

Dowlais Brook, Cwmbran

White-clawed Crayfish Survey, September 2021

Dowlais Brook
Llantarnam Industrial Park
Cwmbran
Torfaen

A Report for Hawkeswood Ecology on behalf of Torfaen County
Borough

Julian Jones Ecology Services

September 2021

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A Report to determine the presence of White-clawed Crayfish in the Dowlais Brook, Llantarnam Industrial Park, Cwmbran. Survey carried out within the brook between two footbridges adjacent to the industrial park.

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1. BACKGROUND

Julian Jones Ecology Services were commissioned by Hawkeswood Ecology to carry out a survey for White-clawed Crayfish (*Austropotamobius pallipes*) within the Dowlais Brook, Cwmbran. The focus of the survey was the Dowlais Brook around two footbridges to the north of the Llantarnam Industrial Park, Cwmbran.

Using the National Grid Reference (NGR) system, the upstream footbridge has a grid reference of ST 29786 93523 and the downstream footbridge is ST 29987 93443. Torfaen County Borough propose repairing and restoring the pair of bridges with the downstream bridge being replaced and adjacent bankside gabions being displaced.

Dowlais Brook is designated a SINC (Site of Importance for Nature Conservation) by Torfaen County Borough and partners, it flows into the Afon Lwyd SINC eventually meeting the River Usk SSSI / SAC. The area of survey (shown in pink on Map 1) is bordered by native broad-leaved woodland to the south and a playing field to the north and north-east. Residential housing lies to the north and north-west and very close to the south, although not directly adjacent to the brook is the extensive Llantarnam Industrial Park.

The survey was carried out using a standardized survey methodology to check for the presence of native, White-clawed Crayfish. Two native crayfish were detected during the survey and a series of recommendations have been given which should be carefully considered prior to any building works commencing on the two footbridges. This report has been written by Julian Jones following a crayfish survey conducted at the Site on 8th September 2021.

2. SURVEYOR EXPERIENCE

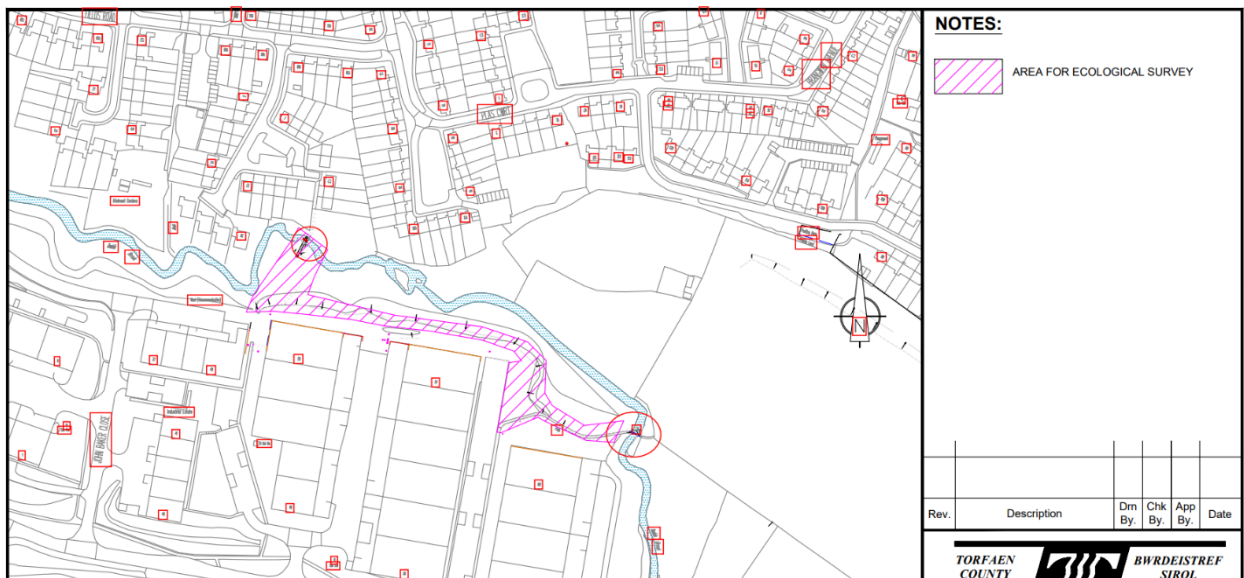
This White-clawed Crayfish survey was carried out by Julian Jones who is also the author of this report. Julian holds a BSc (Hons) degree in Environmental Biology and a MSc in Environmental Management of Protected Areas. He has been a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) for 22 years and a Chartered Environmentalist (CEnv) for over 10 years. He has been involved with White-clawed Crayfish conservation for over 20 years.

