

Project: 'Wings Across the Ings' - fields north of Broomhill
Flash Nature Reserve

Survey: Preliminary Ecological Assessment Survey

Client: Garganey Trust



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Executive summary

The Garganey Trust are proposing to undertake a habitat creation project for the purposes of conservation, on farmland between their existing nature reserve, Broomhill Flash, and RSPB Wombwell Ings.

It will involve the conversion of some of this farmland into wet grassland, open water and reedbeds primarily for the benefit of water birds. Changes in farming practice on the remainder of this area of farmland will also benefit farmland bird species. In addition, the project will also perform a flood storage role for the benefit of businesses and properties further along the Dearne Valley.

A Preliminary Ecological Assessment Survey was undertaken of the site in order to inform a planning application for the proposed project. The habitats and species present were recorded and the potential impacts of the proposed project (both positive and negative) were considered.

Potential short term negative impacts as a result of the construction phase of the project have been identified, however these can be readily mitigated. Positive impacts as a result of wetland habitat creation and changes in farming practices on the remainder of the site will result in long term biodiversity gains, both on the site itself and through its contribution to the important role played by the whole complex of wetland nature reserves in the Dearne Valley.

Introduction

Background to the project

Hazelwood Conservation were commissioned by the Garganey Trust to undertake a Preliminary Ecological Assessment Survey of land north of the Broomhill Flash Nature Reserve, Broomhill, Barnsley, South Yorkshire, S73 0YH (British national grid reference SE 414 033). Part of this land is proposed as the location of a habitat creation project - 'Wings Across the Ings', for the purposes of conservation. The location of the site is shown on Figure 1.

The land north of the Broomhill Flash Nature Reserve, where the project is proposed, is herein referred to as the 'site'. The site comprises two fields with associated ditches and hedgerows located north and adjacent to the Broomhill Flash Nature Reserve, which is owned and managed by the Garganey Trust. To the north of the site is Wombwell Ings, which is owned by the Environment Agency and managed by the RSPB. The location of the site in relation to the surrounding land holdings is shown in Appendix A.

The site is currently privately owned, but will be purchased as part of the project. The project proposals are to 'create new habitats to connect, expand and increase populations of wetland and farmland wildlife, especially nationally declining and priority species of water birds such as lapwing, snipe and redshank. It will also provide a flood protection facility to improve the risk of flooding to properties in the valley through the creation of a new flood washland and a more natural connection to the watercourse of the Bulling Dyke' (Garganey Trust, 2016).

The primary purpose of the project is to significantly improve the nature conservation value of both the site itself and of the wider area.

The proposals for the project require the infilling of a section, and culverting of a section of Bulling Dike, the infilling of a section of existing watercourse on the eastern boundary of the site, the creation of a new outfall in to Bulling Dike, the creation of a flood bund, removal of part of a length of hedgerow (currently the boundary between the two fields on site), along with excavations within the fields as part of the water engineering of the site. Site access will be taken along an existing farm track into the arable field from Everill Gate Lane which is located to the south.

The larger of the two fields which form the site is currently under arable production. The remainder of this field which is not subject to the works described above, will, under the ownership of the Garganey Trust, be let to a farming tenant for continued agricultural use. The farming methods will be tailored towards nature conservation involving switching to spring sown crops, creating 'skylark plots' and field margins, and retaining winter stubble. These changes in farming practice will in themselves represent a significant improvement for biodiversity compared to the

current land-use and complement the improvements being made as a result of the 'Wings Across the Ings' project.

The general arrangement of proposals for the project are shown in Appendix B.

Purpose of this Report

The purpose of this report is to detail the findings of the Preliminary Ecological Assessment Survey. This comprises an Extended Phase 1 Habitat Survey, desk study, and assessment of the suitability of habitats which may be affected by the proposals for their potential to support protected or notable species. Potential impacts will be identified, followed by requirements and recommendations for further survey, mitigation and compensation where required. Suggestions will also be made for biodiversity enhancements which could be made as part of the project, where not already included.

Personnel

This Preliminary Ecological Assessment Survey was undertaken by Maria Parkinson and Gareth Parkinson.

Maria Parkinson is a professional ecologist with over 11 years' experience in ecological consultancy. She has a degree in ecology and is a member of the Chartered Institute of Ecology and Environmental Management. She holds protected species licences which include a Natural England great crested newt survey licence and a Natural England barn owl survey class licence (CL29).

Gareth Parkinson is also a professional ecologist with over 10 years' experience in ecological consultancy. He has a degree in ecology and is a member of the Chartered Institute of Ecology and Environmental Management. Gareth has undertaken many protected species surveys during his career and is a bat specialist who holds Natural England bat, great crested newt and dormouse survey licences, as well as a Natural England barn owl survey class licence (CL29).

Methods

Desk Study

A desk study was undertaken in order to collate existing information regarding designated sites, habitats of principal importance and protected and/or notable species for the site and its surroundings. A data search was requested from Barnsley Biological Record Centre (BBRC), and a search using the Magic website was undertaken for up to 2.5km from the approximate central grid reference of the site (SE 414 033). Any relevant existing data was also requested from the Garganey Trust themselves.

Extended Phase 1 Habitat Survey

The Extended Phase 1 Habitat Survey was undertaken on the 2nd November 2016 by Maria Parkinson and Gareth Parkinson. The survey was undertaken in accordance with the Handbook for Phase 1 Habitat Survey (JNCC, 2010) and involved a walkover survey of the site and its immediate surroundings.

Habitat types are mapped and coded using the classifications given in the Phase 1 Habitat Survey Handbook in which habitat types are determined according to their characteristic vegetation along with other features such as buildings, roads and watercourses.

Where features or habitats which could support protected or notable species are observed, these are recorded in the form of target notes.

Survey limitations

The Extended Phase 1 Habitat survey was undertaken in early November which is likely to have restricted the diversity of flora which was recorded. However, the mild autumn conditions allowed for much vegetation to still be apparent. In addition to this the majority of the site is arable and improved pasture, with the most botanical diversity being restricted to the watercourses which bound the site.

Results

Desk Study

Internationally Designated Sites

There are no Special Protection Areas (SPAs) or Special Areas of Conservation (SACs) within 2.5km of the central grid reference of the site.

Nationally Designated Sites

There are no Sites of Special Scientific Interest (SSSI) within 2.5km of the central grid reference of the site.

Locally Designated Sites

There are five Local Wildlife Sites (LWS) within 2.5km of the central grid reference of the site. These are:

- 🌿 Broomhill Flash and Wombwell Ings LWS. The LWS comprises two nature reserves either side of the site and Bulling Dike, as well as a separate waterbody to the south of Everill Gate Lane. The LWS is primarily designated for the wetland habitats which are important for a range of breeding, passage and wintering birds.
- 🌿 Park Hill Nature Reserve LWS. This LWS is located approximately 250m west of the site. The LWS is a former brickworks which has succeeded to areas of woodland scrub and grassland. Until recently there were few management interventions on the LWS but now scrub control and grassland management is taking place to maintain the diversity of habitats. There are several areas of swamp on the LWS, two ponds, and ditches which include Bulling Dike which forms the northern boundary and provides a link between the LWS and the site.
- 🌿 Old Moor and Wath Ings LWS. This LWS is located approximately 250m east of the site. The LWS comprises extensive areas of floodplain and grazing marsh, open water and reedbeds. It is managed by the RSPB as their main site in their Dearne Valley reserves. The Bulling Dike connects the site to this LWS. The River Dearne forms the northern boundary of the LWS.
- 🌿 Bolton-on-Deerne Wetland LWS. This LWS is located approximately 1km east of the site. It comprises areas of floodplain and grazing marsh, and ponds, which essentially form an extension to the Old Moor and Wath Ings LWS. This LWS is also managed by the RSPB as part of the Dearne Valley reserves.
- 🌿 Gipsy Marsh. This LWS is located approximately 650m south of the site. It comprises ponds, lowland meadow, fen and heath habitats. The site forms part of the RSPB Dearne Valley reserves.

Other designations and wildlife sites

- 🌿 Houghton Washlands is located approximately 1.6km north of the site. It forms part of the RSPB Dearne Valley reserves who now manage the site on behalf of the Environment Agency. Houghton Washlands is currently in the process of being converted from arable farmland to grazing marsh, reedbed, wet woodland and fen.
- 🌿 Parkhill Landfill site. Located to the west of Broomhill Flash Nature Reserve this site and has now been restored with grassland and broadleaved plantation woodland. It provides a habitat link between Broomhill Flash and Parkhill Nature Reserve to the west.
- 🌿 Yorkshire Water - Ings Road site. An operational sewage treatment works with an adjacent area of semi-natural vegetation comprising mostly tall ruderals and grassland, separated by Bulling Dike. This area abounds the site, Broomhill Flash Nature Reserve, Parkhill Landfill site and Parkhill Nature Reserve and is therefore likely to serve a function as a corridor of movement for wildlife between the sites.

Habitats of Principal Importance

The following habitats of principal importance, as listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 are present at or adjacent to the site:

- 🌿 Hedgerows
- 🌿 Coastal and floodplain grazing marsh

Protected and/or notable species

The ecological data search undertaken by BBRC returned 33063 records within 2.5km of the central grid reference of the site. The volume of records reflects both the recorder effort in this locality as well as the importance of the area for wildlife.

From the records returned, a list of protected and/or notable species recorded within 2.5km of the central grid reference of the site has been compiled, which is included in Appendix C. The criteria used to filter protected and/or notable species are inclusion as any of the following: Wildlife and Countryside Act (WCA) 1981 (as amended) protected species, WCA Schedule 9 invasive species, species of principal importance under the NERC Act 2006, RSPB Red or Amber list bird species (BoCC4), WCA Schedule 1 bird species, and birds listed in Annexe 1 of the Birds Directive. These records are discussed below.

Birds

Many bird records were returned for the search area, which comprises numerous well-watched sites - 18436 records, spanning 1962 to 2016. In order to summarise

this data, it was filtered only for species fitting any of the above criteria. From this data, 148 protected or notable bird species have been recorded, for which there are numerous records.

Many records relate to waterfowl, and the summary within the Garganey Trust's project plan document (Wings Across the Ings Project Activity Plan, 2016) concisely summarises this data and the importance of the search area for waterfowl:

'The existing natural heritage along the Dearne NIA river corridor is a mix of wetland and grassland habitats (some, like lowland grazing marsh, neutral grasslands and reedbeds are UK priority habitats in the government's biodiversity strategy Biodiversity 2020), and these support important populations of associated birds such as Lapwing (49 pairs), Snipe (12 pairs), Redshank (19 pairs), Yellow wagtail (2 pairs), Shoveler (12 pairs), Garganey (1 pair), Water Rail (16 pairs), Bittern (1 pair at Old Moor). Most importantly, these areas provide a source of new young birds to their wider populations, since the productivity is good, in contrast to much of lowland England where these bird populations are declining and suffer poor productivity. In winter, the area is home to many hundreds of wildfowl which originate in Northern Europe. Scandinavia and arctic Russia. Birds such as Wigeon, Teal, Pintail, Whooper Swan and these are collectively important as an important concentration of wintering wildfowl.

In addition, the area provides a regional (and national) focus for birdwatching, especially of migrant birds in Spring and Autumn, and there are exceptional gatherings and records of other species (for example up to 6,000 Golden Plovers in autumn, Little Egrets, Spoonbill, Common Crane).'

In addition, species to highlight with respect to the project and which may need to be taken in to account when planning the work include barn owl (*Tyto alba*). Barn owl are frequently recorded south of the site at Broomhill Flash Nature Reserve where they have bred intermittently in the barn owl boxes here (as have kestrel *Falco tinnunculus*) over a number of years.

Breeding lapwing (*Vanellus vanellus*) and skylark (*Alauda arvensis*) have been recorded in the arable field, and the improved pasture field may also support these species. The hedgerows on site with associated hedgerow bottom flora comprising bramble and grass tussocks could support a number of breeding birds, some of which may be notable (as well as protection afforded to all nesting birds) such as linnet (*Carduelis cannabina*) and grey partridge (*Perdix perdix*) which have both been recorded on site. The watercourses which bound the site also offer opportunities for nesting birds, both in the water and in the bankside and emergent vegetation such as reed bunting (*Emberiza schoeniclus*) which has been recorded on or adjacent to the site. Other protected and/or notable species may use the watercourses as a food resource such as kingfisher (*Alcedo atthis*) which has also been recorded on or adjacent to the site and in the wider area.

