

Terrestrial Invertebrate Survey

Proposed Rabbit Ings Regeneration Scheme,
Near Royston, Barnsley

On behalf of the City of Wakefield Metropolitan
District Council and Yorkshire Forward

By WYG Environment

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RABBIT INGS REGENERATION SCHEME: TERRESTRIAL INVERTEBRATE SURVEY

1. INTRODUCTION

1.1 Background to Activity

WYG Environment (WYGE) was commissioned by Carillion on behalf of City of Wakefield Metropolitan Borough Council (WMDC) and Yorkshire Forward (YF) to undertake ecological work as part of a regeneration scheme for the Rabbit Ings site ('the Site') that covers 65.9 hectares of land near the village of Royston, Barnsley. The Site includes land formerly used as a colliery spoil heap, former drift mine and disused sports pitches/recreation ground. The Rabbit Ings Regeneration Scheme ('the Scheme') will include the importation of soil making materials, regrading of steep slopes for Health and Safety reasons, and reclamation works to provide formal and informal recreation uses including sports pitches with two team changing facilities with ancillary site access, car parks and informal open areas with landscape and ecological enhancements.

Following a Phase 1 survey undertaken by Scott Wilson at the Site in 2007, a number of specific habitat and protected/notable species surveys were recommended to accurately predict potential ecological impacts as a result of the proposals. This report provides details of ecological work undertaken at Rabbit Ings in relation to terrestrial invertebrates. The aims of this assessment were:

- To determine whether the Site was used by terrestrial invertebrates with consequent implications for the Scheme with respect to the *Wildlife and Countryside Act 1981* (as amended), the *Conservation (Natural Habitats &c.) Regulations 1994*, and relevant planning and policy guidelines;
- To provide proposals for mitigation measures to offset any environmental impacts caused by the proposed work and to maintain the local terrestrial invertebrate populations at a favourable conservation status; and
- To assist the client to operate within the law.

1.2 Site Location and General Description

The Site (centred around OS grid reference SE 381 118) is located to the north-east of the village of Royston, east of Lund Hill Lane (B6428), some 4.5km north-east of Barnsley, and covers approximately 65.9 hectares (ha). The site is within the administrative boundary of Barnsley Metropolitan Borough Council (BMBC). The majority of the site is owned by WMBC with the recreation ground owned by the Royston and Carlton Community Partnership (RCCP) and a relatively small parcel of land within the south part of the site under the ownership of BMBC.

The site effectively comprises three distinct areas, namely as follows:

- (i) the former Rabbit Ings spoil heap;
- (ii) the former Royston drift mine site located to the north-west of the spoil heap;
and
- (iii) the RCCP recreation ground located to the south-west of the spoil heap.

The Rabbit Ings spoil heap occupies the majority of the Site covering an area of approximately 50.9ha. Sandybridge Lane forms the eastern boundary of the spoil heap and Sandybridge Dyke is located to the south. A dismantled railway, part of Lund Hill Lane, along with the former Royston Drift Mine and some existing employment land is located to the west of the former spoil heap. Open agricultural fields and a former railway line forms the northern boundary of the spoil heap.

The spoil heap comprises a mound of colliery spoil rising approximately 35m to 40m above surrounding land. There are some areas of tree and shrub growth mainly on the southern slopes of the spoil heap, but other parts are sparsely vegetated. The spoil heap appears to be terraced on its northern flank, with steep embankments separating the terrace levels. Parts of the southern flank of the spoil heap are steep sided, leading to a much flatter area of land adjacent to Sandybridge Dyke that has more established areas of tree and shrub vegetation. The top of the spoil heap is generally flat with limited vegetation cover. There is evidence of surface erosion from uncontrolled surface water run-off on parts of the spoil heap. In addition, there is evidence of unauthorised use by motor bikes and 4x4 vehicles on the spoil heap and adjacent land within the Site.

A man-made pond is located in the north-east corner of the Site and a former lagoon is located in the south-west corner.