Julian Jones holds a Natural Resources Wales (NRW) licence (No. S086910/1) to survey for White-clawed Crayfish in Wales. This allows him to: *“disturb and take by hand, stone turning, netting, torching or by use of appropriate traps whilst surveying; White Clawed Crayfish (Austropotamobius pallipes) within all counties of Wales”*.

There are conditions attached to the licence, notably condition no. 90 which states that: *“The Licensee may survey for white-clawed crayfish in any waterway in Wales **other than** the Afon Edw, Cletwr Brook & Nantyr Offeiriad, Clyro Brook, Dulas Brook (Builth Wells) and Sgithwen Brook. These tributaries of the River Wye between Builth Wells and Hay-on-Wye currently support the strongest populations of this species in Wales. Whilst crayfish numbers continue to decline, it is vital to minimize the amount of disturbance to these populations.”*

3. STUDY SITE

The Dowlais Brook SINC is a tributary of Afon Lwyd SINC which flows into the Afon Usk SSSI / SAC. The area of search was on the Dowlais Brook adjacent to the Llantarnam Industrial Park, between two bridges where work has been proposed by Torfaen County Borough (see area shaded pink on Map 1).



Map 1: Dowlais Brook, Llantarnam Business Park, Cwmbran. Area of survey (shaded pink) between the two footbridges (Map from Torfaen County Borough supplied to Hawkeswood Ecology).

4. RELEVANT LEGISLATION & STATUS

White-clawed Crayfish is listed under Schedule 5 of the Wildlife & Countryside Act (as amended) 1981. It is also afforded protection under Annex II(a) and Annex V of the European Habitats Directive and included as a Species of Principal Importance (SPI) under section 7 of the Environment (Wales) Act, 2016.

A Nature Recovery Action Plan (NRAP) is being developed for Torfaen and Blaenau Gwent, but since White-clawed Crayfish has been prioritized within the UK following changes to the biodiversity framework post 2010, it is likely to remain a priority within the Torfaen and Blaenau Gwent NRAP.

The White-clawed Crayfish is classified as endangered under the IUCN Red List (Füreder et al, 2010) and its population trend is considered to be one of decline across its range.

5. SURVEY METHODOLOGY

The sampling method adopted for this survey was taken from the Common Standards Monitoring (CSM) Protocol for population monitoring of White-clawed Crayfish (JNCC, 2015). Key features of this protocol include:

- i) Biosecurity
- ii) Access
- iii) Manual searching or trapping
- iv) Assessing crayfish attributes – species, sex, carapace length, injury or disease
- v) Selecting sites to survey
- vi) Timing of survey
- vii) Processing data
- viii) Licensing issues

i) Biosecurity

In accordance with NRW Licence Number: S086910/1 (Note N10) a Biosecurity Risk Assessment was carried out five days prior to the survey on 3rd September 2021. Preparation was comprehensive and suitable equipment was gathered together using a crayfish surveyors checklist (Peay, 2003; Table 4). All equipment likely to come into contact with the water was thoroughly checked, cleaned, left to dry and then put in a separate container ready for the survey. Items checked, disinfected and dried included: viewing aid; Vernier gauge callipers; thermometer; hand net; holding bucket; wellington boots; thigh waders; life-jacket and ranging pole. A pair of rubber gloves were purchased which remained sealed until open on the morning of the survey prior to entering the site.

