# 13 Nature Conservation and Ecology

## 13.1 Phase I Habitat Report

# Lincoln Eastern Bypass:

# Phase 1 Habitat Survey Report

20th October 2012

*Produced for*
Lincolnshire County Council

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# 1. Introduction

## 1.1. Background

1.1.1. Mouchel was commissioned, by Lincolnshire County Council, to carry out an updated Extended Phase 1 Habitat survey for the proposed Lincoln Eastern Bypass (LEB) scheme.

1.1.2. The proposed scheme will be a single carriageway road through an area of predominantly arable land. The scheme will be located to the east of the city of Lincoln and the villages of Canwick and Bracebridge Heath and to the west of the outlying villages of North Greetwell, Cherry Willingham, Washingborough and Branston (see Figure 1-1). The LEB will provide a new road linking the existing Northern Relief Road to the A15 in the South of Lincoln, and will include a crossing of the River Witham, Lincoln to Market Rasen Railway Line and the Lincoln to Spalding Railway Line.

1.1.3. A full suite of ecology surveys has been previously undertaken by Jacobs for the proposed LEB, as shown in Table 1.1. These surveys were carried out as part of a wider environmental assessment process and were used to inform an Environmental Statement issued in 2009, which accompanied a planning application for the proposed LEB that was granted planning consent in October 2010.

*Table 1.1: Previous ecological surveys*

| Receptor | Type of Survey | Timing |
|---|---|---|
| **Habitats** | | |
| Phase 1 habitat survey | Extended Phase 1 habitat survey[1]. | 2008 |
| **Protected Species** | | |
| Otter | Specific survey | 2008 |
| Water vole | Specific survey | 2008 |
| Bats | Specific survey | 2008 |
| Great crested newt | Specific survey | 2008 |
| Reptiles | Specific survey | 2008 |
| Breeding Birds | Specific survey | 2008 |

[1] Joint Nature Conservancy Council (JNCC) (2003). Handbook for Phase 1 Habitat Survey - A Technique for Environmental Audit, Peterborough, UK.



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| Receptor | Type of Survey | Timing |
|---|---|---|
| Wintering Birds | Specific survey | 2008 |
| Barn Owl | Specific survey | 2008 |
| Invertebrates | Habitat suitability and incidental sighting survey | 2008 |
| Badger | Specific survey | 2008 |

## 1.2. Study rationale and objectives

1.2.1. The aim of the study was to identify any changes to the previous Extended Phase 1 Habitat survey carried out in 2008. To achieve this aim, the following objectives were set:

- Review existing desk study data relating to the scheme regarding legally protected/ecologically important sites, habitats and/or species;
- Field survey review of existing information regarding general habitats within the field survey area and habitats that are ecologically important and/or have legal protection;
- Field survey review of existing information relating to the potential of each identified habitat to support any ecologically important and/or legally protected fauna species; and
- Field survey review of existing information relating to potential ecological effects on protected plant species, or invasive plants species covered by legislation.



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# 2. Methods

## 2.1. Desk study

2.1.1. Biological records (2002-present[2]) within an area extending 1km from the site boundary (the 'study area') were obtained from the following sources:

- Multi Agency Geographic Information Centre website (www.magic.defra.gov.uk);
- Natural England website (www.natureonthemap.org.uk);
- Ordnance Survey (OS) website (www.ordnancesurvey.co.uk).

2.1.2. Receptors included within the scope of the desk study are described in Section 3. Only those receptors that were present within the zone of influence of the proposals (i.e. those present within, adjacent to, or connected by potential effect pathways) have been considered in this report.

*Table 2.1: Receptors included within the desk study*

| Receptor | Description |
|---|---|
| **Protected Sites** | |
| European Protected Sites | Sites protected by the Conservation of Habitats and Species Regulations 2010 (as amended) – Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar convention Wetlands. |
| Sites of Special Scientific Interest (SSSIs) | Sites protected by the Wildlife and Countryside Act 1981 (as amended) |
| National and Local Nature Reserves (NNR/LNR) | Sites protected by the National Parks and Access to the Countryside Act 1949 (as amended) |
| **Protected Species** | |
| European Protected Species | Species specifically protected by the Conservation of Habitats and Species Regulations 2010. |

[2] Records older than 10 years are unlikely to accurately reflect the current community of animals and plants in the area.



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| Receptor | Description |
|---|---|
| Nationally Protected Species | All species of bird, but principally species listed on schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Also animals listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and not European Protected Species, and badgers protected by the Protection of Badgers Act 1992. |
| **Other receptors** | |
| Ancient Woodland | Not protected by a priority conservation habitat covered by the National Planning Policy Framework 2012. |

## 2.2. Field survey

2.2.1. An extended Phase 1 Habitat survey was carried out on the 30th July 2012 covering habitats within a study area extending to 250m from the centre line of the proposed scheme. Habitats present were identified using Natural England's recommended Phase 1 Habitat survey methodology, and are presented with target notes describing features of ecological interest observed.

2.2.2. In addition to mapping habitat types and dominant flora, the potential for the ecological survey area to support species that are protected by law or otherwise of particular nature conservation value, such as those listed as Biodiversity Action Plan (BAP) priority species, was assessed. Incidental field signs or sightings of such species were recorded as seen.

### *Protected Sites*

2.2.3. Records from the Multi Agency Geographic Information Centre website and the Natural England website contained records of protected sites within 1km of the LEB (Table 3.1).

