

Former Bradley Nurseries, Kirklees
Invertebrate Habitat Assessment Technical Note
Waterman Associates
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**Transpennine Route Upgrade
Bradley Junction Compound
Ecological Impact Assessment
Appendix D - IHP**

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Network Rail

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Executive summary

Envance was commissioned by Waterman Associates (the 'Client') on behalf of Atkinrealis on behalf of Network Rail to complete a terrestrial invertebrate habitat survey for a proposed development at the Former Bradley Nurseries, Station Road, Kirklees.

The requirement for a terrestrial invertebrate assessment followed the identification of the Site as showing characteristics typical of Open Mosaic Habitat on Previously Developed Land (OMH) (it should be noted that a separate review is being undertaken as part of the Ecological Impact Assessment (EclA) as to whether or not the site meets the criteria of OMH. This habitat type is highlighted as it has the potential to support important assemblages of invertebrates within. These habitats were identified within the Field Survey undertaken to inform the EclA.

This report comprises an Invertebrate Habitat Potential (IHP) assessment across the Site Boundary.

The Survey Area (shown in Figure 2 of the EclA Report) was assessed for its potential to support important terrestrial invertebrate assemblages by a suitably experienced ecologist, on 29th July 2024. The survey effort was focused on habitats and habitats features that were most likely to be directly impacted by the Proposed Scheme (e.g., through direct habitat loss).

An IHP assessment was undertaken across the Site Boundary. The IHP assessment concluded that the Habitat Elements (as detailed in Table 1 of this technical note) best represented across the Site are as follows:

Survey areas 1 and 2

- HE11 – Bare Ground. Category 'B' *Major*
- HE3 - Nectar Resources, HE7 – Still air (S), HE8 – Still air (H). Category C *Moderate*

The Site was assessed to be valuable to terrestrial invertebrates at the Local level as whilst the Site contained bare sand substrates, a locally scarce habitat type, the lack of similar habitats in the local area and lack of connectivity makes colonisation by rare and/or notable invertebrates highly unlikely.



1. Introduction

1.1 Background

- 1.1.1 Envance has been commissioned to undertake an invertebrate habitat potential survey of the land at Bradley Nursery, Bradley Junction Industrial Estate, Leeds Rd, Huddersfield HD2 1UR (centred on National Grid reference: SE 17162 20093 and extending to ~2ha), hereafter referred to as the 'Site'.
- 1.1.2 The requirement for a terrestrial invertebrate assessment followed the identification of OMH habitat with the potential to support important assemblages of invertebrates within the Proposed Development. These habitats were identified within the PEA Report (e3p 2023). This report comprises an Invertebrate Habitat Potential (IHP) assessment across the Site Boundary as shown in Figure 2 of the Ecological Impact Assessment (EclA) Report (herein referred to as the Survey Area).

1.2 Brief And Objectives

- 1.2.1 Envance was commissioned by Waterman Associates to undertake a terrestrial invertebrate assessment, with the following objectives:
- to undertake a desk study to determine the number and type of invertebrate species records within the Study Area (2km radius of the Site Boundary);
 - identify the key habitats/features within the Survey Area that are likely to be of the greatest value to terrestrial invertebrates; and
 - record incidental terrestrial invertebrate species (if present) within the Survey Area in July 2024.

1.3 Study and Survey Areas

Study area

- 1.3.1 An ecological desk study was completed in March 2023. As part of this study, records of any notable or legally protected species from within the Study Area were requested from West Yorkshire Ecology Service (WYES). The Study Area for this was defined as a 2km radius of the Site Boundary.

Survey Area

- 1.3.2 The IHP Assessment covered the entire Site (hereafter referred to as the 'Survey Area') within the Site Boundary of the Scheme. The habitats and habitat features within the Survey Area were assessed for their potential to support an important terrestrial invertebrate assemblage.



2. Methods

2.1 Desk Study

2.1.1 A desk-based review of existing biological information was undertaken across the Study Area which utilised the following information sources:

- Multi Agency Geographic Information for the Countryside (MAGIC);
- Ordnance Survey mapping and publicly available aerial photography; and
- A data search report from WYES in March 2023 that included recent and historic invertebrate records within 2km.

2.2 Field Survey

2.2.1 The Survey Area was assessed for its potential to support important terrestrial invertebrate assemblages by a suitably experienced ecologist, on 29th July 2024. Survey effort was focussed on habitats and habitats features across the entire Site, as there is likely direct impact by the Proposed Scheme (e.g. through direct habitat loss).

