

2019 Update on White-clawed Crayfish Populations in the Wyre Forest

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Introduction

Members of the Wyre Forest Study Group have been monitoring native White-clawed Crayfish *Austropotamobius pallipes* populations in streams within the Wyre Forest since 2010. A *pallipes* is described as 'threatened' in the ICNU Red Data book (Füreder et. al, 2010). In August 2019 further surveys were completed on two streams by an experienced group of surveyors. Bell Brook had been a hot-spot for native crayfish, but when Crayfish Plague *Aphanomyces astaci* appeared in 2016 all native crayfish were killed. The source of the outbreak was not clear, therefore surveys have continued to try to establish if Signal Crayfish *Pacifastacus leniusculus* have entered the stream. Forest Lodge Stream still has a population of native crayfish and its continued health is of interest.

Methods

A detailed description of methods is provided in the annual Wyre Forest Study Group Review from 2010, 2011 and 2012 (Hill and Hill 2011; Hill and Hill 2012 and Hill 2013). Following the confirmation of Crayfish Plague in Bell Brook in 2016 (Hill, 2017), to reduce the possibility of cross contamination, only bankside torching surveys and environmental DNA (eDNA) sampling were undertaken in 2018.

In previous years water samples were taken for DNA analysis, but this method was not available in 2019.

Results

The watercourses monitored in 2019 are presented in Figure 1 and the details described in the following text.

Habitat

Water levels in 2019 were low and water clarity good: in Forest Lodge Stream 95% of the bed was visible by torch and in Bell Brook between 95% and 100%. There appeared to be no substantial change to the stream channels of either stream, each provided suitable habitat for crayfish – coarse stony substrate, overhanging banks and tree roots.

Forest Lodge Stream

Two surveys were undertaken of Forest Lodge Stream in 2019 by Ann Hill, Graham Hill, Mike Averill and Jane Scott. The upper part of the stream, above the driveway to Forest Lodge, was surveyed on 12 August 2019 between 21:05 and 21:58 (53 minutes) during which three adult and four juvenile White-clawed Crayfish were seen. The lower part of the stream was surveyed on 13 August 2018 between 20:51 and 21:25 (34 mins), five adult and 27 juvenile White-clawed Crayfish were seen, a total of 32 crayfish. The reach within the Helen Mackeness Reserve was also surveyed on 13

