M55 Hub
Ecology

Extended Phase 1 Report

July 2009

Control sheet

Project No & Title: **BOW00101 M55 Hub Extended Phase 1 Report, Ecology**

Client: **Blackpool Council**

Prepared by: **Lyndsey Husband, Senior Ecologist**

Checked by: **Jeremy James, Principal Ecologist**

Date of Issue: **3rd July 2009** **Status: Final**

Version No: 1

Revisions: 0

CONTACT DETAILS

Bowland Ecology Ltd
No 8 Poorsland Barn
Slaidburn
Clitheroe
BB7 3AE

Tel: 01200 446777
Fax: 01200 446775
Web : www.bowlandecology.co.uk

Contents

Executive Summary

Bowland Ecology was commissioned to undertake an extended Phase 1 habitat survey and desk study of the proposed M55 Hub Project. The aim of these studies was to highlight: 1) potential constraints to development, and 2) opportunities to enhance biodiversity.

To enable the results to be described concisely the study area has been broken down into 5 areas by the existing road network (refer to Appendix 1 for areas).

Area 1: to the north east of Junction 4 of the M55 there are a diverse range of habitats present, including deciduous woodland, a network of 16 ponds, areas of marshy grassland and arable land. This area is also dissected by a network of ditches that run into a large dyke situated along the eastern boundary of this area.

Protected species which potentially occur within this area include great crested newts, bats, badgers, water vole, otter and reptiles. Other species of note in this area include brown hare (UK BAP Priority Species) and lapwing.

Area 2: to the south east of Junction 4 of the M55. The woodland belt to the north of the M55 continues along the dyke within this area. It is considered that badgers, bats, otter and water vole could be present within this area. In the north west corner of this area there is a pond that could support great crested newts. The only other notable feature in this area is the presence of giant hogweed on a parcel of land to the south which is listed as an invasive species under the Wildlife and Countryside Act 1981.

Area 3: further south, between the A583 and Midgeland Road/Division Lane the land is predominately agricultural. The network of hedgerows and the mix of arable and pasture land provide value to nesting birds. It was observed during the site walkover that skylark and lapwing were nesting. A single pond is present which could contain great crested newts and there is a stand of woodland to the west that could be suitable habitat for badger setts. The large dyke mentioned previously starts to run east to west in this area and it was identified during the desk study that water vole were present in this feature. Japanese knotweed was found in two locations.

Area 4: to the south of Area 3 the land is being developed for commercial use. The habitats present are being affected by on going development, but there are two ponds present that could support great crested newts and the hedgerow network will provide birds with nesting sites. There is one area of Japanese knotweed on the southern boundary of this area.

Area 5: the remaining area along the western boundary of the study area is predominately residential interspersed by small holdings. Areas of interest include an area of marshy grassland in the north eastern corner which is also designated in part as a Biological Heritage Site. There are a number of ponds in this area that could support great crested newts and the dyke system in the south is known to have supported water voles. The network of gardens, hedgerow and pasture will provide a number of suitable nesting sites for birds. Natural England have also identified two UK BAP habitats in this area (reed bed and coastal floodplain grazing marsh).

Of key significance in respect of potential development proposals is the high likelihood that great crested newts and water vole occur within the study area. It is therefore likely that any development within the site will require licenced mitigation. Standard mitigation measures will also be required for nesting birds. It is possible that other significant interests will be affected such as: badger, bats, otter, reptiles, UK/Local BAP Habitats (reedbed, marshy grassland, broadleaved woodland) and

UK/Local BAP species (birds, vascular plants, invertebrates). Any mitigation for significant ecological features would be developed in accordance with existing best practice guidelines and legislation requirements. Development within the study area offers excellent opportunities for delivering biodiversity gains. In particular some strategic design focused upon: water features and associated habitat (e.g. reedbeds); and enhancement of the current ecological network value of the site (e.g. ditches, hedges and verges) would deliver significant wildlife gains (contributing to UK and local BAP Targets).

1. Introduction

1.1 Bowland Ecology was commissioned to undertake an extended Phase 1 habitat survey and desk study for the proposed M55 Hub Project.

1.2 This stage of the project involves an extended Phase 1 habitat survey (to map habitats, features of interest and scope any further surveys) and a desk study (to gather information regarding statutory and non-statutory wildlife designations; and information relating to protected and notable species).

1.3 The Phase 1 element of the study will inform the scheme design and identify the scope of Phase 2 surveys.

1.4 The site is located to the east of Blackpool town centre and is divided in two, east to west, by the M55 and subsequently the A5230. The habitats present within the study area can also be divided in two, as: the western half of the survey area is dominated by residential properties with small holdings; and the eastern half is a mix of agricultural land and commercial development.

1.5 The local area is characterised by low lying land with a network of drainage ditches, ponds, hedgerows and small blocks of woodland.

2. Methodology

2.1 The method employed within this review consisted of a desk study and extended Phase 1 habitat survey.

2.2 The desk study was undertaken across the site and with a 1.5km buffer zone around the site. This involved an online search of the Multi Agency Geographical Information Centre (www.magic.gov.uk), Natural England's Nature on the Map (www.natureonthemap.org.uk) and the National Biodiversity Network (www.nbn.org.uk). The UK and Local (Lancashire) Biodiversity Action Plans were also consulted.

