ROUNDTABLE - SESSION 2

EXPLOITATION, CONSERVATION AND LEGISLATION

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ABSTRACT

The link between socioeconomics and conservation and the role of legislation in conservation work was discussed in the group with participants from nine European countries. Interest and knowledge among the general public, stakeholders and managers is the key to successful conservation of native crayfish species. Exploitation and conservation do not necessarily exclude each other. A controlled fishery, where it can be sustained, may be an essential tool for conservation by increasing the general awareness and involving more people in the task of protecting the native crayfish species. This strategy is mainly possible for the noble crayfish in the northern part of its distribution, where strong traditions connected to crayfish also exist. A balance between utilisation and overexploitation has to be found and local guidelines for sustainable exploitation produced. Media, the Internet and educational material aimed at schools and stakeholders are excellent ways of reaching a wide audience with information. Universal objectives, rules and regulations at the European level are desirable and the noble crayfish and the stone crayfish should be included in Annex II of the Habitat Directive. Based on this framework detailed regulations are best worked out at the national level, considering the specific crayfish situation in the country. Information about the legislation, the purpose of the legislation and the consequences when not obeying it should be distributed. Stricter regulation of the trade with live alien crayfish is vital because of the associated risk of introducing new diseases and species.

EXPLOITATION, CONSERVATION ET LÉGISLATION

RÉSUMÉ

Le lien entre la socio-économie, la conservation et le rôle de la législation dans le travail de conservation a été discuté dans un groupe constitué de participants de neuf pays Européens. L'intérêt et la connaissance du grand public, des parties prenantes et des managers sont la clé d'une conservation réussie des espèces indigènes d'écrevisses. L'exploitation et la conservation ne s'excluent pas nécessairement. Une pêche contrôlée, quand elle peut être soutenue, peut être un outil essentiel pour la conservation par l'accroissement de la conscience générale et l'implication d'un plus grand nombre de personnes dans la protection des espèces d'écrevisses natives. Cette stratégie est principalement possible pour les écrevisses nobles dans le Nord de son aire de

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distribution, où de fortes traditions relatives aux écrevisses existent déjà. Un équilibre entre l'utilisation et la surexploitation doit être trouvé et des directives locales doivent être établies pour une exploitation durable. Les médias, Internet et le matériel éducatif visant les écoles et les responsables territoriaux sont d'excellents moyens pour une large diffusion de l'information. Les objectifs universels, les règles et les règlements au niveau européen sont souhaitables et les écrevisses nobles ainsi que les écrevisses des torrents doivent être inclues dans l'Annexe II de la directive sur l'Habitat. A partir de ce schéma, les réglementations détaillées sont mieux exécutées au niveau national, considérant la situation spécifique de l'écrevisse dans le pays. Il est indispensable de divulguer des informations sur la législation, sur ses objectifs, les conséquences d'un non-respect de cette législation. La régulation plus stricte du marché des écrevisses étrangères est vitale à cause du risque associé à l'introduction de nouvelles maladies et espèces.

INTRODUCTION

The populations of the native European species the noble crayfish, *Astacus astacus*, the white-clawed crayfish, *Austropotamobius pallipes*, and the stone crayfish, *Austropotamobius torrentium* are in steady decline over their whole distribution. Diseases, habitat destruction, water pollution, and competition and diseases from introductions of non-indigenous species have caused the decline. This has caused great concern and the thematic network CRAYNET was initiated to improve the situation, to facilitate the co-operation between the European countries and to bridge the gap between scientists and stakeholders. One of the actions in the project was to hold several thematic meetings. The meeting in Halden focused on the noble crayfish and had the subtitle "linking socioeconomics and conservation". It may sound strange that an endangered species can be exploited but under some circumstances exploitation is possible and believed to be an essential part of conservation (TAUGBØL and SKURDAL, 1999; TAUGBØL, 2004).

The purpose of this roundtable was to discuss this possible link between conservation and exploitation and how legislation can help with improving the situation for the native European crayfish species. Participants from Czech Republic, Estonia, France, Ireland, Italy, Latvia, Norway, Poland and Sweden attended the roundtable. The discussions focused around questions and discussion points that were presented to the participants when the roundtable started. Due to time restrictions not all questions were dealt with or discussed in detail.

