

WHITE-CLAWED CRAYFISH

Austropotamobius pallipes

Hampshire Biodiversity Partnership

1 INTRODUCTION

The white-clawed crayfish, also known as Atlantic stream or native crayfish, is an international and national priority for conservation action. It is considered to be globally threatened and an endangered species in Europe^{2,3}. A species action plan (SAP) for white-clawed crayfish was published as part of Tranche 1 of UK action plans in *Biodiversity: The UK Steering Group Report*², (Volume 2, page 157).

An estimated decline in numbers and range of between 25-49% nationally² in the last 25 years is paralleled in Hampshire by a similarly dramatic decline¹. The future of this species in Hampshire is very uncertain; it is believed to be critically endangered and is unlikely to survive in the county unless factors responsible for its decline can be addressed.

2 CURRENT STATUS

2.1 Ecology and Habitat Requirements

The white-clawed crayfish is at the edge of its European range in the UK, and is believed to have more exacting habitat requirements here than on the continent¹. Its distribution is generally limited to unpolluted, mineral rich waters with pH 7-9, and calcium greater than 5mg/l which is required for the hardening of its exoskeleton. Although water chemistry, temperature and structural habitat diversity are of primary importance in its choice of habitat, it will occupy a range of still and flowing water bodies.

Its sensitivity to changes in water quality can result in significant losses following pollution incidents. Refuges created by large cobbles, tree and plant root systems and overhanging banks are also of key importance. Although sensitive to excessive siltation, it requires an input of organic material, primarily leaves, as a source of food and calcium.

2.2 Population and Distribution

The white-clawed crayfish is the only freshwater crayfish indigenous to the British Isles. It is found only in Europe, and the UK is the northern-most part of its range. A decade ago

the species was still regarded as widespread throughout its range⁴.

As with all European crayfish species, the white-clawed crayfish is susceptible to the fungal plague (*Aphanomyces astaci*) principally spread via the non-native signal crayfish, sometimes with devastating impacts on whole populations. Plague has certainly been a major factor influencing crayfish distribution and abundance across Europe, but today there is no firm information about its current status. Undocumented historic translocations are also responsible for distorting the natural distribution of the species⁵.

The species is widespread in England, present in some parts of Wales and is believed to be naturally absent from Scotland. Nationally, the species has been declining since the 1980s^{6,9}.

In Hampshire there are few records prior to the 1980s. The River Itchen, formerly believed to be a stronghold for the species, was still supporting white-clawed crayfish along much of its length up until the mid- 1990s. Anecdotal information suggests that it was widespread throughout the main river catchments that drain into the southern Hampshire basin and the Thames basin.

Many records of the species were generated throughout the 1980s and early 1990s as a result of conspicuous behaviour and mass mortalities, both consistent with infection of populations with fungal plague. Distribution in Hampshire is now restricted to six isolated populations, and recent surveys have shown that this species has now probably disappeared from previously known sites in the east and north of the county⁷.

2.3 Important Sites

Populations exist within the River Test, Itchen and Rother catchments⁷. Recent records from the River Avon and Bartley Water (New Forest) are unconfirmed. Recent discoveries of populations in the Rother and Test catchments are atypical Hampshire locations and are of considerable significance: the Rother because it is the only non-calcareous river known to be occupied in Hampshire, and the lower Test because the population exists very close to the tidal limit and is downstream of known signal crayfish populations.

**SPECIES
ACTION
PLAN**

2.4 Protection

The white-clawed crayfish is listed in Appendix III of the Berne Convention and Annexes II and V of the Habitats and Species Directive. It is also listed on Schedule 5 of the 1981 Wildlife and Countryside Act.

In Hampshire the Itchen populations fall within the River Itchen SSSI which is also a candidate Special Area of Conservation (cSAC) for other ecological interests. One of the Test catchment populations falls within the River Test SSSI, and an unconfirmed population on Bartley Water falls within the New Forest SSSI, cSAC and Ramsar Site.

