Land Adjoining 87 Chapel Road, Whaley Bridge, Derbyshire

0035_001
Issue I August 2015

ECOLOGY SURVEY REPORT

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Document record

Job name	Land Adjoining 87 Chapel Road, Whaley Bridge, Derbyshire		
Job number	0035		
Report name	Ecology Survey Report		
Document ref.	001		
Revision	**Date**		
001	25/08/15	**File reference**	0035_001
		Description	ISSUE
		File reference	
		Description	
		File reference	
		Description	

Contents

1 INTRODUCTION

Kate Priestman Limited was commissioned in August 2015, to undertake an ecology survey and appraisal of land adjoining 87 Chapel Road, Whaley Bridge, Derbyshire. This report describes the findings of the ecology survey, and will assess the results in light of the redevelopment proposals for the site.

1.1 Background

The site comprises a narrow area of land, approximately 0.01ha in size. Steep embankments drop away in the north and south of the site. Access to the site is from Chapel Road, which is located adjacent to the north. The current driveway entrance is situated in the north east of the site. The land comprises a mixture of semi-natural vegetation, hardstanding and made ground. Planning permission is sought to build a two-storey, detached, residential building on the area of hardstanding. The peripheral vegetation is to be retained.

An ecology survey was undertaken in 2011 by Sheaf Ecology Limited[1]. The survey identified that an active badger sett was present in the southern part of the site, within a wooded embankment. Since the survey in 2011, the site has remained undeveloped.

Planning permission is now being sought for an amended scheme[2] and in view of the previous findings of the 2011 ecology survey, Derbyshire Wildlife Trust have stated the following:

"Given the previously recorded history of badger in the immediate vicinity, we would advise that an updated ecological assessment should be carried out to accompany the application. Unfortunately the previous report is considered to be out of date and protected species issues need to be fully considered as part of the determination process. A condition would additionally be attached for a check for badger prior to the commencement of work, particularly if there is a time delay between approval and commencement of work".

This report details the findings of the required ecology survey.

1.2 Aims and Objectives

The aims and objectives of the survey are as follows:

- to update the findings of the 2011 ecology survey; record and appraise (relative value) the existing habitats on site and to identify the potential for protected or notable species to be present;
- to assess the implications of the findings of the survey for the proposed works and identify any ecological resources that may pose constraints;
- to provide recommendations and advise as to any further work necessary to ensure legal and best practice compliance.
- to provide mitigation advice where required; and,
- to advise on enhancement and habitat creation opportunities.

[1] Ecological Assessment. Land adjoining 87 Chapel Road, Whaley Bridge, Derbyshire, December 2011. Sheaf Ecology Limited.
[2] This assessment is based on plans as shown on drawing numbers 2015.004.03.H and 2015.004.02.H.

1.3 Legislation, Policy And Guidance

This report is produced in accordance with relevant legislation, policy, best practice guidance and local biodiversity targets. Those that are relevant to this appraisal are summarised in the Appendices (A1).

1.4 Report Structure

The Methodology is detailed in section 2. Section 3 provides the results of the field survey and desk study. Section 4 provides an appraisal of the results. The conclusions are detailed in section 5 and recommendations are detailed in section 6. Additional information is appended to the report.

2 METHODOLOGY

Information about the ecological features that are present within the zone of influence of the proposed site works has been gathered through a combination of desk study and field survey. The methodology for both the desk study and field survey are provided below, together with any limitations identified during the course of the study.

2.1 Desk Study

The previous ecology survey report undertaken by Sheaf Ecology Limited in 2011[1] has been reviewed.

Details of sites designated for their nature conservation importance that occur within close proximity to the proposed development site, have been obtained via a search of MAGIC's website (http://magic.defra.gov.uk/).

Aerial photographs of the site (via Google Maps) have also been reviewed in order to identify any notable habitats within close proximity.

No consultation with regulators, biodiversity record centres or local interest groups have been undertaken in the preparation of this report[3].

2.2 Field Survey

An extended Phase 1 Habitat Survey was carried out on 17 August 2015, by a suitably experienced ecologist[4]. The survey was undertaken in accordance with standard guidance (JNCC, 2010[5]). The extent of each area of homogenous vegetation was recorded, in addition to the potential for the site to support protected or notable species. Habitat within the surrounding area adjacent to the property was noted as part of the survey.

2.3 Limitations

The findings presented in this study represent those at the time of survey and reporting. Variations in these conditions will take place as a result of seasonal factors and with the general passage of time. Notable fauna may travel over wide areas and/or have large home ranges and so can be overlooked within surveys. Species absent at the time of survey may also return to or colonise a site anew at any future time.

[3] The need for more detailed consultation, and further gathering of records and information regarding species and notable sites is considered on a site-by-site basis.
[4] Kate Jackson (CEnv, MCIEEM) has over 13 years experience undertaking professional ecology work. She is a Chartered Environmentalist and full member of the Chartered Institute of Ecology and Environmental Management.
[5] Handbook for Phase 1 habitat survey - a technique for environmental audit. Joint Nature Conservation Committee (JNCC), 2010.

3 RESULTS

The findings of both the desk study search and the field survey are provided below.

