

CONSERVATION OF INVERTEBRATES IN VICTORIA USING THE FLORA AND FAUNA GUARANTEE ACT 1988 — ACHIEVEMENTS AND POTENTIAL FOR IMPROVEMENT.

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Abstract

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Invertebrate conservation in Victoria could be greatly enhanced by changing the way that the *Flora and Fauna Guarantee Act* is used, and also by groups in addition to CNR accepting more responsibility. To date the focus has been largely on single species conservation, an approach which is inefficient and also inadequate for addressing the broader problems of invertebrate conservation. The focus should shift to protection of threatened invertebrate communities and to managing potentially threatening processes, though some protection of single species will still be necessary. However it is also essential that other agencies, academic institutions and so on become more actively involved, for example in research, provision of information for management, and education. CNR lacks the resources to be effective alone.

Background

The *Flora and Fauna Guarantee Act* 1988 can be considered revolutionary legislation. It was the first broadly-based biodiversity conservation Act introduced in Australia. Similar legislation has now been adopted by many other states in Australia, and also by the Commonwealth government. The purpose of the Act is to enable and promote the conservation of flora and fauna, with objectives including to guarantee that taxa can survive, flourish and retain their potential for evolutionary development in the wild, to conserve communities, to manage potentially threatening processes and to ensure that use of flora and fauna by humans is sustainable. A key feature of the Act is that it goes far beyond the protection of single species. It also enables the protection of communities, and tackles the important issue of managing potentially threatening processes. In recognition of the importance of habitat protection, the Act provides a number of mechanisms to facilitate this. As such it provides for a preventative approach.

There are a range of mechanisms to meet the Act's objectives, including the listing process (adding threatened taxa or communities or potentially threatening processes to Schedules of the Act), controls over taking from the wild, the preparation of Action Statements and determination and protection of Critical Habitats.

These are discussed in detail elsewhere (e.g., Butcher et al., 1994; Clunie and Reed, 1995; Mansergh et al., 1995). The ability to delist items is an important aspect of the Act which is worth noting. There are two reasons for delisting. Firstly, improved management can secure a taxon's or community's survival in the wild. This should be recognised as a fundamental and long-term objective for all listed taxa and communities. Secondly, additional research carried out as a result of listing may reveal that the conservation status of an item is different to that previously thought.

Now that the Act has been in operation for over seven years, it is valuable to assess its achievements as well as identify its shortfalls. It is important to assess which areas require improvement and to understand why. Criticism of the Act without worthwhile suggestions for improvement are of little value.

Achievements

Perhaps the most significant achievement has been that invertebrate conservation is now firmly on the conservation agenda. Those working within the Department of Natural Resources and Environment (NRE) as well as the broader community are now more aware of the importance of conserving invertebrates, and impacts of various activities on invertebrates are now given

equal consideration to impacts on more traditionally recognised fauna.

To date, 24 invertebrate taxa and two invertebrate communities have been listed or recommended for listing under the Act. Eleven potentially threatening processes have also been listed, or recommended for listing, at least partially on the basis of posing a threat to invertebrates. Fourteen Action Statements have been published or exist as drafts; these include ten taxa, two communities, and two potentially threatening processes.

The Act requires that public authorities have regard to flora and fauna management objectives. This is reflected in the increased consultation and negotiation both within the Department, and between the Department and other land and water managers over listed taxa, communities or potentially threatening processes. Production of Action Statements involves extensive consultation with land or water managers and also any other members of the community who ask to be involved. This improves the public profile of invertebrates, raises community awareness, and also means that land or water managers take into account the conservation of listed items and appropriate management of processes. Managers who are advised of the presence of a listed taxon or community within their area of operation, or of a potentially threatening process which they may be contributing to, have been generally fairly open to discussions on ways to modify their activities to take into account the protection of items. These include such diverse groups as Shire Councils, the Alpine Resorts Commission, River Management Authorities and CNR Forest Service. Communication within CNR over appropriate management has also improved through the Action Statement process. For example, negotiations with CNR Forest Service regarding the protection of streams where Alpine Stonefly *Thaumatoperla flaveola* occur have resulted in retention of wider streamside buffers than would previously have been the case. The National Parks Service also takes into account the presence of listed items when preparing management plans.