Mammals

157 records of water vole were provided, from 1976 to 2013, mostly of field signs with occasional sightings. These records relate to the many watercourses and waterbodies in the vicinity of the site, including the Old Moor and Wath Ings RSPB reserve, Parkhill Nature Reserve, Elsecar Canal, the River Dearne and River Dove, and RSPB Gypsy Marsh LWS, as well as other unnamed ditches/drains. The closest records to the site are located on Bulling Dike along the north eastern boundary of the site (adjacent to the improved pasture field, see TN6 below), from surveys undertaken in 2013.

Twelve records for otter (*Lutra lutra*) were provided, from 1996 to 2015. The closest records relate to the River Dearne approximately 225m east of the site dated 2007, and the River Dove, approximately 400m north of the site dated 2005.

Four records of the non-native American mink (*Mustela vison*) were provided from 1992 to 2005. The closest record is located on the River Dearne approximately 225m east of the site dated 2005.

130 bat records were provided, from 1967 to 2013, of six species; common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), noctule (*Nyctalus noctula*), leisler's (*Nyctalus leisleri*), daubenton's (*Myotis daubentonii*), and brown long-eared (*Plecotus auritus*), as well as records where species was unknown. The records comprise roost records, as well as field sightings and mist net captures. The most recent records relate mainly to the Old Moor and Wath Ings RSPB reserves, and Park Hill Nature Reserve of foraging bats.

Three badger (*Meles meles*) records were provided, the closest of which is located approximately 700m from the site.

Ten records of hedgehog (*Erinaceus europaeus*) were provided from 1983 to 2014, the closest and most recent records are from Old Moor RSPB reserve and Broomhill Park approximately 650m south east of the site.

Fourteen records of brown hare (*Lepus europaeus*) were provided from 1992 to 2015, the closest of which were from Broomhill Flash Nature Reserve.

Seventeen records of harvest mouse (*Micromys minutus*) were provided from 1992 to 2015, the closest of which were from Park Hill Nature Reserve, and Old Moor and Wath Ings RSPB reserve, with harvest mouse remains also found in barn owl pellets taken from Broomhill Flash Nature Reserve.

Reptiles

Twelve records of reptiles were provided. The oldest of these was from 1994 of grass snake (*Natrix natrix*) from Wombwell Ings, with the more recent records dating from 2004 to 2016. Four species of reptile; grass snake, common lizard

(*Zootoca vivipara*), slow worm (*Anguis fragilis*) and adder have been recorded (*Vipera berus*).

Most of the reptile records are of grass snake, and are all from areas which surround the site including Wombwell Ings, with the grid reference actually corresponding to Bulling Dike along the northern boundary of the site. Other locations include Parkhill Nature Reserve, Everill Gate Lane (south of Broomhill Flash Nature Reserve), and Old Moor RSPB reserve which is linked to the site by watercourses. The slow worm and common lizard records are also from the Old Moor RSPB reserve, and the two adder records are located 0.7km north east of the site.

Amphibians

Seventeen records of amphibian were provided, ranging from 1979 to 2014, of four species; great crested newt (*Triturus cristatus*), smooth newt (*Triturus vulgaris*), frog (*Rana temporaria*), and toad (*Bufo bufo*). The great crested newt (GCN) record is from Wombwell golf course dated 1991, approximately 2.1km south west of the site. The records of smooth newt are more recent (2012) and closer to the site, located at the Old Moor RSPB reserve. Frog and toad records were also provided for the Old Moor RSPB reserve, as well as other wetlands in the vicinity, the closest being a record of frog at Wombwell Ings.

Fish

Two records of European eel (*Anguilla anguilla*) were provided for Old Moor RSPB reserve, where the record notes that 50,000 were introduced in 2010. An adult eel was observed by the Garganey Trust at Broomhill Flash in May 2014.

Invertebrates

There were 4003 records of invertebrates returned as part of the BBRC data search of which 112 records were of notable species. These comprised records of 27 species of moth and butterfly, mostly recorded at the Old Moor RSPB reserve between 1975 and 2016.

A single record was provided of the invasive signal crayfish (*Pacifastacus leniusculus*) from Knoll Beck at the Old Moor RSPB reserve where four were found dead in 2012.

Plants

Records of cornflower (*Centaurea cyanus*) and chamomile (*Chamaemelum nobile*) were provided the closest of which are 1.2km south east of the site and at Old Moor RSPB reserve respectively.

There are also records of several non-native invasive plant species (listed on Schedule 9 of the WCA 1981 (as amended) including:

- 🌿 Japanese knotweed (*Fallopia japonica*) - recorded in the surrounding area including Wombwell Ings, Parkhill Nature Reserve and Gypsy Marsh.
- 🌿 Himalayan balsam (*Impatiens glandulifera*) - recorded in the surrounding area, the closest record being approximately 150m east of the site. Also recorded during the Extended Phase 1 Habitat survey (see below) along the western site boundary.
- 🌿 Giant hogweed (*Heracleum mantegazzianum*) - recorded in the surrounding area, the closest record being approximately 425m north east of the site at Wombwell Ings.
- 🌿 New Zealand pygmyweed (*Crassula helmsii*) - recorded in the surrounding wetland LWS's in 2010, and most recently in 2015 at Parkhill Nature Reserve and Gypsy Marsh. Also recorded during the Extended Phase 1 Habitat survey (see below) along the eastern site boundary.
- 🌿 Water fern (*Azolla filliculoides*) - recorded less frequently than the above invasives, but recorded approximately only 70m east of the site in the adjacent wetlands.
- 🌿 Elodea waterweed species (*Elodea* sp.) - recorded less frequently than the above invasives, but recorded approximately only 20m south of the site in the adjacent wetlands. Also recorded during the Extended Phase 1 Habitat survey (see below) in Bulling Dike.
- 🌿 Cotoneaster (*Cotoneaster horizontalis*), false acacia (*Robinia pseudoacacia*), Japanese rose (*Rosa rugosa*), rhododendron (*Rhododendron ponticum*) - recorded less frequently and further away from the site.

Extended Phase 1 Habitat Survey

The site is located between two wetland nature reserves (Broomhill Flash and Wombwell Ings), with a sewage treatment works and restored landfill site to the west. It is approximately 1km north east of Wombwell, and the wider surrounding landscape comprises further wetland nature reserves to the south and east, and urban areas to the north, west and south west.

The site comprises a large arable field, and a smaller improved grassland pasture field, with associated ditches and hedgerows.

The project proposals are located within the northern section of these fields and ditches. Site access will be taken along an existing farm track into the arable field from Everill Gate Lane which is located to the south.

The target notes below describe any identified features of interest, including habitat assessed as suitable for protected and/or notable species. The target notes are shown on the Extended Phase 1 Habitat Map (Figure 2). A botanical species list recorded during the survey is given as Appendix D, and photographs relating to the survey in Appendix E.

TN1 - Arable field. Large field which slopes away both to the north and south. Currently has stubble cover.

TN2 - Mature trees. A group of three mature, multi-stemmed sycamore (*Acer pseudoplatanus*) trees alongside a ditch.

TN3 - Watercourse. Bulling Dike, a drainage ditch, alongside the northern section of the western boundary of the site. The ditch is bounded by the arable field (TN1) to the east and scrub to the west, with a sewage treatment works beyond this.

The channel is approximately 1.5m wide with steep earth banks up to approximately 4m in height. There is a depth of water 30-50cm, and the direction of flow is north east towards Ings Road. As the ditch approaches the road it widens to around 2m, and the water depth is greater (more consistently around 50cm).

The ditch is partly shaded in the southern section due to the height of the banks and adjacent scrub to the east, but is less so towards Ings Road.

The bankside vegetation is dominated by tall ruderals including rosebay willowherb (*Chamerion angustifolium*), bramble (*Rubus fruticosus* agg.) and nettle (*Urtica dioica*). Himalayan balsam (*Impatiens glandulifera*, Schedule 9 WCA 1981 (as amended)) could be seen occasionally along the bank and channel edge, and it is likely that this is widespread throughout the watercourse (plants are likely to have died back at the time of survey). Small amounts of common reed (*Phragmites australis*) are present on the banks and in the channel, as is hemlock (*Conium maculatum*). Submerged and emergent aquatic vegetation comprised of watercress (*Rorippa nasturtium-aquaticum*) and water starwort (*Callitriche* sp.).

TN4 - Watercourse. Bulling Dike, a drainage ditch, is located alongside Ings Road and the northern boundary of the site. This is a continuation of drainage ditch TN3. The ditch is bounded by the arable field (TN1) to the south and Ings Road (actually a grassed track) to the north, with Wombwell Ings beyond this.

The channel is approximately 2-4m wide with shallow earth banks up to approximately 1m in height. There is a greater depth of water than in TN3 (>50cm), and the direction of flow is eastwards.

The ditch section opposite the caravan site (western end) is partly shaded by a line of weeping willows (*Salix* sp.) on the north bank, but beyond this to the east the ditch has an open profile and is unshaded.

The bankside vegetation is dominated by terrestrial grasses and nettles. The northern bank has recently been mowed along its length. In-channel vegetation is frequent along the length of the ditch. Present are stands of branched bur-reed (*Sparganium erectum*), common reed, reedmace (*Typha latifolia*) and reed canary-grass (*Phalaris arundinacea*). Also present are soft rush (*Juncus effusus*) and gypsywort (*Lycopus europaeus*). Submerged and floating aquatic vegetation

comprises water starwort and duckweed (*Lemna* sp.). Elodea pondweed was also recorded here (Schedule 9 WCA 1981 (as amended)).

TN5 - Watercourse and Hedgerow. Continuation of Bulling Dike but in this section the banks are steeper. Occasional hawthorn (*Crataegus monogyna*) and elder (*Sambucus nigra*) are present along the top of the bank, with a more substantial line of mature hawthorn adjacent to the boundary of the improved pasture field (TN6) which form a defunct hedgerow.

TN6 - Improved grassland. Pasture field with grass species which include Timothy (*Phleum pratense*), perennial ryegrass (*Lolium perenne*), cocksfoot (*Dactylis glomerata*) and false-oat grass (*Arrhenatherum elatius*).

The southern boundary of this field grades in to the adjacent marsh of Broomhill Flash Nature reserve. Tufted hair-grass (*Deschampsia cespitosa*), common reed and hard rush were common along this boundary.

TN7 - Watercourse. Drainage ditch alongside the eastern boundary of the pasture field (TN6) which is also the eastern boundary of the site. The ditch is culverted at the northern end of the field and outfalls into Bulling Dike. The ditch is also bounded by rough grassland to the east which is part of the Broomhill Flash Nature Reserve.

The channel is approximately 20cm wide with shallow earth banks which are overgrown with rushes, tall ruderals and grasses. The ditch held little water at the time of survey (<5cm).

The ditch is currently completely shaded by the bankside vegetation which includes hard rush (*Juncus inflexus*), soft rush, common spike rush (*Eleocharis palustris*) and creeping buttercup (*Ranunculus repens*). Broom (*Cytisus scoparius*) was also noted occasionally on the bank side. Although overgrown, beneath the fallen vegetation the channel remains clear.

At the top of this ditch (to the south) there is a sluice gate (which allows control of the water levels at Broomhill Flash Nature Reserve), beyond which the water depth is much greater (>50cm). The earth banks here vary from steep to shallow, and are approximately 1.5m in height. The bankside vegetation is similar to the other section of this ditch but in here there is also emergent and submerged aquatic vegetation present which includes reedmace, watercress and New Zealand pigmyweed (*Crassula helmsii*, Schedule 9 WCA 1981 (as amended)).

TN8 - Hedgerow. An intact, species poor hedgerow forming the boundary between the arable field (TN1) and pasture field (TN6). The hedgerow is a blackthorn (*Prunus spinosa*) and hawthorn mix, with elder present throughout, and shows historical signs of laying. The hedgerow bottom comprises dense bramble.

TN9 - Hedgerow. A defunct, species poor hedgerow (and fence) along the southern boundary of the site. The arable field (TN1) is to the north and Broomhill Flash Nature Reserve is to the south. The hedgerow is a blackthorn and hawthorn mix, with elder, field maple (*Acer campestre*) and dogrose (*Rosa canina*) present also. The hedgerow bottom comprises dense bramble.

TN10 - Dry ditch. Outside of the site, adjacent to the south of defunct hedgerow TN9 is a ditch which is currently dry and overgrown with vegetation. The channel is approximately 30cm wide and 30cm deep.

Habitat Suitability for protected and/or notable species

Table 1 below gives details of protected and/or notable species which may utilise the habitats recorded during the Extended Phase 1 Habitat Survey.