3.1 Desk Study

3.1.1 Previous Survey Work

Sheaf Ecology Limited undertook a survey and produced a report in 2011[1]. A summary of the findings are presented below:

- The upper part of the site, where the proposed development was to be located was considered to be poor in respect of notable habitat and species.
- Built structures comprising a disused and partially derelict garage [since removed], disused kennels and a chalet building were considered to be of low potential for supporting roosting bats.
- The southern part of the site comprised a steep wooded embankment, which was considered to be relatively rich in terms of species composition. The woodland also was identified as having the potential to support badger and bats.
- Two trees were considered suitable for supporting roosting bats. These were not proposed for removal and therefore, no further survey work was considered necessary.
- An active two-hole badger sett was identified in the wooded part of the site.
- As the works were to be restricted to the hardstanding area, it was considered that works could go ahead as planned, under a method statement with reference to badgers.
- Within 1km of the site a number of Local Wildlife Sites (LWS) were identified:
  - Taxal Pond (HP012) is a small open water site 900m to the south-west of the site.
  - There are two sites comprising unimproved acid grassland at Cadster Reservoir (HP015) and Roosedyche (HP079).
  - Approximately 800m to the north-west of the site is the River Goyt at Whaley Bridge (HP084) which is notified for its 'flowing waters and streams' one of these being the Randal Carr Brook which runs just outside the south-western boundary of the survey site.
  - Other non-LWS sites of interest in the area are the Canal Feeder channel (HP089/3), the Horwich End dismantled railway (HP0085/3), Paddock Lane garden Pond and Chapel Road Wood (HP0090/3).
  - The largest woodland within a 1km radius of the site is Shallcross Wood (HP013/3) 800m to the south- west of the survey site.
  - Throsledale Pasture (HP CWS) 800m to the north of the site has been identified as a potential LWS.

3.1.2 Data Search

The data search has identified sites of ecological note within 2km of the subject site.

Table 1 details statutory designated sites (see Appendix A1) as identified via MAGIC:

Table 1 Designated sites of nature conservation importance within 2km

Site name	Designation and Interest feature(s)	Approximate location
Toddbrook Reservoir Site of Special Scientific Interest (SSSI)	Habitat comprises Standing Open Water and Canals. The site is approximately 19 hectares in size and is in Favourable condition.	1km north west
Coombs Reservoir SSSI	Comprises Standing Water and Canals. The site is approximately 32 hectares in size and is in an Unfavourable - Recovering condition.	1.8km south east
Brookfield Pond Local Nature Reserve (LNR)	Comprises a small mill pond with steep embankments, surrounded by woodland. Approximately 0.46 hectares in size.	1.2km north west

Surrounding land uses comprise residential properties with associated mature gardens. The wider landscape is rural in character

3.2 Field Survey

The following habitats were identified during the extended Phase 1 Habitat Survey and provide an update to the 2011 survey[1] findings. These are described in accordance with standard methodology and guidance provided by the JNCC.

3.2.1 Hardstanding

Hardstanding was present in the form of a car parking area at the top of the entrance driveway, associated with the adjacent residential property (87 Chapel Road).

3.2.2 Introduced Shrub

Introduced Shrub was identified during the 2011 survey in the north west part of the site, whereby a narrow strip of stone built retaining beds at the top of the northern embankment had been planted with ornamental shrubs. This habitat was gradually being encroached upon by ruderal vegetation due to a lack of management.

The 2015 survey found this area mainly to comprise ruderal vegetation and tree saplings, merging with the adjacent semi-natural habitat of the northern embankment (Photograph 1). Species present comprise those commonly found in this type of setting and include bramble (*Rubus fructicosus agg.*), rosebay willowherb (*Chamerion angustifolium*) and dock (*Rumex obtusifolius*).

Photograph 1 Ruderal encroachment into former raised beds

3.2.3 Neutral Semi-Improved Grassland and Scrub

Habitat on the northern embankment, adjoining Chapel Road, was identified as comprising Neutral Semi-Improved Grassland during the 2011 survey. The survey in 2015 found that this habitat had developed into more of a scrub type habitat with associated tree saplings (ash (*Fraxinus excelsior*) and sycamore (*Acer pseudoplantanus*) predominantly), bramble and ruderal vegetation (Photograph 2).

Photograph 2 Habitat on the northern embankment

3.2.4 Ephemeral/Short Perennial & Tall Ruderal

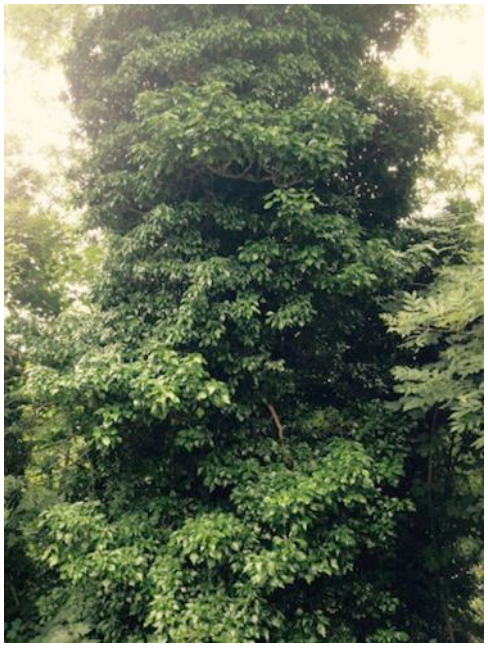
Alongside the main entrance driveway and hardstanding parking area, short ephemeral vegetation was identified during the 2011 survey; found in poor substrate and marginal areas. This type of habitat is typical of urban/brownfield settings and was found to be present during the 2015 survey. Species included cow parsley (*Anthriscuc sylvestris*), ragwort (*Senecio jacobaea*), dock, dandelion (*Taraxacum officinalis agg*.) and ground elder (*Aegopodium podagaria*).

