning consent. Natural England grants EPS licences for projects in England, and will not consider an application until outline consent has been given, if consent is needed. The licence itself will not normally be granted until full planning permission has been given. Licensing authorities expect that licence applications should be based on extensive survey of the local population. Some different arrangements may apply in the case of major public projects and projects that will take place in phases over several years.

SPECIES

Badgers

Badgers are protected under the Badgers Act, from activities that can cause suffering. Vibration from construction plant can cause disturbance, and possibly the collapse of holes. Past Natural England guidelines have suggested that development needs licensing if it involves work within certain distances of a sett (any permanent place of shelter, typically 1 or more holes): heavy construction plant within 30m, light plant within 20m, and hand tools within 10m. Current advice is that the potential impact should be assessed on a site specific basis by an experienced ecologist or a badger specialist. Pile driving and similar operations always need site specific consideration.

Loss of foraging area may be an important factor – badger social groups (clans) probably need at least 3.5ha of permanent grassland or an equivalent woodland resource. Where there are close spaced clans a development project may result in starvation or injury from fighting. Survey should take place in winter, but may need to continue up to the start of development. Licenses are not granted for any actions taking place during the breeding season (1st December – 30th June).

Bat species

All 18 British bat species have EPS status, protected under the WCA and the Habitat Regulations. Bats use a sequence of roosts in an annual cycle, for shelter and breeding. Roost requirements differ between species and suitable roosts are used repeatedly; particular roosts may be critical for the survival of a local population. Legal protection can therefore cover roosts even when they are not occupied. Roost sites include hollows and smaller flaws in trees, roof spaces in houses and other buildings, walls with insulation cavities, wall cladding, cracks and hollows, and caves, cellars and mines. Recently built properties may be used, and most traditional concepts of bat roosts and behaviour are misleading.

Initial bat surveys to check for unknown roosts can take place at any time, but may be less effective in winter, while 'likely absence' often cannot be determined without activity survey involving several visits between May and September. A site with bat activity in the vicinity and suitable roost features, or key habitat features around it, will need careful investigation.

Otters

Otters have EPS status, protected under the WCA and the Habitat Regulations. They are solitary and territorial, typically marking several kilometres of a watercourse as a territory. Otters hunt for fish in water but often travel on land and may move away from the sides of watercourses. They may also use canals. Development issues often centre on not severing territories or dispersal routes, not causing disturbance at night and not disturbing otter holts. Survey can be at any time, but is less reliable in winter.

Dormice

The native Hazel Dormouse has EPS status, protected under the WCA and the Habitat Regulations. They typically occupy areas of dense old woodland and networks of dense hedgerows where there is high species and structural diversity, but are not restricted to these habitats. They avoid open ground, but spread along hedges and woodland edges. Dormice presence should be considered in any scheme that involves removal of hedgerows, woodland or dense undergrowth in areas that are linked by similar habitat to old hedgerow networks and woodlands.

Survey is difficult, and effective survey may be restricted to autumn and winter or require long-term methods.

Water Voles

Water voles received limited legal protection under the WCA in 1998, but the protection was extended in 2008, so the water vole is now fully protected under Section 9. It is an offence to intentionally kill, injure or take (capture) a water vole; possess or control a 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 water voles use for shelter or protection or disturb water voles while they are using such a place; sell, offer for sale or advertise for live or dead water voles.

There is no provision under the WCA for licensing what would otherwise be offences for the purpose of development, maintenance or land management. Such activities must be covered by the formal defence that permits otherwise illegal actions if they are an incidental result of a lawful operation and could not reasonably be avoided. The defence requires that reasonable steps are taken to avoid unnecessary harm or damage. For developers, this can best be achieved by undertaking a water vole survey at the appropriate time prior to planning any work and ensuring that appropriate avoidance or mitigation measures are included in the proposals. Survey can take place throughout the year, but is less reliable in winter. Water voles need sloping earth banks on the sides of water bodies, a good mix of plant food, and refuge from high water levels. The introduced American mink is a critically significant predator, which limits the distribution of water voles.

Fully protected bird species

About 80 bird species are listed in Schedule 1 of the WCA; these are in effect fully protected species. The great majority of these are limited to a few areas of Britain, typically in mountainous, wetland or coastal habitats. There are 3 winter migrant species that can occur throughout Britain; brambling, fieldfare, and redwing. These may occasionally breed in parts of the UK including the West Midlands conurbation, but are unlikely to be an additional issue in development schemes. A further 4 species breed in lowland England and may occur on or close to development sites; kingfisher, barn owl, black redstart and little ringed plover. These all have particular requirements for their breeding sites. Little ringed plover presents a particular problem as it selects nest sites on gravel close to open water. This habitat can be created accidentally in the course of construction work.

Breeding birds

All birds are protected while breeding in the UK, under the WCA. They are protected from killing, injuring, disturbance, destruction of nests and nest sites, and from the taking of eggs. Almost any habitat will provide potential nest sites for some species, including temporary habitat created by construction work. This potentially imposes a severe constraint on development, but the constraint can be avoided by careful timing of site clearance and good site management. Sites should be cleared of cover between late August and early March. Other conservation issues mean that the best periods for site clearance are late September to the end of October, or mid February to early March.

Reptiles

Grass snake, adder, slow worm, and common lizard are widespread reptile species that are partially protected under the WCA. Their protection is against killing, injuring and sale. 'Fear of snakes' is not an acceptable reason for harming any reptiles, and provides no defence against prosecution. These species are often listed in Biodiversity Action Plans, and thus may be a planning issue requiring precautions and habitat mitigation. Survey is not effective in winter, and full survey can be time consuming.