QUESTIONS AND TOPICS

- Exploitation and conservation: Is it a contradiction or an essential combination in the different countries?
- Can exploitation of native species be profitable?
- Does the opportunity to harvest signal crayfish populations encourage illegal introductions?
- Examples of successful conservation of native crayfish species.
- The role of publicity and media in conservation work.
- Advantages and disadvantages connected to the present legislation in the different countries.
- Is it possible/desirable to create universal rules and regulations for Europe?
- Can legislation actually stop the spreading of non-native species?
- Do we need restrictions for the trade with alien species?

DISCUSSION AND SOME ANSWERS

Exploitation and conservation: Is it a contradiction or an essential combination in the different countries?

Exploitation is traditionally not thought as a tool in conservation work, rather the opposite. Public awareness is however one important part of conservation work. By allowing a controlled fishery the interest for native crayfish among landowners, fishermen and those utilizing lakes and rivers will be kept. People will be more willing to protect something that they can see and handle. This is especially true where strong traditions of recreational and commercial crayfish fishery already exist (SWAHN, 2004) and where the possibility to catch crayfish is part of the rural economy and development. The possibility of leasing the fishery or creating other tourist activities around the fishery that can give an income, will further increase the interest (TAUGBØL, 2004), both for the fishing right owner and those taking part in the activities. In countries where alien species are present there is always the threat of illegal introductions. It is good to move the focus from alien crayfish towards the advantages of the native crayfish. If people in general in some way can benefit from the native crayfish species they will be more willing to protect the species and these introductions will be less likely.

First it is however necessary to evaluate the specific situation in the different countries to see where utilization is actually possible, since the picture varies a lot across Europe. The possibility for the exploitation of native crayfish was surveyed among the participants. It was found that in most countries exploitation in the form of fisheries was neither possible nor desirable. The poor status of the European populations of stone crayfish and white-clawed crayfish and their life-history characteristics make the utilization of these species difficult. Of the three native species covered, only noble crayfish was thought to be present in large enough numbers in the northern part of its distribution, *i.e*. in the Scandinavian and the Baltic countries, to sustain any kind of fishery.

The strictest form of protection, a total ban on utilization, may sometimes not have the desired effect but in fact be negative. To illustrate this point the example of Atlantic salmon (*Salmo salar*) was brought up. Salmon populations in Poland were declining and in the mid-1980ies the species was totally protected by law and the fishery were stopped. Some years later the salmon had almost gone extinct. One of the reasons for this was that fishermen and anglers had lost interest in the species because of lack of predictable profit and the efforts to protect it were stopped. Poaching increased, almost leading to the extinction of the salmon. In 1999 salmon was removed from the list of protected species in Poland and fishing was allowed again. Nowadays fishermen, anglers, organisations and the police engage in active protection against poaching, restocking programs have been started and salmon is becoming a quite common species in several of the main Polish rivers.

Even when a fishery cannot be sustained there may be other ways to utilize native crayfish. In many European countries programs for reintroduction of native crayfish have been started. There is usually a lack of suitable stocking material for these introductions. Provided care is taken and the origin of the crayfish, *i.e.* genetic considerations, is taken into account this kind of culture can be beneficial to conservation and should be encouraged. Ideally local material should be used. Culturing crayfish for this purpose may ease the demand from farmers to culture alien species especially since crayfish for restocking usually gets a better price compared to crayfish produced as food.

Other ways to use native crayfish for raising the interest among the public were discussed. Catch-and-release fishery and having the native crayfish on display or having native crayfish in ponds easily accessible close to protected areas were two of the things suggested, provided it was made certain it would not harm natural populations. People would know about the crayfish and get informed and leave the rest of the area in peace.