A preliminary inspection of the Dowlais Brook found it to be mostly very shallow and so thigh waders were not used.

At the end of the survey and following return to base all equipment used was thoroughly checked, disinfected and left to dry for 7 days prior to any further use.

ii) Access

The upstream and downstream footbridges on the Dowlais Brook were reached via Public Rights of Way (PRoW) and the brook was searched from these key sampling points. Parts of the brook between the two bridges are rather inaccessible and have difficult terrain with steep banks, an old weir and deeper water. These parts of the Dowlais Brook were avoided as there was sufficient suitable habitat to carry out refugia searches within easily accessible parts of the brook close to the PRoW.

iii) Manual Searching or Trapping

On 8th September 2021 – the day of the survey, conditions were considered ideal and well within the parameters set out in the CSM protocol.

Manual searching was carried out and it was considered that trapping would not be necessary. With reference to the CSM protocol, and starting at the downstream footbridge, potential refuges were checked by gently lifting cobbles and boulders and then returning other suitable refuges.

In this way an initial 100 refuges were checked for White-clawed Crayfish, moving upstream from the downstream footbridge.

A check was then made for suitable potential refuges in the vicinity of the upstream footbridge with 50 refuges being checked.

iv) Crayfish attributes

As part of the methodology being used any crayfish captured from manual searching were to be recorded in terms of their species, sex and carapace length. In addition any animals showing signs of thelohaniasis (porcelain disease), any animals found dead or dying and any freshly injured animals as a result of the survey, were to be recorded.

v) Selecting Sites for Survey

Refugia were checked facing upstream from the downstream footbridge and for approximately 150 metres upstream; no refugia were checked downstream of the downstream bridge.

Refugia were checked 10 metres upstream of the upstream footbridge and up to approximately 50 metres downstream of the upstream footbridge.

vi) Timing of survey

Optimal time for White-clawed Crayfish survey in most parts of England and Wales is given as being from late July to mid-September (JNCC, 2015; Bradley & Peay, 2013). The survey was carried out at the start of the second week of September after a lengthy dry and warm period of weather.

vii) Processing data

Using the CSM protocol, the mean number of crayfish can be recorded per 100 refuges searched. The protocol also provides notes on recording age structure, population health, presence of non-native crayfish and additional environmental data such as siltation or channel modification (JNCC, 2015).

viii) Licensing Issues

Under NRW Licence Number: S086910/1 (Notes N7-N9) NRW will be sent a report detailing biodiversity records collected in association with this licence. This will include results from the current survey.

6. DESK SURVEY

The brief did not include the need for detailed desk survey, however, a primary reason for survey was historic evidence of the White-clawed Crayfish on the Dowlais Brook near Cwmbran. There are three known records of White-clawed Crayfish in the Dowlais Brook in Cwmbran: two records from 2003 with a National Grid Reference (NGR) of ST 309 928 and a single record from 1st July 2008 with a very similar grid reference of ST 309 927 and a location described as being “Dowlais Brook in Llantarnam Abbey grounds”.

The three records are downstream of the survey site and close to the Llantarnam bypass. These confidential records are from Natural Resources Wales (NRW).

7. SURVEY RESULTS

The Dowlais Brook close to the Llantarnam Industrial Park, Cwmbran within the River Usk catchment, was surveyed for the presence of White-clawed Crayfish on 8th September 2021. Sections of the brook were surveyed for crayfish at the upstream footbridge (NGR: ST 29786 93523) and the downstream footbridge (NGR: ST 29987 93443).

Ambient weather conditions were ideal throughout, being dry, sunny and warm (20C) at the start of the survey becoming overcast and slightly cooler towards the end of the survey. The survey was carried out between 11:45 and 15:00 hours BST.

