APPROACHES TO BIOREGIONAL PLANNING

PART 2
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Bioregional Planning for Biodiversity Conservation

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Aboriginal and Torres Strait Islander Involvement in Bioregional Planning: Requirements and Opportunities Under International and National Law and Policy

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Making Things Work: Aboriginal and Torres Strait Islander Involvement in Bioregional Planning.

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CONTENTS

BIOREGIONAL PLANNING FOR BIODIVERSITY CONSERVATION

A discussion paper prepared for the
Biodiversity Unit
Commonwealth Department of the Environment, Sport and Territories
for the conference
"Approaches to Bioregional Planning: A framework for biodiversity conservation and ecological sustainability"

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EXECUTIVE SUMMARY

Purposes of discussion paper

To provide a framework discussion for bioregional planning and how it can be implemented in Australia in ways which will assist in the conservation of our rich biological diversity
and
To put forward proposals that will facilitate the use of a bioregional approach in developing regional planning which involves all levels of government, industry, environment groups and local communities.

Overview

The task of developing bioregional planning processes which will protect biodiversity is part of Australia's commitment towards a society based on principles of ecologically sustainable development (ESD). There is a wide spectrum of views about how such a society might be established, and the Federal Government is endeavouring to find a path between these, without losing the momentum built up over the past decade. In adopting the policies of ESD, the Convention on Biological Diversity and the National Strategy for the Conservation of Australia's Biological Diversity, a commitment has been made to consider the protection of biodiversity at an equal level with the goals of economic well-being and social equity.

Australia has a history of slow but interrupted progress in regional planning since European settlement. This has been limited by the lack of knowledge about bioregions, ecosystem types and faunal habitats, and by an emerging emphasis on land systems approaches to broad scale mapping.

In this discussion paper, those activities which have the potential to develop into bioregional planning for biodiversity conservation are called precursor activities. Precursor activities have some of the essential elements of bioregional planning, and at least consider how to protect the environment in their strategies and activities.

The Case Studies selected for exploration in this Discussion Paper each provide well advanced examples of bioregional planning at three quite different scales, each of which takes account of the need to maintain biodiversity. Many other examples of precursors are outlined in the Discussion Paper. Examples of best practice are highlighted along with those initiatives which provide the greatest challenges to bioregional planning for biodiversity conservation, but an exhaustive analysis has not been attempted.

Outcomes

The experience to date in precursor activities indicates that one of the difficulties of processes which involve communities, industries and government is the conflict that is created by the clash of entrenched positions and ideologies around environmental issues. Focusing on the desired outcomes in the early stages of planning provides the opportunity for outcomes to be agreed upon and using experts to provide advice at relevant stages is important to providing an objective information base. These two factors, agreed outcomes and objective information, make rational decision making more likely and less conflict ridden than is possible under existing planning processes.

The precursor activities would seem to demonstrate that decision making at a local level, where participants have a real and direct interest in an agreed outcome, is likely to be less plagued by ideology and entrenched positions than are such discussions at a state or national level. However, it is also clear that this decision making needs to be made within the context of bioregional boundaries decided on the basis of scientific research into biodiversity values.

Examination of the existing precursor activities leads to a number of conclusions about the characteristics of bioregional planning processes which are likely to be successful in a goal of conserving biodiversity.

1. **Scientific research** to define appropriate regional boundaries and to expand biodiversity identification and mapping need to occur as the first step in bioregional planning and land management activities of communities, local and State governments.

2. **Community involvement** is essential at all stages. Successful examples of bioregional planning and its precursors have involved consultation with community representatives and commitment from local and State government from the beginning of their planning processes.
3. **The coordination and integration of actions by the three levels of government** is necessary to ensure appropriate definition of bioregional boundaries for each particular region and the development of common goals and objectives for biodiversity conservation at the regional level.
4. Planning is an important beginning to the protection and sustainable use of biodiversity within each bioregion, but expertise, resources and mechanisms for ongoing management of land, water, infrastructure and human activities, as well as the administration of each region must also occur at the bioregional scale.
5. **Flexibility and adaptability** should be the hallmarks of any national approach to bioregional planning for biodiversity conservation, in response firstly to the variety among the communities and individuals who need to be involved, and secondly, to the growing knowledge and understanding of biodiversity problems which need to be addressed.
6. **Resourcing of national approaches** to bioregional planning for biodiversity conservation needs to be significantly increased if approaches to communities, local and State governments are to be successful. Interagency cooperation and interpersonal communication with communities and individuals are critical to the success of the Federal Government taking a lead role in this area, and these should be resourced at meaningful levels. Interest and stakeholder groups need to have the opportunity to participate in bioregional planning processes, and therefore sufficient resources need to be made available for these processes to be accessible to a wide range of people.
7. **Prioritisation** of resource allocation is imperative, and in prioritising there is a need to consider the competing claims of the following:
   - geographical areas where regional planning processes are already occurring (precursor programs)
   - areas where there are demonstrated high levels of interest in environmental issues
   - demographic groups where interest in environmental issues is highest
   - areas where biodiversity threats are highest
   - areas where biodiversity qualities are highest.
8. The establishment of **performance indicators** against which to measure levels of success is essential, both in order to monitor the recovery or maintenance of biodiversity values, and to encourage ongoing involvement and enthusiasm of communities, local and State governments.

Establishment of a national framework

The National Strategy for the Conservation of Australia's Biological Diversity establishes the goal of "protecting biological diversity and maintain[ing] ecological processes and systems". It also lays out clear objectives and actions. Bioregional planning for biodiversity conservation is a mechanism for achieving the goal and objectives. This Discussion Paper recommends that bioregional planning should have three components:

1. An initial and primary focus on the goal of "protecting biological diversity and maintain[ing] ecological processes and systems", rather than on the potential competing mechanisms for its achievement.
2. The development and implementation of a model planning process for protection of biodiversity, which is capable of being adapted to a wide variety of bioregions throughout Australia and which involves the regional community and local and State governments at each stage.
3. Sufficient resourcing to allow the implementation of the model planning process throughout Australia according to national priorities.

A model planning process

A model process is recommended which would be capable of being adapted to bioregional and community situations.

Step 1 Definition of an appropriate bioregion, based on scientifically identified boundaries

Ecologists, mapping experts and those concerned with water catchment and other scientific research would work with State and local governments to define the most appropriate natural boundaries upon which to begin bioregional planning and implementation of programs for the identification and maintenance of biodiversity.

Step 2 Identification of the biodiversity to be protected within a "community of interest"

A public involvement campaign would clearly define and interpret the concept of biodiversity, at the same time as it invited participation on identifying key elements of biodiversity in the region. Community groups, industry representatives, relevant State agencies and local government officials (who together represent a "community of interest") would be approached to provide input, probably to a government funded detailed survey of biodiversity values within the bioregion. Working with relevant scientists, individuals and interest groups within the community would then use agreed methods to collect information about the biodiversity of the region, thus completing a 'rapid biodiversity assessment'. It is likely that partnership agreements may be struck between one or more levels of government.

Step 3 Identification of the threats to biodiversity to be protected within the "community of interest"

Once biodiversity values have been identified, focus groups would be held to discuss threats to that biodiversity. The focus would be upon the actual threatening processes, rather than any particular mechanism which might be adopted to halt the threat.

Step 4 Expert advice sought on the best means of combating the threats

Focus groups would work with experts provided by scientific institutions, and all three levels of government to ascertain what needs to be done to stop the threats degrading biodiversity values.

Step 5 Community agreement on a vision for the future of biodiversity in the region and the best strategies to combat the threats

Focus groups would be helped through experienced facilitation and dispute resolution where necessary, to reach agreement on how to use the expert advice, and the information they have collected themselves, to protect the biodiversity in their region. Achievable targets on the way to achieving their goals would be agreed.

Step 6 Incorporation of strategies into ongoing activities and existing planning processes

Local and State government officers, who have been involved in the planning process through focus groups, incorporate the strategies into their work plans and strategic plans. Local landholders and industries are encouraged to incorporate the strategies in their day-to-day activities.

Step 7 Ongoing monitoring and reporting

Local and State government officers would incorporate consideration of the agreed targets in their annual reporting, and support community biodiversity "watchdog" groups who would monitor the effectiveness of the strategies, and initiate their amendment as necessary. The "watchdog" group would also take account of new information about biodiversity values, and maintain a watching brief on biodiversity values. The results of ongoing biodiversity monitoring would be reported regularly through State of Environment or other reports by local, State and National governments.

Recommendations

1. **That** the Commonwealth Government seek to achieve conservation of biodiversity through cooperative work with other government agencies and communities on a bioregional basis through
   - partnership arrangements with local and State governments on bioregional projects for biodiversity conservation;
   - the work of biodiversity officers located in areas prioritised for biodiversity conservation through bioregional planning;
   - the work of ERIN and scientists supporting the conservation of biodiversity by providing on-the-ground expert advice at an appropriate scale for incorporation into bioregional plans, and
   - education and promotion of biodiversity.

2. **That** a model process for bioregional planning for biodiversity conservation be developed incorporating the following elements:
   - dentification of the bioregion, based on appropriate natural boundaries;
   - identification of the threats to biodiversity to be protected within the "community of interest";
   - expert advice being sought on the best means of combating the threats;
   - community agreement on a vision for biodiversity in the region and the best strategies to combat the threats to it;
   - incorporation of strategies into ongoing activities and existing planning processes, and
   - ongoing monitoring and reporting.
3. **That** the Commonwealth Government encourage State and local governments to incorporate regional biodiversity conservation objectives and guidelines into their policy formulation and planning processes.
4. **That** the Commonwealth Government undertake practical research into community participation and education methods for increasing involvement in biodiversity conservation.
5. **That** Commonwealth Government initiatives focused on regional development include an emphasis on the use of bioregional boundaries appropriate to the conservation of biodiversity, and the inclusion of biodiversity considerations in their working plans.
6. **That** through the Australian local government Association and Municipal Conservation Associations, Regional Organisations of Councils (ROCs) be encouraged to include the conservation of regional biodiversity among their priority objectives.
7. **That** in undertaking the work of spearheading bioregional planning for the protection of biodiversity, the Commonwealth Government ensure that adequate resourcing is provided both for the process as a whole, and to sufficiently support community involvement in that process.
8. **That** the planning professions ensure that strategic plans, policies and land use controls incorporate biodiversity conservation as a high priority objective. This should occur within a bioregional framework established and maintained with community participation as well as interagency and intergovernmental cooperation across administrative boundaries.

A. INTRODUCTION

> ***"****Australia has one of the largest areas of territory that, up to the historical present, was occupied by peoples in an approximately uniform state of hunting culture, changing from region to region chiefly because of the different animals and plants upon which they depended for a living...*
> *When accurately plotted on large-scale maps, it is not very surprising to find there is often a high degree of correlation between tribal limits and ecological and geographical boundaries. Divides, mountain ranges, rivers, general ecological and plant associational boundaries, microclimatic zone limits, straits and peninsulas often furnish clear-cut and stable boundaries..." (Tindale, 1974).*

Purpose of this Discussion Paper

The protection of Australia's rich abundance of natural life - its biodiversity - is now acknowledged as one of the cornerstones in achieving ecologically sustainable development. At the same time, regional planning is moving forward in a variety of contexts across the nation. With a **bioregional** basis being identified as the process most relevant to planning for the maintenance of biodiversity, this paper seeks to:

- *provide a framework discussion for bioregional planning and how it can be implemented in Australia in ways which will assist in the conservation of our rich biological diversity, and*
- *facilitate the use of a bioregional approach in the development of regional planning in ways which involve all levels of government, industry, environment groups and local communities.*

Conserving biodiversity

The National Strategy for the Conservation of Australia's Biological Diversity (CoA 1996) defines biological diversity as "the variety of all life forms - the different plants, animals and micro-organisms, the genes they contain and the ecosystems of which they form a part".

Australia's diverse ecosystems range from the arid systems of central Australia to the alpine ecosystems of the Great Dividing Range, and from the wet tropical rainforests of north-east Queensland to the tall eucalypt forests of Tasmania. Australia is the only developed country which has such a rich diversity of life that it is classified as one of the 12 "megadiverse" places on earth.

It is the diversity of our climatic regions, and our long isolation as an island continent that have resulted in this unusually rich diversity of species and ecosystems. Many are found only in this country and have changed little over time, giving them immense evolutionary significance.

Loss of biodiversity

Human occupation and use of the landscape has almost invariably caused a reduction in biodiversity through species extinctions. Although Aboriginal hunting apparently resulted in the loss of a number of animals from the Australian continent, the rate of loss over the tens of thousands of years of Aboriginal occupation appears to have been very slow.

In the two hundred years since European settlement, the rate of extinction of species has accelerated alarmingly. Around one thousand species are currently at risk of extinction.

Some of our important ecological communities and ecosystems have also disappeared. More than three-quarters of Australia's tropical rainforests have been cleared, and agricultural, urban and other developments have put at risk many temperate grassland ecosystems.

Australia's obligations to conserve biodiversity

Species extinction has been exacerbated by human activity worldwide. It is important to Australia as a nation, and as part of the world community that we fulfil our obligations and take up opportunities to protect our remaining biodiversity.

Australia was one of more than 150 nations to sign the international Convention on Biological Diversity, developed in the lead up to the United Nations Conference on Environment and Development, held in Rio de Janeiro in June 1992. A key aspect of the Convention is its identification of "*in situ* conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings" as "the fundamental requirement for the conservation of biological diversity" (UN Convention, p.2).

The Convention came into force on 29 December 1993 and Australia now has special obligations to manage and use our rich diversity of life sustainably. These are outlined in the National Strategy for the Conservation of Australia's Biological Diversity (CoA 1996)[1] (called "the Strategy" in this discussion paper). The Strategy provides mechanisms for strengthening conservation activities both within National Parks and other protected areas, and outside reserves. It puts forward mechanisms for achieving ecologically sustainable use, and for minimising impacts on our biodiversity through the integration of biodiversity conservation and natural resource management.