Table 1: Habitat Suitability for protected and/or notable species

Species	Habitat Feature
Birds	<p>The arable field supports breeding birds which include lapwing and skylark, and the improved pasture field may also support these species.</p> <p>The hedgerows will support a suite of common bird species which are protected whilst breeding, as well as more notable species such as grey partridge and linnet.</p> <p>The watercourses which bound the site also offer opportunities for common breeding birds, both in the water and in the bankside and emergent vegetation as well as more notable species for example reed bunting. Other protected and/or notable species may use the watercourses as a food resource such as kingfisher (presumed not to breed on Bulling Dike due to absence of vertical bank faces).</p> <p>Barn owl boxes on the adjacent Broomhill Flash Nature Reserve have been shown to support breeding barn owl. No suitable locations for breeding barn owl exist on the site. The improved pasture field and bankside vegetation along the watercourses which bound the site may support foraging barn owl.</p>

Species	Habitat Feature
Water vole (and mink)	<p>The watercourses which bound the site provide suitable habitat for water vole. Burrows which appeared typical of water vole were observed on Bulling Dike along the western and northern boundary of the site.</p> <p>Feeding remains comprising emergent and marginal vegetation were found on the banks, as well as runs through the bankside vegetation. These signs could be indicative of water vole presence, though no latrines which would confirm presence were observed.</p> <p>Data search records have shown that water vole were recorded along Bulling Dike in 2013 and historically throughout the locality.</p> <p>There are historic records of mink and sightings have been made more recently at the RSPB Old Moor reserve. They potentially utilise the watercourses along the site boundaries (and adjacent wetlands). Mink are a non-native predator of water vole. Where populations of mink become established it is unlikely that local water vole populations will survive in the long term, in the absence of coordinated mink control measures.</p>
Otter	<p>Records confirm that otter are present in the wider area. They potentially utilise the watercourses along the site boundaries (and adjacent wetlands) for foraging and as corridors of movement.</p>
Bats	<p>There are no buildings or structures on the site which could provide suitable roosting habitats for bats.</p> <p>There is a group of three mature, multi-stemmed sycamore trees alongside Bulling Dike on the north west boundary of the site. An initial examination of these trees from ground level did not locate any features suitable for roosting bats. However, if these trees are to be directly affected by the proposed works (by felling or pruning) then an assessment of their potential for roosting bats should be undertaken following the guidance set out in Bat Surveys for Professional Ecologists (BCT, 2016).</p> <p>The wetlands and watercourses around the site are likely to provide prey rich environments for foraging bats.</p>

Species	Habitat Feature
Badger	<p>Records show that badger are known in the wider area. Arable farmland, hedgerows and watercourse banks provide suitable habitat for this species.</p> <p>A large single entrance was found along the bottom of hedgerow TN8 which had a substantial spoil heap comprising of large pieces of debris. No badger signs were found here however, and the entrance split within the hole into two smaller tunnels which run either way along the length of the hedgerow. A second smaller hole with rabbit (<i>Oryctolagus cuniculus</i>) droppings was found nearby as were fox (<i>Vulpes vulpes</i>) scats, and it was concluded that the current use of the burrow was by rabbit or fox, though may have been dug historically by badger.</p>
Hedgehog, brown hare, harvest mouse	<p>The site and its surroundings provide suitable habitat for these species, with brown hare being recorded at Broomhill Flash Nature Reserve.</p>
Reptiles	<p>The watercourses along the site boundaries, as well as the improved pasture field provide suitable habitat for reptiles in particular grass snake which have been recorded along Bulling Dike. Slow worm and common lizard could also utilise these habitats, with adder less likely to do so.</p>
GCN (and toads)	<p>The closest GCN record to the site is over 2km away, and historic. It is acknowledged that GCN are likely to be under recorded in the Barnsley district.</p> <p>The existing wetlands and watercourses in the immediate vicinity of the site could provide foraging habitat and corridors of movement for this species. However, the potential for these waterbodies to support breeding GCN is significantly reduced by the presence of large number of waterfowl and predatory birds (such as heron) as well as the likely presence of fish species which would prey on eggs and larvae.</p> <p>It is therefore considered unlikely that GCN are present on the site.</p> <p>Toads will also utilise the habitats described above but are more capable of successful breeding in such situations.</p>
Eels	<p>The existing wetland habitats within and surrounding the site provide good habitat for eels and the existing ecological records show that adult eels have been recorded as well as large scale releases undertaken for conservation purposes.</p>

Species	Habitat Feature
Invertebrates	<p>The majority of the site is currently an arable field. This will have limited potential for invertebrate species. Ploughing of the soil every year disrupts populations of soil dwelling species. Spraying of crops with insecticide will also have a significant impact of the diversity and abundance of species present both in the arable field itself and also adjacent habitats. The improved grassland field is likely to have slightly more value than the arable field where it is only cut rather than ploughed and re-seeded, however the grass dominated sward with low botanical diversity will limit the potential for invertebrate diversity.</p> <p>The watercourses and waterbodies abounding the site will have greater potential for invertebrates, particularly aquatic species where water quality is sufficiently good. In addition the banks of watercourses and marginal vegetation of wetland areas also provide valuable habitats for invertebrate species.</p>
White-clawed crayfish (WCC) (and signal crayfish)	<p>No records of white-clawed crayfish (<i>Austropotamobius pallipes</i>) were returned, however a single record of signal crayfish was provided from the Old Moor RSPB reserve.</p> <p>The watercourses along the site boundaries are not typical WCC habitat, and it is considered unlikely that they are present here, especially with the potential presence of non-native signal crayfish. Signal crayfish are much more tolerant of a wider range of habitats and they may be present in these watercourses.</p>
Plants	<p>No protected and/or notable plant species were recorded on site during the survey or returned from the data search. The potential for protected and/or notable plant species to be present is limited in the arable field and improved grassland within the site due to the land management practices currently being undertaken (i.e. ploughing, fertiliser application, etc).</p> <p>The wetlands, watercourses and their associated marginal habitats are more likely to provide habitat for protected and/or notable plant species although none were recorded during the survey or returned in the data search.</p>

Species	Habitat Feature
Invasive plants	New Zealand pygmyweed, <i>Elodea</i> pondweed, and Himalayan balsam were recorded in the watercourses along the site boundaries. Water fern is also present in the vicinity and may be present in the above watercourses. Japanese knotweed and giant hogweed can also spread via watercourses and may arrive on site via these means (by fragments of vegetation and seed, respectively).

Assessment of Habitats and Species Value

The habitats which have been recorded during the Extended Phase 1 Habitat Survey have been assigned an ecological value, given in Table 2 below. The same assessment has been made of the species which may be present as a result of these habitats. This value is based on professional judgement taking in to account scarcity or abundance, biodiversity policy as well as legal protection.

Table 2 - Assessment of Ecological Value

Habitat feature or Species	Ecological Value
Arable field	Negligible. Arable farmland is widespread, and monoculture crops over a large area offer limited habitat for most animal species. The arable field on site is usually Autumn sown with crops, which removes spilt grain and winter stubble therefore reducing its value to farmland birds. The field supports some species of breeding birds - see 'Birds' below.
Pasture - improved grassland	Moderate. The diversity of plant species in the sward is low which will restrict the potential value of this habitat for invertebrates and therefore for species higher up the food chain. However, this part of the site is indicated as flood plain grazing marsh (a habitat of principal importance under Section 41 of the NERC Act 2006) on Natural England's Priority Habitat Inventory (viewed on the online MAGIC interactive map), and provides suitable habitat for breeding birds including waders such as lapwing. This habitat is also present in the wider area.
Mature broadleaved trees	Negligible. The presence of mature trees on site is limited to a group of three, multi-stemmed sycamore trees alongside Bulling Dike on the north west boundary of the site. Sycamore trees are common and widespread. See 'Bats' and 'Birds' below.

Habitat feature or Species	Ecological Value
Watercourses	<p>Moderate. Bulling Dike appears to have relatively good water quality, with a range of aquatic plants present, although some of these are non-native invasive species.</p> <p>It also provides suitable habitat for protected species such as water vole, otter, European eel and is likely to support a variety of nesting and foraging birds, which may include kingfisher hunting along the watercourse. See species accounts below.</p> <p>The bankside habitats also provide linear strips of semi-natural habitat which will benefit a range of species as well providing a corridor of movement.</p> <p>The drainage ditch along the eastern boundary of the site held little water at the time of survey, which is dependent on water it receives from Broomhill Flash Nature Reserve. Therefore its ability to support the above plant and animals species is more limited. Despite this, its ecological value as part of the wider hydrology of the area is also considered Moderate.</p>
Hedgerows	<p>Moderate. The hedgerows on site, where present, contain a small number of common hedgerow species and limited ground flora. However, they do provide habitat for nesting birds and a valuable food source for birds in the form of berries and hips. Hedgerows are also habitat of principal importance under Section 41 of the NERC Act 2006.</p> <p>Hedgerows provide corridors of movement and shelter for other species such as invertebrates and mammals.</p> <p>Conversely, the presence of hedgerows can restrict the breeding success of birds on the nearby waterbodies as they provide habitat for predators.</p>

Habitat feature or Species	Ecological Value
Birds	<p>Moderate (not including the species assemblages present outwith the site on the adjacent Nature Reserves and LWS's).</p> <p>Although a number of bird species identified as present or potentially present on site are notable, i.e. red or amber list species, species of principal importance etc, they are also typical of the landscape and habitats present, which in turn are common habitats in the wider area. Notwithstanding this all breeding birds are legally protected under the WCA 1981 (as amended).</p> <p>In addition kingfisher receives protection under Schedule 1 of the WCA 1981 (as amended) which affords this species additional protection from disturbance when breeding. Kingfisher have been recorded on the adjacent wildlife sites and the River Dearne, and may hunt along Bulling Dike. However, it is not thought to breed on the site due to the absence of suitable banks for nesting.</p> <p>Barn owl also receives the same protection under Schedule 1 of the WCA 1981 (as amended). No suitable locations for breeding barn owl exist on the site, though the site may support foraging barn owl.</p>
Water vole (and mink)	<p>High. Water vole receive protection under the WCA 1981 (as amended) and are listed as a species of principal importance under Section 41 of the NERC Act 2006.</p> <p>Negative High. Mink are a non-native species listed on Schedule 9 of the WCA 1981 (as amended) and are one of the main factors in the decline of water vole populations.</p>
Otter	<p>High. Otter are a European protected species and are listed as a species of principal importance under Section 41 of the NERC Act 2006.</p>
Bats	<p>High. Bats (and their roosts) are a European protected species. Six of the eighteen species of bat found in the UK are listed as species of principal importance under Section 41 of the NERC Act 2006.</p> <p>The watercourses and wetlands around the site could provide high quality foraging opportunities for bats.</p>

Habitat feature or Species	Ecological Value
Badger	Low. Badgers are a widespread and common species, though populations may be lower locally as a result of persecution. Badger setts are protected from intentional or reckless interference and badgers are protected from disturbance when occupying a sett.
Hedgehog, brown hare, harvest mouse	Low. These species are widespread and locally common but are listed as species of principal importance under Section 41 of the NERC Act 2006.
Reptiles	Low. The reptile species most likely to be present on site are common and widespread species. Reptiles are protected under the WCA 1981 (as amended) from intentional killing and harm and are also listed as species of principal importance under Section 41 of the NERC Act 2006.
GCN (and toads)	High. Great crested newts (and the habitat they utilise) are a European protected species and are listed as species of principal importance under Section 41 of the NERC Act 2006.
Eels	Low. European eel could use the watercourses which abound the site for foraging and as resting places. European eel are a species of principal importance under Section 41 of the NERC Act 2006.
Invertebrates	Low. The majority of the site provides poor habitat for invertebrate species with the exception of the surrounding watercourses and marginal vegetation.
White-clawed crayfish (and signal crayfish)	High. WCC receive protection under the WCA 1981 (as amended) and are listed as a species of principal importance under Section 41 of the NERC Act 2006. The species is threatened and vulnerable to the introduced crayfish plague (<i>Aphanomyces astaci</i>), and as such is subject to concerted conservation efforts.
Plants	Negligible. No protected and/or notable plant species were recorded on site during the survey or returned from the data search.
Invasive plants	<p>High Negative. Invasive plant species listed on Schedule 9 of the WCA 1981 (as amended) were recorded on the site, with others present adjacent to the site and in the wider area.</p> <p>Where present these species will out-compete less vigorous native plant species to the detriment of associated native faunal species. Invasive aquatic plants can also have a detrimental effect on water quality.</p>

Legislation and Policy

The legislation and policy relevant to the protection, conservation and enhancement of biodiversity is listed below in Table 3.

