



Sandleford Park, Newbury

Appendix F14: White-clawed Crayfish Survey Report



Bloor Homes & The Sandleford Farm Partnership February 2019

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FIGURES

Figure 1 – White-clawed Crayfish Survey



Executive Summary

Contents	Summary
Site Location	The site is located at Sandleford Park in Newbury, West Berkshire, centred on OS Grid Reference SU 46847 64550. The site comprises agricultural fields with areas of grassland and several copses of ancient woodland. A central valley runs from the north-western corner of the site towards the River Enborne at the site's southern boundary.
Existing Site Information	WYG completed an initial ecological appraisal in 2008 with update surveys completed in 2011, 2013, 2015, 2016 and 2017. In addition, a number of protected species surveys including white-clawed crayfish have been completed at the site.
Scope of this Survey(s)	The aim of this update report was to determine the likely distribution of white-clawed crayfish and signal crayfish on site based on the results of previously conducted surveys in 2011 and 2013, and to provide updated recommendations for the current proposed development.
Results	<p>No white-clawed crayfish (WCC) records were returned within the 2017 update data search, or earlier data searches, and no WCC were found during the 2011 and 2013 surveys.</p> <p>Three records of signal crayfish (which outcompete WCC, and carry crayfish plague, to which WCC are susceptible) from wider area were returned within the data search.</p> <p>During site surveys, signal crayfish were identified in a tributary of River Enborne close to the southern boundary of the site.</p>
Recommendations	<p>White-clawed crayfish are considered likely to be absent from the site, due to the presence of signal crayfish.</p> <p>Recommendations to limit the spread of signal crayfish and its plague include limiting disturbance of the area. The proposed Country Park in the southern part of the site will largely buffer the disturbance to signal crayfish and therefore spreading of this species as a result of the proposed development is considered unlikely.</p> <p>The retention of bank side vegetation, standard pollution prevention methodologies and limiting disturbance to the streams and the River Enborne are recommended.</p>



Glossary

EMP	Ecological Management Plan
GCN	Great Crested Newt
LBAP	Local Biodiversity Action Plan
LWS	Local Wildlife Site
MCIEEM	Member of Chartered Institute of Ecology & Environmental Management
NE	Natural England
NERC Act	Natural Environment and Rural Communities Act 2006
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site(s) of Special Scientific Interest
W&CA	Wildlife & Countryside Act 1981
WCC	White-clawed Crayfish



1.0 Introduction

1.1 Background

WYG was commissioned by Bloor Homes and the Sandleford Farm Partnership in December 2018 to review the findings of the white clawed crayfish surveys with reference to the current proposals.

The original report was prepared by Senior Ecologist David Goddard MCIEEM, with the current update version completed by Associate Ecologist Tamsin Clark MCIEEM.

1.2 Site Location

The site is located at Sandleford Park in Newbury, West Berkshire and is centred at Ordnance Survey National Grid Reference SU 46847 64550. The survey area, hereafter referred to as the 'site', is shown on Figure 1 and comprises of agricultural fields with areas of grassland and several copses of ancient woodland dispersed throughout. A central valley runs from the north-western corner of the site towards the River Enborne at the site's southern boundary.

For details of the development description, please see the main ES chapter.

1.3 Purpose of the Report

The objectives of this assessment are to:

- Discuss the presence of introduced non-native crayfish species along the River Enborne and associated stream;
- Provide a summary of relevant legislation, planning and policy guidelines relating to white-clawed crayfish ;
- Assist the client to operate within the law;
- Provide advice on mitigation strategies.

Note that Latin names are provided at the first mention of each species and common names (where possible) are then used throughout the rest of the report for ease of reading.



2.0 Crayfish Biology

2.1 White-clawed Crayfish

White-clawed crayfish are a UK native species; however in recent years populations in some rivers have declined sharply due to 'crayfish plague', carried by the non-native signal crayfish (*Pacifastacus leniusculus*), which also outcompetes white-clawed crayfish.

White-clawed crayfish are nocturnal. When they are seen, the females are found to have typically broader and more hairy abdominal regions to accommodate their broods. Adult males have much larger claws than the females and are territorial, especially in the breeding season.

White-clawed crayfish habitat requirements tend to be: clear, well oxygenated water, usually fast flowing rivers typically rich in calcite (calcium carbonate, CaCO_3), which is essential for the hard outer shell of the animal. As a chasmophite, it lives under rocks and stones in the river bed or holes burrowed in to the river banks below the water line.

