Land at Chepstow Road
Raglan
Monmouthshire

An Ecological Survey Report By:

Just MAMMALS Consultancy
Limited Liability Partnership

On Behalf Of:

monmouthshire
sir fynwy

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1 Executive Summary

1.1 An outline planning application for development of residential housing on land at Chepstow Road, Raglan, is being prepared by the present owners – Monmouthshire County Council. To support the proposals, an extended Phase 1 habitat survey was undertaken in July 2013, by an independent experienced ecologist. As no progress with the proposed development had occurred in the intervening period, an update survey was commissioned and carried out in August 2017.

1.2 Following consultation with the planning team further site assessment was conducted in February 2018, intended primarily to identify the potential for bats to be roosting in mature trees on or overhanging the site, and to consider the possible impacts on badgers or reptiles. As more detailed assessment has been undertaken, this ecological survey report details the collective data gathered in the past 4 years, whilst also taking into account the information contained within a dedicated biological data search.

1.3 The site is divided into two fields, both un-grazed, but mown at the time of the initial survey in 2013. A hedge is located along the eastern boundary, and the site abuts a small water course, the Nant y Wilcae, in the south. A total of 67 species of common and wide-spread plants were found, and the site is considered to be of medium ecological value. The update survey in 2017, concluded that the site still holds the same ecological value as in 2013. Appraisal in 2018 was focussed on bats in trees, and badgers – easier to assessed in winter when vegetation is supressed or leaves are absent from trees. Further assessment for reptiles was also considered, although no records were found to be present in the immediate vicinity in the record search.

1.4 Separate assessments have been made of the Nant y Wilcae for otters and native crayfish (see separate report). The southern part of the site is within flood plain, and consequently the development proposals are largely confined to the northern portion of the site. Nonetheless, the riparian corridor is recognised at being significant for a number of species, and careful design of any development will help retain the ecological value of the site. Appropriate recommendations are therefore made in this report.

1.5 A hedgerow along the western boundary is likely to be suitable for dormice, but additional survey is not recommended at this time as the low density presence of these animals is unlikely to be determined by traditional survey techniques in this instance. The site has some potential to be used by reptiles (despite the total absence of records within 2km). Lack of ongoing regular management is providing undisturbed and undeveloped grassland. Small piles of debris are present, which could be used by reptiles, and these would have to be removed from site by hand, in case these are being used by animals for shelter.

1.6 Great crested newts have been recorded in the wider area, and a population has previously been identified to the north-east of the proposed development. However, between the Chepstow Road site and the identified great crested newt site are two roads, another watercourse and several buildings and hard standing/surfaced car parks – suggesting that dispersal between the two sites would be problematic for these animals.

1.7 Birds are likely to be nesting on site, therefore it is recommended to undertake any development work outside the breeding season for birds, which is recognised as the period between the months of March to August inclusive. Where this is not possible, an Ecological Clerk of Works will have to be in attendance when work is being carried out.

1.8 The alien invasive plant species Himalayan balsam is widespread on the site, although focussed along the Nant y Wilcae. Provision of a buffer zone as part of the development is also recommended for this reason too. Total eradication of this invasive species is unlikely to be achieved due to the high level of incursion by this plant on the surrounding land, but where undertaken, might free up the stream bank for amenity purposes.

2 Introduction

2.1 Planning permission is being sought for land off Chepstow Road, Raglan. Development will be for residential housing, the exact number of units not being defined at this point in time. As part of the site lies within the floodplain of an adjacent water course, some of the site will be left undeveloped, apart from a potential amenity or play area. The site, which is 2.08ha in size, lies at National Grid Reference (NGR) SO 4134 0738, at an altitude of approximately 37m Above Ordnance Datum.

2.2 The site is divided into two fields, and is currently unused. In order to assess the ecological value of the site, and the potential for protected species to be present, the Just Mammals Consultancy LLP, was commissioned to carry out an extended Phase 1 habitat assessment. A preliminary ecological appraisal/extended Phase 1 habitat survey was carried out in 2013, and an update survey was carried out in 2017, in order to assess whether the ecological conditions on site remained the same.

2.3 Different types of habitat were assessed, and the potential presence of protected species, such as badgers (*Meles meles*), bats, dormice (*Muscardinus avellanarius*), reptiles and amphibians, as well as nesting birds was considered. This report details the findings of the site assessment. Additionally, it makes recommendations concerning the ecological value of the site as well as the need for further survey work as appropriate. However, it must be read in conjunction with a separate report which sets out the findings of targeted assessments of bat foraging and commuting activity on the site, and appraisal of the Nany y Wilcae brook for native crayfish (*Austropotamobius pallipes*) and otters (*Lutra lutra*).

2.4 Further focussed site assessment was carried out in February 2018 – concentrating on bats in trees (due to the absence of leaves), badgers (again due to the supressed vegetation growth) and reptile potential. Given the level of site assessment that has now been undertaken, it is appropriate to define this document as an ecological survey report.

3 Survey Team Experience

3.1 Surveyor, both for the original appraisal, and the 2017 update, was Carola Hoskins, who is also the co-author of this report. Carola holds an MSc in Environmental Conservation Management and has practical expertise with bats, birds, botanical assessments, mammalian and reptile surveys, both in Britain and overseas. As well as assisting in conservation-based research, she has carried out biodiversity audits and ecological enquiries. Carola has completed a study of water voles and is currently assisting with bird ringing. When Carola undertook the original survey she was a Graduate Member of the Chartered Institute of Ecology and Environmental Management (Grad CIEEM), but at the time of the August 2017, this had been upgraded to Associate Member (ACIEEM). Carola is a Senior Ecologist with the Just Mammals Consultancy LLP.

3.2 A third site assessment, focussing on mammals and reptiles (February 2018), was undertaken by Phil Morgan, who co-authored this report. Phil is a Principal Ecologist with the Just Mammals Consultancy LLP, and has been practicing for over 35 years as a professional ecologist. He has extensive experience of undertaking reptile surveys and has had an interest in Herpetiles since his childhood. Phil was the former ecologist for Dŵr Cymru Welsh Water, and over the past seventeen years has been an independent consultant. In addition, over the past four decades he has undertaken numerous assessments of trees and built structures for the presence of bats, and holds a Natural Resources Wales bat trainers licence. He has extensive experience of undertaking badger surveys, and in 1989 made a significant contribution to a Bristol University run National Badger Sett Survey, which helped establish now widely accepted survey methodologies. In addition, Phil undertook survey of the Severn, Wye, Usk and Taff catchments in 2002, for the Otter Survey of Wales, and undertook a research project into the distribution of otter breeding sites on the Usk catchment in 2004. Phil is a Member of the Chartered Institute of Ecology and Environmental Management (CIEEM), and is registered as a Chartered Environmentalist with the Society for the Environment (CEnv).