2.2.2 To enable a baseline characterisation of these habitats for invertebrates, an IHP assessment was undertaken with reference to standard survey and assessment methodologies outlined in Dobson and Green (2023), a protocol based on previous work by Brooks, 1993; Drake *et al.*, (2007) and English Nature (2005).

2.2.3 A record was made regarding the habitats present and features considered likely to be of significant value or potentially valuable for notable invertebrate assemblages. Such features can include areas with dense patches of flowering plants (including on roadside verges); south facing banks; patchy mosaic habitat including aggregations of bare ground; margins of scrub/woodland and substrate containing high organic content; mature or veteran trees offering standing and fallen dead wood and temporary areas of standing water (e.g., ephemeral pools and seepages) and associated terrestrial habitat (e.g. marshy grassland).

2.2.4 Tables 1 and 2 show details of the IHP assessment protocol

Table 1: Summary of Eleven Habitat Elements Assessed by IHP Survey

Habitat Element	No.	Comments
Decaying wood	HE1	In all its forms; from decaying wood on/in large trees to woodland floor debris
Rotational Management	HE2	Planned or serendipitous; and whether for nature conservation or other purposes
Nectar Sources	HE3	As a proxy for nectar- and pollen resources, as assessment of pollen resources is impracticable on a walk-through survey
Wet Substrates	HE4	Including marginal, marshy, muddy and seasonally inundated habitats, as well as flushes
Open Water Habitats	HE5	The open water element of rivers, lakes, ponds, streams, ditches, etc.
Structural Patchwork	HE6	Habitat mosaics, including, but by no means restricted to open mosaic habitats on previously developed land
Still Air (S)	HE7	Suntraps and still-air microclimates in open situations; the term 'still air' is used in preference to 'wind breaks' as many



		rigid wind breaks are likely to produce turbulent air in their lee
Still Air (H)	HE8	Humid still-air microclimates in sheltered and shaded situations
Connectivity	HE9	Landscape-scale connectivity between the Site and external habitats
Ecoclines	HE10	A graded transition between two or more broad habitats
Bare Earth	HE11	Unshaded bare or sparsely vegetated well-drained substrate, regardless of soil type

Table 2: Grading System Applied to Habitat Elements

Habitat Element	Comments
Exceptional (A)	Very high quality examples of the habitat element, including but not restricted to those of potential regional significance. This may be for reasons of intrinsic quality, rarity, vulnerability, or the perceived importance of its position in the wider landscape
Major (B)	Good quality examples of each habitat element which do not meet the criteria for Exceptional. Likely to be a predominant factor in supporting characteristic and specialised invertebrate assemblages. Considerations might include the extent, maturity and historic and current connectivity of the element.
Moderate (C)	A clear example of the habitat element is present, but which does not qualify as Major. Likely to be of sufficient quality to support a characteristic invertebrate fauna.
Minor (D)	Habitat element is present but is insufficient quality to qualify as Moderate or above. For example, it may be of extremely limited extent, or very sparsely dispersed. Likely to support common and widespread, generalist species.
Negligible/Absent (E)	Habitat element is absent or of insignificant (barely perceptible) quantity.

2.2.5 To enable a baseline characterisation of the Survey Area for invertebrates, the habitat assessment included observations of features that might limit invertebrate interest, as well as those which might be of value for invertebrates.

2.3 Incidental Recording of Terrestrial Invertebrates

2.3.1 During the assessment on 29th July 2024, incidental recordings of invertebrate species were noted e.g. butterflies and dayflying moths, etc.

2.3.2 In addition to this, the IHP assessment was supplemented with sweep-netting and a small number of yellow pan traps were set out across the Site. However, a full targeted survey utilizing a range of sampling techniques was not undertaken during the Site visit.

2.4 Limitations

2.4.1 This assessment is based on a single survey visit in July 2024. The Site visit took place at an optimal time for habitat assessment for terrestrial invertebrates as flora is easily identifiable. However, the species list is limited as only incidental species observed on the day were recorded. No surveys in other months took place in 2024.



3. Results

3.1 Desk Study

- 3.1.1 WYES returned 16 records terrestrial invertebrates within 2km of the Site, including records for Coleoptera (beetles) and Lepidoptera (butterflies and moths), no other orders were represented in the records. Only three species carried any assigned conservation status, i.e. Red List species, species listed in Annex 2 of the Habitats Directive or Section 41 Priority Species. A complete list of invertebrate desk study records provided by WYES is included in Appendix A.