River water temperature on the Dowlais Brook was recorded as 15.5C; the water clarity was good throughout with a low flow and a velocity of well under 20cm per second.

An average river channel width of 5.5 metres was recorded in the sections of brook sampled and an average river depth of 19cm.

The standard survey method as described in section 5 was used throughout, conditions being ideal for manual searching of refuges. Many of the potential refuges detected and searched were in mid-channel although some potential refuges were searched at the margin of the brook. Most of the potential refuges checked were within glides or pools within the brook (for photographs of the search areas, refer to Appendix 1).

Between the two footbridges the margins of the Dowlais Brook are lined by native broad-leaved woodland and the brook was in shade throughout. Playing fields and amenity grassland lie to the north of the brook and the industrial estate to the south.

Potential refuges in the bank of the brook were noted as consisting of some large cobbles / boulders, large tree roots and gabions surrounding boulders around the downstream footbridge; no crayfish burrows were noted.

Much of the substrate of the brook consisted of pebbles (<6.5cm) and cobbles (6.5 – 15cm). Of potential refuges within the brook channel, the most frequently searched were cobbles (15 – 25.6cm) and boulders (25.6 – 40cm). Some larger boulders (>40cm), large woody debris, patches of rubble and other urban debris, including a wooden toilet seat (Appendix 1; Photo 2) were also manually searched as potential crayfish refuges.

Two White-clawed Crayfish were recorded (see Table 1) from 100 refuges searched upstream of the downstream footbridge. Of 50 refuges searched at the upstream footbridge, no crayfish were found.

In total 12 Bullhead (*Cottus gobio*) were found whilst manually searching potential refuges for crayfish. Of the bullhead, 9 were found in the vicinity of the upstream footbridge. Shoals of Minnow (*Phoxinus phoxinus*) were also seen in the brook at both the upstream and downstream footbridges.

Species	M	F	C.L.	<25mm C.L.	Thelohania	F+ young or eggs	Injured	Mori/ dead	Notes
WCC	✓		32mm						
WCC	✓		36mm						

Table 1: Details of White-clawed Crayfish (WCC) found during survey (from White-clawed Crayfish manual survey form template, JNCC, 2015)

8. DISCUSSION

Presence of White-clawed Crayfish was confirmed on the Dowlais Brook adjacent to the Llantarnam Industrial Park, Cwmbran and between the two footbridges where works have been proposed by Torfaen County Borough.

Although presence was confirmed, the population abundance appears to be relatively low and no juveniles were recorded, however more detailed surveys would be required if assumptions were to be made about White-clawed Crayfish population abundance and structure on the Dowlais Brook.

The basis of the survey was not to determine favourable condition status of the White-clawed Crayfish on the Dowlais Brook and in any event it is difficult to use the minimum threshold (i.e. at least 5 crayfish found per 100 refuges checked) to definitely state whether a White-clawed Crayfish population has a favourable condition status or not (JNCC, 2015).

A relatively high frequency of Bullhead is also important to note since the Bullhead is also listed under Annex II of the 'Habitats Directive' and has been used as a qualifying feature for UK SAC rivers such as the River Usk.

No signs of pollution nor recent adverse modification was noted on the Dowlais Brook at this point. Both footbridges are well used and frequented by dog walkers and the pool by the downstream bridge appears to be regularly used by dogs and people alike.

There was some urban debris making up the substrate of the watercourse and this is perhaps unsurprising given that the brook is effectively sandwiched between a large industrial park and a large urban area. However, the woodland contiguous with the course of the Dowlais Brook is an important ecological corridor running through Cwmbran. This has been recognized by the SINC status afforded to the brook and it is hoped that the presence of a healthy White-clawed Crayfish population will be added to the SINC citation.

Based on available information it appears that the proposed works on the downstream footbridge will involve replacement of bridge and bankside gabions and would involve disturbance to the riverbank and a possibility of amounts of sediment being released into the brook. Both of these eventualities could lead to harm to the resident White-clawed Crayfish population. A method statement and mitigation plan would need to be put in place and approved.