4 Survey Methodology

4.1 A botanical and habitat survey, and assessment for the presence and potential presence of protected species, was carried out on Tuesday the 30th of July 2013. The update survey was carried out on Wednesday the 16th of August 2017. A specific visit to inspect trees for their potential to be used by bats, badger setts and reptile habitat was also undertaken on Thursday the 1st of February 2018, when there were few or no leaves on the trees to impair assessment. Details of the survey activities and weather conditions are provided below in Table 2.

4.2 During both the 2013 and 2017 survey visits, the site was walked over recording all plant species and features on a custom-made recording sheet. Habitats and notes were drawn onto a map of the survey site and digital camera photographs were taken. A coloured Phase 1 habitat map was produced, which can be found in Appendix III, and a list of plant species was recorded, as well as casual records of wildlife, which are shown in Appendix IV.

4.3 Assessment for the presence or potential presence of protected species, including bats, badgers, otters, dormice, reptiles and amphibians, was undertaken by considering the features of the site. Such features include grassland, hedgerows, buildings and trees. The potential suitability of the site for nesting birds was also considered.

4.4 The trees on site, or where substantially over hanging the boundary of the site, were assessed on three separate occasions against a six point 'risk scale' which is set out below in Table 1. The third assessment of the trees was undertaken in February 2018, when there were no leaves which might hide usable features which bats could utilise for roosting purposes.

Table 1: Trees and Potential to Support Bat Roosts

Risk Scale	Level of Risk	Reasons for Assessed Risk
1	None	No features which bats could use
2	Minimal	Some light ivy growth or shallow cavities, bark damage
3	Minor Risk	Loose bark, moderate ivy growth some small broken branches
4	Potential Roost	Deep slot crevices, trunk or limb/branch cavities, dense ivy growth
5	Probable Roost	Deep slot crevices, trunk or limb/branch cavities with staining
6	Bat Roost	Actual bat or evidence of bat presence (e.g. bat droppings)

4.5 When considering the likelihood of bats using the trees, the surveyor was not concerned with the size of the overall tree or its trunk diameter as even quite small trees can be used for roosting activity. Tree health is considered to be a much better indicator of the likely use by bats, as these animals have no means of making holes in wood themselves. Instead they are reliant on naturally occurring cavities caused by rot or wind damage; holes made by other species such as woodpeckers; branches or limbs damaged by vehicles or other artificial means; growth of ivy (*Hedera helix*); and loose bark on trunks. As can be seen from Table 1, the assessment scores these natural features in establishing the chance that bats will be able to exploit them.

4.6 As indicated above, each tree is assessed in turn, and ascribed a reference number (e.g. T1). Where trees have multiple trunks from a common base, the tree may be included as one reference. On other occasions, where there is a close grouping of trees, these may also be included under the same reference as a group. Table 7 (see Appendix V), lists all of the trees examined as part of the tree assessment and Figure 3 (see Appendix VI), shows the approximate position of the trees appraised.

5 Site Description

5.1 Situated on the outskirts of Raglan, along Chepstow Road, the site has a semi-urban character. It is made up of two fields of grassland; fencing suggests historic use for grazing animals. The site is level and covers a total area of just over two hectares. There is no evidence of previous development or usage for anything other than agricultural purposes, beyond the remnant base of a former large shed to the rear of the former Brooks Farm.

5.2 Boundaries of the site are mainly fences and hedgerows. The site is fenced off against housing (the former Brooks Farm), at the south-eastern edge. A fence/hedgerow runs along the boundary of the site with Chepstow Road, to the east. Where the site abuts the housing along Fayre Oaks, to the north, a fence runs along it, which continues along the western side of the property, where again, housing is the adjacent land use. In the south, a small water course, the Nant y Wilcae, comprises the boundary of the site. A wire fence separates the two fields.

6 Desktop Study

6.1 A desk top study was commissioned from the South East Wales Biodiversity Record Centre (SEWBReC), for a 2km radius around the proposed development site (Unique reference code 0178-579). This returned details of 444 priority and protected species, covering a wide variety of animal groups – but mainly bird species.

6.2 None of the records relate to the development site itself, with the nearest record, relating to song thrush (*Turdus philomelos*) being some 66m distant. There are no records of bats relating to the site, although a number of species have been noted within 2km, including both common pipistrelle bat (*Pipistrellus pipistrellus*), and soprano pipistrelle bat (*Pipistrellus pygmaeus*), as well as brown long-eared bat (*Plecotus auritus*), noctule bat (*Nyctalus noctula*), Daubenton's bat (*Myotis daubentonii*), Natterer's bat (*Myotis nattereri*), whiskered bat (*Myotis mystacinus*), Brandt's bat (*Myotis brandtii*), greater horseshoe bat (*Rhinolophus ferrumequinum*), and lesser horseshoe bat (*Rhinolophus hipposideros*). There are only two previous records for hedgehog (*Erinaceus*

europaeus) in the 2km search area – suggesting that this species is scarce in the area. Many of these records have been provided by the Just Mammals Consultancy LLP.

6.3 There are ten records of badger, but the majority of these relate to road casualties. Similarly, the four of the five historic records of otter, relate to road casualties on the A40 trunk road. The nearest record of common or hazel dormouse is some 1.5km distant, on the verges of the aforementioned A40 trunk road.

6.4 With respect to reptiles, there is only one previous recording in the area, when a grass snake (*Natrix helvetica*) was recorded some 2.2km from the development site in 2016. There are no records of other snakes or lizards, particularly slow-worm (*Anguis fragilis*).

6.5 Four species of amphibian have been noted within the search area, including common frog (*Rana temporaria*), smooth newt (*Lissotriton vulgaris*), palmate newt (*Lissotriton helveticus*), and several instances of great crested newt (*Triturus cristatus*). Only one of the great crested newt records lies within 500m of the development site, a pond some 395m to the north-east (closest point between pond and site boundary). This site is separated from the study area by both Chepstow Road, Station Road, and Barton Brook. There are also several built structures between the two locations.

6.6 No part of the site is within a statutory designated site of conservation value (e.g. a Site of Special Scientific Interest (SSSI); Special Area of Conservation (SAC); Special Protection Area (SPA); or National Nature Reserve (NNR)). A search within a buffer zone of 2km around the site revealed no such designated sites to be in the area.

6.7 The data search disclosed the presence of four Sites of Importance for Nature Conservation (SINC) within the 2km search radius, these being Cuckoo Row Meadow, some 1.8km to the north-east; Broom House Meadows, approximately 1.1km to the south-west; Carreg Wen, roughly 1.8km south-east; and Llannant Farm, some 1.9km to the east. It is not likely that these sites would be affected by development of the study site.

7 Survey Constraints

7.1 There were no constraints to the survey. Vegetation growth is mature. Access to the site was possible at all times both in 2013 and 2017.

