Update on the White-clawed Crayfish within the Wyre Forest, 2013

ANN AND GRAHAM HILL

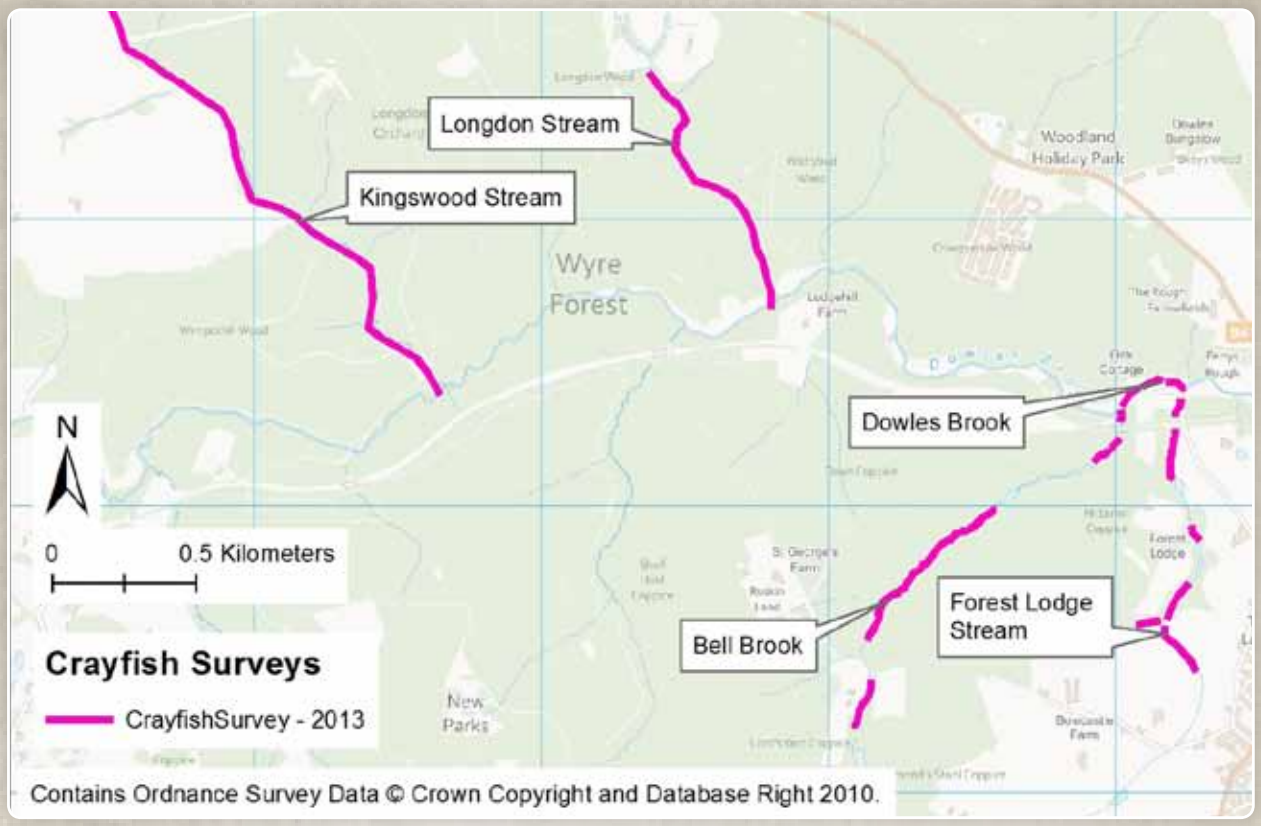

Figure 1: The location of the crayfish monitoring site in the Wyre Forest showing the four sample watercourses.

Background

A programme of annual monitoring of the White-clawed Crayfish population in the Wyre Forest has been underway for the past four years. The study started in 2010 following the discovery of native White-clawed Crayfish in a small stream in the forest. This article gives an update on the findings from the 2013 survey.

Methods

A detailed description of the survey methods are given in the annual Wyre Forest Study Group Reviews for 2010, 2011 and 2012. Methods follow published guidelines and best practice (Peay 2002). The 2013 survey replicated (where possible) the initial surveys with a similar team of surveyors, the same number and location of sample patches and the same amount of survey effort as surveys undertaken in previous years. Variables that may affect (both positively and negatively) efficiency and replication were human factors (i.e. increasing age, decreasing mobility, increasing awareness of habitat and species) and environmental factors (change in channel structure, flow and habitats (i.e. land and tree slippage), difficult and unstable terrain, temperature). Comparison of the observations across the years was interpreted using Catch per Unit Effort (CPUE) data as an index for the long-term monitoring of the crayfish populations. Standard units were used i.e. one minute time periods, one refuge searched by hand and/or one baited trap.

