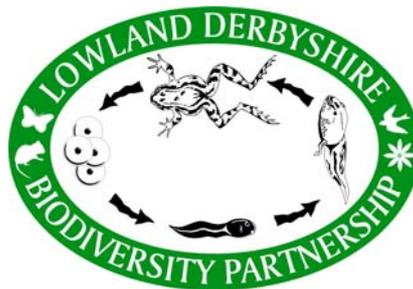

LOWLAND DERBYSHIRE
LOCAL BIODIVERSITY ACTION PLAN

CRAYFISH IN LOWLAND DERBYSHIRE



Picture courtesy of Chesterfield Borough Council

Prepared by the Lowland Derbyshire Biodiversity Partnership



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**This document provides the background information for the White-clawed crayfish
Species Action Plan**

1. Introduction

The white-clawed crayfish, a relative of the lobster, is the UK's only native freshwater crayfish and was until recently widely distributed in alkaline waters¹. In addition to the native species there are at least five non-native species of crayfish which have been introduced to the UK.

The white-clawed crayfish tends to be nocturnal and spends much of its time hiding under stones, in tree roots and in rock crevices. It is omnivorous and feeds on a wide variety of vegetable and animal matter, including fallen leaves, aquatic plants. Occasionally it indulges in cannibalism, particularly on individuals with soft cuticles following their moult². The crayfish forms an important part of the diet of other animals including otters, trout, and herons. In order to avoid predation they tend to emerge at night whilst hiding in refuges during the day. Mating takes place in autumn; the eggs develop whilst attached to the mother's abdomen, and the female overwinters with the eggs still attached to her. After the eggs hatch, the juveniles remain attached to the mother before becoming independent at the beginning of summer. During the first year of life, juveniles may moult more than 7 times. During the winter months they remain largely torpid in refuges becoming active as the water temperatures increase².

The basic requirements for white-clawed crayfish are suitable habitat to provide refuges; an adequate supply of food; access to other crayfish for breeding; suitable water quality; freedom from competition by alien crayfish and crayfish plague.

A number of studies have been carried out on suitable habitat for white-clawed crayfish. Positive features include river banks with deciduous trees, tree roots, a canopy higher than 0.5m with a sloping bank³. Crayfish need a variety of natural and artificial refuges depending of the habitat available. Broadly individuals select refuges which are⁴:

- Fully submerges, although they can survive short periods (hours) uncovered, in damp conditions
- Big enough to amply cover the crayfish, but not too "roomy" for the size of animal
- Stable or relatively resistant to regularly occurring high flows
- Adequately aerated and available for occupation

Other species of crayfish, including the signal crayfish (*Pacifastacus leniusculus*), have been introduced to the UK for crayfish farming to satisfy the catering industry. No consideration was given to this species ability to migrate overland to colonise new habitats. As a consequence, the species rapidly established widespread feral

¹ Holditch, D. (2003). *Ecology of the White-clawed crayfish*. Conserving Natura 2000 Rivers Ecology Series No 1. English Nature, Peterborough.

² Environment Agency. *Freshwater crayfish in Britain and Ireland*. The Environment Agency, Bristol.

³ Foster, J. (1993). *The relationship between refuge size and body size in the crayfish*. *Freshwater Crayfish* 9:345-349

⁴ Peay, S. (2002). *Guidance on Habitat for White-clawed crayfish and its restoration*. Environment Agency Technical Report W1-067/TR.

populations in many waterways, including those populated by native species. The signal crayfish is larger than the white-clawed crayfish and is able to out-compete for food and habitat in most watercourses. It also carries a fungal disease, the crayfish plague, to which the native species has no defence. Incidents of crayfish plague can completely eliminate populations of white-clawed crayfish.

White-clawed crayfish are also vulnerable to water pollution, particularly from the illegal disposal of synthetic pyrethoid sheep dips as well as pesticides and sewage. Habitat modification is also known to impact negatively on white-clawed crayfish.

2. European, and National status and distribution

The white-clawed crayfish is confined to Europe and ranges east to west from former Yugoslavia, Slovenia, Italy, Switzerland and Austria, to Spain, France and the British Isles, where it reaches its most northerly limits. Isolated populations are also known from Germany and Portugal. European populations are more sporadic now than earlier in the century due to habitat modification, pollution and crayfish plague⁵.