8 Survey Results

8.1 Initial appraisal was undertaken on Tuesday the 30th of July 2013 by an experienced ecologist. Update survey was undertaken on Wednesday the 16th of August 2017, by the same ecologist. Details of the conditions under which survey was carried out are given in Table 2 below. Wind speeds given employ the Beaufort scale. Results of the survey efforts are separated by year.

Table 2: Summary of Survey Activity and Weather Conditions

Survey Type and Location	Dates	Timing	Weather Conditions
Day time visual inspection, botanical survey and habitat assessment, including protected species assessment (CH)	30/07/2013	10.50 – 13:10 hours British Summer Time (BST)	Air temperature: 31.8°C Cloud cover: 4/8 oktas Wind speed: F2, light breeze Conditions: Dry
Day time visual inspection, botanical survey and habitat assessment, including protected species assessment (CH)	16/08/2017	12.00 – 13:00 hours BST	Air temperature: 15°C Cloud cover: 5/8 oktas Wind speed: F2, light breeze Conditions: Dry
Day time visual inspection of trees, and general reassessment of mammal and reptile interest (PM)	01/02/2018	12.00 – 13.15 hours Greenwich Mean Time (GMT)	Air temperature: 6.5°C Cloud cover: 2/8 oktas Wind speed: F3, gentle breeze Conditions: Dry
Surveyor	Carola Hoskins (CH); Phil Morgan (PM)		

8.2 The site was divided into three different types of habitat for recording purposes. Table 3 below provides details of the various habitats and the species present in each of them.

Table 3: Summary of Phase 1 Habitat Notes

Habitat	Phase 1 Classification	Description of Area and Typical Species
Type 1	B2.2 Semi-improved neutral grassland	Both fields have a similar species composition with grasses making up most of the ground cover and some common forb species scattered in between. Dominant species are Cock's foot (*Dactylis glomerata*) and Yorkshire fog (*Holcus lanatus*). Also present are Perennial Rye-

		grass (*Lolium perenne*), creeping buttercup (*Ranunculus repens*) and pineappleweed (*Matricaria discoidea*). **Target note:** Some Himalayan balsam (*Impatiens glandulifera*) has spread from the water course into the grassland area.
Type 2	J2.1.1 Intact native, species-rich hedge	The hedge is made up of native species and intact. It runs along the eastern side of the property parallel with Chepstow Road and then along the boundary with the housing that was The Brooks Farm. It is approximately 1.5m wide and 2.5m high. Dominant species are hawthorn (*Crataegus monogyna*) and hazel (*Corylus avellana*). Also present are ash (*Fraxinus excelsior*) and bramble (*Rubus fruticosus*). **Target note:** Himalayan balsam has spread from the water course and is colonising along the hedgerow.
Type 3	A3.1 Scattered trees: tree line	Along the water course, the riparian corridor is mainly a tree line. The corridor is only about 5m wide; the trees are of a height of up to 10m. Ground vegetation is mainly of tall ruderal nature. Tree species present include alder (*Alnus glutinosa*) and willow (*Salix sp.*). Also present are meadowsweet (*Filipendula ulmaria*) and bramble. **Target note:** Himalayan balsam is present in large quantities along the riparian corridor and makes up the majority of the ground vegetation beneath the tree line. The invasion extends beyond the watercourse and beyond the site to the east and west.

8.3 A coloured Phase 1 habitat map was produced (see Appendix III). A total of 67 species of plants were recorded during the survey, as well as casual records of four birds and a number of other species. The site is considered to be of moderate ecological interest. A full list of the species of plant found are given in Table 6 (see Appendix IV).

8.4 Both fields are recently mown to a short sward height of approximately 20cm. The arisings have been left on site. The hedgerow along the eastern end is of a height of approximately 2.5m, and interrupted in the middle by what was the former Brooks Farm, and is now housing. Connectivity is limited to the north where the main urban concentration of Raglan begins. To the south, the hedge connects to the riparian strip of woodland running along the southern end of the property, bordering the Nant y Wilcae watercourse.

8.5 Ecological assessment included consideration of the potential for protected species to be present on site. Bats use trees for roosting purposes and wooded areas for feeding purposes. The initial and follow up assessments of the site judged that none of the trees on site had any major cavities or rot holes conducive to usage by bats. However, following a request from the County Planning Ecologist, another assessment of the trees was undertaken in February 2018, when there were few or no leaves on the trees. That survey, the results of which are given in Table 7, also found no evidence that the trees present on or overhanging the site could be exploited by bats for regular roosting. There are no buildings on site that bats could be using for roosting purposes. It is likely that some foraging activity occurs over the site and that the riparian corridor is being used for commuting purposes.

8.6 Reptiles and amphibians use various kinds of habitat, including green spaces within urban surroundings. There are some potential foraging opportunities for reptiles on site; the watercourse along the southern end could potentially present hunting opportunities for grass snakes. There is little shelter available on the development site though, and the close mowing of the grassland has likely discouraged reptile use of the development site. Two small piles of medium-sized rubble could potentially provide places of shelter for reptiles and amphibians.

8.7 The nearest known great crested newt (GCN) site is some 395m north-east of the most north-easterly edge of the proposed development site. Between the two locations are Chepstow Road, Station Road and Barton Brook, as well as several built structures, included car park areas. The nearest other site, to the south or west of the site, with no obvious significant barriers between is some 1.5km distant. Whilst the habitat on site would be suitable for newts to cross, and to forage upon, the absence of records nearer to the site suggest that GCN are unlikely to be present.

8.8 Badgers will inhabit semi-urban agricultural land, and it is not unknown for them to access domestic gardens where suitable forage habitat can be found. Characteristic field signs of badgers are latrines dug into the ground where clan groups deposit their dung, as well as badger setts, tunnel

systems with multiple entrances. Badgers, as a fairly large animal, also leave obvious runs in the vegetation, particularly along well established routes. No such features were identified within the proposed development site during the various appraisals – although a sett outside this area was identified in 2014.

8.9 During the February 2018 visit, the badger interest on the site was reassessed, being a suitable time of year to do so, with supressed vegetation. A large main badger sett (15+ entrances), is located to the south of the survey area, well over 100m from any proposed construction works. Any animals using this sett have access to fields to the south-west, south, and south-east, once they have crossed Chepstow Road. No runs were identified on the proposed development site, and there is little north-bound connectivity, and no obvious pathways in that direction. Although there is no barrier to animals crossing the road to the north, or indeed the Nant y Wilcae, there seems little motivation for an animal to actually do so. Pathways from this sett were identified, and appear to head off in all directions.

8.10 Hazel dormice make use of hedgerows where these are mature and provide sufficient foraging opportunity. Presence of these animals is indicated by nests found in the hedgerows and nuts opened in a way characteristic to the species. No evidence of dormice was found during the survey.

