Putting the st

National plan nears adoption

Much is already being done in Australia to conserve biological diversity. However, much also remains to be done: we need more information and resources, better coordination, an adequate system of reserves and more effective conservation outside protected areas.

In early 1991 the Biological Diversity Advisory Committee began work on a draft national strategy. The strategy has been further developed by an Australia and New Zealand Environment and Conservation Council taskforce and is now being considered by governments. There has been consultation with government agencies, ministerial councils, business and conservation bodies, local government and industry and community groups.

The strategy aims to protect biological diversity and to maintain ecological processes and systems, which is also a core objective of ecologically sustainable development. It identifies six areas for action:

1. Conservation of biological diversity across Australia. Actions include identifying components of biological diversity important for conservation; planning and managing biological diversity on a bio-regional basis; establishing and managing protected areas; strengthening off-reserve conservation; protecting flora and fauna; conserving threatened species and their habitats and recognising and ensuring the contribution of indigenous peoples.

2. Integrating biological diversity conservation and natural resource management. Actions include developing and implementing national integrated policies for biological resource use industries such as forestry, fisheries, pastoralism and tourism, and

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Bryony Bennett

Whatever the final detail of Australia's biodiversity strategy, the next step will be the giant one of ensuring its successful implementation.

Maintaining ecological processes and systems while allowing access to renewable resources for commercial use is central to Australia's draft strategy for conserving biological diversity.

A suggested framework for assessing the impact of land-use patterns on regional biodiversity has been developed by CSIRO Division of Wildlife and Ecology chief, Dr Brian Walker, and director of the Centre for Resource and Environmental Studies, Australian National University, Professor Henry Nix.

The framework allows alternative land use combinations to be analysed region by region and leads to policy decisions on optimal land-use targets. It is based on four questions. What and where is our biodiversity? What is its functional significance? What is needed for its persistence? What are the appropriate management guidelines?

In an article titled 'Managing Australia's Biological Diversity', published in the July 1993 issue of *Search*, Walker and Nix explain that land-use categories in each region require associated management guidelines and constraints. They say that in the absence of adequate knowledge about biological diversity, either the average biodiversity or its components can be calculated and mapped in a sample set of environmental domains.

The model would be hierarchical, with nested regions providing context at continental, state, regional and local scales. It would complement existing planning pro-cedures, and fit within the overall framework of ecologically sustainable development.

Categories of conservation-related land uses would include reserves; special off-reserve areas (such as corridors); zones where biodiversity and production are both important, and areas where the primary use is for industry, the only constraint being sustainability of ecosystem processes (such as nutrient cycling)

Walker and Nix say careful reassessment of Australia's existing reserves, at a national and regional scale, is needed. This should consider the need for increased multiple-use (using the same site for two or more purposes) of existing reserves and other land tenures. Protected areas, appropriately buffered, do play a vital role in conservation but alone are inadequate to conserve biodiversity.

The goal therefore is to analyse a number of options, to define a target (the optimum com-bination set in the context of economic viability) and to develop a phased, prioritised program for reaching it.

To achieve this goal, it would help to know the distribution and abundance of all Australia's genotypes, species and ecosystems. But because there isn't time to determine this directly, an indirect approach is needed.

Environmental domains

Walker and Nix suggest a parametric approach to resource inventory, based on new methods of data estimation (such as digital elevation modelling), combined with remote sensing and geographic information systems technology. They say these methods, combined with environmental domain analyses, can provide the needed framework quickly (one to two years) and cost-effectively.

Environmental domain analysis partitions the landscape into classes which have different combinations of environmental attributes. It assumes a relationship can be established between these attributes and biological diversity.

The process is based on abiotic environmental attributes affecting physical processes and biological responses (climate, terrain, soil). This focus on processes provides a common framework for evaluating a range of potential land uses from production to