Mitigation measures will need to state how disturbance to the riverbank will be reduced and how any sediment being released into the watercourse will be reduced or prevented. A biosecurity risk assessment will need to be included as well as a pollution prevention plan.

Measures to exclude crayfish from entering construction areas can also be considered - provided the water temperature is 4 degrees C or higher, if the method statement and mitigation put in place is not sufficient to rule out crayfish being harmed by the proposals for the two footbridges.

9. RECOMMENDATIONS

A Conservation Licence application will need to be submitted to Natural Resources Wales (NRW) in advance of the proposed works taking place. The NRW application form can be viewed using this link:

[schedule-5-6-species-licence-application-form_v11-may-2018.docx \(live.com\)](#)

The application will need to be supported by a method statement for the proposed works.

Method statement

The method statement will need to address a number of key issues:

Biosecurity

Prior to, during and following any works, contractors should follow the 'Check-Clean-Dry' procedures regarding themselves, vehicles and any other equipment:

[Natural Resources Wales / Check, Clean and Dry to protect our waters from pests and diseases](#)

Timing of proposed works

Works between the two footbridges should ideally take place between **mid-July and mid-September**. This will reduce disturbance to crayfish, particularly those females carrying eggs and very young juveniles.

Guidance to contractors

All those carrying out the works on the footbridges will need to understand the following:

- That native crayfish may be present and the relevant legislation.
 - The mitigation measures that have been put in place to prevent harm to White-clawed Crayfish.
 - That good working practices will be adhered to at all times.
 - What specific activities have been licensed
 - How to identify white-clawed and non-native crayfish and what to do if they are found.
-
- As a likely condition of any licence issued, further procedures will need to be agreed and documented and an assessment made of the likely impacts on White-clawed Crayfish, especially if they need to be moved. These procedures will need to include prescriptive details on how crayfish will be captured and relocated on the Dowlais Brook.

Potential engineering works

Mechanical excavators and related equipment should work from the bankside only and should not enter into the Dowlais Brook itself.

Pumps should be avoided but if they are deemed necessary to use they must be fitted with mesh guards to prevent drawing up crayfish, fish and other animals.

Dewatering should be avoided, however if any dewatering is required for the proposed works, then a thorough search and removal of crayfish by a suitably licensed ecologist should be carried out immediately after the water is drawn down.

If any footings around the footbridges need to be worked on they should be searched and cleared (under the supervision of a suitably licensed ecologist) of crayfish before works can begin. Once an area is cleared of crayfish, material must be installed and works completed without delay to minimize disturbance and harm to the resident crayfish population.

Proposed removal / replacement of gabions and similar structures has the potential to harm and kill crayfish as well as releasing significant sediment into the watercourse impacting on other key species (e.g. Bullhead) as well as crayfish. If gabions and similar structures need to be moved, any White-clawed Crayfish should be captured, recorded and moved to an agreed receptor site(s) within the Dowlais Brook.

Conservation gain for White Clawed Crayfish on the Dowlais Brook

The licence application and method statement will need to demonstrate a conservation gain for the species as a result of the proposed works on the two footbridges.

In conclusion, this is a summary of likely measures that would need to be included in the method statement to support the licence application. It should not be seen as an exhaustive list and additional requirements may be needed to protect the White-clawed Crayfish population.

10. REFERENCES

Bradley, P., & Peay, S. 2013. Competencies for species survey: white-clawed crayfish. Technical Guidance Series. Chartered Institute of Ecology and Environmental Management. <https://cieem.net/wp-content/uploads/2019/02/CSS-WHITE-CLAWED-CRAYFISH-April-2013.pdf>

Füreder, L., Gherardi, F., Holdich, D., Reynolds, J., Sibley, P. & Souty-Grosset, C. 2010. *Austropotamobius pallipes*. *The IUCN Red List of Threatened Species 2010*: e.T2430A9438817. <https://dx.doi.org/10.2305/IUCN.UK.2010-3.RLTS.T2430A9438817.en>. Downloaded on 30 September 2021.

