



Preliminary Ecological Appraisal (PEA) & Ecological Constraints and Opportunities Plan (ECOP)

WILLOUGHBY 2, WILLOUGHBY-ON-THE-WOLDS, NOTTINGHAMSHIRE (Two Landholdings / Survey Areas: Central OS Grid Reference: SK 595 275)

Preliminary Ecological Appraisal reports are aimed at quickly and concisely communicating the findings of initial ecological survey work completed on sites so that key ecological opportunities and constraints to the planning process are appropriately considered within the design and planning process. The constraints identified may have an influence over the time required to complete the baseline ecological surveys to inform a planning application and may also inform the site layout and requirements for ecological mitigation within the site. Opportunities for incorporating mitigation habitat and ecological enhancement measures within the design are also most easily achieved when considered at an early stage. This document is not prepared for direct submission to the local authority but rather for circulation amongst key members of the design team so that ecological requirements might be adequately considered.

This document has been produced by Clarkson and Woods Ltd. on behalf of Pegasus Group to provide an outline of the ecological constraints identified at the above site and identify opportunities for incorporating biodiversity enhancements into future development proposals. Note that this document aims to provide design and planning advice, and it is not intended to be submitted with a planning application to develop the Site. However, recommendations have been provided below with a view to support and enhance any future applications.

Site Survey

Clarkson and Woods Ltd. have been commissioned by Pegasus Group to complete Extended Phase 1 Habitat Surveys of a site spread over two survey areas (owned by two landowners) which were completed on the 28 January 2022. The results of the Phase 1 Habitats Survey are included in map form on **Figure 1 - 2** below. Pond locations are shown on **Figure 3**. **Figures 4 & 5** at the end of the report shows the survey areas and identifies key constraints as well as opportunities to avoid, mitigate and enhance key ecological features. **Table 3** provides more detail of issues for consideration. **Figure 6** shows the location of both the southern and northern parcels in relation to each other.

A desk based assessment has also been completed which collates information from various sources including the Nottingham Biological and Geological Records Centre (NBGRC), MAGIC.gov.uk and other resources, including Clarkson and Woods' own in-house database. Any records local to the site which might have a bearing upon the future development identified during this search are also highlighted within this short report.

The survey completed identified a number of further species survey requirements. The details of these, together with the associated time constraints is set out below.



Further Ecological Survey Work

The timeline below shows the further ecological survey work that would be expected to accompany a planning application and to inform suitable mitigation. Many of these surveys are seasonally constrained and consultation with the LPAs ecologist is advised.

TASK	Jan 22	Feb 22	Mar 22	April 22	May 22	June 22	July 22	Aug 22	Sept 22	Oct 22	Nov 22	Dec 22
Phase 1 Ecological Walkover Survey	Completed											
Consultation With LPA Ecologist To Agree Survey Scope.												
X1 Scoping Wintering Bird Survey		Completed										
eDNA Surveys of x 15 Ponds For Great Crested Newt												
Scoping Breeding Bird Survey												
Additional Breeding Bird Surveys X3 if required												
PEA Report			Completed									
Ecological Impact Assessment Report												



Key:

- | | |
|--|---|
| Red line boundary | A Arable |
| ● Scattered broadleaved tree | Building |
| ● Target note | Dense scrub |
| — Species-poor hedgerow | Hardstanding |
| - - - Species-rich hedgerow | Poor semi-improved grassland |
| - - - Species-poor hedgerow (defunct) | Semi-natural broadleaved woodland |
| - - - Dry ditch | Standing water |
| + + + + Fence | Amenity grassland |

CLARKSON & WOODS
ECOLOGICAL CONSULTANTS

Project:
Willoughby 2 North

Figure
Phase 1 Habitat Survey Map

Project Number:
7845

Date:
11/03/2022

Figure 1: Extended Phase I Habitat Map (Willoughby 2.1 North Survey Area)

Table 1: Target Notes (Figure 1, Willoughby 2.1 North Survey Area)

No.	Description
TN1	Mature ash tree with knot hole on trunk facing west. Moderate potential for bats
TN2	Pond in neighbour's garden (Pond 3), surrounded by willow trees and largely filled with greater pond sedge. Some standing water could be seen but water levels seemed low. Shallow sloping banks, no fish or waterfowl expected. Good habitat surrounding. 60% shaded by trees. Neighbour reports it has had newt surveys previously which found newts (did not specify which species though)
TN3	Collection of hybrid black poplars with some low potential PRF's. In this area of the field were some logs and rubble which could provide potential habitat for reptiles and amphibians.
TN4	Collection of modern open agricultural buildings and dutch barns used for storing materials. No stock on site. Concrete block walls and metal / asbestos roofs. Probably low potential for bats / barn owl
TN5	Pond 2 which has become degraded due to piles of composted grain / material which has spilt into it. Small amount of water left which had scum on top. Typha and willowherbs emerging from water. Surrounded by common nettle covering steep banks. May dry occasionally - not sure how deep it is. Could be suitable for GCN in future if it recovers from pollution.
TN6	Ash tree in hedge with a couple of PRFS including split and callus roll. Moderate potential for bats
TN7	11+ fieldfare and skylark singing over arable fields
TN8	Badger latrine, 1 pit with fresh dung under hedge
TN9	Badger latrine, 2 pits with fresh dung, foraging snuffle holes and path following hedgeline
TN10	Ash tree in hedge with knot holes on trunk and underside of a branch. Moderate potential for bats
TN11	Badger latrine, 2 pits with fresh dung.
TN12	Badger sett on edge of field margin, adjacent to arable field. Probably an outlier sett, Two entrances, partially used, one facing SW the other facing NW. Entrances quite clear but no recent evidence such as hairs.
TN13	1 disused entrance, likely a former outlier sett, grass and seedlings cover entrance and partially blocked by soil.
TN14	Badger sett with a single well used entrance on very edge of arable field, faces east with tunnel going under field. Probably an outlier sett. Two large well used latrines nearby and a very well used path going down the bank and crossing the road into the woodland on the other side of the road.
TN15	Small pond (Pond 4) on wooded bank by road, just below badger sett. Around 4m x 2m. 100% shaded, no aquatic vegetation and probably dries annually. No fish or water fowl. Good terrestrial habitat, surrounded by woodland. Badger latrine found next to pond.
TN16	Area of trees off site, from looking with binoculars and aerial map there doesn't seem to be a pond there but couldn't get close.
TN17	Former pond appears to have become succeeded by scrub - a small amount of Typha remains in the centre of the scrub but no water was present, assume dry (or damp) for much of the time. Surrounded by bramble and willowherbs.