White-clawed crayfish are omnivorous, feeding on a wide range of freshwater macrophytes (small plants), macro-invertebrates (small insects) and detritus (organic debris). It is also cannibalistic, feeding on recently moulted individuals.

In autumn the female attaches the egg cluster (around 100) to the underside of her abdomen. She overwinters in her burrow with her brood until late spring / early summer when they hatch into miniature crayfish but without their tail-fans. At this stage they are immobile and so cling to the female's abdomen.

The offspring moult into a second stage developing a hairy tail-fan enabling them to become mobile and active. After a second moult they develop an outspread tail-fan and have the appearance of mature crayfish. Juvenile crayfish may undergo seven or more moults during their first full year of life but upon reaching maturity after three to four years they only moult once a year.

2.2 Signal Crayfish

Signal crayfish have been farmed in Britain since the 1970's but are now widespread in rivers throughout much of the UK due to escapes and deliberate illegal introductions. They carry crayfish plague, a virulent fungal disease (*Aphanomyces astaci*) which does not affect the signal crayfish but is lethal to the white-clawed crayfish. It has caused drastic losses of native crayfish in rivers within the UK.

Being much larger and more aggressive, signal crayfish prey on native crayfish, out-compete them for food, and also seriously damage river habitats and native fish populations. They have spread rapidly throughout the UK, spreading with them crayfish plague, wiping out native crayfish populations and adversely affecting fisheries.



3.0 Methodology

3.1 Desk Study

3.1.1 Previous Reports

An extended Phase 1 habitat survey was completed by WYG in 2008, with regular updates, the most recent being in November 2017 (Appendix F1). WYG completed white-clawed crayfish surveys in 2011 with an update in 2013.

3.1.2 Local Ecological Records Centre

Information was requested from the Thames Valley Environmental Records Centre (TVERC) and Hampshire Biodiversity Information Centre (HBIC) in December 2017 for information on any nature conservation designations and protected or notable species records within 2 km of the site.

The data search covers:

- Statutory designated sites for nature conservation, namely SACs, SPAs, Ramsar sites, SSSIs, NNRs and LNRs;
- Non-statutory designated sites for nature conservation, namely LWS;
- Legally protected species, such as great crested newts, bats and badger;
- Notable habitats and species, such as those listed as Habitats or Species of Principal Importance; and,
- Priority habitats or species within the Berkshire LBAP.

The data search did not cover:

- Tree Preservation Orders (TPOs); or
- Conservation Areas designated for their special architectural and historic interest.

3.2 Field Surveys

Prior to the commencement of the 2011 crayfish survey, an assessment of the habitats along the surveyed reach of stream and ditch were made and described. Notes were made on the estimated dimensions of the watercourse and the channel substrate. Any disturbance considered relevant and potentially impacting on results was also noted. The stream flows from the north west to the south east across the site whilst the ditch flows from north to south into the stream at approximately OS Grid reference SU 468 645. The stream flows into the River Enborne at approximately OS Grid reference SU 472 638 (see Figure 1).

The 2013 survey concentrated on the stretch between OS Grid Reference SU 471 641 and SU 472 639 due to the low water levels. This survey consisted of setting traps and torching all water bodies and pools where there remained within the stream.

3.2.1 Refugia Searching

Representative samples of areas along the survey reach between OS Grid Reference SU 472 639 to OS Grid Reference SU 467 645 and OS Grid Reference SU 469 649 to OS Grid Reference SU 468 645 were surveyed in detail for crayfish by searching under suitable refugia (cobbles, large pebbles and debris such as branches) for occupation by crayfish (Peay, 2003). A net was held downstream of



each refuge as it was turned over, in order to catch any adult or larval crayfish dislodged during the searching process.

The survey took place on 11th August 2011, during the optimal period for white-clawed crayfish surveys (the optimal period being July-October of any given year), and was carried out by two experienced ecologists from WYG (David Goddard, holder of white-clawed crayfish survey licence number 20111913, and Emily Hare).

3.2.2 Trapping

A series of nineteen crayfish traps were baited and set out on the 10th July 2013 along the stretch between OS Grid Reference SU 471 641 and SU 472 639 concentrating of the pond where the crayfish species had been recorded during the great crested newt (GCN) survey in 2013. The traps were then retrieved on the 11th July 2013 and were carefully checked for any crayfish within them.

