Cyfoeth Naturiol Cymru
Natural Resources Wales

Assessment of the condition of the white-clawed crayfish *Austropotamobius pallipes* in the River Wye Special Area of Conservation in 2014

David Rogers & Elizabeth Watson

NRW Evidence Report No. 74

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1. Crynodeb Gweithredol

Ym mis Hydref/Tachwedd 2014, fe arolygwyd rhannau o ACA Afon Gwy ar Afon Edw, Nant yr Offeiriad a Nant Sgithwen am gimwch yr afon grafanc wen er mwyn asesu cyflwr poblogaeth cimwch yr afon a chynefin cimwch yr afon. Roedd y samplu yn dilyn methodoleg a ddatblygwyd yn ystod rhaglen fonitro 2003 (Rogers & Watson 2004), ac roedd yn cynnwys cyfuniad o chwilio â llaw a thrapio. Ymgymerwyd â'r gwaith i gyflwyno ychydig o ddata oedd ei angen i asesu p'un a oedd cimwch yr afon grafanc wen mewn cyflwr ffafriol yn ACA Afon Gwy.

Tra bydd rhaid casglu ragor o ddata cyn y gall asesiad llawn gael ei wneud, mae'r diffyg ymddangosiadol o gimwch yr afon grafanc wen yn Afon Edw, wedi marwoldeb yn 2006, yn bryderus o ystyried bod hyn wedi bod yn ddyfrffordd bwysig ar gyfer y rhywogaeth hon yn y gorffennol. Tra bod niferoedd cimychiaid yr afon yn gymharol gadarn yn Nant yr Offeiriaid a Nant Sgithwen, roedd poblogaethau wedi'u cyfyngu yn bennaf i flaenddyfroedd.

Mae'n bwysig i gwblhau gwaith arolwg cimwch yr afon grafanc wen ar ACA Afon Gwy yn 2015 er mwyn i ganlyniadau 2014 gael eu cyfuno fewn i asesiad cyffredinol.

2. Executive Summary

In October/November 2014, parts of the River Wye SAC on the Afon Edw, Nant yr Offeiriad and Sgithwen Brook were surveyed for white-clawed crayfish to assess the condition of both the crayfish populations and crayfish habitat. Sampling followed the methodology developed during the 2003 monitoring programme (Rogers & Watson 2004), and included a combination of manual searching and trapping. The work was undertaken to provide some of the data required to assess whether the white-clawed crayfish in the River Wye SAC was in favourable condition.

Whilst further data will need to be collected before the full assessment can be made, the apparent lack of white-clawed crayfish in the Afon Edw, following a mortality in 2006, is worrying given that this has been a very important waterway for this species in the recent past. Whilst crayfish numbers were relatively robust in Nant yr Offeiriad and Sgithwen Brook, populations were mostly confined to the headwaters.

It is important to complete survey work for white-clawed crayfish on the River Wye SAC in 2015 so that the 2014 results can be amalgamated into an overall assessment.

3. Introduction

3.1. Background information

The white-clawed crayfish *Austropotamobius pallipes* is a feature of the River Wye Special Area of Conservation (SAC). The SAC designation aims to ensure that populations within selected sites are in Favourable Condition and that Favourable Conservation Status (FCS) is maintained across its range. Favourable Condition is defined by a Conservation Objective that is assessed by monitoring appropriate attributes against agreed thresholds. To this end, a standardised monitoring protocol for the white-clawed crayfish was developed as part of the 'LIFE in UK Rivers' project (Peay, 2002).

Surveys for crayfish within the mid-Wye catchment in 1995 and 2002 helped to determine its status and distribution, and identified the most important tributaries on the River Wye (Rogers & Holdich, 1995; Rogers & Watson, 2003). These are Afon Duhonw, Afon Edw, Afon Irfon, Afon Llynfi, Clyro Brook, Dulas Brook (Builth Road), Nant yr Offeiriad and Sgithwen Brook. The surveys also enabled the setting of provisional thresholds for condition assessment within these key tributaries. Using a modified version of the standardised UK monitoring protocol, a condition assessment of the population in the Wye SAC was undertaken in 2003 (Rogers & Watson, 2004). During the course of the monitoring programme, the protocol was further modified to include trapping as well as manual searching to improve the volume of data.

Using five attributes to determine favourable condition (see Table 1), the 2003 assessment concluded that the white-clawed crayfish population was in unfavourable condition, although it was noted that the only failing threshold was the average number of crayfish recorded in each habitat patch. The authors suggested that the "lower limit of [greater than one] is set too high and should be revised" (Rogers & Watson, 2004).

White-clawed crayfish were found in 6 of the 8 monitoring units, being absent from the Afon Duhonw and the Afon Irfon. Whilst porcelain disease was recorded at low incidence, no signal crayfish were detected in any of the monitoring units. Suitable habitat was recorded in 79% of the sampled habitat patches and all monitoring units had a GQA Biological Class of A or B.

Since 2003, signal crayfish appear to have spread within the Bachawy, a tributary of the mid-Wye, despite attempts to control numbers, and may now be in the main Wye river channel (Chris Dyson, pers. comm.). The dispersal of signals within the mid-Wye catchment will have a serious impact upon white-clawed crayfish, by both direct competition and the spread of crayfish plague. Overall the last three years, a captive-rearing programme has released 3000 juvenile white-clawed crayfish into the Afon Chwefru (a tributary of the Afon Irfon). This needs to be taken into account when assessing the condition of the Irfon monitoring unit.

3.2. Objectives

The objective of the 2014 survey work was to undertake monitoring of the white-clawed crayfish and its habitat within the River Wye SAC in order to report on condition as part of the assessment of Favourable Conservation Status for Natura

2000 features. The scope of the project was limited by financial constraints and weather conditions, given that the work was commissioned late in the year.

Table 1: Conservation Objective for the white-clawed crayfish in the River Wye SAC in 2003.

Attribute No.	Conservation objective (when the feature is in favourable condition)	To maintain the white-clawed crayfish *Austropotamobius pallipes* in the River Wye SAC in favourable condition where:
1	**Lower limit**	the average number of crayfish recorded in each habitat patch is: greater than 1
2	**Lower limit**	where: crayfish are present in 5 of the 8 monitoring units
3	**Lower limit**	and where: there is an absence of alien crayfish and plague, and a <10% incidence of porcelain disease
4	**Habitat quality** **Lower limit**	Suitable habitat should be present in 60% of the sampled habitat patches
5	**Lower limit**	and where: water quality is at GQA Biological Class A or B in 5 of the 8 monitoring units
Definition of suitable white-clawed crayfish habitat		River beds with cobble and boulders larger than 15cm along the longest axis, and with little or no siltation.

4. Methods

Monitoring of current condition followed the Common Standards approach adopted during the 2003 assessment, including the use of traps as well as manual searches.

The Nant yr Offeiriad, Edw, Sgithwen Brook, Dulas Brook (Builth Road) [and Llynfi] were considered to be the most important **monitoring units** because most crayfish were found within these tributaries in 2003, and therefore monitoring efforts focussed here in 2014.

A total of 16 x 500m **stretches** were selected randomly within each monitoring unit (see Appendix A to C). Starting from the downstream end of the stretch, a 100m sampling site was selected within each stretch which contained five suitable **habitat patches** measuring from 1 to 20m^2. Within each habitat patch, 10 potential **refuges** (large cobble or boulder >15cm along longest axis) were searched and the number of crayfish recorded. Given the low population levels currently found on the River Wye, the examination of relatively small numbers of refuges sometimes failed to find any crayfish, and timed searches of 15 minutes within each habitat patch were more appropriate as well as the use of traps.

A crayfish habitat recording form was completed for each site. The form consists of the following:

- Basic survey details, including conditions at the time of the survey.
- Habitat details in each habitat patch.
- An overall appraisal of habitat for crayfish and ease of survey in the site.
- Crayfish record, the details of the catch.

A photograph was taken at each site and incorporated into the habitat recording form and where crayfish were found, details were recorded on a crayfish species survey form. Following examination, the crayfish were returned to the water in the position from whence they came.

Special attention was paid to Health and Safety procedures for fieldwork in the water and to the use of appropriate precautions to prevent the spread of crayfish plague.

4.1. Methods of Analysis

4.1.1. Crayfish catch

The crayfish catch was analysed as follows:

- Geographical distribution of crayfish within the monitoring unit showing sites and abundance on a scale of distance upstream from the confluence of the River Wye .
- Crayfish abundance per site as number of crayfish caught at each sampling site, relative abundance at each site and average abundance per monitoring unit. Classification was graded using the 5-point scale shown in Table 2.

Table 2: Average counts of crayfish and classification of population abundance (after Peay, 2002).

Average number of crayfish per site	Population abundance
>5	Very high
>=3, <=5	High
>=1, <3	Moderate
>0, <1	Low
0	Absent/undetected

- Size distribution of population.
- % of population as juveniles less than 25mm carapace (CL)
- Health of population, % of population with thelohaniasis (porcelain disease).
- % of adult females showing signs of breeding.

4.1.2. Habitat

Each sampling site was evaluated for crayfish habitat according to abundance of habitat as shown below.

- Evaluation of crayfish habitat for whole site (scored separately for margins, mid-channel and banks):

0	Not evident or only minimal potential for refuges
1	Present but localised or sparse, in less than a third of site
2	Frequent, covering more than a third of site, or frequent, but small patches
3	Abundant. Potential refuge habitat continuous, or semi-continuous, along more than two-thirds sample site

An evaluation of crayfish habitat score was calculated for each tributary surveyed and also for the River Wye SAC to assess the presence of suitable crayfish habitat.

4.1.3. Water quality

Water quality data was not collected during this survey.

5. Results

The following sections of monitoring units (or tributaries) were surveyed - National Grid Reference down and upstream limits are shown in brackets.

Afon Edw (SO 12602 52787 – SO 13667 57908)

Nant yr Offeiriad (SO 09650 43123 – SO 01648 44173

Sgithwen Brook (SO 08312 40030 – SO 04475 39228)

5.1. Afon Edw

5.1.1. Abundance

The Afon Edw is approximately 18 km in length and was divided into thirty-six 500m stretches. Sixteen of these were selected randomly and were to be sampled using the standard method and trapping but due to the weather conditions during the survey, only sites 11 – 16 were able to be sampled. No crayfish were caught during the present survey.

Table 3: Classification of population abundance – Afon Edw.

Site	COMBINED: STANDARD AND TRAPPING			
	Distance from confluence (km)	No of crayfish per site	Average abundance per patch	Classification of population abundance
1	0	Not surveyed		
2	1	Not surveyed		
3	2	Not surveyed		
4	2.5	Not surveyed		
5	3	Not surveyed		
6	4	Not surveyed		
7	4.5	Not surveyed		
8	6	Not surveyed		

9	6.5	Not surveyed		
10	8	Not surveyed		
11	10	0	0	Absent/undetected
12	10.5	0	0	Absent/undetected
13	11	0	0	Absent/undetected
14	14	0	0	Absent/undetected
15	16.5	0	0	Absent/undetected
16	17	0	0	Absent/undetected
Total		**0**		
		Classification for monitoring unit		**ABSENT/UNDETECTED**

5.1.2. Habitat

Table 4: Summary of evaluation of crayfish habitats - Afon Edw. See Section 4.1.2 for explanation of values.