8.11 Otters inhabit riparian corridors of medium to large streams and will sometimes expand their territories onto smaller streams or use these for commuting purposes. No evidence of otters in form of footprints, spraints or holts, was found during this initial survey, although evidence for presence was established in a separate targeted survey (see separate report). The water course is relatively small and shallow along most of its length.

8.12 Water voles (*Arvicola amphibius*) can be found along slow-flowing small-medium-sized water courses, as well as lakes and ponds. They require dense ground vegetation and certain food species of plant, none of which are available at this site.

8.13 Consideration was made of the potential of the stream to be used by white clawed crayfish (*Austropotamobius pallipes*). As noted above the stream is relatively small and shallow, and in places there are deposits of silt. Whilst the banks are eroded and potential is limited for the species, it is possible that this species is present on the water course.

8.14 Large quantities of Himalayan balsam (*Impatiens glandulifera*) were found present on site in 2013. As is usual for this species, it colonises along the riparian corridor, to the exclusion of all other ground level vegetation, and it is now spreading along the hedgerow and into the field in places. Growth appeared slightly reduced in 2017, but not significantly so.

8.15 A number of birds were observed to be using the site during the survey. The hedgerow and tree line are both suitable for nesting purposes. The open fields were used for foraging purposes by insect-feeders. No nests were observed during the survey, but it is very likely the site is used for breeding purposes.

8.16 The update survey in 2017 revealed no significant changes to the site or its ecological value. Less Himalayan balsam was present on site than in 2013, but still occurs, especially along the water course. The spread into the grassland area is however considerably less, and presumably an eradication effort has been carried out.

8.17 In terms of suitability for protected species, the site remains the same as it was in 2013. The suitability of the water course for otter and crayfish still remains the same, and an update survey was carried out at the same time, which is detailed in a separate report. The other ecological features of the site have not changed, and the riparian habitat is an important corridor as per the above.

9 Discussion and Conclusions

9.1 The fields at Chepstow Road are of moderate interest to wildlife; the main grassland areas less so than the hedges. The riparian corridor offers some potential for wild animals and must not be disturbed as a consequence of any development, even acknowledging that both Chepstow Road, to the east, and the housing to the west, have already significantly encroached on the integrity of this corridor. As currently proposed, as a flood plain, the riparian corridor and its surroundings will be afforded some limited protection, within the development, which will also benefit wildlife. As proposed a buffer zone of approximately 60m depth will be provided.

9.2 Common and often ruderal species are present. The grassland is dominated by grass species and a limited diversity of herb species. Having recently been mown in 2013, the grassland held very limited interest for wildlife. Even so, a number of insects such as crickets and butterflies were observed, including comma (*Polygonia c-album*), and meadow brown (*Maniola jurtina*). During the 2017 survey the grass was significantly taller, although diversity of species remained largely the same. The hedges are mature and intact and provide foraging and commuting corridors for a number of species, including bats. The same holds true for the riparian corridor.

9.3 Protected species were considered during both surveys. There is no potential for the proposed development site to be used by bats for roosting. Indeed the trees on the site, and overhanging the site were appraised on three separate occasions, by two different, but experienced ecologists, and no evidence was found to indicate that any of them had potential to be used by bats.

9.4 The riparian corridor and hedgerows at the southern end of the site are likely used for bat commuting purposes and feeding, and some of the trees are suitable for roosting purposes. Any lighting scheme of the new development will have an impact on the usage of these corridors by bats as well as other species, such as otters. Even acknowledging that a buffer zone will exist between the brook and the development, sensitive lighting will still be needed.

9.5 No evidence, such as latrines or setts, to suggest the presence of badgers on the development site was found during any of the surveys. However, the otter and crayfish survey both in 2014 and 2017, revealed a large badger main sett to be present on the opposite bank of the stream, with well-established links to and presumably also through the Nant y Wilcae. The site is therefore likely to be used by this badger clan for foraging purposes on a regular basis. The fields do not offer resting places for badgers, and as noted above, there are no setts in these areas.

9.6 The hazel dormouse is a species that has had considerable conservation effort directed towards it, yet the true distribution and size of the British is still somewhat unknown. The hedges and riparian trees bounding the site offer suitable habitat for these animals, and their presence cannot be totally dismissed. However, there is little woodland in the surrounding area – which would be an important reservoir for the species – so if they are present, it is likely to be at very low densities, and therefore difficult to determine. Whilst there are dormice along the A40 trunk road, there is no obvious link joining the road and the development site – the urban conurbation of Raglan representing a somewhat large barrier between the two.

9.7 Otters are now considered to be present along every water course in Wales. The Otter Survey of Wales in 2002 found that the Usk catchment (which the Nant y Wilcae, and the connected Olway Brook, form a part of), was comprehensively used by otters. Previous surveys had also revealed the importance of the catchment. It is therefore highly likely that the Nant y Wilcae is inhabited by an otter or otters (as part of an extensive territory – up to 30km), and which might be attracted along the water course to the several ponds which lie upstream – a likely source for amphibians in late winter/spring. In order to protect these animals the proposed buffer zone along the stream corridor must afford some protection and careful design of the development along with protective measures during construction will help in this process.

9.8 Water voles are making a recovery in parts of Wales where habitat is suitable. The Nant y Wilcae does not provide suitable habitat where it abuts the land at Chepstow Road. It is highly unlikely that water voles are present along this shaded water course.

9.9 There is moderate potential for the habitat to be used by reptiles. The small debris piles might have some hibernation potential. The riparian corridor might, in conjunction with the grassland habitat, provide suitable habitat for grass snakes. Although there is a historic record of grass snake revealed by the data search (some 2.2km distant), there are no other reptile sightings within 2km. Since the Nant y Wilcae will be undisturbed during the development, due to the floodplain zone, and the proposed 60m buffer zone, there is likely to be no significant impact on grass snake. However, if the habitat is left undisturbed for much longer, its suitability for reptiles will increase greatly, and colonisation by the more mobile species cannot be ruled out. Again, provided the riparian zone is safeguarded during development, there is limited potential for these animals to be harmed.

9.10 Absence of any records of slow-worm or common lizard may be relevant. It is surprising that no one in the town of Raglan – with around 2000 residents – has ever reported the presence of reptiles. Again however, absence of records does not mean absence of presence – just absence of recorder

effort. Nonetheless, lack of records does tend to suggest that species such as slow-worm are likely to be absent.

9.11 Similarly, there is some small potential for native crayfish to be present – but again no records. Although covered in a separate report, surveys for otters and crayfish did reveal the presence of bullhead (*Cottus gobio*). Presence of this protected species, as well as otter, adds to the importance of the Nant y Wilcae – and qualifies the brook as a Site of Importance for Nature Conservation (SINC).