The Strategy provides a set of principles to guide the protection of biological diversity and the maintenance of ecological processes and systems. Again, a key principle of Australia's approach to biodiversity conservation will be its protection
"in situ".
The Strategy also promotes the need for an expanded knowledge base and more community involvement in the processes for conserving biodiversity.

Bioregional planning is a key element in the Strategy for maintaining biodiversity, being directed primarily towards the implementation of Principles 1, 3 and 4 above. The bioregional planning objective is to:

> Manage biological diversity on a regional basis, using natural boundaries to facilitate the integration of conservation and production-oriented management. (National Strategy for the Conservation of Australia's Biological Diversity, p. 8)

through

> Determin[ing] principles for establishing bioregional planning units that emphasise regional environmental characteristics, are based on environmental parameters, and take account of productive uses and the identity and needs of human communities as appropriate, and
> Undertak[ing] bioregional planning for the conservation of biological diversity.

Principles which form the basis of the National Strategy for the Conservation of Australia's Biological Diversity

1. Biological diversity is best conserved in situ.
2. Although all levels of government have clear responsibility, the cooperation of conservation groups, resource users, indigenous peoples, and the community in general is critical to the conservation of biological diversity.
3. It is vital to anticipate, prevent and attack at source the causes of significant reduction or loss of biological diversity.
4. Processes for and decisions about the allocation and use of Australia's resources should be efficient, equitable and transparent.
5. Lack of full knowledge should not be an excuse for postponing action to conserve biological diversity.
6. The conservation of Australia's biological diversity is affected by international activities and requires actions extending beyond Australia's national jurisdiction.
7. Australians operating beyond our national jurisdiction should respect the principles of conservation and ecologically sustainable use of biological diversity and act in accordance with any relevant national and international laws.
8. Central to the conservation of Australia's biological diversity is the establishment of a comprehensive, representative and adequate system of ecologically viable protected areas integrated with the sympathetic management of all other areas, including agricultural and other resource production systems.
9. The close, traditional association of Australia's indigenous peoples with components of biological diversity should be recognised, as should the desirability of sharing equitably benefits from the innovative use of traditional knowledge of biological diversity. (p. 5)

Ecologically Sustainable Development at all levels of government

The inter-relationships between protection of biodiversity and human activities is recognised in Australia's Strategy and internationally. The Global Biodiversity Strategy (WRI, IUCN, UNEP, 1992) observes that:

> Even if most of Earth's remaining natural ecosystems could be protected from development, they could not adequately maintain biodiversity. The remaining wild is simply not large enough to meet all species' habitat needs or to provide important ecological services, and many of these still-natural ecosystems will inevitably be transformed by human use in the coming decades (p.97).

The Australian House of Representatives Standing Committee on Environment, Recreation and the Arts (1993) has reinforced this, saying:

> While a majority of ecological communities will be protected within reserves, the efficient conservation of all ecosystems and their biological components requires the commitment of the wider community in developing off-reserve measures (p.53).

The National Strategy for Ecologically Sustainable Development was adopted in 1992. One of its three core objectives is :

> to protect biological diversity and maintain essential ecological processes and life-support systems. (Commonwealth of Aust., 1992a p. 8)

The Commonwealth, States and Territories (except Tasmania) and the Australian local governments Association have all acknowledged through their signing of the InterGovernmental Agreement on the

Environment (1992) “that it is vital .. to conserve and improve Australia’s biota…”. Article 3.5.3 of the Agreement states “Conservation of biological diversity and ecological integrity should be a fundamental consideration”.[2]

It should be noted that, in general, the InterGovernmental Agreement on the Environment does not place significant emphasis on regions or regional planning.

Bioregions - the concept

The Global Biodiversity Strategy (WRI, IUCN, UNEP, 1992) provides a useful description of a ‘bioregion’ as being:

- large enough to maintain the integrity of its biological communities, habitats and ecosystems;
- having cultural identity and a sense of home to its local residents;
- containing a mosaic of land uses, and
- having components which are dynamic and interactive.

It states that:

> Within this ecological and social framework, governmental, community, corporate, and other private interests share responsibility for coordinating land-use planning for both public and private land and for defining and implementing development options that will ensure that human needs are met in a sustainable way (p.100).

Biogeographic regions based on physical attributes such as soils, climate, landform and vegetation provide a useful starting point for defining bioregions. However, the degree to which they are adopted and applied by decision-makers at all levels will depend on bringing these attributes together with social and economic considerations.

Biological resources represent assets on which much of Australia’s economic activity is based. At the same time, economic activities will frequently impact on our biological diversity. Social, economic and environmental imperatives are inextricably interlinked. It is important therefore, that planning for the future takes place in ways which integrate those considerations.[3] Bioregional planning provides a framework in which this can occur.

B. REGIONALISM AND THE EMERGENCE OF REGIONAL PLANNING SINCE EUROPEAN SETTLEMENT

Regional planning processes since European settlement

Australian systems of land management and land use planning changed dramatically with European settlement. Among Aboriginal people “Undoubtedly, environment and culture were found to be inextricably entwined in the skilful management of land and water” (Powell 1993, p. 11).

With European settlement, development of the land became the priority of those charged with its management.

> During the early colonial era, bold regionalisations were often employed as administrative expedients in our remote outposts of empire. They took on greater significance after a generation or two and are the sources of many of today’s taken-for-granted regionalisations (Powell 1993, p. 55).

For example, the establishment of the New South Wales Western Land Board in 1902 (later to become the Western Lands Commission) was more likely to have been a response to the needs of the struggling leasehold settlers rather than a recognition of any bioregional imperative.

Regions such as the Murray-Darling Basin provide classic examples of the process by which the Great Dividing Range, rivers and river basins were at first used as local and regional boundaries. But as transport facilities improved, Australians developed an ethic of ‘conquering’ the vast distances across the nation, and in so doing the significance of local regions was often lost. The natural boundaries often extended across State borders (as in the case of the Australian Alps and the Murray-Darling Basin) and in the quest to develop and extend, they were sometimes set aside in favour of administratively or politically expedient alternatives.

Concern for regional development at a national level emerged during the Second World War, when Commonwealth-State cooperation led to a system of regional organisation. In 1944 agreement was reached between the Federal Government and the States that together they should proceed to plan development and decentralisation on a regional basis. The States were divided into regions on a somewhat arbitrary basis and regional development committees were organised in all States to advise and assist Commonwealth and State authorities on regional aspects of policy and administration. Natural features were generally not considered as major criteria in defining regions.

However the Premier of New South Wales (WJ McKell) appointed Scottish geographer James Macdonald Holmes to head a Regional Boundaries Committee, charged with the task of advising the State Director of Reconstruction and Development on regional divisions for New South Wales. Holmes (1944) was a strong proponent of the need for a geographical basis of government which defined regions by human (economic, social and political) and natural resource characteristics and sought to explain that community involvement could not be assumed or requested, but that it must be cultivated.

Following a long history of unsuccessful rural land schemes in Australia (Lines 1992), considerable scientific effort was directed towards descriptive mapping of land suitability for various development opportunities. A Land System approach was developed by CSIRO in the 1940's (Christian and Stewart 1953) and has since been widely used throughout Australia. This approach is based on mapping repeating patterns of geology, soils, topography, hydrology and vegetation to form landscape units and land systems at various scales. This Australian work was well in advance of its time in its comprehensive approach to the natural landscape, and proved capable of adaptation to regional scale. One of its strengths was that a region could be categorised and mapped with very little base information on flora and fauna apart from the dominant vegetation type. However, for that reason it is of limited value for biodiversity planning and conservation management, although the framework remains essentially sound and capable of further refinement with the additional biogeographic data now available.

Following the 1972 Federal election, a new Australian government established the Department of Urban and Regional Development. An Administrative Arrangements Order gazetted by that government in December 1972 gave the Department a role in "matters relating to city and regional planning and development, including assistance to and cooperation with the States and local government bodies". Section 17 of the Grants Commission Act of 1963 gave local governments access to the Grants Commission. This resulted in local government authorities forming regional organisations to apply for grants. The criteria used to define regions included transport connections, socio-economic similarity, communities of interest, population size and patterns of telephone traffic (Department of Urban and Regional Development, 1973).

By 1973, well in advance of other States, Queensland had developed a system for defining regions. The system involved intensive investigation of existing boundaries, homogeneity of industry, economic viability, urban foci, regional population flows and linkages, physical characteristics, provincial city status, size and number of regions and administrative boundaries (Queensland Coordinator General's Department, 1973). The physical characteristics used included topography, soils and water resources. Biological characteristics were not assessed.

In 1975 the Commonwealth Department of Urban and Regional Development published a suggested pattern of biophysical regions for Australia. Catchment boundaries and climatic zones were used to subdivide the continent into segments of a manageable size for the identification of each type or class of landform and lithology, soils and vegetation type and structure. However, it was recognised that these biophysical regional boundaries would not become the administrative boundaries used by regional groupings of local councils (Department of Urban and Regional Development, 1975).

At that time, some local authorities also began to recognise the benefits of nature conservation planning on a regional basis. In 1976 the Upper Yarra Valley and Dandenong Ranges Authority Act established a new type of regional planning authority for the Upper Yarra Valley region. The Authority comprised representatives from various sectors of the community together with councillors from each of the local government Areas in the region.[4] The role of the Authority was to coordinate and regulate conservation, use and development of land through the preparation of a Strategy Plan for the whole of the area. The Authority was to control developments of regional significance through the oversight of the issue of permits for any such developments as it may decide were of 'regional significance' (Bowman,

1979). After preparing an inventory of zoological and botanical sites of significance, a strategic plan was developed including broad management guidelines. By 1992, the strategic plan included all sites of significance and incorporated them into local government planning schemes.

On a broader scale, the Commonwealth Government spent approximately $0.5 million on a comprehensive survey of the values of South West Tasmania (South West Tasmania Resources Survey, 1981). Information was collated on the geology, soils, mineral potential, landforms, landscape, climate, water resources and water power potential, biological resources, forest resources, marine resources, recreational and cultural values of the south west region. From that, recommendations were made as to suggested zoning and land uses for the entire region.

A range of planning models and systems have been used in Australia to integrate environmental data and other information at a regional scale as aids to planning. Among the most sophisticated of these is the SIRO-PLAN, which has undergone substantial refinement since its first use in the 1970s.

SIRO-PLAN was developed within the CSIRO Division of Land Use Research to provide an organising framework for acquiring and using information to analyse regional land use options on the south coast of New South Wales (Austin & Cocks, 1978). SIRO-PLAN establishes a geographic data bank for land evaluation and a series of iterative searches amongst a potentially vast array of area-use strategies (Cocks et al., 1983). The procedure was developed to suit Australian institutional arrangements for land use planning and was widely applied from the mid-1970s to the late 1980s (eg. by the Great Barrier Reef Marine Park Authority and the NSW Crown Lands Office).

LUPLAN is the collective name for the various versions of a computer programming package written to facilitate the implementation of the SIRO-PLAN method by planning practitioners in local government and in resource agencies.

Although SIRO-PLAN and LUPLAN have primarily been used in local government planning and natural area planning (ie. parks, reserves and forests), opportunities exist to use this land use planning method within a bioregional context, especially in zoning and land use allocation.

Development of a sound national geographic basis for the presentation of environmental statistics was recognised as necessary in the early eighties. Considerable effort on the part of the Commonwealth Department of Home Affairs and Environment and CSIRO scientists was expended to develop a method of regionalisation acceptable to all levels of government for the presentation of environmental statistics. The Department of Home Affairs and Environment (1983) commented that this would enable "integrated assessments of the economic and social impact of environmental policies in the assessment of the environmental impact of economic policies".

Despite some difficulties encountered in integrating biological, physical, social and economic phenomena and relating these to local government Areas, this environmental statistics project appears to have offered a way forward for integrating environmental and development needs. Nevertheless, this approach was clearly not adopted at any level of government.

Since then, the emphasis on regional planning has diminished and has only recently been revived by State and Federal Governments.

Regions in Australia before European settlement

The potential contribution of Aboriginal knowledge to biodiversity conservation, research, planning and management is widely recognised, although to date such contributions tend to have been sought only in the context of protected area management. It is also likely that traditional land management will be of benefit to bioregional planning.

Historically, Aboriginal communities have managed the land in their local areas in ways which are sustainable and these areas may be consistent with what we might now call bioregions. The Adelaide Plains, for example, called Tandanya (ACF, 1991) or Tangankald (Tindale, 1974) by Aboriginal people, is one of many such Aboriginal cultural and living regions. It has the same general characteristics of landform and climate, plants and animals and appears to have been managed by Aboriginal people in such a way as to maintain its biodiversity.

Before early European settlement, woodland covered much of the south of Tandanya, the rest being open scrub bordered to seaward by coastal succession and extensive mangroves. Off the coast of

> Tandanya, the sea is fairly shallow and rich in fish. On land, bushfires are a hazard which threaten fixed human settlements but are a part of Tandanya's Aboriginal order. The Kaurna people, who occupied the land before European settlement, used fire to encourage new plant growth and attract game. (Australian Conservation Foundation, 1991 p. 22).

The House of Representatives Standing Committee on Environment, Recreation and the Arts (1993) notes in its report on the role of protected areas in maintaining biodiversity that Aboriginal approaches to land management have much to offer with respect to sustainable use of land. The Committee expressed its support for a recommendation:

> that ATSIC encourage regional councils, Aboriginal communities, land councils, resource agencies and consultants to view land use and land management as an integral part of regional and community planning. (p.72).

While a bioregional approach to land management is now being practised and promoted by many Aboriginal communities who have retained ownership and control of their lands, it is not currently reflected at a national administrative level. The Aboriginal and Torres Strait Islander Commission's Guide to Regional Council Planning (1994) emphasises the need for participatory planning-within ATSIC administrative boundaries, rather than natural boundaries. This may change, however, as under the provisions of the Commonwealth's 1994 Native Title Act negotiations are currently proceeding for the development of the first regional agreement with the indigenous people of Cape York Peninsula.