Table 3: Legislation and Policy

Legislation or Policy	Species/habitats included, level of protection, possible offences	Consequences of contravention
Wildlife and Countryside Act (WCA) 1981 (as amended)	<p>This act contains four Parts and seventeen Schedules, covering protection of wildlife (birds, and some animals and plants).</p> <p>The act protects individual animals from killing, injury, disturbance or taking as well as protecting their nests or resting places from damage, destruction or disturbance.</p> <p>The level of protection afforded depends on the species.</p> <p>Schedule 9 of the act lists non-native invasive species which are prohibited. Introducing or causing the spread of these species is an offence.</p>	Sentences for offences under the act can be a fine of up to £5000 (per individual animal/bird/plant affected) and/or up to 6 months imprisonment.
Countryside and Rights of Way Act (2000) (CROW Act)	This act made several amendments to the Wildlife and Countryside Act 1981 in particular the offence of “disturbance” which was changed from “wilful” to “reckless”.	As above.
Conservation of Species and Habitats Regulations (2010)	<p>The Regulations make it an offence to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4.</p> <p>However, these actions can be made lawful through the granting of licences under certain circumstances by the appropriate authorities.</p>	Sentences for offences under the act can be a fine of up to £5000 (per individual animal/bird/plant affected) and/or up to 6 months imprisonment.

Legislation or Policy	Species/habitats included, level of protection, possible offences	Consequences of contravention
<p>EC Birds Directive</p>	<p>The directive requires member states to set in place measures to preserve, maintain or re-establish a sufficient diversity and area of habitats for all bird species.</p> <p>Certain species, listed in Annex I are subject to special measures concerning their habitat to ensure survival. These include species that are:</p> <ul style="list-style-type: none"> 🌿 in danger of extinction 🌿 vulnerable to habitat change 🌿 in small numbers or restricted local distribution, or 🌿 in need of particular attention because of the specific nature of their habitat <p>The Directive also puts in place general protection for all species of wild birds in the EU. In particular the following are banned:</p> <ul style="list-style-type: none"> 🌿 deliberate destruction or capture of wild birds 🌿 damage to nests 🌿 taking or keeping eggs 🌿 deliberate disturbance which put conservation at risk 🌿 trading or keeping live or dead birds, the hunting of which is banned <p>In the UK these measures are applied via the WCA 1981 (as amended).</p>	<p>Penalties for offences against birds species are as per WCA 1981 (as amended)</p>

Legislation or Policy	Species/habitats included, level of protection, possible offences	Consequences of contravention
<p>Birds of conservation Concern 4 (BoCC4)</p> <p>RSPB Red and Amber lists of declining bird species</p>	<p>The UK’s leading bird conservation organisations have worked together to review the status of birds in the UK, Channel Islands and Isle of Man.</p> <p>The bird species that breed or overwinter were assessed against a set of objective criteria to be placed on the Green, Amber or Red list - indicating an increasing level of conservation concern.</p> <p>A total of 247 species were considered. There are currently 67 species on the Red list, 96 on the Amber list, and 81 on the Green list.</p> <p>The purpose of the lists are to inform conservation action to address the causes of decline.</p>	<p>No direct consequences however many of these species receive protection under other legislation.</p> <p>Developments which negatively affect red or amber list species may not be looked upon favourably by Local Planning Authorities (See NERC act 2006 and NPPF below).</p>
<p>Natural Environment and Rural Communities Act 2006 (NERC Act)</p> <p>Guidance for Public Authorities on Implementing the Biodiversity Duty, Defra (2006)</p>	<p>Under the Act public bodies (such as the Local Planning Authority) have a duty to give regard to biodiversity conservation when carrying out their functions. Conserving biodiversity includes restoring and enhancing species populations and habitats as well as protecting them.</p> <p>Defra guidance for Public Authorities on Implementing the Biodiversity Duty (2006) states that “Incorporating enhancement opportunities into projects may help applicants to achieve planning permission”.</p> <p>The act also includes statutory lists of species and habitats of principal importance (Section 41) which are those most threatened and requiring conservation action.</p>	<p>A public body which has not had regard to biodiversity conservation in the exercise of their functions could have their actions/ decisions challenged at judicial review.</p> <p>Local planning authorities are therefore more likely to look favourably upon applications which meet their requirements in terms of protecting and enhancing biodiversity.</p>

Legislation or Policy	Species/habitats included, level of protection, possible offences	Consequences of contravention
Protection of Badgers Act (1992)	The act affords protection to badgers and their setts.	Sentences for offences under the act can be a fine of up to £5000 (per individual animal affected) and/or up to 6 months imprisonment.
Hedgerow Regulations (1997)	<p>The Regulations protect most countryside hedgerows from being removed (including being uprooted or otherwise destroyed). Hedgerows must be deemed to be ‘important’, meeting certain criteria to be protected under the regulations.</p> <p>If the removal of a hedgerow is undertaken as part of granted planning permission (exceptions apply - refer to legislation) then the regulations do not apply.</p>	Sentences for offences under the Regulations can lead to an unlimited fine.
The Proceeds of Crime Act 2002	<p>Applicable to any offences against wildlife or habitats which resulted in financial gain.</p> <p>For example, where a bat roost is illegally destroyed during the development of a site, the financial advantage gained by not undertaking the appropriate surveys, licences and mitigation could be subject to confiscation.</p>	The act facilitates the recovery of any financial gains made by committing an offence under wildlife legislation.

Legislation or Policy	Species/habitats included, level of protection, possible offences	Consequences of contravention
National Planning Policy Framework (NPPF) 2012	<p>There is a presumption in favour of sustainable development. It states that the planning system should “contribute to protecting and enhancing our natural, built and historic environment” with the aim of “moving from a net loss of bio-diversity to achieving net gains for nature”.</p> <p>Also “Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted.”</p>	Applications for planning permission which meet the aims and objectives of the NPPF are more likely to gain planning permission.
ODPM Circular 06/2005 Biodiversity and Geological Conservation - statutory obligations and their impact within the planning system.	<p>The circular states that “the presence of a protected species is a material consideration when a planning authority is considering a development proposed that, if carried out, would be likely to result in harm to the species or its habitat”.</p> <p>The circular iterates that surveys to determine the presence, status and likely impact on protected species must be carried out before planning permission is granted. Attaching conditions requiring ecological surveys should only be done in <i>exceptional</i> circumstances.</p>	Applications for planning permission which do not include suitable or sufficient ecological surveys, or could not demonstrate exceptional circumstances would not meet the requirements of OPDM Circular 06/2005.

Legislation or Policy	Species/habitats included, level of protection, possible offences	Consequences of contravention
<p>Barnsley Biodiversity Action Plan (BBAP)</p>	<p>The BBAP is being revised to incorporate habitats and species of principal importance under Section 41 of the NERC Act 2006. It is anticipated to be adopted in 2016. The previous, and currently adopted (2nd) version of the plan was published in 2009.</p> <p>The plan is divided into species action plans (SAPs) and habitat action plans (HAPs) of which there are 20 SAPs and 17 HAPs. Each of these sets out the conservation status and challenges for the species or habitat concerned and identifies actions planned to address them.</p> <p>Most of these are now listed as habitats and species of principal importance under Section 41 of the NERC Act 2006.</p>	<p>This document is published by the Barnsley Biodiversity Trust.</p> <p>The BBAP, its aims and objectives, can be a material consideration in the determination of planning applications.</p>

N.B. The above information is intended as a summary of relevant legislation and policy only. For full details please refer to the original legislation and policy documents, all of which are available on the internet.

Impacts

The potential impacts upon the receptors, habitats and species which have been identified as present or potentially present within the site, as well as in the vicinity of this location have been identified in Table 4 below.

The proposed area of works (PAOW) can be seen in Appendix B - General Arrangement of the Proposals. The PAOW is focussed on the northern portion of the site, with site access to be taken via the existing track from Everill Gate Lane to the south.

Table 4: Assessment of Predicted Impacts

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Predicted Impact as a result of the proposed project
Designated Sites	<ul style="list-style-type: none"> - WCA 1981 (as amended) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 	<p>During construction there may be some temporary disturbance of birds using Wombwell Ings LWS and to a lesser extent Broomhill Flash LWS which could be perturbed by construction work, traffic and the presence of construction personnel. However, much of the PAOW is low lying, screened from both of the above reserves by the existing flood bank to the north of Bulling Dike and raised level of the land in the arable field to the south.</p> <p>The new flood bund which will tie in to existing flood bank to the north of Bulling Dike may lead to temporary disturbance of Wombwell Ings LWS.</p> <p>On completion there will be an increased area of improved habitat for birds and other wildlife, linking the existing LWS together which will have a positive impact on species using these sites. Improved water level control for Broomhill Flash Nature Reserve as a result of the project will also have a positive impact.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Predicted Impact as a result of the proposed project
Habitats of Principal Importance	<ul style="list-style-type: none"> - NERC Act 2006 - NPPF 2012 	On completion, the project will result in an increased area of floodplain grazing marsh (habitat of principal importance) within the Dearne Valley.
Arable field	<ul style="list-style-type: none"> - WCA 1981 (as amended) - NERC Act 2006 - NPPF 2012 - BBAP 	<p>Loss of arable farmland for conversion to floodplain grazing marsh.</p> <p>There may be negative impacts upon breeding birds during construction. See 'Birds'.</p>
Pasture - improved grassland	<ul style="list-style-type: none"> - WCA 1981 (as amended) - NERC Act 2006 - NPPF 2012 - BBAP 	<p>This existing habitat will be incorporated in to a wider area of floodplain grazing marsh where it will be managed for the benefit of wildlife.</p> <p>There may be negative impacts upon breeding birds during construction.</p>
Mature broadleaved trees	<ul style="list-style-type: none"> - Conservation of Habitats & Species Regulations 2010 - WCA 1981 (as amended) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 	The mature sycamore trees identified (TN2) are not proposed to be affected by the works. See 'Bats' and 'Birds'.

