

Arcus Consultancy Services Ltd. / Yorkshire Water

Worsborough Water Treatment Works

Further Ecological Survey Report

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EXPERTS IN ECOLOGY

RSK GENERAL NOTES

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Author	Claire Hesketh	**Technical and quality reviewer**	Emily Clark
Signature		Signature	
Date:	9 November 2022	Date:	3 March 2023

Project manager	Lewis Wright
Signature	
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Switchboard: +44 (0)330 223 1074 Company contact: Enquiries@biocensus.co.uk

EXECUTIVE SUMMARY

1. This report presents the results of further ecological surveys, comprising aerial tree inspections for bats, water vole (*Arvicola amphibius*) and otter (*Lutra lutra*) habitat assessment and presence/likely absence surveys associated with the proposed installation of solar photovoltaic (PV) panels at the Yorkshire Water Worsborough Water Treatment Works, OS grid reference; SE 3635 0340.
2. A Preliminary Ecological Appraisal (PEA) of the site was completed as part of the initial scoping project by BL Ecological Consultancy in 2020. A subsequent Ground Level Tree Assessment (GLTA), badger (*Meles meles*) walkover and breeding bird surveys were completed by RSK Biocensus in April 2022.
3. Following recommendations from the GLTA, aerial tree inspections were carried out for trees 1 to 4. No further action is required for Trees 1 and 2.
4. Due to access constraints and health and safety issues, Trees 3 and 4 could not be inspected fully, therefore further survey in the 2023 season is required if these are to be impacted by the works.
5. A water vole habitat assessment survey was carried out of the River Dove running through the site. This was found to be partly suitable, but due to access constraints will need to be re-surveyed in future if the River Dove and Blacker Dike or the immediately adjacent area of either watercourse is to be impacted by the works.
6. A presence/likely-absence survey for otter was carried out on the River Dove which runs through the site. No evidence of otter was recorded, however due to access constraints the River Dove and Blacker Dike will need to be re-surveyed in future if either watercourse or the immediately adjacent area is to be impacted by the works.
7. The data provided within this report are valid for 12 to 18 months. If the proposed works commence after this, then the surveys will need to be repeated to ensure up-to-date information is available to support the development.

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1.0 INTRODUCTION

1.1 Purpose of this report

1.1.1 This report presents the results of aerial tree inspections, water vole (*Arvicola amphibius*) habitat assessment and presence/likely absence for otter (*Lutra lutra*) associated with the proposed installation of solar photovoltaic (PV) panels at the Yorkshire Water Worsborough Water Treatment Works, OS grid reference; SE 36206 03544.

1.2 Landscape context

1.2.1 Worsborough Water Treatment Work is an active waste treatment works located on the southern edge of the village of Worsborough, approximately 3.5km to the south of Barnsley.

1.2.2 The site comprises an operational treatment works containing multiple buildings, water tanks and areas of hard standing, with areas of grassland and scrub around the River Dove and Blacker Dike, which flow through the site. The site is bordered to the north by the Trans Pennine Trail, Lewden Springs Fishery to the east, arable fields to the south and woodland to the west.

1.2.3 The wider surrounding area to the east, west and south comprises open countryside, including woodland, reservoirs and farmland, with occasional towns and villages scattered throughout the area.

1.3 Background Information

1.3.1 A Preliminary Ecological Appraisal (PEA) of the site was completed as part of the initial scoping project by BL Ecological Consultancy in 2020 (Mackenzie 2020).

1.3.2 A ground level tree assessment (GLTA) and badger (*Meles meles*) walkover survey and breeding bird surveys were completed by RSK Biocensus in April 2022 (RSK Biocensus 2022).

1.4 Validity of data

1.4.1 According to CIEEM guidance (CIEEM 2019), survey data are valid for a period of 12 to 18 months from the date of the first survey. Between 18 months and 3 years a professional ecologist will need to undertake a site visit and may also need to update desk study information (effectively updating the PEA / PRA) and review the validity of the reports.

2.0 METHODS

2.1 Bats

2.1.1 The surveys were carried out in accordance with the Bat conservation Trust (BCT) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins 2016).