3.2.5 Broadleaved Semi-Natural Woodland

Broadleaved Semi-Natural Woodland was found to be present along the southern slope of the site during the 2011 and 2015 surveys. This habitat is mature in age and forms part of the Randal Carr Brook valley habitat; the Brook flows at the base of the embankment.

In accordance with the previous survey, the woodland was found to comprise predominantly ash, sycamore and willow (*Salix* sp.) tree species. The dense understory included ivy (*Hedera helix*) and bramble.

Trees of particular note are located at the top of the slope, adjacent to the car parking area. Five mature trees (three ash and two sycamore) were covered in a dense growth of ivy (Photographs 3 and 4).



Photograph 3 Mature ivy covered tree on southern embankment

Photograph 4 Ivy covered trees on southern embankment

3.2.6 Scattered Trees

A row of mature trees was present either side of the entrance driveway (Photograph 5). In addition, scattered trees were present along the northern roadside embankment. Species composition was dominated by ash and sycamore.

Photograph 5 Mature treeline alongside the entrance driveway

3.2.7 Other - Non-Native Invasive

The non-native invasive plant species Himalayan balsam (*Impatiens glandulifera*) was identified adjacent to the car park area at the top of the southern embankment. Himalayan balsam is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England and Wales. As such, it is an offence to plant or otherwise allow this species to grow in the wild.

4 APPRAISAL

Following on from the desk study and field survey, this section of the report will appraise (relative value) the existing habitats on site, and assess the implications of the survey findings for the proposed development[2]. (Recommendations regarding enhancements and habitat creation proposals are covered in section 6, along with mitigation).

4.1 Designated/Notable Sites

Designated sites for nature conservation interest have been identified within 2km of the site (**Table 1**).

The current redevelopment proposals are not considered likely to have a significant adverse effect on these designated sites due to the localised nature of the proposed works and distance to the designated sites.

4.2 Protected/Notable Habitat

Notable habitat has been identified on site in peripheral areas adjacent to the proposed works area (the development is to be constructed within the footprint of the current hardstanding and should not encroach into the adjacent semi-natural habitat). The relatively mature age of vegetation and mix of tree species in peripheral habitats is of intrinsic value as well as having the potential to support protected and notable species. The trees form important habitat linkages with the surrounding landscape and will facilitate foraging, dispersal and commuting purposes for species of fauna, and act as a refuge.

Surrounding habitat includes residential dwellings with mature gardens and a watercourse (Randal Carr Brook). These habitats are also likely to be of some intrinsic value and be of use for species of fauna.

The redevelopment proposals are not anticipated to require any removal of trees or require significant encroachment into the adjacent semi-natural habitat. Due to the localised and relatively small-scale nature of the proposed works, there are no significant effects anticipated to impact on designated sites or habitat within the wider area.

4.3 Protected/Notable Species

Habitat associated with the site has the potential to support protected and notable species. This is discussed further within this section (see Appendix A1 for a summary of relevant legislation, policy and guidance):

4.3.1 Breeding birds

Birds use a variety of both man-made and natural habitats and features for refuge, nesting and foraging purposes.

Habitat on site is likely to be of value for birds as a foraging resource. The site also has the potential to support nesting birds in scrub and mature trees; this habitat is being retained as part of the redevelopment plans and will not be directly affected by the proposals.

It is likely that any birds, using nearby trees for nesting purposes, will be habituated to some degree of disturbance and background noise as a result of the rural fringe setting. Any displacement of birds as a result of construction is likely to be restricted to trees within the site

boundary and adjacent to the works area. Given the temporary nature of the works and the presence of other mature trees and nesting sites within the wider area, any temporary displacement is unlikely to have a significant adverse effect on breeding bird populations.

4.3.2 Bats

The UK has 17 breeding species of bat. They have differing habitat requirements depending on the species, the time of year and the stage in their lifecycles. Main requirements include water, insects, foraging habitat, suitable places to hibernate and roost, and commuting habitat for dispersal[6].

The woodland and treelines on site form important habitat linkages with the surrounding area and have the potential to be used by bats for foraging, dispersal and commuting purposes. The semi-natural habitat in close proximity to the site within garden areas is also likely to support bats for foraging and dispersal purposes. Given the rural fringe setting, it is possible that bat populations within the wider area comprise less commonly recorded species.

There were no buildings within the site boundary. Adjacent to the site was a wooden 'chalet' type building and a residential property (87 Chapel Road). An external inspection of the chalet did not identify any obvious voids or loose woodwork, which could support roosting bats. There is some potential for the house to support roosting bats beneath loose and lifted tiles and woodwork on roofing, if present[7].