9.12 Himalayan balsam is an invasive species and listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). As such, it is illegal to plant or otherwise cause to spread this invasive plant. Its distribution along the water course is such that the opposite bank to the property, as well as the areas up/downstream are all infested with this weed, making effective control or eradication highly unlikely.

9.13 A number of birds were observed during the survey and it is possible that some species are breeding on site. This will most likely be in the hedgerow habitat or within the riparian tree line. Breeding efforts of all wild birds are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

10 Recommendations

10.1 Further survey is recommended for otters and white clawed crayfish (undertaken in 2013 and 2017 – see separate report). It is important to establish usage of the adjacent water course by otters in order to ascertain how these creatures use the rest of the site, and how best to proceed during the development in order to protect the otters from harm. Survey of both banks, looking for field signs such as spraints and holts, along the length of the site, as well as 250m both upstream and downstream of the proposed development, is recommended. Following survey, an Ecological Method Statement can be formulated detailing how the otters will be protected during the development and where design of the new buildings and facilities will have to take otters into account, such as lighting schemes. Survey for otters can be carried out at any time of year. In light of the previous appraisals for otters in 2013 and 2017, it is not considered that additional survey is required.

10.2 A survey of the water course for white clawed crayfish is recommended (undertaken in 2013 and 2017 – see separate report). This protected species is increasingly rare on water courses, largely as a consequence of disease, but also as a consequence of development. White clawed crayfish can be surveyed for between July and early October. In light of the previous appraisals for crayfish in 2013 and 2017, it is not considered that additional survey is required.

10.3 Additional survey effort for dormice is unlikely to confirm their absence or otherwise. Dormouse nest tubes can be put up in the hedges at the site, but if dormice are present then it will be at very low densities, and the chances of them finding or using the tubes is considered to be remote. It is therefore recommended that if a section of hedge must be removed as part of any development, it is inspected beforehand for the presence of dormouse nests, or any other field signs. The inspection must be carried out by an experienced ecologist, and in the event that evidence for dormice presence is established, then work must be halted until a European Protected Species licence has been obtained from Natural Resources Wales. Where the development will not affect the hedgerows or disrupt connectivity with other habitat, no survey effort might be necessary. Optimum survey time for dormice is July to November.

10.4 Birds are likely to be using the site for nesting purposes. It is therefore important that any management or removal work involving the hedgerow is carried out outside the nesting season from March to August inclusive. Where this is not possible, netting of the hedge outside the breeding season is possible in order to prevent nesting efforts being undertaken. However, although a well-established methodology, employed across Britain, netting is only to be used where other options, such as appropriate timing cannot be employed. An Ecological Clerk of Works will have to be present during the works in order to search the hedgerow for nests. If an active nest be found, all work in the vicinity will have to cease until such a time when the breeding effort has been completed. Since no work is proposed along the riparian tree line, it is not expected that birds breeding in this habitat will be affected by the development.

10.5 Himalayan balsam on site will have to be a concern during and following the development. Due to its nature as an invasive plant, disturbance of it on a casual level must be prevented in order to

avoid further spread of the plant. It is recommended to enforce a buffer zone around the infested area along the stream corridor during the development, going 5m beyond the furthest specimen. Depending on when the actual development starts, this might be quite far into the field, so localised control is advisable until such a time. The buffer zone must be separated from the development zone and no access for humans or machinery be allowed into the zone. The zone must not be used for storage or any other purposes. Control of the species in this area is unlikely to be efficient due to the surrounding areas being infested at the same level.

10.6 As a riparian corridor, the water course is vulnerable to pollution incidents caused by the development, which is another reason for the installation of a suitable buffer zone. The buffer zone, which is expected to be approximately 60m in depth, will help keep any harmful substances away from the stream. Furthermore, night-time lighting of the site must be directed away from the stream corridor, so as to avoid disturbance of wildlife. This holds true for both during and after the development and careful lighting schemes will have to be devised.

10.7 It is considered unlikely that reptiles are using the site on a basis other than occasional and opportunistic at the present time. Nothing in the SEWBReC record search suggests that slow-worm or common lizard are present. Consequently no further survey effort is recommended for this group. However, as already stated, if the site continues to be left undisturbed for much longer, it is likely that it will be necessary to carry out survey for reptiles. As a precautionary measure, it is advisable to move the piles of debris found on site by hand in order to avoid damaging any creatures potentially using them for shelter. If reptiles or amphibians are found then advice must be sought from an experienced ecologist immediately.

10.8 Development gives the opportunity to carry out enhancements to benefit wildlife. If the hedgerow(s) have to be removed as part of this proposal, replanting following development would be beneficial. Where possible, species used must be native. Table 4 below includes a list of suitable native species, which can be planted as part of the landscaping proposals. It is essential that such plants are sourced locally in order to reduce likelihood of importing diseases.

Table 4: Recommended Native Tree and Shrub Species

Common Name	Scientific Name
Alder	*Alnus glutinosa*
Crab apple	*Malus sylvestris*
Dogwood	*Cornus sanguinea*
Elder	*Sambucus nigra*
Field maple	*Acer campestre*
Hawthorn	*Crataegus monogyna*
Hazel	*Corylus avellana*
Holly	*Ilex aquifolium*
Rowan	*Sorbus aucuparia*
Silver birch	*Betula pendula*
Yew	*Taxus baccata*

10.9 Additional species which can be planted, which although not exclusively native species, will bring benefits for wildlife are included in Table 5 below. Again, only plants from local stockists must be used where this is possible.

Table 5: Recommended Garden Shrubs

Common Name	Scientific Name
Barberry	*Berberis vulgaris*
Clematis	*Clematis montana* or *Clematis vitalba*
Common broom	*Cytisus scoparius*
Dog rose	*Rosa canina*
Guelder rose	*Viburnum opulus*
Hebe	*Hebe albicans*
Honeysuckle	*Lonicera periclymenum*
Lavender	*Lavandula spp.*
Oregon grape	*Mahonia aquifolium*
Tree cotoneaster	*Cotoneaster 'Coral Beauty'*
Tree cotoneaster	*Cotoneaster Hybridus Pendulus*
Vibernum	*Viburnum davidii*

10.10 It is acceptable for other plant species to be provided on site, as recommended by the landscape architect. However, any planting proposals must include a minimum 70% proportion of the species listed in Tables 4 and 5.

10.11 Most developments include areas of grassland, and whilst some of these will require an amenity grassland seed mix, there are opportunities to sow wildflower grassland areas on parts of the site. To meet these needs it is recommended that the following seed mixes are used. British Seed Houses Mix A24 is a wear and tear mixture suitable for lawns and hard-working areas near to pathways. It contains five species of plant which are suitable for this location. For the wildflower areas the Emorsgate EM3 wildflower seed mix is recommended, with some twenty-five wild plant and grass species.