Summary

The slow but interrupted progression of regional planning has been influenced by the limited state of knowledge of ecosystems in Australia and in particular by the development of a land systems approach to broad-scale mapping based on repeating patterns of geology, landform, soils, drainage and vegetation. To date, the growing body of knowledge about bioregions, ecosystems types and faunal provinces has been used only to plan systems of nature reserves and has not influenced regional planning for other purposes. Although not currently reflected in national administrative arrangements, pre-European Aboriginal practices of land management may provide examples of bioregional management.

C. BIOREGIONAL PLANNING PRECURSORS

In considering how bioregional planning might be widely implemented in Australia for the protection of biodiversity, this section examines working examples of such planning or its precursors. Although the concept of bioregional planning appears in North American literature from the early 1980's onwards, only a few current working examples of bioregional planning in Australia have been identified beyond those highlighted in Section D of this report.[5] There are, however, a broad array of examples of the various precursors to bioregional planning. Many of these have direct relevance to, or have been designed for nature conservation or the maintenance of biodiversity.

The **need** for bioregional planning is now widely accepted in concept and at a policy level. The ESD Intersectoral report, which resulted from workshops involving all levels of government and a wide range of stakeholders states that:

> There is a need for a broad regional perspective, aimed at conserving a representative range of ecosystem types, and at providing corridors between remnants that are now isolated (Comm. of Aust. 1992b, p. 29).

The House of Representatives Standing Committee on the Environment, Recreation and the Arts (1993) reported "considerable support" from "State and local governments, environment groups, and mining, forestry and rural industry representatives" for

> the view that a bioregional framework must be established across the continent for the planning and management of all land and resource use, including natural resource and conservation programs. (p.6).

Much of the experience which forms the basis from which to develop national efforts at bioregional planning is found within local, State and Commonwealth agencies.

Broad national policy is set at the Commonwealth level in consultation with States and Territories and with other stakeholders, and directions are established to ensure Australia meets its international obligations to protect our rich biological diversity. Primary responsibility for land use planning and conservation management rests with State governments, but it is at the local Government level that much of the implementation of policy occurs. Global recognition of the key role which local governments might play in bioregional planning for the maintenance of biodiversity is reflected in Section 28.1 of Agenda 21 (United Nations, 1992) which states that:

> Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and sub-national environmental policies. As the governance closest to the people, they play a vital role in educating, mobilising and responding to the public to promote sustainable development.

Precursors at local government level

The **National Agenda for Australian Local Government** (ALGA, 1994a) recognises that one of the major principles in Integrated Local Area Planning is that:

> We should take a holistic view of local areas, linking related physical, environmental, economic, social and cultural issues, rather than treating them separately (p.27).

While failing to acknowledge the maintenance of biodiversity as a "major challenge" (see p.1), a number of regional commitments are identified in the Agenda as important in "achiev[ing] ecologically sustainable development and protection of the natural environment" (p.18).

On the ground at the local government level, various initiatives are in place to increase the interaction between the different Councils operating within a region. At a coordinating level, Victoria's **Municipal Conservation Association** is the State body promoting local government action on the environment. It recommends the integration of planning and policy making in its Local Agenda 21 (1994). This local government guide to managing for the future is based on "the creation of appropriate local government systems to manage for the future", noting that "Many of the most critical sustainability issues can only be addressed at a scale larger than a single local government" (p.20). Appropriate local government management will:

- **"integrate** planning and policy-making;
- focus on **long-term** outcomes, and
- **involve** all sectors of the community" (p.5).

Loose associations of local governments are forming across the country. Fifty coordinating centres have been established around Australia, each bringing together between five and 20 Councils under the banner of a **Voluntary Regional Organisation of Councils** (ROC)(Brown, 1994). These ROCs provide channels for increased information flow and awareness building on a regional basis, although the extent to which they adopt a bioregional approach or a biodiversity focus is variable.[6]

State Municipal Associations in each State keep local governments and others up to date with local government environmental management. They work to broaden local government environmental networks and maintain and update knowledge on ideas and practices for local environmental management. Both the CouncilNet (a computer based communications and information service based at the Victorian Municipal Conservation Association and designed for local governments across Australia) and federally funded Environmental Resource Officers based in each State Municipal Conservation Association bring improved information to local governments. Biodiversity is just one aspect of their work.

The Federal Government funds the **Integrated Local Area Planning program** which is designed to assist Councils, groups of Councils or joint State and local government develop proposals for strategic planning. Environmental considerations are among the factors which are encompassed by strategic planning processes to be funded.

'Audits' of the biodiversity present in an area and its importance in a local, regional and national context are an important precursor to bioregional planning, **the Hobart City Council's** mapping of the vegetation across the 7700 hectare area of the municipality offering a low cost example. The project used

a MapInfo Geographic Information System to plot data from aerial photographs and ground truthing (Johnson, 1994).

'Auditing' processes are also being assisted by the **Local Greening Plans** guide for vegetation and biodiversity management prepared for local governments by Greening Australia (1994). Greening Plans aim to establish "a new and structured way" of focusing local communities on sustainable land, water, vegetation and biodiversity management. As Greening Australia notes (p. 116) "most local governments are still making their initial measurements about the state of their plant cover", but that in itself is an important starting point for bioregional planning for biodiversity conservation.

More advanced in concept and application is the **Ballarat City Council's Regional Conservation Strategy** (Dec 1991). The Ballarat region, which covers the City of Ballarat and surrounding municipalities (nearly 300,000 ha) is described as:

> an area which has coherence in many of its natural, social and administrative features. It is big enough to have adequate resources to tackle significant projects in an integrated way while still small enough that its population identifies personally with the locality (p. 1).

The Strategy and accompanying Action Plan strive to provide "a charter for sustainable living, for building lifestyles and industries which can be maintained without exhausting the planet's richness and beauty". The four cornerstones on which implementation of the Strategy depends are:

"Community education

A combination of information availability and active participation

Ecological consideration

Accepting responsibility to protect biological diversity.

Integration of conservation and development

Removing the perceived difference between the two and promoting the concept of sustainable development which recognises long term efficiencies in resource and energy usage

Indicators of sustainability

Replacing the narrow and distorting money-based measurements of development with a system of assessment that acknowledges non-monetary elements such as human well being and the state of the environment." (p.10)

Successive chapters of the Ballarat Strategy address restoring of the land, reviving rivers, wetlands and groundwater, protecting flora and fauna, using resources wisely, preserving the past and planning for the future and, finally, personal action.

Arising out of the Strategy is the **Ballarat Linear Network of Communal Spaces (LINCS) project** through which all the linear reserves (road, rail and stream areas) are managed in an integrated way (Ballarat Regional Board for Planning and Development, Undated). The Steering Committee for the LINCS project involves some 30 people representing State agencies, local governments, schools, community conservation organisations and local residents.

Brisbane City Council, the largest local government authority in Australia, is responsible for an area of 1220 square kilometres which includes significant areas of remnant bushland and habitat subject to high development pressures and population growth. In response to growing community concerns about the loss of environmental quality, especially the rates of tree clearing and habitat fragmentation, the Council prepared a number of strategies and inventories during the period 1988-1992. Included among these were a **Conservation Plan**, **Waterways Strategy**, **Wetlands Strategy** and **Bushland Management Strategy**. These are currently being consolidated into an Open Space Strategy, based on a series of Local Area Open Space Plans.

Although Brisbane City Council is a relatively large area with the resources to develop inventories and plans in advance of the remainder of the South-east Queensland region, all strategies attempted to place Brisbane in regional context by defining external links and open space corridors, upstream catchment influences and other regional influences. Nevertheless, most strategies developed in vacuo by Brisbane City Council suffered from a lack of equivalent investigation at a regional level. This is partly being addressed by the SEQ2001 project (see Case Study 1).

The strategy of most direct relevance to biodiversity conservation is the Bushland Management Strategy, the major elements of which are:

- Acquisition of valuable 'at risk' bushland;
- Vegetation Protection Ordinances;
- Conservation Zone and land-use planning;
- bushland rehabilitation;
- community Bushland Care grants;
- management plans for large urban bushlands, and
- community education and consultation.

The role of local government in promoting ecological approaches to landscape planning is also the subject of considerable research. The National local government Environmental Resource Network has conducted a three year project tracing the shifts in needs of local councils in responding to global and national environmental priorities. The publications arising from that work (Brown et al., 1992 and Brown, 1994) identify needs, barriers and opportunities for change.

Precursors at State government level

Many of the programs currently being promoted and funded by State and Territory governments have a regional emphasis, with water catchments often defining their boundaries. However, while there are many quite sound precursors, there is only limited evidence of bioregional planning which integrates planning and management of all aspects of an ecosystem for the maintenance of biodiversity.

Northern Territory

The Northern Territory government has a variety of Land Use planning projects, both urban and rural, all of which contain elements of regional planning. Both the Litchfield Land Use Structure Plan (NT Dept of Lands and Housing, 1990a) and the Darwin Regional Land Use Structure Plan (NT Dept of Lands and Housing, 1990b) have among their specific objectives:

- "evaluation of land capability to ensure future development is balanced with known environmental values and constraints, [and]
- identification of long-term land and water resources in the shire [region] with a land use structure which will ensure appropriate use and management [protection] of these resources…."

The extent to which balance between environmental concerns and economic needs was considered in developing these regions is not clear. However, a similar plan for the Gulf Region (NT Dept of Lands and Housing, 1991) has been widely criticised for its emphasis on resource development rather than environmental protection. None of these plans refers specifically to the maintenance of biodiversity.

Queensland

The Queensland Government has taken an analytical approach to the definition of bioregions. Using a hierarchical approach which moves from broad regional landscapes, through ecosystems, and individual species to genetic variation as the key aspects of biodiversity, the Department of Heritage and Environment (Sattler, 1993) has identified **13 biogeographic regions across the State.** Such a bioregional framework enables:

- "an appreciation of the inherent ecosystem diversity to be conserved within each broad geographic unit that is responding to a particular set of environmental determinants";
- "the use of a scale that is practical in terms of nature conservation and land use planning", and
- "recognition of the major threats to biodiversity on a regional basis and possible interrelationships with other land management issues".

It is then suggested that:

"Policies should address:

(i) an environmental audit of each bioregion;

(ii) the development of a fully representative park system, and

(iii) the development of bioregional management strategies to ensure sustainable land use in conjunction with the protection of biodiversity".

However, the coverage of Queensland to date has been entirely terrestrial and has not included the Great Barrier Reef nor offshore islands, partly because these have been protected adequately by conservation measures. The main emphasis of the development of bioregions has been the need to plan a representative system of mainland conservation reserves. The bioregional framework and priorities were, in general, found to be an inadequate database for regional planning for the SEQ2001 process and required substantial further analysis. Over the past two years the Department of Environment and Heritage has taken the bioregional concept further by assessing regional ecosystem types and specific threats to biodiversity within each region, and these are proving more valuable as a planning tool at a regional scale.

Running concurrently with the Department of Heritage and Environment initiative, the Queensland Government has also adopted an **Integrated Catchment Management Strategy (1991)**. The Strategy is based on five principles, the first of which is that:

> Land and water resources are basic and interactive parts of natural ecosystems and their management should be based on river catchments as geographic units which account for the interactions between these resources.

The Strategy provides for the establishment of Catchment Care Groups and Catchment Coordinating Committees, and a State ICM Coordinating Committee to provide an overview and guidance.

Other States have Integrated Catchment or Total Catchment Management Programs, which are similarly based, although the extent of application to regional biodiversity conservation varies from State to State.

New South Wales

The NSW Environment Protection Authority, in its **Environmental Guidelines for State of Environment Reporting by Local Government** (1993), states that:

> Artificial administrative boundaries such as those for local or State government do not usually coincide with bio-physical boundaries.....It may therefore be beneficial for councils to pool their information and report on impacts in a logical and environmentally integrated context.
>
> Existing co-operation between councils through regional organisations of councils and the TCM process will make the concept of cross-boundary reporting familiar to many councils.... (pp.2-3).

The Guidelines propose that the following need to be addressed:

- "areas of environmental sensitivity;
- important wildlife and habitat corridors;
- unique landscape and vegetation;
- threatened species and recovery plans;
- any environment restoration projects, and
- vegetation cover and any related instruments or policies, including any instruments relating to tree preservation" (p.1).

A supplementary list of themes includes "conservation and biodiversity: Bioregion".

In preparing State of Environment reports in New South Wales, both State and local government agencies have a significant role to play, with the State providing this framework and a statewide report, while local governments provide more detailed local information. Local governments also need to involve their local communities in accurately identifying community concerns, in selecting appropriate indicators of the state of the environment, and in monitoring and gathering information.

Another important bioregional planning precursor is **the Natural Resources Audit Council's North East NSW** study. This process sought to provide "a descriptive, objective and generally agreed account of the values of the public lands and their resources" in the region in order to "provide the Government and interested members of the public with a clear picture of the values of public lands and their natural resources, what features and attributes they possess" (NRAC, 1994; p.2). Based broadly on a bioregion, the study has since become part of a larger Resources and Conservation Assessment Committee program which will provide the types of information upon which to base bioregional planning. Studies in the north-east of New South Wales are limited, however, by truncation at the State border and by an exclusive focus on public lands.

The most advanced example of a NSW bioregional planning precursor is found in the **NSW National Parks and Wildlife Service draft Biodiversity Strategy** (Dec 1992). A biophysical classification system defining 'natural regions' is outlined. Within these 'natural regions' information on various groups of species and the representativeness of the current reserve system are reported as part of the State's State of Environment reporting process (NSW Environment Protection Authority, 1993). With the establishment of a Biodiversity Advisory Committee under the Threatened Species Conservation Act, work on the biodiversity strategy will advance even further. Based on community input through workshops, the Service is also moving to integrate its work on the strategy with other aspects of natural resource use in the State.

