

Goldsmith Ecology

Specialist Services in Aquatic Science



River Calder TRU: Baseline Aquatic Macrophyte Survey

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Final Report

To:
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Cover photo: Rail viaduct over the River Calder at Ravernsthorpe © Goldsmith Ecology

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1. Introduction

1.1. Background

This survey was commissioned by Atkins Ltd. to support ecological assessments relating to the proposed upgrading of the Huddersfield to Westtown, Dewsbury section of the Transpennine Route Upgrade (TRU) scheme. The work is conducted on behalf of the TRU West Alliance (Amey, Arup, Bam Nuttall and Network Rail). This part of the scheme may require in-channel work on a short stretch of the River Calder for the construction of a new viaduct, east of the existing structure.

Although lying outside of any statutory designation, the proposed area of the River Calder is hydrologically linked to the Rochdale Canal and Calder and Hebble Navigations where Floating water plantain *Luronium natans*, is known to occur. *Luronium natans* is a European Protected Species (EPS) listed on Schedule 5 of the Conservation of Habitats and Species Regulations 2017 and is protected under UK law under Schedule 8 of the Wildlife & Countryside Act. 1981 (as amended).

While there are no records of *Luronium natans* from the immediate vicinity of the proposed TRU rail viaduct, there are a number of nearby records listed on the BSBI species database including from within the 1 km (SE2320) where the project is focused (See BSBI 2021). As such, the methods will be focussed on determination of presence or absence of this species within the proposed construction zone.

1.2. Site details



Figure 1 Proposed macrophyte survey location. Red lines show proposed survey extent (approximately 140m in length) on the River Calder. Orange dots represent the approximate centre points of the new viaduct crossing. Black lines show the scheme boundary.

Located approximately 1 km to the southwest of Dewsbury, this section of the River Calder is heavily modified, and the flow regulated by static weirs. Whilst the final location of potential in-channel works is yet to be determined, the current extent of the watercourse within the scheme boundary has been used to determine a conservative survey extent of approximately 140 m from NGR SE 23322 20516 to SE 23464 20504 on the right hand-bank (Figure 1).

The river is between 40 – 60 m wide within the survey zone and up to 3.8 m in depth under normal flow conditions (based on “Calder Viaduct MDL1.8 Underwater Examination Rep”) with the banks shelving relatively steeply into the water.

1.3. Survey team

The survey was undertaken by Ben Goldsmith (Goldsmith Ecology), assisted by Anne Harding (Atkins Ltd.). Ben is a botanist specialising in aquatic plant survey and identification (JNCC accredited) and has undertaken *Luronium natans* surveys (under protected species licences) at over 25 sites in the UK.

In order to fulfil H&S requirements, the survey team was supported by a dedicated water safety team from Sea Training International Ltd.

1.4. Survey aims

The aim of the survey was to establish, with reasonable confidence, the presence or absence of *L. natans* in the River Calder at Ravensthorpe.

1.5. Survey conditions

The survey work was conducted on 2nd August 2021, a period when *Luronium natans* is actively growing and likely to be encountered if present.

Conditions during the survey were calm, with only light winds and mainly bright sunshine.

The survey was conducted from the river bank (H & S precluded use of a boat for this survey). Access to the bank top was good on both banks, but the steep sides and dense vegetation limited safe access to the waters’ edge, particularly on the north bank.

The water was slightly brown and water clarity appeared to be compromised by moderate turbidity (not measured).

2. Methods

Surveys were undertaken from the bank using a modified grapnel on a 20 m line. A lightweight grapnel (right) is favoured over heavier sampling gear (e.g. double-headed rake) for river sampling due to the likelihood of submerged objects causing snags; the tines being designed to bend if caught. The grapnel used here has 10 tines (Figure 2), increasing the effectiveness for sampling smaller submerged plants such as *L. natans*. The methods followed the recommendations set out by Willby *et al.* (2003).

Sampling was restricted by access to the waters' edge, and therefore two or three grapnel throws of approximately 15 m were conducted at each access point, one perpendicular to shore, and the others either upstream or downstream, or both, to increase the coverage (see Figure 3 below).

Figure 2 Aquatic macrophyte grapnel (right).

Because of the possibility of *Luronium natans* being present, a Protected Species licence was sought from NE (Application no. 2021-53907-SCI-SCI). Natural England deemed the application unnecessary on account of no previous records at the site and on the provision that if *L. natans* was encountered, surveying would cease immediately.

