# ROUNDTABLE SESSION 3B

# EDUCATION AS A KEY TO DECAPOD CONSERVATION.

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## INTRODUCTION

In keeping with the conference theme of « knowledge-based management », the workshop examined the « knowledge base » of European crayfish and how this could be directed towards national or international goals of management and conservation.

A starting point of the workshop was that native animals have a special importance in discussions about biodiversity and conservation. This is especially true for freshwater organisms due to the threatened status of their habitats world-wide. Crustacea are also special because their vulnerability seems to be even greater than most other groups using the same habitat types, which has also resulted in their outstandingly high presence in Red Lists. In the IUCN (1996) International Red Data Book for example there are 176 Crustacean species. In Europe, there are species protected by the Bern Convention (COUNCIL OF EUROPE, 1998) and they are also in lists covering smaller geographical scale such as Ukraine or Thüringen (SERBAKA, 1994; ZIMMERMANN, 1993). However, in some European countries *e.g.* the Czech Republic or Hungary further legal measures are needed.

As large, long-lived, edible denizens of good quality brooks and ponds, native European crayfish also have an important heritage image in Europe, representing an integral part of the folk traditions of many countries. This is particularly the case with the noble crayfish, *Astacus astacus* in the Scandinavian countries, but is also of importance elsewhere in its range, and for *Austropotamobius pallipes* in Continental Europe. Traditions surrounding crayfish seem less pronounced in the U.K., and almost absent in Ireland, where the species is nonetheless abundant. Crayfish therefore have a positive image and educational potential possessed by few other invertebrates.

Other crustaceans have a lesser impact on the popular psyche and traditions, but may be almost equally important in terms of ecosystem modelling, biomonitors, bioindicators, or suitable visual examples to demonstrate different biological phenomena - such as behavioural interactions, burrowing, breeding cycles, longevity, articulated limbs - to a lay audience. They are also easy to handle (large enough, widespread, not dangerous), fascinating and comprise a part of our common European heritage.

Freshwater crustaceans may thus be very useful in education and in promoting conservation, and through an interest in their preservation, their habitats may also receive protection, so that improved water quality would often result. This roundtable session posed a number of questions about the importance of crayfish and other crustacean groups, as perceived by participants, in the education of children, third-level students and the general public.

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The roundtable was attended by 26 participants representing 10 countries (Austria, Belgium, Czech Republic, France, Germany, Hungary, Ireland, Italy, Poland, Spain, Sweden). The chairman asked all to participate actively, and started by arranging them in a single large circle. Each participant introduced him or her self, and made a short statement of expertise and interests.

## TOPICS FOR DISCUSSION

The chairman then posed a number of topics and questions for discussion, starting with crayfish in education, and broadening out to include other crustaceans and other native aquatic species, such as amphibians. The general theme was how to provide educational packages which help to conserve the animal and its habitat.

1. The importance of crayfish in national traditions.

2. Use of crustaceans in NGO (non-governmental organisations) campaigns for faunal protection and habitat conservation.

3. Who are the best targets for these campaigns?

4. Use of crustaceans in third-level teaching.

5. Crayfish as indicators of water quality.

6. Monitoring of crustaceans by the public.

7. Distance learning / TV.

## DISCUSSION AND SOME ANSWERS

Due to time constraints not all topics were dealt with in equal detail. However, some answers to those questions not covered were provided during subsequent discussions. The participants proved most interested in the media and conservation opportunities posed by crayfish as dramatic large freshwater crustaceans. Discussions of the use and value of crustaceans in third-level education were also dealt with briefly. The discussion points and answers to the questions have been summarised below, under the main headings.

### The importance of crayfish in national traditions

Participants generally agreed that crayfish had major potential to act as symbols of a good-quality habitat in national and European campaigns to protect fauna and landscape. The importance of crayfish to French people was stressed. Julian REYNOLDS described proposals between France, Spain and Ireland to promote the heritage value of *Austropotamobius pallipes*. These were helped by the species having been placed on Annex 2 of the European Directive on Habitats and Species.

The importance of crayfish in national traditional celebrations in Sweden, Norway and Finland was highlighted by participants. This tradition has led to catch restrictions and other conservation measures to ensure continuity of stocks for the August festival. The economic value added to the actual crayfish catch during the festival was mentioned - specially designed picnic equipment, festive lanterns, etc. In these circumstances, the loss of a crayfish lake to pollution or plague was regarded very seriously.