2.3 Information regarding non-statutory wildlife sites, protected species and notable species was also sought from the record holder for the area, in this case Lancashire County Council.

2.4 The aim of the desk study was to identify the presence of statutory wildlife sites and any legally or notable protected species records for the area.

2.5 The extended Phase 1 Survey was carried out on 15 – 17th June 2009. The weather on the 15th and 16th of June was clear and dry. The survey on the 17th June was affected by rain, but it is not considered that this will have affected the survey results. The timing of the survey was within the optimal period for completing a Phase 1 Survey and allowed for an adequate assessment of the habitats present and their potential to support legally protected species.

2.6 The survey followed Phase 1 habitat survey methodology (NCC, 1990). This involves walking the whole site, mapping and describing different habitats (for example: woodland, grassland, scrub). A colour coded map of the habitats on site is produced, with corresponding target notes of ecologically interesting features.

2.7 The survey was extended such that evidence of fauna and faunal habitat was also recorded (for example potential bat roosts, specialist habitat such as ponds, tracks). The extended version of the Phase 1 survey is a modified approach to the Phase 1 survey and follows the approach recommended by the Guidelines for Baseline Ecological Assessment (IEA, 1995).

3. Review of Information

Desk Study

3.1 As stated above the desk study was undertaken across the site and with a 1.5km buffer zone around the site.

Statutory and non-statutory wildlife sites

3.2 The study area does not include any statutory designated sites. The closest site is Marton Mere, which is designated as a Site of Special Scientific Interest (SSSI) and a Local Nature Reserve. This is however, 500m north of the study area and has been designated for its geology and its ornithological interest (typically species associated with large bodies of open water and reed beds). The affect that the development could have on ornithological species associated with this site should be considered once more detail is available on the scale and nature of the development.

3.3 A single Biological Heritage Site is present within the study area (illustrated on the constraints plan in Appendix 4), which has been designated due to the presence of lesser meadow rue.

Protected species

3.4 Lancashire County Council records identified one known great crested newt pond within the site (indicated on the constraints plan in Appendix 4). The data search identified a further 14 confirmed great crested newt ponds within the search buffer but these ponds appear to be all greater than 250m from the edge of the site.

3.5 The data search also confirmed that water vole have been found on the dyke that runs along the eastern boundary of the site (in 1993), on the dyke that runs east to west through the centre of the study area (in 2007) and also on a dyke that runs out of the south-western corner of the study area (in 2007) (indicated on the constraints plan Appendix 4). A further two water vole sites were identified within the desk study buffer zone.

3.6 The records also indicated that otter were historically recorded in Marton Mere (in 1970 – refer to Appendix 2). Marton Mere is connected to the study area by the large dyke network. It is therefore considered that if otter were still present in the area that they would be using the dyke system that runs through the site.

3.7 The NBN Gateway confirmed that there was the potential for great crested newts within the study area. It also identified that water voles have occurred historically at Marton Mere to the north of the study area, where brown hare were also recorded.

Habitats & Species of Principal Importance (Section 74 Crow Act, Section 41 of the NERC Act)

3.8 It is considered that the majority of Habitats and Species of Principal Importance within Blackpool and the Fylde correspond to areas of existing wildlife designation (e.g. SAC, SSSI, BHS). Natural England's Nature on the Map website shows the following UK BAP Habitats within the desk study area: coastal, floodplain grazing marsh and reed beds.

3.9 The NW Biodiversity Audit lists BAP habitats and species within Blackpool and the Fylde – these will be reviewed and included for reference in the final report together with desk study data.

Vegetation Description from Field Survey

3.10 The extended Phase 1 Survey was only undertaken across the site, it did not cover the 1.5km buffer area included within the desk study. The survey was also restricted to those areas to which the surveyor could gain access readily (private back gardens and small holdings were excluded if views from public land were not available and access was not readily available). A range of habitats were found to be present across the site, and these are listed below:

Habitat Type within Site	**UK or Local BAP Habitat**
Ponds and associated reed beds	Local
Hedgerows	-
Lowland marsh/wet pasture	Local and UK
Lowland dry pasture	Local
Arable land	-
Semi-improved grassland	-
Deciduous woodland	-
Dykes and ditches	-
Amenity grassland	-
Introduced shrubs	-
Tall herb	-

3.11 The Phase 1 survey identified a number of ponds across the site. In total 22 ponds were surveyed during the walkover. A further 4 waterbodies were surveyed of which 3 were large fish ponds (stocked) and one was a road reservoir handling runoff from the A5230. To the west the study area is predominately residential land with small holdings. This area was accessed where possible, but there were areas that were not accessible to the surveyor. The Environmental Statement produced for a development known as Moss House Road identified a further four ponds which could not be accessed during the Phase 1 walkover survey.

3.12 Ponds have been identified as features of value within the local BAP. A number of these ponds also had small reed beds associated, which is also a UK BAP habitat. These ponds are indicated on the Phase 1 plan by target notes 6, 7, 9 and 13. A small area of reed bed is present near target note 35, which is also indicated on Natural England's Nature on a Map website.

3.13 There were a number of fields across the study area that could be classified as lowland damp pasture or coastal, floodplain grazing marsh which are classified either local and/or UK BAP habitats. These areas are scattered across the site, however a number of the fields to the north east of Junction 4 of the M55 would fall into these classifications, as would the fields to the south and west of the A5230 roundabout. Generally it was found that botanical species diversity within these fields was greater than in the dry lowland pastures, which have been improved by the application of fertiliser.

