

PRESIDENTIAL ADDRESS

WILDLIFE CONSERVATION IN NEW ZEALAND

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INTRODUCTION

Previous Presidential Addresses have tended either to focus on the Society itself, its role, purpose or future, or to have taken the form of a discourse on some aspect of ecology of particular interest to the individual President. The two most recent Addresses, by Dr Bull in 1976, on the occasion of the 25th Anniversary of the Society, and by Mr Batcheler in 1977, concentrated on the business, achievements and role of the Society. These two Addresses covered the field so admirably that there seems little point, after such a short interval, in continuing this tradition of introspection. Accordingly, I have decided to permit myself the liberty of talking about a subject that is not only of considerable interest to me, but is one that has considerable topicality and is of relevance to the Society. My subject today is "Wildlife Conservation in New Zealand".

The topicality of wildlife conservation-and conservation generally-is evidenced by several recent events, viz:

1. the extension of protection to designated species of terrestrial and freshwater invertebrates through the Wildlife Amendment Act (1980), and to all but four species of lizards under the Wildlife Order (1981);
2. the issuing, in June 1981, of the Nature Conservation Council's proposal for a New Zealand Conservation Strategy under the heading "Integrating Conservation and Development" (Nature Conservation Council, 1981);
- and 3. the release earlier this month (August 1981) of "The Red Data Book of New Zealand", compiled by Professor Gordon Williams (a former President of the Ecological Society) and Dr David Given (current member of Council and of the Conservation sub-committee), and produced by the Nature Conservation Council (Williams and Given, 1981).

The interest in conservation engendered by these and other events is strongly reinforced by the forthcoming meeting in October this year, in Christchurch, of the 15th General Assembly of I.U.C.N.

The concurrence of these events in 1981 makes this

an appropriate time to review and assess the wildlife conservation scene and to discuss possibilities for the future. There is another good reason why such an assessment is timely, and that is that in January 1979 the topic of "The problem of endangered species and their habitats" was treated in depth at the 49th Congress of ANZAAS, and it is of interest to know what, if any, progress has been made since.

BACKGROUND

Throughout this talk, when I mention "wildlife" I am referring to *native* amphibians, reptiles, birds and bats-plus the selected, named invertebrates included in the Wildlife Amendment Act (1980). All introduced vertebrates, whatever their status, are excluded from consideration.

Because of the constraints of time, and the fact that thorough treatments of the subjects are readily available, I do not propose to consider in detail such matters as why New Zealand's wildlife evolved the way it did, the history of extinctions or the characteristics of the New Zealand fauna. Suffice it to say that New Zealand has, in common with other isolated oceanic island groups, a relatively depauperate terrestrial and freshwater fauna with a high degree of endemism. Such faunas are susceptible to extinction, as evidenced by the fact that of the 217 species or races of birds that have disappeared throughout the world in the last 400 years, 200 have been from islands-despite the fact that island species make up only 10% of the world's avifauna.

New Zealand has a poor record for extinctions; 45 species of birds had become extinct prior to the arrival of Europeans and, in the past 200 years, 8 full species and 7 subspecies of birds have become extinct and a further 23 species or subspecies have become endangered or rare. The endemics have suffered a much higher rate of extinction than the other indigenous forms. Eleven percent of the rare and endangered birds listed in the IUCN Red Data Book are from the New Zealand region.

Looking very briefly at the causative factors that have brought about the present state of affairs, we can identify:

1. climatic and vegetational changes over the past 40,000 years;
2. burning of vegetation cover by Maoris; hunting by Maoris;
3. introduction of the kiore (*Rattus exulans*)
4. and Polynesian dog (*Canis familiaris*)—the former of which probably seriously affected the numbers and distribution of tuatara (*Sphenodon punctatus*), lizards, small petrels and many terrestrial invertebrates, (especially large, flightless, ground-dwelling forms);
5. habitat alterations by Europeans;
6. numerous introductions of exotic animals, of which 33 species of birds, 33 mammals, 16 fish, 1 reptile and 3 frogs have become permanently established.

Of particular significance to present-day wildlife is the continuing serious impact of habitat alterations and the presence of introduced animals, the latter posing problems of predation, competition and disease.