10.12 In order to benefit insects in particular, it is further recommended that additional seeding in the wildflower areas to encourage and benefit nectar feeding invertebrates, is carried out. An appropriate seed mix is available from Emorsgate – EN1. This mixture includes 23 plant species which can be added to the EM3 mix noted above.

10.13 It is important to implement good horticultural practice in any landscaping scheme, including the use of peat-free composts, mulches and soil conditioners. The use of pesticides (i.e. herbicides, insecticides, fungicides and slug pellets etc) must be discouraged to prevent cumulative fatal effects to animals via the food chain, particularly invertebrates, birds and/or mammals. Any pesticides used must be non-residual.

10.14 Ideally, as part of this proposal, the opportunity will be taken to develop a full and detailed biodiversity management plan. The plan would be expected to cover monitoring of all of the enhancement proposals set out above and the appointment of a biodiversity champion during and after the development. However, recommendations to encourage hedgehogs are not proposed, given the relative close proximity to a badger sett, and the ability of badgers to predate hedgehogs.

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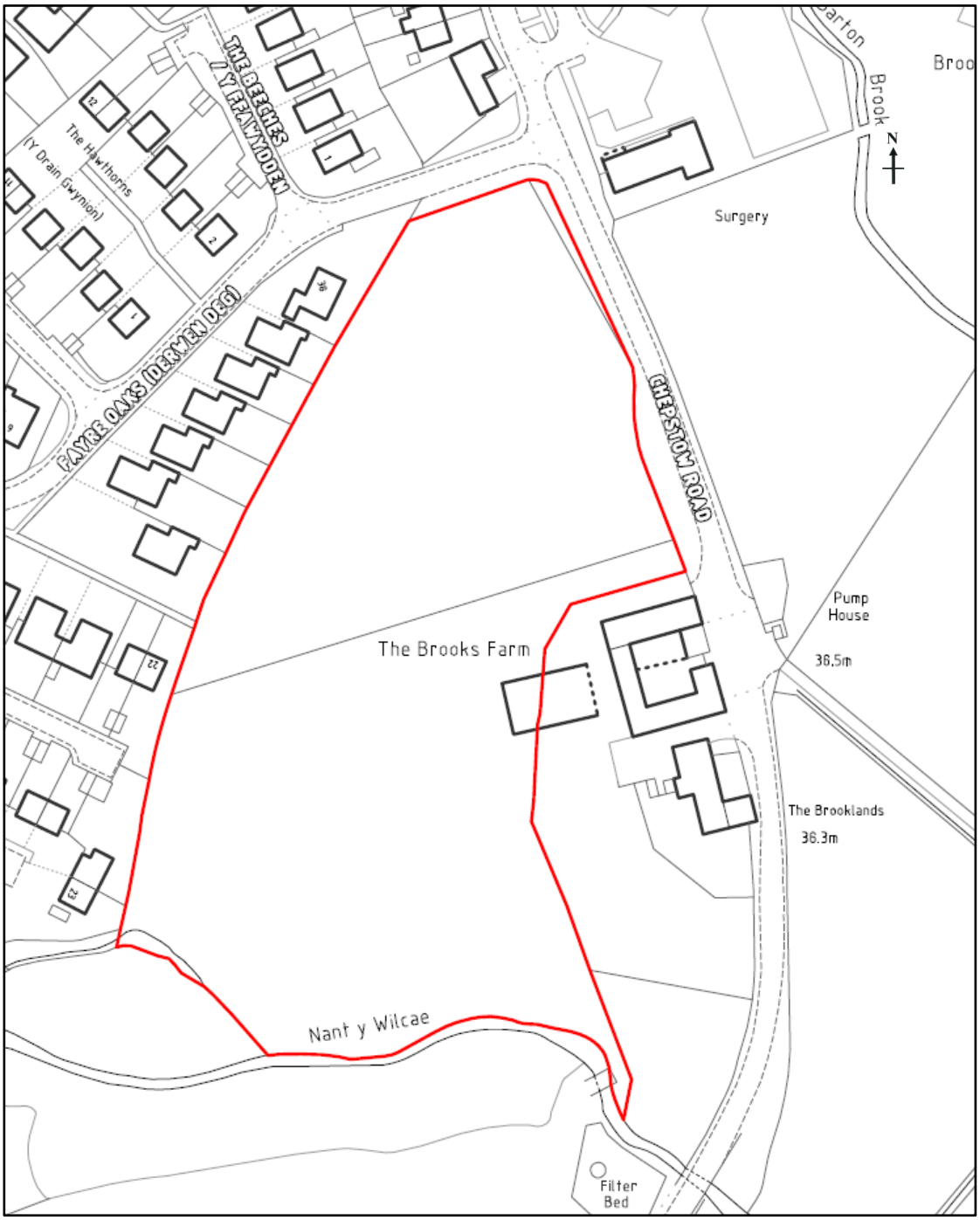
Appendix I: Site Location Plan