The 2011 survey identified two trees as having bat roost potential. One of these (identified as T7 in the 2011 survey) comprised a mature ash tree. This tree has since been removed. The second tree identified as having bat roost potential was a mature sycamore, located towards the top of the southern embankment, adjacent to the car parking area. This tree is still present on site.

Mature trees adjacent to the proposed works area were ivy covered. The 'Habitat Key for the Assessment of Potential Bat-Roost Features in Trees' (2011)[8] provides the following information concerning bat roost potential associated with ivy.

"For ivy to provide an environment suitable for occupation by roosting bats it has to have attained significant age. Typically the stems should be a minimum of 50 mm diameter (ideally some even larger) and have sections that have formed pockets into which bats sidle into or crawl up and under to rest against the bark of the mature tree (Billington pers comm). As the ivy grows upward; younger stems often pass over older ones, or intertwine for support. As the ivy gets older the stems expand and those beneath push the crossing stems away from the bark forming a network of small pockets under the newer growth"[8].

The ivy cover on the trees at the top of the embankment was considered to be sub-optimal for supporting roosting bats.

Trees are classified for roost potential in line with the Bat Conservation Trust (BCT), 2012 guidance as follows[9]:

[6] http://www.bats.org.uk/
[7] 87 Chapel Road was not subject to a bat roost inspection as part of the survey.
[8] Andrews, H. L., 2011. A Habitat Key For The Assessment Of Potential Bat-Roost Features In Trees Document I – Key Instructions.
[9] Hundt L (2012). Bat Surveys: Good Practice Guidelines, 2nd edition, Bat Conservation Trust.

- **Negligible potential/Category 3** - No features identified that could be used by bats (for roosting, foraging or commuting);
- **Low potential/Category 2** – Trees with no obvious potential, although the tree is of a size and age that elevated surveys may result in cracks or crevices being found; *or* the tree supports some features which may have limited potential to support bats; isolated habitat that could be used by foraging bats, e.g. a lone tree or patch of scrub but not parkland and an isolated site not connected by prominent linear features (but if suitable foraging habitat is adjacent it may be valuable if it is all that is available);
- **Moderate potential/Category 1** - Trees with definite bat potential, supporting fewer suitable features that Category 1* trees *or* potential for use by single bats; habitat could be used by foraging bats e.g. trees, shrub, grassland or water and the site is connected with the wider landscape by linear features that could be used by commuting bats, e.g. lines of trees and scrub or linked back gardens;
- **High potential/Category 1*** – Trees with multiple highly suitable features capable *or* supporting large roosts. Features of particular significance for roosting bats, habitat of high quality for foraging bats e.g. broadleaved woodland, tree-lined watercourses and grazed parkland and the site is connected with the wider landscape by strong linear features that would be used by commuting bats, e.g. river/stream valleys or hedgerows, site is close to known roosts; and
- **Confirmed roosting** - A known roost or evidence indicates that roosting bats are present, e.g. bats seen roosting or observed flying from a roost or freely in the habitat; droppings, carcasses, feeding remains, etc. found; and/or bats heard 'chattering' inside on a warm day or at dusk and bats recorded/observed using an area for foraging or commuting.

The trees on site identified as having bat roost potential are considered to be Category 2 trees in line with current BCT guidance.

The trees on site would not require removal as part of the current redevelopment proposals and it is considered that the proposals would have a negligible effect on local bat populations. In line with BCT guidance and the findings of the 2011 survey, it is considered that further bat surveys are not required. Should the proposed works directly affect the trees, the requirement for a bat survey should be reviewed prior to any work going ahead.

4.3.3 Badger

Badgers live in family or social groups of related mature and young adults and cubs, sometimes known as clans. Their "home ranges" consist of feeding grounds and one or more setts. A badger sett is defined in the legislation as "any structure or place, which displays signs indicating current use, by a badger"[10]. Setts can usually be classified as one of the following[11]:

[10] "A sett is defined as currently in use (and thus protected) as long as signs indicative of "current use" are present. Thus, a sett remains protected by the Act until such time as the signs (i.e. 'field signs') have deteriorated or decayed to such an extent that they no longer indicate that the sett is in "current use". Consequently, for a sett to fall within the definition in the Act, a badger need not be in current occupation, and may not have been for some time. As long as there are signs present indicating "current use" the sett is defined as such in the Act and is therefore protected. The maximum lapse of time between last occupation by badgers and the inspection of a sett for it to be considered in "current use" is how long it takes the signs to disappear, or more precisely, to appear so old as to not indicate "current use"". (Protection of Badgers Act 1992 (as amended) Guidance on 'Current Use' in the definition of a Badger Sett. Natural England, June 2009).

[11] Badgers and Development - A Guide to Best Practice and Licensing. Natural England, Interim Guidance Document, Revised December 2011.