Victoria

The work of the Land Conservation Council in Victoria provides a basis for bioregional planning in that State. Established by the Land Conservation Act in 1980, one of the three major functions of the Council is to carry out investigations for and make recommendations to the Minister for Conservation and Environment, on the use of public land in order to provide for the balanced use of land in Victoria. The Council is required to have regard to both the present and future needs of the people of Victoria in relation to the creation and preservation of areas of conservation and recreation values.

Through studies such as the Mallee Regional Review presented in Case Study 2 of this report (see Section C) and the 1990-91 Special Investigation on wilderness, the Council's work provides important information for planning and land management on a bioregional basis.

Tasmania

Until quite recently land use planning in Tasmania has been fragmented, with little integration of biodiversity conservation and resource use needs. However in 1991 the State Government established the Public Land Use Commission as an independent body with the task of inquiring into and making recommendations on the use of public land. The objectives of such inquiry are:

To promote the balanced use of public land based on:-

(i) the purpose for which it is best suited in the long term interest of the State, and

(ii) a thorough evaluation of its potential to fulfil social, economic and environmental needs….

Modelled on Victoria's Land Conservation Council, the Commission released its first public land use report for public comment during 1995 and will develop a set of reserve land classifications designed to ensure a comprehensive, adequate and representative reserve system in Tasmania. At the same time, amendments to planning legislation in Tasmania (Schedule 1) defined as the objectives of the environmental management and planning system in Tasmania:

(a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity; and…..

Together these developments in land use planning set the scene for bioregional planning which integrates both biodiversity conservation and sustainable resource use in Tasmania and provide opportunities for such planning to take place in a bioregional context.

South Australia

South Australia's ongoing Biological Survey based on environmental mapping commenced by Laut et al. (1977) provides a basis for decision-making about the adequacy and representativeness of national parks and other conservation areas across the State. Separating the State into eight land systems or environmental provinces, the Survey has recently been used to assess representation within reserves in each environmental region and for each vegetation association. While strongly targeted towards conservation reserves, rather than to integrated land use planning for biodiversity conservation, the Survey is a useful source of information.

Western Australia

In Western Australia, **integrated catchment management projects** in the Swan/Avon, Peel-Harvey and Blackwood River areas, and the Fitzgerald River Biosphere Project provide precursors to integrated bioregional planning and management for the maintenance of biodiversity. Each of these projects has strong community involvement.

In broad terms, the adequacy of the nature conservation reserve system in Western Australia has over decades been assessed through a land systems approach. More recently, Western Australia has also made a significant commitment to developing surveying and auditing methods to define land use regions. These methods are based mainly on plant geography, drainage divisions and river basins and rainfall. The **Natural Resources Zones of the South West Land Division of Western Australia** in particular are described as providing "a framework in which natural resource data may be reported and analysed on an ecologically meaningful basis" thus enabling "development of strategies for the protection and management of natural resources" (Allison, Brandenburg & Beeston, 1993 p.1).

Western Australia's wheatbelt offers an example of regional planning work initiated not by governments, but by scientists and the community working together to conserve biodiversity within a production-oriented landscape. Using a pilot project centred on one local catchment in the wheatbelt, CSIRO scientists, supported by the Commonwealth Department of Environment, are developing landscape models which identify options for conserving regional biodiversity while achieving sustainable agriculture. This link between the scientific community and landholders and rural communities is unusual and seems likely to enhance the opportunities for successful outcomes.[7]

A focus on catchments and hydrological boundaries in WA was supported by Tinley (1986) who suggested that "hydrologic units are the only kind of ecosystem which most closely meet the ... requirements as the principal organisational template for coordinating conservation and development" (p. 223). Tinley contended that hydrologic units best identify "the minimum area encompassing all the process and response relationships of an ecosystem in terms of the combined interactions between physical, biotic and human activities". They are also "practically identifiable in the field, on maps and

air photographs, and recognisable as the single unifying system common to the greatest number of interests and objectives" (p. 223).

However, in proposing this model, Tinley also commented that:

> The habit of dealing with problems singly has to be replaced with a systems analysis approach which considers people as part of the environment, and which develops a framework of salient information from which it is possible to anticipate crises, to recognise new opportunities for creative thinking, and to ensure cooperation between urban and rural functions bound together by their regional setting. (p. 222).

Further opportunities at Commonwealth Government level

> Australia is a large and diverse continent and it is impossible to treat it as a single ecological unit. Therefore, the nature and importance of various environmental issues can be expected to vary considerably between parts of the country. It is therefore desirable to develop some form of regionalisation as part of an overall SoE reporting framework. (Discussion Paper on Development of a National State of Environment Reporting System, CEPA, 1992 p. 13)

As seen in Sections A and B of this Discussion Paper, the Commonwealth has taken several policy initiatives which provide precursors to bioregional planning. However, despite strong and wide-ranging support for regional planning which takes account of environmental needs, a number of major national programs initiated by the Commonwealth fail to work within any bioregional focus.

A report by the **Commonwealth Taskforce on Regional Development** released in 1993 places strong emphasis on economic development. The Taskforce's Strategy for developing Australia, written from a regional perspective, is based on three principles:

- All regions should have equal access - as far as possible - to basic infrastructure;
- The regions should have the opportunity to develop their local economies, and
- Those regions suffering some specific disadvantage, for example their remoteness, should have access to special assistance.

In its submission to the Taskforce, the Australian Conservation Foundation (ACF) placed significant emphasis on the adoption of bioregional frameworks for regional development (Aust. Conservation Foundation, Oct 1993). However, the Taskforce report makes only scant reference to 'Environmental Management', and no direct consideration is given to the maintenance of biodiversity or the need to plan for this from a bioregional perspective.

The only reference to the environment in the then Prime Minister Keating's **'Working Nation'** statement appears in two case studies. It is suggested that guidelines are developed to ensure that regional plans result in "ecologically sustainable, highly productive, self-funding integrated agriculture which will repair and improve the environment and dramatically increase their contribution to the national GDP" (Commonwealth of Aust. 1994a, p.21). Again, biodiversity is not a subject for consideration.

A major initiative arising out of the 'Working Nation' statement is the **Regional Environmental Employment Projects (REEP).** REEP was designed to provide training and job opportunities on projects for environmental management and restoration and the development of green industries that have a strategic regional planning context, particularly in rural and remote areas. Subject areas to be addressed through REEP included environmental repair, eco-tourism and waste management.

Yet, despite this opportunity, the **Regional Development Program** (to which the Department of Housing and Regional Development committed $150 million over four years) placed heavy emphasis on traditional economic and employment issues. While designed to enable regions to shape their own future, the Regional Development Program failed to integrate biodiversity aspects. This was reinforced in the draft Environmental Consultancy report on Australian Urban and Regional Development (Jan 1995), circulated for community input. Despite its title, this paper focused on issues relating to air and water quality, energy problems, waste management and coastal urbanisation problems in Australia's cities and took little account of either the need to maintain biodiversity or the need for bioregional planning.

As discussed in Section B, traditional Aboriginal land management practices have much to offer in considering current approaches to bioregionally based land management. **ATSIC** has developed a detailed **Regional Planning Framework** which places emphasis on solving immediate problems for

Aboriginal people and promoting the growth of indigenous culture while tackling the root causes of disadvantage. However, the Framework does not seek to use or take account of bioregional boundaries. Once preparations for the development of a Regional Plan are in place, ATSIC identifies the construction of a Regional Profile as the essential first element which might form the basis for regional planning. Included in this are the following:

- A description of the physical nature of the region;
- A description of indigenous cultural groups of the region;
- The history of the indigenous peoples in the region;
- A brief description of the communities making up the region;
- Some human statistics;
- A description of 'needs' and 'supportive needs' that exist at the regional level;
- An analysis of the resources available to satisfy these 'needs' and the constraints to be overcome, including insufficiency of resources, and
- An analysis of the region's economy.

Precursors at an intergovernmental level

Several examples exist of cooperative programs in which the Commonwealth, State and local governments, and the community work together to achieve common goals.

In some instances Federal, State and/or local governments have been working together within a defined region over extended periods of time, while in other cases this collaborative effort is only now being initiated. Many of these collaborative efforts are also significant in the extent to which they involve local communities or interest groups.

The **Murray-Darling Basin** has long been recognised as an entity definable by natural environmental boundaries and requiring common management (see Powell, 1993). In recent times the Murray-Darling Basin Commission's Natural Resources Management Strategy has moved to ensure that funding support goes to those projects which adopt an integrated regional approach.[8]

The **Great Barrier Reef Marine Park** (see Case Study 3, Section C) offers another well-developed example of regional planning for the conservation and sustainable use of natural resources and the environment. Established in 1975, the Marine Park has been zoned and managed for a variety of uses consistent with the conservation of its values as a World Heritage Area.

Both **Landcare** and **Total or Integrated Catchment Management** programs may serve to maintain biodiversity, although in the view of the consultants their primary focus at least initially was the protection and management of productive lands. More recently, the National Landcare Program has identified the need for an integrated regional approach to biodiversity conservation and sustainable resource use.[9]

In the years since 1990, the **Australian Heritage Commission** has progressively developed a **regional assessment process** aimed at identifying in a systematic way, all of the natural, historic and Aboriginal cultural heritage values associated with a particular region.

After an initial scoping agreement in which government obligations, regional objectives and interests and broad forest uses are identified, the assessment process involves the Commonwealth and the States in jointly identifying and assessing the environmental and heritage values, economic opportunities and social impacts of resource use options, and industry and community aspirations, taking particular account of Aboriginal and Torres Strait Islander concerns.

From that, forest resource use options will be developed with the participation of local government, industry, trade unions, regional economic development organisations, conservation groups and other interested parties. Although not yet in place, such regional forest assessments might offer a way forward in those regions currently dependent upon a diminishing forest resource.

To date the methods have been applied only to particular forests in Western Australia and Victoria, but the assessment process is equally relevant to other areas.

The regional assessment process developed by the Australian Heritage Commission has recently been extended to include the assessment of values beyond those which are of national heritage interest. Building on a discussion paper released for public comment in May 1994, the Commonwealth has developed a position paper (in press) for regional forest assessment in line with the requirements of the

National Forest Policy Statement (1992). The process, which includes three stages is intended to form the basis for regional forest agreements which accommodate both nature conservation and forest resource needs.

The **Australian Nature Conservation Agency's (ANCA) interim biogeographic regionalisation for Australia** (Thackway & Cresswell, 1994), was developed in consultation with representatives from nature conservation agencies in all States and Territories to assist in the development of a comprehensive national reserve system for nature conservation and the protection of biodiversity. The process is based on physical and biological measures such geology, soils, climate and vegetation. Although offering a theoretical basis from which to move forward in designing a comprehensive national system of nature conservation reserves, it is not able to account for human needs and the 'sense of community' which are important to the development of bioregional planning.

From a production-oriented perspective, **provisional agro-ecological regions** of Australia were developed by the SCA Working Group on sustainable agriculture in 1991. Some 102 provisional environmental regions in Australia were identified, based "essentially, but not exclusively" (McNee and Hook, 1991 p. 23) on local government areas. The analysis was based on environmental components including climate, landform, lithology, natural vegetation, soils, land cover and river basins, and recognised State boundaries and local government boundaries. A map of some 46 agro-ecological regions was then developed which was intended to enable the identification of key resource management issues, including vegetation degradation, remnant vegetation decline, feral and native animals and land use competition.

The Federal Government's Ecologically Sustainable Development Working Group on Agriculture recognised the value of agro-ecological regions, and proposed a simplified version. Eleven agroecological regions were considered by the Working Group and these were used as a basis for describing Australian natural resources and associated farming systems (McNee and Hook 1991 p. 26).

The **Cape York Peninsula Land Use Strategy**, being conducted jointly by the Commonwealth and Queensland governments seeks to "Provide a basis for ecologically sustainable resource use and management in Cape York Peninsula in accordance with the obligations, responsibilities and objectives of the Commonwealth and Queensland Governments".

The information gathering initial stage of this project, which is nearing completion involves two major aspects. A Natural Resources Analysis Program being carried out by government agencies will provide an inventory and map of natural resources such as soils, vegetation, fauna and water resources across the Cape.

A concurrent Land Use Program has used workshops, working groups and community networks to involve Aboriginal and Torres Strait Islander people, graziers, conservation groups, Shire Councils and other Cape York Peninsula residents in extensive information gathering. Reports have focused on environment and natural heritage, economic, people and infrastructure issues and institutional arrangements relating to them. Each of the reports has been publicly reviewed.

Out of this first stage of the Cape York Land Use Strategy will follow the development and implementation of principles and policies for nature conservation, mining, tourism, primary industries and other land uses on Cape York Peninsula.

The cross-border arrangements for management of **Australia's alpine region** offer another example of bioregional planning and management. Land use interests in this region are common across State borders, such that the Victorian, New South Wales, Australian Capital Territory and Commonwealth governments have jointly established planning processes for the management of this area.

The processes involved in developing a **National Strategy for Rangelands Management** might also provide precursors to bioregional planning. In discussing planning, management and tools, it was noted that:

> Any activity undertaken in a particular area should be related to the overall (or agreed) management objectives of the area. Regional planning based on objectives and appropriate ecological boundaries, which take into account the ecological diversity as well as the range of uses of that particular area, could be a useful approach. (National Rangelands Management Working Group's Issues Paper Feb 1994 p.4).

The **National Ecotourism Strategy** released in 1994 was developed through a process of wide public consultation, including workshops in all States and Territories and a national call for submissions. It recognises the need for protection of the environment and its role in nature-based tourism in Australia, and at the same time places strong emphasis on special features of local and regional environments and their importance to ecotourism. Thus, the 'natural planning units' for ecotourism coincide with those most appropriate to bioregional planning for the maintenance of biodiversity.