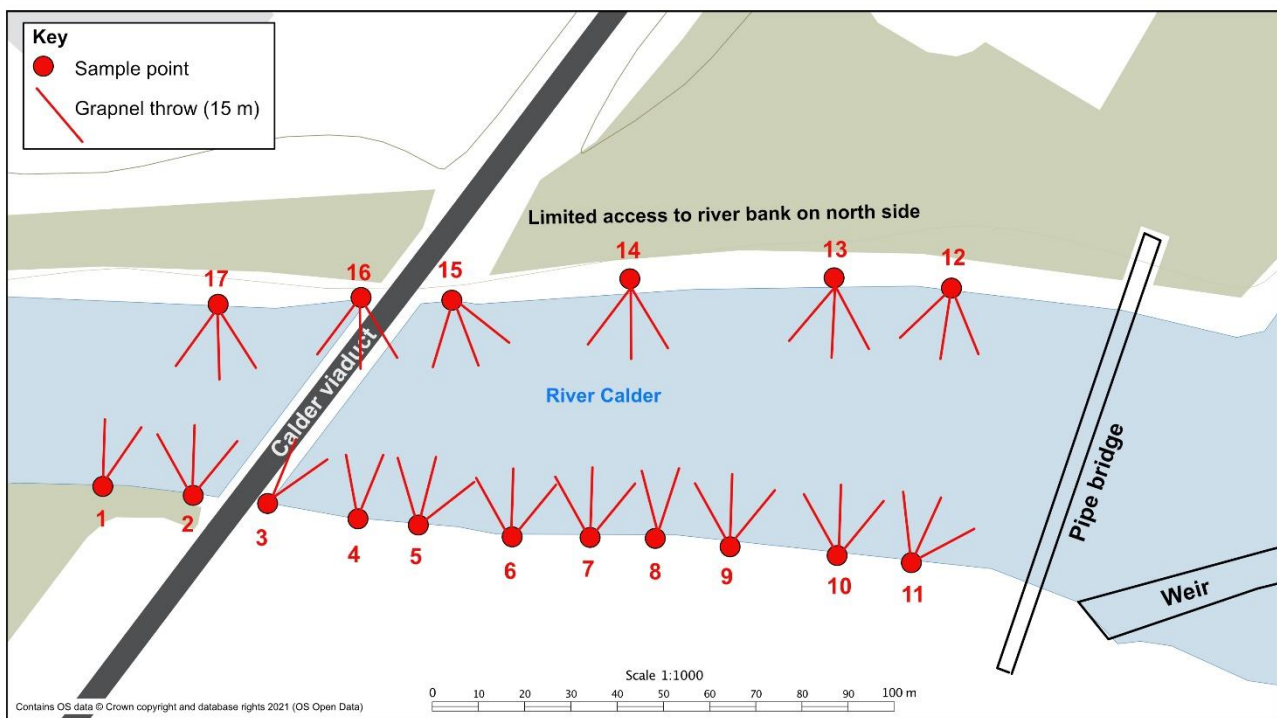


Figure 3 River Calder TRU sampling points.

Sample points were recorded with GPS (Garmin GPSMAP 64ST¹) and if encountered, aquatic plant species recorded for each grapnel throw. The georeferenced data are included in Appendix I.

¹ GPS accuracy was generally to within ± 3 m – but sometimes up to ± 6 m where tree cover was high

3. Results

3.1. Aquatic macrophytes

A total of 47 grapnel hauls were made from 17 points along the south and north banks.

Luronium natans was not recorded, and habitat generally considered to be poor for this species within the survey area due to the steeply sloping banks and deep and slightly turbid water (2.5 – 3.5 m) in the open channel.

A total of five higher aquatic plant species were recorded and one submerged bryophyte (Table 1). This included two highly invasive, non-native species, Nuttall's waterweed *Elodea nuttallii* (Figure 4a) and Floating pennywort *Hydrocotyle ranunculoides* (Figure 4b).

In general, aquatic plant biomass was very low in the main channel, with only small amounts of plant material coming up on the grapnel. In the margins, and within the emergent stems of reed sweet grass *Glyceria maxima* and reed canary grass *Phalaris arundinacea*, starwort and duckweed were more common and along the north bank, Floating pennywort frequent.

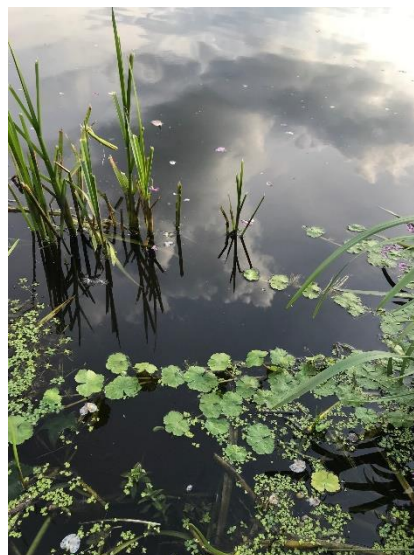
Table 1 Aquatic macrophyte data from River Calder TRU sampling points (02/08/2021)

Common Name	Scientific name	Overall abundance
Starwort sp.	<i>Callitriche</i> sp.	Frequent
Nuttall's waterweed	<i>Elodea nuttallii</i>	Occasional
Floating pennywort	<i>Hydrocotyle ranunculoides</i>	Frequent
Common duckweed	<i>Lemna minor</i>	Occasional
Fennel pondweed	<i>Potamogeton pectinatus</i>	Rare
Kneiff's feather-moss	<i>Leptodictyum riparium</i>	Occasional
Filamentous green algae	<i>Cladophora</i> spp.	Frequent

The presence of invasive non-native species requires further investigation and works will require an INNS risk and mitigation plan.



a.)



b.)



c.)