It was agreed that exploitation and conservation do not exclude each other *per se*, but may constitute a fruitful combination that can be recommended. In countries where the status of the native crayfish populations allows it, a sustainable fishery can be a useful and even essential tool in conservation by engaging more people in the task. A careful control of the effects of the fishery is needed to assure that it does not have negative effects. This can be accomplished by monitoring and by collecting catch statistics. Rules and regulations on a national and local level may be needed to control the situation and to avoid over-exploitation. The possibility to fish should be accompanied by information about the rules and the situation. Strict regulations now may improve the situation later on and rules and regulations are more easily respected if it is made clear that it opens up for the utilization of crayfish in the future. Local guidelines for sustainable exploitation of native species should be produced.

Can exploitation of native species be profitable?

In countries where both alien and native crayfish occur and there is a commercial interest with a market where both species are available, native crayfish usually pays better. In Sweden and Finland the market is demanding and noble crayfish is an appreciated delicacy. The native noble crayfish is paid at least twice as much as the introduced signal crayfish, *Pacifastacus leniusculus*. It is interesting to note that the price is not only a matter of availability on the market but that the noble crayfish pays better also in Finland, where the harvest of noble crayfish is larger than the harvest of signal crayfish. There seems to be an inherent value, connected to traditions, in the original native species reflected in the price. This price difference also holds for farmed crayfish.

By leasing the fishery and by supplying equipment, boats, cabins, and food to tourists and companies, the value of the fishery can be further enhanced compared to just selling the harvest on the market.

With the increasing interest in reintroducing native crayfish to restored habitats there is an increased demand for farmed stocking material since natural populations can not always be used. In Poland the price on the market for noble crayfish rose with the start of the restocking program in 1999. Usually crayfish for stocking can be sold at smaller size and pays a higher price compared to crayfish sold as food.

Does the opportunity to harvest populations of signal crayfish encourage illegal introductions?

The simple answer to this question is yes. The possibility makes stocking material readily available and regardless if it is permitted or not the availability of signal crayfish increases the risk of introductions to places where they should not be stocked. Crayfish are unfortunately easy to transport for long time periods and for long distances without special equipment. Coupled with the tradition of transporting crayfish alive until boiled for food, it makes an illegal introduction easy to perform. It is extremely rare that people are caught or punished for the act.

If the signal crayfish fishery is common there is also the risk that crayfish plague is accidentally spread to other waters with fishing gear and equipment that is not properly disinfected. The most effective way to remove this threat would be to totally prohibit the signal crayfish fishery but this option is not feasible in countries where the fishery is extensive. Instead information about the risks and restrictions on the transportation of live crayfish is needed.

Examples of successful conservation of native crayfish species

It was generally agreed that a more positive attitude towards conserving the native crayfish species has been noted lately, both among the general public and from the authorities. Several examples were mentioned including designating Special Areas

of Conservation (SAC) and the initiation of programs for reintroduction with economical support from the state. Two successful examples will be mentioned.

The noble crayfish in the Halden watershed in Norway was eradicated due to crayfish plague 1989-1991. A joint project between landowners and authorities was initiated. Having assured that the crayfish plague was gone, reintroductions of more than 20000 crayfish started in 1995. The costs were shared equally between landowners and authorities. The outcome of the introductions has been monitored and reproducing populations are now present. Today it is possible to fish noble crayfish again in these waters, void of crayfish eight years ago (TAUGBØL, 2004).

In 1986 Ireland was struck by the crayfish plague probably brought there by infected fishing gear (REYNOLDS, 1988). Around 1990 there was an interest and demand for introducing signal crayfish into the country for farming purposes. The legislation in Ireland however bans all import of live crayfish, the law stood up and the request was turned down. This caused disappointment even when the culture would probably not have brought any economic benefits. Today Ireland is one of the few countries in Europe with only the native (narrow-clawed) crayfish present.

The role of publicity and media in conservation work

As pointed out many times lack of knowledge is one of the main obstacles to successful conservation. Publicity in media is of uttermost importance since media is obviously the channel through which information can reach the widest audience. Information about native crayfish released in newspapers, TV and radio will thus be very effective. It is sometimes difficult to control what is actually released and which headlines are used but this can be overcome by being prepared and serving sound information and attractive messages to the journalists, that will usually accept most of it due to lack of time.