3.14 Of particular interest was a small area of marshy grassland indicated by target note 20 on the Phase 1 plan, which was dominated by *Carex* sp. and *Juncus* sp. and a single spike of Northern marsh-orchid *Dactylorhiza purpurella* was recorded. Also of interest was the marshy grassland indicated by target note 34, part of which has been designated as a Biological Heritage Site.

3.15 An important habitat that extends through the study area is the network of ditches and dykes. At the time of the survey there had been an extended period without rain, therefore some of the dry ditches could contain water during the wetter months of the year. A large dyke system also affects the study area and is indicated on the Phase 1 habitat plan by target note 15. Typically this waterway is between 1 and 2 metres wide and is predominately surrounded by grasses including false oat grass *Arrhenatherum elatius*, cock's foot *Dactylis glomerata* and tall herbs including common nettle *Urtica dioica*, *Epilobium hirsutum*, creeping thistle *Cirsium arvense* and one section supports bracken *Pteridium aquilinum*. This network of ditches and dykes potentially will provide important habitat for a number of species. They will also act as a route by which species can move into the area e.g. reptiles and water vole.

3.16 There are three large stands of woodland within the study area. The first stand is indicated by target note 5, which appears to be a natural stand of deciduous woodland, which is a mix of semi-mature and mature trees. Species present include sycamore *Acer pseudoplatanus*, ash *Fraxinus excelsior*, wych elm *Ulmus glabra*, common lime *Tilia europaea* and pedunculate oak *Quercus robur*. Around the majority of the edge of this woodland is a hawthorn *Crataegus monogyna* hedgerow. The second stand is indicated by target note 31 and is plantation woodland that appears to have been planted around the now restored landfill, which lies to the north of this area of woodland. Typically the trees within this woodland are semi-mature. The third is indicated by target note 24 and is situated along a dyke, historically it probably linked to the wood indicated by target note 5. Access into the wood was restricted by a dense hawthorn hedge that runs around this woodland.

3.17 There are a number of small stands of woodland through out the study area which were found to be semi-mature trees planted as screening vegetation. The occurrence of trees within the hedgerow network was limited and if present typically semi-mature.

3.18 There are a number of hedgerows across the study area, which are shown on the Phase 1 Map (Appendix 3) and on the Constraints Plan (Appendix 4). These are typically species poor containing only hawthorn and elder *Sambucus nigra*. There was only one hedgerow that appeared more diverse, which runs along Wild Lane between target note 31 and 37.

3.19 There were a few locations that invasive botanical species was identified. Three locations of Japanese knotweed *Fallopia japonica* are indicated on the Phase 1 habitat plan by target notes 21, 30 and 37. Giant hogweed *Heracleum mantegazzianum* was found in one location and is highlighted on the Phase 1 map by target note 27.

Faunal Description from Field Survey

Great Crested Newts

3.20 The desk study identified that one of the ponds within the site was known to contain great crested newts (target note 10). It was determined during the Phase 1 survey that a further 21 ponds could potentially be used by great crested newts. In addition the Environmental Statement produced for Moss House Road indicated another 4 ponds that could provide suitable habitat. Depending on where the proposed development is situated within the area surveyed for Phase 1, it may be necessary to look beyond the site boundary. As great crested newts can potentially migrate between ponds that are 500m apart, however a distance of 250m should be considered as a guide in terms of mitigation requirements.

Plans indicate that there are a number of ponds outside of the site area that may contain great crested newts.

Breeding Birds

3.21 During the Phase 1 walkover survey skylarks (local BAP species) were observed within an area of grassland upon the restored landfill site (indicated on the Constraints Plan Appendix 3).

3.22 It is further considered that the hedgerows and woodland would provide suitable nesting sites for a range of bird species.

3.23 The Environmental Statement produced for Moss House Road highlighted that records indicated that corn bunting (local BAP species) have historically been present between School Lane and Division Lane, which is in the south west corner of the site. In addition the records from Lancashire County Council indicated that there was the potential for a further 22 Local or UK BAP bird species to be present within the study area (records only indicate the location as SD33 – refer to Appendix 2).

3.24 A number of the fields were also being used by lapwings *Vanellus vanellus* and oystercatchers *Haematopus ostralegus* at the time of the Phase 1 walkover. Pheasants were also being feed to the north-east of Junction 4 of the M55.

Badgers

3.25 No setts were confirmed at the time of the Phase 1 walkover, but it is considered that the mix of grassland, arable and woodland on site would provide badgers with the habitat that they would require for foraging and sett construction. There is the potential for setts not to have been found during the Phase 1 walkover due to the extent of the three large stands of woodland on site and also in areas of dense scrub and/or wide hedgerows.

Water Voles and Otter

3.26 The record search identified that water vole are known to be present on a dyke that runs along the eastern boundary, which then runs east to west across the centre of the study area. They were also found south of the site on a dyke that extends into the south west corner of the site. It is considered that the dyke and ditch network across the site would be suitable for water vole and that potentially this population will expand and contract its distribution due to population fluctuations and also levels of water within this network of waterways.

3.27 The record search also identified that otter were historically recorded at Marton Mere. Since this record was taken otter under went a dramatic population decline within the UK, but the otter population is now recovering and it is considered that the large dykes that run through the site could potentially support otters.

