

In their introduction to the fourth edition, the authors comment on the dynamic nature of the task of assessing the conservation status of Australia's flora. This is evident by the ROTAP publication history and the considerable additions to the list over the last 17 years. The ROTAP series arose from lists of rare and endangered species for each State and Territory compiled by Specht, Roe and Boughton and published as a supplement to the *Australian Journal of Botany* in 1974. With the intent of assessing the conservation status of Australia's flora from a national perspective, the lists were further developed by CSIRO in 1979 and published as *Plants at Risk in Australia* (by Hartley and Leigh). Subsequent versions were published in 1981 (ROTAP by Leigh, Briggs and Hartley) and 1988 (ROTAP: 1988 Revised Edition by Briggs and Leigh). Since Hartley and Leigh (1979), the ROTAP list has expanded from 2 053 to 5 031 taxa. The authors consider changes to the list over time to be a result of new information from surveys and research, reductions in the level of threat through the declaration of new reserves and agreements, continued decline of many species despite improved knowledge and management techniques, and the inclusion of subspecies and varieties (not included in editions prior to 1995). In addition to these changes in the number of taxa listed, there has been 3 270 amendments to data for listed taxa, and 2 012 additional records of regional data for taxa already listed. Rare or threatened flora lists published independently by State and Territory agencies since the last ROTAP edition, have been used to update the ROTAP list. The list represents a significant level of collaboration and contribution from Australian National, State and Territory taxonomists, ecologists, botanical consultants and amateur botanists.

No list of biological information is complete without summary statistics and ROTAP delivers the goods. Statistics on numbers of taxa, distribution across conservation categories, state and regional distribution of rare and endangered taxa, and extent of reservation within states and territories. For those of us who feel more relieved knowing that populations of endangered/rare taxa are within national parks or reserves, ROTAP tells us that 54.4% of the total taxa are at a lower level of risk than the remainder. A sobering statistic, however, is that for 74% of these "safer" taxa we do not know the size of the reserved population/s.

Geographic comparisons identify Western Australia, and particularly the floristically diverse south-west, as

having the greatest proportion (46%) of Australia's endangered/rare taxa. Despite this, Western Australia has the lowest proportion (45.6%) of reserved endangered/rare taxa with only a 1.1% increase in this statistic over the seven years prior to publication of this new edition of ROTAP. It should also be stated that due to the significant lack of accurate size data for reserved populations, it will be some considerable time before the level of such information will be improved.

Given the dynamic nature of the pressures placed on taxa, deliberations over the conservation status of Australian flora and the extent of poorly known species, it is not surprising that continuous updating of the ROTAP list is required to provide accurate and up to date information. But how relevant is the ROTAP list? In Australia there are three national lists of threatened/rare flora, ROTAP, the Australian and New Zealand Environment and Conservation Council (ANZECC) Threatened Australian Flora List, and the Endangered Species Protection Act Schedule 1 (ESP Act). ANZECC is the Federal, Territory and State Governments' recognized working list of the status of nationally threatened plant species but, like the ROTAP list, has no legal status. The list included in the ESP Act however has legal status and is based on the agreed ANZECC list at the time the Act was proclaimed. It can be argued that despite the ROTAP not having a formal status, it is an important reference work that is more up to date than the ANZECC and ESP Act lists due to the delays usually associated with government consideration and approval processes. What the ROTAP list has that the others do not are rare and poorly known taxa and many endangered and vulnerable taxa that have not yet made it to the ANZECC and ESP Act lists. The ROTAP list therefore gives a much more complete picture of the Australian threatened/rare flora and its value is as an academic reference work and not as a legislative tool.

One should not expect any substantial information in ROTAP on how to best manage endangered/rare taxa. The book is intended to be a significant reference on this topic and I believe it fulfils that objective completely. If you work or have an interest in this field it is likely that you are already familiar with previous editions of this work. This fourth edition includes substantial additions and is well worth the modest investment.

The exploitation of mammal populations

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THE exploitation of mammal populations forms in part, the proceedings of a symposium held in London in November, 1994 by two "scientific animal charities", the Universities Federation for Animal Welfare (UFAW) and the Mammal Society. It contains 22

chapters arranged in five sections: Exploitation of mammal populations past, present and future; Harvesting wild mammal populations; Hunting and its impact on wildlife; Wildlife trade and conservation; and Ecotourism-making mammal populations pay.