*Table 3.1: Recent Records of protected species within the 1km of the LEB.*

| Protected Sites | |
|---|---|
| **European Protected Sites** | There are no European Protected sites within the zone of influence of the proposed LEB. |
| **SSSIs** | Greetwell Hollow Quarry SSSI: This site is designated for its geological features, being considered of national importance for its exposures of Lincolnshire Limestone. The quarry is no longer active, therefore in some areas dense scrub has developed on unworked ground and on spoil. |



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| Protected Sites | |
|---|---|
| **NNRs/LNRs –** | • Greetwell Wood Site of Nature Conservation Interest (SNCI)<br>• Canwick Hall Wood SNCI;<br>• Washingborough Junction SNCI;<br>• Witham Corridor Local Wildlife Site (LWS); and,<br>• Greetwell Junction Railway Embankment LWS. |
| **Ancient Woodland –** | The proposed LEB will not impact any areas classed as Ancient Woodland. |

### *Protected Species*

*Table 3.2: Recent Records of protected species within the 10km grid squares containing the proposed LEB.*

| Protected Species | Location | Date of Record |
|---|---|---|
| **European Protected Species** | | |
| Water vole *Arvicola amphibious* | SK96 | 2002 |
| Water vole *Arvicola amphibious* | TF07 | 2003 |
| Daubentons *Myotis daubentonii* | SK96 | 2004 - 2011 |
| Brown long-eared bat *Plecotus auritus* | TF07 | No date - After 2002 |
| Otter *Lutra lutra* | TF07 | No date - After 2002 |
| **Nationally Protected Species** | | |
| Badger *Meles meles* | TF07 | No date - After 2002 |
| Fieldfare *Turdus pilaris* | TF07 | No date - After 2002 |
| Brambling *Fringilla montifringilla* | TF07 | No date - After 2002 |

## 2.3. Field Survey

### 2.3.1. Extended Phase 1 Habitat Survey Review



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### *Habitats*

2.3.2. The following habitat types were recorded within the study area:

- Improved grassland;
- Species-rich, semi-improved grassland;
- Marshy acid grassland;
- Amenity grassland;
- Broadleaved woodland;
- Broadleaved plantation;
- Mixed plantation;
- Dense scrub;
- Species-rich hedgerows;
- Species-poor hedgerows;
- Standing water;
- Running water;
- Arable and
- Bare ground/hard standing/travel infrastructure including rail lines, underpasses and bridges.

### *Grassland*

2.3.3. The neutral species-rich semi-improved grassland is characterised by grasses including wavy hair grass *Deschampsia flexuosa*, crested dog's tail *Cynosurus cristatus*, annual meadow grass *Poa annua*, meadow fescue *Festuca pratensis* and cock's-foot *Dactylis glomerata*. Selfheal *Prunella vulgaris*, creeping cinquefoil *Potentilla reptans*, common knapweed *Centaurea nigra*, perforate St-John's wort *Hypericum perforatum* and common nettle *Urtica dioica* are frequent.

2.3.4. The grassland running between North Delph and the River Witham is coarse grassland dominated by tall oat grass, *Arrhenatherum elatius* and cock's-foot (Photograph 21). Also present were common nettle, spear thistle *Cirsium vulgare*, broad-leaved dock *Rumex obtusifolius*, common ragwort *Senecio jacobaea*, hogweed *Heracleum sphondyllium*, soft rush *Juncus effusus* and Yorkshire fog *Holcus lanatus*.



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2.3.5. The improved grassland is less species rich and is dominated by grasses, red clover *Trifolium pratense*, hop trefoil *Trifolium pratense* and ribwort plantain *Plantago lanceolata*. These are indicative of he avy grazing and fertilizer use. The amenity grassland areas comprise close mown perennial ryegrass *Lolium perenne*, common bent *Agrostis tenuis*, annual meadow-grass and r ed fescue *Festuca rubra* with daisy *Bellis perennis*, dandelion *Taraxacum officinale* agg., red clover and ger mander speedwell *Veronica chamaedrys*.

### *Woodland*

2.3.6. The areas of woodland are characterised by ash *Fraxinus excelsior*, oak *Quercus robur*, beech *Fagus sylvatica* and sycamore *Acer pseudoplatanus*, with small-leaved lime *Tilia cordata* and English elm *Ulmus procera*, the under-storey is dominated by hawthorn *Crataegus monogyna*. The under-storey of Greetwell Wood is dominated by elder *Sambucus nigra* and extensive stands of s nowberry *Symphoricarpos albus*. Elsewhere, a species-rich ground flora includes locally dominant common nettle, bramble Rubus fruticosa agg a nd hogweed with other species including cleavers *Galium aprine*, red campion *Silene dioica*, wood avens *Geum urbanum* and nettle-leaved bellflower *Campanula trachelium.*

2.3.7. The presence of pheasant pens, game feeders and mammal traps indicates that Greetwell Wood is used for extensive game rearing.

2.3.8. The areas of pl antation woodland are dominated by ash with frequent sycamore, field maple *Acer campestre* and hazel *Corylus avellana*.

### *Scrub*

2.3.9. Dense and s cattered scrub is dominated by bramble, hawthorn and blackthorn *Prunus spinosa*. Scrub is frequent in Greetwell Hollow Quarry SSSI and adjacent to the railway lines.

### *Hedgerows*

2.3.10. The hedgerows are dominated by hawthorn, with frequent elder, wych elm *Ulmus glabra,* blackthorn, field maple, ash, wild privet *Ligustrum vulgare* dog rose *Rosa canina*, blackberry, and ivy *Hedera helix*. None of the hedgerows surveyed would qualify as Important under the Hedgerow Regulations 1997. H owever, all hedgerows are a U KBAP priority habitat and can provide suitable habitat for nesting birds and small mammals. They are included as a priority habitat in the Lincolnshire LBAP. This habitat has been assessed as being of conservation value at the local level.

### *Standing Water*

2.3.11. There are several ponds within the area surveyed, the l argest at Greetwell Hollow Quarry SSSI and a c luster of ponds between the quar ry and the River Witham corridor.



