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THE PAST, FUTURE AND PRESENT OF BIODIVERSITY CONSERVATION IN AUSTRALIA

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Australia has a poor record for biodiversity conservation. Government and community priorities promote growth and resource exploitation over conservation and ecologically sustainable land and water use. Programmes to protect biodiversity are inadequate, poorly funded, and inappropriate. Consequently, Australia has a large extinction debt and the 21st Century will see massive losses of continental biodiversity. Because birds are well-known, these trends are already evident among Australia's avifauna and illustrate the magnitude of the problems facing biodiversity conservation in 21st Century Australia. Only by ending land clearing, limiting population growth, and adopting scientifically based land management and conservation practices can these trends be reversed. This is unlikely, as Australia's largely urban population is ill-informed, while the scientific community is marginalised and the agenda of green groups perpetuates the *status quo*.

INTRODUCTION

In the first year of the 21st Century, the World faces an extinction crisis comparable to the mass extinction of dinosaurs at the end of Cretaceous 65 million years ago following the collision of Earth and an asteroid. The current crisis differs in that the loss of Earth's biodiversity is the result of human interference with planetary processes. The impact of humans is more complex than an asteroid's, but equally dangerous to life and no more evident than on the Australian continent. The human history of Australia is one of environmental change and extinction on a continental scale. It began with the first Australians (Flannery 1995), but in 200 years of European settlement, patterns of land and water degradation and the loss of biodiversity have developed which give Australia the unenviable record of being the continent most altered by Europeans in the briefest time (Recher & Lim 1990).

The Extinction of Australia's Birds: For Example

In 1999, I predicted the extinction of half of Australia's bird species during the 21st Century (Recher 1999). I expressed my concerns in terms of species, because people equate biodiversity and extinction to species and the extinction of species. In reality, biodiversity embraces the full range of genetic variation within a species and is better expressed at the population level than at the species level. Biodiversity also includes biotic communities. The loss of this variety and complexity was the substance of my prediction of the extinction of the Australian avifauna. Australia has already lost significant amounts of avian diversity at the population and community levels. Birds are the animals that I have studied all my life. It is not surprising therefore that I express my concerns about the impact of humans on Australia in terms of their extinction. I am not alone in my concern for the survival of Australia's birdlife. Garnett and Crowley (2000) identified 264 of Australia's 1247 taxa of birds, or 20% of species and subspecies, as threatened. This is the 'official' list because the assessment of status was commissioned by government and conducted according to legislative criteria and international protocols.

The disparity between my prediction of a 50% loss during this century and the 20% suggested by Garnett and Crowley appears large. But is it? Our knowledge of Australia's birds and other wildlife is limited. Even with mammals there is confusion over species boundaries and there are few data on temporal and spatial patterns of species abundances. Data on the status of invertebrates (the 99% of biodiversity) is largely non-existent. Taxonomically, birds are well-known and most unique populations are described. Birds also have an advantage over mammals in that the distribution of species is relatively well described, habitat and resource requirements are

known, and there are reasonable data on patterns of species abundances, as well as information on the response of birds to disturbance. Birds therefore provide an opportunity to explore the status of the Australian biota and to identify major threatening processes. If this is correct, why do assessments of status differ by more than 100%?

The difference is as much political as it is biological. In my 1999 paper, I pointed out that Garnett's earlier assessment of avian status (Garnett 1992) was constrained by legislation and international guidelines which narrowly defined the criteria used in assigning taxa to categories of threat. Garnett and Crowley (2000) were also obliged to adopt the conventional species-subspecies approach to biodiversity. I used much broader criteria of endangerment and accepted the definition of biodiversity which includes the full range of genetic variation within a species. I placed great significance on populations, local extinctions and declines in abundance. Moreover, I extrapolated trends in abundance and threatening processes through the next century. Official assessments of status are snapshots in time. While they predict extinction if remedial action is not taken, they seldom acknowledge the risks to abundant (common) and/or widely distributed taxa if habitat degradation and other threats persist or intensify. Nor are they enabled to predict patterns of continental extinction based on patterns of regional decline. Yet, it these local events which foreshadow continental losses.