Figure 1: Site location plan



Note: Survey boundary indicated in red

Appendix II: Site Photographs

Plate 1: Looking west from entrance

Plate 2: Hedgerow along eastern boundary

Plate 3: View towards riparian corridor

Plate 4: Grassland and trees in south of property

Plate 5: Himalayan balsam along boundary

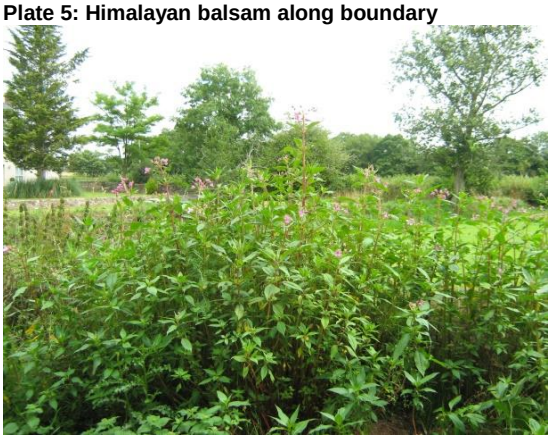


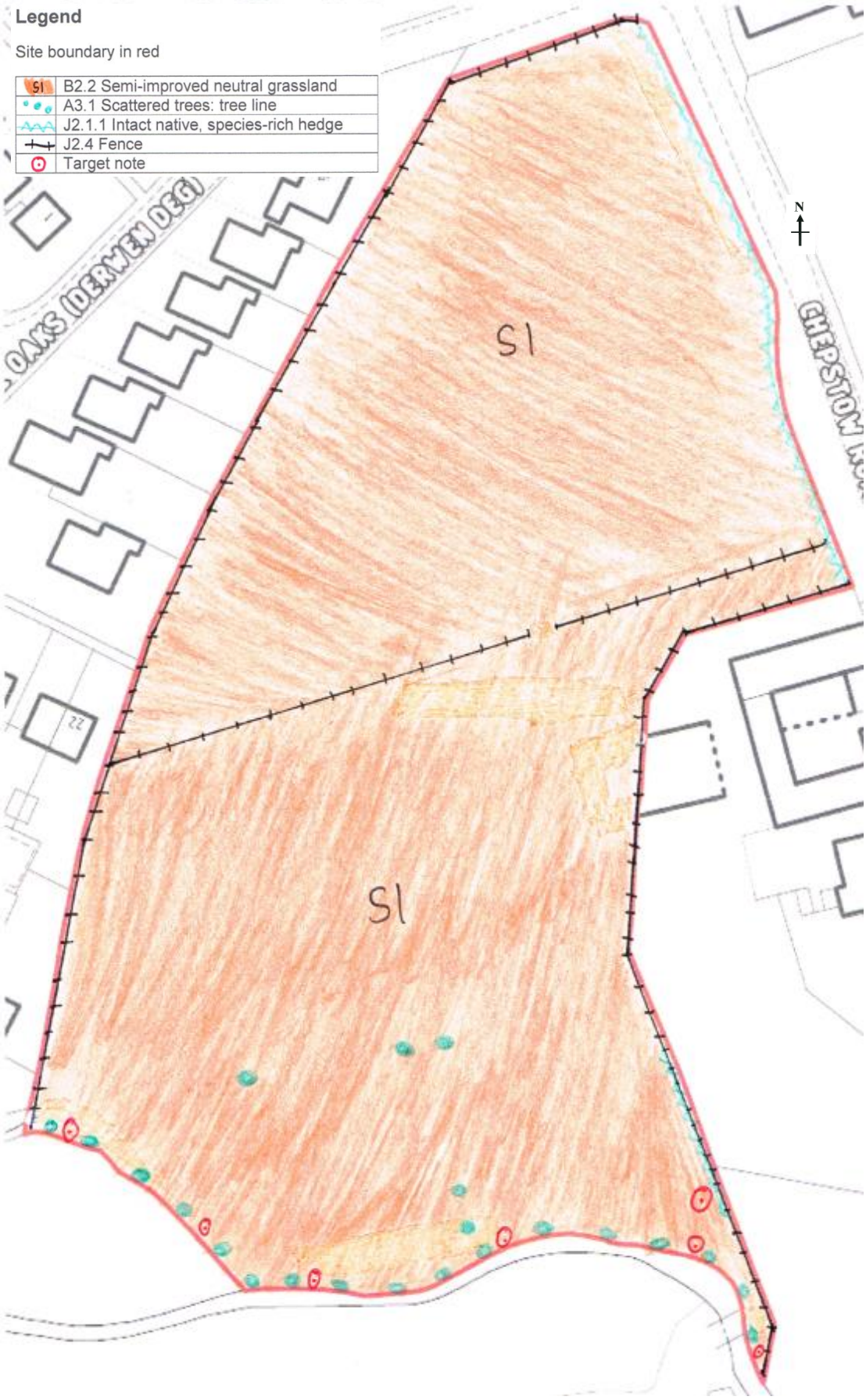
Plate 6: Water course

Plate 7: Disused kingfisher nest

Plate 8: Part of badger sett in tree roots

Appendix III: Phase 1 Habitat Map

Figure 2: Phase 1 habitat map



Appendix IV: List of Recorded Species

Table 6: List of Recorded Species

Common Name	Scientific Name	1	2	3
Alder	*Alnus glutinosa*			●
Ash	*Fraxinus excelsior*		●	
Beech	*Fagus sylvatica*		●	
Bent grass, a	*Agrostis sp.*	●		
Black horehound	*Ballota nigra*	●		
Blackthorn	*Prunus spinosa*		●	
Bracken	*Pteridium aquilinum*	●		
Bramble	*Rubus fruticosus agg.*		●	
Broad-leaved dock	*Rumex obtusifolius*	●		
Charlock	*Sinapsis arvensis*		●	
Clover, a	*Trifolium sp.*	●		
Cock's-foot	*Dactylis glomerata*	●		
Colt's-foot	*Tussilago farfara*	●		
Common bird's-foot trefoil	*Lotus corniculatus*	●		
Common knotgrass	*Polygonum aviculare*	●		
Common nettle	*Urtica dioica*	●		
Common sorrel	*Rumex acetosa*	●		
Cow parsley	*Anthriscus sylvestris*	●		
Creeping buttercup	*Ranunculus repens*	●		
Dandelion	*Taraxacum agg.*	●		
Elder	*Sambucus nigra*		●	
False oat-grass	*Arrhenatherum elatius*	●		
Field bindweed	*Convolvulus arvensis*	●		
Fumitory	*Fumaria sp.*	●		
Good King Henry	*Chenopodium bonus henricus*	●		
Goosegrass	*Galium aparine*	●		●
Greater plantain	*Plantago major*	●		
Groundsel	*Senecio vulgaris*	●		
Hawthorn	*Crataegus monogyna*		●	●
Hazel	*Corylus avellana*		●	
Hedge bindweed	*Calystegia sepium*		●	
Hedge woundwort	*Stachys sylvatica*	●		
Herb-Robert	*Geranium robertianum*	●		
Himalayan balsam	*Impatiens glandulifera*	●	●	●
Hogweed	*Heracleum sphondylium*	●		
Holly	*Ilex aquifolium*		●	
Hop	*Humulus lupulus*		●	
Hop trefoil	*Trifolium campestre*	●		
Horsetail, a	*Equisetum spp.*	●		
Ivy	*Hedera helix*		●	
Lords and ladies	*Arum maculatum*	●		
Meadow buttercup	*Ranunculus acris*	●		
Meadow-grass, a	*Poa sp.*	●		
Meadowsweet	*Filipendula ulmaria*	●	●	●
Nipplewort	*Lapsana communis*	●		●
Oak	*Quercus sp.*	●		
Perennial rye-grass	*Lolium perenne*	●		
Pineappleweed	*Matricaria discoidea*	●		
Red clover	*Trifolium pratense*	●		
Redshank	*Persicaria maculosa*	●		
Ribwort plantain	*Plantago lanceolata*	●		
Rose, a	*Rose sp.*		●	
Rosebay willowherb	*Chamerion angustifolium*	●		
Rush, a	*Juncus sp.*	●		
Scarlet pimpernel	*Anagallis arvensis*	●		
Sedge, a	*Carex sp.*	●		
Sheep sorrel	*Rumex acetosella*	●		
Shepherd's-purse	*Capsella bursa-pastoris*	●		
Silverweed	*Potentilla anserina*	●		
Snow berry	*Symphoricarpus sp.*	●		
Speedwell, a	*Veronica sp.*	●		
Spurge, a	*Euphorbia sp.*	●		
Thistle	*Cirsium sp.*	●		●
Timothy	*Phleum pratense*	●		
White clover	*Trifolium repens*	●		
Willow, a	*Salix sp.*			●
Yarrow	*Achillea millefolium*	●		
Yorkshire fog	*Holcus lanatus*	●		