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### *Running Water*

2.3.12. Three major watercourses flow through the study area east to west. These are the River Witham, North Delph and South Delph. The River Witham is approximately 30m wide with steep banks. The banks are dominated by Yorkshire fog and reed canary grass *Phalaris arundinacea*. Aquatic vegetation comprises of reed sweet grass *Glyceria maxima*, amphibious bistort *Polygonum amphibium*, yellow flag *Iris pseudacorus* and water figwort *Scrophularia auriculata*.

2.3.13. North Delph is canalised and approximately 2-3m wide with steep banks. Banks are dominated by an improved grassland sward. Rich aquatic plant assemblage including fennel pondweed *Potamogeton pectinatus*, curled pondweed *Potamogeton crispus*, water starwort *Callitriche stagnalis* agg.,and common duckweed *Lemna minor*.

2.3.14. South Delph is also canalised and approximately 10m wide. Aquatic vegetation comprises of common/fat duckweed *Lemna spp*., Nuttall's waterweed *Elodea nuttallii*, yellow water-lilly *Nymphae lutea*, unbranched/branched bur-reed,*Sparganium spp*. and perfoliate pondweed *Potamogeton perfoliatus*.

### *Arable land*

2.3.15. This is the most abundant habitat type in the study area. Arable fields are dominated by areas of agricultural crop and bounded by field margins which are generally of limited botanical interest, typically an improved grassland strip or rough grassland and species poor hedgerows.

### *Bare ground and hard standing*

2.3.16. The most notable area of bare ground is Greetwell Hollow Quarry, which has been designated as SSSI because of its geological interest. Extensive areas of exposed quarry face contain cracks and crevices that are suitable for use by bat as roosts and as nest sites for breeding birds. The quarry floor contains areas of rough grassland and a pond.

2.3.17. Other areas of bare ground and hard standing include the access roads and infrastructure associated with the railway lines such as underpasses and bridges.

2.3.18. The 2012 field survey confirmed that the dominant habitat types and sensitive ecological features identified during the 2008 Phase 1 Habitat survey remain broadly the same. Only the following two areas have altered during this time.

- An area of amenity grassland has been extended (Phase 1 Habitat Map: Appendix 1). This will not affect the Ecological Impact Assessment (EcIA) which was undertaken in 2008.



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- An area of buildings has been extended in to an area previously identified as arable habitat (Phase 1 Habitat Map: Appendix 1). This will not affect the EcIA which was undertaken in 2008.

### *Bats*

2.3.19. Previous bat surveys (Jacobs; 2008) identified 9 potential tree roost sites, all within or adjacent to Greetwell Wood SNCI. Dusk emergence and dawn return surveys were carried out for these potential tree roost sites and no bats were recorded either emerging at dusk or returning at dawn. Roosts identified at Manor Farm and Greetwell were also subject to dusk emergence/dawn swarming surveys on three occasions between July and August 2008. The presence of roosting brown long-eared bats at Greetwell Hall and common pipistrelles at Manor Farm was confirmed.

2.3.20. In addition, general bat activity of the entire study area was assessed via transect surveys in 2008 (Jacobs; 2008). These surveys found that five bat species use the area affected by the LEB for foraging and commuting. These species are:

- Common pipistrelle *Pipistrellus pipistrellus*;
- Soprano pipistrelle *Pipistrellus pygmaeus*;
- Brown long-eared *Plecotus auritus*;
- Noctule *Nyctalus noctula*; and
- Daubenton's *Myotis daubentonii*.

2.3.21. The 2012 field survey identified that the habitats remain broadly the same as in the 2008 survey and the survey results retain their relevancy.

### *Great crested newt*

2.3.22. Jacobs undertook presence/likely absence surveys for great crested newt *Triturus cristatus* within all areas of open water within the study area in 2008 and 2009. No great crested newts were found during these surveys.

2.3.23. During the 2012 Extended Phase 1 Habitat Survey a sighting of a single great crested newt was made within the pond in Greetwell Hollow Quarry SSSI (Appendix 1: Phase 1 Habitat Survey Map: TN 3). This pond contains established aquatic and marginal vegetation, and occurs in close proximity to the proposed scheme.

### *Breeding Birds*

2.3.24. The 2008 breeding bird surveys (Jacobs; 2008) recorded a total of 34 bird species within and immediately adjacent to the proposed LEB; of which 13 were key bird species (key bird species are those which are listed under:



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Wildlife and Countryside Act 1981 ( Schedule 1 P art 1) (WCA1i), Joint Nature Conservation Committee Red List Species (JNCC Red list), Joint Nature Conservation Committee Amber List Species (JNCC Amber list), United Kingdom Biodiversity Action Plan (UK BAP) and Lincolnshire LBAP.

2.3.25. The 2008 breeding bird survey identified potential impacts to nesting birds in areas of vegetation, as well as potential impacts to ground nesting birds such as skylark *Alauda arvensis* and lapwing *Vanellus vanellus*. The grassland habitat either side of the River Witham corridor was highlighted as a valuable foraging/nesting resource for key species of breeding birds such as reed bunting *Emberiza schoeniclus* and barn owl *Tyto alba*. Kingfisher *Alcedo atthis* was also observed hunting along the River Witham and associated watercourses. The report identified that the River Witham corridor is a key resource for this species.

2.3.26. The 2012 field survey confirmed that the habitats remain broadly the same as those recorded in the 2008 survey and the survey results retain their relevancy.

### *Wintering Birds*

2.3.27. The 2008 wintering bird surveys (Jacobs; 2008) recorded a total of 43 bird species within and immediately adjacent to the proposed LEB; In total, of which 22 were key bird species.