Site Edw	In margin	In mid channel	In banks	
1	Not surveyed			
2	Not surveyed			
3	Not surveyed			
4	Not surveyed			
5	Not surveyed			
6	Not surveyed			
7	Not surveyed			
8	Not surveyed			
9	Not surveyed			
10	Not surveyed			
11	2	2	2	
12	2	2	2	
13	2	2	2	
14	3	3	3	
15	3	3	3	
16	3	3	3	
Total (Sites 11 – 16)	**15**	**15**	**15**	
			Total for Afon Edw (Sites 11- 16)	**83%**

5.2. Nant yr Offeiriad

5.2.1. Abundance

Nant yr Offeiriad is approximately 9.5 km in length and was divided into nineteen 500m stretches. Sixteen of these were randomly selected and sampled using the standard method and trapping. A total of 122 crayfish were caught on Nant yr Offeiriad. Raw data can be found in Appendix 1.

Table 5: Classification of population abundance – Nant yr Offeiriad.

Site	COMBINED STANDARD AND TRAPPING			
	Distance from confluence (km)	No of crayfish per site	Average abundance per patch	Classification of population abundance
1	0	0	0	Absent/undetected
2	0.5	0	0	Absent/undetected
3	1	0	0	Absent/undetected
4	1.5	0	0	Absent/undetected

5	2	0	0	Absent/undetected
6	2.5	0	0	Absent/undetected
7	3	0	0	Absent/undetected
8	3.5	0	0	Absent/undetected
9	4	0	0	Absent/undetected
10	4.5	0	0	Absent/undetected
11	5.5	8	1.6	Moderate
12	6.5	32	6.4	Very high
13	7	48	9.6	Very high
14	7.5	14	2.8	Moderate
15	8	12	2.4	Moderate
16	8.5	8	1.6	Moderate
Total		**122**		
		Classification		**MODERATE**

5.2.2. Analysis of catch in Nant yr Offeiriad

A total of 122 crayfish (45 females and 77 males) were caught on Nant yr Offeiriad. Carapace lengths ranged between 17 and 47 mm. Figure 1 illustrates carapace length frequency.

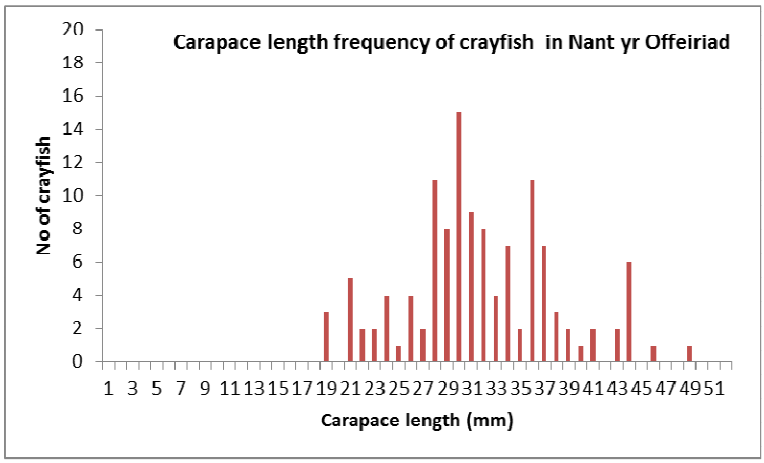


Figure 1: Summary of carapace length frequency of crayfish caught on Nant yr Offeiriad.

Table 6 shows analysis of other information gathered on examination of crayfish caught. Individual crayfish details can be found in Appendix 1.

Table 6: Other information regarding crayfish population on Nant yr Offeiriad.

	Percentage of crayfish affected
Thelohania	8 (6%)
Damage	18 (15%)
Indication of females breeding (with glair)	39 (87%)

5.2.3. Habitat

Table 7. Summary of evaluation of crayfish habitats - Nant yr Offeiriad. See Section 4.1.2 for explanation of values.

Site Nant yr Offeiriad	In margin	In mid channel	In banks	
1	3	3	3	
2	3	2	1	
3	2	2	1	
4	3	3	0	
5	3	3	1	
6	2	3	2	
7	3	3	1	
8	3	3	2	
9	2	3	2	
10	3	3	3	
11	3	3	3	
12	3	3	2	
13	3	3	3	
14	2	3	3	
15	2	2	2	
16	2	2	2	
Total	**42**	**44**	**31**	
Total for Nant yr Offeiriad Monitoring Unit				**81%**

5.3. Sgithwen Brook

5.3.1. Abundance

Sgithwen Brook is approximately 8 km in length and was divided into sixteen 500m stretches.

Due to time limitations only sites 9 – 16 were surveyed during the present survey. Crayfish were found in most of these upstream sites and as in the 2003 survey, Site 14 had the highest abundance. No crayfish were found at the most upstream site, (Site 16) where the land use changes in character to conifer forest, despite the dense population immediately downstream.

A total of 98 crayfish were caught on Sgithwen Brook. Raw data can be found in Appendix 1.

Table 8: Classification of population abundance in Sites 9 - 16 – Sgithwen Brook.

Site	Distance from confluence (km)	COMBINED STANDARD AND TRAPPING		
		No of crayfish per site	Average abundance per patch	Classification of population abundance
1	0	Not surveyed		
2	0.5	Not surveyed		
3	1	Not surveyed		
4	1.5	Not surveyed		
5	2	Not surveyed		
6	2.5	Not surveyed		
7	3	Not surveyed		
8	3.5	Not surveyed		
9	4	7	1.4	Moderate
10	4.5	4	0.8	Low
11	5	8	1.6	Moderate
12	5.5	2	0.4	Low
13	6	4	0.8	Low
14	6.5	54	10.8	Very high
15	7	19	3.8	High
16	7.5	0	0	Absent/undetected
Total		**98**		
		Classification for this section		**MODERATE**

5.3.2. Analysis of catch in Sgithwen Brook

A total of 98 crayfish (42 females and 56 males) were caught on Sgithwen Brook. Carapace lengths ranged between 16 and 42 mm. Figure 2 illustrates carapace length frequency.

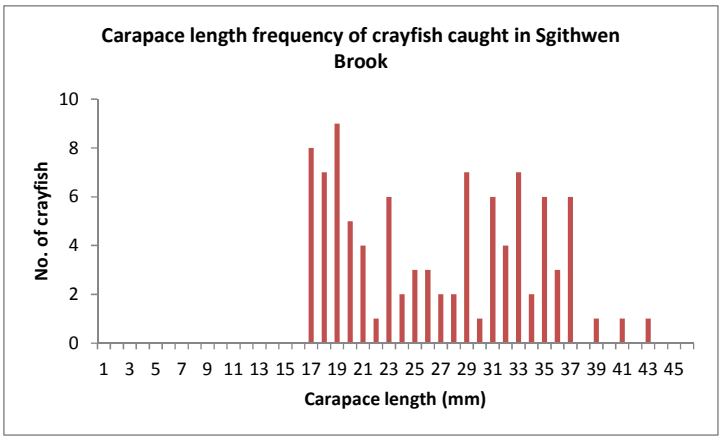


Figure 2: Summary of carapace length frequency of crayfish caught on Sgithwen Brook (Sites 9 -16).

Table 9 shows analysis of other information gathered on examination of crayfish caught. Individual crayfish details can be found in Appendix 1.

Table 9: Other information regarding crayfish population on Sgithwen Brook.

	Percentage of crayfish affected
Thelohania	4 (4%)
Damage	8 (8%)
Indication of females breeding (with glair)	29 (69%)

5.3.3. Habitat

Table 10: Summary of evaluation of crayfish habitats - Sgithwen Brook. See Section 4.1.2 for explanation of values.

Site Sgithwen Brook	In margin	In mid channel	In banks	
1	Not surveyed			
2	Not surveyed			
3	Not surveyed			
4	Not surveyed			
5	Not surveyed			
6	Not surveyed			
7	Not surveyed			
8	Not surveyed			
9	3	3	1	
10	3	3	3	
11	3	3	2	
12	3	3	1	
13	3	3	2	
14	3	3	3	
15	3	3	2	
16	3	3	1	
Total (Sites 9-16)	**24**	**24**	**15**	
Total for Sgithwen Brook (Sites 9 – 16)				**88%**

6. Discussion – Analysis of Attributes

The project objective was to report on condition as part of the assessment of Favourable Conservation Status for Natura 2000 features using the provisional conservation objectives as supplied with the project specification (Table 1, Section 2) which lists the lower limits for these. The following sections address each of the attributes and determine whether the lower limit has been attained in this survey. It should be noted, however, that survey work in 2014 only considered three of the eight monitoring units and any assessment is incomplete until the other five units are surveyed.

Attribute 1: Average number of crayfish

The average crayfish per patch was greater than one (the limit, see Table 1) i.e. above the threshold, in the Offeiriad and Sgithwen (Sites 9-16) but not the Edw (Sites 11-16; Table 11).

Table 11: Average crayfish per patch in each monitoring unit.

Monitoring unit	Total crayfish caught	Number of patches	Average crayfish per patch
Offeiriad	122	80	1.5
Edw (Sites 11-16)	0	30	0
Sgithwen (Sites 9-16)	98	40	2.5

Attribute 2: Crayfish distribution

Crayfish were found in two of the three monitoring units surveyed (Table 12) and further survey work will need to be undertaken to establish whether five monitoring units (the limit, see Table1) house crayfish and this Attribute is met.

Table 12: Distribution and density of crayfish in monitoring units.

Monitoring unit	Classification
Offeiriad	Moderate
Edw (Sites 11-16)	Absent/undetected
Sgithwen (Sites 9-16)	Moderate

Attribute 3: Alien crayfish/plague and porcelain disease

No non-native crayfish were found in the survey, there was no evidence of plague and less than 10% incidence of porcelain disease (the limit, see Table 1), thus this Attribute has been met in the areas surveyed.

Table 13: Incidence of thelohania in crayfish from each monitoring unit.

Monitoring unit	Incidence of Thelohania
Offeiriad	6%
Edw (Sites 11-16)	Not applicable
Sgithwen (Sites 9-16)	4%

Attribute 4: Habitat Quality, extent of suitable habitat

All of the areas surveyed had suitable habitat present in more than 60% of the sampled patches, which is sufficient for this Attribute to be met.

Table 14: Percentage of suitable habitat

Monitoring unit	In margins	In mid-channel	In banks	Overall evaluation
Offeiriad	88%	92%	65%	81%
Edw (Sites 11-16)	83%	83%	83%	83%
Sgithwen (Sites 9-16)	100%	100%	63%	88%
Suitable habitat in area surveyed				83%

7. Conclusion

Although conclusions cannot be drawn about the River Wye SAC as a whole until more survey work is done, one can comment on the three monitoring units surveyed. Nant yr Offeiriad was surveyed fully and yielded 1.5 crayfish per patch with low incidence of Thelohania (6%) and sufficient suitable habitat. It met all the Attribute needs of the SAC, although it should be noted that whilst the crayfish population is dense in places it is only found in the upper reaches of this river.