The interest in using the Internet as of source of information is steadily increasing and the webpages of the network CRAYNET and the open discussion forum will help in educating the citizens through the collection and publication of information on crayfish from across Europe. An addition of a section with answers to frequently asked questions (FAQ) would be helpful in this respect.

The role of education was discussed and as pointed out earlier the younger generation is probably the best target for information about native crayfish (PUKY *et al*., 2002). The children are curious and receptive and can in turn educate their parents. Information, educational material, posters and pamphlets aimed at schools and museums should be produced and distributed. Other target groups for educational material are the people directly involved with crayfish and their organisations, *e.g.* fishermen, landowners, anglers, fish shops, customs personal and those utilizing rivers and lakes for recreation.

Advantages and disadvantages connected to the present legislation in the different countries

The legislation concerning crayfish varies a lot between the European countries and even within countries (see VIGNEUX *et al*., 2002 for a review). The variation is a reflection of differences in *e.g.* history, culture, economy and political system. A survey among the participants showed that there have been no major changes in national legislation since the last review, apart from the recently imposed import ban in Sweden (EDSMAN, 2004). The general feeling was that changing the legislation is very difficult, and if possible changes take a long time to accomplish. A more uniform legislation is needed in light of the legislative diversity present today. A totally uniform set of rules down to detail across Europe is however neither possible nor desirable, since the national and local regulations have to be adjusted to the actual situation in the different countries.

The situation in the Czech republic was brought up as one of some examples when legislation aimed at protecting a species actually has opposite effects. Legislation strictly protects the noble crayfish. This means that all kinds of manipulation of the species and its habitat is forbidden, including disturbing, moving, catching, collecting, or breeding the species in captivity. The situation gets even more complicated since the introduced signal crayfish is present, but not regulated by the legislation and therefore allowed for catching. It is hard to keep the interest for noble crayfish alive under these circumstances. Clearly a program for reintroductions of the species would improve the situation, and is needed in order to preserve it, but this is not allowed with the present strict legislation.

There are however many examples of good laws were the legislation works as intended and we have a lot to learn from each other. The participants recommended that the discussion and information exchange should continue and that joint efforts to harmonise national and local regulations across Europe should be promoted.

Is it possible/desirable to create universal rules and regulations for Europe?

At the European level, universal objectives, rules and regulations are desirable. The inclusion of native crayfish species in directives, policies and EU legislation was strongly favoured by all the participants since this will increase pressure on nations and governments to act in favour of native crayfish species. Based on this general framework the detailed regulations where thought best worked out at the national level, taking into consideration the practical limitations and specific circumstances of the country, as mentioned above.

In order to work with conservation issues throughout Europe one of the working groups in Poitiers recommended that the noble crayfish and the stone crayfish should be integrated into Annex II in the EU Habitat Directive (VIGNEUX *et al.*, 2002). This was discussed in the group since there was concern that if the recommendation was successful that would hinder any exploitation of the species. Participants from Sweden, Norway and the Baltic countries thought that this may have an adverse effect in countries where utilization of crayfish is a prerequisite for the conservation of the species. If for example noble crayfish could not be fished the interest for people to keep it would be gone. Apparently it is however possible to have a species in both Annex II and V and at the same time utilize it for fisheries, as is the case for the Atlantic salmon. The group agreed on repeating the recommendation to include also *A. astacus* and *A. torrentium* in Annex II of the Directive.

The EU Water Framework Directive (dir 2000/60/EG) has recently been adopted. The Directive aims at organising the work to ensure surface water of good quality status and the work should be performed over whole catchment areas regardless of national borders. Good status also includes the preservation of biological diversity, of which native crayfish is certainly one part, and threats to the biological diversity shall be controlled. This will lead to increased monitoring efforts being advantageous to the native crayfish. In order to conserve native crayfish one must know what species, native and alien, are present and where they occur. Within the CRAYNET network, one of the tasks is to produce an atlas with the European crayfish distribution. The information collected will be valuable and the co-operation over borders initiated by this work will be beneficial when implementing this directive.

Can legislation actually stop the spreading of non-native species?