2.3.28. The 2008 wintering bird survey identified that arable is the dominant habitat type in the study area and is a valuable resource for key bird species such as lapwing that over-winter in this habitat. Hedgerows throughout the study area also provide a valuable winter foraging resource for overwintering bird species such as redwing *Turdus iliacus* and fieldfare *Turdus pilaris*.

2.3.29. The 2012 field survey confirmed that the habitats remain broadly the same as in the 2008 survey and the survey results retain their relevancy.

### *Otter*

2.3.30. Otter surveys were carried out by Jacobs in 2008 along five watercourses considered potentially suitable for this species.

- North Delph;
- River Witham;
- South Delph;
- Canwick Fen Drain; and
- Tributary of Branston Brook.

2.3.31. No evidence of otters was recorded at any of the sites surveyed.



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2.3.32. The 2012 field survey confirmed that the habitats remain broadly the same as in the 2008 survey and the survey results retain their relevancy.

### *Reptiles*

2.3.33. Reptile surveys were undertaken by Jacobs in 2008 within areas of habitat considered suitable for use by reptiles, . This was limited to grassland and riparian habitat associated with the River Witham corridor. The survey identified that grass snake *Natrix natrix* occurred commonly within the River Witham corridor.

2.3.34. The 2012 field survey confirmed that the habitats remain broadly the same as in the 2008 survey and the survey results retain their relevancy.

### *Water vole*

2.3.35. Water vole surveys were carried out within six locations in 2008 (Jacobs; 2008). Evidence of water vole was identified within four of the locations surveyed;

- North Delph;
- River Witham;
- South Delph; and
- Canwick Fen Drain.

2.3.36. The 2012 field survey confirmed that the habitats remain broadly the same as in the 2008 survey and the survey results retain their relevancy.

### *Invertebrates*

2.3.37. Jacobs recorded incidental sightings of invertebrates and documented these in the form of an invertebrate survey report in 2008. Thirteen invertebrate species were identified during the survey. The survey identified six different habitats which provide a valuable resource for invertebrate species;

- Dead wood habitats (Greetwell Wood);
- Veteran trees (Greetwell Wood);
- River Witham corridor;
- Semi-improved grasslands associated with the River Witham;
- Hedgerows; and
- Scrubby watersides.



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2.3.38. The 2012 field survey confirmed that the habitats remain broadly the same as in the 2008 survey and the survey results retain their relevancy.



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# 3. Recommendations

## 3.1. Field Survey

### *Extended Phase 1 Habitat Survey Review*

3.1.1. The minor changes of habitat type recorded during the 2012 survey are considered to have a negligible effect on the wider ecological impact assessment.

3.1.2. The remaining habitat types have been previously identified during the ecological assessment process and therefore the recommendations made previously, regarding potential adverse effects on these habitats remain unchanged.

### *Protected Species*

3.1.3. During the 2012 field survey a single great crested newt was identified within a pond in Greetwell Hollow Quarry SSSI (Appendix 1: Phase 1 Habitat Map: TN 3). This pond lies in close proximity to the propsoed line of the route and is likely to be affected by the proposals. Great crested newts and their habitats are protected by law through their inclusion within Schedule II of the Conservation of Habitats and Species Regulations 2010. It is recommended that further investigation of this species at this location is undertaken during the appropriate time of year, in accordance with the great crested newt mitigation guidelines[3]. This will enable determination of the population size class of any newts present and enable confirmation of whether the pond is used by great crested newts as a breeding site. This information will enable appropriate mitigation to be determined and whether the works are likely to require a Natural England Development Licence application.

3.1.4. The 2012 field survey identified that the habitats remain broadly the same as in the 2008 survey and it is therefore considered that other protected species survey results retain their relevancy. The mitigation described in the ES (Jacobs; 2009) remains appropriate.

[3] English Nature (2001). Great Crested Newt Mitigation Guidelines, English Nature, Peterborough.



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# Appendix 1: Phase 1 Habitat Map

## Target Notes

TN1 – Wet ditch heavily chocked with vegetation (watercress, reeds/rushes) with some mammal burrows present

TN2 – Well shaded pond with limited marginal vegetation alongside seasonally wet ditch

TN3 – Pond within quarry, great crested newt visually recorded and other amphibians present – good pond plus terrestrial habitats to support amphibians

TN4 – Mammal tracks, snuffle holes and badger hairs leading onto railway embankments (no access) – previously recorded badger sett on the embankments of the railway likely to still be in use

TN5 – Greatwell wood – multiple trees (20+) with high bat potential - woodpecker holes, splits and cracks, fungal decay and hazard beams on mature Sycamore, Ash and Oaks (PHOTOS ON COLLABORATOR)

TN6 – Greatwell wood - Two well used badger setts within greatwell wood (3 hole annex at TF 00773 71315 and 5 holes main sett at TF 00741 71304) – fresh footprints, hairs, latrines, fresh spoil and footprints present.

TN7 – Badger sett disused (3 holes at TF 00633 71257) within hedgerow

TN8 – Bat box present on mature ash by River Witham (Schwegler 2FF type) at TF 00451 70852

TN9 – 2 x railway bridges / underpass where road is likely to go under road – surrounded by embankments of immature ash stands on pumice style construction (old railway line) – brick and concrete construction to bridges – no bat potential - emerges onto scrub embankment.