The Afon Edw was surveyed in the upper reaches before the weather (causing increase in river depth, colour and flow) prevented downstream surveying. No crayfish were found although there was sufficient suitable habitat quality. The absence of crayfish was thought to be due to a crayfish mortality in 2006 which was highlighted to the current surveyors by local residents. This mortality was investigated by the Environment Agency at the time but no cause of death was identified. The following account was supplied by Catrin Grimstead of Natural Resources Wales:

"In 1977 native crayfish were found at two downstream sites on the River Edw (Lilley *et al*., 1979). Subsequently, in 1988, it was shown to hold a large population of native crayfish within the midstream section both upstream and downstream of Hundred House and at a downstream site upstream of Aberedw (Foster, 1996). Subsequent surveys found many crayfish at downstream (Holdich, 1993) sites and at several sites along the stretch of river from Hundred House to Aberedw (Rogers & Holdich, 1995). Although the number of individuals found showed considerable decline, subsequent reports from the following ten years confirmed their presence along this stretch (Slater & House, 2001; Rogers & Watson, 2003b; Slater & Howells, 2003a; Howells, 2005) and further upstream from Frank's Bridge (Rogers & Watson, 2003b). The decline in numbers were suspected to be the result of a sheep dip pollution event (Slater & House, 2001), as the Environment Agency reported a pollution incident of unknown cause in 1997 (Environment Agency, 1997), and / or the result of increased siltation following deforestation in the area (Slater, 2002; Slater & Howells, 2003a).

"A subsequent Environment Agency Wales investigation in 2006 reported many dead native crayfish along the river upstream of Frank's Bridge but no cause of death was identified (Environment Agency, 2006). The most recent survey of eight of the sites which contained crayfish in 2003 (Rogers & Watson, 2003b) found no crayfish remaining (Slater *et al*., 2008b). It is unknown if there has been a further pollution event in the river. Both the 2006 and the 2008 surveys found freshwater invertebrates, including gammarus and insect larvae, and fish within the river. A previous report on a pyrethroid pollution incident on the Sgithwen Brook showed that freshwater invertebrates, salmon and trout fry rapidly returned to the area in the years following the event, but that crayfish did not (Wilkins, 1998). It is therefore possible that an unreported incident occurred on the River Edw between 2004 and 2006, after which the freshwater fauna returned to the area with the exception of the native crayfish."

The absence of crayfish in 2006 when other riverine invertebrates and fish were found is more suggestive of crayfish plague than a pollution incident, with the disease going undetected. Further investigation of the tributaries of the Edw, particularly those adjacent to the Bachawy which supports signal crayfish, would be worthwhile to ascertain whether there were any signal crayfish in the catchment and maybe shed light on the reason for the disappearance.

Sgithwen Brook was surveyed in the upper reaches before time limited the survey. The average catch per patch was high, at 2.5 crayfish per patch, but this is likely to be lower for the river as a whole if the population density follows the same pattern as found in 2003 (Rogers & Watson 2004).

It is important to complete survey work for white-clawed crayfish on the River Wye SAC in 2015 so that the 2014 results can be amalgamated into an overall assessment.

8. Recommendations

- Survey the five monitoring units of the River Wye SAC not done in the present survey (Afon Duhonw, Afon Irfon, Afon Llynfi, Clyro Brook and Dulas Brook) and complete survey work on the Afon Edw and Sgithwen Brook.

- Survey tributaries of the monitoring units to assess native populations and possible distribution of signals.

9. References

JNCC 2001 *EU Habitats Directive*. jncc.defra.gov.uk/PDF/comm02D07.pdf

Peay, S. 2002. *A standardised survey and monitoring protocol for the white-clawed crayfish* Austropotamobius pallipes *in the UK*. Life in UK Rivers.

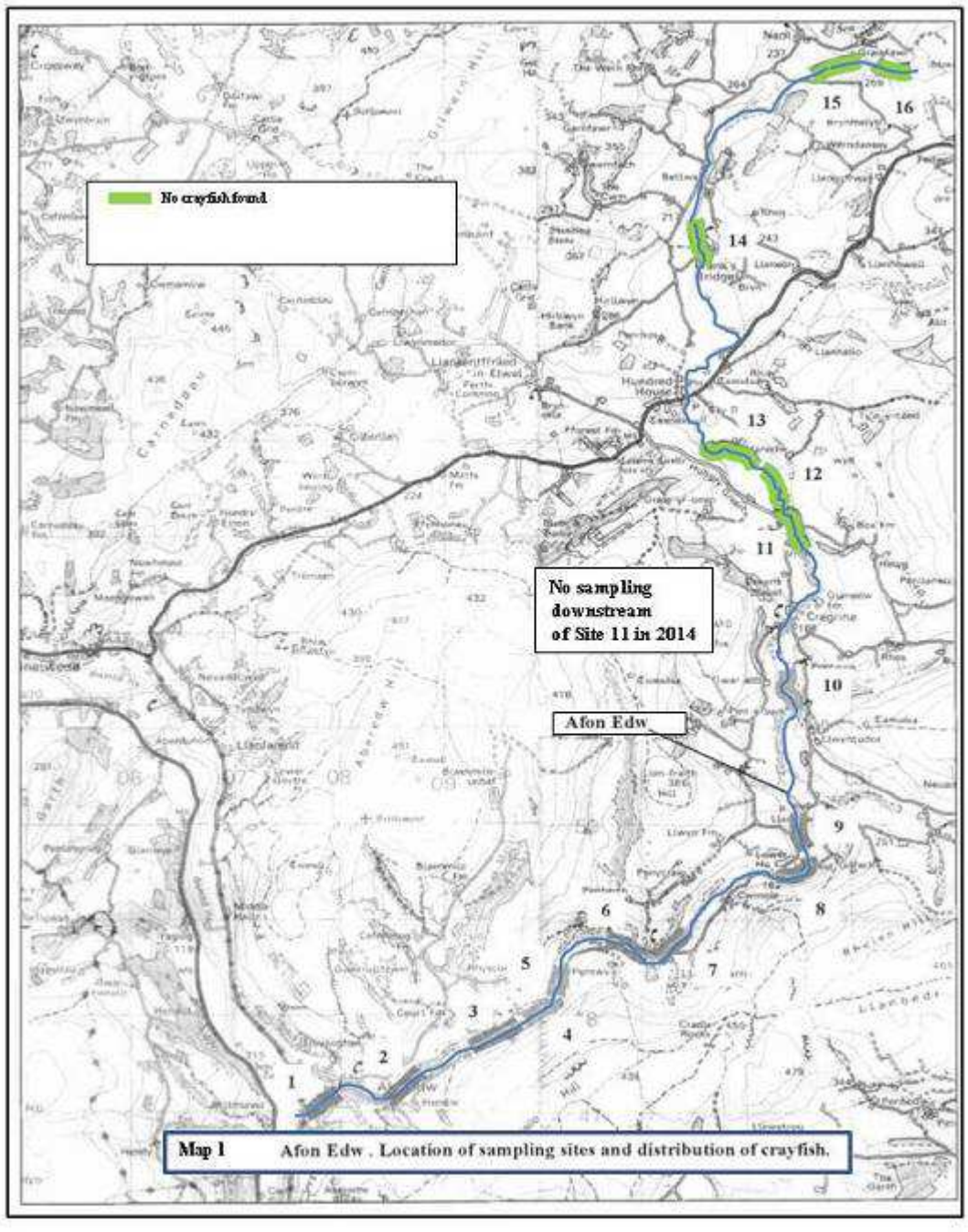
Rogers, D. & Holdich, D.M. 1995. *Survey of white-clawed crayfish distribution in the tributaries of the rivers Usk and Wye.* CCW Contract Science. **137**. Countryside Council for Wales.

Rogers, D. & Watson, E. 2003*. The status of the white-clawed crayfish* Austropotamobius pallipes *in the mid-Wye catchment, 2002.* CCW Contract Science. **543**. Countryside Council for Wales.

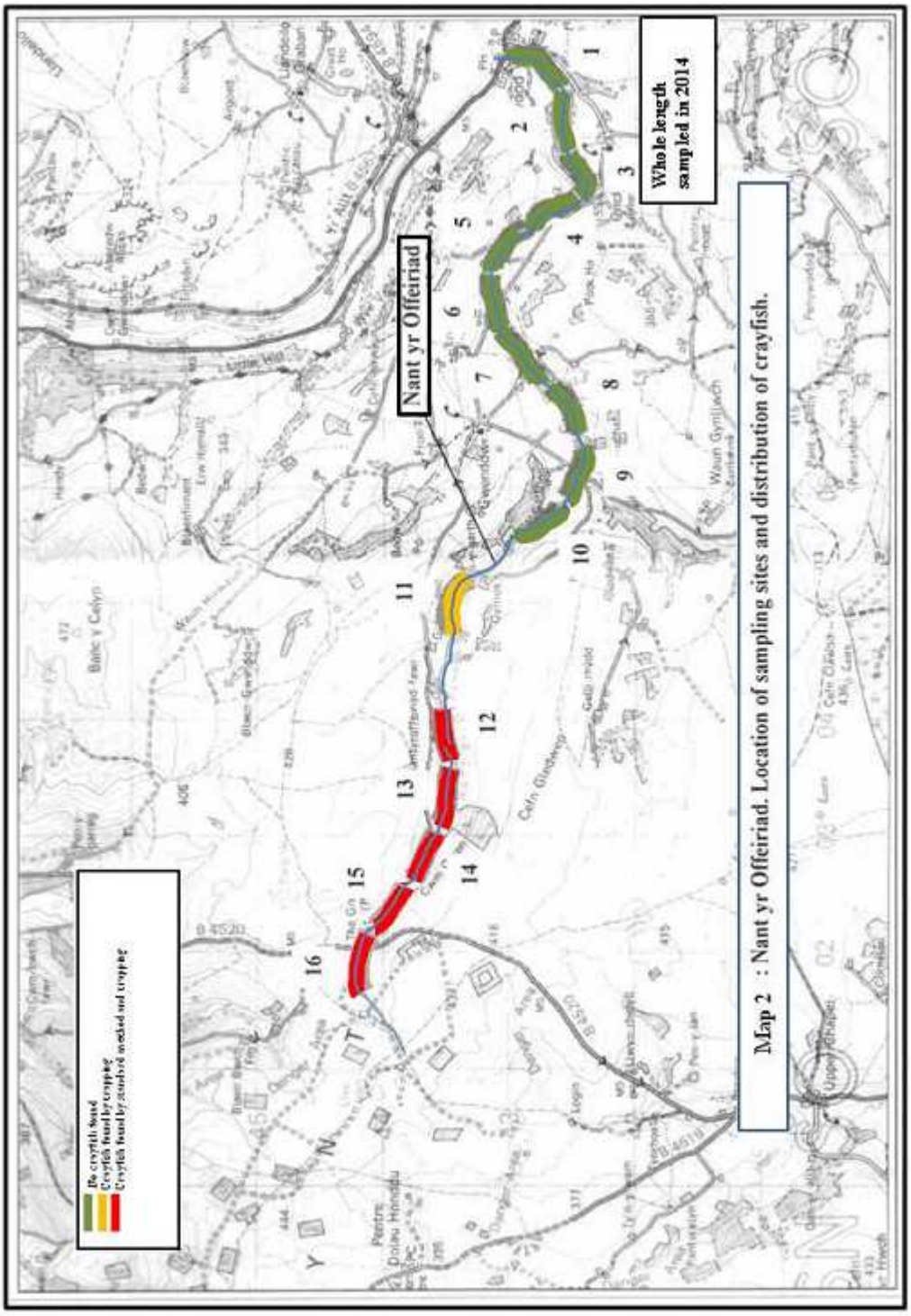
Rogers, D. & Watson, E. 2004*. Assessment of condition of white-clawed crayfish* Austropotamobius pallipes *in the River Wye candidate Special Area of Conservation.* CCW Environmental Monitoring Report No 2. FC-73-05-33. Countryside Council for Wales.