THE PRESENT NEW ZEALAND SCENE

New Zealand wildlife presently comprises 3 species of frogs, about 39 reptiles, 77 species of breeding birds and 2 mammals. If we stray slightly from our strict definition of wildlife, we can add to our list, for the benefit of comparison, about 30 species of fish and nearly 10,000 species of terrestrial insects.

"The Red Data Book of New Zealand" (Williams and Given, 1981) includes only endemic full species of animals and plants. Of the 41 species of vertebrates listed, 7 are regarded as having become extinct during the present century leaving 34 endangered, vulnerable, rare or indeterminate. Birds have suffered more than the other groups, but there are no grounds for complacency with the latter.

Some characteristics of many of the species of New Zealand wildlife count against them when their survival is in doubt. For example, there is a tendency for species to be long-lived and to have a low reproductive rate (e.g. takahe (*Notornis mantelli*), tuatara). Low reproductive rates make species extremely vulnerable, as they cannot compensate for increased rates of mortality. Some species have suffered rapid declines e.g. South Island thrush (*Turnagra c. capensis*), stitchbird (*Notiomystis cincta*), weta-punga (*Deinacrida heteracantha*), sometimes for no apparent reason. In some instances there are obvious reasons for declines or extinctions, such as the loss of five bird species and one bat on Big South Cape Island after ship rats (*Rattus rattus*) became estab-

lished in 1964. Rapid declines may end in extinction, or lead to disjunct distributions, as in the cases of takahe, black robin (*Petroica traversi*), South Island saddle back (*Philesturnus carunculatus*) and black stilt (*Himantopus novaezealandiae*). Sudden and dramatic declines pose serious problems for those concerned with wildlife conservation because of the short time between discovery of the phenomenon and the need for management.

MANAGEMENT OF ENDANGERED SPECIES

So far I have filled in some of the background to the wildlife situation in New Zealand, identified the wildlife groups involved, and commented on their conservation status. I want now to say a little about management, its philosophy and techniques.

Put simply, a species becomes endangered because of deleterious effects of environmental factors on survivorship and/ or fecundity. If a decline is to be halted, then a management programme must overcome the detrimental factors and improve survivorship, fecundity or both.

For good, practical reasons the approach to endangered species management that has developed in New Zealand and throughout the world is one in which attention has been focused on the immediate causes of a species' decline (e.g. poor reproductive success) rather than on possible ultimate causes (e.g. habitat deterioration). In a sense, immediate causes of declines may be regarded as the symptoms shown by a population in response to ultimate factors. Management which places emphasis on treating symptoms, rather than the causative factors, has been referred to, in connection with birds, as "clinical ornithology".

Management can be passive or active. Passive management includes the passing and enforcement of protective legislation and the creation of reserves to protect wildlife and wildlife habitat. Both these kinds of management are used in New Zealand. Techniques for active management include: transferring fauna to offshore islands; captive-breeding; predator and competitor control; cross-fostering; and habitat improvement. Transfer of birds to islands which have been relatively unmodified by settlement and are free of mammalian predators, or which have been rehabilitated by removal of noxious animals and through habitat improvement, is a very successful management technique—South Island saddleback, black robin, South Island robin (*Petroica australis*), little spotted kiwi (*Apteryx oweni*). Captive-breeding has also had its successes, with takahe, brown teal (*Anas aucklandica chlorotis*), Forbes' parakeet (*Cyanoramphus auriceps forbesi*)

and kiwis, and there is some hope that re-introductions into the wild could succeed in establishing viable populations of brown teal, at least. Black stilts have been raised from eggs collected in the wild. Predator control is being employed with takahe, black stilts and kakapo (*Strigops habroptilus*) and competitor control (of red deer *Cervus elaphus*) with takahe. The successful cross-fostering of black robin chicks to Chatham Island warblers (*Gerygone albofrontata*) on Little Mangere Island, boosting the population from 5 to 8, has been in the news recently and has considerable potential for other endangered species.

All of the techniques noted have played a part in helping to boost the productivity of species, to reduce mortality or to provide more suitable habitat. Later I want to consider the future use of these and other management methods.

