European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC)

Supporting documentation for the Third Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2007 to December 2012
Conservation status assessment for

Species:

S1092 - White-clawed crayfish (*Austropotamobius pallipes*)

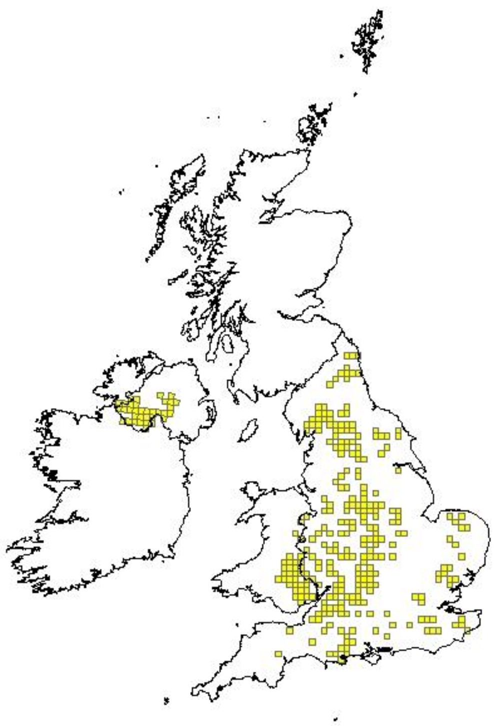
IMPORTANT NOTE – PLEASE READ

- The country-level reporting information contained in this document is a contribution to the Article 17 UK report for the habitat/species concerned.
- It has been provided by **Natural England** and refers only to the state of the habitat/species in **England** - it does not constitute an assessment for the whole of the UK.
- The Article 17 UK Approach document provides details on how this information has been used and, combined with information supplied by other Statutory Nature Conservation Bodies
- The format of the document is closely aligned to that set out by the European Commission for Member State reporting – as a result, some of the fields are not applicable at a country-level and have deliberately been left blank – in addition, the content of most fields is constrained by the EC reporting categories.

Reporting format on the 'main results of the surveillance under Article 11' for Annex II, IV & V species

Field name	*Brief explanations*	
0.2 Species	**0.2.1 Species code**	**S1092**
	0.2.2 Species scientific name	***Austropotamobius pallipes***
	0.2.3 Alternative species scientific name Optional	
	0.2.4 Common name Optional	**white-clawed crayfish**

1.1 Maps			
1.1.1 Distribution map		**Sensitive**	**False**



1.1.2 Method used - map	**Estimate based on partial data with some extrapolation and/or modelling**
1.1.3 Year or period	**2007-2012**
1.1.4 Additional distribution map	**True**
1.1.5 Range map	

2.1 Biogeographical region & marine regions	**ATL**
2.2 Published sources	**"Rogers, D. & Watson, E. (2010) Distribution database for crayfish in England and Wales. In Species Survival Conference, Securing White-clawed Crayfish in a Changing Environment. Bristol, November 2010** **David Rogers Associates, Control of crayfish plague in England and Wales, 2010, DEFRA Project FC1196.** **http://www.environment-agency.gov.uk/research/library/data/97343.aspx** **Adrian HUTCHINGS, Monitoring Austropotamobius pallipes (Lereboullet) in a chalk stream in southern England, Crayfish Conservation in the British Isles 2009, http://iz.carnegiemnh.org/crayfish/IAA/docs/2009_Crayfish_Conservation_in_the_British_Isles_LR.pdf** **Vicky KINDEMBA and Andrew WHITEHOUSE, Using GIS to identify and prioritise regional ark sites for white-clawed crayfish: aggregate and mineral extraction sites in South-west England, Crayfish Conservation in the British Isles 2009** **Holditch & Reeve (1989) Status of native crayfish with particular reference to crayfish plague, alien introductions and pollution, Update September 1989, Nature Conservancy Council contract HF3-03-432. CSD Report 999.** **State of the Natural Environment Report, 3, Biodiversity, 3.7, Open Water, Natural England, 2008.** **Johnsen, S.I. and Taugbøl, T. (2010): NOBANIS – Invasive Alien Species Fact Sheet – Pacifastacus leniusculus. – From: Online Database of the North European and Baltic Network on Invasive Alien Species – NOBANIS www.nobanis.org, Date of access x/x/201x.** **Joint Nature Conservation Committee. 2007. Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17** **Buglife Ark site selection tool at http://www.buglife.org.uk/conservation/currentprojects/Species+Action/Conserving+our+Crayfish/Crayfish+Ark+Site+Selection+Criteria** **Mainstone, C, 2012, Natural England Article 17 report, in draft. Report on the main results of the surveillance under article 17 for annex I , CODE: 3260, Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-**

	Batrachion vegetation."