Fauna				
Green-veined white	*Pieris napi*			
Meadow brown (female)	*Maniola jurtina*			
Comma	*Polygonia c-album*			
Mole	*Talpa europaea*			
House martin	*Delichon urbicum*			
Raven	*Corvus corax*			
Magpie	*Pica pica*			
Blackbird	*Turdus merula*			

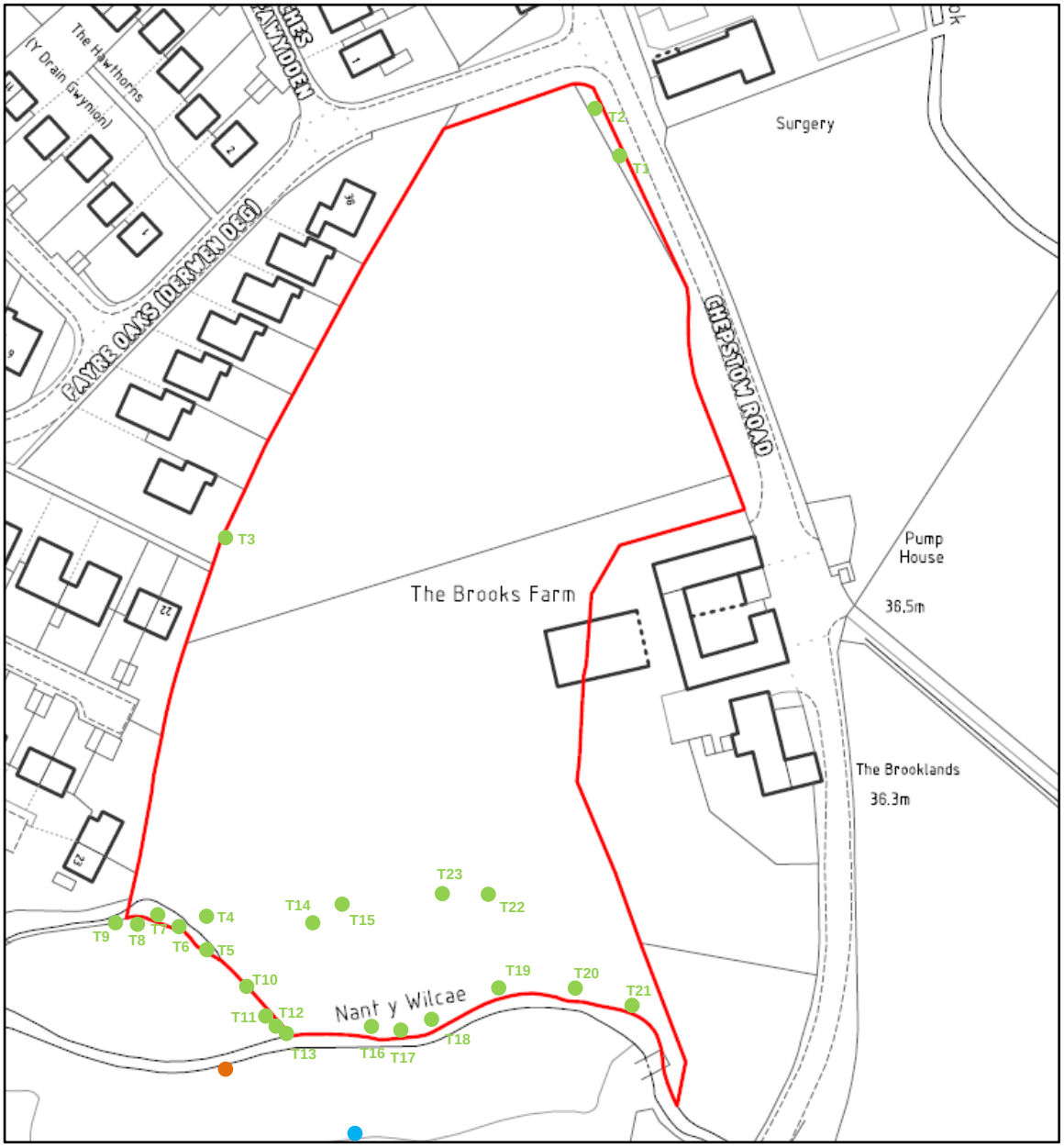
Appendix V: Tree Survey Results

Table 7: Tree Survey Findings

Reference No.	Common Name	Scientific Name	Findings	Risk Scale of Bat Presence
T1	Oak	*Quercus sp.*	Immature specimen with no usable features	1
T2	Beech	*Fagus sylvatica*	Immature specimen with no usable features	1
T3	Oak	*Quercus sp.*	No usable features	1
T4	Ash	*Fraxinus excelsior*	Immature specimen with no usable features	1
T5 (multi-stemmed)	Ash	*Fraxinus excelsior*	Light ivy growth on one trunk	2
T6	Ash	*Fraxinus excelsior*	Broken branch	3
T7	Ash	*Fraxinus excelsior*	Bifurcated trunk	3
T8	Alder	*Alnus glutinosa*	Moderate ivy growth	3
T9	Alder	*Alnus glutinosa*	No usable features	1
T10 (group of 12 trees)	Alder	*Alnus glutinosa*	Light ivy growth	2
T11	Ash	*Fraxinus excelsior*	Moderate ivy growth	3
T12	Ash	*Fraxinus excelsior*	Moderate ivy growth	3
T13	Alder	*Alnus glutinosa*	Light ivy growth	2
T14	Hawthorn	*Crataegus monogyna*	No usable features	1
T15	Hawthorn	*Crataegus monogyna*	Light ivy growth	2
T16 (group of 8 trees)	Alder	*Alnus glutinosa*	No usable features	1
T17	Hawthorn	*Crataegus monogyna*	No usable features	1
T18	Alder	*Alnus glutinosa*	No usable features	1
T19	Ash	*Fraxinus excelsior*	Immature specimen with no usable features	1
T20	Alder	*Alnus glutinosa*	No usable features	1
T21 (multi-stemmed)	Alder	*Alnus glutinosa*	Light ivy growth	2
T22	Alder	*Alnus glutinosa*	No usable features	1
T23	Hawthorn	*Crataegus monogyna*	No usable features	1

Appendix VI: Tree Survey and Other Feature Plan

Figure 3: Tree and other feature plan



Key:

Survey boundary

Trees

Badger sett

Disused kingfisher nest site

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This Ecological Survey Report is valid for a period of two years from February 2018.

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