TN18	Pedunculate oak with moderate potential for bats
TN19	Pedunculate oak with moderate potential for bats
TN20	Ash tree with PRF's with moderate potential for bats
TN21	Ash tree with PRF's with moderate potential for bats
TN22	Pond in woodland edge just adjacent to site (Pond 1). Very clear water, around 30cm deep, some aquatic vegetation and dead leaves could be seen. On edge of wood, 100% shaded, probably never dries. No fish or fowl expected.
TN23	Willow tree with PRFs with moderate potential for bats
TN24	Badger sett with one partially used entrance facing west and two partially used entrances facing north (on edge of arable field). Possibly an annexe sett to the main sett further along the hedge.
TN25	Badger sett, the majority of entrances are on the south side of the hedge outside of the site boundary. In total we found: 8 well used, 2 partially used and 1 disused entrance, likely main sett. At least one entrance had bedding and a well used path. One of the well used entrances was on the site side in the field margin.
TN26	Two storey farmhouse with brick walls and interlocking concrete tiles, chimneys present. Some gaps at gable ends but tiles generally well fitting. Roof space probably present. Likely to be Moderate potential for roosting bats.
TN27	Semi improved grassland field not currently grazed and is becoming rank and tussocky. Dominated by Yorkshire fog with frequent cock's-foot and occasional perennial rye-grass. Frequent cow parsley especially along hedge, occasional creeping thistle, dandelion and broadleaved dock. Sward 10-15cm with larger tussocks of 20-30cm. Some thatching which could provide habitat for foraging barn owl. Also could support reptiles and amphibians.
TN28	Buffer along woodland edge, a wider than usual arable margin - around 15m, grasses with frequent bramble scrub cut to ground level

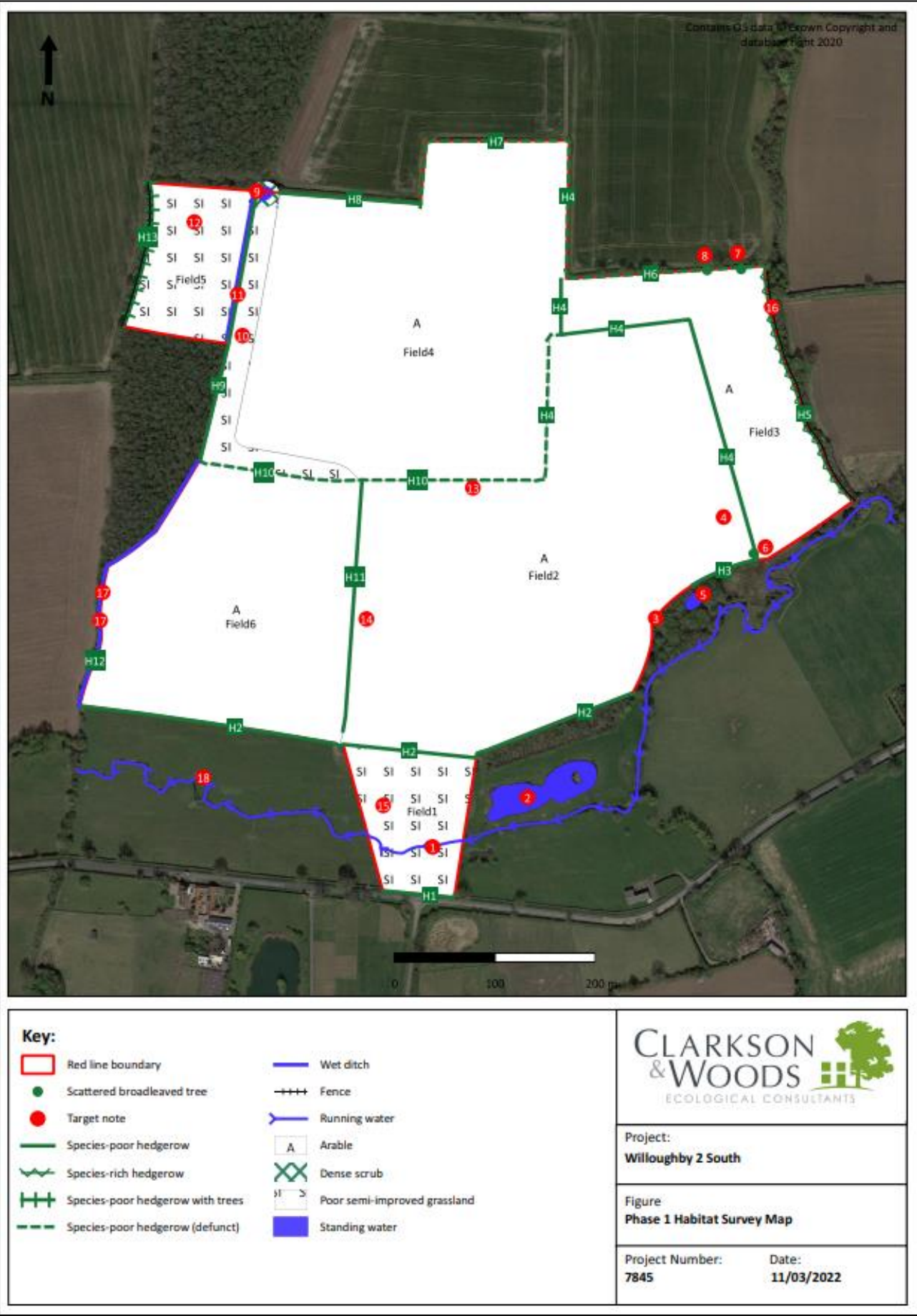


Figure 2: Extended Phase I Habitat Map (Willoughby 2.2 South Survey Area)

