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Conclusions and recommendations of the OECD workshop on the ecology of introduced, exotic wildlife: Fundamental and economic aspects

Göran Sjöberg & Heikki M.T. Hokkanen

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The deliberate and accidental relocation of birds and mammals around the globe has been and continues to be integral to patterns of human population spread, settlement and economic development. The outcomes of these relocations have been and may be irreversible, with long-term positive and negative implications for ecological, economic and recreational values. Therefore, for each such relocation there are benefits and/or costs which may not always be predictable but which can be realistically assessed and evaluated. A critical point may have been reached in society's recognition of the value of global biodiversity and its wish to mitigate threats to this. Therefore the OECD invited 16 leading scientists in the area of wildlife ecology to review the existing knowledge about vertebrate introductions, and to formulate recommendations for handling such introductions on a sound scientific basis in the future. These recommendations include a proposal to regulate all introductions of exotic vertebrates, to consult neighbouring countries and the public about such introductions, to adopt a combined white-list/black-list approach, and to establish national advisory committees for recommending actions in these questions.

Key words: exotics, wildlife, introduced species, ecological impact, eradication, control of populations, decision system

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Following Frank & McCoy (1990), we suggest that the term introduced species should only designate deliberate introductions by man, and that other adventive species should be named immigrants.

Background

Translocations of vertebrate species are proceeding at an unprecedented rate around the world, and have the potential to cause massive changes in both natural ecosystems and in agricultural and urban systems. On the other hand, there are certain potential economic and social benefits from some species introductions. Risk assessment can be made, and the risk can be compared to expected benefits (Bomford 1991, Ruesink et al. 1995).

Introductions of exotic vertebrates have been shown to affect native species through hybridisation, parasite or disease transmission, predation, herbivory or competition, or by many other means (Danell 1996, Dickman 1996, Gebhardt 1996, Kauhala 1996, Nummi 1996, Simberloff 1996, Sutherland et al. 1996). Substantial alteration of native ecological communities can also result (Atkinson 1996, Gebhardt 1996). This could be of particular concern in areas protected for conservation purposes. In addition, introduced vertebrates can cause damage to agriculture, forestry, and fisheries, as well as hazards to human and animal health (Gebhardt 1996).

Conclusions

As specific conclusions the OECD workshop wanted to emphasise that vertebrate introductions have certain distinctive ecological characteristics, such as:

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- Many introductions of vertebrates result in a permanent establishment of a species (Ebenhard 1988). Establishment is sometimes facilitated by previous changes in the environment (Myers 1986, Brown 1989). This, however, is not always necessary (Nummi 1996).
- In a suitable environment, organisms tend to spread at a certain rate if not artificially contained or controlled (van den Bosch et al 1992, Hengeveld 1996).
- Eradication of an established bird or mammal population is almost always extremely difficult and costly. Even for the control of populations, expensive measures need to be taken. Control through hunting may sometimes be efficient, but this depends on national and international market prices of meat and fur (Parkes et al. 1996, Dickman 1996). Application of toxins, which is costly, has been used against exotic mammals, but is often not considered acceptable by the public (Sutherland et al. 1996). Also the use of species-specific microbial control agents, or the control of fertility and lactation - a recent development - may lead to social and political complications (Sutherland et al. 1996).
- Exotic vertebrates tend to have a high rate of causing pest problems or environmental damage (Ebenhard 1988). Mammal examples include rabbits, brown and pacific rats, muskrats and brush-tailed possums (Atkinson 1996, Dickman 1996, Gebhardt 1996); bird examples include the Canada goose and the ring-necked pheasant (Gebhardt 1996).

Recommendations

Based on the considerations above, and on the joint expertise of the participants, the consensus view was reached that:

A) All introductions of non-indigenous vertebrates for whatever purpose, including agricultural production, hunting, tourism, pet keeping, recreation, and research, should be regulated. Introductions from one ecological region to another should be regulated as well, even within the same country.

B) Regulation should be based on the general principles that have been outlined for Australia (Bomford 1991). Similar documents should be adopted as a means of regulation by all countries, and it should be based on a hierarchical decision system concerning the benefits as well as the potential costs and risks of the introduction.

C) A species to be introduced should fulfill the following criteria:
   1. It should carry a substantial economic or social benefit to the community.
   2. It should not be harmful to humans.
   3. The species
      a) is not likely to become established in the wild, or
      b) should not have an adverse ecological impact, or
      c) should be possible to eradicate.
   4. If the species does cause some adverse impact, its benefits should outweigh its actual and potential costs.

D. Decisions concerning introductions should be made at the relevant ministry in each country based on recommendations of an advisory committee, and after consulting the views and considering the interests of other countries at risk. The advisory committee should have a broad expertise in ecology, evolution, genetics, and invasion biology. Before permission of an introduction is granted, a notification period of 60 days for comments from the public should be allowed.

E. For efficient handling of applications for introduction, species can be placed in three different categories, specific to each ecological region:
   1. A so called 'black list' which includes species which are not allowed for introduction under any conditions.
   2. A 'white list' which includes species that already have been cleared as safe, and which do not require any further considerations.
   3. All applications concerning species not included in any of these two categories should go through the full assessment according to the above-mentioned mechanism. Renewed application should be made for a species for each new case of introduction, unless it is explicitly included in the 'white list'. By 'species' in this context we consider all genetically distinct population segments, or 'evolutionary units'.

F. Special regulations should be considered for the spread, or containment of spread, of a species, irrespective of whether a permission for introduction has been granted.

G. The advisory committee should continually reassess the status of species on the white list, as well as species that have entered the area without passing through the above process, based on monitoring of ecological and economic consequences of the introduction.

H. An introduced species, already established in an area, that has been found to cause substantial economic damage compared to benefits, or that threatens native species or ecological communities, should if possible be eradicated, and the environment restored. If this is not technically or economically possible, appropriate measures should be taken to stop the further spread of the species, or if not even this is possible, its numbers should be sufficiently controlled.

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