Bats

3.28 The number of mature trees within the study area that could provide bat roosting sites was considered to be limited to trees within the woodland belts indicated by target note 5, 24 and 31, as the majority of other trees across the site were semi-mature or immature.

3.29 There are a large number of residential properties across the study area and these were not assessed individually as to their potential to support bats due to their large number, but it is considered likely that bats would be roosting within some of these buildings.

3.30 Foraging for bats across the study area was considered to be good due to the network of linkages across the site (inc hedgerows, ditches and dykes) and suitable foraging habitat in the form of woodland belts, long grassland and open water.

Brown Hare

3.31 Brown hare *Lepus europaeus* were seen within the fields to the north west of Junction 4 of the M55. It is considered that all of the fields within this area will provide suitable habitat (e.g. mix of arable, grassland and tall herb) for brown hare.

Reptiles

3.32 The records searches identified that there was only one record of common lizard *Zootoca vivipara* in the area, and that was associated with the coast. Potentially this lack of records could relate to a lack of survey effort rather than an absence of animals. It is considered that the waterway network could provide a route by which reptiles could move into the area and there are a number of locations where there is a mix of grassland and open ground that would provide suitable habitat.

4. Recommendations

4.1 The review of the existing information identifies that there are a number of habitats and species present that would need to be considered during development of this area, including:

Habitats	**Species of note that they support**
Ditches and dykes	Water voles, otter, linkage for the migration of reptiles and bats. Also a foraging resource for bats. Potentially valuable habitat for invertebrates and vascular plants.
Ponds	Great crested newts and foraging habitat for bats. Potentially valuable habitat for invertebrates and vascular plants.
Reed bed	Nesting habitat for birds.
Marshy grassland/pasture	Ground nesting birds and brown hare. Also botanically interesting.
Woodland	Potential for bat roosts and badger setts. Suitable habitat for foraging bats and badgers.
Hedgerows	Nesting birds and connective linkages.
Introduced shrub	Invasive species (Japanese knotweed, giant hogweed).

Further Survey Requirements

4.2 It is recommended that the following surveys are undertaken (note: the extent and scope of these works will depend on the nature of the development and are seasonally constrained).

Further Survey	**Period when surveys can be undertaken**
Survey for water vole and otter in dykes and ditches	Surveys for water vole can be undertaken from Feb – Oct, but optimal time is May – June (water levels will affect the survey). Otter can be surveyed anytime of year but signs will be affected by water level.
Great crested newts (Habitat Suitability Index for ponds, to assess their potential to support great crested newts was completed during the Phase 1 survey on those ponds that could be accessed)	Surveys undertaken from March – June (must include visits between mid-April and mid-May).

Bird breeding survey	Surveys can potentially occur from Mar – Oct. Survey should be timed to pick up a range of bird species.
Bat roost potential survey	Anytime of year, winter is better for tree surveys, when leaves have fallen.
Badger survey	Survey for setts can be undertaken at any time of year. Spring and autumn/winter is most effective when vegetation has died back and leaves have been lost.
Reptile survey	March-June or Sept-Oct
Phase 2 botanical survey – lowland damp pasture and coastal (e.g. purple ramping fumitory).	Optimal time June - July
Invertebrates (ditches – beetles, rough grassland – Roesel's bush cricket).	Optimal time June - July

Mitigation Overview

Habitat Loss and Fragmentation

4.3 There is the potential that BAP habitats or habitats of local importance including lowland damp pasture, reed bed, coastal and floodplain grazing marsh, hedgerows, ponds and deciduous woodland could be lost during the development of this site. There are a number of ways in which this loss could be mitigated for depending on the type of habitat that may be lost. This mitigation could include:

- Undertaking new plantings to increase the diversity of the remaining hedgerow network to improve their ecological value.
- Incorporate new species rich hedgerows, ditches or rough grassland belts into the new development to maintain and create habitat linkages.
- The adjustment of land management on areas of land that could develop into marshy grassland e.g. reduce grazing pressure and do not apply fertiliser.
- Plant areas of woodland within the proposed development.
- To increase species diversity, there may be the option to create other BAP habitats within the development area that are currently absent or occur in small isolated quantities.
- The protection of ponds where possible on site and the creation of ponds and ditches to compensate for changing habitats on site or the loss of water features.

- Creation of habitat in advance of development e.g. wetland features and ponds which will provide potential mitigation and enhancement opportunities in advance of impacts.

- Translocation of habitat, potentially by the collection of seed or temporary storage of turf, if the habitat dictates that this would be a beneficial approach.

Great Crested Newts

4.4 Great crested newts are protected by UK legislation under the Wildlife and Countryside Act 1981 and by European legislation under the Habitats Directive 1992, which is translated in to UK legislation by the Conservation (Natural Habitats &c.) Regulations 1994. Therefore it is an offence to:

- Deliberately capture or kill any animal,
- Deliberately disturb any such animal,
- Deliberately take or destroy the eggs of such an animal, or
- To damage or destroy the breeding site or resting place of such an animal.

4.5 Therefore if great crested newts are found within ponds that will be affected by the development or the development is to affect suitable terrestrial habitat within 250m of a pond within great crested newts a licence will be required from Natural England.

4.6 To obtain a licence from Natural England evidence will need to be provided to show that the survey effort has been sufficient to determine the size of the population. In addition suitable mitigation will need to be provided.