In addition to the daytime manual searches and night-time torching, baited traps were used to survey the in-stream pond in Bell Brook. Environment Agency (EA) approval to trap was obtained. Two designs of plastic mesh trap with funnel entrances were used: the dimensions of both trap designs complied with EA rules for the measurements and type of trap. Ten traps of each design were used, one of each trap design was placed as a pair in ten favourable habitats on the south bank of the pond. Twenty traps in total were used and the individual trap was baited with cat food. Traps were set in the afternoon and all traps were retrieved and the catch emptied within twenty four hours of the setting of a trap.

All survey work was undertaken by two licensed surveyors and several assistants between 13 August and 7 October 2013. The site and the location of the four watercourses are shown in Figure 1.

Bell Brook

Bell Brook continued to support excellent and abundant in-stream refugia with frequent refuges in the bank. There was a continuing increase of total crayfish records (all survey methods combined) from the watercourse (see Figure 2).

This article is an extract from the Wyre Forest Study Group annual Review 2013

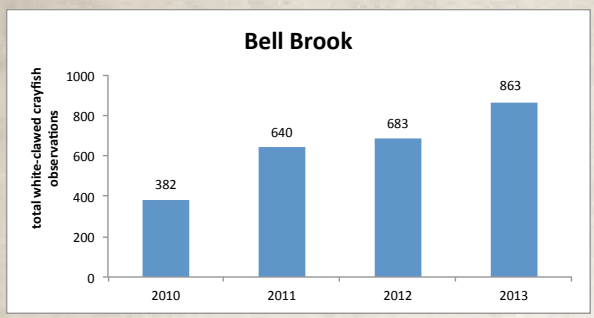

Figure 2: Total combined White-clawed Crayfish observations using standard day-time manual searches, night-time torching, casual searches and baited traps in Bell Brook between 2010 and 2013.

There was a maximum count during one night-time torching survey of 812 White-clawed Crayfish. The overall population, based on Catch per Unit Effort, showed a slight decline in 2013 but overall the population abundance continued to remain high, Figure 3. Observations of White-clawed Crayfish active at night increased whilst White-clawed Crayfish found during standard manual searches of suitable habitat decreased.

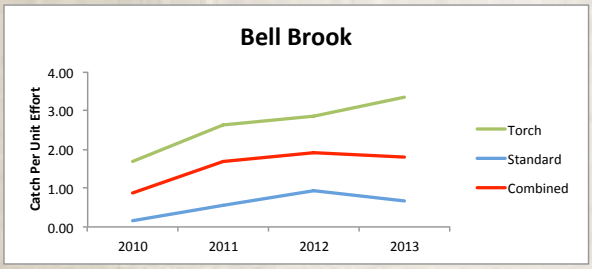

Figure 3: Comparison of Catch Per Unit Effort of White-clawed Crayfish observations using different survey methods in Bell Brook between 2010 and 2013. Standard units were used i.e. one minute time periods and/or one refuge searched by hand.

Both male and female White-clawed Crayfish were present in Bell Brook in 2013. Of those caught 81% were female (25 individuals), 19% were male (6 individuals) and the percentage of the population classed as juveniles (<25mm carapace length from tip of rostrum to junction of carapace and tail) was 16%. Recorded carapace length ranged between a female with 11.20mm carapace and a male with 39.00mm carapace length (average 28.4mm carapace length). Dismembered crayfish were found along Bow Brook, interestingly at the same place as on previous years.

The results from the baited traps were disappointing with only two White-clawed Crayfish caught (both individuals caught in the same design of trap) although frequent disturbance of the water (e.g. dogs swimming in the water) may have confused the results.

Forest Lodge Stream

Forest Lodge Stream also had abundant bank-side habitat (under cut banks, large tree roots) and locally abundant in-stream habitat (boulders, cobbles, tree roots, debris dams). The water levels were low to moderate and there was a high degree of silt in the water in the upper reaches above the silt traps. There was an increase in White-clawed Crayfish records from the 2011 population levels following the period of low flow in 2011 when the population crashed but the population still has not back to 2010 levels, Figure 4. The maximum count for a survey was 20 during torching of Forest Lodge Stream from the culvert to the gabions by Forest Lodge Road.