The white-clawed crayfish was formerly widespread in Britain where conditions were suitable. Large populations were previously known from central Ireland, the Welsh borderland and England, except for the extreme south west⁶. Prior to the 1980s, UK populations of white-clawed crayfish were relatively stable. Since the early 1980s, many populations have been eliminated by crayfish plague and most of the remaining populations are concentrated in the northern and central part of England.⁷

Sibley (2003)⁸ provides a current picture of white-clawed crayfish distribution in the UK. He records that between 1990 and 1996 white-clawed crayfish were recorded in 298 10km squares. The North-east and Midlands were most densely populated together accounting for 45% of all of the 10km squares in Britain. Since 1997 the population has declined falling to 256 10km squares during 1997-2003 a fall of 14%.

The distribution of non-indigenous crayfish species has increased. Between 1990 and 1996 they were recorded in 189 10km squares and this increased to 300 10km squares between 1997 and 2003, a rise of 59% nationally. The greatest relative percentage increase were seen in the Midlands where records increased by 150%.

Sibley⁸ states that should the current rate of increase continue unchecked, the white-clawed crayfish faces possible extinction in the UK within approximately 30 years. Current thinking, amongst crayfish experts, is that populations of white-clawed crayfish

⁵ Holditch, D. (2003). *Ecology of the White-clawed crayfish*. Conserving Natura 2000 Rivers Ecology Series No 1. English Nature, Peterborough.

⁶ Holdich, D & Rogers (1997). *Austropotamobius pallipes in the British Isles – distribution, threats and legislation*. Bulletin Français de la Pêche et de la Pisciculture 347, 597-616.

⁷ Holditch, D. (2003). *Ecology of the White-clawed crayfish*. Conserving Natura 2000 Rivers Ecology Series No 1. English Nature, Peterborough.

⁸ Sibley, P (2003) *The distribution of crayfish in Britain*. IN Management & Conservation of Crayfish. Proceedings of a conference held on 7th November 2002 at the Nottingham Forest Football Club, Nottingham, UK. Environment Agency.

will only survive if they are within sites not connected to rivers and streams. So-called ark sites could be ponds and lakes with suitable habitat where there is no connection to rivers for non-indigenous crayfish to invade. White-clawed crayfish could be re-introduced to suitable ark sites.

3. Local status and distribution

White-clawed crayfish were known in the Rivers Wye, Derwent and Dove in the late 1800s and early 1900s⁹.

White-clawed crayfish have been recorded on all of the major rivers in Derbyshire, however the current documented distribution shows them only still present on a very small number of rivers and streams. Evidence collated for the Mid Derbyshire Biodiversity Action Plan in 1997 shows white-clawed crayfish present in 9 10 km squares, SK23, SK33, SK34, SK35, SK36, SK37, SK38, SK43 and SK44.

Since then a number of different studies and surveys have recorded crayfish in different parts of lowland Derbyshire.

White-clawed crayfish have been recorded in the Markeaton Brook which flows between Kedleston and Derby since at least the early 1980s. Crayfish were initially found in the lakes at both Markeaton Park and Kedleston Park when they were dredged in the 1980's. A large number of white-clawed crayfish were translocated from the lower lake at Kedleston Park in 2001 suggesting a large population throughout the lake system as a whole, probably centred on each of the weirs. White-clawed crayfish were recorded widely within Markeaton Brook in 2004/5 from Kedleston Hall to the confluence with the River Derwent¹⁰. However, the species was recorded from only a limited number of survey sections due to general lack of favourable habitat features particularly in the upper reaches. Population densities were high where favourable habitat such as cobble and boulder were present. No crayfish were recorded from within the Mackworth Brook, although the presence of trout and bullhead indicate good habitat. No signal crayfish were recorded in the catchment.

Following the loss of the entire white-clawed crayfish population on the River Lathkill in the Peak District in 1993 a small population were re-introduced to the river in September 2000¹¹. White-clawed crayfish were recorded on the River Dove until an outbreak of Crayfish plague in 2005 wiped the population out. In August 2003 Severn Trent Water transferred 450 white-clawed crayfish from their reservoir at Nanpantan, Leicestershire to Carsington Water. The two relocation sites at Carsington Water were monitored in 2005 and were found to have spread along suitable habitat around the reservoir. White-clawed crayfish are also known to be present at Staunton Harold Reservoir associated with the population at Calke Abbey.

⁹ Jourdain, F.C.R. (1905). Crustaceans. In: Page, W. (Ed). *The Victoria History of the Counties of England. Derbyshire Vol. 1.* pp 102-109. London: Constable.

¹⁰ ECUS (2006) Markeaton Brook Management Plan.