The survey took place on 10th and 11th July 2013, during the optimal period for white-clawed crayfish surveys (the optimal period being July-October of any given year), and was carried out by two experienced ecologists from WYG (David Goddard, holder of white-clawed crayfish survey licence number WML-CL11 (12/2012), and Clare May).

3.2.3 Nocturnal Torchlight Searching

White-clawed crayfish are active at night, when they leave their refugia to forage. A torchlight survey was carried out on the night of the 10th July 2013 to detect any nocturnal crayfish activity. The survey was conducted from the bank sides along the stream, using 1,000,000 candlepower CluLite lamps to illuminate the bed of the river. The survey was carried out by two experienced ecologists from WYG (David Goddard, holder of white-clawed crayfish survey licence number WML-CL11 (12/2012), and Clare May).

3.3 Limitations

The survey was completed in 2013, and followed earlier surveys completed in 2011. Although this was completed some time ago, the most recent Phase 1 (November 2017, Appendix F1) has not confirmed any significant changes to the site. Given the known presence of signal crayfish on the site, it is considered extremely unlikely that white-clawed crayfish would now be present within the site.

In 2013, the stream could not be surveyed along the whole length due to the density of the woodland / scrub which had grown over the stream and made access to the stream difficult in places. The pond at OS Grid Reference SU 471 640 was rather turbid making it difficult to see the pond bottom during the torchlight survey. However, this was not considered to represent a significant limitation to the survey results.

4.0 Baseline Conditions

4.1 Crayfish Records

There were no records of white-clawed crayfish returned from TVERC and HBIC.

TVERC returned three records of signal crayfish, two of these were from River Enborne outside of the site boundaries. In the year 2000 the crayfish was recorded approximately 1.5km downstream of the site boundary, while in 2001 the crayfish was recorded approximately 1.5km upstream of the site. One record was from River Kennet & Avon Canal, that is north of the River Enborne.

4.2 Survey Results

4.2.1 Weather Conditions

Survey conditions on the 11th of August 2011 were overcast with occasional bright and sunny spells with 90% cloud cover, wind force 2, and the water temperature was 14°C which conforms to the conditions required as stated in Peay (2003).

Survey conditions on the 10th and 11th July 2013 were bright and sunny with 60% cloud cover, wind force 2.

4.2.2 Habitats

Within the survey reach, the stream flows from north west to south east and varies in width between 1m and 3m with a riffle and pool system with depths varying from 25mm over some of the boulders / bed rock within the river to 1.5m where the pools exist (see Photograph 1 below). The stream has been dammed with steel piling and this has created a pool which is approximately 20m x 30m (see Photograph 2 below).

Photograph 1 Bed Substrate of Stream in Survey Reach





Photograph 2 Pool Made by Damming of Stream



The river bed substrate consists of small amounts of silt covering the gravel and bedrock, with areas of pebble, cobble and tree roots which present potential refugia sites for crayfish (see Photograph 3 below).

Photograph 3 Bed Substrate



There was no vegetation except a small amount of algae growing within the stream and occasional mosses growing on the tops of some boulders. The banks were heavily wooded with few more open areas vegetated by ruderals and scrub (see Photograph 4 below).

Photograph 4 Bank Side Vegetation Along The Stream Within Survey Reach



The drain which flows into the stream flows through an open marshy field with stands of rush (see Photograph 5 below). The width of the drain varies from approximately 1m to 15m and in depth from 30mm to 200mm, the drain has been heavily poached by the cattle and contains a considerable amount of silt.

Photograph 5 The Drain Which Flows into the Stream



4.2.3 Crayfish Presence

In 2011 survey, no crayfish of any species were recorded. It was noted that the river channel substrate appeared to offer suitable habitat for crayfish along with the tree roots extending into the stream from the bank side, however the heavy over shading along the majority of the stream from the trees and scrub reduces the streams potential to support crayfish.

The water quality in the surveyor's professional opinion was good, being clear with minimal algal growth with a good number of aquatic invertebrates being recorded during the survey.

The stream also contained a number of bullhead (*Cottus gobio*) (see Photograph 6 below).

Photograph 6 Bullhead (*Cottus gobio*)



The torchlight survey recorded a single crayfish species briefly at OS Grid reference SU 471 641 as it disappeared under a tree root on the bank side (Figure 1, Crayfish 2). Despite waiting for some time (circa 10 minutes) at the location, the crayfish did not reappear to allow positive identification to be made.