Through the 'Prohibition of Keeping Live Fish (Crayfish) Order - May 1996', MAFF have designated the River Itchen and all rivers in the New Forest as 'no go' areas for non-licensed keeping of signal crayfish. Section 14 of the Wildlife and Countryside Act also makes it an offence to release or allow the escape of all non-native crayfish species.

Through the Natura 2000 moderation process it is likely that white-clawed crayfish will be added to the features of existing cSACs and new cSACs in England and Wales in 2000.

3 CURRENT FACTORS AFFECTING WHITE-CLAWED CRAYFISH

- Crayfish plague. The principal vector for plague is the alien signal crayfish species *Pacifastacus leniusculus*. Other vectors of the fungal spores may include mud, weed, angling and survey equipment such as wellington boots and nets, machinery such as that used during flood defence operations, and crayfish predators such as otters, birds, and fish. All of these potential vectors can move or be moved between water bodies. The fungus is difficult to isolate and therefore difficult to confirm as cause of death (confirmed on the Hampshire Avon only).
- The spread of and competition with alien crayfish species. Most catchments in Hampshire now hold signal crayfish populations of varying sizes. Particular strongholds for this exotic species can be found in the lower River Test, in the middle and lower Hampshire Avon, the Rivers Wey, Loddon, Lyde and Whitewater in northern Hampshire and the Basingstoke canal⁷.
- Habitat change - direct or indirect loss or deterioration through inappropriate or inadequate management of habitat and surrounding land.

- Changes to water quality - through pollution from point sources below cress/fish farms, waste water treatment works and diffuse, land-use derived pollution.

- Changes in water quantity - through abstraction and climate change/variability.

- Predation - natural predation through aquatic mammals, birds, fish and other native crayfish, and unnatural predation through over stocking of rivers with fish such as rainbow trout and alien crayfish.

4 CURRENT ACTION

4.1 National

- The National Rivers Authority and the Joint Nature Conservation Committee (JNCC) have produced national crayfish conservation action plans⁶. The UK SAP for white-clawed crayfish² outlines several areas of current action for the species.

- 'Eradication of Alien Crayfish Populations: Environment Agency R&D Technical Report W169'¹⁰ was commissioned to develop a plan for testing suitable methods of eradication based on a review of current knowledge.

- The Environment Agency re-published its national crayfish leaflet in 1999.

- Recent research into the examination of crayfish DNA should help to shed light on the genetic variability within and between populations of the species across Europe¹¹.

4.2 Local

- The Hampshire 'Native Crayfish Project', a collaborative venture between Sparsholt College, the Environment Agency, English Nature, and East Hampshire Area of Outstanding Natural Beauty (AONB)¹, has achieved the following:

- establishment of a Native Crayfish Working Group in 1995;
- river enhancement work on Candover Brook, in 1997;
- public relations, awareness, training and education;
- the completion of a number of river surveys and implementation of monitoring;
- compilation of a database of information on distribution, held at Sparsholt College and given to the Biological Record Centre (Monks Wood) and Nottingham University;

White-Clawed Crayfish

- a native crayfish rearing unit at Sparsholt College.
 - Conservation actions for white-clawed crayfish are listed in the Environment Agency/English Nature publication 'Conservation Strategies for Riverine SSSIs Test and Itchen' ⁸.
 - An Environment Agency/ Sparsholt College 'Crayfish Project Officer' was employed during summer 1999 to deliver key PR, survey, monitoring and database actions.
 - All relevant Environment Agency Local Environment Action Plans (LEAPs) have been produced and the needs of crayfish are included where relevant.
 - Water Level Management Plans (WLMPs) for the Rivers Test, Itchen and Hampshire Avon have now been produced or are in final draft
- stages, and the needs of crayfish are included where relevant.
- A Hampshire crayfish leaflet has been produced and disseminated.
 - The River Anton has been proposed for designation as a Site of Importance for Nature Conservation (SINC) for native crayfish by Hampshire County Council (HCC). HCC have proposed to extend the upper Rother SINC to encompass downstream reaches that have populations of native crayfish.