10. Appendices

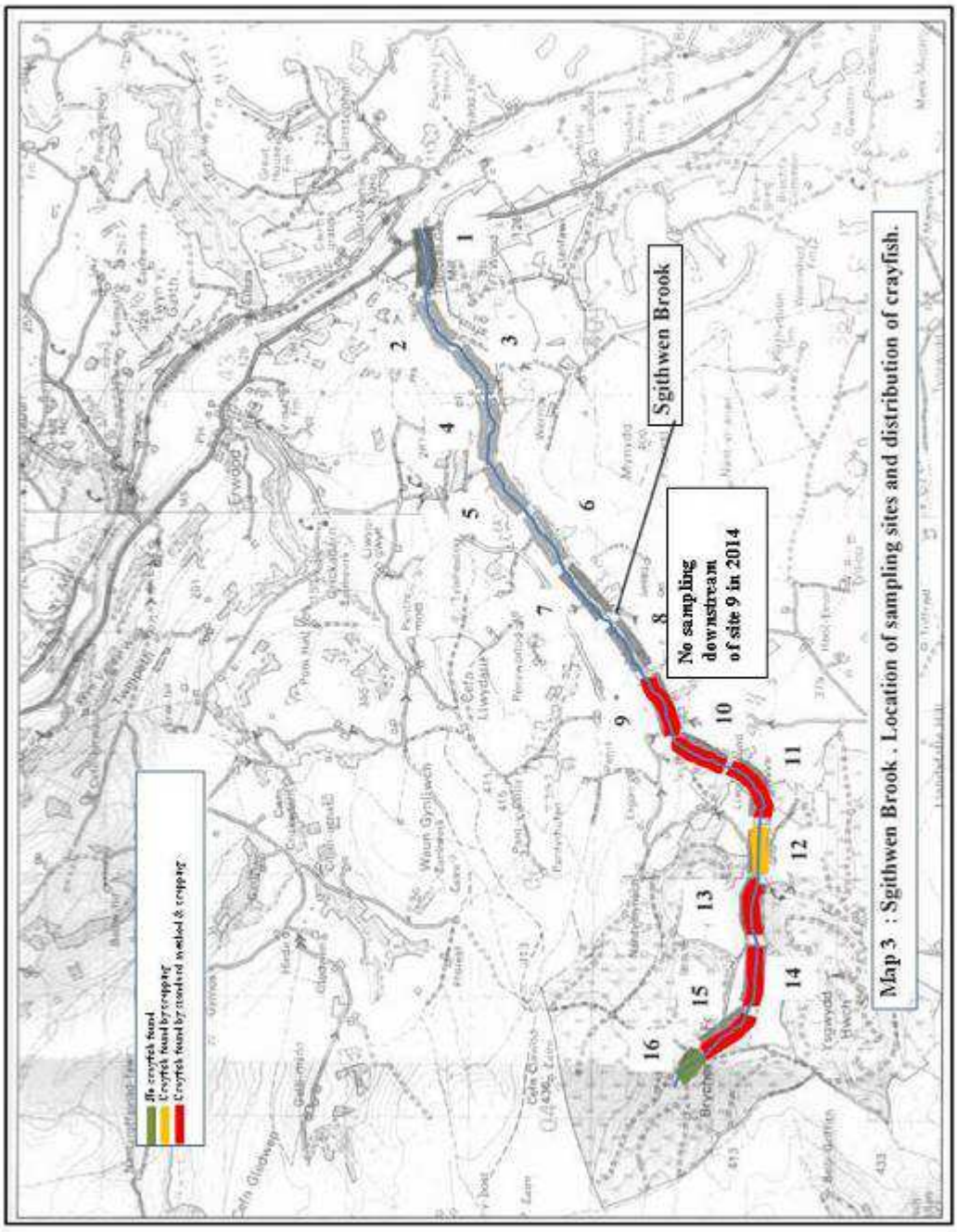
10.1. Appendix A: Location of sampling stations and distribution of white-clawed crayfish in the Afon Edw in October 2014.



10.2. Appendix B: Location of sampling stations and distribution of white-clawed crayfish in Nant yr Offeiriad in October 2014.



10.3. Appendix C: Location of sampling stations and distribution of white-clawed crayfish in Sgithwen Brook in October 2014.



10.4. Appendix D: Details of individual white-clawed crayfish records in Nant yr Offeiriad in October 2014.

Site 11

CRAYFISH RECORDING FORM

Catchment	Wye		River	Offeiriad			Site reference	**11**	
Date	10/10/2014		Surveyors	DR LW			Sheet no.	1	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	*A.p*	M	32						4
2	*A.p*	M	36						4
3	*A.p*	M	35						4
4	*A.p*	F	34			G			4
5	*A.p*	M	39						4
6	*A.p*	F	28		PD				4
7	*A.p*	M	32						4
8	*A.p*	M	27	AL OI					4

Site 12

CRAYFISH RECORDING FORM

Catchment	Wye		River	Offeiriad			Site reference	**12**	
Date	10/10/2014		Surveyors	DR LW			Sheet no.	2	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	*A.p*	M	22	ML				P1	1
2	*A.p*	F	27			G		P2	1
3	*A.p*	F	32			G		P2	1
4	*A.p*	M	26	MR	PD			P2	1
5	*A.p*	F	20		PD			P3	1
6	*A.p*	M	19					P3	1
7	*A.p*	M	42					P3	1
8	*A.p*	M	35	MR				P3	1
9	A.p	F	32			G		P4	1
10	A.p	F	17					P4	1
11	*A.p*	M	27						4
12	*A.p*	F	28			G			4
13	*A.p*	M	36						4
14	*A.p*	F	26	ML	PD				4
15	*A.p*	M	30	MR					4
16	*A.p*	M	34						4
17	*A.p*	F	28			G			4
18	*A.p*	M	28						4
19	A.p	M	36						4
20	A.p	F	26			G			4
21	*A.p*	M	29	OI					4
22	*A.p*	M	30						4

23	*A.p*	M	28						4
24	*A.p*	F	28			G			4
25	*A.p*	M	26	RL					4
26	*A.p*	M	34						4
27	*A.p*	M	26						4
28	*A.p*	F	32			G			4
29	*A.p*	F	30			G			4
30	*A.p*	M	34						4
31	*A.p*	M	26						4
32	*A.p*	M	28						4

Site 13

CRAYFISH RECORDING FORM

Catchment	Wye		River	Offeiriad			Site reference	**13**	
Date	10/10/2014		Surveyors	DR LW			Sheet no.	3	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	*A.p*	F	34			G		P1	1
2	*A.p*	M	47					P1	1
3	*A.p*	F	28			G		P1	1
4	*A.p*	F	28			G		P2	1
5	*A.p*	M	24	ML				P2	1
6	*A.p*	M	42					P2	1
7	*A.p*	F	23			G		P2	1
8	*A.p*	M	34					P2	1
9	A.p	M	19		BS			P2	1
10	A.p	M	17					P2	1
11	A.p	M	28e					P2	1
12	A.p	M	42					P2	1
13	A.p	M	41					P2	1
14	A.p	M	42					P3	1
15	A.p	M	35		PD			P3	1
16	A.p	F	42			G		P3	1
17	A.p	M	34					P3	1
18	A.p	M	19					P3	1
19	A.p	M	41					P3	1
20	A.p	F	32			G		P3	1
21	A.p	M	22					P3	1
22	A.p	F	22			G		P3	1
23	A.p	F	29			G		P3	1
24	A.p	M	42					P3	1
25	A.p	M	34					P3	1
26	A.p	F	28	OM		G		P4	1
27	A.p	M	44					P5	1
28	A.p	M	26					P5	1
29	A.p	M	37					P5	1
30	A.p	M	30					P5	1
31	A.p	M	38						4
32	A.p	F	21	MR	PD				4

33	A.p	F	35			G			4
34	A.p	F	26			G			4
35	A.p	F	37			G			4
36	A.p	M	33						4
37	A.p	M	25						4
38	A.p	M	27						4
39	A.p	F	31			G			4
40	A.p	M	34						4
41	A.p	M	32						4
42	A.p	M	31	MR					4
43	A.p	M	33						4
44	A.p	F	19			G			4
45	A.p	M	27						4

Site 13

CRAYFISH RECORDING FORM

Catchment	Wye		River	Offeiriad			Site reference	**13**	
Date	10/10/2014		Surveyors	DR LW			Sheet no.	3a	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
46	*A.p*	M	35						4
47	*A.p*	F	26			G			4
48	*A.p*	M	28						4

Site 14

CRAYFISH RECORDING FORM

Catchment	Wye		River	Offeiriad			Site reference	**14**	
Date	10/10/2014		Surveyors	DR LW			Sheet no.	4	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	*A.p*	F	30	OI		G		P2	1
2	*A.p*	F	30			G		P2	1
3	*A.p*	M	29					P2	1
4	*A.p*	F	27			G		P2	1
5	*A.p*	F	29			G		P3	1
6	*A.p*	M	29					P3	1
7	*A.p*	F	31			G		P4	1
8	*A.p*	M	34		PD				4
9	*A.p*	F	27			G			4
10	*A.p*	F	28			G			4
11	*A.p*	M	35						4
12	*A.p*	M	24	ML					4
13	*A.p*	F	24			G			4
14	*A.p*	M	26						4

Site 15

CRAYFISH RECORDING FORM

Catchment	Wye		River	Offeiriad			Site reference	15	
Date	09/10/2014		Surveyors	DR LW			Sheet no.	5	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	*A.p*	M	21	AR				P4	1
2	*A.p*	M	39					P4	1
3	*A.p*	M	20					P5	1
4	*A.p*	F	31			G			4
5	*A.p*	M	28	ML					4
6	*A.p*	M	29						4
7	*A.p*	F	26			G			4
8	*A.p*	M	29						4
9	*A.p*	F	24			G			4
10	*A.p*	M	34						4
11	*A.p*	M	35						4
12	*A.p*	F	27	MR		G			4

Site 16

CRAYFISH RECORDING FORM

Catchment	Wye		River	Offeiriad			Site reference	16	
Date	09/10/2014		Surveyors	DR LW			Sheet no.	6	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	*A.p*	F	17		PD			P3	1
2	*A.p*	M	30						4
3	*A.p*	M	36						4
4	*A.p*	M	29						4
5	*A.p*	M	29						4
6	*A.p*	F	28			G			4
7	*A.p*	F	30			G			4
8	*A.p*	M	25	OI					4

10.5. Appendix E: Details of individual white-clawed crayfish records in Sgithwen Brook in October 2014.

Site 9

CRAYFISH RECORDING FORM

Catchment	Wye		River	Sgithwen			Site reference	9	
Date	16/10/2014		Surveyors	DR LW			Sheet no.	Sg1	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	Ap	M	36					P5	1
2	Ap	M	32					P5	1
3	Ap	F	22			G		P5	1
4	Ap	M	32						4
5	Ap	M	36						4
6	Ap	M	35						4
7	Ap	M	30						4

Site 10

CRAYFISH RECORDING FORM

Catchment	Wye		River	Sgithwen			Site reference	10	
Date	16/10/2014		Surveyors	DR LW			Sheet no.	2	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	Ap	F	21	OI	PD			P3	1
2	Ap	F	17						4
3	Ap	M	33						4
4	Ap	M	30						4

Site 11

CRAYFISH RECORDING FORM

Catchment	Wye		River	Sgithwen			Site reference	11	
Date	16/10/2014		Surveyors	DR LW			Sheet no.	Sg 3	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	Ap	M	19					P2	1
2	Ap	M	19					P4	1
3	Ap	F	36	RM		G		P5	1
4	Ap	F	32			G			4
5	Ap	F	31			G			4
6	Ap	M	42						4
7	Ap	M	34						4
8	Ap	M	25	LM					4