Another significant benefit of listing and of Action Statement preparation has been the attraction of funding, that might previously have been unavailable, for specific actions necessary to protect taxa and communities and manage potentially threatening processes. Funding for research and protective actions for listed invertebrates and communities has come from a

number of bodies including CNR, Australian Nature Conservation Agency, Australian Heritage Commission, Australian Geographic Society and World Wide Fund for Nature. A direct result of this funding has been a significant increase in our knowledge of their distribution and conservation status (e.g., Otway Stonefly, alpine invertebrates, San Remo Marine Community).

There are many examples where listing of items has resulted in direct management action. Two examples are provided below. Protection and management of the San Remo Marine Community has been a direct result of listing and Action Statement preparation. Surveys to identify other occurrences of the community have been undertaken, increasing our sparse knowledge of the marine environment. Recently, the community has been invaded by the exotic grass *Spartina*, posing a serious threat to the community. Introduction and spread of *Spartina* into estuarine environments has received a recommendation for listing as a potentially threatening process. This invasion by *Spartina* is now being controlled. Without listing the community, or recognition of the threatening process, the protection of this area may not have been a management priority.

Another example of the benefits provided by the Act is the management of Butterfly Community No. 1, which occurs at Mt Piper. Following listing, the public profile of the Butterfly Community has greatly increased. Protection of this community has focussed on appropriate planning, management, research and monitoring and has involved extensive liaison between the Department, the local Shire and adjoining landholders. The extensive research is demonstrated by the presentation of a number of related papers at the Invertebrate Biodiversity and Conservation Conference.

A further achievement of the Act has been that two taxa have been recommended for delisting. In these cases, data obtained subsequent to listing has enabled the more accurate determination of the conservation status of these taxa. Prior to the advent of the Act, this information may never have been collected because of the lack of interest and funding into invertebrate conservation. Lack of information is a significant handicap to appropriate management.

The increased awareness of those outside CNR can be demonstrated by the involvement of some academic institutions in the Flora and Fauna Guarantee process. For example, a third year subject within the Melbourne University

Zoology Department requires students to prepare versions of Action Statements. This has enabled a large number of students to become aware of the objectives of the Act and its implementation. Many of these students are likely to continue in science or become land and water managers who will be need to understand the Act. Ongoing contact between CNR staff and students from other institutions indicates that awareness of the *Flora and Fauna Guarantee Act* 1988 is reasonably widespread.

Improvements

It should be recognised that the introduction of the Act has led to an improvement in the approach to invertebrate conservation in Victoria. However, there are three major issues that need to be addressed to improve its effectiveness in invertebrate biodiversity conservation.

From single-species management to management of communities and threats

Firstly, we need to move away from the focus on single-species conservation, which has been one of the main criticisms of the implementation of the Act. Reasons for this focus are that single-species management has been the more traditional approach and so has a greater acceptance, for example by funding bodies. It can also seem more pressing at the time, especially if a specific threat has been identified. In addition, nominations for single species are more common than for communities or threats, and management is directed toward listed items.

There are times when the single-species approach is valid and necessary. When a taxon is under imminent threat of extinction, immediate targeted action may be essential. Management of flagship species, those which have high public appeal, can be used to focus attention and resources. These species can act as 'umbrella' species if their management will confer protection on other taxa in the same area or with similar requirements. Keystone taxa, which have a critical ecological role and whose survival is therefore essential for the survival of other taxa, may also be a priority. Protection of taxa which are taxonomically isolated can also be important in maximising the protection of genetic diversity.

However, with the vast number of invertebrate species, and the generally poor taxonomic, distributional and ecological knowledge of many groups, this approach is clearly inadequate for dealing with all threatened, or presumed threatened, taxa. It can also be an inef-

ficient use of resources. Tackling the issues related to a single species may result in a narrow approach, while slightly more effort may greatly increase the overall biodiversity benefit. There is also the potential for repetition of effort, where the same issues are dealt with over and over when protecting different species. A broader approach, such as management of a whole community or a potentially threatening process, may avoid this. The problem of single-species preservation has also been recognised in the United States, which established similar legislation over 20 years ago. Bloomgarden (1995) notes that the *Endangered Species Act* 1973 is likely to fail to keep up with the increasing numbers of species needing protection if it continues to focus on single-species protection.