¹¹ Le Bas, B. & Rogers, D. (2000) *White-clawed crayfish reintroduction to the River Lathkill, Derbyshire, an interim report.* IN Crayfish Conference Leeds. Proceedings of the Crayfish Conference held on 26-27th April 2000

White-clawed crayfish were rediscovered in Betty's and Thatch House Ponds within Calke Abbey in 2005.

Records of white-clawed crayfish in North East Derbyshire come from the River Amber north of Ogston Reservoir, on the Moss Brook near Eckington and on Highlow Brook on the edge of Sheffield. There were reports of white-claw crayfish in the Moss Valley some years ago particularly in the River Moss between Eckington and Ford Bottom as well as the tributaries that feed the Moss. Signal crayfish have been identified since in the ponds at Marsh Lane that lead into the River Moss. Attempts were made at the time to eradicate the signal crayfish by trapping but it became apparent that this was having little effect on the population and so the capture program was discontinued after the first 2 years or so. Subsequent small scale surveys for white-clawed crayfish have been negative although a through survey has not been undertaken.

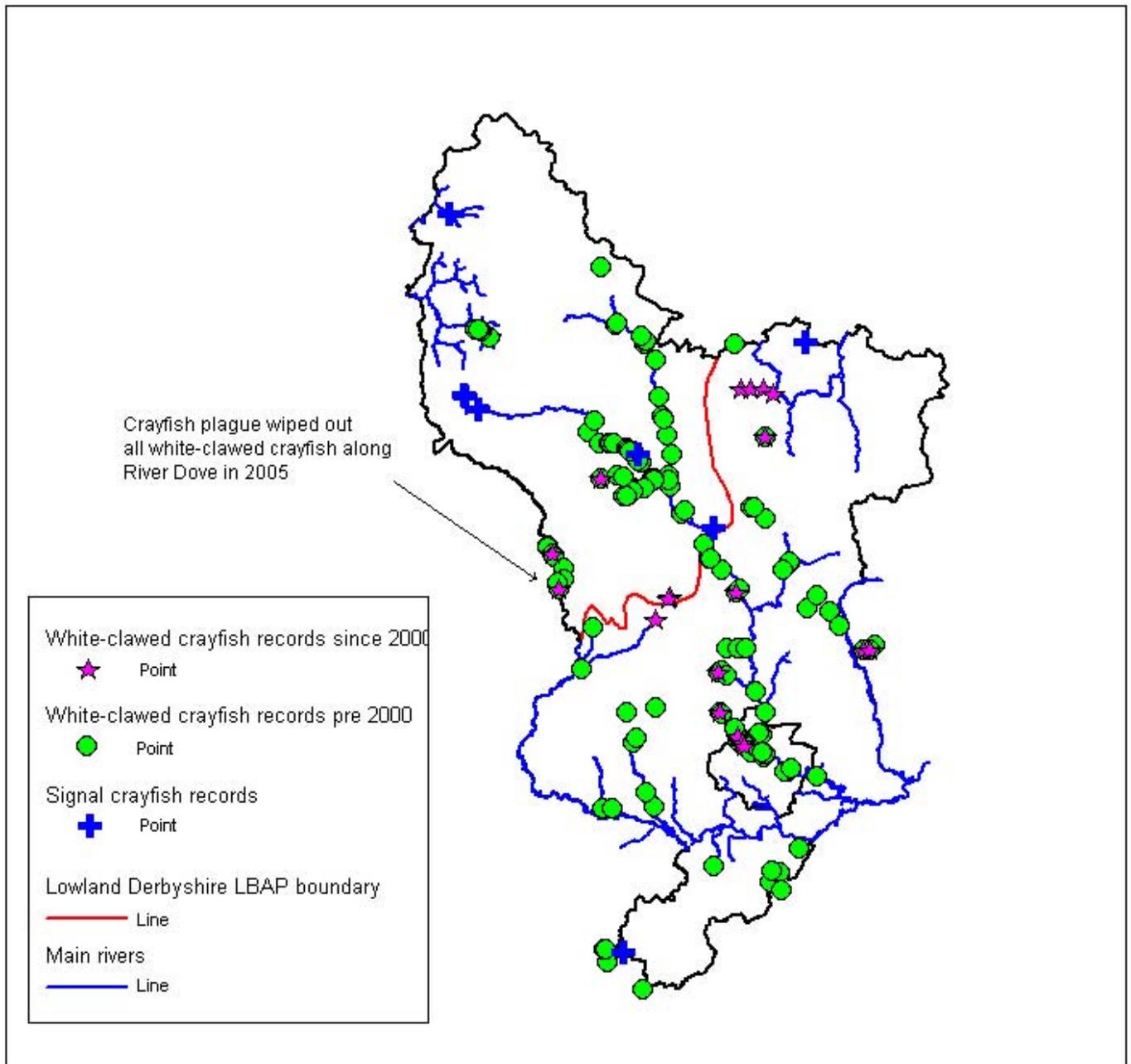
During the summer of 2006 Chesterfield Borough Council and the Environment Agency undertook a survey of crayfish within the Rother catchment, centering upon the borough of Chesterfield. An extensive search of the Barlow Brook and its main tributaries revealed a healthy population as far as the Industrial Estate at Sheepbridge but not into the River Drone. An extensive search of the Hipper and its main tributaries revealed no trace of what was once considered to be a stable population of crayfish. However, it was possible to discount a previous record of American Signal Crayfish on the Hipper a couple of years ago since no crayfish of either species were found. If the record had been accurate we would have expected to find a well-established population of signal crayfish. It is likely that the record was of a juvenile/sub-adult white-clawed crayfish and confusion may have arisen with an inexperienced surveyor as colour variation can include individuals of an almost brick-red colouration.