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Predicted Impact as a result of the proposed project
Watercourses	<ul style="list-style-type: none"> - Conservation of Habitats & Species Regulations 2010 - WCA 1981 (as amended) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - BBAP 	<p>Bulling Dike will be diverted along a new course in the north west corner of the PAOW. Approximately 125m of the old course will be infilled along the western boundary of the site and approximately 35m of the watercourse will be culverted along the northern boundary of the site in order to connect the new flood bund with the existing bund to the north of Bulling Dike.</p> <p>The diverted course of Bulling Dike will create approximately 175m of new channel with associated bankside and marginal vegetation.</p> <p>The ditch along the eastern boundary of the site that provides the outfall for Broomhill Flash Nature Reserve will be diverted to allow flooding of the new floodplain grazing marsh. Approximately 30m of the existing ditch will be infilled at its northern end.</p> <p>Shallow wet grassland features will be created in what is currently arable land and improved grassland.</p> <p>A new area of open water, reedbed and areas of seasonally inundated grassland will be created on what is currently arable land.</p> <p>A new outfall will be created into Bulling Dike which would result in the loss of some existing bankside vegetation.</p> <p>See individual species accounts below.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Predicted Impact as a result of the proposed project
Hedgerows	<ul style="list-style-type: none"> - WCA 1981 (as amended) - Hedgerow Regulations 1997 - NERC Act 2006 - NPPF 2012 - BBAP 	<p>Approximately 100m of hedgerow will be removed to create the area of wet grassland.</p> <p>There may be negative impacts upon species which utilise this hedgerow habitat, in particular breeding birds. See 'Birds' below.</p> <p>However, the removal of some habitat for predators of waterfowl, such as fox, will be beneficial to these species and therefore contribute to the overall positive impact of the project.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Predicted Impact as a result of the proposed project
Birds	<ul style="list-style-type: none"> - WCA 1981 (as amended) - Nests of all species are protected from damage or destruction whilst in-use. - WCA Schedule 1 species protected from disturbance (of adults or dependent young) whilst building a nest and whilst on or near a nest with eggs or young. - EC Birds Directive Annex 1 species subject to special measures concerning their habitat to ensure survival - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>See ‘Designated sites’ above for impacts on species using Broomhill Flash Nature Reserve and Wombwell Ings LWS.</p> <p>There will be an increase in wetland habitats providing benefits for the target species of the project, which include lapwing, snipe and redshank, on what is currently arable land and improved grassland.</p> <p>The loss of hedgerow would have a negative impact on birds which forage, shelter and/or breed in this habitat for example grey partridge. But may also have a positive impact on waterfowl by removing habitat suitable for predators such as fox.</p> <p>Skylark and lapwing have been recorded breeding on the arable field. The habitats which are to be created will offer improved nesting opportunities for these species. In addition, the changes to agricultural practice in the remainder of the arable field will result in a positive impact on these species.</p> <p>Possibility of offences being committed during construction (destruction of nests, all species, site wide) without appropriate mitigation.</p> <p>No disturbance impacts are predicted on breeding barn owl as the nest boxes at Broomhill Flash Nature Reserve are located a significant distance from the PAOW.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Predicted Impact as a result of the proposed project
Water vole (and mink)	<ul style="list-style-type: none"> - WCA 1981 (as amended) - Protected from capture, killing, injuring or disturbance whilst occupying a place of shelter or protection (i.e. burrows). Their places of shelter and protection are protected from damage, destruction or obstruction. - WCA 1981 (as amended) <ul style="list-style-type: none"> - Schedule 9 species (American mink) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>There may be both direct impacts and indirect disturbance impacts upon water vole during construction if they are present in Bulling Dike, and the ditch along the eastern boundary of the site.</p> <p>The project includes the re-alignment of Bulling Dike. This would involve the infilling of a section and culverting of a section of Bulling Dike, creating a new outfall in to Bulling Dike, and the infilling of a section of the eastern boundary ditch, where water vole may be present.</p> <p>Without mitigation the proposed works have the potential to result in offences being committed if water vole are present.</p> <p>In the long term, the project would have a positive impact on water vole through the provision of significantly increased areas of wetland, shallow watercourses, and the realigned section of Bulling Dike which they can use for foraging and breeding.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Predicted Impact as a result of the proposed project
Otter	<ul style="list-style-type: none"> - Conservation of Habitats & Species Regulations 2010 - WCA 1981 (as amended) - Protected from capture, killing, injury and disturbance. Breeding sites and resting places are protected from damage, destruction or obstruction - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>During construction there may be temporary disturbance to otter which use the surrounding watercourses as a corridor of movement, if they are present. However, as this species is mostly nocturnal, and the work will be undertaken only in daylight, the risk of this occurring is low.</p> <p>The increased wetland habitat and linking of existing wetland habitats resulting from the project are likely to have a positive impact on otter.</p> <p>No habitat providing suitable locations for resting places or breeding will be affected.</p>
Bats	<ul style="list-style-type: none"> - Conservation of Habitats & Species Regulations 2010 - WCA 1981 (as amended) - Protected from capture, killing, injury and disturbance. Breeding sites and resting places are protected from damage, destruction or obstruction. - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>No habitat suitable for roosting bats will be affected.</p> <p>The provision of increased wetland habitat through the project is likely to have a positive impact on local bat populations as a result of a significant increase the availability of insect prey.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Predicted Impact as a result of the proposed project
Badger	<ul style="list-style-type: none"> - Protection of Badgers Act 1992 - Protected from taking, killing and injuring. - Setts protected from interference; damage, destruction or disturbing a badger whilst occupying a sett. - ODPM Circular 06/2005 	<p>No impact.</p> <p>Although a species specific badger survey has not been undertaken, the site is not complex (comprising two fields), and all of the boundary features and watercourses were walked along as part of the Extended Phase 1 Habitat Survey. No active badger setts were found within or adjacent to the site.</p>
Hedgehog, brown hare, harvest mouse	<ul style="list-style-type: none"> - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>No impacts are predicted upon hedgehog.</p> <p>The increase in the area of grassland habitat is likely to benefit brown hare.</p> <p>The increase in the area of reedbed and other marginal vegetation will improve potential nesting habitat for harvest mouse.</p>
Reptiles (common species)	<ul style="list-style-type: none"> - WCA 1981 (as amended) - Protected from intentional killing or injuring. - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>Where suitable reptile habitat (particularly riparian vegetation for grass snake) is directly impacted upon during construction, this could result in offences being committed, without mitigation.</p> <p>The proposed wetland habitat will result in improved habitat for reptiles, particularly grass snake, by increasing the population of amphibian and small mammal prey, as well as providing corridors of movement between existing foraging areas.</p> <p>Other reptile species may benefit from the new habitat created where they are able to colonise from other populations nearby.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Predicted Impact as a result of the proposed project
GCN (and toads)	<ul style="list-style-type: none"> - Conservation of Habitats & Species Regulations 2010 - WCA 1981 (as amended) - Protected from capture, killing, injury and disturbance. Breeding sites and resting places are protected from damage, destruction or obstruction. (Partial protection only for common toad) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>It is considered unlikely that GCN are present on or adjacent to the site, and therefore no impact on this species is predicted.</p> <p>There may be temporary impacts upon toads during construction where works are affecting the watercourses and watercourse banks, and hedgerow. However, the increased wetland habitat created will benefit this species in the long term.</p>
Eel	<ul style="list-style-type: none"> - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 	<p>There are unlikely to be direct impacts on eels during construction due to their high level of mobility within the aquatic environment.</p> <p>The creation of increased areas of wetland and improved connectivity between existing wetland sites is likely to be beneficial to eels in the long term.</p>
Invertebrates	<ul style="list-style-type: none"> - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 	<p>No impact.</p> <p>The creation of the wetland habitats will increase the structural diversity on site, and the availability of niches to support a wider range of invertebrate species.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Predicted Impact as a result of the proposed project
White-clawed crayfish (and signal crayfish)	<ul style="list-style-type: none"> - Conservation of Habitats & Species Regulations 2010 - WCA 1981 (as amended) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>No impact on WCC.</p> <p>If signal crayfish are present then there is a risk that crayfish plague could be spread to other sites on construction equipment or machinery without mitigation.</p>
Plants	<ul style="list-style-type: none"> - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 	<p>No impact upon protected or notable plant species.</p> <p>The creation of new wetland habitats is likely to result in a positive impact on the botanical diversity of the site.</p>
Invasive plants	<ul style="list-style-type: none"> - WCA 1981 (as amended) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 	<p>The construction phase of the project could result in the spread of invasive plant species, in the absence of mitigation, resulting in offences and a negative impact on biodiversity.</p> <p>The management of the site for conservation could provide an improved opportunity to control invasive plant species in the long term.</p>

Requirements and Recommendations

Where predicted impacts upon a particular habitat or species have been identified, requirements and/or recommendations for these are detailed in Table 5 below.

It is recommended that a construction method statement be prepared for the proposed works. This should contain all of the measures required to minimise the potential negative effects of the proposed works on wildlife, both on the site and on the adjacent sites.

In order to ensure that all site staff follow the requirements of the construction method statement it should form part of the site induction for staff managing and undertaking the construction work.

A designated member of site staff should be appointed to ensure that the method statement is adhered to.

Table 5: Requirements and Recommendations

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Requirements and/or Recommendations to avoid or minimise the predicted impacts
Designated Sites	<ul style="list-style-type: none"> - WCA 1981 (as amended) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 	The construction method statement will contain measures to minimise disturbance to birds and other wildlife on Broomhill Flash and Wombwell Ings LWS.
Arable field	<ul style="list-style-type: none"> - WCA 1981 (as amended) - NERC Act 2006 - NPPF 2012 - BBAP 	See 'Birds' below.
Pasture - improved grassland	<ul style="list-style-type: none"> - WCA 1981 (as amended) - NERC Act 2006 - NPPF 2012 - BBAP 	See 'Birds' below

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Requirements and/or Recommendations to avoid or minimise the predicted impacts
Watercourses	<ul style="list-style-type: none"> - Conservation of Habitats & Species Regulations 2010 - WCA 1981 (as amended) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - BBAP 	<p>Pollution prevention and control measures must be put in place during the proposed construction work.</p> <p>See 'Water vole', 'Birds' and 'Reptiles' below.</p>
Hedgerows	<ul style="list-style-type: none"> - WCA 1981 (as amended) - Hedgerow Regulations 1997 - NERC Act 2006 - NPPF 2012 - BBAP 	<p>See 'Birds' below.</p> <p>It is recommended that replacement hedge planting be undertaken on adjacent land to offset losses.</p>
Birds	<ul style="list-style-type: none"> - WCA 1981 (as amended) - Nests of all species are protected from damage or destruction whilst in-use. - WCA Schedule 1 species protected from disturbance (of adults or dependent young) whilst building a nest and whilst on or near a nest with eggs or young. - EC Birds Directive Annex 1 species subject to special measures concerning their habitat to ensure survival - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>Construction work (or at least initial site clearance) should be undertaken outside of the breeding bird season (generally considered to be between the end of February and the end of August) to avoid the destruction or damage to nests and/or eggs.</p> <p>This is particularly important for the removal of hedgerows but also for initial clearance of the improved grassland, arable field and any works to bankside vegetation.</p> <p>If work needs to commence within the breeding bird season then work must be immediately preceded by an inspection of the site, undertaken by a suitably qualified and experienced ornithologist.</p> <p>It is recommended that replacement hedge planting be undertaken on adjacent land to offset losses.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Requirements and/or Recommendations to avoid or minimise the predicted impacts
Water vole (and mink)	<ul style="list-style-type: none"> - WCA 1981 (as amended) - Protected from capture, killing, injuring or disturbance whilst occupying a place of shelter or protection (i.e. burrows). Their places of shelter and protection are protected from damage, destruction or obstruction. - WCA 1981 (as amended) <ul style="list-style-type: none"> - Schedule 9 species (American mink) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>Prior to the commencement of the proposed works a water vole survey must be undertaken on Bulling Dike and the eastern boundary ditch to ascertain the current status of this species. These surveys could be required as a condition of planning permission (see justification at the end of this section).</p> <p>Water vole surveys should be undertaken between mid-April and the end of September.</p> <p>Surveys should be undertaken in line with ‘The Water Vole Mitigation Handbook’ (Dean <i>et al</i>, 2016).</p> <p>If water vole presence is not confirmed by the survey then they are likely to be absent and no further mitigation is required.</p> <p>If the results of the water vole survey confirm water vole presence, then the results will be used to formulate a mitigation strategy, and where necessary a Natural England licence application, to facilitate the proposed works.</p> <p>The project would have a long term positive impact on water vole through the provision of significantly increased areas of wetland and shallow watercourses which they can use for foraging and breeding.</p> <p>Where a Natural England licence is required this ‘conservation benefit’ for water vole would be a requirement of the licence.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Requirements and/or Recommendations to avoid or minimise the predicted impacts
Otter	<ul style="list-style-type: none"> - Conservation of Habitats & Species Regulations 2010 - WCA 1981 (as amended) - Protected from capture, killing, injury and disturbance. Breeding sites and resting places are protected from damage, destruction or obstruction - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	Although no work at night is anticipated, this should be a requirement of the construction method statement, to negate the risk of disturbing otter during the works.
Badger	<ul style="list-style-type: none"> - Protection of Badgers Act 1992 - Protected from taking, killing and injuring. - Setts protected from interference; damage, destruction or disturbing a badger whilst occupying a sett. - ODPM Circular 06/2005 	A pre-construction badger survey should be undertaken to ensure that no setts have been dug on or adjacent to the PAOW.
Reptiles (common species)	<ul style="list-style-type: none"> - WCA 1981 (as amended) - Protected from intentional killing or injuring. - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	The construction method statement will contain measures to minimise the risk of injuring and/or killing reptiles during the proposed works.

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Requirements and/or Recommendations to avoid or minimise the predicted impacts
GCN (and toads)	<ul style="list-style-type: none"> - Conservation of Habitats & Species Regulations 2010 - WCA 1981 (as amended) - Protected from capture, killing, injury and disturbance. Breeding sites and resting places are protected from damage, destruction or obstruction. (Partial protection only for common toad) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>GCN - None.</p> <p>Toad - The construction method statement will contain measures to minimise the risk of injuring and/or killing toad during the proposed works.</p>
White-clawed crayfish (and signal crayfish)	<ul style="list-style-type: none"> - Conservation of Habitats & Species Regulations 2010 - WCA 1981 (as amended) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 - BBAP 	<p>WCC - None.</p> <p>Signal crayfish - The construction method statement will contain details of measures to prevent the potential spread of crayfish plague.</p> <p>These measures are likely to involve biosecurity measures such as thorough drying of work clothing and boots as well as cleaning down of machinery.</p>

Receptor, Habitat feature or Species	Legislation or Policy (where relevant)	Requirements and/or Recommendations to avoid or minimise the predicted impacts
Invasive plants	<ul style="list-style-type: none"> - WCA 1981 (as amended) - CROW Act 2000 - NERC Act 2006 - NPPF 2012 - ODPM Circular 06/2005 	<p>A survey of the site (which includes the PAOW) for invasive plants should be undertaken in the summer immediately prior to construction, to ascertain the extent of the invasive plant species present.</p> <p>The result of this survey will inform a procedure for dealing with soil that is potentially contaminated with invasive plants or their seeds and will form part of the construction method statement.</p> <p>The construction method statement will contain details of measures to prevent the potential spread of invasive plants.</p> <p>These measures are likely to involve biosecurity measures such as thorough washing of work clothing and boots as well as cleaning down of machinery.</p>

With particular reference to the recommendations for water vole survey; ODPM Circular 06/2005 ‘Biodiversity and Geological Conservation - statutory obligations and their impact within the planning system’ contains provision for the granting of planning permission, with conditions for ecological surveys, under *exceptional circumstances*. In this instance it is proposed that exceptional circumstances exist given that the primary purpose of the project is nature conservation and biodiversity enhancement.