Table 2: Target Notes (Figure 2, Willoughby 2.2 South Survey Area)

No.	Description
TN1	Kingston Brook, a stream flowing through sheep grazed field, approx 2m wide, moderate flow and at least 30cm deep. Moderately steep to shallow banks with grasses. Potential for water voles.
TN2	Large pond with wigeon and mallard, grey heron. Feathers on bank indicate well used by water fowl. Sheep grazed grass around pond. A few tufts of rushes, possibly fish stocked. Shaded by occasional small willow but generally 95% no shading. Unknown aquatic vegetation. Potentially supports GCN
TN3	Badger sett (probably subsidiary) on edge of field margin and adjacent woodland. 2 partially used entrances and 2 disused entrances. The closest of the partially used entrances faces west and is around 1m from arable field.
TN4	Brown hare observed in field
TN5	Pond in woodland, 100% shaded by trees, filled with leaves and branches, at least 20cm + deep, may dry sometimes. No fish or fowl expected. Around 10m x 2m. Good surrounding habitat, no aquatic vegetation noted.
TN6	Ash with trunk half dead and missing, some rot holes in heartwood. Cluttered. Low to moderate potential for bats.
TN7	Ash with extensive rot and hollow limbs, many features but quite cluttered. Moderate potential for bats.
TN8	Ash with vertical split on length of trunk facing south. High potential for bats.
TN9	Pond in corner of field, around 5m diameter. 100% shaded and surrounded by scrub. No fish or fowl expected. No vegetation seen in the pond. Probably dries annually, very shallow.
TN10	Field margin around 30m wide, strip of SI grassland which appeared species poor. Grasses included perennial ryegrass, tufted hair-grass, Yorkshire fog and occasional soft rush. Sward around 20-30cm long, possibly left for pheasants or is too wet for cultivation. May be good for snipe, brown hare etc.
TN11	Ditch which runs along boundary of site, mostly dry but some damp areas and standing water especially where pipes drain in. Ditch covered with scrub from base of hedge.
TN12	Small field of poor semi-improved grassland which was dominated by Yorkshire fog and included perennial ryegrass, cock's-foot, red fescue and timothy, white clover and creeping buttercup. Cut to 20-25cm. Not grazed. Possibly set aside for game birds/shooting?
TN13	Badger sett on edge of arable field, likely a subsidiary but possibly a small main sett. Total of 2 well used, 2 partially used and 3 disused entrances: One p.u. with fresh latrine near entrance, faces east; one w.u. on very edge of arable field, faces south; 1 d.u. facing south under hedge; 1 w.u. on north side of hedge facing south; 2 d.u. (destroyed by ploughing) collapsed entrances in arable field; 1 p.u. a little further along hedgeline from others, facing east in centre of hedge.
TN14	Abundant song thrush foraging activity along hedge, numerous piles of snail shells next to stones every few metres
TN15	Sheep grazed Species poor SI grassland, grazed to a typically low level. Dominated by rough meadow-grass, with rarely occurring tufted hair-grass and creeping thistle. Mosses indicate damp substrate. Ridge and furrows obvious.
TN16	Snipe flushed from arable margin
TN17	Two pedunculate oak trees with moderate bat potential



TN18	Lapwing could be heard somewhere south of site, but was not seen during survey. Only one individual calling
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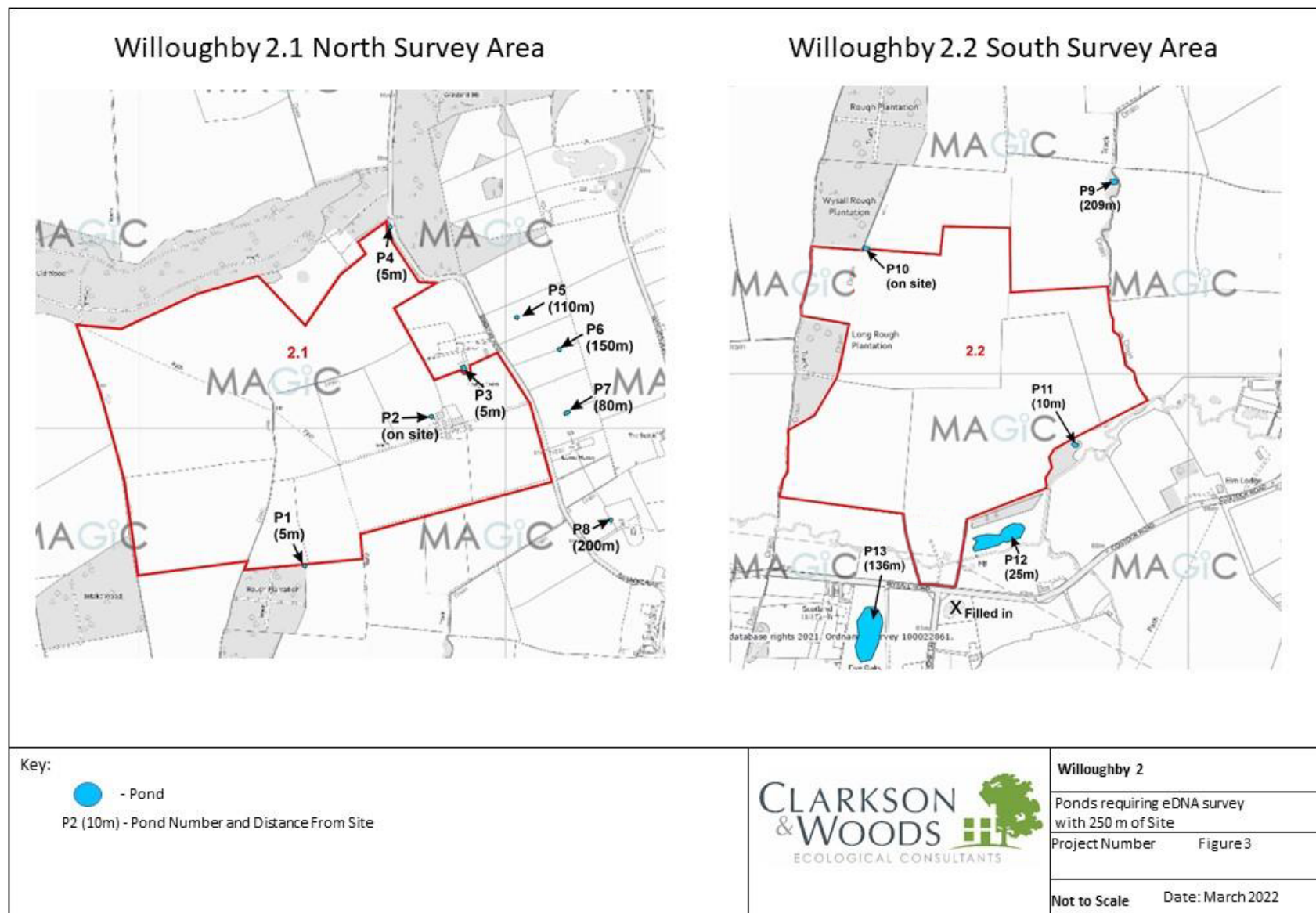