NEGLECTED ELEMENTS OF FAUNA

It is not by chance that much of what I have said so far about wildlife conservation has concerned birds, because, with the exception of the tuatara and, to a lesser extent, the native frogs, the protection of other faunal groups has been neglected. This is not too surprising when we consider that:

1. most invertebrates, lizards and fish are not conspicuous enough, or well enough known, to have made much impact on the public;
- 2 many people have a natural aversion, or even phobia, towards certain invertebrates e.g. spiders, wetas. It is not easy to raise public enthusiasm for protection of creatures that many people find repulsive;
- 3 many closely-related species of invertebrates, particularly, are difficult to identify with certainty in the field, even for an expert;
- 4 the taxonomy of some lizards and invertebrates is in dispute;
- 5 experts disagree as to what constitutes an endangered species of insect. Does restriction of an endemic species to one island make it endangered? Under present conditions perhaps no; but what if rodents reach a previously rodent-free island?

Many invertebrates are under threat because of loss of habitat and some through predation by introduced insects and birds. Habitat loss is by far the most serious because of the very large proportion of the terrestrial and aquatic invertebrates that could not survive without native vegetation.

Invertebrates

The introduction of the Wildlife Amendment Act

(1980) provides protection for some rare and endangered invertebrates. Only species comprising large, conspicuous individuals are included because of the impracticality of protecting species which have only small individuals. Provision is made for the addition or deletion of species by Orders in Council.

There has been some criticism of the inclusion of invertebrates within the Wildlife Act, largely on the grounds that such protection will impede collection and study. Some entomologists are also critical of the species list, arguing that about half are not endangered, the status of some is unknown, and problems of identification make protection impossible.

Proponents of the legislation believe that *bona fides* scientists will have no trouble obtaining permits to collect and that the Amendment will stimulate, rather than impede, study. As more is learned about the status of invertebrates, then species can easily be added to, or deleted from, the list.

Present management for invertebrates includes: protective legislation; reserves; fencing habitat to keep stock out (land snails); island transfers (Stephens Island weta (*Deinacrida rugosa*) from Mana Island to Maud Island); and captive-breeding (snails).

Lizards

Many lizard species are now extremely rare and several are endangered. Some rare species are restricted to islands free of mammalian predators. Rodents have a particularly marked effect on lizards; islands with rodents have fewer lizard species and notably fewer individuals.

The Wildlife Order (1981) confers protection on all but 4 common species of lizards: common gecko (*Hoplodactylus maculatus*), forest gecko (*H. granulatus*), McCann's skink (*Leiolopisma nigriplantare maccanni*) and copper skink (*Cyclodina aenea*). Eleven lizard species are listed in "The Red Data Book of New Zealand" (Williams and Given, 1981).

Present management is restricted largely to habitat protection and captive-breeding.

FUTURE PROSPECTS

There can be no doubt that there will continue to be increased pressure on wildlife habitat, with all that this means to sensitive wildlife species. It is probable that reduction of forest habitat will push birds such as the kaka (*Nestor meridionalis*), yellowhead (*Mohou ochrocephala*) and robin into the endangered category by the turn of the century. It is an unfortunate fact of life that often the status of species is found to be worse than was realised when studies begin e.g. little spotted kiwi, black stilt. On the other

hand, there are grounds for cautious optimism when recent advances in management and knowledge of species such as black robin, takahe and kakapo are taken into account, and when re-discoveries are made-e.g. orange-fronted parakeet (*Cyanoramphus malherbi*).

What are some of the issues that have to be faced if future wildlife conservation is to be effective?

1. *Ecosystem reservation.* There is a good case to be made for attempts to protect representative communities of animals in areas that are still relatively unmodified. For invertebrates and lizards reserves would not need to be large. This idea of "ecosystem reservation" and protection of habitats has a lot to recommend it.
2. *Conservation within natural habitats on mainland.* The main purpose of endangered species management is to preserve species, *but wherever possible this should be done by conserving them within their natural habitats.* Establishment of populations on islands, in other refuges, and in captivity is a vital, desirable and necessary part of management, but ideally should be secondary to the main aim of re-creating healthy, self-sustaining populations in suitable habitats within the natural range of the species.
3. *Problems of conservation on mainland.* What of the problems of conserving bird species on the mainland e.g. kokako (*Callaeas cinerea*)? It could well be that we have to face up to the possibility of adopting a "game-warden" approach to conservation, with persons appointed specifically to manage one or more species and their habitats, carrying out predator control, habitat improvement, etc. This will cost money. It will also need much more in the way of multidisciplinary research by teams of workers from several organizations—"ecosystem research" with a conservation objective.
4. *Research.* It has become evident in recent years that for effective management of an endangered species it is necessary to have an intimate knowledge of the life-history and ecology of threatened species.
The first requirement of a research programme is to identify the fundamental problems and then to design techniques to help the species to overcome its difficulties. Often the urgency of the situation will mean that management procedures must be implemented immediately, and in such cases scientists and management officers must learn what they can while working directly with the endangered animal.

