

Eradication of Alien Crayfish Populations

The overall objective of the project was to provide a review of the current knowledge concerning alien crayfish eradication and to develop a project plan for testing suitable methods of eradication based on this knowledge. Most information for the literature review was obtained from published work but significant use was made of unpublished information from other sources such as personal knowledge and contacts. The project was undertaken as part of the Biodiversity Action Plan for the native crayfish with a view to identifying actions to help protect remaining populations from the alien species.

Many areas of Britain have native crayfish populations which are under threat from signal crayfish. Eradication or control of alien crayfish features in Biodiversity Action Plans for native crayfish at national and local levels.

A survey of the relevant literature revealed very few references directly relating to the eradication of nuisance crayfish populations. Those known about have been small scale experiments in which either predatory fish, intensive trapping or biocides were used, although there are other options. Methods of eradication of crayfish have not been tried in the field to any great extent anywhere in the world. Therefore, the opportunity to try a method in Britain that has already proved successful elsewhere is not possible.

There are five broad categories for eradication procedure based on control methods used of insects; legislative, mechanical (by hand or using traps), biological (parasites, disease and predators), physical (environmental manipulation) or chemical (biocides, attractants, repelling agents). Combinations of these methods at each site are likely to be more effective than any one method on its own. The methods deemed suitable for large scale eradication trials are sustained trapping, the use of fish predators, and draining down and drying out of ponds and lakes or isolation of sections of river. In addition, a naturally occurring chemical, rotenone, used as a piscicide in fisheries management, may be suitable as an astacicide provided the risks to other fauna are taken fully into account, but other insecticides are unlikely to be acceptable until more research is done on their environmental impact. The use of seine nets and fyke nets are not considered further since they are more expensive and less environmentally acceptable as mammals (e.g. otters) and fish may also be caught. The development of food and sexual attractants is beyond the scope of this project but could be the subject of a Ph.D. studentship. The development of more virulent strains of crayfish plague are not environmentally acceptable due to the possible impact on native crayfish, and development of strains of *Bacillus thuringiensis* capable of killing crayfish could be explored but is beyond the scope of this project. Sterilisation of males is unlikely to succeed.

Several Environment Agency staff have explored means of controlling or eradicating signal crayfish populations. Most projects of this nature are not written up or followed up adequately to be of use on a national scale. Sites where work of this nature has been attempted are included in the final report although some of the methodology has already been undertaken, because the opportunity to test a method of eradication is difficult to arrange. In addition, this is the most cost effective means of testing control or eradication methods.

The sites were chosen for a combination of reasons;

1. The opportunity exists to test a method of eradication,
2. There is a good chance of success,
3. Interest and/or involvement of Environment Agency and English Nature exists,
4. The need for urgent action exists as there are native crayfish nearby which are threatened by the alien populations in some cases,
5. Expert opinion was used to assess the suitability of this site via the literature search.

Five sites are proposed for the trials; two river sites, one for mechanical and one for mechanical and biological eradication, and three still-waters for chemical, physical, and mechanical and biological eradication. In addition, two reserve sites are proposed, one still-water for chemical eradication and one river for mechanical and biological eradication. These were selected in case trials at the other sites could not progress for any reason.

These sites represent a variety of freshwater environments and a variety of methods of eradication. The project plan is structured in a logical sequence covering the background, objectives, methodology and other issues at each site proposed for trials. The long term aim is to produce a protocol for determining the best means of control or eradication in different situations.

The project plan is for use by Environment Agency and English Nature staff in testing eradication techniques and developing a protocol for eradication or control of alien crayfish populations. The R&D report will be provided to head office and all regions of the Agency and to English Nature. The results of the literature review will be published in the scientific literature.

This R&D Technical Summary relates to information from Project W1-030 contained in the following outputs:

**R&D Technical Report W169:
Eradication of Alien Crayfish Populations**

Internal Status: Released to Regions
External Status: Released to Public Domain

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Copies of the documents are available internally from the Regional Information Centre (R&D Management Support Officer in Regions with no library).

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