Directing greater effort into nominating and protecting threatened invertebrate communities and managing potentially threatening processes would improve the status of invertebrate conservation.

The benefits of community conservation are that it provides an umbrella effect so that greater biodiversity is protected, it maintains an interactive ecological unit, and, because a community includes undescribed taxa, the problem of poor taxonomic knowledge of invertebrates is avoided. Given the benefits, directing increased attention toward protection of communities is warranted. The identification of threatened invertebrate communities is undisputedly difficult with many scientists disagreeing as to what constitutes a valid community. To date, only two listed communities have been described on the basis of the invertebrate fauna, these are the San Remo Marine Community and Butterfly Community No. 1, which occurs on Mt Piper. Action Statements have been produced for both, and the ongoing management appears to be successful. Most other communities listed have been described on the basis of floristics. An important point is that all components of a community are protected when they are part of that community. Therefore a community need not be described on the basis of the invertebrates in order to provide protection to them.

The identification and management of potentially threatening processes is without doubt the most effective means of conserving invertebrates. As threats are generally broadscale, their successful management can protect a broad range of biota and their habitats. In addition, the nomination and listing of threats draws attention to them within the general community,

which assists in the necessary acceptance of the need for change.

To date, a number of potentially threatening processes have been listed, particularly in relation to the freshwater environment. While only eleven were listed (or recommended for listing) largely or partially on the basis of threats posed to invertebrates, the management of most would assist with invertebrate conservation. For a number of reasons, progress towards producing Action Statements and managing threats has been slower than for single species. Production of Action Statements requires considerably more time, due both to determining appropriate management needs, and also the consultation required to facilitate acceptance by other land and water managers and the community. For changes to be implemented, all those involved, from high level managers to those workers on the ground, must be involved in consultation and be committed to change. The limited availability of people to perform this work, especially as Government departments shed staff, is an obvious constraint.

In most cases, progress toward amelioration of potentially threatening processes can be expected to be slow, and may not be immediately obvious. Frequently, the magnitude of required change is large, and may involve change in entrenched management practices, existing infrastructure, and public opinion. The area over which a threat operates is generally large, and a broad range of stakeholders are often involved, for example Government Departments, River Management Authorities, Shire Councils and individual landholders. Land and water managers may have entirely opposite needs and ideas of managing land to that required for conservation.

With the magnitude of change required, it is not feasible to expect the *Flora and Fauna Guarantee Act* 1988 alone to resolve complex issues and enable all the necessary changes to be implemented. The answer lies more in improving linkages with other programs, policies and legislation, in increasing the level of involvement in new and existing processes and programs with the objective of influencing these to improve management of threatening processes and protect flora and fauna values. Examples are involvement in the Landcare program to reduce sedimentation of streams (which is a potentially threatening process listed under the Act), and input to the Bulk Water Entitlement process in relation to the 'alterations to flow regimes of rivers and streams' also listed under the Act.

Through the Bulk Water Entitlement process there is the potential to allocate appropriate environmental flows to waterways. Consultation between CNR and other land and water managers over threatening processes is ongoing, and is leading to slow changes. For example, CNR maintains a constant involvement with River Management Authorities over the issue of removal of wood debris from rivers, a listed potentially threatening process.

In management of threatening processes, sparse information regarding the ecological requirements of most invertebrates is also a problem — in many cases the precise way in which a threat operates on invertebrates is not known, meaning that appropriate changes in management cannot be identified with certainty.

There is a strong need for education and effective liaison to assist the community to understand why potentially threatening processes detrimentally affect flora and fauna and their habitat, how they can change their current practices and their responsibilities under the Act. Assisting land managers to understand the range of benefits of responsible management to not only flora and fauna and their habitat, but also to their own livelihood in terms of land degradation is an important issue.

Potentially threatening processes are for the most part extremely difficult to manage, and the prospect of resolving inappropriate management is daunting. However, the obvious benefits of management of threats mean that increased effort in this area is justified.