JNCC, 2015. CSM Guidance for Freshwater Fauna. Oct. 2015 ISSN 1743-8160 (Online).

Peay, S. 2003. *Monitoring the White-clawed Crayfish Austropotamobius pallipes*.
Conserving Natura 2000 Rivers Monitoring Series No. 1. English Nature, Peterborough.

APPENDIX 1: Site Photographs



Photo 1: View of downstream footbridge – two White-clawed Crayfish were found upstream of this bridge



Photo 2: Urban debris such as this old wooden toilet seat provided a suitable refuge for Bullhead



Photo 3: Between the two footbridges the Dowlais Brook was found to be gravelly with plenty of small cobbles and woody debris



Photo 4: The whole length of the brook between the two footbridges was lined by broad-leaved woodland

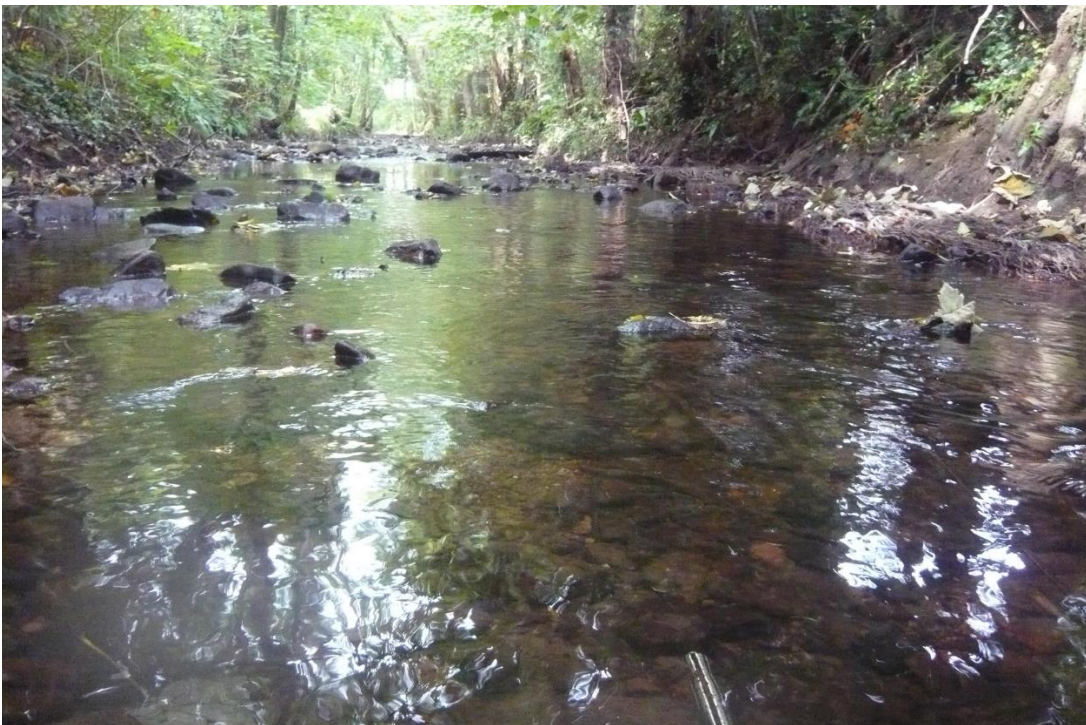


Photo 5: The banks of the brook were often quite steep, composed of large tree roots, boulders and in places artificial structures such as gabions



Photo 6: Some houses and gardens are adjacent to the brook upstream of the upstream footbridge



Photo 7: View from the upstream footbridge

APPENDIX 2: White-clawed Crayfish Photographs



Photo 8: White-clawed Crayfish in holding bucket prior to measurement and safe release



Photo 9: Although relatively docile, White-clawed Crayfish males do show defensive behaviour prior to measurement of carapace