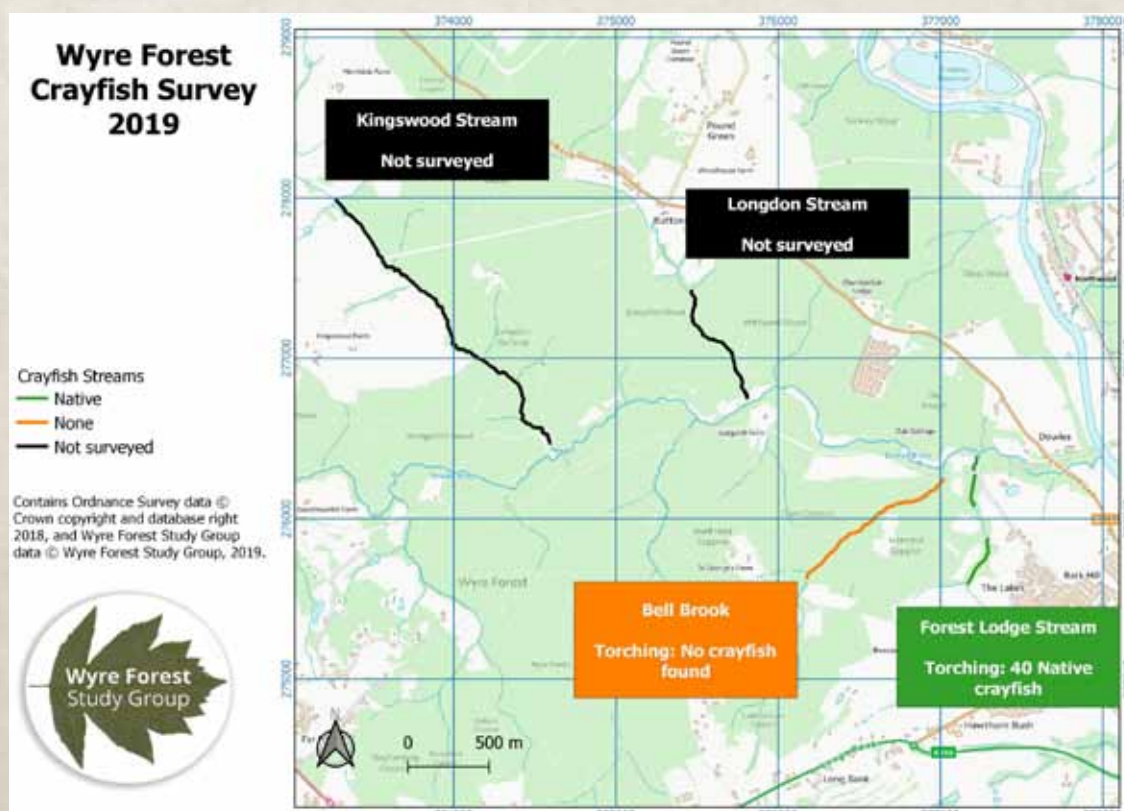


Figure 1: Location of watercourses surveyed in the Wyre Forest in 2019 showing results from each stream

This article is an extract from the Wyre Forest Study Group annual Review 2019

August 2019 between 21:54 and 22:11 (17 minutes), one juvenile White-clawed Crayfish was recorded although no adults were seen. Bed visibility was generally good with 95% of the bed visible in each reach (Table 1).

Torching	FL Upper	FL Lower	FL HMR
Date	12/08/2019	13/08/2019	13/08/2019
Surveyors	AH GH JS MA	AH GH JS MA	AH GH JS MA
Survey Start	21:05	20:51	21:54
Survey Finish	21:58	21:25	22:11
Water temp	14.5	16.7	
Water level	Low	Low	Low
Visibility %	95	95	95
Survey Mins	00:53	00:34	00:17
Native Adult	3	5	0
Native Juvenile	4	27	1
Signal Adult	0	0	0
Signal Juvenile	0	0	0

Table 1. 2019 Crayfish survey results from Forest Lodge Stream (FL); Helen Mackenness Reserve (HMR).

A total of 40 White-clawed crayfish were seen during the 2019 torch survey (Figure 2), a considerable drop from numbers recorded in 2018. The catch per unit effort value (0.38) is also a decrease from the previous year (Figure 3), both 2018 and 2019 data include the

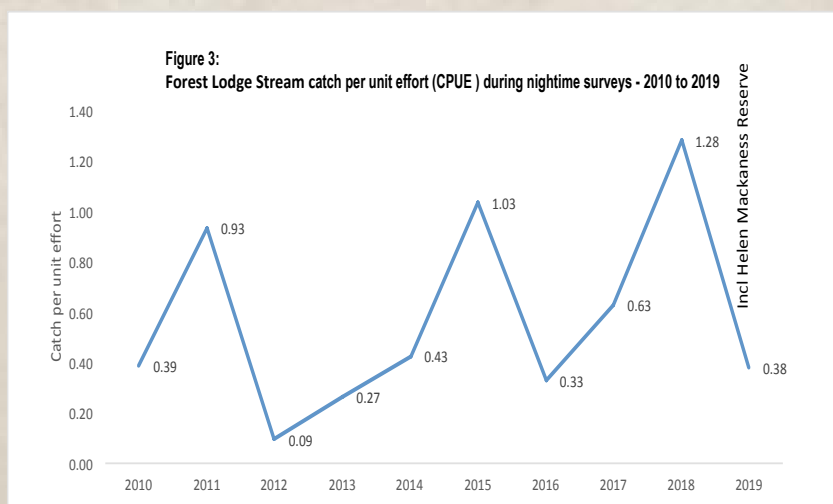
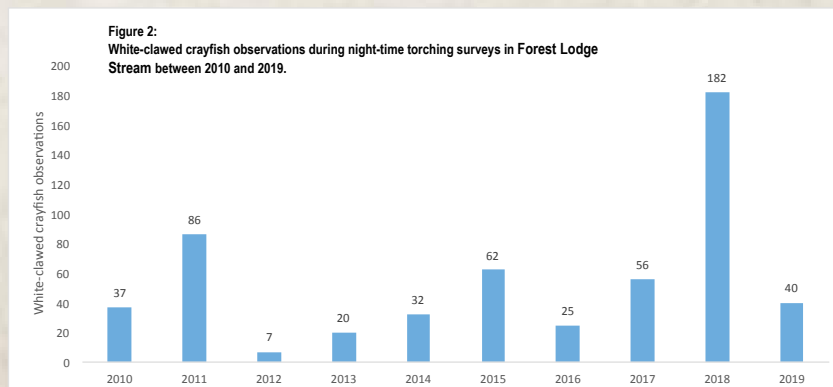
additional reach of Forest Lodge Stream in the Helen Mackenness Reserve, where one crayfish were noted during 17 minutes of survey. The CPUE for the two upper reaches of Forest Lodge Stream was 0.45, and this figure is directly comparable to previous surveys.