2.3 Range	
2.3.1 Surface area Range	**147**
	Figure 3 in Rogers & Watson (2010) should be consulted to see the effective extinction of pure native crayfish sub-catchments in southern England over the reporting priod (though extended), with only parts of the Midlands and northern England having any strength left. Even in those area, a number of mixed catchments can be noted.
2.3.2 Method used Surface area of Range	**Estimate based on partial data with some extrapolation and/or modelling**
2.3.3 Short-term trend Period	**2001-2012**
2.3.4 Short term trend Trend direction	**decrease**
	Mapping work in the Southwest (Kindemba & Whitehouse, 2009) demonstrate the continued fall of the river catchments to signal invasion (between 1970-2008), with only 14 catchments holding only native crayfish, 2 categories of mixed occupation (38 catchments), & 52 catchments with only non-native crayfish , with 92 empty catchments, a proportion of which which would be unsuitable being on acidic geology, for example. As Rogers and Watson (2010) noted "the rate of spread and colonization of P. leniusculus in sub catchments previously occupied 166 by A. pallipes. In 2010 there were only 81 sub catchments containing only A. pallipes whereas pre-1990 there were 187. In contrast, there are now 275 sub catchments containing only P. leniusculus compared to 96, pre-1990. In addition there are also 115 sub catchments that currently have both species present (i.e. a total of 390 sub catchments contain P. leniusculus) the majority of which contain a larger number of P. leniusculus populations. Observations to date suggest that it is only a matter of time before the A. pallipes populations disappear and these sub catchments will become occupied by P. Leniusculus only."
2.3.5 Short-term trend Magnitude	**a) Minimum**
	b) Maximum
2.3.6 Long-term trend Period	**1990-2012**
2.3.7 Long-term trend Trend direction	**decrease**

2.3.8 Long-term trend Magnitude Optional	**a) Minimum**	
	b) Maximum	
2.3.9 Favourable reference range	**a) Value in km²**	
	b) Operator for FRR	
	c) FRR is unknown (indicated by "true")	**False**
	d) Method used to set FRR	
2.3.10 Reason for change Is the difference between the reported value in 2.3.1 and the previous reporting round mainly due to…	**a) Genuine change?**	**True**
	b) Improved knowledge/more accurate data?	**False**
	c) Use of different method (e.g. "Range tool")?	**False**

2.4 Population		
2.4.1 Population size estimation (using individuals or agreed exceptions where possible)	**a) Unit**	
	b) Minimum	
	c) Maximum	

2.4.2 Population size estimation (using population unit other than individuals) Optional *(if 2.4.1 filled in)*	**a) Unit**	**number of map 10x10 km grid cells**
	Population has been forced to adopt a coarse 10km sq assessment framework, as it remains impossible to assess the scale of the population across the whole of England, especially in a dynamic and declining population. The database does not easily accept sub-catchment as a measurement type, despite its value. It is likely that the losses have continued, invalidating some of these 10km squares, as signal crayfish continue their spread across catchments and sub-catchments. Hutchings (2009) demonstrated over a long term study on the Upper itchen that native crayfish populations can be fairly stable when both isolated and in the conditions operating across that watercourse, strongly indicating that the impact on the species is linked to non-native species invasion, and not a result of wider factors such as climate change.	
	b) Minimum	**147**
	c) Maximum	**147**
2.4.3 Additional information on population estimates / conversion Optional	**a) Definition of "locality"**	
	b) Method to convert data	
	c) Problems encountered to provide population size estimation	
2.4.4 Year or period	**2007-2012**	
2.4.5 Method used Population size	**Estimate based on partial data with some extrapolation and/or modelling**	
2.4.6 Short-term trend Period	**2001-2012**	
2.4.7 Short-term trend Trend direction	**decrease >1%/year**	
2.4.8 Short-term trend Magnitude	**a) Minimum**	**214**
	b) Maximum	**214**

	This is the 214 ten km squares with the last crayfish record being in the period 2001-2006 which, out of the total of 348 recorded squares (2001-2012) equates to some 61.5% of the squares with no subsequent record. Some of this will be observer bias, rather than loss.	
	c) Confidence interval	
2.4.9 Short-term trend Method used	**Estimate based on partial data with some extrapolation and/or modelling**	
2.4.10 Long-term trend – Period	**1989-2012**	
2.4.11 Long-term trend Trend direction	**decrease 1% or less/year**	
2.4.12 Long-term trend Magnitude Optional	**a) Minimum**	**295**
	b) Maximum	**295**
	c) Confidence interval	
2.4.13 Long term trend Method used	**2**	
2.4.14 Favourable reference population	**a) Number of individuals/agreed exceptions/other units**	**350**
	b) Operator	**approximately equal to**
	c) FRP is unknown indicated by "true"	**False**
	d) Method used to set FRP	**based on 1989 map of UK distribution.**