There appeared to be no apparent reason for the loss of the Hipper population, and therefore questions must be asked about the previous Environment Agency records. It is unclear at this point how their records were collected and thus whether the population has been in decline for sometime. Once it has been established whether these were incidental reports or whether a targeted survey was undertaken, and the extent of the survey, a clearer picture may emerge.

The fact that no American signal crayfish were found during the survey is encouraging, despite the apparent loss of white-claws from the Hipper. One potential ark site was identified at Holmbrook Valley Park, although this needs further survey work to make sure the site is secure in future from signal crayfish, and that no deliberate transfer of signal crayfish has already occurred. If the scheme proves viable the Barlow Brook has been identified as a suitable donor site.

Map 1 shows the distribution of crayfish in Derbyshire, taken from records on the protected species database. It should be noted, however, that this picture is not complete.

Map 1 shows crayfish distribution in Derbyshire



4. Strategic background & legal protection

The white-clawed crayfish was listed as a priority species for action in the UK Biodiversity Action Plan¹² and a species action plan was produced in 1997¹³. A national white-clawed crayfish steering group guides the implementation of the UK BAP's national white-clawed crayfish action plan.

The white-clawed crayfish is listed in Appendix III of the 1979 Bern Convention and on Annexes II and V of the Habitats Directive.

In 1998 the white-clawed crayfish was added to Schedule 5 of the Wildlife and Countryside Act. It is therefore an offence to intentionally take any white-clawed crayfish from the wild, or sell wild crayfish. (It is currently not an offence to disturb or kill indigenous crayfish).

Three species of non-indigenous crayfish (signal, noble and narrow-clawed) are listed on Schedule 9 of the Wildlife and Countryside Act. This makes it an offence for any person to release or allow to escape into the wild any of these species. New legislation on non-indigenous crayfish was provided by an Order made under the Import of Live Fish Act 1980. The Crayfish Order makes it an offence to keep any non-indigenous crayfish without a license in 'no-go' areas. The areas where licences are not required for signal crayfish have been specified in detail and relate to areas where signal crayfish are widespread. Such areas are generally in the south of England.

Under the Salmon and Freshwater Fisheries Act (1975), crayfish are legally classed as freshwater fish. Crayfish introduction to a watercourse is regulated by the Act and requires the consent of the Environment Agency.

As a protected species, the white-clawed crayfish is also covered by the requirements of the government's Planning Policy Statement 9: Biodiversity and Geological Conservation (PPS9). This requires that the presence of a protected species is a material consideration in the determination of a planning application and suggests that planning authorities should request surveys prior to granting permission and, where an over-riding need is demonstrated, attach appropriate planning conditions to secure the protection of the species. Under PPS9 local authorities should also, through their planning function, take steps to maintain, enhance, restore or add to biodiversity interests, furthering the conservation of habitats and species that DEFRA consider to be of 'principal importance'. These should be protected from the adverse effects of development and permission for development should be refused where harm to such species or habitats would result, unless the need for, and benefits of the development clearly outweigh that harm. White-clawed crayfish are listed as a species of principal importance by DEFRA.

¹² Department of the Environment (1995). *Biodiversity: the UK Steering Group Report Volume 2: Action Plans*. London: HMSO.

¹³ White-clawed crayfish Steering Group (1997). *Species Action Plan for the United Kingdom- White-clawed crayfish *Austropotamobius pallipes**.