The crayfish traps when retrieved on the 11th July 2013 contained no crayfish of any species but there were a number of bullheads recorded. There were two traps set within the pool where the torchlight record was made and sixteen were set around the pond where a crayfish had been recorded during the great crested newt survey in 2013 (Figure 1, Crayfish 1). The remaining trap was set downstream of this pond.

4.2.4 2013 Otter / Water Vole Survey

During an otter / water vole survey which was conducted by Graeme Smart and Isla Hoffmann on the 17th October 2013, the presence of signal crayfish was confirmed through the finding two live males and also remains of signal crayfish along the River Enborne, and thus it is considered unlikely that white-clawed crayfish are present.

4.2.5 2018 Aquatic Invertebrate Survey

As noted in Appendix F13, a single signal crayfish was observed in the stream at the same location as during the 2011 survey (Figure 1, Crayfish 2).



5.0 Relevant Legislation

The white-clawed crayfish is listed on Schedule 5 of the *Wildlife and Countryside Act 1981 (as amended)* in respect of Sections 9(1) (taking only) and 9(5) of the 1981 Act which makes it an offence to intentionally take or sell white-clawed crayfish.

The white-clawed crayfish is also a species of principle importance under the Natural Environment and Rural Communities (NERC) Act 2006 and is therefore a material consideration during the planning process.



6.0 Discussion

6.1 Signal Crayfish

A single crayfish species was recorded during the surveys undertaken during 2013, thus indicating that there is a very small population present on site. However due to the brief views obtained it was not possible to determine which species of crayfish it was. Subsequently during the otter / water vole survey in October 2013, signal crayfish were confirmed as being present on site. In addition, signal crayfish were noted in the stream on site during 2018 aquatic invertebrate surveys (Appendix F13).

Given the presence of signal crayfish on site, it is considered that white-clawed crayfish are likely to be absent from Sandleford Park.

6.2 Recommendations

As signal crayfish is an invasive species, the following precautions are recommended to reduce the risk of spreading this species, so as not to breach the *Wildlife and Countryside Act 1981 (as amended)*:

- Any equipment or personal protective equipment that becomes wet due to working in or adjacent to the stream should be disinfected following the completion of work each day so as to stop any potential spread of the crayfish plague within the site or to other sites.
- Appropriate pollution prevention control methods should be employed throughout the development process so as to avoid any pollution entering the water courses on site and flowing into the River Enborne.
- When construction work is undertaken it is recommended that all appropriate methods are employed to avoid and reduce to an absolute minimum, any siltation or runoff taking place, particularly when creating the crossings points over the water course. This can be partly achieved by making sure that all excavated material is not stored adjacent to any of the water courses on site. All relevant Pollution Prevention Guidelines (PPGs) should be adhered to. This is addressed within the EMMP (Appendix 18).
- Construction works are not proposed within the southern part of the site near the River Enborne. In addition, public access to existing watercourses is not proposed to be encouraged. This will reduce the risk of crayfish /crayfish plague contamination from pedestrians and dog walkers.

Please be aware that should a signal crayfish be removed from the stream it will be an offence under the wildlife and Countryside Act 1981 (as amended) to release it back into the stream. It is recommended to place it in a bucket with water and seek advice from a suitably qualified ecologist.

In the unlikely event that native white-clawed crayfish are found during the development works all operations should cease immediately and advice from Natural England be sought prior to the recommencement of any work activities.



6.3 Enhancements

It is requirement of the revised NPPF to provide enhancements for biodiversity as part of development. Ongoing ecological involvement in the design evolution for this development has ensured that enhancements have been incorporated into the design, construction and operation of the site. The following measures are of particular relevance to freshwater species:

- Following the construction of any crossing points required over the streams, the banks will be reinstated to the same height and profile and allowed to vegetate naturally from the surrounding area. This will help to maintain the streams in as natural condition as possible.
- It is recommended that no trees should be removed from along the water courses during the development works as their removal will potentially cause siltation of the water course.



7.0 References

- Peay, S. (2003). Monitoring the White-clawed Crayfish *Austropotamobius pallipes*. Conserving Natura 2000 Rivers Monitoring Series No. 1, English Nature, Peterborough.
- WYG (2015) Sandleford Park: White-clawed Crayfish Survey report.



FIGURES

Figure 1 – White-clawed Crayfish Survey