2.1.2 The surveys were carried out by Tom West (survey lead), Steven Whitcher and Jamie Ingram. Tom is a senior consultant, with over five years' experience and is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Tom holds a Natural England class 2 license for bats (2019-40871-CLS-CLS).

Aerial Tree Inspections

2.1.3 For trees identified as having high or moderate potential during the GLTA, aerial climbing assessments were used (where safe) to complete a detailed inspection of the potential features and inspect for evidence of roosting bats. The aerial inspections of Trees 1, 2, 3 and 4 were carried out by Tom West, Steven Whitcher and Jamie Ingram on 2 September. Trees 3 and 4 were inspected for a second time on 28 September.

2.1.4 Trees 1 and 2 were downgraded to low roosting potential after the first climbing survey and did not require the second aerial assessment. Trees 3 and 4 were partly surveyed during both site visits.

2.1.5 Tree roost inspections at height also constitute a presence/absence survey and can be used in place of dusk/dawn surveys if all features can be fully inspected using an endoscope or torch.

2.2 Water vole Survey

2.2.1 The water vole habitat survey was carried out on 20 September 2022 by Claire Hesketh and Elizabeth Fenn.

2.2.2 The water vole survey involves a thorough search for field signs indicating presence – including droppings (the principal evidence required), feeding remains, burrows and footprints – was completed during the breeding season when field evidence of water vole is more evident (Dean et al. 2016). The breeding season for the majority of the UK is considered to be between mid-April to the end of September (though this can vary depending on season variation based on latitude and altitude).

2.2.3 The watercourse was assessed for suitability to support water vole using the criteria detailed within Table 1 below.

Table 1: *Criteria for assessing the value of habitat for water voles (Dean 2021)*

Habitat category	Dry areas for burrows or nests			Herbaceous vegetation	Water
	Bank profile	Bank substrate	Variation in water level		
Optimal (all criteria need to be met)	Steep (approaching 1:1) on at least one side of a watercourse. Steep or shallow on static waterbodies or fen-type habitat.	Earth or peat	No noticeable variation during the summer months; banks are not overtopped regularly.	Continuous swathe of tall and luxurious riparian vegetation providing 90 – 100% cover on the banks (tall tussocky grassland) and marginal / in channel vegetation is present (emergent species)	Permanent water
Good (all criteria need to be met)	Steep (approaching 1:1) on at least one side of a watercourse. Steep or shallow on static waterbodies or fen-type habitat.	Earth or peak banks, or stony / reinforced bank with gaps allowing access to the earth behind	No noticeable variation during the summer months; banks are not overtopped regularly.	Continuous swathe of bankside or in-channel (emergent) vegetation providing at least 60% ground cover. May be dominant by grasses and weeds rather than luxurious riparian vegetation. The vegetation should generally be tall, except in urban or suburban areas, where shorter bankside vegetation may also qualify.	Permanent water. Or routinely wet for at least 2-3 months during the summer, and where other 'good' habitat is present in immediately adjacent areas with permanent water.
Suitable but poor	Any habitat that falls short of the criteria to qualify as 'good' but does not meet the criteria of 'negligible' value could reasonably be considered to be 'suitable but poor'				
Negligible (will generally need to meet the criteria for herbaceous vegetation and at least one other)	Shallow profile on both banks	Rocky or gravel, unsuitable for burrowing	Considerable variation in water level – the bank toe can move by more than 1m horizontally over the breeding season	No or limited bankside and marginal vegetation (due to shading or other 'permanent factors – note that management can change and is often a 'temporary' factor).	N/A
	Vertical bank face with no burrowing opportunities behind it	Reinforced banks with no gaps	n/a		

a. Overtopping once every 5–10 years is likely to be too frequent in most cases; overtopping less frequently than this may also be problematic for water voles.

2.3 Otter Survey

2.3.1 The presence/likely absence survey for otters was carried out on 20 September 2022 by Claire Hesketh and Elizabeth Fenn.