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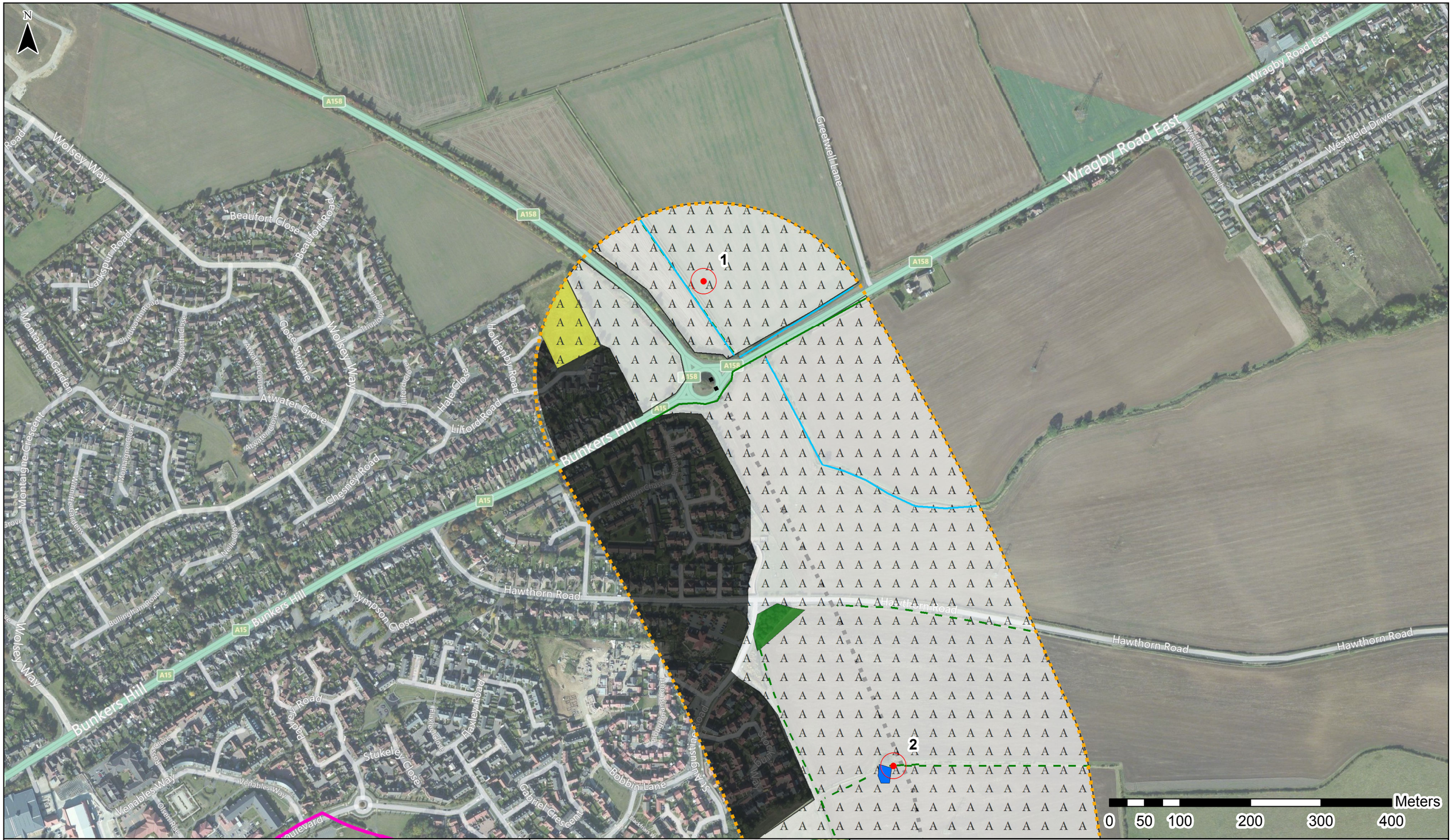
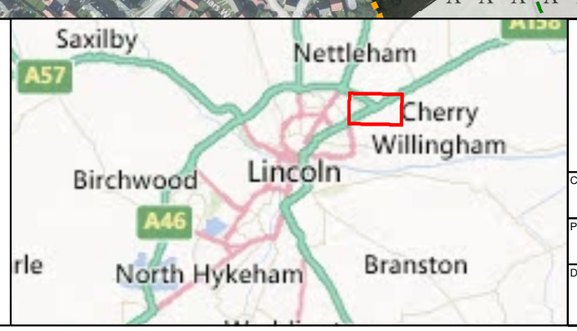



**Legend**

- 250m Buffer
- Target Note
- Boundary Removed
- Defunct Hedge - Species Poor
- Intact Hedge - Species Poor
- Intact Hedge - Species Rich
- Wet Ditch
- Quarry
- Water
- Tall Ruderal
- Scattered Broadleaved
- Neutral Grassland - Semi Improved
- Mixed Plantation
- Marshy Grassland
- Improved Grassland
- Dense Scrub
- Buildings
- Broadleaved Semi-Natural
- Broadleaved Plantation
- Bare Ground
- Arable
- Amenity Grassland

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**Legend**

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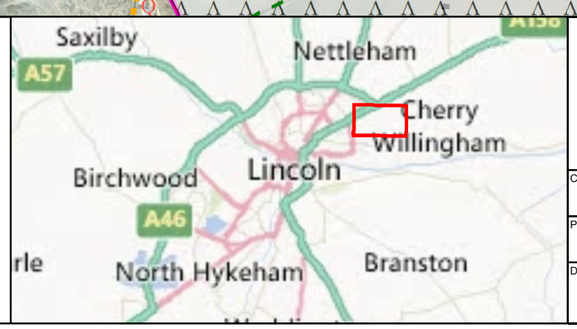