2.4.15 Reason for change Is the difference between the value reported at 2.4.1 or 2.4.2 and the previous reporting round mainly due to:	**a) Genuine change?**	**True**
	b) Improved knowledge/more accurate data?	**False**
	c) Use of different method (e.g. "Range tool")?	**False**

2.5 Habitat for the species		
2.5.1 Area estimation	**147**	
2.5.2 Year or period	**2007-2012**	
2.5.3 Method used Habitat for the species	**Estimate based on partial data with some extrapolation and/or modelling**	
2.5.4 Quality of the habitat	**a) Habitat quality**	**Moderate**
	The assumptiopn here is that signal crayfish, whilst part of the ecosystem in many Englisg rivers now, as not considered as part of the habitat fot the purspose of this assessment, but that is it based on physio-chemical parameters of water qulaity, rather than a mix of physio-chemical and competition and disease-vectoring that signals bring to the picture. Moderate is therefore based on water quality.	
	b) Assessment method	**General quality assessment (GQA) as undertaken by the Environment Agency.** **Biological quality - an indicator of overall health of rivers: In 2008, 72 per cent of English rivers were at this level - the best on record, this is up from 55 per cent in 1990.** **Chemical quality - an indicator of organic pollution in general : In 2008 79 per cent of English rivers were at excellent or good quality, up from 55 per cent in 1990.** **Nutrient status - phosphate and nitrate in rivers: In 2008, 51 per cent of English rivers had high concentrations of phosphate compared with 69 per cent in 1990. High concentrations of nitrate**

		were found in 32 per cent of English rivers in 2008 compared with 36 per cent in 1995. **However, the latter part of the reporting period saw the introduction of the Water Framework Directive reporting system classification:** **All surface waters England and Wales:** **28% of surface water bodies (rivers, lakes, transitional & coastal) are at good ecological status/potential or better, compared to 27% in 2009** **For overall status of surface water bodies, 28% are good status or better, compared with 27% in 2009.** **On this basis, it seems reasonable to take a middle ground approach and place the habitat as Moderate. In any instance, water quality is now not the major driver in native crayfish decline, so the point it less significant.**
2.5.5 Short-term trend Period	**2000-2012**	
2.5.6 Short-term trend Trend direction	**increase**	
2.5.7 Long-term trend Period		
2.5.8 Long-term trend Trend direction		
	For the longer term trend one can look back to Holditch & Reeve (1989) and roughly count the number of ten km squares occupied by native crayfish in England, arriving at about 350 (will include some Welsh sites as the boundary is not shown on the old map, neither are the source records revealed). This is now down to 147 ten km squares, equating to around a 58% loss. This has some caveats of course, as crayfish were poorly recorded until the plague became noticed, and surveyor bias operates through in the detection of populations out with targetted survey, but the trend is clear.	
2.5.9 Area of suitable habitat for the species	**a) Value in km²**	**0**
	There are 138,624 linear kilometres of rivers and canals in England, though only some of this would be capable of supporting crayfish; there is no area calculation of the resource otherwise (State of the Natural Environment, 2008)	
	b) Absence of data indicated as '0'	
2.5.10 Reason for change Is the difference between the	**a) Genuine change?**	**False**

value reported at 2.5.1 and the previous reporting round mainly due to		
	b) Improved knowledge/more accurate data?	**False**
	c) Use of different method (e.g. "Range tool")?	**False**

2.6 Main pressures		
a) Pressure	**b) Ranking**	**c) Pollution qualifier**
	H = high importance M = medium importance L = low importance	
I01: invasive non-native species	H	
A07: use of biocides, hormones and chemicals	M	
D01: Roads, paths and railroads	L	
F06: Hunting, fishing or collecting activities not referred to above	L	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	L	

2.6.1 Method used – Pressures	**based exclusively or to a larger extent on real data from sites/occurrences or other data sources**

2.7 Threats		
a) Threat	**b) Ranking**	**c) Pollution qualifier**
	H = high importance M = medium importance L = low importance	
I01: invasive non-native species	H	
K03: Interspecific faunal relations	H	