5 OBJECTIVES

The overall aim of this Plan is to protect and increase the distribution and population of white-clawed crayfish in Hampshire. This broad aim translates the specific objectives set out below. Where feasible, objectives have been allocated targets against which achievement can be measured. The 'Proposed Action' table in section 6 identifies the action to be taken to meet these objectives.

	OBJECTIVES	PROPOSED ACTIONS
A	Maintain existing populations and range of white-clawed crayfish in Hampshire, preventing further fragmentation or loss.	1-15, 17, 19, 22-25
B	Enhance the status of white-clawed crayfish in Hampshire by increasing the population strength at existing sites, and seek to restore at appropriate sites.	1-17, 19, 22-25
C	Establish a comprehensive understanding of white-clawed crayfish distribution, status and ecological requirements in Hampshire through appropriate research, survey and monitoring.	18-22, 25
D	Promote communication, education and awareness of the status and needs of white-clawed crayfish.	5-9, 11-13, 17, 22-25

6 PROPOSED ACTION

The following table lists the actions required to achieve the objectives set out in this Plan. Each action has been assigned to one or more 'Key Partners'. Key Partners are those organisations that are expected to take responsibility for the delivery of the actions assigned to them, according to the targets set in this Plan. Other organisations may also be involved in the delivery of action, and they have been indicated in the 'Others' column.

Key to symbols in Action Table:

- ◆ To be completed by the indicated year. Work can commence at any time before the due date, at the discretion of the Key Partner.
- ◆⇨ Design or production of a plan/strategy to be completed by this year and then followed by its implementation.
- ➡ To start by the indicated year and usually followed by ongoing work. A start arrow in year 2000 can indicate a new action, or a new impetus to existing work.
- ⇨ Work that has already begun and is ongoing.

	ACTION	DELIVERY BY		YEAR						MEETS OBJ.
		Key Partner	Others	2000	2001	2002	2003	2004	2010	
				◆ = complete by ➡ = start by ⇨ = ongoing ◆⇨ = design by and implement						
Site and Species Policy and Protection										
1	Enforce section 14 of the Wildlife and Countryside Act which prohibits illegal introductions of non-native species to the wild.	EN	EA	➡						A, B
2	Regulate crayfish/fish movements through Section 30 of the Salmon and Freshwater Fisheries Act 1975 and use byelaws to control baiting with crayfish. (Fisheries byelaws and legislation are currently being reviewed).	EN, EA		➡						A, B
3	For newly discovered and existing populations lying outside designated conservation areas, consider an appropriate designation such as SSSI, SINC.	EN, HCC	HWT, LAs				◆			A, B
4	Ensure 'Water Quality Objectives' support existing and potential native crayfish populations.	EA	SCH	⇨	⇨	⇨	⇨	⇨	⇨	A, B
5	Endeavour to take account of the conservation requirements of this species when reviewing and adjusting agri-environment schemes.	MAFF/F RCA	EA	➡						A, B, D
6	Encourage bodies that offer various agri-environment and landscape improvement schemes (e.g. ESA and Countryside Stewardship) to target areas in Hampshire which have greatest influence on habitat quality for crayfish.	EA, EN, HWT, LAs	MAFF/ FRCA, FWAG	➡						A, B, D
7	Ensure that future development, drainage or hydrological alterations do not affect the integrity of existing crayfish sites, and that the needs of the species are properly recognised in the strategic planning process.	LAs, EN, EA		⇨	⇨	⇨	⇨	⇨	⇨	A, B, D