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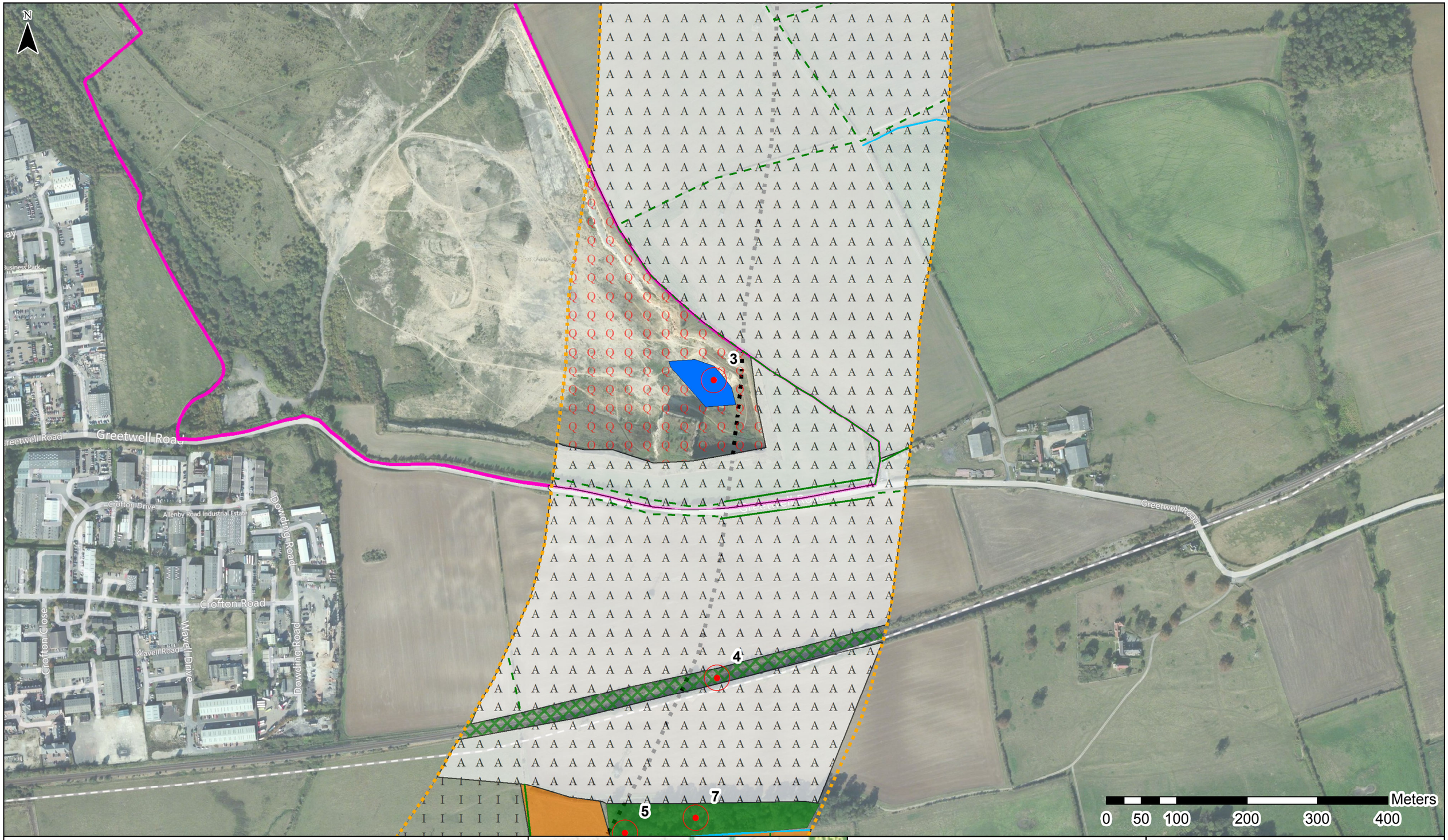


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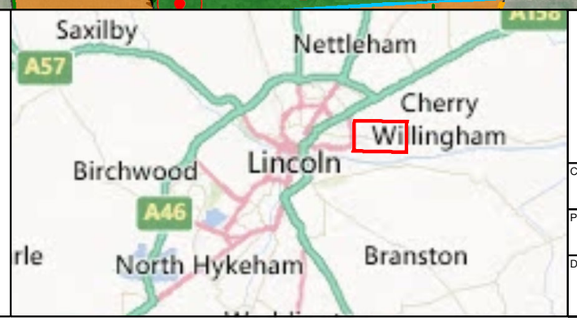