**Use of crustaceans in NGO (non-governmental organisations) campaigns for faunal protection and habitat conservation**

While crustaceans are not widely used as a focus of conservation projects in Europe, the Chairman provided positive examples of how the amphibians had been very successfully made a focus of such campaigns in Hungary (PUKY *et al.*, 1999). From a relatively small NGO base, volunteer teachers went out across the country to talk to voluntary groups, teachers and schoolchildren and to provide them with illustrative materials. Television programmes, videos, post-cards, stickers, wall-charts, all can contribute to such a campaign, and each can be seen as a separate fund-raising opportunity rather than as a cost to the campaign. Participants also mentioned as examples, the use of birds and of wild flowers in such campaigns.

National postage stamps can help promote the message: Irish stamps feature native birds, and the crayfish *A. pallipes* has been featured on several. Fishery Boards and Environmental Agencies will sometimes produce relevant posters and leaflets. For example, in Sweden, Fskeriverket has produced a coloured poster about crayfish, printed in three languages (Swedish, English, Spanish) (Lennart EDSMAN), and in UK, the Environment Agency has produced a coloured leaflet « The Crayfish Code: Protecting Native Crayfish in the Midlands » (from Environment Agency, transmitted by David HOLDICH). In many European countries, larger documents and manuals are also available (*e.g.* from the Environment Agency, UK; Wildlife Service, Ireland; Bayerisches Landesamt fur Wasserwirtschaft, etc.).

**Who are the best targets for these campaigns?**

The Roundtable participants considered children, adults and third-level students as potential targets for a crayfish conservation campaign. Children are naturally interested, and their participation in observations and surveys can be a valuable basis for conservation. Max THIBAULT described his use of pamphlets directed at children. Schools are receptive to educational material, such as posters and information packs. Their support is of utmost importance as by having posters in the classroom all year round they not only create interest in nature-oriented pupils but also make crayfish (or other « hidden » animal neighbours) become a part of everyday life of the young generation. The posters thus have a long-term effect on their environmental perception and help to develop positive attitudes. Natural history societies can play an important role in stimulating interest in adults and children organising both lectures and field walks.

At third level, crayfish provide opportunities for understanding the decapod crustacean structure, and they are large, long-lived and robust enough to be studied over time and tracked over distance.

It was agreed that schoolchildren are the best targets. Lacking many *a priori* ideas about invertebrates as unpleasant or dangerous animals, they are receptive to interesting and novel messages, and will spread the information through their homes and friends in a way that is not duplicated by their parents. If a positive attitude to conservation is promoted through interesting activities, children will assimilate it and expand it to a wider field including their parents. It is essential, however, to maintain a fresh approach and provide new material at regular intervals. It is also important that even if a main target group has been selected, education activities should also have other aims such as communicating with anglers, informing politicians or the general public.

**Use of crustaceans in third-level teaching**

Julian REYNOLDS briefly outlined the main aspects of this topic. Many European Universities teach a full or part course on Crustacean diversity, anatomical structure and function, exemplifying a major group of the Arthropoda.

Crustaceans include a number of relatively large, long-lived forms among the Decapoda, which are visually arresting, but the group as a whole provides an excellent example of the main ideas and problems in modern taxonomy. However, they feature little in courses on behaviour, wildlife conservation or animal resource management. Here an obvious goal would be the increase of such material in the curriculum. This requires Decapoda specialists to present their results in a way that students are enabled to use them in the building up of ideas and information on habitat and species conservation.

**Crayfish as indicators of water quality**

This area was covered in other roundtable sessions, dealing for example with monitoring for presence or abundance of crayfish and the use of questionnaires (see Roundtable 1A). Therefore, only aspects involving education are covered here. It is also important to ensure that information about water quality and crayfish presence, frequency or population structure is time-specific and contemporaneous, although anecdotes and folk memory are valid under other headings.