In defining 'ecotourism', the strategy notes that "Ecotourism opportunities will be lost if the resilience of an area and the ability of its community to absorb impact are exceeded or if its biodiversity and physical appearance are altered significantly." (p.13).

In discussing integrated regional planning, the strategy observes that:

> Regional planning and development strategies could assist communities to make informed decisions about tourism opportunities and help to overcome the regulatory differences across boundaries. This may involve community education for participation on the planning process .....Strategies could also address the need for an integrated approach to tourism development and management by government agencies at all levels.
>
> Integrated regional planning and development strategies can improve the capacity of regions to attract foreign and domestic tourists to natural areas, help to distribute the economic benefits of ecotourism widely and help to reduce environmental pressures on peak demand areas..... (p.26).

The strategy goes on to define approaches to integrated regional planning relevant to ecotourism, and sets an objective to:

> Develop a strategic approach to integrated regional planning based on ecologically sustainable principles and practices and incorporating ecotourism. (p. 27).

However, although the National Ecotourism Strategy makes these commitments, the Commonwealth's approach to tourism development more generally lacks any real commitment to bioregional planning or to the maintenance of biodiversity. In a recent consultancy report to the Commonwealth Department of Environment, Preece et al. (1995) note "... if tourism is to develop in an ecologically sustainable way, the current political and institutional fragmentation existing in land-use planning will need to be overcome" (p.44).

Preece et al. (1995) propose a series of steps for "integrating biodiversity conservation with nature-based and eco-tourism", steps which might prove essential to bioregional planning for the maintenance of biodiversity. One of the five steps proposed in this process is to "Assess on a regional basis, current nature-based and ecotourism activity and formulate regional development plans to support these activities" (p.10).

The **Regional Tourism Development Program**, for which the 1993/94 Federal Budget provided $23 million over four years, aims:

> ...to improve the capability of regions to attract international and domestic tourists by providing grants for development of integrated regional tourism plans, diversification of the product base of regions, provision of tourism infrastructure and coordination of tourism information at a regional level (p.11).

It notes, however, that local governments are "fundamental" to an integrated planning process and that "Local governments also have a major role in promoting the design and development of environmentally sensitive and energy efficient facilities through their local planning and building approval processes."

The international context

Bioregional planning is a relatively new concept internationally and has received widespread attention only since the UN Conference on Environment and Development, held in Rio de Janeiro in June 1992.

In discussing the management of biodiversity throughout the human environment, the Global Biodiversity Strategy (WRI, IUCN, UNEP; 1992), devotes a substantial section to the need for bioregional management. It describes the nature and dynamic of a bioregion and presents actions for achieving the objectives of:

- Creating the institutional conditions for bioregional conservation and development;
- Supporting biodiversity conservation initiatives in the private sector, and
- Incorporating biodiversity conservation into the management of biological resources.

The Global Biodiversity Strategy (p. 102) highlights the example of the **La Amistad Biosphere Reserve in Costa Rica**. Encompassing 12 per cent of the country's land and a significant portion of plant and animal species, the area is a complex of inhabited and protected natural areas which enable socio-economic development while conserving selected 'wildland areas'. As the authors of the Global Biodiversity Strategy note:

> The [La Amistad bioregional management] strategy presents an enormous challenge. Instituting integrated management policies will require the commission to engage in frequent negotiation and conflict resolution. In addition, having exhausted its agricultural frontier, the country is struggling to cope with a heavy burden of external debt. Since the strategy was formulated in 1988, the epicenter of the terrible April 1991 earthquake fell within the biosphere reserve, destroying roads and homes and further isolating communities. Visionary planning to accommodate these needs while ensuring conservation will have to guide reconstruction.

However, a number of factors suggest that integrated regional planning may succeed in La Amistad. The authors go on to identify as positive factors the provision of financial, technical and political support from other government agencies, from communities within or near the reserve and from international organisations.

The **Netherlands Government**, through its national environmental policy planning processes, has published three major policy plans on the natural environment: the Nature Policy Plan, the Environmental Policy Plan and a plan for Water Management. Accompanying these are a "Green Space" plan which brings biodiversity conservation into physical planning, and a variety of sectoral policies which provide a further basis for sustainable use of biological resources. Within the Nature Policy Plan, special attention is given to trans-border natural areas such as the Wadden Sea along the coasts of Denmark, Germany and the Netherlands. Lack of resources in the initial stages of the Plan is a problem as "much more money is needed in the first decade of realisation to prevent further decline of habitats and species" (Miller & Lanou, in press).

Through its national environmental policy planning processes, the Netherlands Government has developed 'ROM' projects in which environmental and physical planning aspects are tackled together. Aside from the 'ROM' projects, there is also a Grants Scheme for Soil Protection Areas and environmental protection areas have been introduced into the Environmental Management Act. The national enforcement structures in the Netherlands also promote "co-operation between all bodies responsible for enforcement at the national, provincial and regional levels".

New Zealand provides an advanced example of a developed country which has shifted towards regional planning which takes account of biodiversity conservation. Extensive restructuring of land management and local government systems combine with environmental legislation reform through the introduction of the Natural Resource Management Act.[10] This Act has as its single stated purpose:

> managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while-
>
> (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations;
>
> (b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems, and
>
> (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

Although it is too early to assess concrete outcomes for the conservation of biodiversity resulting from the restructuring, it does allow planning and natural resource management to occur on an integrated regional basis. New Zealand lecturer in environmental economics Cath Wallace (ACF, 1994) identifies several advantages in the new system. There may be lessons for Australia in moving towards bioregional planning. [11]

In developing countries, **Integrated Conservation and Development Projects** (ICDPs) have both strengths and weaknesses in their effectiveness in linking biodiversity conservation in protected areas with social and economic development in surrounding communities (Brandon & Wells, 1992).

The **Annapurna Conservation Area** in Nepal links conservation with human development and relies on public participation and education to achieve its goals. Established in 1985 and protected in legislation in 1989, the area includes a wilderness zone, together with an anthropological zone maintaining

traditional ways of life and landscape, a protected forest/seasonal grazing zone, an intensive use zone catering to local and tourism trekking needs and a special management zone in which efforts are directed towards reversing adverse environmental impacts (see Lucas, 1992). This Conservation Area is seen by Brandon & Wells (1992) to be "one of the most promising ICDPs". It is judged to have "made significant progress in motivating a sceptical local population to participate in natural resource management decision making, although local institutions are not expected to assume major responsibility for several years".

Five **Monarch Butterfly Overwintering Reserves** located in a volcanic range in central Mexico are seen by Brandon & Wells (1992) as less successful examples of a developing country ICDP. The reserves, each of which is surrounded by a buffer zone, span 31 communal landholdings. Despite strong lobbying by the local conservation organisation and the provision of funding for research and guarding of the parks, they are coming under increasing development pressures. "Population growth is high, and few economic opportunities exist, declining agricultural productivity, increasing landlessness and worsening poverty are leading to logging, cattle grazing, and agricultural expansion into the core park areas and buffer zones" (p.559).

The **Serengeti Greater Ecosystem** in Kenya and Tanzania encompasses the Serengeti National Park, Tanzania's Maswa Game Reserve and the Maasai Mara National Reserve, and the Ngorongoro Conservation Area (see Lucas, 1992). Adjoining the Serengeti National Park, the Ngorongoro Conservation Area was established in 1975 with the objectives of:

- conservation and development of natural resources;
- promotion of tourism, and
- safeguarding and promoting the interests of the Maasai.

In recent times conflicts between pastoralism and conservation have increased, with a rapid growth in a population which is becoming more sedentary in lifestyle, placing pressures on inadequate livestock populations. There is a need for improved scientific information on both social and ecological aspects of the conservation area. Along with effective control of poaching and protection of key species, these are seen as priority conservation needs.

Summary

The protection of biodiversity and maintenance of essential ecological processes and life-support systems are an underpinning principle in attaining ecologically sustainable development. Local, State and Commonwealth governments have all made a commitment to that goal, and the key elements of this are reflected in the findings of a key Commonwealth government committee.

> ...three fundamental elements emerged as essential for action to maintain biodiversity and ecological processes: a bioregional approach to planning; an ecologically representative reserve system; and community involvement (The House of Representatives Standing Committee on the Environment, Recreation and the Arts January 1993 p. xiii).

The experience in Australia and overseas shows that successful projects which integrate bioregional planning and biodiversity conservation also take account of, and incorporate community aspirations and needs. In analysing the failures of planning in the United States to adequately incorporate ecological and social goals, Steiner (1991) identifies a need for:

> an approach that can assist planners to analyse the problems of a region as they relate to each other, to the landscape, and to the national and local political economic structure (p.8).

This he refers to as 'applied human ecology' or 'an ecological approach to landscape planning'.

Existing precursors to bioregional planning can identify both the key elements for success and the barriers to improved use of bioregions in planning for the protection of biodiversity, and this will be examined further in Section E.

D. CASE STUDIES

Case Study 1 SEQ2001 Project

Background

The Queensland Government convened the SEQ2001 Conference in December 1990 to discuss the issues confronting the rapidly growing region of South East Queensland (SEQ). It is estimated that the present (1991) population of 1.85 million in the Brisbane-Ipswich-Gold Coast-North Coast area will increase to more than three million by the year 2011, equivalent to 1000 additional people moving into the region each week.

The 1990 conference established the following:

- Many of the region's environmental resources, growth issues and relationships transgress local government boundaries;
- The 20 local authorities within the region are and will continue to be the level of government responsible for planning their communities;
- A regional approach to growth management and planning in the region is needed to meet the challenge of continuing rapid population growth;
- An integrated approach is necessary for the identification, protection and management of the region's natural resources to ensure their maintenance for the benefit of current and future generations, and
- A growth management strategy will require the co-operation of all levels of government and the community.

The SEQ region for the purposes of the SEQ2001 Project stretches from Noosa in the north, to Toowoomba in the west and south to the New South Wales border, and includes 20 local authorities. South-east Queensland is widely accepted as a region of common interest by the community and represents approximately half of the South-east Queensland biogeographic region.

Planning Process Resources and Model

From the outset the SEQ2001 Project was a 'bottom-up' collaborative process with initiatives and priorities defined by a broad cross-section of the community. A Regional Planning Advisory Group (RPAG), established in July 1991 to undertake and oversee the project, included Commonwealth, State and local government, professional, community, environment, business/industry and union sector representatives. RPAG was assisted by external Reference Groups for each sector, plus five broadly representative working groups in the areas of environment, infrastructure, social planning, transport and urban futures. Voluntary Working Groups were responsible for developing (through a staffed Technical Support Group), position papers, draft policies and final policy papers for 15 projects:

- Nature Conservation;
- Open Space and Recreation;
- Agricultural Land;
- Rivers and Coastal Management;
- Rural Residential;
- Cultural Development;
- Major Centres;
- Extractive Industry;
- Residential Choice and Efficiency;
- Water and Waste Water;
- Human Services Infrastructure;
- Solid Waste;
- Livability;
- Industry Location and Tourism, and
- Transport.

Each of these required allocation of departmental resources to provide expertise and guidance to the Technical Support Group, on brief to the Working Groups. This necessarily involved changes in Departmental priorities to bring forward planned programs relating to South-east Queensland but in many cases the techniques and processes developed during SEQ2001 have subsequently been applied to other regions.

Inevitably the SEQ2001 project encountered initial reluctance from some government departments to commit scarce resources to initiatives of a non-government process, or to revise existing planning. Most agencies had previously undertaken detailed regional planning for infrastructure within their area of responsibility, in some cases with considerable community consultation, and were loathe to discard their agenda and start afresh. However the commitment of the State Government to the SEQ2001 project, through a senior Cabinet Committee (Planning and Infrastructure Coordination Committee) ensured the active cooperation of all departments.

In parallel with the 15 projects, the RPAG prepared a draft Regional Outline Plan (ROP) based on criteria for parameters such as water and air quality, transport, human services and employment. It also proposed institutional arrangements for effective implementation. The ROP consisted of an Environmental Constraints map, a Preferred Pattern of Urban Development map, and a set of principles. However the end product of the SEQ2001 Project was directed primarily towards policy development, agency responsibilities and implementation arrangements, rather than a deterministic spatial structure plan. At a regional scale involving 20 local authorities, each with considerable autonomy in land use planning, it was considered more important to set in place appropriate arrangements and policies than to produce a 'Master Plan', although an outline Structure Plan was essential to give form to the recommendations.

The final Regional Framework for Growth Management document incorporated action plans from each of the final policy papers. The Regional Framework was based on a Vision Statement, a significant element of which involves the protection and management of the region's natural assets to preserve biodiversity and maintain a high standard of environmental amenity. This aspect is further reinforced within the ROP with a principle to maintain and restore the diversity of landscapes, plants and animals in the region and the ecological processes essential for their continued existence.

In October 1991 the Queensland Government allocated a budget of $2 million to SEQ2001, 75 per cent of which was for State Government expenditure and the remainder for local authorities to expend through four regional organisations of Councils. State Government funds were used to establish a secretariat and Technical Support Group, for consultancy projects and for salaries of officers on secondment from various departments.

Nature Conservation and Biodiversity

The consultative RPAG process identified the need to clearly define areas available for development of new housing and associated infrastructure with minimal impact on environmental values and quality. The Nature Conservation project therefore aimed to describe biodiversity by mapping six Regional Environmental Provinces and describing the conservation status of the 42 major vegetation types present in SEQ (compared with 44 in the entire biogeographic region). Information presented and incorporated in planning was mainly at a regional scale, although the sub-regional data in environmental provinces may be useful for later planning at sub-regional scale.

In order to prepare this information, the Department of Environment and Heritage drew upon the broader planning context of Biogeographic Regions in Queensland. As indicated in Table 1, the South-east Queensland Biogeographic Region is relatively well conserved when compared to the other 12 regions in Queensland at the ecosystem level of biodiversity. Of the 44 ecosystems identified in the region, 95 per cent are conserved in national parks and reserves, with 84 per cent conserved in more than one area.