Site 12

CRAYFISH RECORDING FORM

Catchment	Wye		River	Sgithwen			Site reference	12	
Date	16/10/2014		Surveyors	DR LW			Sheet no.	Sg 4	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	Ap	M	33						4
2	Ap	F	36			G			4

Site 13

CRAYFISH RECORDING FORM

Catchment	Wye		River				Site reference	13	
Date	15/10/2014		Surveyors	DR LW			Sheet no.	Sg 5	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	Ap	M	23					P5	1
2	Ap	F	18						4
3	Ap	M	25						4
4	Ap	M	18						4

Site 14

CRAYFISH RECORDING FORM

Catchment	Wye		River	Sgithwen			Site reference	14	
Date	15/10/2014		Surveyors	DR LW			Sheet no.	Sg 6	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	Ap	F	22			G		P1	1
2	Ap	F	17					P1	1
3	Ap	M	19					P1	1
4	Ap	M	16					P1	1
5	Ap	M	17					P1	1
6	Ap	M	17					P1	1
7	Ap	F	23			G		P2	1
8	Ap	M	16					P2	1
9	Ap	F	16					P2	1
10	Ap	M	16					P2	1
11	Ap	M	17					P2	1
12	Ap	M	18					P2	1
13	Ap	F	22			G		P2	1
14	Ap	F	16					P3	1
15	Ap	M	18					P3	1
16	Ap	F	17					P4	1
17	Ap	M	16					P5	1

18	Ap	M	40	LM RM					4
19	Ap	M	38						4
20	Ap	F	34			G			4
21	Ap	F	32			G			4
22	Ap	M	31						4
23	Ap	M	31						4
24	Ap	M	35						4
25	Ap	F	28			G			4
26	Ap	F	34			G			4
27	Ap	M	36		PD				4
28	Ap	F	32			G			4
29	Ap	F	34	LM		G			4
30	Ap	F	30			G			4
31	Ap	M	20						4
32	Ap	F	30			G			4
33	Ap	F	29			G			4
34	Ap	M	32						4
35	Ap	F	27						4
36	Ap	M	22						4
37	Ap	F	30						4
38	Ap	F	31			G			4
39	Ap	M	30						4
40	Ap	M	28						4
41	Ap	M	34	RM					

Site 14

CRAYFISH RECORDING FORM

Catchment	Wye		River	Sgithwen			Site reference	**14**	
Date	15/10/2014		Surveyors	DR LW			Sheet no.	Sg 6a	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
42	Ap	M	36	OM					4
43	Ap	F	35			G			4
44	Ap	M	18						4
45	Ap	F	28			G			4
46	Ap	M	20						4
47	Ap	M	24						4
48	Ap	M	24						4
49	Ap	M	22		PD				4
50	Ap	M	22						4
51	Ap	F	24	RL					4
52	Ap	F	28			G			4
53	Ap	F	28			G			4
54	Ap	M	28						4

Site 15

CRAYFISH RECORDING FORM

Catchment	Wye		River	Sgithwen			Site reference	**15**	
Date	15/10/2014		Surveyors	DR LW			Sheet no.	Sg 7	
Record no.	Species	Sex	Carapace length, mm	Damage	Disease	Breeding	Moult	Sub-site location ref.	Catch method
1	Ap	F	32			G		P1	1
2	Ap	F	19			G		P1	1
3	Ap	M	18					P1	1
4	Ap	M	18					P2	1
5	Ap	M	17					P2	1
6	Ap	M	18					P4	1
7	Ap	M	16					P4	1
8	Ap	F	27			G			4
9	Ap	F	25			G			4
10	Ap	M	34						4
11	Ap	M	28						4
12	Ap	F	20		PD				4
13	Ap	F	16	LM					4
14	Ap	F	26			G			4
15	Ap	M	20						4
16	Ap	M	28						4
17	Ap	F	26			G			4
18	Ap	F	18						4
19	Ap	F	19			G			4

10.6. Appendix F: White-clawed crayfish habitat survey forms for Afon Edw, October 2014.

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Edw		Site (no., name)	**11**		
Date (dd/mm/yy)	14/10/2014	Surveyors	DR LW			Grid ref.	SO 12602 52787		
Weather, good 1, mod 2, poor 3	2	Flow norm 1, low 2, fall 3, rise 4	4				Start and finish time	1500-1700	
Photo ref. & Location	At 300m								
Site length (m)	400								
Width channel (m)	5	Descript. (channel features, landuse)							

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	5x1	3x1	5x1	2x2	4x1
Channel (1 margins, 2 mid, 3 both, other specify)	3	1	1	1	3
Depth (metres)	0.3	0.2	0.3	0.3	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	3	4	3	4	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)	YES	YES	YES	YES	YES
woody debris					
other urban debris					YES
tree roots, fine					
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					

bedrock					
cobble (6.5-15cm)					
pebble (<6.5cm)					
gravel (<1.6cm)					
sand (<2mm)					
clay					
silt	YES	YES	YES	YES	YES
Siltation none					
low					
moderate	YES	YES	YES	YES	YES
high					
Refuges in bank none					
cobble/boulder		YES	YES	YES	
tree roots, large	YES	YES			YES
vertical or undercut bank					
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	MOD	MOD	MOD	MOD	MOD
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	2	
in mid channel	2	
in banks	2	
surveyability	2	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Edw		Site (no., name)	**12**		
Date (dd/mm/yy)	14/10/2014	Surveyors	DR LW			Grid ref.	SO 12384 53394		
Weather, good 1, mod 2, poor 3	2	Flow norm 1, low 2, fall 3, rise 4	4				Start and finish time	1300-1500	
Photo ref. & Location	In first 100m								
Site length (m)	400								
Width channel (m)	5	Descript. (channel features, landuse)	Series of pools with slow flowing glides						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	2x1	3x1	3x2	3x1	2x1
Channel (1 margins, 2 mid, 3 both, other specify)	1	1	3	1	1
Depth (metres)	0.2	0.2	0.3	0.2	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	3	3	2	3	3
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris	YES		YES		
other urban debris					
tree roots, fine	YES	YES	YES	YES	YES
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock	YES	YES			
cobble (6.5-15cm)					

pebble (<6.5cm)					
gravel (<1.6cm)					
sand (<2mm)					YES
clay					
silt			YES	YES	
Siltation none					
low					
moderate	YES	YES	YES	YES	YES
high					
Refuges in bank none					
cobble/boulder		YES		YES	
tree roots, large		YES			YES
vertical or undercut bank	YES		YES		
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	LIGHT	LIGHT	HEAVY	HEAVY	MOD
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	2	
in mid channel	2	
in banks	2	
surveyability	2	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Edw		Site (no., name)	**13**		
Date (dd/mm/yy)	14/10/2014	Surveyors	DR, LW			Grid ref.	SO 12047 53816		
Weather, good 1, mod 2, poor 3	2	Flow norm 1, low 2, fall 3, rise 4	4				Start and finish time	1100 - 1300	
Photo ref. & Location	In first 100m.								
Site length (m)	400								
Width channel (m)	4	Descript. (channel features, landuse)	Land use - grazing with stock access.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	5x1	7x1	2x2	2x2	5x1
Channel (1 margins, 2 mid, 3 both, other specify)	1	1	3	2	1
Depth (metres)	0.2	0.2	0.2	0.3	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	5	4	3
Refuges in channel	tick all present in patch, ain type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)	YES	YES	YES	YES	YES
woody debris					
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock		YES	YES	YES	
cobble (6.5-15cm)					

pebble (<6.5cm)					
gravel (<1.6cm)					
sand (<2mm)	YES				YES
clay					
silt					
Siltation none					
low			YES		YES
moderate	YES	YES		YES	
high					
Refuges in bank none					
cobble/boulder					
tree roots, large		YES	YES	YES	YES
vertical or undercut bank	YES				
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	MOD	MOD	LIGHT	LIGHT	MOD
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	2	
in mid channel	2	
in banks	2	
surveyability	2	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye			River	Edw		Site (no., name)	**14**	
Date (dd/mm/yy)	14/10/2014	Surveyors	DR LW				Grid ref.	SO 11549 55871	
Weather, good 1, mod 2, poor 3	2	Flow norm 1, low 2, fall 3, rise 4	4					Start and finish time	0900-1100
Photo ref. & Location	In first 100m								
Site length (m)	100								
Width channel (m)	3	Descript. (channel features, landuse)	Land use - Agriculture with occasional stock access to water. Good access from road bridge						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x2	3x2	3x2	4x2	4x2
Channel (1 margins, 2 mid, 3 both, other specify)	3	3	3	3	3
Depth (metres)	0.2	0.2	0.3	0.2	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	3	3	2	2	3
Refuges in channel	tick all present in patch,main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)		YES			
rubble (give size)					
woody debris	YES	YES			
other urban debris					
tree roots, fine	YES	YES	YES	YES	YES
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)				YES	

pebble (<6.5cm)					
gravel (<1.6cm)	YES	YES			
sand (<2mm)					
clay					
silt			YES		YES
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none	YES	YES	YES		YES
cobble/boulder				YES	
tree roots, large				YES	
vertical or undercut bank					
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	MOD	MOD	HEAVY	HEAVY	HEAVY
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.): Approximately 6 years ago local resident reported crayfish mortality. Only dead crayfish found; no moribund. Wye and Usk Foundation informed but no cause identified.
in margins	3	
in mid channel	3	
in banks	3	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye			River	Edw		Site (no., name)	**15**	
Date (dd/mm/yy)	13/10/2014	Surveyors	DR LW				Grid ref.	SO 12632 57817	
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1500-1700	
Photo ref. & Location	In first 100m								
Site length (m)	100								
Width channel (m)	2.5	Descript. (channel features, landuse)	Land use - grazing. Very heavy stock accesss in areas. Areas of deep pools and small stony riffles. Some mud banks with possible crayfish burrows.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	5x1	3x2	4x2	6x2	3x2
Channel (1 margins, 2 mid, 3 both, other specify)	1	3	3	3	3
Depth (metres)	0.3	0.3	0.3	0.2	0.4
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	3	3	3	3
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris					
other urban debris					
tree roots, fine	YES	YES	YES	YES	
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)					

pebble (<6.5cm)					
gravel (<1.6cm)					
sand (<2mm)					
clay					
silt	YES	YES	YES	YES	YES
Siltation none					
low					
moderate	YES				
high		YES	YES	YES	YES
Refuges in bank none			YES	YES	
cobble/boulder					
tree roots, large		YES			YES
vertical or undercut bank	YES	YES	YES	YES	YES
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	LOW	HEAVY	MOD	HEAVY	HEAVY
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	3	
in mid channel	3	
in banks	3	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye			River	Edw		Site (no., name)	**16**	
Date (dd/mm/yy)	13/10/2014	Surveyors	DR LW				Grid ref.	SO 13203 57976	
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1300-1500	
Photo ref. & Location	In first 100m								
Site length (m)	100								
Width channel (m)	3	Descript. (channel features, landuse)	Land use grazing and woodland. Highly agricultural area.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x1	3x1	4x1	2x2	4x2
Channel (1 margins, 2 mid, 3 both, other specify)	1	2	1	3	1
Depth (metres)	0.2	0.3	0.2	0.2	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	3	3	5	2
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris	YES	YES	YES	YES	YES
other urban debris					
tree roots, fine	YES		YES		YES
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)					

pebble (<6.5cm)					
gravel (<1.6cm)				YES	
sand (<2mm)					
clay	YES	YES	YES		YES
silt					
Siltation none					
low					
moderate	YES	YES	YES	YES	YES
high					
Refuges in bank none					
cobble/boulder					
tree roots, large	YES	YES	YES	YES	YES
vertical or undercut bank					
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	HEAVY	HEAVY	MOD	MOD	MOD
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):Variable patches with lots of fallen trees. Deep stone layer to reach substrate.
in margins	3	
in mid channel	3	
in banks	3	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