5. *Importance of immediate and ultimate causes of endangerment.* Management of endangered species is not an either/or proposition with regard to the question of the relative importance of immediate and ultimate causes of endangerment. Effective programmes will address both: for the former, the aim is to assist the species through a crucial period; for the latter, the objective is to make the natural environment suitable for the long-term survival of the species. Neither is likely to be effective alone.

6. *Integrated management.* The only realistic approach to endangered species management is an integrated one that combines skilful interventions to boost productivity and reduce mortality with attempts to solve the basic, underlying problems. Clearly, there is no point doing the one without the other. In particular, the species would be no better off in the wild after management ceases if the basic problems are still unsolved.

Integrated management has several key elements including: research; protection of species and their habitats; public education; active management; population monitoring; co-ordinated overall planning. Research is fundamental, because without the necessary information about the biology and ecology of the species the job of the managers is much more difficult.

7. *Management options.* Various management options should be used concurrently, if possible. Although the main aim might be to retain a species on the mainland in its natural habitat, it still may be that transfers to offshore islands have a part to play in extending the distribution and establishing more populations. Some island transfers have been "desperation measures"—a final attempt to rescue the species, as for the black robin—but they should not be regarded only as a last resort; nor should they be regarded as the only answer to every problem. There are some problems with island transfers, not least of which is finding enough suitable islands, with the right combination of vegetation, climate, species composition, lack of predators, etc. Other factors also have to be taken into account, such as the "saturation" level of islands; the possible impact of transferred species on the island ecosystem; and the desire to conserve unique communities on some islands e.g. outlying or sub-antarctic islands.

Islands have their place as repositories for

endangered species, but the problems should not be overlooked.

8. *Co-ordinated planning.* Clearly, there will be a need for the co-ordinated planning mentioned as one component of the integrated management scheme. The Wildlife Service has the statutory responsibility for wildlife, but has limited resources for research and management. A co-ordinated programme will be necessary, with the Wildlife Service carrying out management, applied research on rare or endangered species and some fundamental research on species, communities and habitats not immediately threatened. Other government agencies, for example DSIR, could carry out ecosystem and population research of a fundamental nature, but with relevance to conservation, and collaborate with the Wildlife Service on some projects. Universities have an important role in research of several kinds, including basic work on wildlife not yet threatened. Students could be encouraged to work on relevant topics by means of scholarships, contracts and grants-in-aid.

Societies also have an important part to play. The Royal Forest and Bird Protection Society is already deeply involved with research and management of black stilt and kokako, in association with the Wildlife Service, and this involvement should continue.

There is also a place for captive-breeding of many wildlife species, this involving the co-operation of private breeders. This could be of particular significance for lizards-but would require the setting-up of a number of captive colonies throughout the country and the careful maintenance of studbooks and records to limit inbreeding and to reduce artificial selection. The long-delayed maturity and low reproductive rate of some lizards will pose problems, but it could payoff in the long-term if lizards prove to be more amenable than birds to re-introduction to the wild.

9. Efficient wildlife conservation costs money and organisations such as the National Provident Fund, World Wildlife Fund, and private firms could contribute here. In addition, the Electricity Department and the Ministry of Works and Development could fund research and management in areas where their activities affect wildlife e.g. black stilt in the Mackenzie Country .

CONCLUSIONS

It is an exciting time in the field of wildlife conservation. There are disappointments from time to time, when habitats are lost, the distributions of endangered species shrink and numbers dwindle. But there are high points too, when re-discoveries of species are made, kakapo young are reared, cats (*Felis catus*) are eliminated from Little Barrier Island, and more legislative recognition is given to wildlife. What is needed now is a vigorous, well-coordinated programme of integrated research and management with government agencies, societies and individuals all playing their part. Last, but not least, is the continuing need for the public to be kept informed about what is happening in conservation-and we all have a part to play here, both individually and as a Society .

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