The relatively high representation of ecosystems within SEQ has largely been the result of greater population and political pressure within the region, and consequently State government funding for investigations of regional biodiversity, such as the SEQ2001 Project and Nature Search 2001.

However, at the finer scale of resolution required by the SEQ2001 project, critical biodiversity conservation issues became apparent:

- Vegetation loss is a major issue where 28 per cent of pre-European vegetation cover remains along mainland coastal areas of the region;
- Along the mainland coastal strip urbanisation, rural residential development and associated activities during the past 14 - 17 years have:

- reduced dry sclerophyll forest by 33 per cent and based on existing trends all forests outside reserves are predicted to disappear by the year 2016;
- reduced paperbark tea tree (*Melaleuca quinquenervia*) forest by 50 per cent, predicted to disappear (apart from reserves) by the year 2004;
- reduced heathland by 34 per cent and predicted to disappear (apart from reserves) by 2018, and
- reduced littoral vegetation by 23 per cent.

Overall, at present rates of removal, the majority of native vegetation outside reserves will disappear from coastal SEQ by the year 2019, with only minor remnants retained;

- Much of the Subcoastal Lowlands Province was cleared many years ago for agriculture and grazing and only 11.4 per cent remains vegetated with intact and semi-intact bushland;
- Although most major ecosystem types in coastal areas are represented in conservation reserves, continued clearing and fragmentation will reduce reserves to isolated "islands" causing local extinction of species, reduction in local diversity of ecosystems, loss of open space and removal of bushland important as local landmarks;
- Several widespread ecosystem types such as lowland eucalypt forest and alluvial rainforest have poor conservation status, and
- Although most of the mountains and ranges of the region remain vegetated with low rates of vegetation loss (eg nine per cent of tall open forest of the wet sclerophyll type has been cleared during the past 14 - 17 years), there is a need to ensure that these areas remain unfragmented and connected to other areas whenever possible.

Table 1 Representation of Major Ecosystems in National Parks and Reserves[1] in each Biogeographic Region of Queensland

Biogeographic region	**Representation of Ecosystems[2]**		
	Number conserved (number in region)	**% conserved**	**% conserved in more than one reserve**
North West Highlands	30 (41)	73	24
Gulf Plains	30 (69)	43	15
Cape York Peninsula	87 (134)	65	41
Mitchell Grass Downs	26 (61)	41	18
Channel Country Complex	42 (54)	78	56
Mulga Lands	45 (62)	73	39
Wet Tropical Rainforests	45 (58)	78	62
Central Mackay Coast	20 (21)	95	76
Einasleigh Uplands	20 (42)	48	17
Desert Uplands	27 (40)	67	25
Brigalow Belt	103 (139)	74	42
South East Queensland	**42 (44)**	**95**	**84**
Northern New England Tableland	10 (18)	55	28
TOTAL	**526 (783)**	**67**	

Source: QDEH 1994

Note:

1 National Parks and Reserves > 1000 ha and includes proposals in process of gazettal.

2 Regional ecosystems represent a classification of vegetation and other environmental attributes recognisable at a mapping scale of approximately 1:250 000.

Biodiversity conservation in the past has focussed on the role of national parks to capture representative samples of major ecosystems. The SEQ2001 project recognises that a system of national parks alone will not achieve the key objective of conserving biodiversity because reserves will become isolated, suitable land is no longer available and there are considerable economic and social costs of acquiring large tracts of private land currently.

A long term community-based inventory of the fauna of SEQ (Nature Search 2001) was launched in January 1992 by the Queensland Government Minister for Environment and Heritage as part of the SEQ2001 Project. This was originally a two year project but this was extended to at least June 1995.

Nature Search 2001 is a co-operative project involving voluntary coordinators, local authorities, Queensland Department of Environment and Heritage support staff and survey teams and associated Government and external agencies. As Nature Search is reliant on the active participation of volunteers, an extensive support network has been established. Approximately 800 000 wildlife records have been collected on a grid cell basis during the first three years of the project, and entered into a Geographic Information System which enables the mapping of species diversity and other species information. All Councils within SEQ will be provided with the data collected which will form part of their data base for planning and management. It is proposed to update the data when additional information becomes available.

Regional Open Space System

Rapid urbanisation and population growth in the SEQ region has the potential to detract from its 'livability' by reducing open space values and landscape setting. A significant outcome of the SEQ2001 Project is the proposal for the establishment of an extensive Regional Open Space System (ROSS) to protect and enhance the conservation, cultural, recreational and landscape resources of the region. The open space framework will include native reserves, forests, coastline, rivers, mountain ranges and other elements that strengthen regional identity and image.

The core of the ROSS will comprise predominantly public land and will be supplemented with private land subject to covenant-type agreements on the management for one or more ROSS purposes. Private land may also be purchased for inclusion into the ROSS and land to be included in the 'ROSS buffer' which will be subject to tighter planning controls.

A ROSS Committee has been convened to guide the establishment of the ROSS. The Committee includes State Government representatives and the four co-ordinators of the Sub-regional Organisations of Councils. A comprehensive network of advisory groups involving business, tourism, conservation, academic and landholder interests has also been established to advise the ROSS Committee of areas which should be brought into the ROSS.

Community Consultation Process

Cross-sectoral consultation and participation was the basis of much of the work undertaken during the SEQ2001 Project. The RPAG committed itself to "broad and meaningful consultation" with the objective of developing a high level of ownership of, and commitment to, the outcomes of the project by all levels of government and the community. This was achieved through representative arrangements and targeted consultation along with the provision of significant opportunities for public reaction to the output of the project. A structured consultation process also provided opportunities for the resolution of conflicts between stakeholders which may otherwise have been impediments to improving regional planning and co-ordination.

The representative structures of the RPAG and the Working Groups ensured that a wide range of perspectives from all levels of government and other sectors were considered on the development of the growth management recommendations.

During the preparation of the draft Policy Papers a program of targeted consultation was conducted. Seminars and workshops were conducted on specific policy issues, and individuals and groups with expertise on these areas were invited to attend. The outcomes of these workshops contributed significantly to the development of the Policy Paper.

A series of public seminars were conducted around SEQ following the release of both the draft and final Policy Papers. Interested sectors of the community were invited to attend the seminars, to question, clarify and address any concerns about the recommendations of the project.

Public comment was also invited on the draft recommendations of the RPAG for a period of three months. During this time submissions were received from a broad range of organisations and individuals. Submissions were considered and amendments to all papers were made accordingly.

The success of the SEQ2001 Project has been based on a partnership between all spheres of government and relevant community interest groups. This approach taken by the Queensland Government and the RPAG offers a stark alternative to the regional planning mechanisms operating in other parts of Australia. It is not a prescriptive approach which is left to the jurisdiction of one department or level of government but involves a co-operative and co-ordinated partnership approach to growth management.

This consultative process was demanding in its commitment of sector representatives on a voluntary basis, and there were several committees and working groups which suffered a decline in active membership as people lost enthusiasm or ran out of available time. However a solid core of participants remained consistent throughout the process, probably because:

- there was considerable pent-up demand for regional planning, particularly within the planning profession, and a realisation that finally the State Government was serious about regional planning
- the structural approach to representation meant that committee members were responsible to their constituents to see the process through and report back to an interested network of contacts
- there was always a perception that the Government might waver in its support for regional planning if the consultative process failed, and that many in Government did not initially understand the full implications of regional planning
- there was a real sense of contribution to solving an urgent problem and improving the outcome for the entire community, and a sense that the working groups and committees were in a position of real influence
- senior paid officers of lobby organisations such as unions, conservation groups and development bodies provided a consistent presence on all committees as they appreciated the importance of the issues and competed for influence over the outcomes.

However, the process was not all plain sailing. At the outset, committees and working groups floundered without a specific planning model as a framework, and it was some time before the nature of the outcome became apparent. The translation of the collaborative policy papers into a Regional Outline Plan and then a Regional Growth Management Strategy was not transparent to all participants, and to some extent this step was a ‘black box’ process absorbing inputs and then producing a plan. Few people involved in SEQ2001 had a clear idea on how all the bits were fitting together.

Other problems to emerge at the outset related to the difficulty of prioritising the multitude of issues, lumping them together into achievable projects and assigning them to appropriate Working Groups. Inevitably there were conflicts over cross-disciplinary issues and assignment of responsibilities, and over balanced representation on Working Groups. After these issues were amicably resolved, the point of conflict shifted partly to departmental officers. Several officers found themselves answerable to two masters - firstly as senior policy advisers within their departments with a degree of commitment to existing policies and structures, and secondly on brief to representative Working Groups to develop new policies and arrangements.

Current Position

Following the release of the final report and recommendations in 1994 a Regional Co-ordination Committee (RCC) was established to promote and monitor the Regional Framework for Growth Management as the recommendations are put into practice. The RCC is an inter-governmental advisory forum, involving all levels of government, which promotes co-ordinated regional planning within South East Queensland and will also review and modify the Framework when appropriate. The RCC will be supported by a Regional Non-government Sector Committee (RNGSC) which will be the “voice of the wider committee” in many of the regional decisions made by the RCC. The RNGSC will include members of the environment, human services, industry, land development and union sectors and will provide advice to the RCC on certain growth management issues as they arise.

A Regional Resource Unit has been established within the Department of Housing, local government and Planning, with two years funding ($175 000) remaining from the original $2 million budget allocation. Additional funds have been provided by the Department of Lands to maintain and expand the Geographic Information System needed to implement the ROSS.

The SEQ region has been divided into four sub-regions which each undertook sub-regional structure planning which took the regional work down to the next level of detail and tested the feasibility of the regional proposals. Sub-regional Organisations of Councils were the lead agencies for the sub-regional planning process which also involved a partnership approach between State and local government . The first sub-regional structure plans were finalised in March 1995 and the Regional Framework for Growth Management was then reviewed and modified to ensure it reflects the needs and realities of the region as a whole.

Conclusions

The following points should be regarded as the strategic issues and factors critical to the success of the SEQ2001 Project:

- The Project uses existing local government boundaries which allows the findings and recommendations to be implemented at the local government level;
- The SEQ region represents a substantial sub-region within a larger biogeographic region for the purposes of protecting Queensland's biodiversity;
- The Project is largely driven by nature conservation aspects which were advanced ahead of other aspects;
- The Project recognised that National Parks alone will have difficultly in achieving the key objective of conserving biodiversity within the region;
- The Project established a co-operative and co-ordinated partnership approach between all spheres of government and relevant community interest groups on a representative basis;
- The lack of information on the distribution of wildlife and their habitats was addressed through a co-operative project involving community based volunteers (Nature Search 2001);
- The establishment of four sub-regions allowed more detailed planning of the area to be undertaken.

In general, the project provided a catalyst for improved inter-governmental and intra-governmental communications, and created broad awareness in the community, the media and government agencies regarding the interrelationships of regional issues, and environmental constraints (such as water and air quality and rates of vegetation loss) applicable to the entire region.

Case Study 2: Mallee Region Review

Background

The Victorian Department of Planning and Development and the Department of Conservation and Natural Resources have divided the State into 16 regions for the purposes of planning and managing public land. The Land Conservation Council (LCC) was established under State Government legislation in 1970. One of its functions is to make recommendations to the Minister for Planning and Development on the strategic use of public land in order to provide for the balanced use of land in Victoria.

The Mallee region in north western Victoria, comprises almost one fifth of the area of the State and is bound to the north and west by the State borders of New South Wales and South Australia. Within the region public land occupies approximately 1.67 million hectares (37 per cent of region) with the majority located in two parcels adjacent to the South Australian border and the balance located along the Murray River and scattered throughout the agricultural areas. The region does not use existing local government boundaries and has been formed as the south eastern extent of Australia's semi-arid inland. It derives its name from the characteristic and widespread native scrub of low multi-stemmed eucalypts called mallee. The Mallee Region (within Victoria) only represents part of the Murray-Darling Depression biogeographic region as shown in the Interim Biogeographic Regionalisation for Australia (Thackway & Cresswell, 1994).

The LCC commenced the first investigation of the Mallee region in 1972, and published a descriptive report in 1974. Final recommendations on the use of public land in the area were published in 1977. The LCC planned to commence the Mallee review during 1986, however community concern expressed early in 1985 over the clearing of public mallee for agriculture and the lack of detailed ecological information about the region prompted the State Government to ask the Council to bring forward its review of the Mallee Region. Advertisements stating the LCC intention to review the Mallee Region appeared in the Victorian Government Gazette and newspapers (Victorian and local) in June 1985.

The main purpose of the review was thus to assess the LCC's previous land use decisions in the light of changing demands and the availability of new information.

Planning Process

The first stage in the review process involved the preparation of a descriptive resources report which:

- described the cultural heritage significance of the region;
- briefly described the physical and biological characteristics of the land (landscape evolution and soils, climate, water resources and utilisation, vegetation, fauna and land systems);
- examined alternative forms of land use (nature conservation, recreation, primary production, forest produce, minerals and stone, utilities and other land uses, and hazards and conflicts);
- assessed the hazards and conflicts associated with such uses.

The information required for the descriptive resources report was obtained from the following sources:

- original "Report on the Mallee Study Area", published in 1974;
- government departments, public authorities and interested individuals;
- additional studies of the ecology and agricultural use prepared by the Victorian Department of Conservation, Forests and Lands, the Museum of Victoria and the LCC.

During the Mallee Region Review a number of important issues regarding the use of public land were identified:

- salinity;
- wildlife corridors;
- limited cultivation leases;
- grazing intensity;
- water regulation and wetland protection;
- exploration and mining;
- agriculture; and
- broombush harvesting.

Following the public review of the descriptive resources report the LCC published proposed recommendations for the use of public land within the region. The LCC considered all submissions and prepared final recommendations for Government approval. The recommendations are grouped under major land use categories, such as Parks, Wilderness Area, State Forest, and so on.