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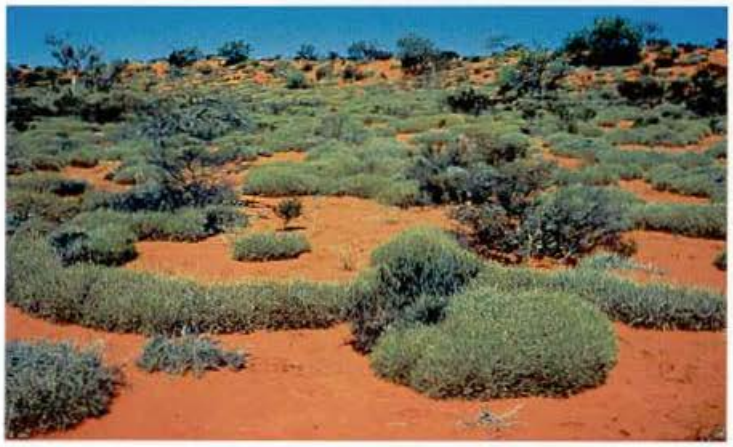

Categories of conservation-related land uses would include reserves, off-reserve areas and zones, such as the rangelands, where biodiversity and production are both important.

conservation. It also provides a framework for future analyses because it is based on relatively stable attributes of the abiotic environment.

Walker and Nix say the use of environmental domains is not an end in itself. It is a means of getting to a target, (the distribution and abundance of species) using a modelling approach based on established relations between the known distribution of biota and the environment. Other areas of research needing more attention are population viability analysis, the functional role of biodiversity and management guidelines and constraints.

Research into extinction probability analysis of species is needed to identify, for particular areas and management regimes, which species are likely to be at risk and to establish requirements for their survival. The resulting generic models will show how conservation targets can be achieved.

The following questions need answers. What are the requirements for long-term persistence of populations? How many individuals constitute a safe or viable population and how much area do they need? How is viability influenced by land-use practices? How much immigration is necessary?

One of the values of biodiversity is its role in providing ecosystem services (such as maintaining levels of nutrients and regulating water supply). A body of information is needed that will allow proper assessment of this role, under any set of conditions. For example, we need to build on the work that has established relations between soil biodiversity and the processes that maintain soil fertility, especially in intensive agricultural regions.

Another area of concern is the functional significance of a decline in genetic variability. It is thought that under the pressure of resource use (grazing, logging, cultivation) there may be a decline in or loss of genetically-determined traits (such as disease resistance) even though the species, as such, is still abundant and apparently thriving. The extent of this phenomenon, and its significance, needs to be established.

It is also important to know how different kinds of land management will affect an area's biodiversity. Existing conservation management guidelines need to be enhanced through further study, particularly regarding biodiversity response to disturbance. Policy instruments to implement these guidelines are needed.

Walker and Nix say biodiversity does not recognise political and institutional boundaries. It can be viewed as a unifying component that demands a collaborative and cooperative approach. They say complete, common agreement seldom will be reached, but their framework can be used to evaluate a range of options and will enable a policy decision based on a proper understanding of the various biodiversity and economic costs and benefits.

The practical values of the framework presented by Walker and Nix are threefold: it deals with a defined region set in a national context; outcomes are explicit; and the basis for decision-making is visible and objective.

The bulk of this article appears in Search, *July 1993, Vol. 6 and was written by Professor Henry Nix, director of the Centre for Resource and Environmental Studies and Dr Brian Walker, chief of the CSIRO Division of Wildlife and Ecology.*

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ensuring that Australia benefits from the use of genetic material and products derived from its biological diversity.

3. Managing threatening processes: Major threats need to be controlled through understanding threatening processes and their control. These include improved management of native vegetation, weeds and pests; minimising and controlling pollution; reducing the adverse impacts of fire; planning for climate change; effective rehabilitation; and better procedures for impact assessment.

4. Improving our knowledge. An adequate understanding of biological diversity is needed. We must make knowledge available for conservation and management; identify and rectify gaps in knowledge; recognise the value of the knowledge of indigenous people; increase training and monitoring; and speed information dissemination.

5. Engaging community involvement. Important steps include increasing the availability of information on biological diversity; developing educational programs; and facilitating greater public involvement in planning processes, environmental impact assessment and biological diversity programs.

6. Australia's international role. Australia needs to ensure that relevant bilateral and international agreements are implemented, including the Convention on Biological Diversity; promote the development of relevant new agreements and ensure that biological diversity conservation is considered in trading agreements and aid programs.

The success of the national strategy will depend on its implementation, which will rely on the cooperation of all sectors of society. It is important that biological diversity conservation is integrated into decision-making, that complementary state and territory strategies are developed, that local government is involved in regional planning and management and that adequate funding is provided. Implementation of this strategy is a necessary part of Australia achieving an ecologically-sustainable future.