10.7. Appendix G: White-clawed crayfish habitat survey forms for Nant yr Offeiriad, October 2014.

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**1**		
Date (dd/mm/yy)	13/10/2014	Surveyors	DR LW			Grid ref. (d/s end)	SO 09650 43123		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1			Start and finish time	1100-1300		
Photo ref. & Location	view upstream from roadbridge								
Site length (m)	100								
Width channel (m)	5	Descript. (channel features, landuse)	Access good through garden. Land use - woodland and urban. Otters known to be in area. Good habitat present.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	1x3	2x2	2x2	3x1	3x2
Channel (1 margins, 2 mid, 3 both, other specify)	3	2	3	1	3
Depth (metres)	0.3	0.4	0.2	0.1	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	1	3	4	4	3
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)	YES	YES	YES	YES	YES
woody debris					
other urban debris					YES
tree roots, fine	YES	YES			YES
moss					YES
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					YES
cobble (6.5-15cm)					

pebble (<6.5cm)					
gravel (<1.6cm)	YES	YES	YES	YES	
sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder		YES	YES	YES	YES
tree roots, large	YES		YES	YES	YES
vertical or undercut bank	YES			YES	
dry stone wall					YES
other reinforced					
crayfish burrows					
Shading above	MOD	MOD	MOD	MOD	MOD
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	3	
in mid channel	3	
in banks	3	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**2**		
Date (dd/mm/yy)	13/10/2014	Surveyors	DR LW			Grid ref.	SO 09542 42629		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	0900-1100	
Photo ref. & Location	Mid Point at footbridge								
Site length (m)	100								
Width channel (m)	6	Descript. (channel features, landuse)	Access down very steep woodland footpath. Landuse - woodland. Series of riffles and pools, some very deep. Excellent habitat throughout.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	1x6	3x3	6x1	5x2	3x2
Channel (1 margins, 2 mid, 3 both, other specify)	3	2	1	3	3
Depth (metres)	0.3	0.2	0.2	0.3	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	5	2	3	3
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)	YES	YES	YES	YES	YES
woody debris					
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock	YES	YES	YES	YES	YES
cobble (6.5-15cm)					
pebble (<6.5cm)					
gravel (<1.6cm)					

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					YES
cobble/boulder	YES	YES	YES	YES	
tree roots, large vertical or undercut bank					
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	HEAVY	HEAVY	HEAVY	HEAVY	HEAVY
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	3	
in mid channel	2	
in banks	1	
surveyability	2	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	3		
Date (dd/mm/yy)	12/10/2014	Surveyors	DR LW			Grid ref.	SO 08926 42561		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1500-1700	
Photo ref. & Location	In 1st 100m								
Site length (m)	100		Access very difficult across field and down very steep woodland bank. Excellent surveyability once there.Good habitat.						
Width channel (m)	7	Descript. (channel features, landuse)							

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	1x8	3x3	8x1	4x3	5x2
Channel (1 margins, 2 mid, 3 both, other specify)	3	2	1	3	3
Depth (metres)	0.3	0.3	0.1	0.2	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	4	2	2
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris					
other urban debris					
tree roots, fine					
moss					
filamentous algae					

other submerged veg.					
emergents					
Main substrate beneath					
bedrock				YES	YES
cobble (6.5-15cm)					
pebble (<6.5cm)					
gravel (<1.6cm)	YES	YES	YES		
sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none	YES	YES	YES	YES	YES
cobble/boulder					
tree roots, large					
vertical or undercut bank					
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	HEAVY	HEAVY	HEAVY	HEAVY	HEAVY
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score
in margins	2
in mid channel	2
in banks	1
surveyability	3
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.	
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**4**		
Date (dd/mm/yy)	12/10/2014	Surveyors	DR LW			Grid ref.	SO 08596 42386		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1300-1500	
Photo ref. & Location	In 1st 100m								
Site length (m)	100								
Width channel (m)	7	Descript. (channel features, landuse)	Access down very steep wooded banks. Land use - woodland and grazing. Looks good habitat throughout.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	1x7	3x3	6x1	3x2	1x7
Channel (1 margins, 2 mid, 3 both, other specify)	3	2	1	2	3
Depth (metres)	0.3	0.3	0.1	0.3	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	5	4	3	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris					
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)	YES	YES	YES	YES	YES
pebble (<6.5cm)					
gravel (<1.6cm)					

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none	YES	YES	YES	YES	YES
cobble/boulder					
tree roots, large vertical or undercut bank					
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	HEAVY	HEAVY	HEAVY	HEAVY	HEAVY
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	3	
in mid channel	3	
in banks	0	
surveyability	2	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**5**		
Date (dd/mm/yy)	12/10/2014	Surveyors	DR LW			Grid ref.	SO 08224 42923		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1100 - 1300	
Photo ref. & Location	Upstream end								
Site length (m)	100								
Width channel (m)	6	Descript. (channel features, landuse)	Access good across fields. Land use grazing and woodland. Stock access to river.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x2	1x5	5x1	1x6	3x3
Channel (1 margins, 2 mid, 3 both, other specify)	1	3	1	3	2
Depth (metres)	0.2	0.2	0.1	0.3	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	2	5	4	4	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)	YES	YES	YES		
woody debris					
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)					
pebble (<6.5cm)					
gravel (<1.6cm)	YES	YES	YES	YES	YES

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder	YES	YES	YES	YES	YES
tree roots, large vertical or undercut bank					
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	MOD	HEAVY	MOD	MOD	MOD
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	3	
in mid channel	3	
in banks	1	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**6**		
Date (dd/mm/yy)	12/10/2014	Surveyors	DR LW			Grid ref.	SO07681 43093		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	0900-1100	
Photo ref. & Location	In 1st 100m								
Site length (m)	100								
Width channel (m)	4	Descript. (channel features, landuse)	Access good via road bridge. Landuse grazing for sheep. Shaded on one side open to stock on other side.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	2x2	4x2	4x2	2x2	5x1
Channel (1 margins, 2 mid, 3 both, other specify)	2	2	2	1	2
Depth (metres)	0.2	0.3	0.2	0.2	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	4	4	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris					
other urban debris					
tree roots, fine	YES				
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)	YES	YES	YES	YES	YES
pebble (<6.5cm)					
gravel (<1.6cm)					

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder				YES	YES
tree roots, large	YES	YES	YES		
vertical or undercut bank					
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	MOD	MOD	HEAVY	HEAVY	MOD
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score
in margins	2
in mid channel	3
in banks	2
surveyability	3
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.	
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	7		
Date (dd/mm/yy)	11/10/2014	Surveyors	DR LW			Grid ref.	SO 07277 42979		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1			Start and finish time	1500-1700		
Photo ref. & Location	Upstream end								
Site length (m)	100								
Width channel (m)	5	Descript. (channel features, landuse)	Access from roadbridge. Land use - woodland. Series of riffles, waterfalls and pools - some very deep.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	2x5	2x5	5x3	4x3	4x3
Channel (1 margins, 2 mid, 3 both, other specify)	2	2	3	1	1
Depth (metres)	0.3	0.3	0.2	0.2	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	3	4	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris	YES			YES	
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)	YES	YES	YES	YES	YES
pebble (<6.5cm)					
gravel (<1.6cm)					

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					YES
cobble/boulder	YES				
tree roots, large vertical or undercut bank		YES	YES	YES	
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	MOD	MOD	MOD	MOD	MOD
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score
in margins	3
in mid channel	3
in banks	1
surveyability	3
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.	
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**8**		
Date (dd/mm/yy)	11/10/2014	Surveyors	DR LW			Grid ref.	SO 06933 42733		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1300-1500	
Photo ref. & Location	Downstream end								
Site length (m)	100								
Width channel (m)	5	Descript. (channel features, landuse)	Access from road bridge. Land use - grazing and woodland. Good habitat throughout.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x3	2x4	3x4	2x3	3x2
Channel (1 margins, 2 mid, 3 both, other specify)	3	3	3	2	2
Depth (metres)	0.2	0.2	0.2	0.3	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	5	5	4	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris				YES	
other urban debris					
tree roots, fine	YES		YES	YES	
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)	YES	YES	YES	YES	YES
pebble (<6.5cm)					
gravel (<1.6cm)					

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder	YES	YES	YES	YES	YES
tree roots, large vertical or undercut bank	YES			YES	
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	HEAVY	HEAVY	HEAVY	HEAVY	HEAVY
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score
in margins	3
in mid channel	3
in banks	2
surveyability	3
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.	
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**9**		
Date (dd/mm/yy)	11/10/2014	Surveyors	DR LW			Grid ref.	SO06264 42414		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1			Start and finish time	1100 - 1300		
Photo ref. & Location	Mid point								
Site length (m)	100								
Width channel (m)	4	Descript. (channel features, landuse)	Access good via road bridge. Fully shaded on left bank with some erosion. Right side field with occasional shading. Land use - grazing . Good habitat throughout.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	2x3	2x4	2x4	3x1	3x3
Channel (1 margins, 2 mid, 3 both, other specify)	2	2	3	3	1
Depth (metres)	0.3	0.2	0.3	0.3	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	4	4	5
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris					YES
other urban debris					
tree roots, fine	YES				
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)	YES	YES	YES	YES	YES
pebble (<6.5cm)					
gravel (<1.6cm)					

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder	YES	YES	YES	YES	YES
tree roots, large vertical or undercut bank	YES	YES	YES	YES	YES
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	MOD	HEAVY	HEAVY	MOD	HEAVY
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score
in margins	2
in mid channel	3
in banks	2
surveyability	3
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.	2
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**10**		
Date (dd/mm/yy)	11/10/2014	Surveyors	DR LW			Grid ref.	SO 05861 42621		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	0900-1100	
Photo ref. & Location	In 1st 100m								
Site length (m)	100								
Width channel (m)	3	Descript. (channel features, landuse)	Access down steep wooded banks. Heavily wooded with many large tree roots. Land use - grazing, stock access to river.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x3	3x3	4x2	3x3	3x3
Channel (1 margins, 2 mid, 3 both, other specify)	2	2	1	3	3
Depth (metres)	0.4	0.4	0.2	0.25	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	3	4	4	3	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES				
rubble (give size)					
woody debris	YES		YES		
other urban debris					
tree roots, fine		YES			
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock	YES				
cobble (6.5-15cm)		YES	YES	YES	YES
pebble (<6.5cm)					
gravel (<1.6cm)					