The estimated cost of the Mallee Region Review between June 1985 and August 1989 was half a million dollars which included consultant fees, salaries and reports. In 1993/94 the Victorian Government allocated a budget of $1.085 million to the operation of the LCC. These funds were used for salaries and operating expenses.

The responsible authority for strategic planning on freehold land within the region is local government. The content and procedures for the preparation of these plans is controlled by State legislation administered by the Department of Planning and Development. During the preparation of these strategic plans the LCC provides input to ensure a consistent approach to strategic planning for private and public lands in the Mallee Region.

Nature Conservation and Biodiversity

The term 'mallee' is often used to describe a wide range of vegetation communities dominated by multi-stemmed species of *Eucalyptus*, and it is clear that species composition varies considerably between south-

eastern Australia and Western Australia. In fact, quite marked differences exist between the New South Wales and Victorian mallee.

Altogether, about three-quarters of Australia's mallee vegetation (including semi-arid woodlands such as those dominated by *Casuarina* species and native pine) has been cleared, mainly for agriculture. Sizeable areas still exist in New South Wales and Western Australia, but these are subject to grazing by stock and the vegetation structure and botanical composition have been considerably modified by this grazing and by altered fire regimes. As animal habitat, mallee vegetation is changed in major ways.

At the time of European settlement, mallee is estimated to have covered about 10.4 million ha of the Murray-Darling Basin, with around 4.2 million ha of that in Victoria. A continuous belt extended from southern New South Wales and north-western Victoria to the eastern edge of the Flinders Ranges in South Australia.

In Victoria, mallee vegetation (including semi-arid woodlands) originally occupied some 19 per cent of the State. Approximately one-third (1.6 million ha) of this remains as public land, mostly within the Big Desert and Sunset Country blocks. The remainder has been alienated and substantially cleared for agriculture. The public land portion of the Mallee Area of Victoria comprises about 15 per cent of the former extent of Murray-Darling mallee vegetation.

In South Australia, virtually the only uncleared mallee occurs in conservation reserves. In New South Wales, while only a relatively small proportion of the original mallee has been physically cleared, much of that in the south-west of the State has been greatly modified by heavy grazing by domestic stock, and most uncleared mallee is still grazed. An embargo on the clearing of mallee in south-western New South Wales was lifted in May 1988.

Some 13 per cent of the original area of mallee in the Murray-Darling Basin is included in existing conservation reserves (New South Wales 3.1 per cent, South Australia 5.5 per cent, Victoria 4.7 per cent).

The significance of the Victorian region is therefore very high as it provides the only opportunity to further protect relatively unmodified examples of mallee vegetation and faunal habitats in south eastern Australia. It is also one of the few semi-arid regions of the world where relatively large tracts of undisturbed vegetation remain.

In the Victorian context, the Mallee Region makes an important contribution to the broad range of natural environments occurring in the State. The mallee environment differs markedly from the outstanding natural values of the Alpine and East Gippsland areas of the State, but it has equally significant nature conservation and land protection values that are important components of Victoria's natural heritage.

The Mallee Region Review identified approximately 1 000 species of native plants within the region, of these, 200 are regarded as rare or endangered. The report identified that only 20 per cent of the vegetation on public land was within a conservation reserve and several communities (sand plain grassland, gypseous plains grassland, gypseous rise woodland, alluvial plains shrubland and alluvial rise shrubland) were unreserved at that time.

Also there is very little representation on public land of the once-extensive mallee environments of heavier (clayey) soils. These were among the first areas to be alienated as they were more favourable for agriculture.

The LCC recognised that the reserve system should include adequate representation of all plant communities, and this was an important consideration in the additional areas proposed for National Parks and other reserves.

Other recommendations relevant to conserving the region's biodiversity included:

- reducing the effects of salinity by replanting native vegetation and improving agroforestry, cropping and grazing techniques;
- minimising further fragmentation of public land to retain and protect wildlife corridors;
- no further areas of native vegetation to be cleared and some areas to be rehabilitated;
- discontinuous grazing within native vegetation areas; and
- excluding salt and gypseous material extraction from flora and fauna reserves.

The Victorian Government was placing greater emphasis than ever before on the protection of other values outside the reserve system. The recommendations from the review were consistent with the aims of the State Conservation Strategy in relation to such areas. These were to:

- maintain essential ecological processes and life-support systems;
- preserve genetic diversity;
- maintain renewable resources;
- protect and manage natural systems and their diversity for the non-material needs of society.

The draft report 'Towards an Interim Biogeographic Regionalisation for Australia' (Thackway & Cresswell, 1994) identifies the Mallee Region as part of the Murray/Darling Depression, which is one of ten IBRA Regions within Victoria. Of the 87 land systems in the Murray/Darling Depression, 77 per cent (67) are conserved in reserve systems with a low level of bias in representativeness, defined as the extent to which the existing system of protected areas fails to provide a representative sample of the natural systems of each IBRA region. An assessment of bias in Victorian IBRA regions is indicated in Table 2.

Table 2 Interim Biogeographic Regionalisation for Australia Assessment of bias in Victorian Regions

	Number of Land Systems	Number of Land Systems in Cons. Reserve System	% Cons Res. /No. Land Systems	Bias
1. Murray/Darling Depression	87	67	77%	Low
2. Narracoorte Coastal Plain	17	14	82%	Low
3. Victorian Volcanic Plain	80	18	23%	High
4. South-East Coastal Plain	200	80	40%	Mod.
5. South-Eastern Highlands	152	94	62%	Mod.
6. Australian Alps	48	39	81%	Low
7. South-East Inland Slopes	185	96	62%	Mod.
8. Riverina	45	8	18%	High
9. Furneaux	6	6	100%	Nil
10. South-East Corner	28	25	89%	Low
TOTAL	**848**	**447**		

Bias Level
High less than 30% of land systems represented. Few of the land systems in proportion to their occurrence
Moderate 30-70% of land systems represented. Most land systems represented, but with a bias in their representation.
Low Greater than 70% of land systems represented. Most land systems in proportion to their occurrence.
Nil All land systems represented.
Source: LCC 1995

Community Consultation

The community consultation process adopted for the Mallee Region Review was a standard procedure followed by the LCC for conducting investigations and making recommendations to the Minister for Planning and Development on the use of public land within Victoria. The procedure is set out below.

1. A notice of the LCC's intention to commence an investigation in an area is published in the Government Gazette, State newspapers and local newspapers circulating in the area.
2. A factual descriptive resources report is prepared by officers of the LCC. The report does not contain land use recommendations, but provides an objective basis for public submissions.
3. The LCC then invites individuals and interested bodies to make written submissions on the balanced use of public land, having regard to resource use and conservation needs now and into the future. The submission period is at least 60 days, and in some cases longer, after publication of the report. The Mallee Report attracted 201 submissions.
4. The LCC considers the report and all submissions, and also undertakes field trips to the respective areas, before drafting a set of proposed recommendations. Publication of the proposed recommendations is advertised and copies are sent to each person or body that has made a submission. There is then a further 60 day or 90 day period during which submissions may be made in response to the proposed recommendations. In the case of the Mallee Region Review, during this period public

meetings and meetings with lessees were held. LCC officers were relocated to the region to answer queries regarding the draft recommendations.

Current Position

The final recommendations (with minor variations) were all adopted by the Victorian Government in 1989. The extensions to the National Parks have been approved and implemented while the grazing strategy is being implemented over a six year phasing out period. The majority of recommendations will be implemented over the next ten to 15 years. The priority of implementing recommendations is set by the State Government and the availability of departmental resources.

The time delay between the adoption of recommendations by government and their legal implementation caused some management and planning difficulties.

Future review of the Mallee Region will be carried out on a needs basis.

Conclusions

The following points should be regarded as the strategic issues and factors critical to the success of the Mallee Region Review:

- The descriptive report provided an extensive and valuable environmental data base;
- A standard community consultation procedure which provides a high level of local community involvement;
- Government and community recognition that the Mallee Region represents not only the south-eastern extremity of a widespread biogeographic region, but also an opportunity to protect representative samples of the Murray/Darling Depression biodiversity which had been lost from other areas, and
- The LCC officers involved in the review were relocated to the region as part of the community consultation process.

Case Study 3: Great Barrier Reef World Heritage Area Strategic Plan

Background

The Great Barrier Reef is a maze of reefs and islands stretching more than 2 000 kilometres along the Queensland coast. It is the largest coral reef system in the world and one of the richest in biological diversity (GBRMPA 1994a).

The reef covers approximately 350 000 sq kms and runs parallel to the Queensland coast from Cape York in the north, to Bundaberg in the south (see Figure 4). Often called the Eighth Wonder of the World, it is home to more than 1 500 species of fish, over 4 000 kinds of corals, 4 000 types of molluscs and over 240 species of birds. It is also a breeding ground for some of the world's endangered species such as the humpback whale, green sea turtle and dugong (Digance and Eckert 1992).

Nearly all of the Reef is located within the perimeter of the Great Barrier Reef Marine Park. The Commonwealth's jurisdiction ends at the low water mark (except on the few islands that are owned by the Commonwealth) with islands within the outer boundaries of the Marine Park falling within the jurisdiction of Queensland State laws. The Marine Park is managed by the Great Barrier Reef Marine Park Authority (GBRMPA) which was established in 1975 (Digance and Eckert 1992).

The Authority is a Commonwealth statutory body consisting of a full-time Chairman and two part-time members, one of whom is nominated by the Queensland Government (GBRMPA 1994b). The Great Barrier Reef Marine Park Act 1975 (Cth) enumerates the Authority's functions, the primary goal being:

> to provide for the protection, wise use, understanding and enjoyment of the Great Barrier Reef in perpetuity through the care and development of the Great Barrier Reef Marine Park.

The following aims are subordinate to the primary goal:

- to protect the natural qualities of the Great Barrier Reef, while providing for reasonable use of the Reef Region;
- to involve the community meaningfully in the care and development of the Marine Park;

- to achieve competence and fairness in the care and development of the Marine Park through the conduct of research, and the deliberate acquisition, use and dissemination of relevant information from research and other sources;
- to provide for economic development consistent with meeting the goal and other aims of the Authority;
- to achieve integrated management of the Great Barrier Reef through active leadership and through constantly seeking improvements in coordinated management;
- to achieve management of the Marine Park primarily through the community's commitment to the protection of the Great Barrier Reef and its understanding and acceptance of the provisions of zoning, regulations and management practices;
- to provide recognition of Aboriginal and Torres Strait Islander traditional affiliations and rights in management of the Marine Park;
- to minimise costs of caring for and developing the Marine Park consistent with meeting the goal and other aims of the Authority;
- to minimise regulation of, and interference in, human activities, consistent with meeting the goal and other aims of the Authority;
- to achieve its goal and other aims by employing people of high calibre, assisting them to reach their full potential, providing a rewarding, useful and caring work environment, and encouraging them to pursue relevant training and development opportunities;
- to make the authority's expertise available nationally and internationally;
- to adapt actively the Marine Park and the operations of the Authority to changing circumstances.

The Great Barrier Reef Marine Park is not a National Park. It is a multiple-use protected area, fitting the definition of Category VI of the classification system used by IUCN, the World Conservation Union (IUCN, 1994), while recognising that areas within the Park meet a number of other IUCN categories. The Park also meets the criteria for selection and management as a Biosphere Reserve, although it has not been formally proposed or established as one. The Reef was inscribed on the World Heritage List in 1981 as a natural site, on the basis of its outstanding natural, cultural and historical features and its integrity as a self perpetuating ecological system (GBRMPAa). The Great Barrier Reef satisfies all four natural criteria of outstanding universal value set out in Article 2 of the World Heritage Convention, being:

- an example of a major stage in the earth's evolutionary history;
- an outstanding example of geological processes, biological evolution and people's interaction with their natural environment;
- a place with unique, rare and superlative natural phenomena;
- a place which provides habitats for rare and endangered species of plants and animals.

As the Great Barrier Reef World Heritage Area contains virtually all of the Great Barrier Reef, it meets the following conditions of integrity necessary to ensure the maintenance of the above values. Thus it contains:

- all the key interrelated and interdependent elements in their natural relationships;
- all of the elements necessary for the system to be self perpetuating;
- superlative natural phenomena and areas of exceptional natural beauty;
- the habitat requirements for the survival of rare and threatened species;
- protected areas for migratory species (GBRMPAa).

The Great Barrier Reef World Heritage Area consists of the Great Barrier Reef Marine Park (93 per cent of the World Heritage Area), Queensland waters not in the Great Barrier Reef Marine Park (two per cent), and islands (five per cent).

Unlike other coral reef systems in the world, the Great Barrier Reef has not been intensively used for human subsistence. Apart from some very small areas, the Great Barrier Reef is still in pristine condition relative to the majority of reef areas and has not been unduly affected by human activity (Kelleher and Craik 1992).

Planning Process, Resources and Model

Sustainable use of the Great Barrier Reef and associated islands for conservation, tourism, fishing and other uses has been planned and managed through several cycles of research, community consultation

and zoning through the GBRMPA. The most recent planning process was the World Heritage Area Strategic Plan (Chenoweth & Assoc. 1994).

From the outset, planning for control of fishing, shipping, tourism and other uses of the reef and associated waters was based on a zoning arrangement. This was implemented by dividing the Marine Park into five sections from north to south, not only to break the planning and management tasks for such a huge area into manageable units, but also to recognise that stakeholders and affected communities were associated with particular sections of the adjacent coastline. It also recognised that while the Reef is a single functioning ecosystem in many respects, its latitudinal range spans a range of distributional provenances for marine species (Kelleher and Craik 1992).

Zoning for particular activities and protective measures for each section has been based primarily on ecological needs rather than trying to meet demands for the three major groups of activities

- tourism and shipping use,
- resource harvesting - primarily fishing, and
- development - mainly land based development for tourism.

Although planning is not demand driven, protective measures are primarily aimed at controlling and directing these three broad groups of activities.