1. Main Setts: These usually have a large number of holes with large spoil heaps, and look well used. They usually have well used paths to and from the sett and between sett entrances. Although normally the breeding sett, and in continual use all year round, it is possible to find a main sett that has become disused because of excessive disturbance or for some other reason.
2. Annexe Setts: These are always close to a main sett and are usually connected to the main sett by one or more obvious, well-worn paths. They usually consist of several holes, but are not necessarily in use all the time, even if the main sett is very active.
3. Subsidiary Setts: Often these have only a few holes, are usually at least 50 m from a main sett, and do not have an obvious path connecting them with another sett. They are not continuously active.
4. Outlying Setts: These usually only have one or two holes, often have little spoil outside the entrance(s), have no obvious path connecting them with another sett, and are only used sporadically.
(Natural England, 2011)[11].

Badger is not a UK Priority Species, and this species is common in the UK and the region. However, it has does have some conservation interest in the local context, and is legally protected under the Protection of Badgers Act 1992 (see Appendices A1).

The ecology survey carried out in 2011[1] identified a badger sett within the wooded southern embankment, that appeared to be active at the time of surveying. The sett was located approximately 4m away from the proposed works area. A follow-up survey carried out in 2012 by Sheaf Ecology Limited, found that this sett was no longer in use.

The 2015 survey did not identify any signs of badger activity within the zone of influence of the proposed works. There were no active runs through the woodland area or other field signs that would indicate the presence of badgers. A mammal burrow at the base of a tree along the embankment was considered unsuitable for use by badger due to its size and shape. It is considered likely to be used by fox.

In view of the absence of any recent badger activity, it is considered that the proposed development would have a negligible effect on the local badger population. Recommendations regarding further survey work and mitigation are detailed in section 6.

4.3.4 Reptiles

Reptiles require a variety of habitat types to fulfil their ecological requirements throughout the seasons and life stages. They require a combination of open sunny areas for basking, and grassland and scrub habitat for refuge, dispersal and foraging purposes, they also require suitable habitat in which to hibernate over winter months. Reptiles have limited dispersal ability, which makes them vulnerable to declining habitat quality and fragmentation.

Habitat on site was considered largely sub-optimal in suitability to support reptiles. However, the northern embankment does have some potential to support commonly recorded reptiles in the stone retaining walls and grassland/scrub vegetation.

The proposed works will not significantly affect the peripheral semi-natural habitat; the area of hardstanding where the building is to be constructed is considered to be unsuitable for reptiles, therefore, the effect of the development on the local reptile population is considered to be negligible.

4.3.5 Great Crested Newts (and Amphibians)

Great crested newts (*Triturus cristatus)* and other amphibians require a range of habitat types depending on the time of year and stage in their lifecycle. Generally, they need waterbodies for breeding purposes, suitable terrestrial habitat for refuge and dispersal, and suitable hibernation habitat over winter months. They also occur in metapopulations, so connectivity and dispersal habitat between ponds is important.

Terrestrial habitat on site was generally found to be sub-optimal for supporting amphibians. However, the northern embankment does have some potential to support commonly recorded amphibians during their terrestrial stage in the stone walls and grassland/scrub vegetation.

The proposed works will not significantly affect the peripheral semi-natural habitat, and the area of hardstanding where the building is to be constructed is considered to be unsuitable for amphibians, therefore, the effect of the development on the local amphibian population is considered to be negligible.

4.3.6 Invertebrates

The invertebrate interest is predominantly associated with semi-natural habitat located around the site boundaries. Species present are likely to comprise more commonly recorded species although there is the potential for more notable species to be present.

Habitat around the site boundaries is to be retained during the works and the proposals do not infringe further on this habitat. It is therefore considered that the proposals are unlikely to have a significant effect on any notable invertebrate species.

4.3.7 Other notable species

The hedgehog (*Erinaceus europaeus*) is a Priority Species that does not receive any specific legal protection. This species has declined by 77% in the last 25 years and is targeted for conservation action at the national level (JNCC, 2010). Hedgehogs are present in many green spaces, particularly semi-natural habitats including gardens. The woodland and grassland on site and within the wider area is likely to provide foraging areas and refuge for hedgehog.

Deer will also make use of the kind of woodland habitat found on site. Deer do not receive any specific legal protection.

Remaining habitat on site that is of use to hedgehog and deer will not be removed under the current redevelopment proposals. It is considered unlikely that disturbance (noise, vibration etc.) from construction works would have a significant effect on these species as suitable habitat is present in the wider area for these species to be temporarily displaced to. Any displacement is likely to be reversed upon completion of the works.

5 CONCLUSIONS

The survey carried out in August 2015 has identified that overall the site is of some intrinsic ecological value in terms of habitat composition. It has been shown to have the potential to support protected species including bats and badger.

The planning application comprises the construction of single detached residential property. These works are not considered to require any tree removal or significant habitat removal and effects on habitats and species are largely considered to be negligible.

There is some scope for increasing the ecological value of the site for species such as bats, birds and invertebrates. These suggestions are detailed in section 6 along with other recommendations.

6 RECOMMENDATIONS

The mitigation measures and proposed enhancements detailed below have been made following on from the ecology survey in order to ensure that best practice and policy is adhered to, and to feed into the design process to maximise the biodiversity value of the site. These are based on redevelopment proposals, as known to date[2].