The former Royston Drift Mine site occupies an area of land approximately 6.5ha, located to the north-west of the spoil heap, east of Lund Hill Lane, and to the north of existing industrial land. It comprises a relatively flat area of land with an area of hardstanding along with the remains of former roadways and footings for former colliery buildings.

The RCCP derelict sports pitches/recreation ground is located adjacent to the south-west part of the spoil heap and covers an area of approximately 8.5ha. The sports pitches are in poor condition and are infrequently used; they have been 'ploughed' to prevent motorcycle and 4x4 access. The eastern boundary of this part of the Site is formed by a disused railway line adjacent to the spoil heap. The western boundary is formed by a public footpath, with Lund Hill Lane to the west, and the southern boundary by a hedgerow.

A public footpath runs generally along the northern site boundary, in part within the Site, providing a link between Lund Hill Lane in the west and Sandybridge Lane to the east. In addition, a public footpath runs from Lund Hill Lane in a south-east direction, to the north of the sports pitches/recreation ground, and leaves the southern boundary of the Site to connect with the wider rights of way network including the Trans Pennine Trail.

1.3 Surrounding Area

Land to the north and east of the Site includes open fields used for agriculture. The village of Shafton is located approximately 0.5km to the south-east of the spoil heap with intervening agricultural land. The Sandybridge Dyke is located along the southern boundary of the Site and the Trans Pennine Trail, with woodland areas and agricultural land to the south.

South-west of the spoil heap and outside the Site is a restored waste disposal tip (Cudworth Landfill Site) forming a prominent mound rising 10m above the surrounding land. West of the RCCP recreation ground is a railway line that runs north-south, passing over Lund Hill Lane, approximately 100m west of the site boundary. In addition, a former landfill site is located outside and to the north of the former drift mine part of the Site.

Between Lund Hill Lane and the former spoil heap is an area of land that is currently used for employment purposes, including a pallet yard and a number of other business activities.

The Monkton Coke and Chemical Works is located to the west of the Site and Lund Hill Lane. North of this coke works and to the west of Lund Hill Lane is a coal storage yard.

Royston Village is located to the south-west of the Site. Some residential properties and a nursery school on the east side of this village are located to the west of Lund Hill Lane approximately 100m distant from the south-west of the Site boundary. There are some residential properties along Lund Hill Lane approximately 250m north of the Site.

The Site is surrounded by arable land to the north, amenity fields and agricultural fields beyond to the south and is bordered by Lund Hill Lane and Sandybridge Lane to the west and east respectively.

1.4 Proposed Work

The Scheme provides for the regeneration of the Site and will primarily involve some importation of soil making materials, regrading and reclamation works to provide formal and informal recreation uses including sports pitches with two team changing facilities, ancillary site access, car parks, and informal open space areas with landscape and ecological enhancements. The Scheme will take 12-18 months to complete, subject to works being progressed within the appropriate soil handling season.

2. DESK STUDY

2.1 Legislation and Guidance

There are a number of invertebrate species that are protected by European and UK legislation including those listed on Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and the *Conservation (Natural Habitats, &c.) Regulations 1994* (as amended). As a result, some species are protected from some or all of the following (amongst others): (i) killing, injuring or taking; (ii) possession or control; (iii)

damage to, destruction of or obstruction of access to any places used for shelter or protection; and (iv) disturbance while using such a structure. Following a review in 2007 of species listed on the UK Biodiversity Action Plan (BAP), there has been a significant increase in the number of invertebrates included. The current UK BAP now lists 411 invertebrate species.

Paragraph 14 of Planning Policy Statement 9: Biodiversity and Geological Conservation (2005) states that 'Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. When considering proposals, local planning authorities should maximise such opportunities in and around developments, using planning obligations where appropriate.' Therefore, where developments requiring planning permission may affect protected or notable species, such as those invertebrate species listed on the UK BAP, it is preferable that an appropriate mitigation strategy is produced to ensure they are protected from the adverse effects of development and options to negate the impact should be considered

2.2 Baseline Data

The British Dragonfly Society (BDS) has a section of their web site designated to the 'key sites' of the British Isles (<http://www.dragonflysoc.org.uk/keysites.html>). From this site the vice-counties that make up Yorkshire currently have one nationally or locally important damselfly and four dragonflies. These are red-eyed damselfly (*Erytroma najas*), migrant hawkers (*Aeshna mixta*), emperor dragonfly (*Anax imperator*), broad-bodied chaser (*Libellula depressa*) and the black-tailed skimmer (*Orthetrum cancellatum*).