Such a condition could require the submission of a suitable survey report to the LPA which would conclude that either; water vole are likely to be absent, or that they are present, in which case a mitigation strategy for that species would form part of the survey report.

It is considered that, even if water vole are found to be present during the conditioned survey, their mitigation requirements could be met given the nature of the proposed project. The granting of planning permission is therefore unlikely to result in a situation where suitable mitigation could not be achieved (and therefore that the condition could not be discharged).

Summary

Impacts upon the ecology of the site, and potential temporary disturbance impacts upon the adjacent LWS, as a result of the proposed works are considered to be low, **if the above requirements and recommendations are implemented (Table 5).**

The completed project will result in an overall gain in biodiversity at the site. It will also increase the area of a Habitat of Principal Importance by creating floodplain grazing marsh, link together two areas of an existing LWS, and provide long term management of the site for the benefit of wildlife, in particular species of declining waterfowl.

Impacts upon protected species which are present or potentially present will be avoided if the above requirements (Table 5) are implemented.

Potential for Enhancement

The National Planning Policy Framework (2012) aims to move “from a net loss of bio-diversity to achieving net gains for nature”. In order to achieve this there is now a “presumption in favour of sustainable development”. Proposals which can demonstrate that they have taken the opportunity “to incorporate biodiversity in and around developments should be encouraged”.

In addition “Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted.”

Guidance for Public Authorities on Implementing the Biodiversity Duty (Defra, 2006) advises Local Planning Authorities that “incorporating enhancement opportunities into projects may help applicants to achieve planning permission”.

The ‘Wings Across the Ings’ project is itself a biodiversity enhancement project. The site is being taken out of intensive agricultural use and put into conservation management for the benefit of wildlife.

The following measures could also be incorporated in to the proposed project in order to further enhance the biodiversity gain achieved:

Mink control - The instigation of an organised, catchment wide program of mink control is strongly encouraged. The presence of mink in the catchment is an ongoing threat to remaining colonies of water vole in the area and a major impediment to re-colonisation of suitable habitat by water vole. A control program of this scale is considered particularly achievable in this locality given the level of local involvement in land management by conservation charities such as the Garganey Trust and RSPB.

Reptile refugia - Whilst potential foraging habitat for grass snake is relatively common in this locality, there don’t appear to be many suitable features on site for refuge, breeding or hibernation. The creation of such features is relatively simple and could utilise some of the materials arising from the proposed works (i.e. brash, soil) and from ongoing management of the site (i.e. cut grass in piles).

Otter holt - Whilst the wetland habitats already present (and those proposed as part of this project) provide suitable habitat for foraging and commuting otter, no suitable resting places for otter were observed on or adjacent to the site. The provision of an artificial otter holt within the proposed project could encourage otter to use the site more widely and possibly to breed in the area.

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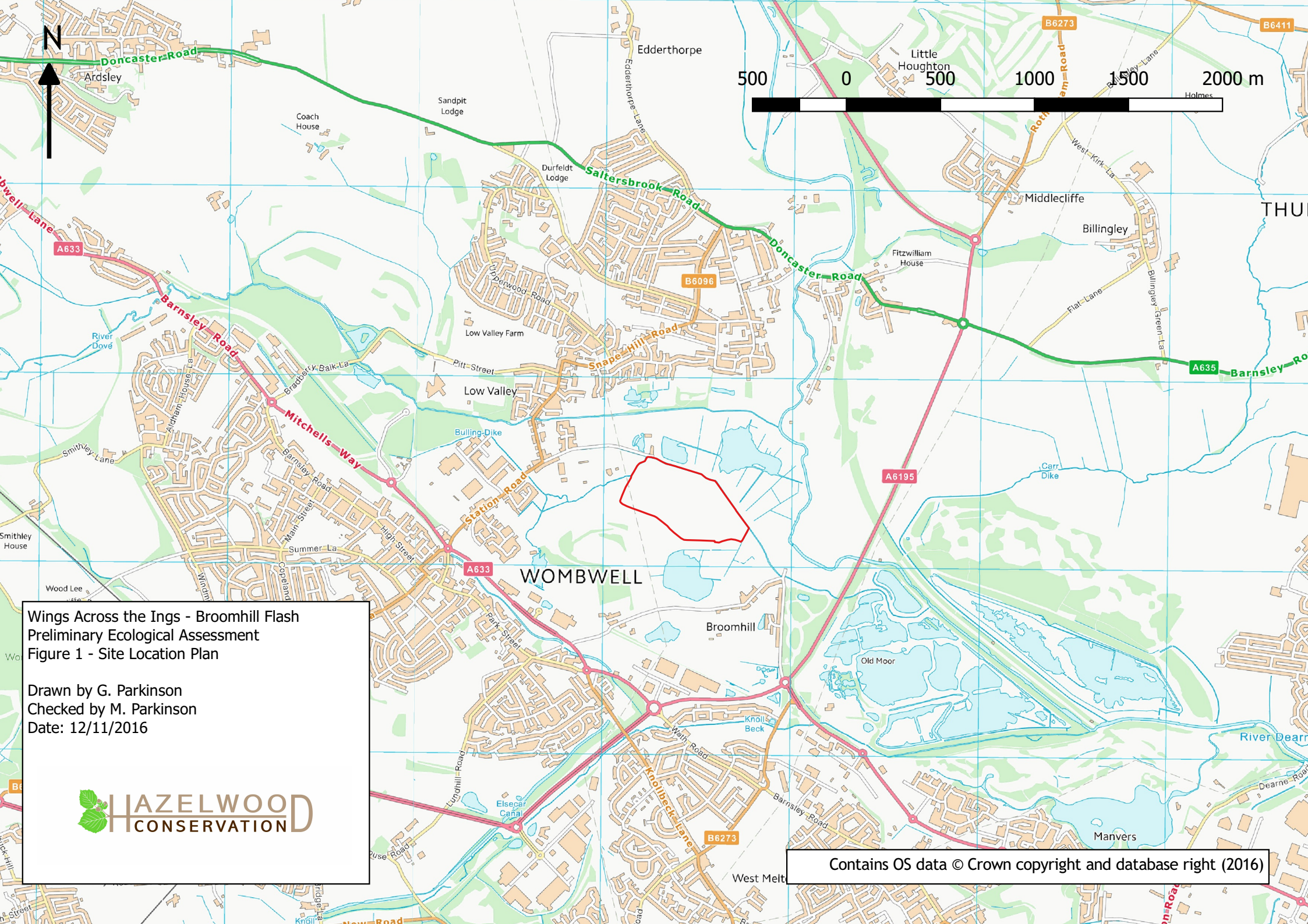
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Figure 1 - Site Location Plan



Wings Across the Ings - Broomhill Flash
Preliminary Ecological Assessment
Figure 1 - Site Location Plan

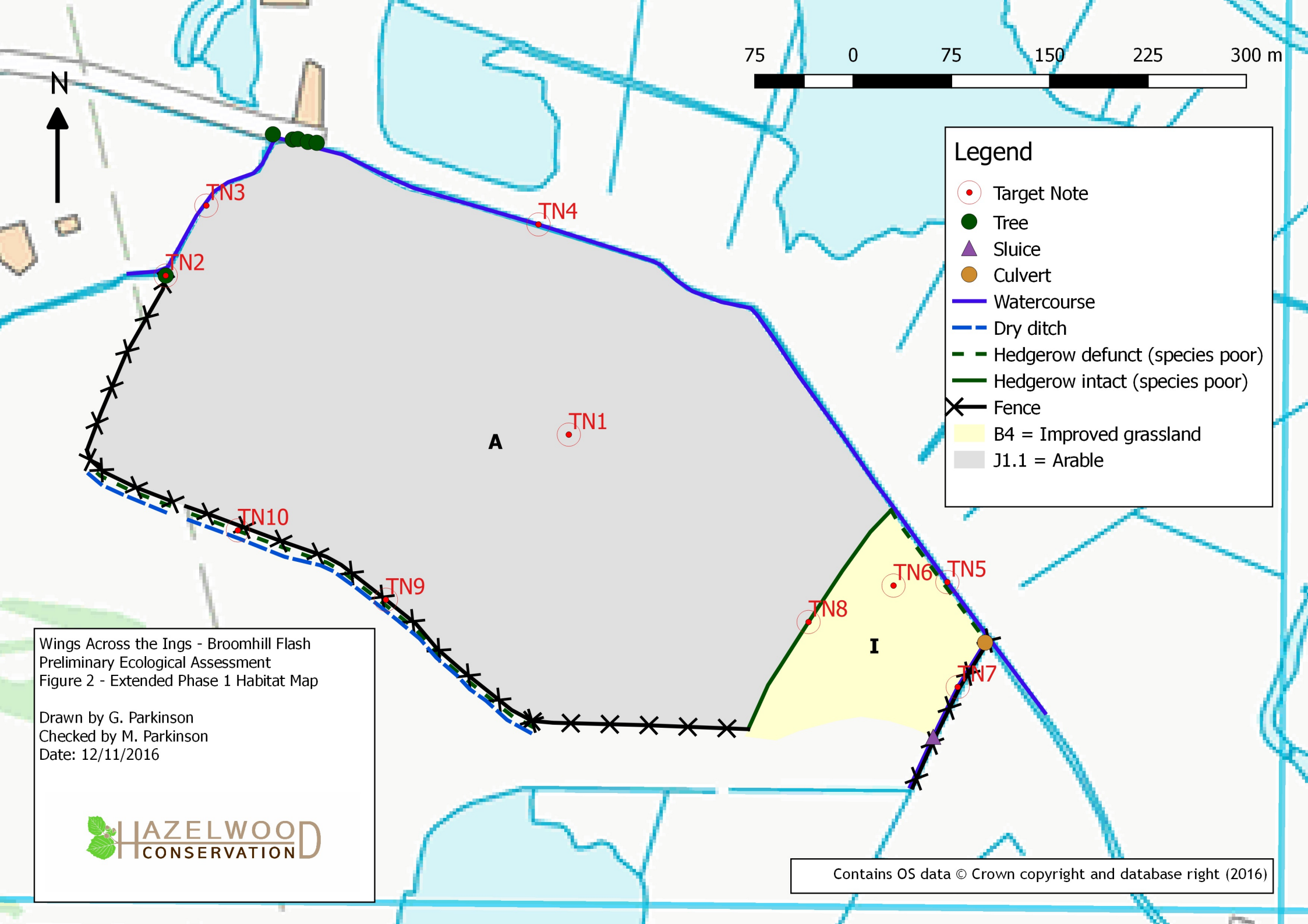
Drawn by G. Parkinson
Checked by M. Parkinson
Date: 12/11/2016



HAZELWOOD
CONSERVATION

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Figure 2 - Extended Phase 1 Habitat Map



75 0 75 150 225 300 m



Legend

- Target Note
- Tree
- ▲ Sluice
- Culvert
- Watercourse
- - - Dry ditch
- - - Hedgerow defunct (species poor)
- Hedgerow intact (species poor)
- ✕ Fence
- B4 = Improved grassland
- J1.1 = Arable

Wings Across the Ings - Broomhill Flash
 Preliminary Ecological Assessment
 Figure 2 - Extended Phase 1 Habitat Map