4.7 If a pond containing great crested newts is to be directly affected or suitable terrestrial habitat within the vicinity of a known great crested newt pond is to be affected it may be necessary to fence and trap out these areas and relocate the newts to suitable habitat. In addition compensation for the loss of this habitat will be required. This mitigation could be the construction of ponds, establishment of connective linkages, creation of suitable hibernation sites or improvement of grasslands so that they provide suitable cover and foraging while great crested newts are terrestrial.

Breeding Birds

4.8 All works affecting habitats suitable for breeding birds (e.g. hedgerow removal, tree felling) must be undertaken outside of the bird nesting season, which extends from March – August inclusive.

4.9 Loss of suitable bird nesting habitat should be compensated for. Potentially this mitigation could take the form of the erection of bird boxes, the planting of hedgerows, reed beds or woodland stands.

Badgers

4.10 Badger setts are protected under the Badger Act 1992. Therefore, if badgers setts were to be found within the development area, and works needed to occur either within the vicinity of a sett that could have a negative impact on the welfare of the animal or if it was determined that a sett needed to be closed a licence would be required from Natural England.

4.11 Typically licences to disturb badger setts will only be issued for works that occur from the beginning of July to the end of November, to ensure badgers are active and do not have any dependent young. If a licence is required sufficient survey

effort needs to have been completed to ensure that the use of the sett by badgers is fully understood.

Water Vole

4.12 Water voles are fully protected by the provisions of Schedule 5 of the Wildlife and Countryside Act 1981, since April 2008. Therefore it is an offence to:

- Intentionally kill, injure or take water voles.
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection.
- Intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose.

4.13 If water voles are found within a water way or adjacent to a waterway that is to be affected by development, then a licence may be required from Natural England. It may be necessary to displace or translocate the water voles from the waterway that is to be affected and create new habitat to mitigate for the loss of the original habitat.

Otter

4.14 Otter are protected in the same manner as great crested newts in that they are protected under the Wildlife and Countryside Act 1981 and the Conservation (Natural Habitats &c.) Regulation 1994.

4.15 If an otter holt were to be affected by works then a licence would be required and it may be necessary to create a replacement holt. It is important that otters are allow to continue to migrate along all waterways so it may also be necessary to install mitigation into road crossing points to enable continued migration and to prevent animals being forced to cross roads resulting in accidental losses of animals.

Bats

4.16 Bats are protected in the same manner as otter and great crested newts in that they are protected under the Wildlife and Countryside Act 1981 and the Conservation (Natural Habitats &c.) Regulation 1994.

4.17 Therefore if a bat roost (e.g. tree roost, building roost) is identified on site and it is determined that this feature will be disturb or destroyed by development, then a licence would be required from Natural England prior to those works taking place.

4.18 To obtain a licence sufficient survey effort would need to be demonstrated to characterise how the roost is used, loss/destruction/disturbance of the roost should be timed to ensure that bats are unlikely to be present and if necessary exclusion methods employed. In addition mitigation would need to be developed to compensate for the loss of this roosting site e.g. bat boxes, bat barns. The scale and nature of the mitigation would depend on the nature of the roost.

Brown Hare

4.19 Brown hare are not protected by UK legislation but they are identified as a UK BAP species and therefore are a material consideration during development.

4.20 Mitigation should be provided if the habitat that they depend upon is to be lost e.g. tussocky grassland, arable. This mitigation should take the form of habitat creation in an area adjacent to that containing the brown hare so they can relocate on their own accord. Care should be taken to try and not severe linkages between suitable habitat.

Reptiles

4.21 Common lizard receive partial protection under the Wildlife and Countryside Act 1981. This makes it an offence to:

- intentionally kill and injure these reptiles;
- sell, offer or expose for sale, or have in possession or transport for the purpose of sale, any live or dead wild animal or any part of, or anything derived from, such an animal.

4.22 Therefore, if any of the reptiles listed above were to be found within a habitat that is to be lost, then these animals would need to be relocated to suitable habitat. This may involve the creation of that habitat.

Invasive Botanical Species

4.23 It is an offence to plant or cause Japanese knotweed and giant hogweed and to spread either in the wild under the Wildlife and Countryside Act 1981. Therefore, it is recommended that control of these species with herbicide starts immediately to prevent the extent of the stands of these species increasing, which ultimately will make the cost of control more expensive, if it is left untreated.

Enhancements Overview

4.24 The approach to designing enhancements should pay reference to Local Biodiversity Action Plan Targets (Lancashire Biodiversity Action Plan - http://www.lancspartners.org/lbap/). It is considered that the following habitats and species listed on the Lancashire BAP could benefit as a consequence of development within the study area:

- **BAP Habitats:** Arable Farmland, Broadleaved and Mixed Woodlands, Reedbed, Species-rich Neutral Grassland; and
- **BAP Species:** Farmland Birds, Lapwing, Reed Bunting, Skylark, Bats, Brown Hare, Otter, Water Vole, Amphibians (inc. Great Crest Newt).