Prioritisation for management

A criticism of the Act has been that invertebrate taxa which we know little about are nominated and listed based on current available information which is often sparse. The nomination process is an open one, and anyone can nominate an item that they believe worthy of listing. Items are nominated for different reasons; they may be clearly threatened, subject to an imminent threat, declining in abundance or distribution, or they may be very rare. It should be recognised that the SAC (the expert panel which assesses the validity of nominations) must make a decision based on available information, and items can only be rejected for listing if they are invalid or ineligible. This approach to decision making is in line with the precautionary principle, which states that 'where there are threats of serious or irreversible environmental dam-

age, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation' (IAE, 1992). Subsequent surveys may then discover that an item is not in fact threatened, in which case the item is nominated for delisting. This highlights the problem of lack of base line information. However, it is difficult to deny that there are benefits in collecting new information on invertebrates. The issue of poor baseline data has been illustrated by Doeg (this issue), which discusses difficulties in assessing the conservation status of invertebrate taxa.

Rather than condemning the process, the answer lies in adopting a more responsible and methodical approach to management. Without wishing to inhibit public involvement in nominations, it is also necessary for those with access to scientific data and information and/or those with an understanding of ecological processes to ensure that items which are of a high conservation priority are nominated for listing. As listing immediately sets in train a management process, and resources are directed towards listed items, it is critical priority items are nominated. It is inevitable that there will be some prioritisation of management effort because of funding and time constraints. Therefore it is important to ensure that those items given priority are ones which will maximise invertebrate conservation. Appropriate methods should be developed to facilitate prioritisation of management — not only taxa, but also communities and potentially threatening processes. There is an abundant literature available on subject of prioritisation for conservation (e.g., Crozier, 1992; Given and Norton, 1993; New, 1987; Vane-Wright et al., 1991).

Spreading the load

The third area where there is substantial room for improvement lies in groups outside CNR taking on responsibility and ownership of the *Flora and Fauna Guarantee Act* 1988. Rather than viewing the Act as a dry piece of legislation that is the government's responsibility to administer, it should really be viewed as a community-based approach to conservation. Those interested in invertebrate conservation should look more closely at how they can participate in the *Flora and Fauna Guarantee* program to improve its effectiveness. This can only come about through a better understanding of the Act and a willingness to take responsibility. To date, there has been limited involvement by scientists

and the public. For example, a breakdown of those who nominate items for listing demonstrates the involvement of different groups: nominations by CNR represent 46.6% of all received, 33.5% by conservation groups, 15.8% by individuals and only 4% by academic institutions. The low level of involvement with the Act by organisations which are specifically involved in conservation programs means that they do not make use of its benefits for invertebrate conservation. Clearly a broader use of the Act would make it more effective and accepted within the wider community. The lack of involvement to date may be due to insufficient effort in publicising the Act since its establishment or in a lack of responsibility of those outside CNR.

There are a number of areas where the community, including scientists from academic and other institutions, could increase their level of involvement by playing a key role in:

- setting priorities for management of items;
- identifying and nominating threatened communities, and potentially threatening processes;
- providing information and advice for appropriate management of threatened taxa, communities and potentially threatening processes;
- preparation of Action Statements (this would increase ownership and strengthen links between different land management organisations, as well as research institutions);
- increasing advocacy for invertebrate conservation, either as individuals or through organised groups; and
- increasing public knowledge of the *Flora and Fauna Guarantee Act* 1988, for example through school or university courses.

Summary — what we need to do

The advent of the *Flora and Fauna Guarantee Act* 1988 has led to a significant improvement in invertebrate conservation in Victoria. Benefits include incorporating consideration of invertebrate conservation in planning and management, increased funding and research and increased public profile. While it has clearly been a step forward, there are ways in which the Act's effectiveness can be improved. Recognising areas which need improvement should lead to further advances in invertebrate biodiversity conservation. A greater focus is needed on the broader approach of management of communities and potentially threatening processes and

setting priorities for nominations and for the management of listed items. Publicising the Act to a greater degree and educating the public on how they can be involved, the effectiveness of the legislation could be significantly enhanced.

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