6.1 Mitigation

6.1.1 General Protection Measures

Mature trees and semi-natural vegetation within the development site should be retained and protected throughout construction. Works and associated material storage (etc.) should not be undertaken within the root protection zone of trees.

Mature lines of vegetation around the site boundaries should be retained. This habitat maintains connectivity with surrounding habitat, is likely to be of benefit for bats and for a number of other species, and assists dispersal through the wider area.

No significant areas of vegetation clearance are proposed. Should any areas of scrub need to be removed, this clearance should be undertaken outside of the bird-breeding season (typically March to August inclusive). If it is not possible to remove vegetation outside of these times, an ecologist should undertake a check for breeding birds prior to any works commencing.

6.1.2 Lighting

Artificial lighting can have a significant adverse effect on a number of species, in particular bats. Lighting should only be used where absolutely necessary. Lighting should be directed to the area of need and light-spill should not be allowed to occur. Woodland areas in particular should be protected from light spill. Lighting columns/fixings should be kept as low as possible in order to keep light at a low level. The time lights are on should be limited to provide periods of darkness and/or they should be operational by sensor system.

6.1.3 Badgers

Whilst there was no evidence of badger activity during the 2015 survey, in view of their previously recorded presence on the embankment, it is prudent to undertake a check for badgers prior to any works commencing to ensure that legislation and best practice guidance is not contravened.

The check should be undertaken by a suitably experienced ecologist. The survey should comprise walking the site, focusing on suitable habitat and features that may be used by badgers. This includes all linear features, embankments and site boundaries and areas of scrub, woodland and grassland.

The following indicators of badger presence should be recorded if seen during the survey:

6.1.3.1 Badger Trails

When surveying for evidence of badger activity, the identification of animal trails are located in the first instance. All identified trails should be followed and inspected to search for evidence of the species using the trail. Animal trails are also created by other species such as rabbit (*Oryctolagus cuniculus*), fox (*Vulpes vulpes*) or deer; to confirm that they belong to badger, the presence of footprints, adjacent latrines or hairs snagged on fences should be sought.

Well-used badger trails may lead to a sett location and as a result, when a trail is located it should be followed for as far as possible.

6.1.3.2 Badger Latrines

Badger latrines are shallow pits excavated by badgers and used to deposit dung and to mark territorial boundaries. Badger latrines are often found in association with well-used trails and are often used to mark the territorial limits of a social group. The incidence of latrines and their level of use may be particularly high where two badger territories meet.
The site should be searched for the presence of latrines during the check.

6.1.3.3 Badger Setts

Badger setts are the most useful means of establishing the presence of badgers on a site and their status. In areas where food supplies support good numbers of badgers, a well established badger sett will typically contain approximately six to twelve entrance holes.

There is however considerable variation in the size of badger setts, both in terms of the number of entrance holes and the length of the tunnel systems beyond the entrances. Small setts may consist of a single hole with one tunnel leading to a chamber a few metres underground. In other cases badger setts may have many entrances and be located over a large area, these are generally historic and long established setts.

If a badger sett is found to be active it may be necessary to apply for a licence prior to works commencing. Licence applications can take a number of weeks to complete; therefore, the check should be scheduled early on as part of any development programme to ensure that delays and associated costs are avoided.

6.1.4 Reptiles and Amphibians

There is considered to be some potential for reptiles and amphibians to use habitat on the northern embankment for refuge purposes. Consequently, the following recommendations should be implemented to ensure legal and best practice compliance:

- The construction works should commence within the active season for reptiles, which is typically from March/April to September (weather dependent).
- Suitable refuge features that are required for removal as part of the works, such as stone walls, log piles, rubble and scrub, should be subject to removal under an ecological watching brief. An experienced ecologist should move any reptiles and amphibians found as part of this process to suitable habitat nearby.

6.1.5 Non-Native Invasive Species

Himalayan balsam was identified adjacent to the hardstanding area, at the top of the southern embankment. Himalayan balsam is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England and Wales. As such, it is an offence to plant or otherwise allow this species to grow in the wild.

Introduced as a garden plant in the early 19th century it is now widespread in the UK, especially along urban rivers. The plant spreads solely by seeds, which are small and easily carried by wind or water.

Himalayan balsam out-competes native plant species and where it grows in dense stands along river banks it can impede flow at times of high rainfall, increasing the likelihood of flooding. Die back over winter can leave banks bare and exposed to erosion.

Control measures[12] should aim to prevent flowering, and are best carried out before June for maximum effectiveness.

6.1.5.1 Cutting

Cut at ground level using a scythe, machete, flail or strimmer before the flowering stage in June. Cutting earlier than this will promote greater seed production from plants that regrow. Cutting should be repeated annually until no more growth occurs.

6.1.5.2 Pulling

Shallow-rooted plants can be pulled up very easily and disposed of by burning, or composting unless seeds are present.

6.1.5.3 Chemical Treatment

Glyphosate
Treat with a weed wipe in mixed stands, or by foliar spray in dense stands, before flowering. If all plants are controlled, then spraying should only be required for two to three years.

2,4-D amine
Treat during early spring at the rosette stage for effective control.

In general it is essential to establish vegetation quickly after control measures have been applied. A dense grass sward is ideal, as it tends to discourage seed germination.