SPECIES ACTION PLAN

White-Clawed Crayfish

	species are properly recognised in the strategic planning process.									
8	Ensure that competent authorities review the potential impact of their operations on white-clawed crayfish in cSACs.	EA, LAs	EN, HCWG					◆		A, B, D
9	Maintain existing 'no go' areas for signal crayfish in the River Itchen and rivers in the New Forest. Review/refine boundaries of 'no go' areas through national steering group.	MAFF/FRCA	EN, SCH, EA	↔	↔	↔	↔	↔	↔	A, B, D
Site and Species Management										
10	Encourage sympathetic habitat management where appropriate by translating recommendations of research into on-the-ground actions: EA through its regulatory, operational and influencing roles; EN through Management Statements/ Agreements; FRCA through agri-environment schemes, and generally through the use of promotional material.	EA, EN, MAFF/FRCA	FWAG, LAs, HWT, SCH, NFU, CLA, TIA	➔						A, B
11	Under the Habitats Directive, all cSACs require management plans. Plans for the Itchen, New Forest and Hampshire Avon should make provision for white-clawed crayfish.	EN	HCWG					◆		A, B, D
12	Ensure that the LEAP for the River Wey (in draft) gives due consideration to the needs of white-clawed crayfish.	EA				◆				A, B, D
13	With the agreement of riparian landowners, local fishing interests and others, devise and implement (through the 3 year employment of a project officer) strategic site-based management plans which take steps to safeguard the interests of key populations.	SCH	HCWG, EA, EN, LAs, HWT, MAFF/FRCA, NFU, CLA, TIA,					◆		A, B, D
14	Ensure that the requirements of the white-clawed crayfish are considered during the production and implementation of other action plans for habitats used by the white-clawed crayfish (particularly the Chalk Streams HAP), and for species with overlapping distributions.	EA, EN, SCH	HCWG, HWT, HCC	➔						A, B
15	Consider eradication and control of signal crayfish from top priority sites within Test and Rother catchments following guidance from the national steering group.	HCWG	NFU, CLA, TIA	◆						A, B
16	Consider reintroduction and restocking of native crayfish to suitable areas, subject to guidance from national steering group and results of research detailing habitat requirements, genetic integrity etc.	HCWG	NFU, CLA, TIA	◆						B
17	Seek to encourage landowners to take up land management schemes such as ESA and Countryside Stewardship on riparian land where	FRCA, FWAG,	EA, EN, NFU,							A, B, D

SPECIES ACTION PLAN

White-Clawed Crayfish

sympathetic management would benefit habitat quality for crayfish.	HMAP	CLA, TIA	➔						
--	------	----------	---	--	--	--	--	--	--

	ACTION	DELIVERY BY		YEAR						MEETS OBJ.
		Key Partner	Others	2000	2001	2002	2003	2004	2010	
				◆ = complete by ➔ = start by ⇔ = ongoing ◆⇔ = design by and implement						
Research, Survey and Monitoring										
18	Continue the survey programme to confirm and assess populations of white-clawed and signal crayfish on the River Rother, Main River Test, New Forest Rivers, River Itchen at Itchenstoke Mill and Winnall Moors, and Hampshire Avon	SCH, EA						◆ 2005		C
19	Establish long-term monitoring programmes for white-clawed and signal crayfish at key sites.	SCH	EA, EN	➔						A, B, C
20	Establish a regional database for crayfish records from which records can be forwarded to appropriate national and local databases.	SCH	EA, HCC	➔						C
21	Ensure that crayfish records generated through EA fisheries surveys are entered automatically onto the EA Fish Classification System, and then on to the Regional Database.	EA		➔						C
22	Continue to develop Sparsholt College as a focus of research in the Southeast for crayfish biology and conservation. Particular lines of research to follow include captive-breeding methods, survey and monitoring, and the ecological and habitat requirements for both the native white-clawed and signal crayfish.	SCH	EA, EN	⇔	⇔	⇔	⇔	⇔	⇔	A, B, C, D
Communication, Awareness and Promotion										
23	Seek to increase awareness of the ecology and conservation requirements of white-clawed crayfish, particularly amongst crayfish farmers, fishermen and the pet trade.	EN, EN	HCWG	⇔	⇔	⇔	⇔	⇔	⇔	A, B, D
24	Promote an appreciation for, and the conservation of, white-clawed crayfish in Hampshire through provision of habitat guidelines, workshops, events and open days, press releases and appeals for records.	HCWG		⇔	⇔	⇔	⇔	⇔	⇔	A, B, D
25	Maintain liaison with the National Crayfish BAP Steering Group in order to facilitate efficient exchange of information on research progress and national issues.	HCWG		⇔	⇔	⇔	⇔	⇔	⇔	A, B, C, D