Figure 4 a.) *Elodea nuttallii*, b.) *Hydrocotyle ranunculoides* and c.) Himalayan balsam, *Impatiens glandulifera*.

In addition to the filamentous green algae, the moss *Leptodictyum riparium* was present, mainly growing at the waterline. This moss is typical of damp shady places next to water and tolerates inundation and is often recorded as part of the submerged flora.

3.2. Marginal and emergent vegetation.

Although not part of the survey, reed sweet grass *Glyceria maxima* and reed canary grass *Phalaris arundinacea* were noted as abundant along both banks, and rosebay willowherb *Chamaenerion angustifolium* (non native) common on the south bank.

The non-native Himalayan balsam, *Impatiens glandulifera* (Figure 4c) was abundant throughout the survey area on both banks.

4. Appraisal of the survey results

4.1. Aquatic plants

Within the surveyed area the River Calder is relatively deep with steep sloping sides to the channel, making it poor habitat for most submerged aquatic plant species. This is exacerbated by the water being slightly brown in colour and turbid, thus limiting the light penetration.

No *Luronium natans* was detected during the survey and the habitat and current conditions considered to be poor for this species, making its presence here unlikely.

The Invasive non-native species Nuttall's waterweed *Elodea nuttallii* was the most common species within the deeper water of the channel. This species is widely established in UK freshwaters, but failure to contain its spread and that of *Hydrocotyle ranunculoides* and *Impatiens glandulifera* during construction would constitute an offence under The Invasive Alien Species (Enforcement and Permitting) Order 2019. An INNS risk management plan should therefore include these species.

5. References

BSBI (2020a) BSBI maps: *Luronium natans*. Online at:
<https://bsbi.org/maps?taxonid=2cd4p9h.fff#style=N4lgdghgtgpiBcloE8AEBnGAXLBLMA5uiAL5A> [accessed July 2021]

Willby, N., Eaton, J. & Clarke, S. (2003). Monitoring the Floating Water-plantain.
Conserving Natura 2000 Rivers Monitoring Series No. 11, English Nature, Peterborough.

6. Appendix I

Point	Grapple haul	Waypoint	<i>Elodea nuttallii</i>	<i>Callitriche</i> sp.	<i>Potamogeton pectinatus</i>	<i>Leptodictyum riparium</i>	<i>Hydrocotyle ranunculoides</i>	<i>Lemna minor</i>	Filamentous green algae
1	a	SE2321620545	1		1				1
1	b	SE2321620545							1
2	a	SE2323620543	1						
2	b	SE2323620543	1						
2	c	SE2323620543	1						
3	a	SE2325520544	1						
3	b	SE2325520544							
4	a	SE2327120540							
4	b	SE2327120540							1
5	a	SE2328420537							1
5	b	SE2328420537				1			
5	c	SE2328420537							
6	a	SE2330520534				1			
6	b	SE2330520534		1		1			
6	c	SE2330520534		1					
7	a	SE2332120537							
7	b	SE2332120537							
7	c	SE2332120537							
8	a	SE2333620533							
8	b	SE2333620533							
9	a	SE2335220531		1					
9	b	SE2335220531							
9	c	SE2335220531				1			
10	a	SE2337520530							
10	b	SE2337520530	1						
10	c	SE2337520530	1	1					
11	a	SE2339120528	1						
11	b	SE2339120528							
11	c	SE2339120528	1						
12	a	SE2340020587	1					1	
12	b	SE2340020587					1		
12	c	SE2340020587	1	1					
13	a	SE2337420593	1	1					
13	b	SE2337420593					1	1	
13	c	SE2337420593	1	1					
14	a	SE2333020593		1					
14	b	SE2333020593					1	1	

Point	Grapple haul	Waypoint	<i>Elodea nuttallii</i>	<i>Callitriche</i> sp.	<i>Potamogeton pectinatus</i>	<i>Leptodictyum riparium</i>	<i>Hydrocotyle ranunculoides</i>	<i>Lemna minor</i>	Filamentous green algae
14	c	SE2333020593	1	1					
15	a	SE2328820592							
15	b	SE2328820592					1		
15	c	SE2328820592							
16	a	SE2327120577							
16	b	SE2327120577							
16	c	SE2327120577							
17	a	SE2323920586							
17	b	SE2323920586	1	1					
17	c	SE2323920586	1						

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