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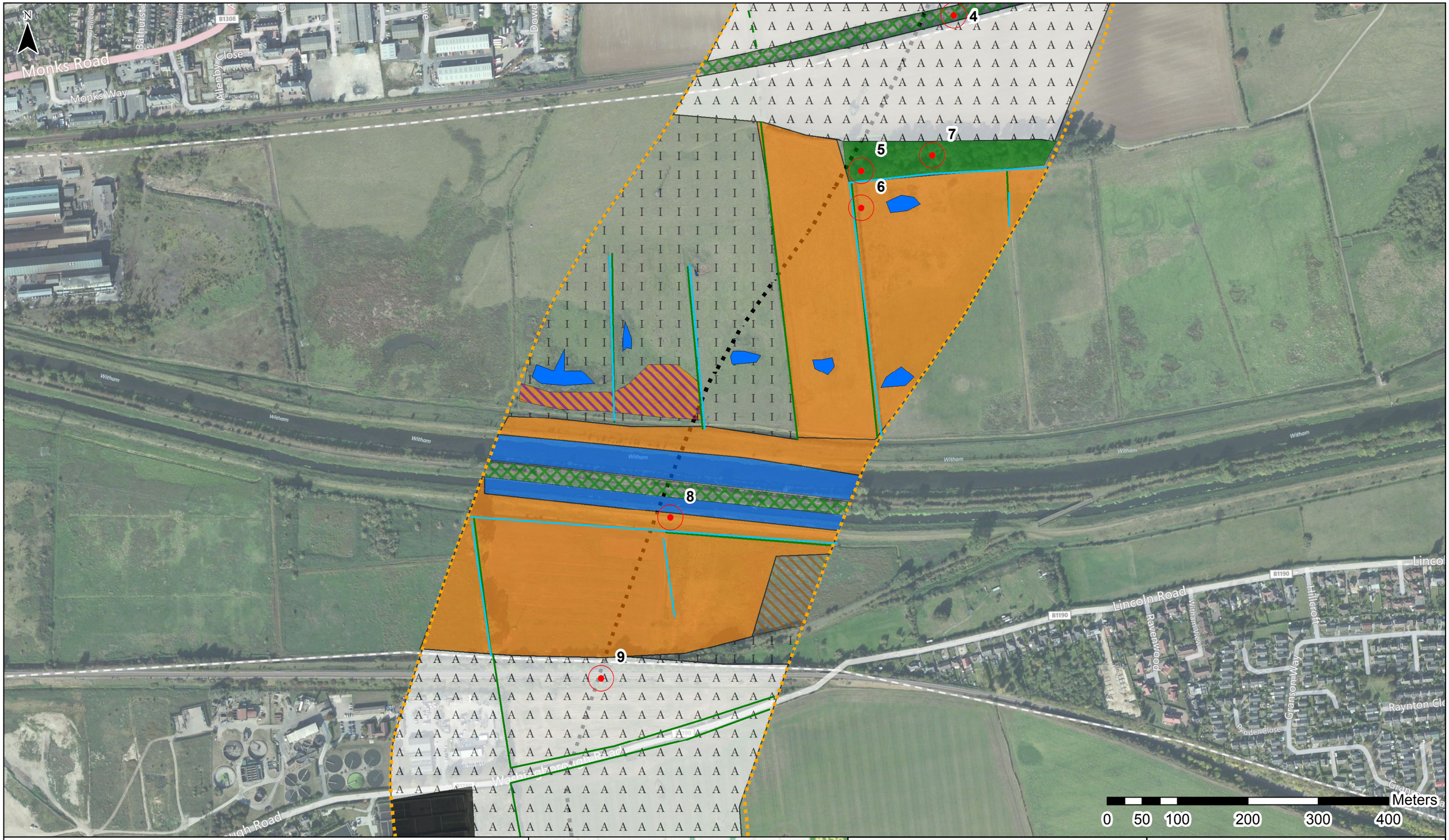
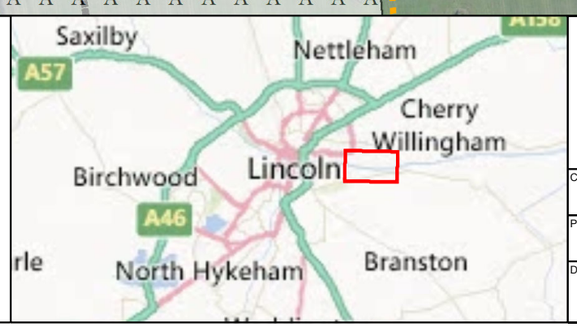



**Legend**

- 250m Buffer
- Target Note
- Boundary Removed
- Defunct Hedge - Species Poor
- Intact Hedge - Species Poor
- Intact Hedge - Species Rich
- Wet Ditch
- Quarry
- Water
- Tall Ruderal
- Scattered Broadleaved
- Neutral Grassland - Semi Improved
- Mixed Plantation
- Marshy Grassland
- Improved Grassland
- Dense Scrub
- Buildings
- Broadleaved Semi-Natural
- Broadleaved Plantation
- Bare Ground
- Arable
- Amenity Grassland

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Client: Lincolnshire County Council

Project: Lincoln Eastern Bypass

Drawing Title: Phase 1 Habitat Survey Map

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**Legend**

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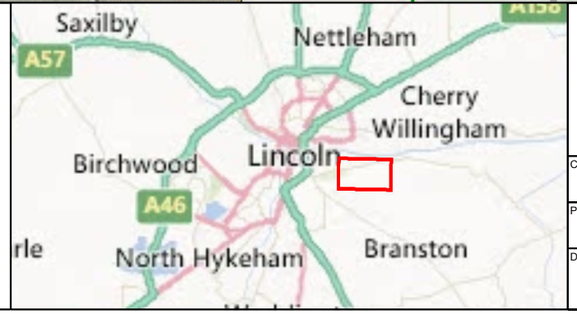


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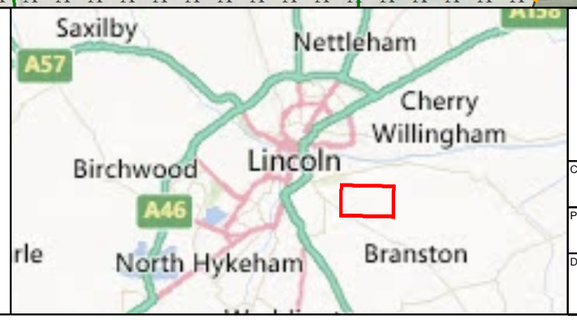


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N

Lincolm Road

B1188

Lincolm Road

B1188

Lincolm Road

Lincolm Road

B1188

B1188

Lincolm Road

0 50 100 200 300 400 Meters

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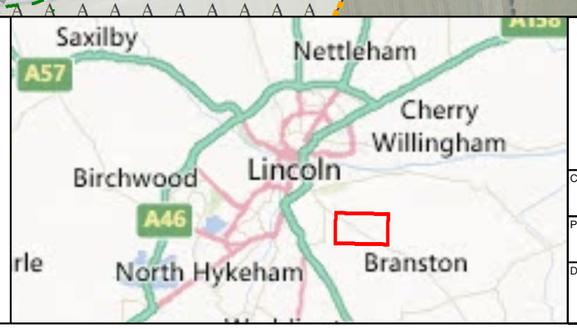