For reptile species the conditions that apply to the 'incidental result' defence (see water vole notes) are particularly relevant; reasonable effort has to be made to avoid harming them. Because they are hard to find and seek shelter when disturbed it is usually necessary to capture and remove them before development begins.

Two fully protected reptiles, smooth snake and sand lizard, are limited to sites in the south of England and to western coastal areas.

Great crested newts

Great crested newts have EPS status, fully protected under the WCA and the Habitat Regulations.

They are amphibians that breed in water but hibernate and forage on land. Typical breeding ponds are small, fish free, with aquatic vegetation, and close to other similar ponds. Good land habitat has areas of dense vegetation and hedge banks or loose material that provide shelter. Populations are often localised, and newts may use habitat that is not particularly favourable. They generally remain within 100m of breeding ponds, but can spread further, with 500m being the generally accepted limit.

Survey can take place between mid February and mid September, but the March to June period is most important. Considerable survey effort may be needed to show that newts are probably absent from any site with or close to suitable ponds.

One survey option is environmental DNA testing (eDNA) of water samples from the pond, with sampling carried out by a gcN survey licence holder between mid April and the end of June. A 'not present' result is not as definite a proof of absence as a nil return from a full trapping and torching programme, but may be accepted by planning authorities.

Other amphibians

Natterjack toad, a European Protected Species, is rare and appears to be limited to a few known sites. The pool frog, which is an EPS as of October 2008, currently has limited populations found in a very few known sites in the UK.

Common frog, common toad, smooth newts and palmate newts all have partial protection under the WCA, from sale and associated activities only. Populations in urban areas may be vulnerable, so are included in some local Biodiversity Action Plans.

White clawed crayfish

The endangered native crayfish is partially protected, from taking and sale. Non-native species carry a disease that is fatal to the native species, so must not be introduced or returned to any water bodies, and if taken must be killed. This means that any 'capture' of a crayfish can result in an offence, and accidental introduction of non-native crayfish or their diseases must be avoided. Native populations are now restricted to some streams, large pools and isolated sections of canal. Licences are needed for most forms of survey, which is effectively limited to the April to October period.

Other fully protected species

There are many more plant and animal species that have EPS status or fully protected status, including for example some fish, rare aquatic plants, and some beetles and lichens associated with veteran trees. These species, such as the floating water plantain, violet click beetle and the pearl mussel are usually restricted to known and protected sites.

Other priority, BAP and listed species

Planning policies often include protection for UK Priority species and local BAP species, and as a planning matter this protection will relate to their habitat rather than the individual organisms. This protection may also extend to 'red data book' species, 'birds of conservation concern' (British Trust for Ornithology listing) and UK rare or notable species. Some local BAP plans also have broad categories such as 'all solitary wasps and bees', 'farmland birds' or 'all wild native orchids'. Many of these species are well known, such as skylarks, lapwings and fritillary butterflies, but others are very obscure and would not normally be considered in a pre-planning ecological survey. In general, any planning application that affects old trees, long-established woodland, wetland, hedgerows and heathland, and diverse grassland of any age on thin soils, needs to protect these habitats as far as possible.

Plant species

The sites where protected, rare or valued plants are found have mostly been recorded and would be reported in record searches, but care needs to be taken around relatively unimproved or undisturbed habitats. No plants should be uprooted or parts of plants collected without the owner's permission.

There is a minor issue concerning bluebells; the true wild native bluebell is protected against commercial harvesting, through protection against sale under the WCA. Hybrid bluebells are often found growing wild, but true native populations should be conserved and where unavoidably dug up in the course of development should not be traded in any way.

Schedule 9 plant species

These are certain invasive non-native plants that can cause serious harm to semi-natural habitats. Japanese knotweed is the classic example and has been on the schedule for many years, but the schedule has been expanded in recent years to include several water plants sold by nurseries as 'oxygenating plants', and some shrubs commonly used in landscape schemes, including five cotoneaster shrubs.

It is in effect an offence to remove any part of these plants in a live condition from a development site without special provision for handling and disposing of them; soil and rubbish or brash including their live roots and shoots are best considered as a form of toxic waste and can incur high tip charges. Destruction or eradication on site, before work begins, is the best approach. In the case of Japanese knotweed this can take several years, and in the case of water plants ponds may need to be completely drained down.

Sources of information

The most reliable information comes from the websites of government organisations, government sponsored organisations and local government:

Natural England: www.gov.uk/government/organisations/naturalengland/services-information

Natural Resources Wales: www.naturalresourceswales/protected species

The NRW site provides additional information about different licensing arrangements in Wales

Scottish Natural Heritage: www.snh.gov.uk species licensing section

Scottish law is a little different, but the SNH website provides some very clear summaries of the protected species issues

For all of the above it is easiest to simply do an online search, inputting the name of the organisation and 'protected species', although it is worthwhile to look at the wider information around species conservation.

Local government websites contain planning advice and usually have links to their nature conservation SPD and the local biodiversity action plan. The local BAP can be accessed by searching on the city or county name and 'BAP'.

www.nonnativespecies.org is a government sponsored body and provides very good information on invasive species, although it is not specifically aimed at development-related issues

Some conservation organisations are very scientific in their approach and their websites provide sound information on the various species involved:

www.arctrust.org/planning for amphibians and reptiles

www.bats.org.uk go to planning through 'search' or 'I am looking for' and to 'about bats' for species details

www.bto.org and go to 'bird facts' for species information

And, finally:

Stories about protected species in the national and local media, and in magazines aimed at particular interest groups, are very often misleading and wrong in many details. Easy target, cheap headlines, they are not going to get sued by a newt.

These notes are presented as the view of ecologists, based on the understanding of wildlife law and planning policy gained in the course of that work and on advice given in various official publications. These notes are not formal legal advice, which should be sought from members of the legal profession with specialist knowledge of wildlife law.