I based my assessment of the state of the Australian avifauna on regional patterns of extinction, the continental scale of habitat loss and degradation, and my expectation of continued habitat loss and increasing degradation of land and water. (see State of the Environment Advisory Council, 1996). Pastures and crops cover 50-70 percent of the land area of all states except Tasmania (24%) (Barson *et al.* 2000). Moreover, almost all remnant native vegetation in farming areas is degraded (SEAC 1996). Although little land has been cleared in Australia's rangelands which comprise 75% of the continent's land area, this vast region is overgrazed and exotic species allowed to proliferate (SEAC 1996).

Virtually all populations of all species of birds in the agricultural zones have declined in abundance in proportion to the extent of habitat clearing. For example, the central sheep-wheat zone of southwestern Western Australia retains less than seven percent of its original vegetation and all bird species dependent on native vegetation have declined in abundance by at least 93% depending on habitat type (Recher 1999). Although some dependent species are abundant in vegetation remnants, continued degradation of remnants by agriculture and rising water tables threaten more than half of the remaining vegetation. As regional populations diminish and remnants are increasingly isolated, opportunities for recolonization following chance extinctions become small and regional extinction more likely. This is the pattern for regional avifaunas throughout Australia: an endlessly repeated story of decline and extinction, accompanied by the increased abundance of a few species of agricultural and urban commensals.

A similar pattern of change occurs in the pastoral zone with about equal proportions of species in decline, stable or increasing in abundance. When considering threats to biodiversity, an increase in the abundance of species is as much a symptom of dysfunctional ecosystems and lost biodiversity as is decline and extinction. Official lists of the status of species only consider threatened species, but do not list species which have increased in abundance. Thus, official lists not only fail to acknowledge the loss of individuals already incurred by still common birds, they do not list losses arising from changes in community composition.

The Future State of Australia's Avifauna

There is no part of Australia in which the avifauna has not been adversely affected by Europeans (Recher 1999). Depending on the extent of habitat loss and degradation, only 10 to 60% of species will survive regionally. Where the smallest number persist, all will be urban and agricultural commensals. Where more species persist, about half will be present in increased numbers, while the remainder will linger as small, fragile populations. Migrants and nomads will disappear from the arid and semi-arid zones. Only along the well-watered coasts will a larger proportion of regional species survive. However, I do not expect these largely forest dependent species to persist much beyond the 21st Century without changes in forest management and better conservation reserves. The increased intensity and frequency of logging, an unrepresentative and fragmented system of forest reserves, and the failure to integrate biodiversity management across the forest estate will progressively degrade forest ecosystems and lead to the decline of forest

wildlife. When coupled with global warming, this is an ominous scenario for the long-term future of Australia's forest biodiversity. The most immediate and significant threat to Australia's biodiversity is land clearing. It should also be the easiest to resolve, but the average annual clearing rate (1997-99) for Queensland alone was 425, 000 ha (State Landcover and Trees Study, 2000) because politicians did not care enough about conservation and the future to put politics aside. Not only are increasingly large proportions of natural vegetation lost each year, but clearing woodlands on this scale means an average annual loss of 9 - 18 million birds (20 - 40 individuals/ha; Recher 1985), as well as all other wildlife formerly living in the cleared woodlands. Large scale conversion of native vegetation to intensive agriculture is developing in the Northern Territory and northwestern Western Australia with the result that northern Australia is now experiencing the rapid loss of biodiversity witnessed in southern Australia during the 19th and 20th Centuries. Global warming, land clearing and habitat fragmentation, the proliferation of exotic plants and animals, abnormal abundances of some native species, and increasing land and water degradation leave little scope for wildlife to adapt and survive. Because these same processes affect the quality of human life and risk Australia's welfare as a nation, we need to ask why the national response to land degradation and biodiversity loss is minimal and ineffective.