Figure 3: Pond Locations Map



Table 6: Potential Constraints and Opportunities Related to Development of Site

Ecological Receptor	Constraints and Likely Impacts During Construction and Operation. Requirements for further survey are highlighted.	Recommended Mitigation, Opportunities and Enhancements.
Designated Sites		
Statutory and Non-Statutory Sites	<ul style="list-style-type: none">No internationally designated sites lie within 5km.No nationally designated sites within 2km.Keyworth Meadow Local Nature Reserve (LNR) lies 1.6km to the north-east of Willoughby 2.1 North. The LNR comprises 1ha of flower-rich grassland, with additional wetland flora associated with the bordering brook. Ponds at the site support great crested newts. Turtle dove occurred until 2012.8 Sites of Importance for Nature Conservation (SINCs) lie within 2km of the Survey Areas.Bunny Old Wood SINC is the closest non-statutory site, immediately adjacent to the northern boundary of Willoughby 2.1 North Survey Area. This is an ancient broadleaved woodland, dominated by ash, with pedunculate oak and wych elm, a dense understorey and ground flora including sanicle, wood-sedge and bluebell. The wood is of importance to butterflies, including white-letter hairstreak. <p>The other closest SINCs are:</p> <ul style="list-style-type: none">Windmill Hill SINC lies around 100m north-east of Willoughby 2.1 North Survey Area, east of Bunny Wood. It comprises mature deciduous woodland with ground flora including bluebell, dog's mercury and enchanter's nightshade.Wysall West Grassland SINC is around 180m east of Willoughby 2.1 North Survey Area, a semi-improved horse pasture with remnants of more species-rich grassland around edges supporting species such as meadow vetchling, common knapweed and Lady's bedstraw.	<ul style="list-style-type: none">The EclA will need to consider all potential impacts on Bunny Old Wood SINC which borders the site. A buffer of at least 30m between the site and the edge of Bunny Old Wood is recommended. There may be scope for enhancing this buffer strip to complement the woodland edge and potentially provide additional habitat suitable for butterflies including white-letter hairstreak.A CEMP prepared for the site should outline good practice construction sites measures to prevent impacts on the nearest designated sites, through minimising run-off, dust and spoil pollution.



Ecological Receptor	Constraints and Likely Impacts During Construction and Operation. <u>Requirements for further survey are highlighted.</u>	Recommended Mitigation, Opportunities and Enhancements.
	<ul style="list-style-type: none">• Marblaegis Mine, Bunny SINC lies to the north of Bunny Old Wood, around 300m from the site. It is an old gypsum mine which supports a diversity of calcareous flora. Including wild carrot, fairy flax, eyebright sp, tor-grass and hoary plantain.• Costock Road SINC is around 300m east of Willoughby 2.2 South Survey Area, and comprises species-rich hedgerows either side of the road and include buckthorn, hazel, dogwood, field maple, small leaved lime and crab apple. The associated road verges are species-rich and include salad burnet, common bird's trefoil and common knapweed. <p>Potential direct impacts on Bunny Old Wood SINC during construction or operation are likely to be limited, but indirect impacts could include noise and dust during construction.</p> <p>The other SINC's are unlikely to be affected by the proposals due to their distance from the site.</p>	
Habitats		
Trees	<ul style="list-style-type: none">• A number of mature trees were identified within the hedgerow network in both survey areas, which are important ecological features.• Many of the trees have some potential to support roosting bats but moderate and high potential trees are identified as Target Notes on Figures 1 - 2 (See 'Bats').• There are no woodlands within the survey areas, but both survey areas border woodland in places.	<ul style="list-style-type: none">• Retain mature trees where possible – these are likely to be important landscape and ecology features and may contribute to green corridors.• The design will need to take into account root protection zones in accordance with BS 5837: Trees in relation to design, demolition and construction.• Any works needed to the trees (such as removal or de-limbing) should be identified early as these trees may be suitable for roosting bats, nesting birds etc.