The Rob Frith and Associates Ltd. Report (2003) states that:

- No protected or BAP species were recorded from the Site during the survey;
- Three Red Data Book (RDB), ten Nationally Scarce and one Regionally Scarce species were recorded.
- A number of species were recorded (116) that have a restricted (Local) national distribution.
- 509 target group taxa were recorded from the site and comprised 40 species (7.9%rel) of *Hemiptera* (bugs), 257 species (52.5%rel) of *Coleoptera*

(beetles), 109 species (21.4%rel) of *Diptera* (flies) , 32 species (6.3%rel) of aculeate *Hymenoptera* (ants, bees, wasps) and 61 species (12.0%rel) of *Opiliones* and *Araneae* (harvestman and spiders).

- 67 non-target group taxa were recorded (incidentally) from other invertebrate groups giving a final site total of 576 invertebrate taxa recorded.

Data from the National Biodiversity Network (NBN) gateway revealed the following species records: (UK BAP - UK Biodiversity Action Plan; SOCC - Species of Conservation Concern)

Table 1: NBN records with 2km of the site

Common Name	Scientific Name	Status
Argent & Sable (moth)	<i>Rheumaptera hastata</i>	UK BAP
hymenoptera	<i>Nomada lathburiana</i>	SOCC
beetle	<i>Atomaria lohsei</i>	SOCC

3. METHODOLOGY

The Site was visited on four occasions between May and August 2008 to record the terrestrial invertebrates within the site. The survey dates were 20th May, 9th June, 9th July and 13th August. On each survey the invertebrates were sampled from the different habitat types within the Site using a variety of hand-collecting methods, these being the beating tray, sweep netting, grubbing around under logs etc. and aerial netting (Eyre, 1996; Hill *et al.*, 2005; New, 1998). Alongside these methods, the butterflies and dragonflies encountered during the surveys were specifically recorded along with any other invertebrate that was readily identifiable (Eyre, 1996; Hill *et al.*, 2005). Other methods of invertebrate sampling such as pit fall traps and malaise trapping were considered but discounted due to the potential problems of vandalism on such an open site and having to leave the equipment on site between visits.

4. SURVEY RESULTS

The following invertebrate species were identified at the Site during the 2008 surveys:

Table 2: Butterflies

Common Name	Scientific Name
Small skipper	<i>Thymelicus sylvestris</i>
Large skipper	<i>Ochlodes venata</i>
Dingy skipper	<i>Erynnis tages</i>
Brimstone	<i>Gonepteryx rhamni</i>
Large white	<i>Pieris brassicae</i>
Small white	<i>Pieris rapae</i>
Green-veined white	<i>Pieris napi</i>
Orange tip	<i>Anthocaris cardamines</i>
Small copper	<i>Lycaena phlaeas</i>
Common blue	<i>Polyommatus icarus</i>
Small tortoiseshell	<i>Aglais urticae</i>
Peacock	<i>Inachis io</i>
Speckled wood	<i>Parage aegeria</i>
Wall	<i>Lasiommata megera</i>
Gatekeeper	<i>Pyronia tithonus</i>
Meadow brown	<i>Maniola jurtina</i>
Small heath	<i>Coenonympha pamphilus</i>
Ringlet	<i>Aphantopus hyperantus</i>

Three species of butterfly are listed on the UK Biodiversity Action Plan (UK BAP) as a result of the 2007 changes (JNCC, 2008). These are the dingy skipper (*Erynnis tages*), wall (*Lasiommata megera*) and small heath (*Coenonympha pamphilus*).