6.1.5.4 Biosecurity During Construction

In order to ensure that Himalayan balsam is not carried off site, the following methods during construction are recommended.

- Educate site workers to identify the plant and to operate in accordance with the biosecurity procedures below.
- Mark out areas of Himalayan balsam and avoid tracking through these areas on foot and with vehicles.
- Ensure footwear is clean (visually from soil and debris) before leaving the site.
- Ensure vehicle is kept clean - in particular remove any accumulated mud before leaving the site.
- Make use of facilities provided on the site to clean footwear/equipment.
- Keep access to a minimum.
- Keep to established tracks and park vehicles on hard standing.

6.2 Habitat Creation

Any landscaping as part of the redevelopment proposals, should focus on diversifying the current habitat on site and supporting species such as bats, badger, birds and invertebrates. Habitat should be of botanical interest, through the selection of an appropriate species palette. Planting should be designed to provide interest and ecological benefit all year round.

In general, any new planting should favour the use of sustainable locally sourced, locally appropriate and native species although some ornamental species can provide ecological value if chosen appropriately.

6.2.1 Grassland

In order to increase the habitat diversity on site, the northern embankment could be diversified (e.g. creation of wildflower areas), through the introduction of an appropriate

[12] www.nonnativespecies.org

species mix comprising native and locally appropriate species; this area should then be managed in such a way as to be ecologically beneficial through an appropriate mowing regime.

6.2.2 Flowering Plants

Areas of formal planting should aim to introduce an appropriate species mix in order to support species such as invertebrates, which are beneficial to bats. Again, plants should be locally sourced and locally appropriate. Planting species to attract nocturnal flying insects would benefit bats and should comprise pale flowers that are more easily seen at night, single flowers such as the daisy (*Compositae, Asteraceae*) or carrot (*Apiaceae, Umbelliferae*) family.

6.3 Enhancement Measures

There are a variety of measures that would further enhance the site for ecology[13].

6.3.1 Bat Boxes

The installation of bat boxes on buildings and trees can provide valuable support for these species in a local context. Bat boxes can contribute to local biodiversity targets and can be designed to fit into the building fabric itself during the construction phase or can be retro-fitted.

6.3.2 Bird Boxes

The inclusion of nest boxes for birds within developments (on trees and within the building fabric/retro-fitted) can significantly contribute to the biodiversity value of the development and provide ecological value in the local context. This is the case particularly if boxes are aimed at attracting species of local importance.

6.3.3 Living Walls/Climbers

The addition of suitable climbers up vertical structures provides valuable habitat for species such as invertebrates and birds. Honeysuckles (*Lonicera* spp., including the native *L. periclymenum*) and climbing roses (*Rosa* spp. especially wild species such as dog rose *R. canina* and field rose *R. arvensis*) provide scent to gardens as well as being of ecological value.

6.3.4 Invertebrate Boxes and Log Piles

Invertebrates exist in every environment and are often at the base of the food chain where they provide a crucial food source for birds, bats and many other species. Many species have declined in recent years and can be found on UK and local Priority species lists. Invertebrates can easily be encouraged by the installation of insect boxes and houses.

Other benefits of encouraging invertebrates include the control of pest species lower in the food chain such as greenfly and aphids, which are eaten by ladybirds and wasp larvae. Pollinating insects will also help to encourage the growth of flowering plants.

In the autumn and winter as the nights start getting colder, bugs need a safe dry place to shelter and hibernate. Installing a bug hotel will provide bumblebees, beetles, spider and snails a place to stay over the winter period[14].

[13] The numbers, type and method of installation and management of these features should be undertaken under the supervision and advice of a suitably experienced ecologist.
[14] https://www.buglife.org.uk/activities-for-you/wildlife-gardening

The addition of features, such as log piles, to an area(s) of the landscaping would increase the value of the site for species such as hedgehog and invertebrates.

APPENDICES

Contents:

A1 Legislation, Policy and Guidance

The principal legislation relating to ecological resources, that are relevant to this appraisal, are as follows:

- Wildlife and Countryside Act 1981 (as amended);
- Conservation of Habitats and Species Regulations 2010 (which consolidates all the various amendments made to the Conservation [Natural Habitats, &c.] Regulations, 1994);
- Countryside and Rights of Way (CROW) Act 2000; and,
- Natural Environment and Rural Communities (NERC) Act 2006.

Legislation is also in place to protect species. Those relevant to this report are detailed below:

A1.1 Bats

All species of bat are strictly protected in Europe and in the UK by the Wildlife & Countryside Act 1981 and the Conservation (Natural Habitats &c) Regulations 1994. This protection makes it illegal to intentionally kill, injure, capture or disturb bats, and to damage, destroy or prevent access to roost sites.

Bats are listed as Priority Species under the UK Biodiversity Action Plan (BAP).

A1.2 Breeding birds

Under the Wildlife and Countryside Act 1981 (as amended), all birds, their nests and eggs are protected by law and it is thus an offence, with certain exceptions, to intentionally kill, injure or take any wild bird; intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built; and intentionally take or destroy the egg of any wild bird.