2.3.2 All watercourses within the site and up to 250 m up and downstream where access permitted were surveyed for the presence of otter. The weather prior to the survey was dry with no rain. Suitable bank-side and water-edge habitats were systematically searched for field signs of the species including:

- spraint (droppings);

- footprints,
- slides;
- paths;
- feeding evidence;
- holts (underground resting places); and
- couches (temporary resting places).

2.3.3 The location of any otter evidence recorded during the surveys was marked using a tablet which allows the data to be accurately mapped from GPS location and using GIS software. Photographs were also taken to record otter evidence where identified.

2.4 Constraints and limitations

Bats

2.4.1 Canopy sections of Tree 3 could not be inspected during the aerial surveys, due to extensive deadwood making it unsafe to climb. A dusk emergence survey was planned but due to the dense vegetation on site, accessing the tree during the dark was deemed unsafe and they survey was not able to go ahead. It was not possible to reschedule this survey during the 2022 survey season, as September and October are sub-optimal for bat surveys.

2.4.2 As guidelines require trees of high potential to undergo three surveys, this survey effort is not sufficient to conclude the likely presence or absence of roosting bats within this tree. Further survey is therefore recommended if the trees are to be affected by future works, as discussed in the evaluation.

2.4.3 Due to the distance between the trees and current proposed working area, this is not considered to be a major constraint.

Water Voles

2.4.4 The section of the River Dove surveyed was found to be densely vegetated making a thorough inspection for field signs difficult. Blacker Dike was also inaccessible due to vegetation and therefore was not surveyed.

2.4.5 Conditions were not considered suitable for an accurate assessment of the presence or absence of water voles. Further survey is therefore recommended as discussed in the evaluation.

Otters

2.4.6 The section of the River Dove surveyed was found to be densely vegetated making a thorough inspection for field signs difficult. Blacker Dike was also inaccessible due to dense vegetation and therefore was not surveyed.

2.4.7 Conditions were not considered suitable for an accurate assessment of the presence or absence of otters. Further survey is therefore recommended as discussed in the evaluation.

RESULTS

2.5 Aerial Tree Inspection

2.5.1 No evidence of roosting bats was found during the aerial tree inspections of Trees 1 to 4. Trees 1 and 2 were downgraded to low potential after the first inspection and therefore required no further survey.

2.5.2 After 2 inspections Trees 3 and 4 were assessed as having high and moderate bat roosting potential respectively. As the canopy section of Tree 3 could not safely be inspected during the aerial surveys, a dusk emergence survey was required to complete the full set of 3 surveys. Due to the time constraints of the survey season and access issues, an emergence survey of Trees 3 and 4 was not possible. Therefore, further survey may be required as described in the conclusion.

2.5.3 A breakdown of the potential roosting features surveyed during the aerial tree inspections can be found in Appendix A.

2.6 Water Vole Survey

2.6.1 No evidence of water vole activity was recorded during the survey, however both watercourses were densely overgrown which made searching for field signs difficult and largely ineffective. On the basis of these findings alone, presence cannot be ruled out, highlighting a requirement for further survey.

2.7 Otter Survey

2.7.1 No evidence of otter activity was recorded during the survey, however both watercourses were densely overgrown which made searching for field signs difficult and largely ineffective. On the basis of these findings alone, presence cannot be ruled out, highlighting the requirement for further survey.

2.8 Incidental Findings

Invasive Plant Species

2.8.1 During the surveys carried out on the site, Himalayan Balsam (*Impatiens glandulifera*), an invasive pant species, was noted.

3.0 EVALUATION AND CONCLUSIONS

3.1 Bats

3.1.1 No evidence of roosting bats was found during the aerial tree inspections. For Trees 1 and 2, this survey effort is sufficient to conclude the likely absence of bats in these trees. Therefore, no further survey action is required regarding roosting bats.

3.1.2 As much as was possible of Trees 3 and 4 were subject to two climbing surveys each, and preliminarily rated high and moderate potential respectively. According to the BCT guidelines, this survey effort is not sufficient to conclude the likely presence or absence of roosting bats within these trees. It is unlikely that these trees will be impacted by the works, however if these trees are to be affected, they will require further surveys to determine whether they are being used by bats.