Table 3: Dragonflies

Common Name	Scientific Name
Emerald damselfly	<i>Lestes sponsa</i>
Large red damselfly	<i>Pyrrhosoma nymphula</i>
Azure damselfly	<i>Coenagrion puella</i>
Common blue damselfly	<i>Enallagma cyathigerum</i>
Blue-tailed damselfly	<i>Ischnura elegans</i>
Southern hawker	<i>Aeshna cyanea</i>
Brown hawker	<i>Aeshna grandis</i>
Migrant hawker	<i>Aeshna mixta</i>
Emperor dragonfly	<i>Anax imperator</i>
Four-spotted chaser	<i>Libellula quadrimaculata</i>
Broad-bodied chaser	<i>Libellula depressa</i>
Black-tailed skimmer	<i>Orthetrum cancellatum</i>
Common darter	<i>Sympetrum striolatum</i>
Ruddy darter	<i>Sympetrum sanguineum</i>

All of the dragonfly species previously recorded within Yorkshire and detailed on the British Dragonfly Society website (see Section 2.2), with the exception of the red-eyed damselfly, have been recorded at the Site. The habitats within the Site are

not considered suitable for the red-eyed damselfly and it is considered unlikely they are present. The British Dragonfly Society states that a site within Yorkshire must have had eight dragonfly species recorded within the last ten years for it to qualify as a 'key site'. Thus, Rabbit Ings qualifies as a key site for Odonata.

Table 4: Moths

Common Name	Scientific Name
Clouded border	<i>Lomaspilis marginata</i>
Willow ermine	<i>Yponomeuta rorella</i>
Latticed heath	<i>Semiothisa clathrata</i>
Shaded broad-bar	<i>Scotopteryx chenopodiata</i>
Narrow-bordered five-spot burnet	<i>Zygaena lonicerae</i>
Six-spot burnet	<i>Zygaena filipendulae</i>
The cinnabar - caterpillar	<i>Tyria jacobaeae</i>

Two species of moth which were recorded at the Site are listed on the UK BAP; these are the latticed heath (*Semiothisa clathrata*) and the shaded broad-bar (*Scotopteryx chenopodiata*).

Table 5: Ladybirds

Common Name	Scientific Name
7-spot Ladybird	<i>Coccinella 7-punctata</i>
22-spot ladybird	<i>Psyllobora 22-punctata</i>
Water ladybird	<i>Anisosticta 19-punctata</i>

Table 6: Bees

Common Name	Scientific Name
White-tailed bumblebee	<i>Bombus lucorum</i>
Tawny mining bee	<i>Andrena Fulva</i>
Common carder bumblebee	<i>Bombus pascuorum</i>
Red-tailed bumblebee	<i>Bombus lapidarius</i>

Table 7: Shieldbugs

Common Name	Latin Name
Gorse shieldbug	<i>Piezodorus lituratus</i>

Table 8: Longhorn Beetles

Common Name	Scientific Name
	<i>Agapanthea villosa viridescens</i>

Table 9: Click Beetles

Common Name	Scientific Name
	<i>Athous haemorrhoidalis</i>

Table 10: Tiger Beetles

Common Name	Scientific Name
Green tiger beetle	<i>Cicindela campestris</i>

Table 11: Ants

Common Name	Scientific Name
Red ant	<i>Myrmica rubra</i>
	<i>Formica fusca</i>

Table 12: Earwigs

Common Name	Scientific Name
Common earwig	<i>Forficula auricularia</i> (female)

Table 13: Hoverflies

Common Name	Scientific Name
	<i>Syrphus vitripennis</i>
	<i>Metasyrphus luniger</i>
	<i>Platycheirus clypeatus</i>

Table 14: Snails

Common Name	Scientific Name
Roman snail	<i>Helix pomatia</i>
Garden snail	<i>Helix aspersa</i>
White-lipped banded snail	<i>Cepaea hortensis</i>
Brown-lipped banded snail	<i>Cepaea nemoralis</i>

Table 15: Others

Common Name	Scientific Name
Black and red froghopper	<i>Cercopis vulnerata</i>
Scorpion fly	<i>Panorpa communis</i>

With the exception of the dragonflies, no known species of invertebrate were recorded at the Site that receive legal protection or are listed on the UK BAP. However, it should be noted that further identification work is required to confirm the species of a number of individuals recorded and, in addition, the survey

methodologies employed during these surveys will not have sampled all invertebrate groups.