Ecological Receptor	Constraints and Likely Impacts During Construction and Operation. <u>Requirements for further survey are highlighted.</u>	Recommended Mitigation, Opportunities and Enhancements.
Hedgerows	<ul style="list-style-type: none">• Extensive network of hedgerows present on site, which are often species-poor and defunct, but do include some species-rich hedgerows. The hedgerows across the Survey Areas include occasional standard trees.• Hedgerows are a Habitat of Principal Importance (S41 of NERC Act) and are listed in the Nottingham Local Biodiversity Action Plan (LBAP) as they are important ecological features.• Hedgerows may be damaged during construction or sections may need to be removed for access.	<ul style="list-style-type: none">• Highly recommend that hedgerows are retained wherever possible and an adequately protective buffer (minimum 5m) provided along the bases.• Any gaps for access should be minimised with existing gaps utilised where possible.• Protection of hedgerows during construction using security fencing, stock-proof fencing or temporary fencing. Stock-proof fencing would be preferable where security fencing not required as this will protect the hedgerows if sheep grazing takes place during operation.• Enhance retained hedgerows through infilling gaps, bringing hedgerows under favourable management, which maximises biodiversity value.• Should any loss of hedgerow or boundary feature be required, it should be replaced on a 2:1 basis by planting native, species-rich, double-planted hedgerows.
Arable land	<ul style="list-style-type: none">• The field margins were narrow in most places and species-poor.• Willoughby 2.1 North Survey Area included a wider arable margin along the northern edge• Willoughby 2.2 South Survey Area included a wider arable margin along the edge of Field 4 (see Grassland below).• Although of low floristic value, the arable land is likely to be valuable for farmland birds (see 'Birds'). This is one of the reasons that arable / improved grassland has a Habitat Action Plan in the Nottingham LBAP.	<ul style="list-style-type: none">• Arable land within the array is likely to be replaced by grassland. Measures to maximise the benefits of grassland, such as seeding with wildflower mix, should be set out in a Landscape and Ecology Management Plan (LEMP). This would include grassland management prescriptions to ensure that new grasslands provide significant enhancement for wildlife including farmland birds.• Conservation grazing or mowing regime should be applied to all or some (at least half) of the operational site, with minimal intervention in the summer months to allow establishment of a diverse sward.



Ecological Receptor	Constraints and Likely Impacts During Construction and Operation. Requirements for further survey are highlighted.	Recommended Mitigation, Opportunities and Enhancements.
Grassland	<ul style="list-style-type: none">Field 1 in Willoughby 2.1 North Survey Area was semi-improved neutral grassland which appeared species-poor. The grassland was ungrazed and tussocky.Field 1 in Willoughby 2.2 South Survey Area was sheep-grazed pasture, comprising semi-improved neutral grassland. The grassland was grazed short and appeared species poor.Field 5 in Willoughby 2.2 South Survey Area comprised semi-improved neutral grassland. The grassland is possibly cut for hay and appeared species-poor but may provide habitat for ground nesting birds.Willoughby 2.2 South Survey Area included a wide strip of semi-improved neutral grassland strip at one side of Field 4. The grassland appeared to be species-poor but may provide habitat for ground nesting birds.	<ul style="list-style-type: none">There is opportunity to retain and enhance the existing grassland through appropriate management to increase species and structural diversity.
Watercourse and Ditches	<ul style="list-style-type: none">Kingston Brook flows through Field 1 in Willoughby 2.2 South Survey Area. There is also a wet ditch on this site, and a number of dry ditches in both survey areas.There is the potential for runoff or pollution events during construction, which may impact watercourses running adjacent to the site (which may in turn affect watercourses downstream of the site).The stream may be suitable for water vole (see 'Water Voles' below)	<ul style="list-style-type: none">A buffer of at least 10m is recommended between the array and Kingston Brook.A buffer of at least 5m should be established between the array and any ditches.A CEMP for the site should contain measures to prevent impacts on the ditches and stream. Site compounds should not be situated within 10m of watercourses.
Ponds	<ul style="list-style-type: none">Willoughby 2.1 North Survey Area has one pond on site and three ponds within 5m of the site boundaryWilloughby 2.2 South Survey Area has one pond on site and two ponds within 25m of the site boundaryIn addition to the ponds on site, a total of 13 ponds have been identified within 250m of the two survey areas, as indicated on Figure 3 & 4 Pond Maps (See 'Great Crested Newts').	<ul style="list-style-type: none">A buffer of at least 10m should be established between the array and ponds on site. A wider buffer may be recommended if any of the ponds on site are confirmed to support great crested newts.A CEMP for the site should contain measures to prevent pollution and run-off entering the ponds on and immediately adjacent to the site.There is scope for enhancing existing ponds on site and/or creating new ponds on site to help boost biodiversity.
Buildings	<ul style="list-style-type: none">Willoughby 2.1 North Survey Area has a farmhouse and a collection of modern agricultural barns.Assume buildings are being retained; but if any impacts such as demolition, modification, lighting etc are expected on any of the buildings, bat and barn owl surveys will be required.	<ul style="list-style-type: none">The buildings could be enhanced for bats and barn owls by installing roost and nest boxes for these species.



Ecological Receptor	Constraints and Likely Impacts During Construction and Operation. <u>Requirements for further survey are highlighted.</u>	Recommended Mitigation, Opportunities and Enhancements.
Fauna and Flora		
Badgers	<ul style="list-style-type: none">Protected under WCA 1981.NBGRC returned 17 records of badger with 1km including setts, road casualties and latrines. Badger setts were recorded in Bunny Old Wood and Windmill Hill Wood.Willoughby 2.1 North Survey Area supported four active setts: A likely main sett was present on the southern hedgerow boundary, the majority of the entrances were just off-site in the adjacent field, but some entrances emerged on to the arable field margin of the site. A likely annex sett was also present on site, further west along this hedgerow boundary.There were three outlier setts along the north-eastern hedgerow boundary, one of which was well used and one was disused.There were latrines across the site, indicating frequent badger movement across Willoughby 2.1 North.Willoughby 2.2 South Survey Area had a likely subsidiary sett on the edge of Field 2 in the centre of the site. There was also a likely subsidiary sett on the southern edge of the site. No latrines were found in this survey area.Risk of an offence being committed (killing / injury of badgers or sett damage) during construction works.	<ul style="list-style-type: none">Badger setts should be retained and protected during construction phase by erection of protection fencing, with a suitable buffer width of at least 10-20m (depending on the size and status of the sett).Further surveys/mitigation may be required should any badger setts require exclusion (i.e. where a suitable buffer cannot be provided).Given that badgers can create new setts in a relatively short space of time, an update badger survey would be recommended prior to construction commencing.
Wintering Birds	<ul style="list-style-type: none">A <u>wintering bird scoping survey</u> is currently being undertaken and an updated assessment will be provided following completion of this survey.The initial Phase I recorded large flocks of fieldfare and occasional redwings at Willoughby 2.1 North Survey Area. Skylark were singing over arable fields in this survey area, indicating this species is likely to breed on site.Willoughby 2.2 South Survey Area supported snipe, song thrush and a lapwing was recorded near to the site.	<ul style="list-style-type: none">Consider incorporating 'winter bird seed habitat' creation in some areas, where arable land is sown with a mixture of crop and other seeds for the benefit of wintering birds and cultivated and reseeded approximately every 2 years.Lightly manage hedgerows to benefit winter thrushesSkylark squares within off-site land may need to be considered (although principally for breeding skylark rather than wintering birds).