**SPECIES
ACTION
PLAN**

KEY TO ORGANISATIONS:

EA Environment Agency
EN English Nature
FRCA Farming and Rural Conservation Agency
FWAG Farming and Wildlife Advisory Group
HCC Hampshire County Council
HCWG Hampshire Crayfish Working Group

HWT Hampshire Wildlife Trust
MAFF Ministry of Agriculture, Fisheries and Food
LAs Local Authorities
SCH Sparsholt College Hampshire
TIA Test & Itchen Association

REFERENCES

SPECIES
ACTION
PLAN

1. **Audit of priority species of rivers and wetlands: White-clawed Crayfish *Austropotamobius pallipes* in south Hampshire and the Isle of Wight**, A R Hutchings, Environment Agency, Hampshire & Isle of Wight Wildlife Trust, Sparsholt College, 1997.
2. **Biodiversity: The UK Steering Group Report, Volume 2 Action Plans**, Department of the Environment, HMSO, 1995.
3. **IUCN Red list of threatened animals**, B Groombridge (Ed), IUCN, Gland, Switzerland and Cambridge, UK, 1988.
4. A. Pallipes and A. torrentium, with observations on their interactions with other species in Europe, P-J Laurent in **Freshwater Crayfish, Biology, Management and Exploitation**, D M Holdich and R R Lowery (Eds), 1988.
5. **Freshwater Crayfish: Biology, Management and Exploitation**, D M Holdich and R S Lowery, Croom Helm, London, 1988.
6. **Crayfish Conservation**, D M Holdich, W D Rogers, and J P Reader, NRA Project Record 378/10/N and Y, 1995.
7. **Native Crayfish Project - East Hampshire Rivers Survey**, A R Hutchings and C Elliott, EA/EN/Hampshire AONB Project, 1998 (see also the 1997 Interim Report on the Project).
8. **Riverine SSSI Conservation Strategies of the Rivers Test and Itchen**, T J Holzer, Draft EA/EN internal document, 1998.
9. Distribution of freshwater crayfish in the British Isles, with particular reference to crayfish plague, alien introductions and water quality. D M Holdich and I D Reeve, **Aquatic Conservation** 1: 139-158, 1991.
10. **Eradication of Alien Crayfish Populations**, David Rogers Associates, Environment Agency R&D Technical Report W169, 1998.
11. **Isolation and genetic variability in the populations of the white-clawed crayfish *A.pallipes* in Poitou-Charentes (France)**, C Souty-Grosset and F Grandjean, 1996 (Paper given at the 11th Symp. of the Int. Astacology Ass. Thunder Bay, Canada).
12. **The Conservation (Natural Habitats, &c.) Regulations 1994**, Statutory Instruments No. 2716, HMSO, London, 1994.

This is one of many Habitat, Species and Topic Action Plans being prepared by the Hampshire Biodiversity Partnership. It will be monitored by the Partnership and fully reviewed in 2004.

This species action plan has been prepared by Tim Holzer and the White-Clawed Crayfish SAP Working Group on behalf of the Hampshire Biodiversity Partnership.

For further information contact: Tim Holzer, Environment Agency, Tel: 01962 713267