Additional protection is offered to those scarce species listed on Schedule 1 of the Act such that it is an offence to intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

A1.3 Badgers

Badgers and their setts are protected under the Protection of Badgers Act 1992, which makes it illegal to kill, injure or take badgers or to interfere with a badger sett. The term 'badger sett' refers to the system of tunnels and chambers, in which badgers live, and their entrances and immediate surrounds. The 1992 Act specifically defines a sett as "any structure or place, which displays signs indicating current use by a badger". Interference with a sett includes blocking tunnels or damaging the sett in any way.

Activities affecting badgers or their setts that would otherwise be illegal can be carried out under licence where there is suitable justification and the problem cannot be resolved by alternative means.

A1.4 Reptiles

All British native reptile species are afforded at least some level of protection under the Wildlife & Countryside Act 1981 (as amended). Common lizards, grass snakes, adders (*Vipera berus*) and slow worms are protected from killing and injury only. Protection is not extended to their habitats. Therefore, construction activities should not result in the death of individual reptiles where they are known to occur.

A1.5 Great Crested Newts

The great crested newt (*Triturus cristatus*) is strictly protected in Europe and in the UK under the Wildlife & Countryside Act 1981 and the Conservation (Natural Habitats &c) Regulations 2010. It is illegal to deliberately kill, injure, capture or disturb great crested newts or to obstruct access to areas where they live and breed. Their habitat is also protected against damage or destruction. This legislation applies to all life stages including eggs, tadpoles, juveniles and adults.

A1.6 Invertebrates

Certain scarce or rare invertebrates are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), affording them protection against possession and sale and, in some cases killing and injury or deliberate destruction of their habitat. The UK Priority Species lists invertebrate species, which are considered to be especially threatened or scarce.

This report has also been produced in line with relevant policy and guidance. This includes the following:

A1.7 UK Post-2010 Biodiversity Framework

As a result of new drivers and requirements, the 'UK Post-2010 Biodiversity Framework', published in July 2012, has now succeeded the UK BAP. In particular, due to devolution and the creation of country-level biodiversity strategies, much of the work previously carried out under the UK BAP is now focussed at a country level. Additionally, international priorities have now changed: accordingly, the framework sets out the priorities for UK-level work to support the Convention on Biological Diversity's (CBD's) Strategic Plan for Biodiversity 2011-2020 and its five strategic goals and 20 'Aichi Targets', agreed at the CBD meeting in Nagoya, Japan, in October 2010; and the new EU Biodiversity Strategy (EUBS) in May 2011. However, the UK BAP lists of priority species and habitats remain important and valuable reference sources.

The UK Biodiversity Action Plan (UK BAP) was produced in accordance with the 1992 UN Convention on Biological Diversity. It describes the UK's biological resources and commits a detailed plan for the protection of these resources, focusing on key habitats and species considered as being of particular significance to nature conservation within a UK context.

Priority species and priority habitats listed under the UK BAP and local BAP are addressed at all levels of UK planning policy, the aim of this being that development contributes to halting further losses and encouraging population enhancement.

Under the Natural Environment and Rural Communities (NERC) Act 2006, it is now the duty of all governmental departments to take Priority species into account as a material consideration in the determination of planning applications.

A1.8 The National Planning Policy Framework (NPPF)

The NPPF, published in April 2012 replaces all Planning Policy Statements and Guidance (PPSs and PPGs).

The stipulations for conservation and enhancement of the natural environment state that the planning system should minimise the impacts on biodiversity and where possible restore degraded or depleted habitats.

The main aim is to contribute to the government objective to halt the overall decline in biodiversity, through the establishment of coherent ecological networks that are more resilient to current and future environmental pressures. There has also been a range of conservation and enhancement principles established to guide planning processes and decisions.
Local planning authorities have been given responsibility to set the strategic approach for the creation, protection, enhancement and management of biodiversity networks through planning at the landscape-scale, often across local authority boundaries.

The NPPF emphasises the importance of local green space and states that Local Planning Authorities (LPA's) should plan positively for the creation, protection, enhancement and management of biodiversity networks and green infrastructure.

A1.9 The England 2020 Biodiversity Strategy

The England Biodiversity Strategy 2020 (August 2011) was published by Defra in response to the National Environment White Paper. It sets the Government's objectives for halting the net loss of biodiversity by 2020 and promotes the recognition of the intrinsic value of the benefits from biodiversity, by society.

It emphasises the landscape-scale and ecosystems approach for the demonstration of the benefits obtained from ecosystem services, their interactions and feedbacks rather than a species approach in order to establish more coherent and resilient ecological networks.

A1.10 BS42020: Biodiversity - Code of practice for planning and development

Published in August 2013, "The UK commitment to halt overall loss of biodiversity by 2020 in line with the European Biodiversity Strategy and UN Aichi targets, is passed down to local authorities to implement, mainly through planning policy. To assist organisations affected by these commitments, BSI has published BS 42020 Biodiversity in planning and development – Code of practice which offers a coherent methodology for biodiversity management.

The British Standard seeks to promote transparency and consistency in the quality and appropriateness of ecological information submitted with planning applications and applications for other regulatory approvals"[15].

[15] http://shop.bsigroup.com/ProductDetail/?pid=000000000030258704