4.25 Potential enhancement opportunities on this site which could deliver BAP targets include (note: these can be developed further once the scale and nature of the development is known):

- Enhancement of existing habitat, by better management to encourage a greater range of species to use the area e.g. modify grazing regime (benefit farmland birds, lapwing, skylark, bats, amphibians).
- Enhance the number of floral and faunal species present within the area by identifying how habitat diversity could be increased e.g. create reed beds, water features, scrub, tall herb, grassland, disturbed ground etc (benefit to lapwing, reed bunting, bats, water vole and amphibians).

- Development of ponds and ditches to increase habitat diversity and develop habitat linkages which have been lost due to the historical removal of hedgerows (benefit to farmland birds, reed bunting, bats, amphibians, otter).
- Plant diverse hedgerows to establish new linkages. Also facilitate the development of trees within the hedgerows as these are absent from most of the hedgerows on site, and with time these features would provide bird nesting habitat, bat roosting sites and dead wood for invertebrates (benefit to farmland birds, bats, invertebrates and amphibians).
- Erection of bat and bird boxes within the young woodland stands to provide suitable roosting and nesting habitat in areas that provide food but no suitable breeding sites. Also the construction of log piles to encourage invertebrates associated with dead wood.
- Creation of hibernacula for great crested newts and reptiles.

4.26 It is considered that the low lying nature of the local landscape gives excellent opportunities to integrate water/wetland features which would deliver significant wildlife and landscape gains. This approach could potentially integrate with other environmental requirements such as Sustainable Urban Drainage Systems (SUDS) and attenuation of water flows from any new development. Careful consideration will need to be given to the design and location of wetland to ensure that wetland development can be achieved to deliver conservation objectives and maintain air safety. Habitat design will need to be governed by further bird survey to establish the nature of the potential risk and the habitat design criteria to minimise the risk of bird strike (e.g. not including habitat that might attract nesting heron).

References

Bat Conservation Trust (2007). *Bat Surveys – Good Practice Guidelines*. BCT
English Nature (2001). *Great Crested Newt Mitigation Guidelines*. Natural England
English Nature (2002). *Badgers and Development*. Natural England
English Nature (2004). *Bat Mitigation Guidelines*. Natural England
Environment Agency (2007). *Managing Japanese Knotweed on Development Sites – The Knotweed Code of Practice*. Environment Agency
Natural England (2008). *Technical Information Note TIN 042, Water Voles and Development Licensing Policy*. Natural England.
Regional Biodiversity Steering Group for North West England (1998). *Wild about the North West: A Biodiversity Audit of North West England.*

Appendices

Appendix 1 Executive Summary - Area Plan

Appendix 2 Desk Study Data

Table of Species Records of Note within the Study Area.

Common Name	Latin Name	Date Recorded	Grid Reference	Level of Protection/Value
Amphibians				
Great Crested Newt	*Triturus cristatus*	May 1992	SD35203386	European Protected Species/UK BAP/Lancs BAP Provisional Short List
Mammals				
Water Vole	*Arvicola terrestris*	17/07/2007	SD33193303 - 20 Keasdon Avenue	Schedule 5 Wildlife and Countryside Act1981/UK BAP/Lancashire Biodiversity Action Plan Provisional Long List
Water Vole	*Arvicola terrestris*	April 1993	SD360331 - Wyre Catchment - main drain	Schedule 5 Wildlife and Countryside Act1981/UK BAP/Lancashire Biodiversity Action Plan Provisional Long List
Otter	*Lutra lutra*	09/11/1955	SD344353 - Marton Mere	Schedule 5 Wildlife and Countryside Act1981/UK BAP/Lancashire Biodiversity Action Plan Provisional Long List
Otter	*Lutra lutra*	1970	SD343354 - Marton Mere	Schedule 5 Wildlife and Countryside Act1981/UK BAP/Lancashire Biodiversity Action Plan Provisional Long List
Brown Hare	*Lepus europaeus*	2002	SD3430	UK BAP/Lancs BAP Provisional Long List
Birds				
Whooper Swan	*Cygnus cygnus*	21/12/2007	SD33K	Lancs BAP Provisional Long List
Bewick's Swan	*Cygnus columbianus*	20/12/2007	SD33K	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Linnet	*Carduelis cannabina*	1997	SD33H	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
House Sparrow	*Passer domesticus*	1997	SD33H	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Skylark	*Alauda arvensis*	1997	SD33I	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Swallow	*Hirundo rustica*	1997	SD33I	Lancashire Biodiversity Action Plan Provisional Long List
Cuckoo	*Cuculus canorus*	1997	SD33M	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Starling	*Sturnus vulgaris*	1997	SD33M	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Lapwing	*Vanellus vanellus*	1997	SD33M	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List

House Martin	*Delichon urbica*	1998	SD33N	Lancashire Biodiversity Action Plan Provisional Long List
Grey Partridge	*Perdix perdix*	1998	SD33T	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Reed Bunting	*Emberiza schoeniclus*	1998	SD33T	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Turtle Dove	*Streptopelia turtur*	1998	SD33T	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Song Thrush	*Turdus philomelos*	1998	SD33I	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Corn Bunting	*Miliaria calandra*	1997	SD33L	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Grasshopper Warbler	*Locustella naevia*	1997	SD33I	Lancs BAP Provisional Long List
Grey Heron	*Ardea cinerea*	1997	SD33I	Lancs BAP Provisional Long List
Spotted Flycatcher	*Muscicapa striata*	1997	SD33I	Lancs BAP Provisional Long List
Tree Sparrow	*Passer montanus*	1998	SD33S	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Shoveler	*Anas clypeata*	1998	SD33S	Lancs BAP Provisional Long List
Yellowhammer	*Emberiza citrinella*	1998	SD33T	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Curlew	*Numenius arquata*	1999	SD33R	UK Biodiversity Action Plan priority species/Lancs BAP Provisional Long List
Quail	*Coturnix coturnix*	1997	SD33K	Lancs BAP Provisional Long List
Plants				
Lesser Meadow-Rue	*Thalictrum minus*	1984	SD326323	Lancs BAP Provisional Long List