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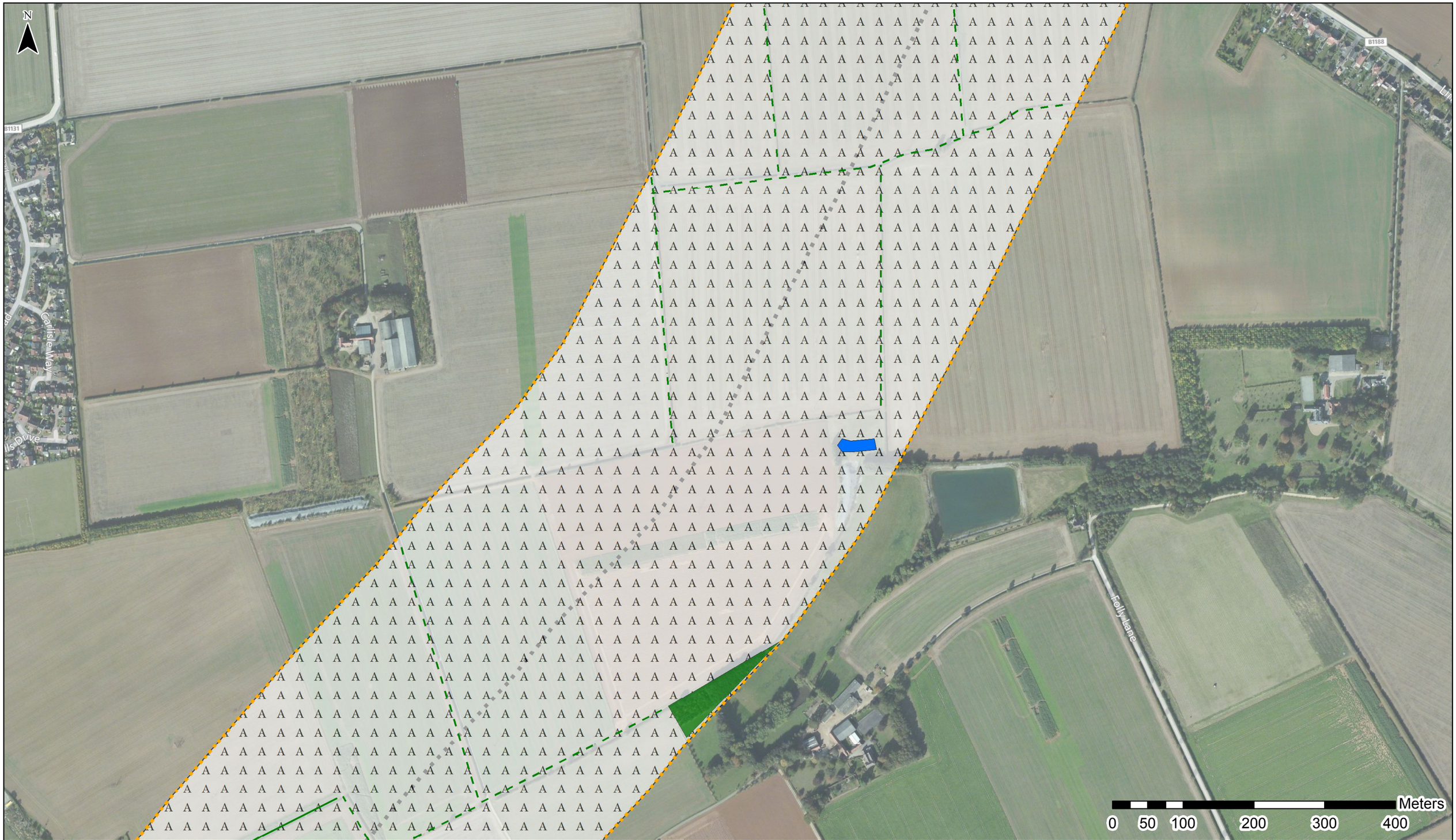


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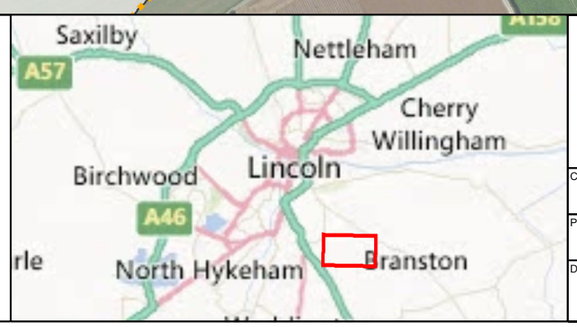


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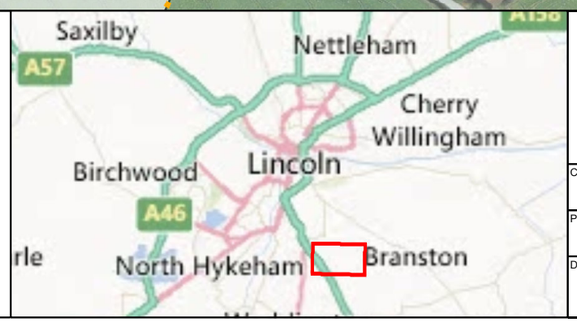


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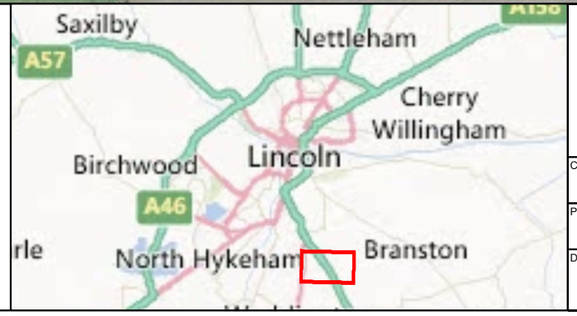


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