Breeding Birds	<ul style="list-style-type: none">• Protected under Wildlife and Countryside Act (WCA) 1981.• Skylark are a Species of Principal Importance (S41 of NERC Act).• WBRC returned a large number of records of notable birds within 1km including farmland species such as skylark, linnet, grey partridge, corn bunting, yellowhammer and tree sparrow. Willow tit, marsh tit, yellow wagtail, woodcock and hobby are amongst birds recorded at Bunny Old Wood SINC, adjacent to Willoughby 2.1 North.• There are numerous records of barn owl foraging approximately 380m to the west of Willoughby 2.1 North.• The Phase I survey noted skylark to be singing over arable fields in Willoughby 2.1 North, indicating this species likely breeds on site.• Potential for offence to be committed by damaging/destroying active birds' nests should ground nesting birds be present during construction or birds be present within trees/hedgerows which require removal.• The farm buildings did not appear highly suitable for breeding barn owls but if due to be affected, a barn owl survey should be undertaken.• Breeding bird scoping survey in March 2021 in order to confirm the species breeding on site, in particular skylark on the arable fields. The findings of the scoping survey will determine the need for more comprehensive breeding bird surveys between March and June, although this should be discussed with the LPA ecologist.	<ul style="list-style-type: none">• Recommend liaising with LPA ecologist early to agree scope of bird surveys.• Depending on the findings, mitigation is likely to be required and would need to be outside the footprint of the array. Approximately 2ha per skylark territory would be required and this would comprise grassland or arable ley which is uncut during April to August inclusive to achieve a sward height of 20-50cm. This would need agreement with neighbouring landowner.• Provide new nesting opportunities through nest boxes on trees.
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Bats	<ul style="list-style-type: none">• European Protected Species, Species of Principal Importance (S41 of NERC Act) and bats have a Species Action Plan in the LBAP.• NBGRC returned records of 12 bat roosts within 1km of the Site since 2010, including brown long-eared <i>Plecotus auritus</i> and common pipistrelle <i>Pipistrellus pipistrellus</i>. The closest roost was a brown long-eared roost, located approximately 500m east of the Site within Wysall, recorded in 2015.• NBGRC returned 109 records of bat within 1km of the Site, species included brown long-eared, common pipistrelle, soprano pipistrelle <i>Pipistrellus pygmaeus</i>, <i>Myotis sp.</i>, and Noctule <i>Nyctalus noctula</i>. There was also a record of barbastelle (5 audio passes) from 2019 in Bunny Old Wood, around 60m from the site.• Two bat mitigation licences were applied for within a 1km radius of the Site, the closest being 450m south west from the Site, in Wysall.• Site boundaries (woodland edges, watercourses and hedgerows) may be important commuting/ foraging routes.• Many trees in the hedgerows had potential roosting features. Any work required (such as felling or delimbing) has the risk of impacting roosting bats.• The farmhouse and agricultural buildings may provide potential roost sites for bats. Any impacts such as demolition, modification, lighting etc would require a preliminary roost assessment and potentially activity surveys which are seasonally constrained.• Consideration should be given over whether any lighting will be required either during construction or operation as this may impact bats on the site.	<ul style="list-style-type: none">• Recommend liaising with the LPA ecologist at an early stage to ensure that they are in agreement in terms of the need (or lack of need) for further survey.• Retain and enhance 'corridors' (hedgerows). Minimise any gaps created.• Any work to trees or buildings on site will require updated roost assessment and further survey and ECoW work may be required.• Avoid lighting during construction and operation. Should lighting be required, a strategy should be prepared to reduce impacts on important habitats.• Enhance site with additional roosting opportunities through bat boxes on trees and buildings.
Otters and Water Voles	<ul style="list-style-type: none">• NBGRC returned two records of water vole within 1km; both were on Kingston Brook, downstream from the site, but dated from 1987.• NBGRC also returned a record of otter on Kingston Brook, near to the large pond (P12) adjacent to Willoughby 2.2 South Survey Area. This record was dated from 2000. There was also a record from 2001 of otter on Fairham Brook, north of Bunny Old Wood, over 1km from Willoughby 2.1 North.• Kingston Brook runs through Willoughby 2.2 South, and the watercourse is still potentially suitable to support otters and water voles.• Potential impacts which could affect otters and water voles include bankside vegetation removal and disturbance, pollution run-off, changes in ground water or drainage levels. If there are any impacts predicted on the watercourse and it's banks (including vegetation removal), an otter and water vole survey will be required.	<ul style="list-style-type: none">• Watercourse to be protected with a suitable buffer of at least 10m and provisions included within a CEMP to protect these features.