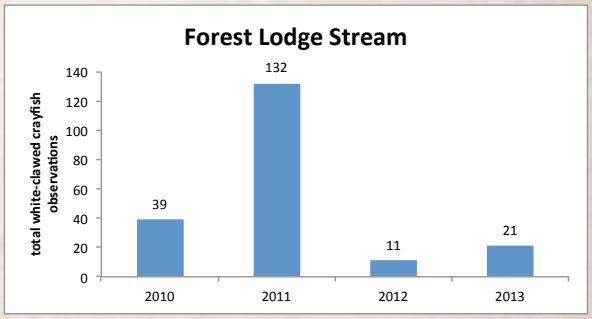

Figure 4: Total combined White-clawed Crayfish observations using standard day-time manual searches, night-time torching, rescue operations and casual searches in Forest Lodge Stream between 2010 and 2013.

The results to date indicated that the White-clawed Crayfish population in Forest Lodge Stream was increasing following the drought and rescue operation of 2011 and the subsequent fall in population levels in 2012, Figure 5.

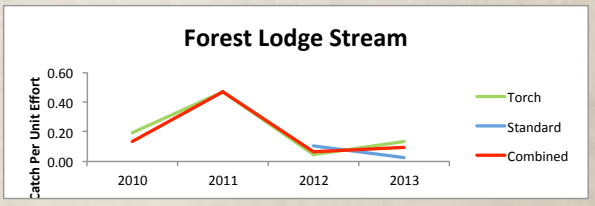

Figure 5: Comparison of Catch Per Unit Effort of White-clawed Crayfish observations using different survey methods in Forest Lodge Stream between 2010 and 2013. Standard units were used i.e. one minute time periods and/or one refuge searched by hand.

No individuals were caught during the standard manual survey so carapace size and the sex of individuals in 2013 is unknown but the percentage of the population classed as juveniles (juvenile = 25mm carapace length) recorded during torching of Forest Lodge Stream was 25%. Dead crayfish and the absence of large fish in the watercourse may be a result of the very dry weather

in July and early August, when the stream may have dried up.

Kingswood Stream

Bankside habitat and in-stream habitat was very variable but overall the habitat was good. The water was often too turbid to torch and search effectively and filamentous algae were frequently observed floating or attached to the substrate. Thirteen crayfish were recorded in Kingswood Stream during two surveys, Figure 6.

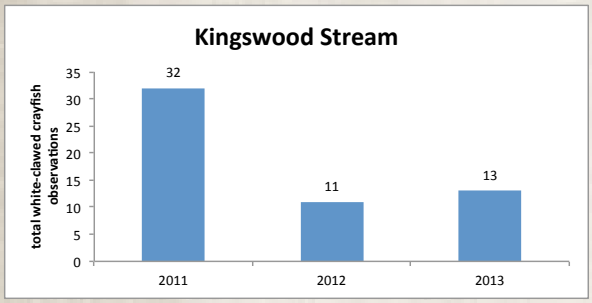

Figure 6: Total combined White-clawed Crayfish observations using standard day-time manual searches, night-time torching and casual searches in Kingswood Stream between 2011 and 2013.

The maximum count per survey was twelve during torching. The White-clawed Crayfish population in Kingswood Stream had increased slightly on the 2012 observations but still not attained the abundance recorded in 2011, Figure 7.

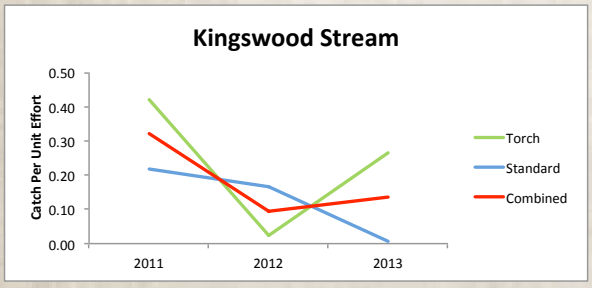

Figure 7: Comparison of Catch Per Unit Effort of White-clawed Crayfish observations using different survey methods in Kingswood Stream between 2011 and 2013. Standard units were used i.e. one minute time periods and/or one refuge searched by hand.

Both male and female White-clawed Crayfish were recorded in Kingswood Stream. Of those caught three were male and one was female and the percentage of the population classed as juveniles (juvenile = 25mm carapace length) was 25%. Carapace size ranged between 13.8mm and 46.2mm carapace length (average 28.32mm carapace length). Four intact dead adults, with no evidence of injury, were found on the margins of the water during the survey.