Politics and Biodiversity Conservation

As on all continents, there are significant impediments to biodiversity conservation in Australia. Australia shares some of these with other Western nations, but others are uniquely Australian. In line with the value systems which dominate human society, Australians are committed to economic growth and the exploitation of resources. There is an attitude that resources not being used for economic gain are wasted. Nor is it understood that other organisms already use and depend on these resources or that allowing resources to remain undeveloped has important economic, ecological and social benefits. For example, water flowing into the ocean is necessary to sustain coastal fisheries, while unlogged forest and uncleared land are important carbon sinks, not to mention their recreational value or their importance to other organisms. Australian governments promote policies to encourage population and economic growth. The two are often seen as mutually dependent. Success of these policies is measured by the usual economic and social indicators: gross domestic product, access to education and health care, longevity, security in old age, social support for the young and disadvantaged, and freedom from fear. Emphasis is on material well-being and monetary wealth, as distinct from cultural or intellectual wealth or the environment. Environmental quality is a concern only to the extent it affects the principal economic indicators. For example, there is concern about urban air and water quality with legislation enacted to limit pollution so risks to health and economic development are kept at acceptable (although not non-existent) levels. By contrast, there is little concern about the loss of urban open space or about restrictions on public access to community resources (e.g., swimming pools and theatre) created by higher entry fees and inadequate public transport as the population grows and resource competition intensifies.

The emphasis on urban pollution as the principal indicator of environmental quality is brought about by the high proportion (>80%) of Australians who live in cities and who rarely venture into the 'bush'. These people have little knowledge or understanding of Australia's biodiversity or of the continent's ecology. For the majority, Australia is a vast, unspoiled and underpopulated continent: the need to increase birth and immigration rates is a constant theme of national leaders in government and industry. Conservation biologists familiar with Australia's environmental problems and the loss of continental biodiversity find this 'frontier mentality' difficult to comprehend, but it helps explain why governments succeed with policies that inevitably lead to more, not less, land and water degradation outside the city limits. In terms of its environmental impacts, Australia's population has already exceeded the continent's carrying capacity suggesting the need to limit or reduce the size of the population, not increase it (Flannery 1995, Recher and Lavery 1999).

Education, Conservation and the Environment

Most Australians have limited understanding of the dependence of agriculture on functional ecosystems or understand their own dependence on global life-support systems. Although improving, environmental and ecological education in Australian schools is not seen as important and is mainly relegated to primary school. Given Australia's environmental history, a case can be made to treat ecological and environmental education as equal in importance to reading, writing

and arithmetic, but this is not happening. While the failure to educate Australians about the intricacies of the environment in which they live hampers the develop of effective conservation policies, the conservation of Australia's biodiversity has not been helped by the narrow agenda of green groups. Those Australians who do value natural areas and promote the conservation of wildlife also have a limited understanding of continental biodiversity and the requirements for long-term nature conservation. Greens have traditionally promoted the conservation of wilderness, sought restrictions on resource use, and advocated the protection of threatened species. Until very recently, little attention was given to the pastoral and agricultural zones, to animals other than mammals or birds, or to achieving a scientifically based reserve system, as distinct from one based on the needs of people as represented by the greens themselves. Current biodiversity conservation programmes (e.g., Regional Forest Agreements; Recher 1998) in Australia have little or no scientific basis or relevance.

Recent efforts by peak conservation bodies, such as the Australian Conservation Foundation, to promote ecologically sustainable development and form alliances with agriculture and industry do little more than restate established policies of growth and development. Such initiatives ignore the need for population control, nor do they promote the restructuring of agriculture, forestry and fisheries according to ecological criteria. The goal appears to be to maintain the *status quo*. Conservation action in Australia is about creating national parks, protecting wilderness, and saving endangered species. Mostly this can be done at little economic, political or social cost because it is not necessary to have long-term solutions. Long-term solutions to Australia's extinction debt include the cessation of land clearing and the creation of a reserve system designed to sample biodiversity in a representative fashion and managed so organisms and communities can adapt to global warming. Instead, all that is required from politicians to meet green demands is a long list of wilderness dedications, a little money to protect endangered vertebrates from immediate extinction, and an end to whaling and hunting, none of which are essential for long-term biodiversity conservation. Mostly these expectations can be achieved by re-allocating land use within the public conservation estate (e.g., from State Forest to National Park) and by grandstanding at international meetings. Any public concern about land degradation arising from the failure to prevent clearing or to regulate grazing is placated by planting a few trees - preferably as commercial crops. The success or otherwise of these programmes is irrelevant. Politically, it is only necessary to be seen to be doing something, rather than to do something which will benefit the environment, but requires courage and leadership to implement.

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