A wide range of topics are covered, with the central theme being the utilization of mammals. Chapters include Saiga antelope in Kalmykia (near the Caspian Sea), Capybaras in South America, meat hunting in the Serengeti, hunting and the deployment of hounds in the United Kingdom and other forms of sport hunting

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elsewhere, and game ranching in southern Africa. It is after midway through the text that the underlying dilemma facing contemporary wildlife managers is reached — *Should mammal populations [or wildlife in general] be assigned an economic value to encourage landholders, traditional or otherwise, to manage such stocks for sustainable conservation?*

The answer to this question begins with Kock addressing conflicts that the Zimbabwe government has had with conservation and animal welfare organizations, including UFAW (see the chapter by Child in Prescott-Allen and Prescott-Allen, 1996). Kock argues that wildlife management in Zimbabwe provides a model for the sustainable use of wildlife. Innovative developments for wildlife management, such as conservancies and CAMPFIRE (Communal Area Management Programme for Indigenous Resources) are described, and deserve consideration by Australian wildlife managers. Conservancies involve co-operative wildlife management (e.g., ecotourism, trophy and meat hunting) on several privately owned properties. The CAMPFIRE initiative concerns wildlife management on communal land by the local community such that revenues earned from wildlife resources accrue to the local people.

The opposing viewpoint polarizes the debate, and is put forcefully by Lavigne and colleagues. They argue that sustainable utilization of mammals is a seriously flawed argument and can only result in over-exploitation. They conclude that placing value on dead wildlife in the marketplace is rarely a sustainable activity, except perhaps, if the exploited species has a high reproductive rate and a low economic value, and is adequately managed through supportive legislation. Clearly, such restrictions would limit the scope of mammal exploitation.

None of the chapters is primarily about wildlife management in Australia, although the often conflicting issue of land tenure and wildlife conservation is applicable throughout the world. One reference to the Australian problem is the chapter describing mammal harvests in several countries, in which kangaroo harvesting in Australia is reviewed. It is concluded that kangaroo harvesting has a positive impact on the ecosystem, because it is well controlled, provides supplementary income to landholders, and it enables landowners to reduce livestock numbers thus encouraging land rehabilitation! No citation substantiates that statement, nor is there any acknowledgement that agriculture in Australia or elsewhere provides an abundance of resources that typically result in the dramatic and often sustained increase in the populations of such species.

Also ignored is the difficulty in determining appropriate target densities of kangaroos, in that it depends upon the extent to which kangaroos are a pest or resource [actual or potential], or a mix of both. Perceptions contribute significantly to value judgements (see Putman 1989), and the notion that kangaroos are pests is widespread, and in many quarters, is

taken as a starting premise upon which kangaroo management decisions or recommendations are based. The view that conventional pastoral and agricultural activities constitute the only legitimate use of the countryside, and that kangaroos are acceptable only while they are "controlled", is ubiquitous. Hence, kangaroo "management" is often synonymous with pest control, even after all Australian governments have endorsed policies which formally recognize kangaroos as a resource.

The wildlife conservation movement grew from a concern, often from the exploiters themselves (Eltringham 1994), that wild animals were being over-exploited and required management. Even when wildlife is managed, welfare considerations are often insufficient, as this concept is rarely considered in the formal consideration of sustainable wildlife management (Kirkwood *et al.* 1994). While there is a lot of rhetoric in the debate on sustainable use, there should be no illusions. Exploiting wildlife solely for profit will carry the risk of extinction, even under the guise of conservation; any use of living organisms depletes wildlife resources, is often associated with the degradation of supporting ecosystems, and often eventuates in the loss of populations and species (Willers 1994). Sustainable usage of a species in isolation is unlikely to guarantee the conservation of that particular taxon or its habitat. Wildlife conservation requires the conservation of genetic diversity, natural selective forces, and the maintenance of the full range of species interactions (MacNab 1991). These requirements for the sustained conservation of wild resources, however defined, extend beyond ethnic boundaries and perimeter fences.

The limited information available suggests that broadly based, integrated programmes of wildlife utilization have the most potential to be sustainable, and this book represents a significant contribution to an ongoing debate. We should also recognize that the "need" to exploit wildlife is a reflection of the human condition.

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