3.2 Field Survey

Invertebrate Habitat Potential (IHP) Assessment

Site Habitat Descriptions

- 3.2.1 The Site comprised derelict land, formerly used as a plant nursery with polytunnels and an industrial greenhouse. The buildings and other structures were demolished down to slab level during early 2022, leaving bare ground, ephemeral/short perennial, scrub, and grassland habitats to establish. The Site is bisected by a hardstanding, tarmacked road running through the Site from the south to the northeast.
- 3.2.2 The Site is relatively isolated, surrounded by residential housing to the north and industrial units to the east and west. An active treelined railway is located approximately 20m south of the Site, connecting the Site to valuable habitats in the wider landscape. The Huddersfield Broad Canal and River Colne lie approximately 140m and 170m south of the Site respectively. The features also provide connectivity to numerous woodland areas in the local area, providing important habitat links across the wider landscape.

Survey Area 1

- 3.2.3 Survey area 1 covers the southern section of the Site, to the north of the railway corridor. The habitat here largely comprised areas of sparsely vegetated ground within stepped terraces maintained by retaining walls over a dry sandy substrate. The area supported a limited variety of flowering plants that provide nectar and pollen resources for a range of insect pollinators. The sandy substrate was present over ground membranes, and in places where the membranes were broken or not present, the habitat was represented by species poor other neutral grassland or dense scrub. The adjacent screening band of cypress trees to the south provided a windbreak, allowing still air habitats to be present, particularly in the southwest corner. However, due to the height of the screening vegetation, shading limits the duration of direct sunlight that it can receive. Standing water was notably absent from this area during the assessment. No evidence of management was recorded.
- 3.2.4 The scrub was composed of bramble *Rubus fruticosus agg.*, and buddleia *Buddleia davidii* with hedge bindweed *Calystegia sepium* which would provide pollen and nectar in June and July, but also included species such as spear thistle *Cirsium vulgare*, rosebay willowherb *Chamaenerion angustifolium*, and ragwort *Jacobaea vulgare*. The grassland was composed of a mix of flowering plants, particularly those of the *Apiaceae* and *Asteraceae* families, such as various hawkbits and hawkweeds, hogweed *Heracleum sphondylium*, as well as white melilot *Melilotus albus*, tall melilotus *M. altissimus*, and hare's foot clover *Trifolium arvense*. This habitat is summarised in terms of IHP categories below in Table 3 below and is accompanied by photographs and habitat features of note (Appendix B).

Table 3: Survey Area 1 IHP assessment results



Habitat Element	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11
IHP Grading	E	E	C	E	E	C	D	C	D	D	B

3.2.5 During the survey, a range of solitary and social bees, flies, wasps and grasshoppers were recorded in this area, along with several species of common butterflies and dragonflies. A notable record from this area (and further across the Site) was of the moth species cinnabar *Tyria jacobaea* with low numbers of larvae recorded on ragwort. The cinnabar moth is a Natural Environment Research Council (NERC) S41 priority species in England.

Survey Area 2

3.2.6 Survey area 2 covers the northern section of the Site, located between the access road that bisects the Site and the A62/Station Road junction outside the Site to the north. The habitat here comprised tall sward but species poor other neutral grassland over sparse sandy substrate. Like survey area 1, the substrate here was over ground control membranes and in places where the membranes were damaged or not present, self-set silver birch *Betula pendula* saplings and other scrub species were present and succeeding the Site from the west. The grassland was species poor with no evidence of management. Plant species recorded in this location included creeping thistle, bramble, tall melilot, and hawthorn *Crataegus monogyna*. Other species included: cock's-foot *Dactylis glomerata*, nipplewort *Lapsana communis*, curled leaf dock *Rumex obtusifolius*, common daisy *Bellis perennis*, ox-eye daisy *Leucanthemum vulgare*, cranesbill *Geranium sp.*, common nettle *Urtica dioica*, and red fescue *Festuca rubra*.

3.2.7 This area was unshaded, with areas of bare ground present represented by sand substrates over ground control membranes. The eastern edge of the area offers some shelter, with still air and plentiful shade provided by a small pocket of deciduous woodland. Standing water was notably absent from this area during the assessment. The vegetation shows little sign of management with the Site appearing to have been left derelict since the demolition of the nursery greenhouses. This habitat is summarised in terms of IHP categories below in Table 4 below and is accompanied by photographs and habitat features of note (Appendix B).