The negative impact of alien species is well known with many examples of non-native crayfish introductions having an adverse effect on native crayfish and other fauna and flora (HOLDICH, 1999; LODGE *et al*., 2000). Legislation is the only tool available to authorities when trying to improve the situation for native species. In most countries there are restrictions or total bans on introducing alien crayfish species so often the legislation needed already exists.

The problem is that people have to know that the legislation exists and this is not always the case. They also have to regard the legislation as sensible, to know the ecological consequences if not followed and they have to respect the law. It is hard to maintain this respect when almost no one is caught and punished. Participants from southern Europe expressed concern that in their countries people are more inclined to disregard the law. The participants from northern Europe assured them that when it comes to crayfish people in the north do not always obey the rules either, since commercial interests may be involved. Again it was agreed that the key to solving the problem with accidental introductions was knowledge and information.

In many cases exaggerated and unrealistic expectations on the success of introductions and the productivity of alien crayfish is believed to be the driving force behind the illegal introductions. If expectations are high enough people do not care about the legislation. In Sweden stunted populations of the introduced signal crayfish are getting more and more common. This means that few individuals of attractive (large) size can be harvested. If this information is widely spread people may refrain from illegal introductions of signal crayfish.

Do we need restrictions for the trade with alien species?

Trade with live animals means transportation and handling of a large quantity of individuals that may escape or may be accidentally or deliberately introduced into natural waters. There are numerous examples of trade with live animals resulting in new species and new diseases entering a country. Alien crayfish are no exceptions and they pose a threat to native crayfish species by being vectors for diseases and being potential competitors. Only a few individuals or the containers they are transported in can spread diseases and one of the most notable examples of this is the spread of the crayfish plague throughout Europe. Likewise a small number of crayfish that ends up in natural waters may result in the establishment of a new population. Crayfish are quite easily transported alive and if they escape they can survive a long time out of the water. When regulations for trade exist regarding species there is still the problem of correct species identification by customs personal.

It was concluded that restrictions on trade with live alien crayfish was needed and of uttermost importance because of the high risks associated. Regulation in the strictest form, that is a total ban on trade with live crayfish, is desirable but this has sometimes been difficult to achieve because of the principles of free trade. It was also pointed out that transportation of live crayfish within countries should be minimised or controlled with regard to the risk of spreading diseases.

Of the European countries Ireland Norway and Estonia have a total ban on importation of alien crayfish species. Recently Sweden also imposed a ban on the importation of alien crayfish. That this was possible gives hope for the future.

CONCLUSIONS

Interest and knowledge among the general public, landowners, fishing right owners, crayfish farmers, fishermen, managers and those utilizing rivers and lakes for recreation is a prerequisite for successful conservation of native crayfish species.

There is no contradiction between exploitation and conservation. In some European countries there are strong traditions connected to crayfish and crayfish fishery. There the exploitation in the form of a controlled fishery, where it can be sustained, may instead be an essential tool in conservation work by increasing the general awareness and by involving more people in the task of protecting the species. A balance between utilization and over-exploitation has to be found and this will also be the aim for those utilizing the crayfish. Local guidelines for sustainable exploitation should be produced. Other ways of utilizing native crayfish *e.g.* farming native crayfish for restocking purposes is possible.

Publicity is important in conservation work and media is an excellent way of spreading information about native crayfish to the widest audience. Educational material aimed at schools, museums, stakeholders and managers should be produced. The webpage of the CRAYNET network serves a source of knowledge by collecting and publishing information on crayfish and can be improved by adding answers to frequently asked questions.

At the European level, universal objectives, rules and regulations are desirable and native crayfish species should be included in directives, policies and EU legislation. The noble crayfish and the stone crayfish should be included in Annex II of the EU Habitat Directive. Joint efforts to harmonise national and local regulations across Europe should be promoted. Based on this general framework the detailed regulations are best worked out at the national level taking into consideration the specific situation in the country.

Information about the legislation, the purpose of the legislation and the consequences when not obeying it should be distributed.

The task of producing the atlas on crayfish distribution within CRAYNET will be helpful when implementing the EU Water Framework Directive.

Restrictions on the trade with live alien crayfish are vital because of the associated risk of introducing new diseases and species. Transportation of live crayfish within countries should be controlled.

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