3.1.3 In the event that any trees assessed as having bat potential are to be removed, they will require a pre-fell check by a licensed ecologist.

3.2 Water Voles

3.2.1 No signs of water vole were recorded during the walkover survey, however due to lack of safe access to large portions of the River Dove and Blacker Dike this is not deemed sufficient to rule out the presence of water vole on site.

3.2.2 If the River Dove or Blacker Dike, or area immediately adjacent to either of these watercourses, is to be impacted by the works then further surveys will be required to make a thorough assessment for water voles. These surveys should be carried out in the spring of 2023, before the vegetation along both watercourses becomes a constraint.

3.3 Otters

3.3.1 No signs of otter were recorded during the walkover survey, however due to lack of safe access to large portions of the River Dove and Blacker Dike this is not deemed sufficient to rule out the presence of otters on site.

3.3.2 If the River Dove or Blacker Dike, or area immediately adjacent either of these watercourses is to be impacted by the works then further surveys will be required to make a thorough assessment for otters. These surveys should be carried out in the spring of 2023, before the vegetation along both watercourses becomes a constraint.

3.3.3 Efforts should be made to avoid works the wooded section of the River Dove to the north west of the site as this holds the greatest potential for otter, with regard to suitable sheltered resting areas.

3.4 Incidental Findings

Invasive Plant Species

3.4.1 Himalayan Balsam is a non native invasive plant species listed under Schedule 9 of The Wildlife and Countryside Act (1981) and care must be taken to prevent the spread of this species at the site.

3.4.2 This species is an annual that dies back in the winter and spreads primarily by seed. Large quantities of seed are likely present in the soil where this plant occurs. Spread to other sites can be prevented by washing down equipment leaving site. The soil contaminated with *Impatiens glandulifera* (Himalayan Balsam) seed should not be re-used on site without treatment to remove seeds, unless they are in a location where seed will be able to germinate.

3.4.3 It is recommended that an invasive species survey is carried out in spring of 2023, before the works commence.

4.0 REFERENCES

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5.0 FIGURES

Figure 1 – Further Survey Area

436100 436150 436200 436250 436300 436350 436400 436450 436500 436550

403600 403550 403500 403450 403400 403350 403300 403250

River Dove

River Dove

Blacker Dike

Blacker Dike

1

2

3

4

Legend:

Site Boundary

Water Course Survey Area

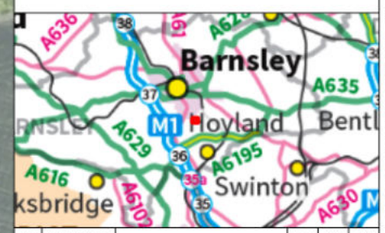
Aerial Tree Inspection Surveys Results

Bat Roost Potential

High

Moderate

Low



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Yorkshire Water Solar Sites Eco Surveys

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Worsborough Further Surveys

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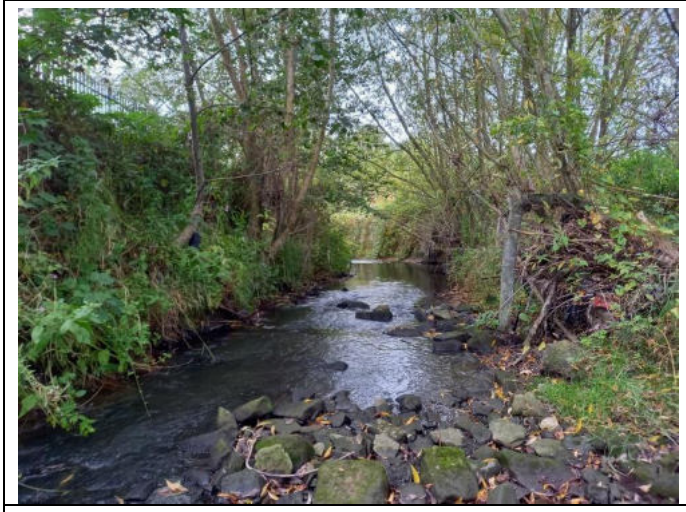
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APPENDIX A – AERIAL TREE ASSESSMENT DATA