Appendix 3 Phase 1 Habitat Plan and Target Notes

Target Notes that Accompany the Phase 1 Plan

Target Number	Description
1	Lapwing *Vanellus vanellus* are nesting close to this pond. There is no emergent vegetation, water quality is poor as it is used for cattle water. No ducks present and no fish likely. No shade. Pond is approximately 15x5m. Two channels have been dug from this area into a lower lying section. This was dry at the time of the survey.
2	This pond is surrounded by a bed of soft rush *Juncus effusus*. The pond is used for cattle water so water quality is poor to moderate. Emergent vegetation includes *Eleocharis palustris* agg. and soft rush. Small frogs seen around the margin and there were dragonflies and damselflies around the pond. Moorhens were present. There was 60% cover of emergent vegetation. No shade. Pond was approximately 20x10m.
3	This farm building has burnt down and has consequently lost most of the roof. The end section has kept its roof and is accessible as the end window has been lost. Evidence was seen that this area is occupied by pigeon. It was considered that the building would be of low bat roost potential. There are two portakabins in the grounds of this building. One of these does have a board that runs around the entire exterior of the building that bat could tuck under, but this was covered in cobwebs all the way around potentially indicating that bats have not entered this feature. The gardens now provide potentially good reptile habitat as there are areas of rough grassland to forage and hardstanding/gravel to bask.
4	Two ponds – one of the ponds is within the woodland and is approx 30x15m it is in 100% shade, there is no emergent vegetation, water quality is poor. No wildfowl seen, fish may be present. Pond two is further into the field and has a margin of emergent vegetation comprised of yellow flag *Iris pseudacorus* (10% cover). Water quality is still poor. No sign of wildfowl or fish. It is approximately 15x10m.
5	Large band of deciduous woodland. It was considered that the trees could provide bats with roosting sites. In addition the woodland would provide good foraging habitat for bats and a good connective linkage. Particularly as the wood is connected to multiple ponds and the large dyke running along the eastern edge of the study area. The woodland also could provide suitable habitat for badgers to have setts and to forage. As the trees are mature within this woodland and there is plenty of dead wood an interesting assemblage of invertebrates may be present.
6	Two pond – one is in the woodland and is 30x15m, 5% emergent vegetation – yellow flag, 100% shade, water quality poor – turbidity could indicate the presence of fish. The second pond is more in the field. 10x5m, 60% shade and 20% emergent vegetation comprised of yellow flag and common reed *Phragmites australis*.
7	This is a large pond. At the time of the survey the top end of the pond had dried out leaving a bed of bulrush *Typha latifolia*. Pond is 35x15m, emergent vegetation is comprised of bulrush, yellow flag and soft rush. The pond connects to a hedgerow and the top end is surrounded by scrub inc. hawthorn *Crataegus monogyna*.
8	Large pond 50x50m. It is considered that fish are likely and it was observed that there were a number of ducks and moorhens on the pond. Water quality appeared poor. There was 5% emergent cover provided by bulrush and shade

	covered 30% of the pond. One end of the pond is surrounded by crack willow *Salix fragilis*, hawthorn and elder *Sambucus nigra*. The other end opens into semi-improved grassland and tall herb.
9	This pond is surrounded by a moderately sized area of tall herb, with scrub at the rear. The pond is approximately 30x10m. The scrub at the rear is comprised of grey willow *Salix cinerea* and goat willow *Salix caprea* and hawthorn. There is no emergent vegetation. The water was turbid.
10	This pond is approximately 20x20m. It has yellow flag around its margin and is totally covered in weed. Water level was very low. Also surrounded by hawthorn and semi-improved grassland. No wildfowl present, due to low water level it is considered that fish would struggle to survive.
11	Dry ditch surrounded by tall herb and grassland species.
12	Stand of plantation woodland. This at the rear of a private property and could not be accessed at the time of the survey. Trees considered too young for bats but could potentially be suitable for a badger sett. Species present include ash *Fraxinus excelsior*, rowan *Sorbus aucuparia*, silver birch *Betula pendula*, aspen *Populus tremula* and oak *Quercus* sp.
13	Pond is approximately 20x15. A heron *Ardea cinerea* was present indicating that fish may be present. As was a swan *Cygnus olor*. Emergent vegetation included broad leaved pondweed *Potamogeton natans*, water plantain *Alisma plantago-aquatica* and yellow flag. Water quality was good. Around the pond was also common reed and soft rush.
14	A stand of bamboo was found.
15	There is a large dyke that runs through the study area. This is surrounded generally by grassland and tall herb, but can include hawthorn, bracken *Pteridium aquilinum*, trees inc. sycamore *Acer pseudoplatanus*. It is considered that this could provide good water vole habitat. It would provide a commuting and foraging resource for bats and would provide a route along which reptiles could move into the area. Water quality looked good and a range of emergent species were present along its length. It was also considered that this feature could support an interesting assemblage of invertebrates.
16	This pond is overgrown by bulrush with no free water remaining. The pond is situated within a dense area of tall herb inc. creeping thistle *Cirsium arvense* and common nettle *Urtica dioica*.
17	The pond is approximately 50x40m. There is 20% cover by emergent vegetation including bulrush and reed canary grass *Phalaris arundinacea*. Moor hens are present. Potential for fish. Water quality moderate.
18	This feature appears as two ponds on the plan but they are linked together. The pond is 90% shaded and there is no emergent vegetation. Water quality is poor. Unlikely to be used by wildfowl as it is too enclosed. Situated next to a pheasant feeding station.
19	This is a large pond approximately 50x20m. It is heavily shaded – 60% shade. Ducks are present and fish are likely. Water was turbid and water quality was considered to be poor. The pond is surrounded by wood. The trees are generally semi-mature and were considered unlikely to provide bats with roosting opportunities. There is a network of tunnels in the wood as there is a pheasant feed stations here. The tunnels found were rat and rabbit. No badger setts were found, but it is possible that badgers would also be in this area due to the pheasant feed stations and the surrounding mix of arable, grassland and woodland that surrounds this area.