**Monitoring of crustaceans by the public**

Habitats listed under the EU Habitats Directive as SACs (Special Areas for Conservation) have some protection under the Directive, and while there will be a degree of wardening by the state, these might be the best sites in which to involve the public initially. Most aquatic habitats are linked by streams or marshes, allowing easy spread of disease or alien species. The current geographical limits of a native crayfish species is therefore important to determine. It was suggested that local people, particularly fishermen, may provide valuable information here. Local or national identification keys with colour photographs, as already exist in a number of countries, *e.g.* in the Czech Republic, France and the U.K. (KOZÁK *et al.*, 1998; ASSOCIATION DES ASTACICULTEURS DE FRANCE, 2001; HOLDICH and ROGERS, 1997) could be a help, together with special workshops for interested individuals. It would also be important to reach people with limited interest *e.g.* through concise leaflets, such as those already circulating *e.g.* in Sweden and Austria (EDSMAN, 2001; PEKNY and PÖCKL 1998).

The type of water habitat, whether still or flowing, is important in deciding on how the public may best and safely provide information of educational or conservation value. A key issue here is the limited ability of crayfish, in contrast to winged insects, to recolonise stream sections following pollution events.

A protected species may only be caught and handled under licence, which should be a priority for an involved NGO to obtain. The protected status will limit the practical educational work that can be done, but it could include capture and release, photography and video, and perhaps captive breeding.

**Distance learning / TV**

Distance learning is already important for 2$^{nd}$ and 3$^{rd}$ level on a national scale, and this should be one target of any crayfish / crustacean conservation programme. Training courses for third level could encompass both fundamental aspects such as evolution, behaviour and ecophysiology, and applied aspects - crayfish as bioindicators, their susceptibility to organic pollution or heavy metals, and the use as models for development of commercial aquaculture systems.

In every European country, there are amateur and professional wildlife experts and TV presenters expert in filming, photographing and interpreting. For strongest effects these should be involved in any distance learning programmes.

## CONCLUSIONS

This roundtable aimed to maximise the participation and interactions of participants. A starting point was that native crayfish have a heritage value in some parts of Europe - how can we provide educational packages which help conserve the animal and its habitat? What practical educational work can be done with a protected species? We discussed how native animals could be made the focus of educational strategies, with special emphasis on crustaceans.

It was agreed that children are naturally interested, and their participation can be a valuable basis for conservation. Schools are receptive to educational material such as posters and information packs, and natural history societies can play an important role as organisers for the spreading of more specific knowledge. At third level, crayfish provide opportunities for understanding arthropod structure, and they are large, long-lived and robust enough to be studied over time and tracked over distance.

Crayfish require a clean habitat, and so tie in well with people's concerns about their environment - landscape, air and water quality. Crayfish problems associated with disease or environmental deterioration require publicity aimed at specific user groups and at the general public, who could usefully be involved in monitoring programmes.

The roundtable concluded by recognising that the conservation message is paramount, and can be effectively provided in TV material, postcards, stamps and leaflets. The website of the proposed European network CRAYNET, discussed at the Poitiers Meeting, has among its aims citizen education through the collection and dissemination of publicity information on crayfish from across Europe.

## SOME EXAMPLES OF PUBLICITY MATERIAL ALREADY AVAILABLE ARE AS FOLLOWS:

AUSTRIA: Natur und Land, Zetschrift des Osterreichischen Naturschutzbundes. Heft 6, 2000 « Sherenritter » Flusskrebse und ihre Gefährdung durch die Krebspest.

FRANCE: Crayfish Leaflet for children (M. THIBAULT)

« La Clé des Champs. Pour mieux connaître la nature et les paysages des Deux-Sèvres » edited by the Conseil Général des Deux-Sèvres: Strip cartoon for children about the life of endangered *A. pallipes*, with the message « tu peux agir pour la sauver en participant à la propreté des rivières ».

GERMANY: Information leaflets Flusskrebse in Baden-Württemberg Gefärdhung und Schutz (P. DEHUS)/ Flusskrebse in Bayern.

IRELAND: Wildlife Manual « Conservation management of the white-clawed crayfish » (J. REYNOLDS).

UNITED KINGDOM: Species under threat! Native Crayfish in Hampshire (Environment Agency, English Nature)

The Crayfish Code: Protecting native crayfish in the midlands...with the slogan « Help us to save the native crayfish! », Environment Agency with financial support of English Nature, Severn Trent Water and International Association of Astacology.

SPAIN: El cangrejo de rio en León (V. GAUDIOSO, J.D. CELADA, J. CARRAL, P. RODRIGUEZ).

SWEDEN: Card and poster « The crayfish Struggle » (L. EDSMAN).

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