Tree Aeriel Inspection of Potential Roost Features (PRF) Results																			
Tree ID	Grid Reference	Species	Ground Assessment Category	Ground Assessment PRF Description	PRF ID	PRF Type	PRF Location	PRF Height approx (m)	PRF Orientation	PRF Diameter at entrance approx (cm x cm)	PRF Depth approx (cm)	PRF Description	Bat Evidence	Hibernation Potential	PRF Category	Fully Inspected	Overall Tree Category	Climbing Survey One 02.09.2022	Climbing Survey Two 28.09.2023
1	436451 403459	Poplar (Populus sp)	Moderate	Rotten main stem and seond stem, open throughout as large tube cavities, as well as knothole and tearout.	1a	Main stem cavity	Trunk					Large tube cavity open to top. Can't be fully inspected but open to elements although there may be cavities in sides that can't be seen.	None visible	No	Low	No - not safe to climb	Low	No bat roosting evidence found	N/A
					1b	Second stem cavity	Trunk					Large tube cavity open to top. Can't be fully inspected but open to elements although there may be cavities in sides that can't be seen.	None visible	No	Low	No - not safe to climb			
					1c	Knot hole	Trunk	1	W	8 x 6	8	Knot hole at 1m west facing within dense clutter - leading to cavity in stem. Extends to spire at top. Internal conditions: wet, blackened, woodlice present.	No	No	Low	Yes			
					1d	Tear out	Trunk	0.5	W	8 x 4	8	Tear out at 0.5m west. Void extending up behind bark. Internal conditions: dry	No	No	Low	Yes			
2	436174 403494	Oak (Quercus sp)	Moderate	Ivy cover on stem and limbs	2a	Ivy cover	Trunk					Ivy cover - No significant ivy plates or hidden features visible.	None visible	No	Low	Yes	Low	No bat roosting evidence found	N/A
3	436549 403434	Willow (Salix sp)	High	Multiple tear outs and snapped limbs, plus some flaking bark.	3a	Tear out	Trunk	1	S	15 x 10	60+	Large tear out at base of tree facing south, 1m. Huge cavity in base of tree. Impossible to fully inspect, extends over 1m up stem and down to ground level. Internal conditions: damp and blackened, with slugs and woodlice present	None visible		High	No - cavity too big	High	No bat roosting evidence found	No bat roosting evidence found
					3b	Flaking bark	Limb		SW	5 x 2	5	Flaking bark on lower limb facing southwest. Tapering void behind fragile bark plate. Dry inside.	None visible	No	Low	Yes			
					3c	Tear out	Trunk	4	S	20 x 2	4	Large south facing tear out at 4m. Cavity behind callus on side of large tear out. Remaining tear out low potential. Dry and rough inside.	None	No	Moderate	Yes			
					3d	Snapped limb	Limb	7	W	100+ x 3		Snapped main limb. Cavity present between heartwood and callus. No anchor to fully inspect. Visible from 1m below and clearly a high potential feature with an extensive cavity around the heartwood.			High	No - not safe to inspect			
					3e	Tear out	Limb	7	SW	2 x 100+		Large tear out on main southwest facing limb. Cracks in the heartwood and behind the callus on a large tear out feature. No safe anchor to fully inspect but appears to be a high potential feature.			High	No - not safe to inspect			
					3f	Tear out	Limb	7	N			Large tear out on main limb faing north. No safe anchor to fully inspect.				No - not safe to inspect			
					3g	Snapped limb	Limb		S			Snapped south facing limb. Twisted creatin various features. No safe anchor to fully inspect.				No - not safe to inspect			
4	436383 403355	Willow (Salix sp)	High	Tear out at base of tree	4a	Tear out	Trunk	1	W	50 x 3	7	Tear out with wedge cavity extending up from tear out. Internal conditions: dry and smooth in some areas.	None		Moderate	Yes	Moderate	No bat roosting evidence found	No bat roosting evidence found

APPENDIX B – SITE PHOTOGRAPHS

	Plate 1 – Overgrown vegetation along banks
	Plate 2 – Vertical concrete banks along part of the watercourse