In addition to field surveys undertaken by WYGE in 2008, observations were made by Mick Birkenshaw and Sian Taylor of Groundwork Dearne Valley during 2007 and 2008. The records were passed to WYGE and are detailed below:

Table 16: Butterflies

Common Name	Scientific Name
Red admiral	<i>Vanessa atalanta</i>
Comma	<i>Polygonia c-album</i>

Table 17: Moths

Common Name	Scientific Name
Yellow shell	<i>camptogramma bilieata</i>

Table 18: Ladybirds

Common Name	Scientific Name
14-spot Ladybird	<i>Propylea 14-punctata</i>

Table 19: Beetles

Common Name	Scientific Name
Devils coach horse	<i>Staphylinus olens</i>

5. IMPACTS AND RECOMMENDATIONS.

Key areas were identified within the Site that appeared to be more important than others for terrestrial invertebrates and were determined as a result of habitat assessment, species diversity and population size approximations. These were:

- The grassland area in the north-west corner of the Site immediately to the south of Ponds 2a, 2b and 3;
- The grassed valley area immediately to the south Ponds 2a, 2b and 3 along the northern boundary. This area is especially important for the dingy skipper butterfly as a result of the significant amount of the larval food plant common bird's-foot-trefoil (*Lotus corniculatus*);

- The heath land areas adjacent to the eastern boundary of the Site;
- The gorse (*Ulex europaeus*) and bramble (*Rubus fruticosus* agg.) areas along the south facing slopes adjacent to the southern boundary of the Site; and
- The aquatic habitats and their immediate surrounds as many species of invertebrate other than *Odonata* have an aquatic larval stage or require the damper conditions that these habitats provide.

Five species of butterfly and moth which were recorded at the Site are listed on the UK BAP and efforts will be made to conserve these species and enhance the habitats for them. This will include the retention of an area to the south of Ponds 2a, 2b and 3 where bird's-foot trefoil (the larval food plant for the dingy skipper butterfly) is present.

The ponds within and adjacent to the Site are considered to form an important part of the ecological network for terrestrial invertebrates as they support individuals in varying stages of their lifecycle. The characteristics of the ponds vary and are at differing stages of succession which allows the Site to support a greater diversity of invertebrates. One of the 11 ponds surveyed will be lost as a result of the proposed Scheme although this will be replicated 230m south-east of the existing pond, along with a number of additional ponds and wetland areas, towards the completion of the project. The new pond will mimic many of the beneficial characteristics identified in Pond 1. Therefore, any adverse impact on the local invertebrate population as a result of the Scheme is considered to be temporary. A long-term management plan for the Site will be implemented to maintain its value to wildlife, including invertebrates, for at least five years following completion of the Scheme.

The retention of terrestrial habitats throughout the Scheme, including to the south of Ponds 2a, 2b and 3 and the wildlife area in the south-east corner, is considered likely to minimise the impact of the proposals on invertebrates by providing a refuge for displaced individuals and allowing recolonisation of disturbed areas to occur once work is complete.

As well as limiting the impact on biodiversity as a result of the Scheme, the plans have incorporated enhancement measures to increase the value of the site to wildlife in the future. This includes the creation of additional wetland areas, the

planting of native species of local provenance and the management of a diverse mosaic of habitat types to provide a variety of niche environments in which invertebrates can thrive (Kirby, 2001; Gilbert and Anderson, 1998).