Great Crested Newts	<ul style="list-style-type: none"> • European Protected Species and local BAP species. • NBGRC returned 14 records of great crested newt within 1km of the Site although most dated pre-2000. • The most recent record was from 2012, of adults in a garden pond nearly 500m to the east. • MAGIC website showed no GCN licence applications within 1km of the Site. • There are 2 ponds on site: P2 on Willoughby 2.1 North, and P10 Willoughby 2.2 South. P2 was assessed to be Below Average and P10 was Poor suitability. • In addition to the two ponds on site, a total of 13 ponds have been identified within 250m of the site boundaries, although most of these ponds have not been accessed to check if they still exist and are suitable for great crested newts. In particular, P1, P3, P4 and P11 are very close to the site boundaries. • eDNA survey required between mid-April and June. Access to all ponds will need to be arranged with relevant landowners for this survey. Habitat Suitability Index surveys should be undertaken at the same time. 	<ul style="list-style-type: none"> • Reversion of arable land to grassland within the array is likely to be of significant benefit for newts during their terrestrial phase (if present). • Further mitigation may be required; to be determined through further surveys. • Potential to enhance the ponds on site for amphibians including great crested newts by simple management such as reducing scrub shading ponds • Potential to enhance site by creating new ponds
Other Species	<ul style="list-style-type: none"> • Brown hare – seen on Field 2 at Willoughby 2.2 South. Both survey areas provide suitable habitat. Risk of injury during construction or fragmentation of habitat with fencing. • Reptiles – since 2010, there have been a few records of grass snake and one record of slow worm within 1km of the site. Reptiles are likely to be restricted to field boundaries and areas of grassland. Risk of killing/injury during ground works particularly if affecting field boundaries or grassland. • Dormice – Hedgerows provide the only habitat on site suitable for dormice. However this species is rare in Nottinghamshire with localised re-introduction sites. There are no records of the species within 2km of the survey area. • Invertebrates – Bunny Old Wood SINC bordering the site supports white-letter hairstreak. Grizzled skipper has been recorded at Marblaegis Mine, Bunny SINC. The arable land on site is unlikely to support a notable or diverse community of invertebrates but species typical of farmland are expected including a range of common pollinators. 	<ul style="list-style-type: none"> • Brown hare – allow gaps in fencing (usually via natural undulations in the ground). This species is known to favour solar farms and so would likely benefit from the development. • Reptiles – protection of field boundaries with a buffer of at least 5m would avoid impacts on reptiles, if present. If undertaking ground works on grassland during summer, a method statement should be followed to mow the grassland to a progressively lower height, in warm weather, to encourage any reptiles to temporarily disperse. Reversion of arable to grassland is likely to benefit reptiles, but additional features for reptiles could include log piles, hibernacula, ponds and leaving strips of grassland unmanaged (e.g. alongside hedgerows). • Dormice – whilst it is of low risk for this species to occur on site, the hedgerow network will be retained and protected with a suitable buffer of at least 5m and provisions included within a CEMP to protect these features. • Invertebrates - Cessation of intensive arable farming and sowing of a diverse seed mix post construction would enhance the site for invertebrates. Opportunity to enhance margins along woodland edges for butterflies, particularly for white-letter hairstreak along the buffer with Bunny Old Wood.



Biodiversity Net Gain

- Rushcliffe Local Plan Part 2 requires an assessment of Biodiversity Net Gain (BNG) to be calculated to determine the overall impact of the development on biodiversity (Policy P38, Non-Designated Biodiversity Assets and the Wider Ecological Network). In line with emerging national and local planning policy, a Biodiversity Impact Assessment score will need to be calculated for the Site, using the DEFRA Biodiversity Metric 3.0 Calculation Tool. This metric is used to calculate the biodiversity value of area and linear habitats both before and after development, and is used as a proxy measure to determine if a development is likely to result in an on-site habitat biodiversity net loss or gain.
- A detailed BNG assessment has not been conducted at this stage but will be undertaken as part of the EclA prepared for this project. For solar developments where the baseline habitat is arable vegetation, this is typically replaced by permanent grassland. On a large solar site of this size, this represents the replacement of a significant area of low grade habitat (arable) with a higher grade of habitat (permanent grassland). The outcome of the assessment is therefore likely to be a substantial net gain in biodiversity. If part or all of the new grassland is also seeded with native wildflower seed mixes the Net gain score would be increased further.