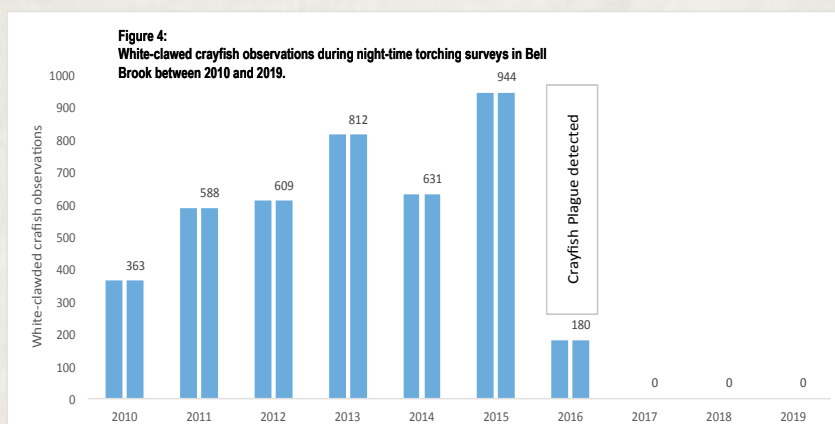
Bell Brook

A torch survey of Bell Brook was undertaken on 15 August 2019 by three surveyors (Ann Hill, Mike Averill and Jane Scott); surveying started at 20:42 and concluded at 22:20. No crayfish were seen during the survey (Table 2, Figure 4).

Torching	Bell Brook
Date	15/08/2019
Surveyors	AH MA JS
Survey Start	20:42
Survey Finish	22:20
Water temp	
Water level	Low
Visibility %	95%
Survey Mins	01:38
Native Adult	0
Native Juvenile	0
Signal Adult	0
Signal Juvenile	0

Table 2. 2019 Crayfish survey results from Bell Brook (BB).





Discussion

Forest Lodge Stream continues to support a population of White-clawed Crayfish, which is good news. The population size, as measured by CPUE, fluctuates from year to year. 2018 was a particularly good year with 182 individuals seen (Hill and Troth, 2019). The reduction to 40 individuals in 2019 was not expected, although that figure broadly fits with the overall population size during the last 10 years. All individuals seen in 2019 appeared to be healthy and there were no signs of crayfish plague. The presence of both adult and juvenile crayfish indicates that this is a breeding population. Forest Lodge Stream is the last known population of native crayfish in Wyre, but it is vulnerable to extinction being surrounded by streams with invasive Signal Crayfish and Crayfish Plague.

The population of native crayfish in Bell Brook was wiped out in 2016 when Crayfish Plague was introduced. The 2019 survey did not find any crayfish. If plague had been introduced following the introduction of Signal Crayfish it is likely that surveys over the past three years would have found evidence of their presence; it hasn't. Crayfish habitat remains good in Bell Brook.

Conclusion

Native crayfish are still present in Forest Lodge Stream. Whilst this is good news the White-clawed Crayfish population this is still vulnerable to extinction. Signal Crayfish are host to Crayfish Plague and the vector by which plague was introduced to the UK (Kozubíková-Balcarová and Horká, 2015), but the 2019 surveys did not find any crayfish in Bell Brook, even though plague was introduced into the brook in 2016, and DNA analysis in 2018 found Signal Crayfish DNA in St. George's Stream near its confluence with Bell Brook. From this evidence, it would seem that plague was not introduced directly by Signal Crayfish, and it is likely that infected water was introduced to the stream by a third party.

Bell Brook remains a candidate for White-clawed Crayfish re-introduction, although more investigations would be needed to ensure that results presented here (and in previous years) are up-to-date. Crayfish habitat remains excellent and water quality does not appear to have diminished since 2016. However, the paths beside the brook are popular with walkers, cyclists and dog walkers, one of whom is most likely to have introduced plague to the stream. If access to the brook by these groups could be managed so as to exclude them from the water then the chances of any re-introduction would be improved considerably.

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