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder	YES		YES	YES	YES
tree roots, large vertical or undercut bank		YES	YES	YES	YES
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	HEAVY	HEAVY	HEAVY	HEAVY	HEAVY
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Patch 1, downstream end of site was on bedrock with fewer refuges. Patch 2 like Site 9.
in margins	3	
in mid channel	3	
in banks	3	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye			River	Offeiriad		Site (no., name)	**11**	
Date (dd/mm/yy)	10/10/2014	Surveyors	DR LW				Grid ref.	SO 05269 43142	
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1500 - 1700	
Photo ref. & Location	Downstream end								
Site length (m)	100								
Width channel (m)	3	Descript. (channel features, landuse)	Access through farmyard. Land use grazing adjacent to farmyard. Site just upstream of farmyard.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	4x3	3x3	4x3	4x3	4x3
Channel (1 margins, 2 mid, 3 both, other specify)	3	2	3	2	3
Depth (metres)	0.3	0.3	0.3	0.3	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	5	4	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)					
rubble (give size)					
woody debris					
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)	YES	YES	YES	YES	YES
pebble (<6.5cm)					
gravel (<1.6cm)					

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder	YES	YES	YES	YES	YES
tree roots, large vertical or undercut bank	YES	YES	YES	YES	YES
	YES	YES	YES	YES	YES
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	MOD	LIGHT	MOD	MOD	MOD
Crayfish manually					
Crayfish by trap	8				
Total crayfish caught	8				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	3	
in mid channel	3	
in banks	3	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	8	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**12**		
Date (dd/mm/yy)	10/10/2014	Surveyors	DR LW			Grid ref.	SO 04635 43457		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1300-1500	
Photo ref. & Location	In 1st 100m								
Site length (m)	100								
Width channel (m)	3	Descript. (channel features, landuse)	Good access across steep field. Land use - grazing and woodland						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x2	2x2	3x1	5x2	3x3
Channel (1 margins, 2 mid, 3 both, other specify)	3	3	1	1	2
Depth (metres)	0.4	0.3	0.3	0.2	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	5	4	4	5	5
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)			YES		
rubble (give size)					
woody debris					
other urban debris					
tree roots, fine	YES	YES	YES	YES	YES
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)					
pebble (<6.5cm)					
gravel (<1.6cm)	YES	YES	YES	YES	YES

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder			YES	YES	YES
tree roots, large vertical or undercut bank					
	YES	YES			
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	HEAVY	MOD	MOD	MOD	MOD
Crayfish manually	1	3	4	2	
Crayfish by trap	22				
Total crayfish caught	32				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Patch 1 - earth banks on right side
in margins	3	
in mid channel	3	
in banks	2	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	32	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**13**	
Date (dd/mm/yy)	10/10/2014	Surveyors	DR LW			Grid ref.	SO 03771 43539	
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1			Start and finish time	1100-1300	
Photo ref. & Location	In 1st 100m							
Site length (m)	100							
Width channel (m)	3	Descript. (channel features, landuse)	Access down moderately steep wooded bank. Land use woodland and grazing with limited stock access to water. Appears to be excellent habitat.					

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x3	2x3	3x3	3x3	3x2
Channel (1 margins, 2 mid, 3 both, other specify)	3	3	3	3	3
Depth (metres)	0.3	0.3	0.2	0.2	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	3	4	4	4	5
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)					
rubble (give size)					
woody debris	YES			YES	YES
other urban debris					
tree roots, fine	YES	YES	YES	YES	
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)					
pebble (<6.5cm)					
gravel (<1.6cm)	YES	YES	YES	YES	YES

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none		YES			
cobble/boulder					
tree roots, large	YES		YES	YES	YES
vertical or undercut bank					
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	HEAVY	HEAVY	HEAVY	MOD	HEAVY
Crayfish manually	3	10	12	1	4
Crayfish by trap	18				
Total crayfish caught	48				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score
in margins	3
in mid channel	3
in banks	3
surveyability	3
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.	
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	48

Patch 1 & 2 had earth banks with no crayfish burrows. An otter holt has recently been installed and it is believed that otters have started to use it. Photo of crayfish found at this site

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**14**		
Date (dd/mm/yy)	10/10/2014	Surveyors	DR LW			Grid ref.	SO 03000 43674		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	0900-1100	
Photo ref. & Location	In 1st 100m								
Site length (m)	100	Descript. (channel features, landuse)	Access over moorland. Land use moorland grazing and woodland. Stock access throughout						
Width channel (m)	1								
	sample patch 1		sample patch 2		sample patch 3		sample patch 4		sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4		1 & 4		1 & 4		1 & 4		1 & 4
Details (if not standard)									
Extent (l x w patch)	6x1		4x1		5x1		6x1		6x1
Channel (1 margins, 2 mid, 3 both, other specify)	3		3		3		3		3
Depth (metres)	0.1		0.2		0.2		0.2		0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	5		4		4		4		4
Refuges in channel	tick all present in patch, main types searched in red								
cobble (6.5-15cm)	YES		YES		YES		YES		YES
cobble (15-25.6cm)	YES		YES		YES		YES		YES
boulder (25.6-40cm)	YES		YES		YES		YES		YES
boulder (>40cm)	YES		YES						
rubble (give size)									
woody debris							YES		
other urban debris									
tree roots, fine									
moss									
filamentous algae									
other submerged veg.	YES		YES		YES		YES		YES
emergents									
Main substrate beneath									
bedrock									
cobble (6.5-15cm)									
pebble (<6.5cm)									
gravel (<1.6cm)	YES		YES		YES		YES		YES

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder					
tree roots, large vertical or undercut bank					
	YES	YES	YES	YES	YES
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	NONE	NONE	NONE	NONE	NONE
Crayfish manually		4	2	1	
Crayfish by trap	7				
Total crayfish caught	14				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	2	
in mid channel	3	
in banks	3	
surveyability	2	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	14	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**15**		
Date (dd/mm/yy)	09/10/2014	Surveyors	DR LW			Grid ref.	SO 02620 43857		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1100-1300	
Photo ref. & Location	In 1st 100m								
Site length (m)	400m								
Width channel (m)	1	Descript. (channel features, landuse)	Access good walking from road. Low water. Very few large boulders/stones.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x1	4x1	5x1	5x1	7x1
Channel (1 margins, 2 mid, 3 both, other specify)	3	3	3	3	3
Depth (metres)	0.2	0.2	0.2	0.2	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	4	4	4
Refuges in channel	tick all present in patch, ring main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES			
boulder (>40cm)					
rubble (give size)					
woody debris					
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.	YES	YES	YES	YES	YES
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)					
pebble (<6.5cm)					
gravel (<1.6cm)	YES	YES	YES	YES	YES

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder					
tree roots, large vertical or undercut bank					
	YES	YES	YES	YES	YES
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	NONE	NONE	NONE	NONE	NONE
Crayfish manually				2	1
Crayfish by trap	9				
Total crayfish caught	12				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	2	
in mid channel	2	
in banks	2	
surveyability	2	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	12	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Offeiriad		Site (no., name)	**16**		
Date (dd/mm/yy)	09/10/2014	Surveyors	DR LW			Grid ref.	SO 02021 44210		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	0900-1100	
Photo ref. & Location	In 1st 100m								
Site length (m)	400								
Width channel (m)	0.5	Descript. (channel features, landuse)	Access good walking from road. Very few large boulders/stones.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	4x0.5	4x0.5	5x0.5	5x0.5	5x0.5
Channel (1 margins, 2 mid, 3 both, other specify)	3	3	3	3	3
Depth (metres)	0.2	0.2	0.2	0.2	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	4	4	4
Refuges in channel	tick all present in patch, ring main type(s) searched				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)					
boulder (>40cm)					
rubble (give size)					
woody debris					
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.	YES	YES	YES	YES	YES
emergents	YES	YES	YES	YES	YES
Main substrate beneath					
bedrock					
cobble (6.5-15cm)					
pebble (<6.5cm)					
gravel (<1.6cm)	YES	YES	YES	YES	YES

sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder					
tree roots, large vertical or undercut bank					
	YES	YES	YES	YES	YES
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	NONE	NONE	NONE	NONE	NONE
Crayfish manually			1		
Crayfish by trap	7				
Total crayfish caught	8				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	2	
in mid channel	2	
in banks	2	
surveyability	2	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	8	

10.8. Appendix H: White-clawed crayfish habitat survey forms for Sgithwen Brook, October 2014.

CRAYFISH HABITAT SURVEY FORM

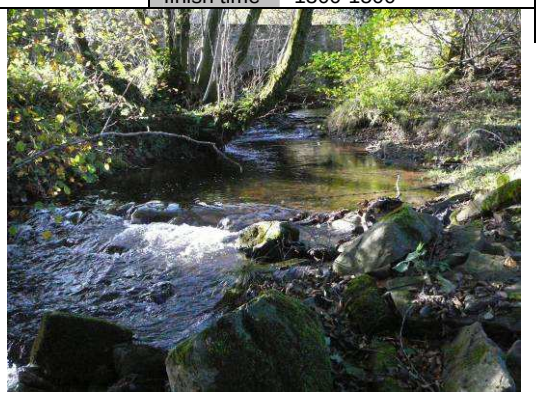
Catchment	Wye		River	Sgithwen		Site (no., name)	**9**		
Date (dd/mm/yy)	16/10/2014	Surveyors	DR LW			Grid ref.	SO 08312 40030		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1500-1700	
Photo ref. & Location	Immediately downstream of 1st 100m								
Site length (m)	100								
Width channel (m)	4	Descript. (channel features, landuse)	Land use - woodland, grazing. Access - roadbridge at downstream end. Series of bedrock waterfalls, pools and stoney areas.						

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x2	6x1	6x1	6x1	6x1
Channel (1 margins, 2 mid, 3 both, other specify)	3	3	3	3	3
Depth (metres)	0.2	0.2	0.3	0.2	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	4	4	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris	YES	YES	YES	YES	YES
other urban debris					
tree roots, fine	YES				YES
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					

bedrock					
cobble (6.5-15cm)	YES	YES	YES	YES	YES
pebble (<6.5cm)					
gravel (<1.6cm)					
sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none		YES		YES	
cobble/boulder					
tree roots, large	YES		YES		YES
vertical or undercut bank					
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT
Crayfish manually	0	0	0	0	3
Crayfish by trap	4				
Total crayfish caught	7				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):Stock access throughout.
in margins	3	
in mid channel	3	
in banks	1	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	7	

CRAYFISH HABITAT SURVEY FORM

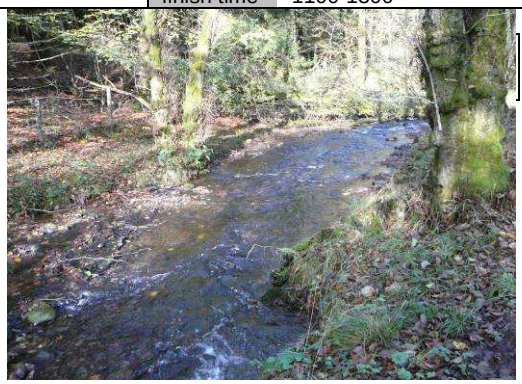
Catchment	Wye	River	Sgithwen	Site (no., name)	**10**
Date (dd/mm/yy)	16/10/2014	Surveyors	DR LW	Grid ref.	SO 07659 39571
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1	Start and finish time	1300-1500
Photo ref. & Location	400m mark				
Site length (m)	100				
Width channel (m)	3	Descript. (channel features, landuse)	Land use - agricultural. Easy access via road bridge		