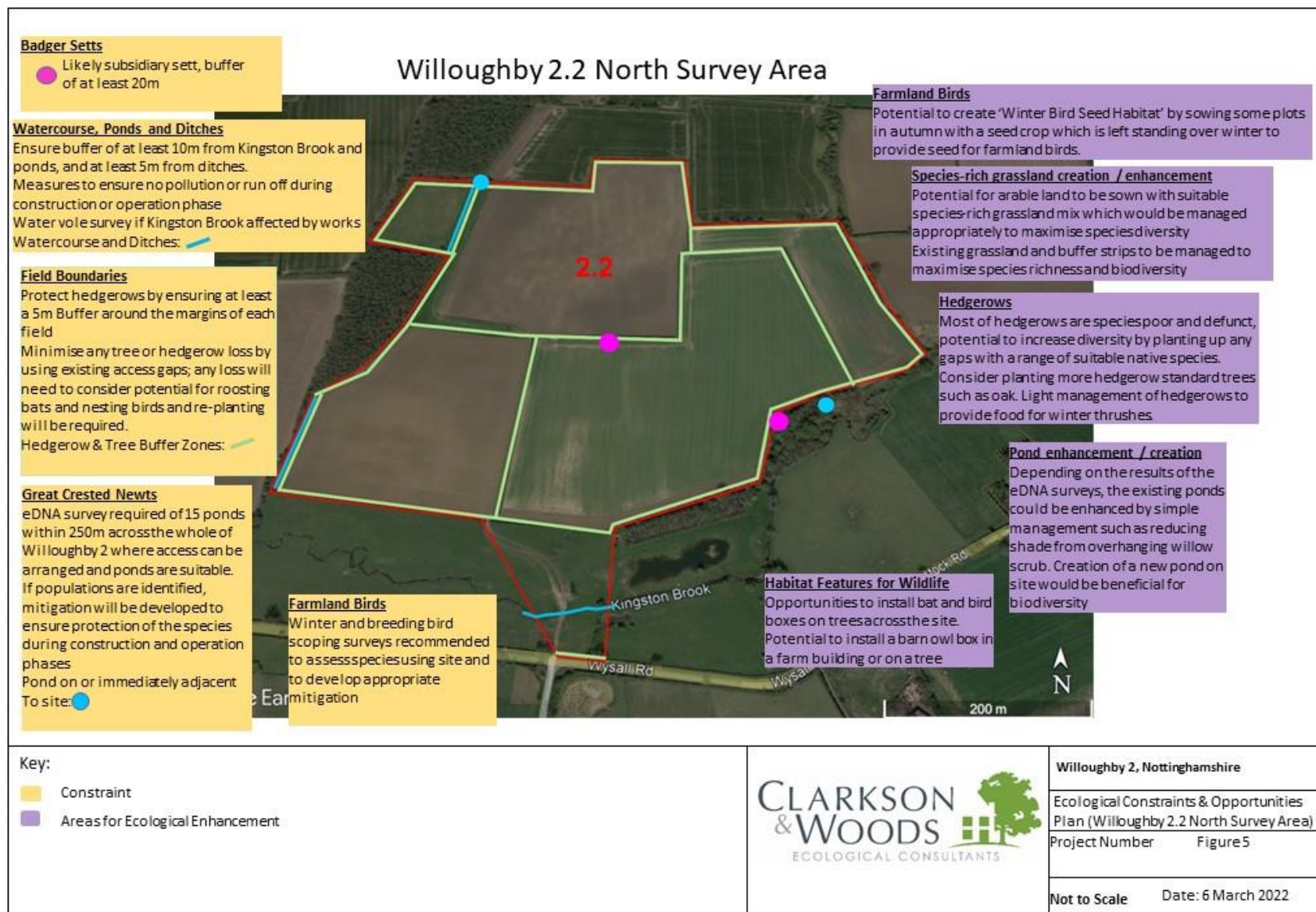


Figure 5: Ecological Constraints and Opportunities Map – Willoughby 2.2 South Survey Area

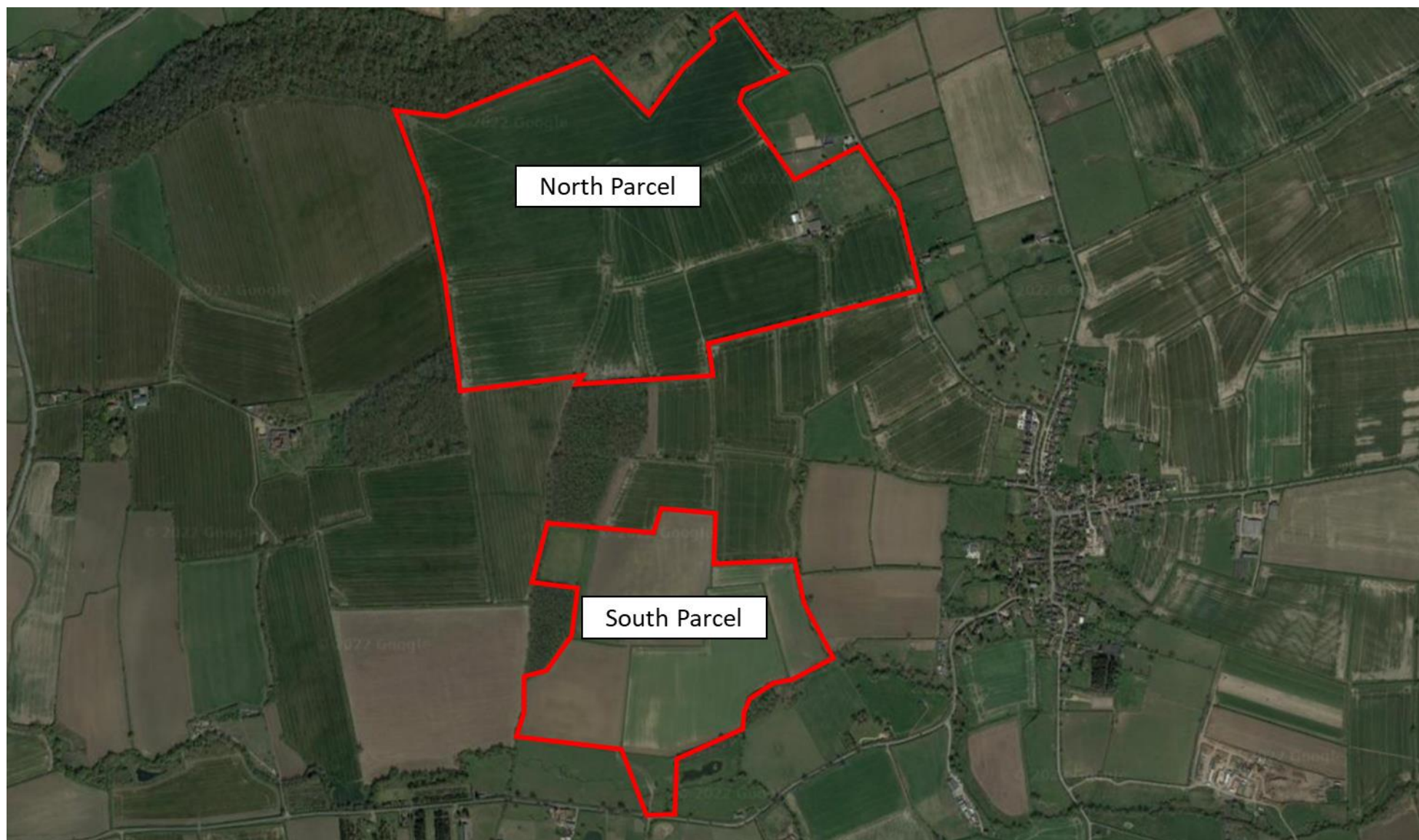


Figure 6: Location of North and South Parcels



Summary / Conclusion

Whilst there are certain sensitivities relating to this site, it is considered that the development would be able to mitigate any adverse impacts through careful design following the guidance given above. The proposed scale of the development allows for substantial ecological mitigation areas, which could lead to a net biodiversity gain in the long-term and would in turn be compliant with relevant legislation and policy.

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