Table 4: Survey Area 2 IHP assessment results

Habitat Element	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11
IHP Grading	D	E	C	E	E	C	D	C	D	D	B

3.2.8 The survey recorded common and widespread species from the following groups: bees, wasps, true flies, hoverflies, crickets, grasshoppers and spiders. A notable record here was of the ruby tailed cuckoo wasp *Chrysis ignita* Agg., these wasps are parasitoids of solitary bees.

Notable habitat features

3.2.9 Whilst the Site lacked a diverse range of habitat features, with a tall but sparse grass sward dominating the Site, there was a feature of note. On the east side of the Site, adjacent to the Site access road there was a small bare earth facet NGR SE 17179 20129. This type of habitat is of high value to many solitary bees, wasps and several beetle species that use earth faces for creating nesting and breeding burrows. However, whilst close inspection of this feature revealed a few small tunnels, it did not appear to be in high usage as nesting habitat as the soils were firmly packed and baked hard by the sun.

Incidental Recordings of Terrestrial Invertebrates

3.2.10 During the IHP assessments for each Survey Area, observations were made on invertebrate species present at the time of the Site walkover. The species recorded include those from the following



groups, but not limited to; *Arachnidae* (Spiders and their allies), *Coleoptera* (beetles), *Diptera* (trueflies), *Lepidoptera* (butterflies and moths) and *Hemiptera* (true bugs) and *Hymenoptera*.



4. Conclusion

- 4.1.1 An IHP assessment was undertaken across the Site Boundary. The IHP assessment concluded that the Habitat Elements (as detailed in Table 1 of this technical note) best represented across the Site are as follows:
- HE11 – Bare Ground: Category B *Major*
 - HE3 - Nectar Resources, HE7 – Still air (S), HE8 – Still air (H): Category C *Moderate*
- 4.1.2 The Site has been left derelict since the recent demolition of the nursery greenhouses in the early half of 2022, the habitats present within the Site lack maturity and are representative of early successional habitats, with the most notable in Site habitat represented by bare earth habitats created by sands left behind from nursery operations. The nectar sources available within the Site are dominated by species that utilise anemochory (wind dispersal) to spread, or those that are typically spread by bird droppings (bramble). The Site lacks any permanent water, with water only being held very temporarily by ground membranes, and as the Site sits within an urban area, connectivity to Sites for colonisation or dispersal is poor. This lack of Site maturity and within Site permanent water limits the value of the Site to invertebrates.
- 4.1.3 The Site is assessed to be of value to invertebrates at the local level only, with species recorded during the Site walkover all representing common species that have good powers of dispersal. The bare ground present within the Site is an unusual habitat that is not well represented in the local area, however due to the poor connectivity of the Site, it is unlikely that highly specialist invertebrate species or assemblages that utilise bare sands will be able to colonise the Site.



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Appendix A – Desk study records within 2km

Species	Taxon Group	No. of Records	Designation
<i>Meloe proscarabaeus</i> Black oil beetle	Insect – beetle <i>Coleoptera</i>	One	NERC S41 Priority Species
<i>Malthodes pumilus</i> A soldier beetle	Insect – beetle <i>Coleoptera</i>	One	Nil
<i>Melasis buprestoides</i> A false click beetle	Insect – beetle <i>Coleoptera</i>	One	Nil
<i>Psylliodes cuprea</i> A leaf beetle	Insect – beetle <i>Coleoptera</i>	One	Nil
<i>Coenonympha pamphilus</i> small heath	Insect – butterfly <i>Lepidoptera</i>	Three	NERC S41 Priority Species IUCN Vulnerable
<i>Lycaena phlaeas</i> Small copper	Insect – butterfly <i>Lepidoptera</i>	Two	Nil
<i>Lasiommata mergera</i> Wall	Insect – butterfly <i>Lepidoptera</i>	Five	Nil
<i>Tyria jacobaeae</i> Cinnabar	Insect – moth <i>Lepidoptera</i>	One	NERC S41 Priority Species
<i>Hepialus humuli</i> Ghost moth	Insect – moth <i>Lepidoptera</i>	One	Nil