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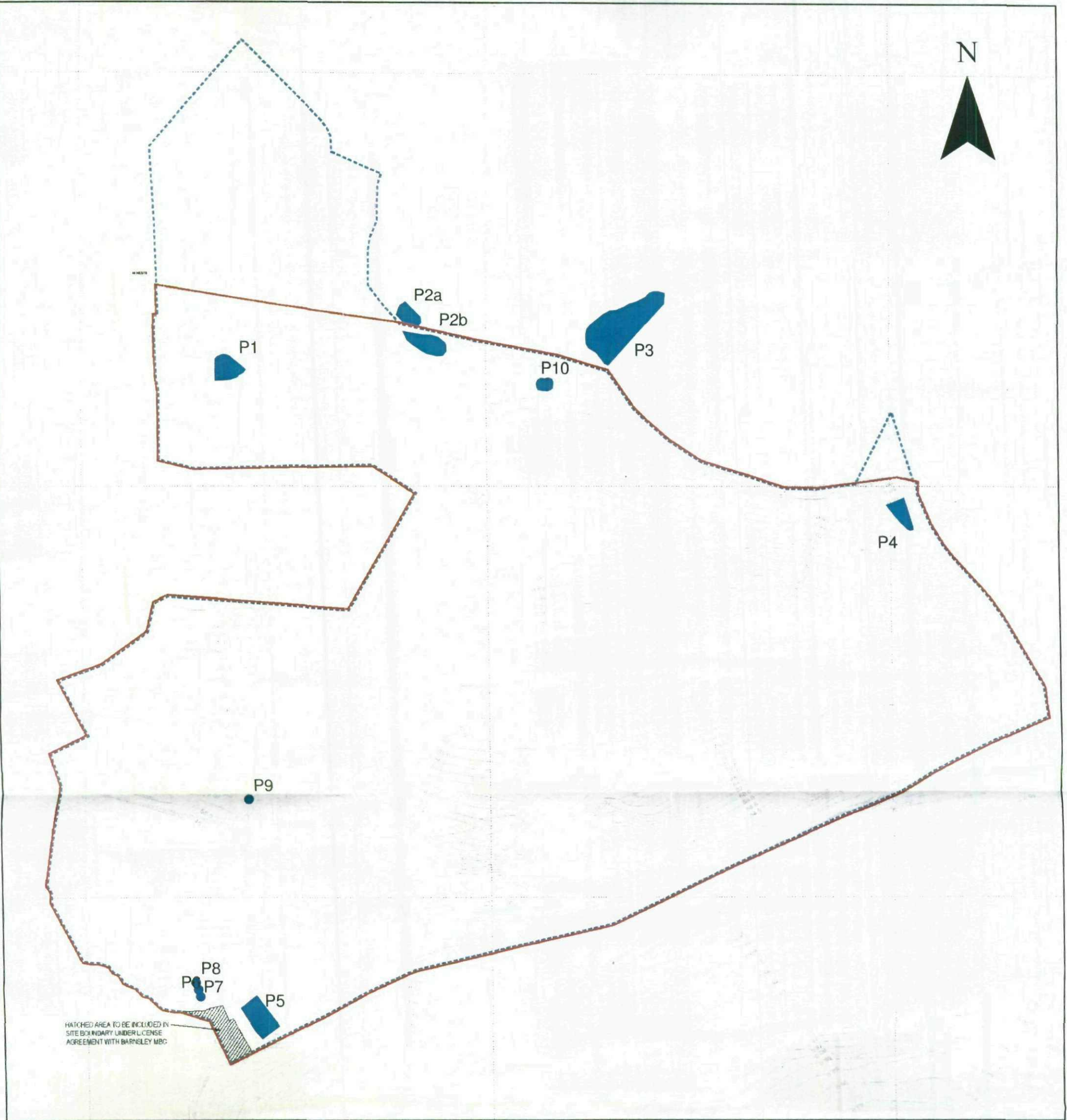
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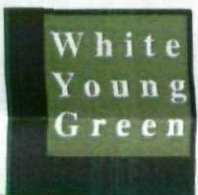
Rabbit Ings: Extended Phase 1 Habitat Survey.



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Environmental

Project

Rabbit Ings Colliery

Drawing Title:

Aquatic macro-invertebrate survey
Pond locations

Scale at A3:	Drawn by: TK	Date: 23/07/08	Checked By: DG	Date: 23/07/08	Approved By: RP	Date: 23/07/08
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