Longdon Stream

The White-clawed Crayfish population has always been low in Longdon Stream but in 2013 no evidence of White-clawed Crayfish was found in the watercourse, Figure 8. However, a dead White-clawed Crayfish was found in the garden at Knowles Mill (600m downstream) a few weeks prior to the survey and following a period of heavy rainfall.

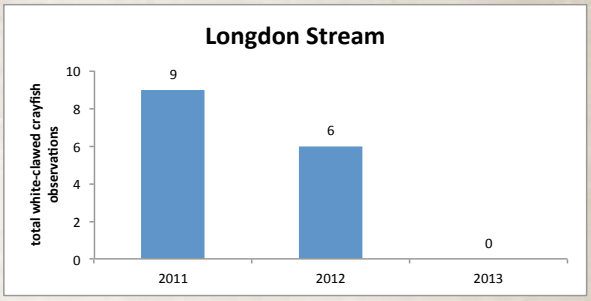

Figure 8: Total combined White-clawed Crayfish observations using standard day-time manual searches, night-time torching and casual searches in Longdon Stream between 2011 and 2013.

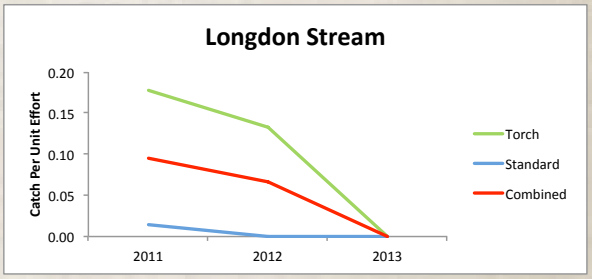

Figure 9: Comparison of Catch Per Unit Effort of White-clawed Crayfish observations using different survey methods in Longdon Stream between 2011 and 2013. Standard units were used i.e. one minute time periods and/or one refuge searched by hand.

Discussion

In-stream and bankside habitat remained excellent in all four watercourses. White-clawed crayfish were recorded in three of the four watercourses. No evidence of non-native crayfish was found in any of the four watercourses. All White-clawed Crayfish caught and recorded appeared healthy with no evidence of crayfish-plague.

Monitoring evidence to date indicates that:

- Bell Brook population is in favourable condition (male, female and juveniles were present) with a high population abundance, no declining trend in relative abundance and no known threats to the population. The finds from the surveys are thought to be representative of the population abundance.
- Forest Lodge population is in favourable condition (male, female and juveniles present) with a variable


Female White-clawed Crayfish Ann Hill

relative abundance related to high and low flow conditions which is a constant and unpredictable threat to the population. Survey results are likely to be an under-estimate of population size due to difficulty of sampling i.e. frequent to abundant inaccessible refugia, unstable terrain etc. The population appears to be resilient in the face of adverse environmental factors.

• Kingswood Stream population is low (most likely due to historic issues of water quality that have now been partly resolved) but has a slowly recovering trend in relative population abundance (male, female and juveniles were present).

• There was no evidence found of the previously recorded "low and declining" populations of 2011 and 2012 although it should be noted that the survey may not record where population abundance is low and that one White-clawed Crayfish was found in the locality during the preceding month.

Overall, there was not much change in habitat and population. It is still too early to detect long-term change in population abundance but in the short-term there is concern regarding the population in Longdon Stream. The programme of annual monitoring is planned to continue.

References

Hill, A., 2010. Atlantic Stream Crayfish in Wyre. In: Winnall, R. (Ed.) Wyre Forest Study Group Review 2010.

Hill, A., 2011. Crayfish of Wyre Forest – an update. In: Winnall, R. (Ed.) Wyre Forest Study Group Review 2011.

Hill, A., 2012. Annual Monitoring of the White-clawed Crayfish Poppulations within the Wyre Forest. In: Winnall, R. (Ed.) Wyre Forest Study Group Review 2012.

Peay, S., 2002. A Standardised Survey and Monitoring Protocol for the White-clawed Crayfish in the UK. Life in UK Rivers LIF 02-11-37. EC LIFE Programme, DG Env.D.1., Brussels, Belgium.

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

Acknowledgements

We are grateful to the Wyre Forest Study Group and Forestry Commission who provided local knowledge and access details, Natural England and private landowners for access permissions and the volunteers, especially Mike Averill, Jane Scott and Rosemary Winnall, who assisted with the survey work.


Crayfish recorders 2013 from left: Jane Scott, Cassie Needham, Paul Hoban, Graham Hill, Rosemary Winnall, Mike Averill Ann Hill