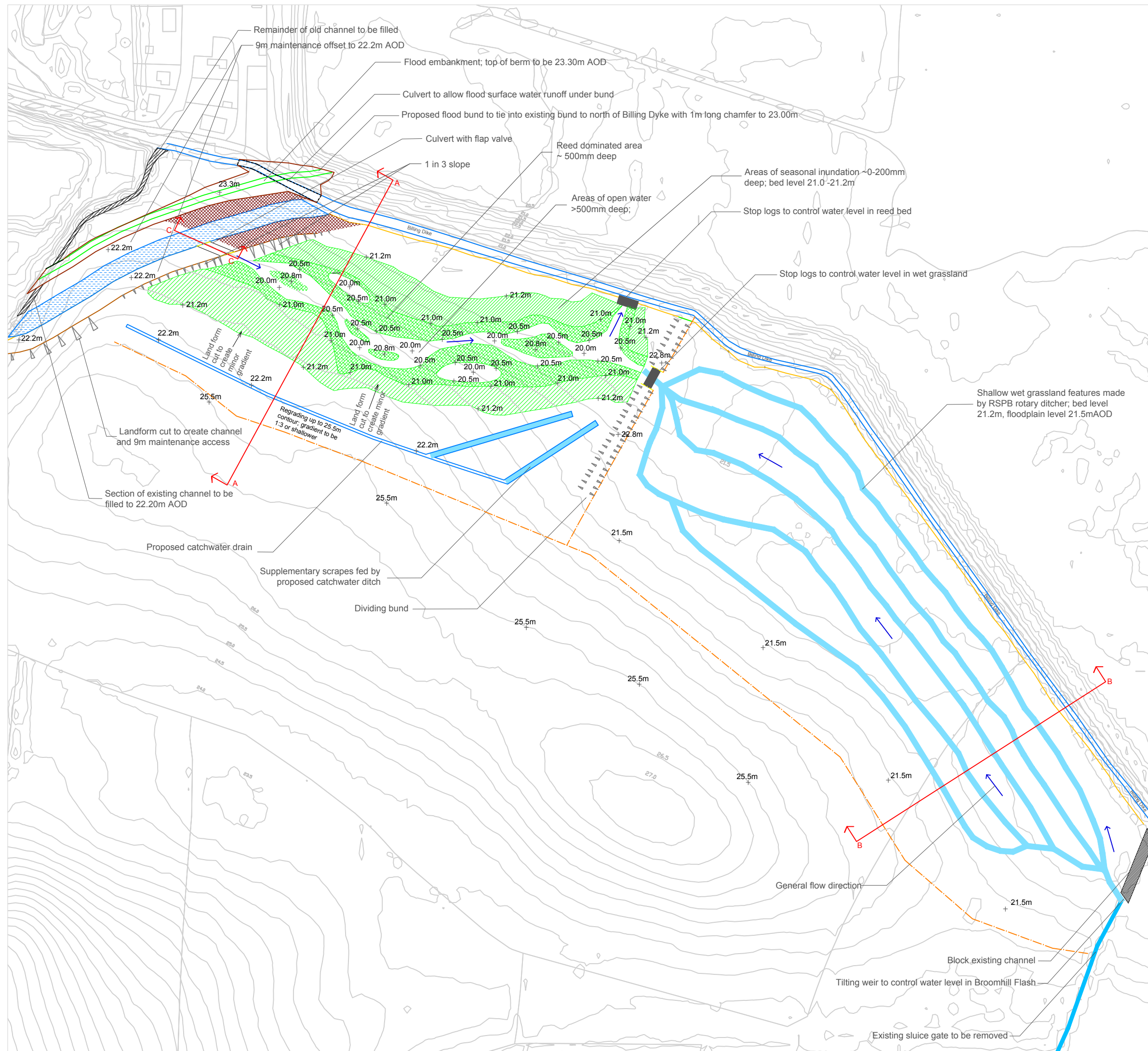
Drawn by G. Parkinson
 Checked by M. Parkinson
 Date: 12/11/2016

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Appendix A - Location of the site in relation to the surrounding land holdings (provided by the Garganey Trust)



Appendix B - General Arrangement of the Proposals



Key

- Proposed Scrape (max. 10m width) [Light blue box]
- New Channel [Blue hatched box]
- Seasonal areas of inundation [Green hatched box]
- Reed dominated area [Cross-hatched box]
- Areas to be filled for level 9m maintenance access [Brown hatched box]
- Flood embankment [Green and red hatched box]
- Channels to be filled [Black hatched box]
- Control Structure [Black rectangle]
- General Flow Direction [Blue arrow]
- Post and wire fence [Yellow dashed line]
- Post and rail fencing [Red dashed line]
- Existing contours [Grey line]

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for

Garganey Trust Wombwell Wetlands Extension General Arrangement

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Scale:	1:2000 at A3	Drawn:	A. Craven
		Designed:	A. Craven
		Checked:	D. Mould
		Approved:	D. Mould
Project Number:	2015s2285		
Drawing Number:	2015s2285-GA01	Rev.:	v1.10
		Sheet No.:	1 of 1
		Status:	DRAFT

Appendix C - BBRC Data, protected and/or notable species recorded within 2.5km of the central grid reference of the site

Group	Scientific name	Common name	WCA 1981 protected species (excl. birds)	Species of principal importance (NERC Act 2006)	RSPB BoCC4 Red or Amber list bird species	WCA 1981 Schedule 1 birds	EC Birds Directive Annex 1 birds
Amphibian	<i>Bufo bufo</i>	Common toad	X	X			
Amphibian	<i>Rana temporaria</i>	Common frog	X				
Amphibian	<i>Triturus cristatus</i>	Great crested newt	X	X			
Amphibian	<i>Triturus vulgaris</i>	Smooth newt	X				
Bird	<i>Accipiter gentilis</i>	Goshawk				X	X
Bird	<i>Alauda arvensis</i>	Skylark			X		
Bird	<i>Alcedo atthis</i>	Kingfisher			X	X	X
Bird	<i>Anas acuta</i>	Pintail			X	X	
Bird	<i>Anas clypeata</i>	Shoveler			X		
Bird	<i>Anas crecca</i>	Teal			X		
Bird	<i>Anas penelope</i>	Wigeon			X		
Bird	<i>Anas querquedula</i>	Garganey			X	X	
Bird	<i>Anas strepera</i>	Gadwall			X		
Bird	<i>Anser albifrons</i>	White-Fronted Goose			X		
Bird	<i>Anser anser</i>	Greylag Goose			X	X	
Bird	<i>Anser brachyrhynchus</i>	Pink-Footed Goose			X		
Bird	<i>Anser erythropus</i>	Lesser White-Fronted Goose			X		
Bird	<i>Anser fabalis</i>	Bean Goose			X		
Bird	<i>Anthus pratensis</i>	Meadow Pipit			X		
Bird	<i>Anthus trivialis</i>	Tree Pipit		X	X		
Bird	<i>Ardea purpurea</i>	Purple Heron				X	X
Bird	<i>Arenaria interpres</i>	Turnstone			X		
Bird	<i>Asio flammeus</i>	Short-Eared Owl			X		X
Bird	<i>Aythya ferina</i>	Pochard			X		
Bird	<i>Aythya marila</i>	Scaup		X	X	X	
Bird	<i>Botaurus stellaris</i>	Bittern		X	X	X	X

Group	Scientific name	Common name	WCA 1981 protected species (excl. birds)	Species of principal importance (NERC Act 2006)	RSPB BoCC4 Red or Amber list bird species	WCA 1981 Schedule 1 birds	EC Birds Directive Annex 1 birds
Bird	<i>Branta bernicla</i>	Brent Goose		X	X		
Bird	<i>Branta leucopsis</i>	Barnacle Goose			X		X
Bird	<i>Bucephala clangula</i>	Goldeneye			X	X	
Bird	<i>Burhinus oediconemus</i>	Stone-Curlew		X	X	X	X
Bird	<i>Calidris alpina</i>	Dunlin			X		
Bird	<i>Calidris canutus</i>	Knot			X		
Bird	<i>Calidris maritima</i>	Purple Sandpiper			X	X	
Bird	<i>Calidris temminckii</i>	Temminck's Stint				X	
Bird	<i>Carduelis cabaret</i>	Lesser Redpoll		X	X		
Bird	<i>Carduelis cannabina</i>	Linnet			X		
Bird	<i>Carduelis carduelis</i>	Goldfinch			X		
Bird	<i>Carduelis flavirostris</i>	Twite			X		
Bird	<i>Cettia cetti</i>	Cetti's Warbler			X	X	
Bird	<i>Charadrius dubius</i>	Little Ringed Plover				X	
Bird	<i>Charadrius hiaticula</i>	Ringed Plover			X		
Bird	<i>Charadrius morinellus</i>	Dotterel			X	X	X
Bird	<i>Chlidonias hybridus</i>	Whiskered Tern					X
Bird	<i>Chlidonias niger</i>	Black Tern				X	X
Bird	<i>Ciconia ciconia</i>	White Stork					X
Bird	<i>Circus aeruginosus</i>	Marsh Harrier			X	X	X
Bird	<i>Circus cyaneus</i>	Hen Harrier			X	X	X
Bird	<i>Clangula hyemalis</i>	Long-Tailed Duck			X	X	X
Bird	<i>Coccothraustes coccothraustes</i>	Hawfinch		X	X		
Bird	<i>Columba oenas</i>	Stock Dove			X		
Bird	<i>Coturnix coturnix</i>	Quail			X	X	
Bird	<i>Cuculus canorus</i>	Cuckoo		X	X		
Bird	<i>Cygnus columbianus</i>	Bewick's Swan			X	X	X

Group	Scientific name	Common name	WCA 1981 protected species (excl. birds)	Species of principal importance (NERC Act 2006)	RSPB BoCC4 Red or Amber list bird species	WCA 1981 Schedule 1 birds	EC Birds Directive Annex 1 birds
Bird	<i>Cygnus cygnus</i>	Whooper Swan			X	X	X
Bird	<i>Cygnus olor</i>	Mute Swan			X		
Bird	<i>Delichon urbica</i>	House Martin			X		
Bird	<i>Egretta alba</i>	Great White Egret					X
Bird	<i>Egretta garzetta</i>	Little Egret			X		X
Bird	<i>Emberiza citrinella</i>	Yellowhammer		X	X		
Bird	<i>Emberiza schoeniclus</i>	Reed Bunting		X	X		
Bird	<i>Falco columbarius</i>	Merlin			X	X	X
Bird	<i>Falco peregrinus</i>	Peregrine			X	X	X
Bird	<i>Falco subbuteo</i>	Hobby				X	
Bird	<i>Falco tinnunculus</i>	Kestrel			X		
Bird	<i>Fringilla montifringilla</i>	Brambling			X	X	
Bird	<i>Gallinago gallinago</i>	Snipe			X		
Bird	<i>Grus grus</i>	Crane			X		X
Bird	<i>Haematopus ostralegus</i>	Oystercatcher			X		
Bird	<i>Himantopus himantopus</i>	Black-Winged Stilt					X
Bird	<i>Hirundo rustica</i>	Swallow			X		
Bird	<i>Ixobrychus minutus</i>	Little Bittern					X
Bird	<i>Larus argentatus</i>	Herring Gull			X		
Bird	<i>Larus argentatus subsp. cachinnans</i>	Yellow-legged Gull			X		
Bird	<i>Larus canus</i>	Common Gull			X		
Bird	<i>Larus fuscus</i>	Lesser Black-Backed Gull			X		
Bird	<i>Larus melanocephalus</i>	Mediterranean Gull			X	X	X
Bird	<i>Larus minutus</i>	Little Gull				X	

Group	Scientific name	Common name	WCA 1981 protected species (excl. birds)	Species of principal importance (NERC Act 2006)	RSPB BoCC4 Red or Amber list bird species	WCA 1981 Schedule 1 birds	EC Birds Directive Annex 1 birds
Bird	<i>Larus ridibundus</i>	Black-headed Gull			X		
Bird	<i>Limosa lapponica</i>	Bar-Tailed Godwit			X		X
Bird	<i>Limosa limosa</i>	Black-Tailed Godwit			X	X	
Bird	<i>Locustella luscinioides</i>	Savi's Warbler		X	X	X	
Bird	<i>Locustella naevia</i>	Grasshopper Warbler		X	X		
Bird	<i>Lullula arborea</i>	Woodlark		X	X	X	X
Bird	<i>Lymnocyptes minimus</i>	Jack Snipe			X		
Bird	<i>Melanitta nigra</i>	Common Scoter		X	X	X	
Bird	<i>Miliaria calandra</i>	Corn Bunting			X		
Bird	<i>Milvus milvus</i>	Red Kite			X	X	X
Bird	<i>Motacilla cinerea</i>	Grey Wagtail			X		
Bird	<i>Motacilla flava</i>	Yellow Wagtail		X	X		
Bird	<i>Muscicapa striata</i>	Spotted Flycatcher		X	X		
Bird	<i>Numenius arquata</i>	Curlew		X	X		
Bird	<i>Numenius phaeopus</i>	Whimbrel			X	X	
Bird	<i>Oceanodroma leucorhoa</i>	Leach's Petrel			X	X	X
Bird	<i>Pandion haliaetus</i>	Osprey			X	X	
Bird	<i>Panurus biarmicus</i>	Bearded Tit				X	
Bird	<i>Parus montanus</i>	Willow Tit			X		
Bird	<i>Parus palustris</i>	Marsh Tit			X		
Bird	<i>Passer domesticus</i>	House Sparrow		X	X		
Bird	<i>Passer montanus</i>	Tree Sparrow		X	X		
Bird	<i>Perdix perdix</i>	Grey Partridge		X	X		
Bird	<i>Pernis apivorus</i>	Honey Buzzard			X	X	X
Bird	<i>Phalacrocorax carbo</i>	Cormorant			X		
Bird	<i>Phalaropus lobatus</i>	Red-Necked Phalarope		X	X	X	X