20	This area of marshy grassland is dominated by *Juncus effusus, Juncus conglomeratus, Carex* sp. One spike of *Dactylorhiza purpurella* was also found in this area.
21	Small stand of Japanese knotweed approximately 8x1m.
22	Access to this area could not be achieved by the surveyor. However, looking over a fence it was considered possible that there were stands of Japanese knotweed in this area. Species identification would need to be confirmed.
23	This pond is 15x10m. It is surrounded on one half by willow and hawthorn. The opposite side by grassland. There is emergent pondweed, water plantain and floating sweet grass *Glyceria fluitans*, which covers 50% of the surface.
24	A deciduous woodland. The trees are of an age that they could provide roosting sites for bats. Potentially this wood may also provide badgers with suitable sites for setts. Tree species present include horse chestnut *Aesculus hippocastanum*, sycamore, elder and wych elm *Ulmus glabra*.
25	This pond is within a semi-mature woodland with very limited ground flora. The pond is within 100% shade. There were no emergent macrophytes. Willow is growing within the pond. The water quality within the pond appeared poor and there was a lot of litter in the pond. Unlikely to be used by wildfowl, due to a lack of flight lines. Unlikely to be fish due to the low water level.
26	Pond approximately 25x15m. Situated within a grassland. The margin of the pond is defined by yellow flag and there is some white water lily *Nuphar alba* present – 10% coverage. No shade. Likely to be used by wildfowl and there is the possibility of fish. Water quality was moderate.
27	Giant hogweed *Heracleum mantegazzianum* is present within this area of tall herb.
28	Large pond – 70x40m. Limited emergent vegetation – bulrush resulting in 10% coverage. Likely to be wildfowl and fish. Pond is surrounded by grassland and scrub.
29	Pond is 25x15m and around it margin are stands of common club rush *Scirpus lacustris*, water plantain and floating sweet grass. The surface was also largely covered with pondweed. Therefore 90% coverage. There was no shade. It was considered unlikely that there would be fish. No wildfowl present at the time of the survey.
30	Stand of Japanese knotweed – 10x6m
31	Shelter belt of trees has been planted around a restored landfill, which would have provided screening when the landfill was active. It is considered that most of the trees will be too immature to provide bat roost potential, but a further survey is recommended. The trees will provide foraging for bats and could provide badgers with suitable habitat for sett construction.
32	Stocked fishing pond – reducing the likelihood of great crested newts being present. Emergent vegetation includes yellow lily and bulrush – 20% coverage. Likely to be used by wildfowl as it is quiet open. The pond is surrounded by semi-mature woodland. 20% shade over the pond. Pond is approximately 25x25m.
33	This pond is in the middle of a horse field. The pond is approximately 10x10m. It is covered in crowfoot *Ranunculus* sp. and there is no other emergent vegetation around the perimeter of the pond. It is likely that this pond would be used by wildfowl as it is so open. It is unknown if fish are present. The water quality of the pond was considered mod-good.
34	These areas are dominated by soft rush and compact rush.. The grass sward

	also includes species such as reed sweet grass *Glyceria maxima*. It is considered that these areas may need further assessment as to their botanical value.
35	Tunnel under the road. It was assessed as to its bat roost potential. It was found that the pointing within the tunnel is in good condition. Therefore there are no crevices that bats could use as roosting sites.
36	Network of wet ditches which have water vole potential.
37	Small stand of Japanese knotweed – 1x1m
38	A large fishing pond, which is surrounded by semi-mature trees and a caravan park. 40% of the surface of the water is covered with water lilies. This pond is stocked with fish so the potential for newts is greatly reduced. The pond is approximately 60x40m. Water quality appeared good.
39	Access to this reservoir is restricted. Surveyor was informed by a neighbour that the reservoir was constructed to handle runoff from the road. Therefore water quality maybe poor. The reservoir is approximately 50x40m. The surface was in part covered with water lilies in the area that could be seen from the fencing. The reservoir is surrounded by immature/semi-mature woodland. It could not be determined how deep the reservoir was or the nature of the sides of the reservoir from surveyors location.

Appendix 4 Constraints Plan