Appendix B – Site Photographs



Appendix C – Incidental records

Species	Common	Designation
Aranae		
<i>Araneus diadematus</i>	European garden spider	
<i>Araniella cucurbitina</i>	Cucumber crab spider	
<i>Metellina segmentata</i>	-	
<i>Tibellus oblongus</i>	Running crab spider	
<i>Tetragnatha montana</i>	Long jawed orb weaver	
<i>Xysticus cristatus</i>	Common crab spider	
Coleoptera		
<i>Calathus melanocephalus</i>	A ground beetle	
<i>Notiophilus biguttatus</i>	-	
<i>Oedemera nobilis</i>	-	
<i>Rhagonycha fulva</i>	Hogweed bonking beetle	
<i>Agriotes obscurus</i>	-	
<i>Denticollis linearis</i>	-	
Diptera		
<i>Bibio hortulanus</i>	Marchfly	
<i>Brachicoma devia</i>	-	
<i>Calliphora vicina</i>	-	
<i>Calliphora vomitoria</i>	Blue bottle	
<i>Cheilosia albitarsis</i>	Late buttercup Cheilosia	
<i>Cheilosia illustrata</i>	-	
<i>Chloromyia formosa</i>	Broad centurion	
<i>Chrysogaster solstitialis</i>	Dark-winged chrysogaster	
<i>Chrysopilus asiliformis</i>	The little snipe fly	
<i>Drosophila spp.</i>	-	
<i>Helophilus pendulus</i>	-	
<i>Lonchoptera bifurcata</i>	-	
<i>Sicus ferrugineus</i>	-	
<i>Tephritis ruralis</i>	-	
<i>Tropidia scita</i>	-	
<i>Xyphosia miliaria</i>	Thistle gall fly	
<i>Bibio marci</i>	St Mark's fly	
<i>Episyrphus balteatus</i>	Marmalade fly	
<i>Eristalis nemorum</i>	-	
<i>Eristalis tenax</i>	-	
<i>Syrphus ribesii</i>	-	
<i>Syrphus torvus</i>	-	
Hemiptera		
<i>Aelia acuminata</i>	Bishop's mitre	
<i>Amblytylus nasutus</i>	-	
<i>Apolygus spinolae</i>	-	



<i>Cicadella viridis</i>	Green leafhopper	
<i>Closterotomus norwegicus</i>	Potato capsid bug	
<i>Eurydema oleracea</i>	Crucifer shield bug	
<i>Kleidocerys resedae</i>	Birch catkin bug	
<i>Legnotus limbosus</i>	Bordered shield bug	
<i>Leptopterna dolabrata</i>	Meadow plant bug	
<i>Notostira elongata</i>	-	
<i>Orthotylus flavinervis</i>	-	
Hymenoptera		
<i>Apis mellifera</i>	Honeybee	
<i>Arge pagana</i>	Rose sawfly	
<i>Bombus hortorum</i>	Small garden bumblebee	
<i>Bombus terrestris</i>	Garden bumblebee	
<i>Bombus hypnorum</i>	Tree bumblebee	
<i>Bombus lapidarius</i>	Red-tailed bumblebee	
<i>Bombus pascuorum</i>	Common carder bee	
<i>Bombus pratorum</i>	Early bumblebee	
<i>Lasius flavus</i>	Meadow ant	
<i>Lasius niger</i>	-	
<i>Sphecodes gibbus</i>	Dark-winged blood bee	
<i>Vespula germanica</i>	German wasp	
<i>Vespula vulgaris</i>	Common wasp	
<i>Ametastegia glabrata</i>	Dock sawfly	
Isopoda		
<i>Oniscus asellus</i>	Shiny woodlouse	
<i>Philoscia muscorum</i>	Striped woodlouse	
Lepidoptera		
<i>Aglais io</i>	Peacock	
<i>Aphantopus hyperantus</i>	Ringlet	
<i>Lycaena phlaeas</i>	Small copper	
<i>Maniola jurtina</i>	Meadow brown	
<i>Ochlodes sylvanus</i>	Large skipper	
<i>Parage aegeria</i>	Speckled wood	
<i>Pieris brassicae</i>	Large white	
<i>Pieris napi</i>	Green veined white	
<i>Pieris rapae</i>	small white	
<i>Polyommatus icarus</i>	Common blue	
<i>Pterophorus pentadactyla</i>	White plume moth	
<i>Pyronia tithonus</i>	Gatekeeper	
<i>Thymelicus lineola</i>	Essex skipper	
<i>Thymelicus sylvestris</i>	Small skipper	
<i>Tyria jacobaeae</i>	Cinnabar	S41
<i>Vanessa atalanta</i>	Red admiral	
Mollusca		
<i>Cepaea nemoralis</i>	Brown lipped snail	



Odonata		
<i>Aeshna cyanea</i>	Southern hawker	
<i>Aeshna grandis</i>	Bronze hawker	
Orthoptera		
<i>Chorthippus brunneus</i>	Common field grasshopper	
<i>Tetrix undulata</i>	Common ground hopper	