Group	Scientific name	Common name	WCA 1981 protected species (excl. birds)	Species of principal importance (NERC Act 2006)	RSPB BoCC4 Red or Amber list bird species	WCA 1981 Schedule 1 birds	EC Birds Directive Annex 1 birds
Bird	<i>Philomachus pugnax</i>	Ruff			X	X	X
Bird	<i>Phoenicurus ochruros</i>	Black Redstart			X	X	
Bird	<i>Phoenicurus phoenicurus</i>	Redstart			X		
Bird	<i>Phylloscopus trochilus</i>	Willow Warbler			X		
Bird	<i>Picus viridis</i>	Green Woodpecker			X		
Bird	<i>Platalea leucorodia</i>	Eurasian Spoonbill			X	X	X
Bird	<i>Platalea leucorodia</i>	Spoonbill			X	X	X
Bird	<i>Plectrophenax nivalis</i>	Snow Bunting			X	X	
Bird	<i>Plegadis falcinellus</i>	Glossy Ibis					X
Bird	<i>Pluvialis apricaria</i>	Golden Plover			X		X
Bird	<i>Pluvialis squatarola</i>	Grey Plover			X		
Bird	<i>Podiceps grisegena</i>	Red-Necked Grebe			X		
Bird	<i>Podiceps nigricollis</i>	Black-Necked Grebe			X	X	
Bird	<i>Porzana porzana</i>	Spotted Crake			X	X	X
Bird	<i>Prunella modularis</i>	Dunnock			X		
Bird	<i>Pyrrhula pyrrhula</i>	Bullfinch			X		
Bird	<i>Rallus aquaticus</i>	Water Rail			X		
Bird	<i>Recurvirostra avosetta</i>	Avocet			X	X	X
Bird	<i>Recurvirostra avosetta</i>	Pied Avocet			X	X	X
Bird	<i>Regulus ignicapillus</i>	Firecrest			X	X	
Bird	<i>Regulus regulus</i>	Goldcrest			X		
Bird	<i>Riparia riparia</i>	Sand Martin			X		
Bird	<i>Rissa tridactyla</i>	Kittiwake			X		
Bird	<i>Saxicola torquata</i>	Stonechat			X		
Bird	<i>Scolopax rusticola</i>	Woodcock			X		

Group	Scientific name	Common name	WCA 1981 protected species (excl. birds)	Species of principal importance (NERC Act 2006)	RSPB BoCC4 Red or Amber list bird species	WCA 1981 Schedule 1 birds	EC Birds Directive Annex 1 birds
Bird	<i>Stercorarius parasiticus</i>	Arctic Skua		X			
Bird	<i>Stercorarius skua</i>	Great Skua			X		
Bird	<i>Sterna albifrons</i>	Little Tern			X	X	X
Bird	<i>Sterna dougallii</i>	Roseate Tern		X	X	X	X
Bird	<i>Sterna hirundo</i>	Common Tern					X
Bird	<i>Sterna paradisaea</i>	Arctic Tern			X		X
Bird	<i>Sterna sandvicensis</i>	Sandwich Tern			X		X
Bird	<i>Streptopelia turtur</i>	Turtle Dove		X	X		
Bird	<i>Sturnus vulgaris</i>	Starling			X		
Bird	<i>Sula bassana</i>	Gannet			X		
Bird	<i>Tadorna tadorna</i>	Shelduck			X		
Bird	<i>Tringa erythropus</i>	Spotted Redshank			X		
Bird	<i>Tringa glareola</i>	Wood Sandpiper			X	X	X
Bird	<i>Tringa nebularia</i>	Greenshank			X	X	X
Bird	<i>Tringa ochropus</i>	Green Sandpiper			X	X	X
Bird	<i>Tringa totanus</i>	Common Redshank			X		
Bird	<i>Turdus iliacus</i>	Redwing			X	X	
Bird	<i>Turdus merula</i>	Blackbird			X		
Bird	<i>Turdus philomelos</i>	Song Thrush			X		
Bird	<i>Turdus pilaris</i>	Fieldfare			X	X	
Bird	<i>Turdus torquatus</i>	Ring Ouzel		X	X		
Bird	<i>Turdus viscivorus</i>	Mistle Thrush			X		
Bird	<i>Tyto alba</i>	Barn Owl			X	X	
Bird	<i>Vanellus vanellus</i>	Northern Lapwing		X	X		
Fish	<i>Anguilla anguilla</i>	Eel		X			
Invertebrate	<i>Acronicta psi</i>	Grey dagger		X			
Invertebrate	<i>Allophyes oxyacanthae</i>	Green-brindled crescent		X			

Group	Scientific name	Common name	WCA 1981 protected species (excl. birds)	Species of principal importance (NERC Act 2006)	RSPB BoCC4 Red or Amber list bird species	WCA 1981 Schedule 1 birds	EC Birds Directive Annex 1 birds
Invertebrate	<i>Amphipyra tragopoginis</i>	Mouse moth		X			
Invertebrate	<i>Apamea remissa</i>	Dusky brocade		X			
Invertebrate	<i>Caradrina morpheus</i>	Mottled rustic		X			
Invertebrate	<i>Chesias legatella</i>	Streak		X			
Invertebrate	<i>Coenonympha pamphilus</i>	Small heath		X			
Invertebrate	<i>Diarsia rubi</i>	Small square-spot		X			
Invertebrate	<i>Ecliptopera silaceata</i>	Small phoenix		X			
Invertebrate	<i>Ennomos fuscantaria</i>	Dusky thorn		X			
Invertebrate	<i>Erynnis tages</i>	Dingy skipper		X			
Invertebrate	<i>Hepialus humuli</i>	Ghost moth		X			
Invertebrate	<i>Hoplodrina blanda</i>	Rustic		X			
Invertebrate	<i>Hydraecia micacea</i>	Rosy rustic		X			
Invertebrate	<i>Lasiommata megera</i>	Wall		X			
Invertebrate	<i>Melanchra persicariae</i>	Dot moth		X			
Invertebrate	<i>Mesoligia literosa</i>	Rosy minor		X			
Invertebrate	<i>Mythimna comma</i>	Shoulder-striped wainscot		X			
Invertebrate	<i>Orthosia gracilis</i>	Powdered quaker		X			
Invertebrate	<i>Rhizedra lutosa</i>	Large wainscot		X			
Invertebrate	<i>Scotopteryx chenopodiata</i>	Shaded broad-bar		X			
Invertebrate	<i>Semiothisa clathrata</i>	Latticed heath		X			
Invertebrate	<i>Spilosoma lubricipeda</i>	White ermine		X			
Invertebrate	<i>Spilosoma luteum</i>	Buff ermine		X			
Invertebrate	<i>Tyria jacobaeae</i>	Cinnabar		X			
Invertebrate	<i>Xanthia icteritia</i>	Sallow		X			

Group	Scientific name	Common name	WCA 1981 protected species (excl. birds)	Species of principal importance (NERC Act 2006)	RSPB BoCC4 Red or Amber list bird species	WCA 1981 Schedule 1 birds	EC Birds Directive Annex 1 birds
Invertebrate	<i>Xanthorhoe ferrugata</i>	Dark-barred twin-spot carpet		X			
Mammal	<i>Erinaceus europaeus</i>	Hedgehog		X			
Mammal	<i>Lepus europaeus</i>	Brown hare		X			
Mammal	<i>Lutra lutra</i>	Otter	X	X			
Mammal	<i>Micromys minutus</i>	Harvest mouse		X			
Mammal	<i>Myotis daubentonii</i>	Daubenton's bat	X				
Mammal	<i>Nyctalus leisleri</i>	Leisler's bat	X				
Mammal	<i>Nyctalus noctula</i>	Noctule bat	X	X			
Mammal	<i>Pipistrellus pipistrellus</i>	Pipistrelle bat	X				
Mammal	<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle bat		X			
Mammal	<i>Plecotus auritus</i>	Brown long-eared bat	X	X			
Plant	<i>Centaurea cyanus</i>	Cornflower		X			
Plant	<i>Chamaemelum nobile</i>	Chamomile		X			
Reptile	<i>Anguis fragilis</i>	Slow-worm	X	X			
Reptile	<i>Lacerta vivipara</i>	Viviparous lizard	X	X			
Reptile	<i>Natrix natrix</i>	Grass snake	X	X			
Reptile	<i>Vipera berus</i>	Adder	X	X			

Appendix D - Botanical Species List

Common name	Scientific name
Annual meadow-grass	<i>Poa annua</i>
Blackthorn	<i>Prunus spinosa</i>
Bramble	<i>Rubus fruticosus</i> agg.
Branched bur-reed	<i>Sparganium erectum</i>
Broad-leaved willowherb	<i>Epilobium montanum</i>
Broom	<i>Cytisus scoparius</i>
Cleavers	<i>Galium aparine</i>
Cocksfoot	<i>Dactylus glomerata</i>
Common chickweed	<i>Stellaria media</i>
Common ragwort	<i>Senecio jacobaea</i>
Common reed	<i>Phragmites australis</i>
Common sorrel	<i>Rumex acetosa</i>
Common spike rush	<i>Eleocharis palustris</i>
Creeping bent	<i>Agrostis stolonifera</i>
Creeping buttercup	<i>Ranunculus repens</i>
Creeping thistle	<i>Cirsium arvense</i>
Dandelion	<i>Taraxacum officinale</i> agg.
Dog-rose	<i>Rosa canina</i>
Duckweed	<i>Lemna</i> sp.
Elder	<i>Sambucus nigra</i>
<i>Elodea</i> pondweed	<i>Elodea</i> sp.
False-oat grass	<i>Arrhenatherum elatius</i>
Field horsetail	<i>Equisetum arvense</i>
Field maple	<i>Acer campestre</i>
Field speedwell	<i>Veronica persica</i>
Groundsel	<i>Senecio vulgaris</i>
Gypsywort	<i>Lycopus europaeus</i>
Hard rush	<i>Juncus inflexus</i>
Hawthorn	<i>Crataegus monogyna</i>
Hemlock	<i>Conium maculatum</i>
Himalayan balsam	<i>Impatiens glandulifera</i>
Mugwort	<i>Artemisia vulgaris</i>
Nettle	<i>Urtica dioica</i>
New Zealand pygmyweed	<i>Crassula helmsii</i>
Nipplewort	<i>Lapsana communis</i>
Perennial ryegrass	<i>Lolium perenne</i>
Reed canary-grass	<i>Phalaris arundinacea</i>

Common name	Scientific name
Reedmace	<i>Typha latifolia</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Rosebay willowherb	<i>Chamerion angustifolium</i>
Soft rush	<i>Juncus effusus</i>
Sycamore	<i>Acer pseudoplatanus</i>
Timothy	<i>Phleum pratense</i>
Tufted hair-grass	<i>Deschampsia cespitosa</i>
Water starwort	<i>Callitriche</i> sp.
Watercress	<i>Rorippa nasturtium-aquaticum</i>
Weeping willow	<i>Salix</i> sp.
White dead-nettle	<i>Lamium album</i>
Yellow rattle	<i>Rhinanthus minor</i>
Yorkshire fog	<i>Holcus lanatus</i>

Appendix E - Photographs



Photograph 1 - Looking north east across the large arable field which comprises the majority of the site, as described in TN1. Photograph taken from the field entrance.



Photograph 2 - Mature multi-stemmed sycamore trees located alongside the ditch, as described in TN2.



Photograph 3 - Looking north along the section of Bulling Dike located along the north western boundary of the site, as described in TN3.



Photograph 4 - Looking east along Bulling Dike as described in TN4. The Wombwell Ings hide can be seen in the distance to the north of the ditch.



Photograph 5 - Looking north through the defunct hawthorn hedgerow, with Bulling Dike in the channel below the steep banks, as described in TN5.



Photograph 6 - Looking south east across the improved grassland pasture field as described in TN6.



Photograph 7 - Looking south west along the ditch which forms the eastern boundary of the site along the pasture field (TN6) as described in TN7. The sluice gate, which allows control of the water levels at Broomhill Flash Nature Reserve can be seen.



Photograph 8 - Looking north east along the intact, species poor hedgerow which forms the boundary between the improved pasture field (TN6) and arable field (TN1) as described in TN8.



Photograph 9 - Looking north west along the southern boundary of the site and arable field. The defunct, species poor hedgerow can be seen along the boundary as described in TN9.



Photograph 10 - Showing the dry ditch just outside of the site, adjacent to the southern boundary as described in TN10.