2.7.1 Method used – Threats	**expert opinion**

2.8 Complementary information	
2.8.1 Justification of % thresholds for trends	
2.8.2 Other relevant information	**Much of the spatial focus has been on sub-catchment or catchment level, as this is core scheme the Environment Agency utilise. So, pre-1990, there were 187 sub-catchments holding native crayfish, this having dropped to 81 in the UK (Rogers & Watson, 2010). The attendent increase in signal crayfish range at the same time from 96 sub-catchments in the UK pre-1990, to over** **390 in 2010. It is enitirely conceivable under the scenario for native crayfish to occur only with ark sites and hydrologically remote and unconnected head water systems where signal crayfish are either incapable of colonising on their own, or being placed there.** **There is some feeling that the spread of signal crayfish may well have been exacerbated by deliberate introduction in support of local gastronomy, though the reality, extent, or validity of this belief remains unexplored. Disinfection protocols have been part of the crayfish licence system in England for a number of years. Much work has been done with the disposal of sheep dip by the Enviroment Agency, but there are stil instances of rogue disposal into water-courses, resulting in colony decimation.** **The development of Ark sites as established crayfish refuges goes some way to compensating for range loss, though their area is small compared to the lengths of river and stream lost to signal crayfish incursion.**
2.8.3 Trans-boundary assessment	

2.9 Conclusions *(assessment of conservation status at end of reporting period)*
Please refer to the United Kingdom assessment for this species.

3 Natura 2000 coverage & conservation measures - Annex II species
(only applies to species listed under Annex II of the Directive)

3.1 Population

3.1.1 Population size Estimation of population size included in the SAC network	**a) Unit**	**number of map 10x10 km grid cells**
	Though the range within the SAC series remains at 2,539.82ha of habitat, some 186.02 ha have been lost through crayfish plague and direct signal crayfish incursion. Three of the SAC have lost or nearly lost their native populations, leaving only 2 SAC being deemed good and 1 threatened (Rogers & Watson, 2010). The "secure" SAC are all in Northern England above the edge of current signal incursion. Examination of the current status of SACs indicates that most designated sites were vulnerable and only three of the original sites (the River Kent, the River Eden and Ensor's Pool) are free from crayfish plague or a hydrological link to P. leniusculus. Only 24 sub catchments contain A. Pallipes populations that do not have a hydrological link and it is these populations that are considered to be the most valuable and should be the focus of conservation efforts and resources.	
	b) Minimum	**25.4**
	c) Maximum	**25.4**
3.1.2 Method used	**Estimate based on expert opinion with no or minimal sampling**	
3.1.3 Trend of population size within the network (short-term trend)	**decrease**	

3.2 Conservation measures

Conservation measures taken (i.e. already being implemented) within the reporting period and provided information about their importance, location and evaluation.

3.2.1 Measure	**3.2.2 Type**					**3.2.3 Ranking** H = high importance M = medium importance L = low importance	**3.2.4 Location** where the measure is PRIMARILY applied			**3.2.5 Broad evaluation of the measure**					
	a) Legal/statutory	**b) Administrative**	**c) Contractual**	**d) Recurrent**	**e) One-off**		**a) Inside**	**b) Outside**	**c) Both inside & outside**	**a) Maintain**	**b) Enhance**	**c) Long term**	**d) No effect**	**e) Unknown**	**f) Not evaluated**

4.1: Restoring/improving water quality				Y		M			Y			Y			
6.1: Establish protected areas/sites				Y		H		Y							Y
7.0: Other species management measures				Y		L			Y				Y		
7.1: Regulation/ Management of hunting and taking					Y	M			Y		Y				
7.4: Specific single species or species group management measures				Y		H			Y				Y		

A number of trials and attempts are controlling or removing signal crayfish have been attempted, though none have seemingly worked and are expensive. Johnson & Taugbol(2010) gives a European view of this and is worth consulting. Given the mapped scale of signal crayfish invasion into the number of sub-catchments it now occupies, any control seems rather fruitless.
The role and eventual status of Ark sites for native crayfish is still unknown, though it is conceivable, given the trends, that native crayfish could well end up being confined to those sites in England. Buglife as an organisation has lead in the development of selection guidelines for Ark sites, this being through a spreadsheet-based matrix approach, and is widely adopted.
The legislative and licensing framework around native crayfish may have secured best practice and consideration of native populations, and therefore will have reduced ancillary losses, but set against the overall losses caused by signal crayfish have effectively been neutralised. Companies facilitating signal crayfish removal for culinary purposes, whilst slighly impacting the target populations, can do nothing on the wider scene, being driven by market demands and site request, and so not a strategic programme. This is ranked as low and ineffective as a measure.