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	5x1	7x2	7x2	5x2	7x1
Channel (1 margins, 2 mid, 3 both, other specify)	1	1	2	3	3
Depth (metres)	0.4	0.2	0.3	0.3	0.3
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	5	5	4
Refuges in channel	tick all present in patch,main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris	YES	YES	YES	YES	YES
other urban debris					
tree roots, fine	YES	YES	YES		
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)	YES	YES	YES	YES	YES

pebble (<6.5cm)					
gravel (<1.6cm)					
sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder	YES	YES	YES	YES	YES
tree roots, large	YES	YES	YES	YES	YES
vertical or undercut bank		YES		YES	
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	MOD	HEAVY	MOD	HEAVY	HEAVY
Crayfish manually	0	0	1	0	0
Crayfish by trap	3				
Total crayfish caught	4				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):Excellent habitat throughout
in margins	3	
in mid channel	3	
in banks	3	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	4	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye		River	Sgithwen		Site (no., name)	**11**		
Date (dd/mm/yy)	16/10/2014	Surveyors	DR LW			Grid ref.	SO 06970 39107		
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1				Start and finish time	1100-1300	
Photo ref. & Location	In 1st 100m								
Site length (m)	100								
Width channel (m)	2.5	Descript. (channel features, landuse)	Land use - woodland. Access from roadbridge in Site 10						
	sample patch 1		sample patch 2		sample patch 3	sample patch 4		sample patch 5	
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4		1 & 4		1 & 4	1 & 4		1 & 4	
Details (if not standard)									
Extent (l x w patch)	2x2		4x2		3x2	8x1		10x1	
Channel (1 margins, 2 mid, 3 both, other specify)	1		1		2	2		3	
Depth (metres)	0.2		0.2		0.2	0.3		0.2	
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	5		4		4	5		5	
Refuges in channel	tick all present in patch,main type(s) searched in red								
cobble (6.5-15cm)	YES		YES		YES	YES		YES	
cobble (15-25.6cm)	YES		YES		YES	YES		YES	
boulder (25.6-40cm)	YES		YES		YES	YES		YES	
boulder (>40cm)	YES		YES		YES	YES		YES	
rubble (give size)									
woody debris	YES		YES		YES	YES		YES	
other urban debris									
tree roots, fine									
moss									
filamentous algae									
other submerged veg.									
emergents									
Main substrate beneath									
bedrock									
cobble (6.5-15cm)	YES		YES		YES	YES		YES	

pebble (<6.5cm)					
gravel (<1.6cm)					
sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none	YES	YES			
cobble/boulder			YES	YES	YES
tree roots, large				YES	YES
vertical or undercut bank			YES	YES	
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	HEAVY	HEAVY	HEAVY	HEAVY	HEAVY
Crayfish manually		1		1	1
Crayfish by trap	5				
Total crayfish caught	8				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):Excellent habitat
in margins	3	
in mid channel	3	
in banks	2	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	8	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye	River	Sgithwen	Site (no., name)	**12**
Date (dd/mm/yy)	16/10/2014	Surveyors	DR LW	Grid ref.	SO 06541 38597
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1	Start and finish time	0900-1100
Photo ref. & Location	Mid point of site				
Site length (m)	100				
Width channel (m)	3	Descript. (channel features, landuse)	Land use - woodland and village. Access via roadbridge.		

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x2	4x2	6x2	5x1	3x1
Channel (1 margins, 2 mid, 3 both, other specify)	2	1	3	1	3
Depth (metres)	0.2	0.2	0.2	0.2	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	4	4	4
Refuges in channel	tick all present in patch,main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris	YES	YES	YES	YES	YES
other urban debris					
tree roots, fine	YES	YES	YES	YES	YES
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock	YES	YES	YES	YES	YES
cobble (6.5-15cm)					

pebble (<6.5cm)					
gravel (<1.6cm)					
sand (<2mm)					
clay					
silt					
Siltation none	YES	YES	YES	YES	YES
low					
moderate					
high					
Refuges in bank none					
cobble/boulder	YES	YES			
tree roots, large	YES	YES	YES	YES	YES
vertical or undercut bank	YES				
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	HEAVY	HEAVY	HEAVY	HEAVY	HEAVY
Crayfish manually	0	0	0	0	0
Crayfish by trap	2				
Total crayfish caught	2				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	3	
in mid channel	3	
in banks	1	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	2	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye	River	Sgithwen	Site (no., name)	**13**
Date (dd/mm/yy)	15/10/2014	Surveyors	DR LW	Grid ref.	SO 06010 38645
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1	Start and finish time	1500-1700
Photo ref. & Location	Towards upstream end of site				
Site length (m)	100				
Width channel (m)	1.5	Descript. (channel features, landuse)	Land use - grazing, total stock access. Easy access across field.		

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	6x1	6x1	6x1	6x1	6x1
Channel (1 margins, 2 mid, 3 both, other specify)	3	3	3	3	3
Depth (metres)	0.2	0.2	0.2	0.2	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	4	4	4	4	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris					
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)					

pebble (<6.5cm)					
gravel (<1.6cm)	YES	YES	YES	YES	YES
sand (<2mm)					
clay					
silt					
Siltation none	YES	YES	YES	YES	YES
low					
moderate					
high					
Refuges in bank none					
cobble/boulder	YES	YES	YES	YES	YES
tree roots, large					
vertical or undercut bank	YES	YES	YES	YES	YES
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	NONE	NONE	NONE	NONE	NONE
Crayfish manually					1
Crayfish by trap	3				
Total crayfish caught	4				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):Site is mostly a straight channel except for the most upstream end where there is more diversity of habitat
in margins	3	
in mid channel	3	
in banks	2	
surveyability	1	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	4	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye	River	Sgithwen	Site (no., name)	**14**
Date (dd/mm/yy)	15/10/2014	Surveyors	DR LW	Grid ref.	SO 05720 38718
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1	Start and finish time	1300-1500
Photo ref. & Location	At 100 m between patches 1 and 2				
Site length (m)	100				
Width channel (m)	1.5 - 2.5	Descript. (channel features, landuse)	Land use - farmyard and grazing. Irish bridge between Patches 1 & 2. Good habitat throughout. Easy access through farmyard		

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	6x4	8x2	5x1	5x1	5x1
Channel (1 margins, 2 mid, 3 both, other specify)	3	2	3	3	3
Depth (metres)	0.3	0.3	0.3	0.3	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	3	3	4	4	4
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris				YES	
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)					

pebble (<6.5cm)					
gravel (<1.6cm)		YES	YES	YES	
sand (<2mm)					
clay					
silt	YES	YES			
Siltation none		YES	YES	YES	
low					
moderate	YES	YES			
high					
Refuges in bank none	YES	YES			
cobble/boulder		YES			
tree roots, large		YES			
vertical or undercut bank		YES		YES	YES
dry stone wall					
other reinforced					
crayfish burrows					YES
Shading above	NONE	NONE	NONE	MOD	MOD
Crayfish manually	6	7	2	1	1
Crayfish by trap	37				
Total crayfish caught	54				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):Good habitat throughout. Six crayfish seen walking across riverbed from Irish bridge (in photo). Also reports of largest crayfish ever seen in this area by local farmers.
in margins	3	
in mid channel	3	
in banks	3	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	54	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye	River	Sgithwen	Site (no., name)	**15**
Date (dd/mm/yy)	15/10/2014	Surveyors	DR LW	Grid ref.	SO 05116 38682
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1	Start and finish time	1100-1300
Photo ref. & Location	In 1st 100m				
Site length (m)	100				
Width channel (m)	1.5 - 3	Descript. (channel features, landuse)	Land use - woodland and grazing. Easy access across field. Good habitat throughout.		

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	3x2	3x2	4x3	5x1	5x1
Channel (1 margins, 2 mid, 3 both, other specify)	3	3	1	3	3
Depth (metres)	0.2	0.2	0.3	0.2	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	5	5	2	3	5
Refuges in channel	tick all present in patch,main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris	YES	YES			
other urban debris					
tree roots, fine	YES	YES			
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath					
bedrock					
cobble (6.5-15cm)					

pebble (<6.5cm)					
gravel (<1.6cm)	YES	YES	YES	YES	YES
sand (<2mm)					
clay					
silt					
Siltation none					
low	YES	YES	YES	YES	YES
moderate					
high					
Refuges in bank none					
cobble/boulder	YES	YES	YES	YES	YES
tree roots, large	YES	YES			
vertical or undercut bank	YES	YES		YES	YES
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	LOW	MOD	HEAVY	HEAVY	LOW
Crayfish manually	3	2		2	
Crayfish by trap	12				
Total crayfish caught	19				

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score	Notes (survey conditions, patches etc.):
in margins	3	
in mid channel	3	
in banks	2	
surveyability	3	
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.		
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	19	

CRAYFISH HABITAT SURVEY FORM

Catchment	Wye	River	Sgithwen	Site (no., name)	**16**
Date (dd/mm/yy)	15/10/2014	Surveyors	DR LW	Grid ref.	SO 04620 39077
Weather, good 1, mod 2, poor 3	1	Flow norm 1, low 2, fall 3, rise 4	1	Start and finish time	0900-1100
Photo ref. & Location	Pond				
Site length (m)	100				
Width channel (m)	1.5	Descript. (channel features, landuse)	Land use - forestry plus forestry store. Small stream channel with adjacent pond.		

	sample patch 1	sample patch 2	sample patch 3	sample patch 4	sample patch 5
Survey method, std 1, quad 2, net/kick 3, trap 4, view 5	1 & 4	1 & 4	1 & 4	1 & 4	1 & 4
Details (if not standard)					
Extent (l x w patch)	8x1	8x1	8x1	8x1	8x1
Channel (1 margins, 2 mid, 3 both, other specify)	3	3	3	3	3
Depth (metres)	0.2	0.2	0.2	0.3	0.2
Feature (1 marg. d'water, 2 pool, 3 glide, 4 run, 5 riffle)	5	4	4	3	3
Refuges in channel	tick all present in patch, main type(s) searched in red				
cobble (6.5-15cm)	YES	YES	YES	YES	YES
cobble (15-25.6cm)	YES	YES	YES	YES	YES
boulder (25.6-40cm)	YES	YES	YES	YES	YES
boulder (>40cm)	YES	YES	YES	YES	YES
rubble (give size)					
woody debris	YES			YES	
other urban debris					
tree roots, fine					
moss					
filamentous algae					
other submerged veg.					
emergents					
Main substrate beneath				CONCRETE	
bedrock					
cobble (6.5-15cm)					

pebble (<6.5cm)	YES	YES	YES		YES
gravel (<1.6cm)					
sand (<2mm)					
clay					
silt					
Siltation none	YES	YES	YES	YES	YES
low					
moderate					
high					
Refuges in bank none	YES			YES	YES
cobble/boulder					
tree roots, large					
vertical or undercut bank		YES	YES		
dry stone wall					
other reinforced					
crayfish burrows					
Shading above	MOD	MOD	MOD	MOD	MOD
Crayfish manually					
Crayfish by trap					
Total crayfish caught					

Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	Score
in margins	3
in mid channel	3
in banks	1
surveyability	3
Problems pollution 1, erosion 2, (E if >33% affected), aliens 3.	
Total crayfish (by 1 method, note total(s) by other methods in notes if applicable)	0

Notes (survey conditions, patches etc.):Patch 4 - river piped under track, contains boulders and cobbles. Photos of river upstream and downstream of piped section.

10.9. Data Archive Appendix

The data archive contains:

[A] The final report in Microsoft Word and Adobe PDF formats.

[B] Species records, which are held on the NRW Recorder 6 database.

Metadata for this project is publicly accessible through Natural Resources Wales' Library Catalogue http://libcat.naturalresources.wales or http://catllyfr.cyfoethnaturiol.cymru by searching 'Dataset Titles'. The metadata is held as record no 115954.

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