As ecological need and environmental constraints have been progressively defined and the pressures and impact of increasing use have been assessed through an extensive program of scientific investigation, zones have been periodically reviewed and amended. Each cycle of planning and zoning for each section has been accompanied by consultation with stakeholders and public review of draft plans, and has been followed closely by parallel State Government zoning of islands and foreshores adjacent to the Marine Park.

Planning for the management of the Great Barrier Reef Marine Park, comprising one of the world's most biodiverse areas, is in essence a strategy for biodiversity conservation, which to date, appears to have been relatively successful. Over-exploitation of the Great Barrier Reef has largely been prevented. A balance between human need and environmental protection has been struck through the application of a broadly based management strategy to a large marine ecosystem. This strategy caters for use, appreciation and enjoyment, while protecting a range of specific areas and organisms. (Kelleher and Craik 1992).

The Marine Parks which cover most of the Area are divided into sections. The Great Barrier Reef Marine Park Authority and Queensland Department of Environment and Heritage produce zoning plans for each section of the Reef and subject to these, management plans and operational plans to guide their activities (GBRMPA, 1994a).

Through the use of zoning, conflicting activities are separated, areas are provided which are suitable for particular activities and some areas are protected from use. Levels of protection within the Park vary from almost complete absence of restriction on activity in some zones, to zones within which almost no human activities are permitted (Kelleher and Craik, 1992).

The zones are fixed during the life of a zoning plan (generally five to seven years). They are complemented by generally smaller areas that give special protection from time to time to animal breeding or nesting sites, to sites in general use and other zones which are required to be protected to allow appreciation of nature free from fishing or collecting and to sites suitable for scientific research.

Because of a dramatic increase in use of the Marine Park by tourists, the existing zoning system, which focuses on fishing, is proving inadequate. There is increasing competition for tourism use of particular sites. Usually these sites are near major areas of coastal development (eg Cairns or Townsville) or have particular attributes which make them suitable for tourism - the Whitsunday Islands, for example (Kelleher and Craik. 1992).

The Authority is addressing the issue of localised development pressure by undertaking strategic planning exercises in areas of increasing tourism demand and undertaking research into identifying the important factors which affect amenity and social carrying capacity. Jointly with the Queensland Department of Environment and Heritage, responsible for Island National Parks and Queensland Marine Parks, the Authority is developing area statements and management plans for groups of islands and reefs and individual islands and reefs respectively. These plans, which will involve periods of public comment, will identify existing and recommended activities and acceptable levels of impact to attempt to ensure a

range of recreational experiences is available and that the cumulative effect of activities is addressed before acceptable levels of impact are exceeded through a series of individual permit decisions. Within each area ‘a range of experience settings’ is proposed to ensure that tourism does not preclude alternative opportunities.

To overcome some of the difficulties outlined above and to ensure all interest and user groups and management agencies are working to a common agenda, the Authority coordinated the development of a 25 Year Strategic Plan for the Great Barrier Reef World Heritage Area with the objective of all groups creating a shared vision of how they would like the area to be in 25 years time, and developing strategies to achieve that vision (Kelleher and Craik, 1992).

A better overall reef-wide perspective on management of the entire Area is needed in order to better fulfil the responsibilities of World Heritage management. It is a large system and needs to be managed as one through a system-wide World Heritage Area Strategic Plan for the next 25 years. The Plan also seeks to reach agreement on ‘reasonable use’, and set objectives and targets by which the effectiveness of management can be assessed, and critical issues can be addressed. The Plan aims to maintain World Heritage values while allowing reasonable use of the Area’s resources (GBRMPA, 1994a).

The planning process for the Great Barrier Reef is regarded as one of the most comprehensive and integrated in the world. It has created a shared vision among many disparate community, political and business groups and enabled them to chart a shared future for natural area management (Chenoweth & Assoc. 1994).

People and organisations who use the resources of the Area need a framework within which they can plan and operate. With a clear idea of the future directions for management, businesses and industries will know where they stand.

This planning exercise appears to be a world first. Never before has there been such a participatory regional plan based on joint decision making developed for a World Heritage Area, or indeed, any such large area (Kelleher and Craik, 1992).

However, the record of Commonwealth-State integration of responsibilities has not always been easy and there has been considerable duplication. The GBRMPA model is not one that has been repeated in other similar situations. Development approval processes are often complicated by the overlapping government responsibilities and will be difficult to reconcile with the State Government’s ‘one stop shop’ approach to an integrated development approval process. Despite the considerable resources committed to GBRMPA, the sheer size of the Great Barrier Reef and the multitude of uses and activities hamper implementation of management strategies (Chenoweth & Assoc., 1994).

In Australia the major determinant of administrative survival of organisations like the Authority is public support. In the long run, government support flows from it. Recognising that the Authority and the Marine Park concept already have a degree of public support, the Authority must act in ways which sustain or increase that support (Kelleher and Craik, 1992).

Perhaps the system of management which has been developed on the Great Barrier Reef could be applied elsewhere, although the acceptability of any management system is likely to be diminished where there are very high levels of usage and economic dependence on reef areas, for example in many parts of Asia. It is ironic that these are the areas that are most in need of management (Kelleher and Craik, 1992)..

The Plan provides a policy framework for evaluation of proposed programs and actions. Much of the success of the Marine Park is the result of applying these policies, and can be applied in natural resource management anywhere, not only in Australia. Much of the thrust of policy is communication with, and involvement of the public in the development and care of the Marine Park. Education and information programs are therefore critically important elements of the Authority’s work (Kelleher and Craik, 1992).

Nature Conservation and Biodiversity

The Great Barrier Reef is an outstanding example of biotically structured ecosystems of high diversity dependent on the structuring organisms. In addition, there is evidence that many species of structuring organisms (in this case coral) are themselves dependent on one another, with some reefs acting as critical sources of larvae and others as sinks. The Marine Park, and areas immediately adjacent to it, contain a broad range of mangroves and 14 species of seagrasses. Disruption of conditions for structuring

organisms would have negative consequences for a vast array of dependent species (Kelleher and Craik, 1992).

It has always been the aim of the Authority to ensure that the Great Barrier Reef is managed as a single ecosystem including all the waters of the Great Barrier Reef Region and the 900 islands within its outer boundaries (Kelleher and Craik, 1992).

This has largely been achieved through coordinated planning, administration and management between the Authority and Queensland Government agencies.

The effects on the Great Barrier Reef of human activities on the mainland are more intractable. Probably the major issue is run-off of nutrient enriched water from farm land. However, even in this case high levels of cooperation in research have been achieved between the Authority, farmers' organisations and State Government agencies responsible for primary industry. It seems that if cooperation is achieved in carrying out research into a problem then that cooperation is likely to extend into defining and applying ways of curing the problem (Kelleher and Craik, 1992).

Community Consultation Process

The project to develop the 25-Year Strategic Plan began in August 1991. Its purpose was to describe a future vision for the Area and to determine objectives and strategies which will ensure that this vision is achievable. An independent chairperson/facilitator was appointed to advise on participative strategic planning, to design and guide the process and to ensure that the Plan fairly represents the views expressed (GBRMPA, 1994a).

The organisations involved in developing this Plan included user groups such as tourist operators, commercial and recreational fishing groups and scientists, interest groups and Commonwealth, State and local government agencies. Over 60 organisations were represented in the planning process. The Great Barrier Reef Marine Park Authority initiated the project and acted as project manager.

While the consultation process involved Aboriginal liaison, during the process it became apparent that traditional community consultation mechanisms and tools were not appropriate for Aboriginal people (GBRMPA, 1994a).

Initially separate non-government and government workshops were held to identify critical issues and develop visions of the future.

A Planning Team was established from these two workshops to represent all the stakeholders in the development of this Plan. Guided by the facilitator, this team agreed upon a final vision and developed long-term (25 year) and short-term (five year) objectives and strategies that would realise this vision. As the strategies were being developed, feedback was regularly provided to the organisations originally involved. Formal endorsement of the Plan by these stakeholder organisations was sought. The critical issues have been referenced to the strategies (GBRMPA, 1994a).

A draft Plan was released for public comment over an eight week period in May, June and July 1992. Almost 4 000 copies of the draft Plan were distributed. Over 50 meetings were held to discuss the Plan with interested groups and more than 280 submissions were received. Some of these submissions represented an entire sector response. The submission from the conservation sector was from 11 different organisations and resulted from wide consultation within the conservation groups. The tourism submission presented comments from several meetings, workshops and discussions held with that industry by the tourism representatives on the Planning Team (GBRMPA, 1994a).

Research groups were conducted in coastal Queensland cities and Brisbane, Sydney and Melbourne, to obtain detailed responses to the Plan format and content. In total, there were 120 participants in these groups.

Specific communication strategies were conducted for local government and land-based industries, consisting of workshops in regional centres, and special mailouts. A strategy to increase the Aboriginal and Torres Strait Islander input to the Plan was developed. It included sending the Plan to Aboriginal and Torres Strait Islander organisations and communities, visits to communities and a display at the Laura Dance Festival, which is attended by almost all the Aboriginal communities from Townsville to Cape York.

The Planning Team redrafted and further developed the Plan in light of the comments received from public participation and stakeholder organisations to produce a final draft Plan.

Outstanding issues were addressed by small groups and refinements to the Plan agreed at the final Planning Team meeting on 1 June 1993 (GBRMPA, 1994a).

Current Position

Two issues could not be completely resolved during the planning process. Mining in the World Heritage Area and Aboriginal and Torres Strait Islander interests, are "in continuance", and will be negotiated on a continuing basis (GBRMPA, 1994a).

Late in 1993 resolution of one significant aspect of the mining issue was achieved with the Queensland Government's decision to ban oil drilling and exploration in areas of its jurisdiction in the World Heritage Area.

In July 1994 Tthe Strategic Plan was officially launched by the Prime Minister, the Hon. Paul Keating, and was distributed widely in July 1994.

The estimated cost for the preparation of the Strategic Plan was $200,000 - $250,000, which was predominantly consultants' fees. GBRMPA officers also played a major role, but their costs were absorbed into normal GBRMPA operating expenses.

The day-to-day management activities such as enforcement, surveillance, monitoring and education are carried out principally by agencies of the Queensland Government, subject to the Great Barrier Reef Marine Park Authority, in accordance with an agreement between the Commonwealth and Queensland Governments.

The 1993-94 costs for the day-to-day management were $6.8 million (QLD - $3.3 million and Commonwealth - $3.5 million). The estimated costs for 1994-95 were $8.7 million (GBRMPA, 1994a).

Despite the thoroughness and sophistication of planning and management for Great Barrier Reef protection, the most significant threats to biodiversity are outside the direct planning control of the GBRMPA. The increase in nutrient and turbidity levels of waters offshore from mainland agricultural and urban areas, although not yet at levels sufficient to affect the reef ecosystem, is potentially detrimental to many reef dwelling organisms and processes. The Plan's recognition of the impact of local private landholders on the reef has focused on ensuring that local government planning and integrated catchment management recognise the interaction between the reef's biological systems and the productive land uses that can have the potential to impact on them.

Conclusions

The planning, marine park management, public education and consultation initiatives of the GBRMPA, including the 25-year Strategic Plan for the Great Barrier Reef World Heritage Area represent 'best practice' in the following areas (Chenoweth & Assoc., 1994):

- Planning has been adaptive and evolutionary, having started with the challenge of adapting land-based land capability zoning to a sensitive marine environment and a 'national icon' subject to a diversity of uses and rapidly increasing tourist pressures, and community consultation awareness, Aboriginal involvement and demands for consultation; and then for its management as a World Heritage Area.
- Planning is based on best available data, with ongoing commitment to research and monitoring; and specified periods of complete review of all zoning and strategic plans.
- The approach of the Great Barrier Reef Marine Park Authority (GBRMPA) is highly consultative with all stakeholders, successfully crosses administration boundaries and balances entrepreneurial development and regulation.
- The Authority has led the way in exploring 'user-pays', developer contributions to monitoring and independent reviews of EIA, and in developing some of the other ground rules necessary for ecologically sustainable development in tourism.
- Management includes intensive education campaigns to inform the public about the need for careful management and acceptable usage; and includes promotion of the role of the GBRMPA as a responsible manager.

- The Strategic Plan incorporates ecologically sustainable development, precautionary and carrying capacity principles; and is reviewed on a regular basis.

Summary

The Case Studies reported in this section were selected because they provide well-advanced examples of bioregional planning at three quite different scales, each of which takes account of the need to maintain biodiversity.

While each of these studies focuses on a region defined by administrative boundaries (whether local, State or Federal), each also takes account of both biological and social needs in a region of significant economic productivity. In each of the Case Study regions, the need to define adequacy of reservation for nature conservation formed an integral part of land use planning.

The boundaries used are significant in each of the Case Studies. In the case of the SEQ2001 project, the Northern Rivers Region of New South Wales, which lies just over the State border, is undertaking an exercise similar in some respects to that of SEQ2001, but that work is being done in the context of NSW bioregions. However, many of the ecosystems in each of these regions (eg. coastal sand heaths, Border Ranges rainforests and others) are continuous.

The Great Barrier Reef illustrates the enormous land/sea 'barrier' which exists in planning. Despite all the sophisticated planning for the Great Barrier Reef, the greatest threat to its biodiversity is from land uses on shore over which the Great Barrier Reef Marine Park Authority has no planning authority.

None of the Case Studies examined adequately addresses cumulative or incremental impacts on land-based biodiversity, although the Great Barrier Reef study does so for marine, tidal and island areas. However, each has laid some groundwork to enable consideration of such impacts in the future. Bioregional planning needs to rely on other legislation, such as environment protection Acts to cover cumulative effects.

Each has involved extensive research and investigation of the physical, biological and cultural values of the region, although the extent to which the community was involved in the identification work varied from an extensive involvement through the Nature Search 2001 project in SEQ2001 to a much more limited involvement of 'interested individuals' and expert consultants in the Land Conservation Council's Victorian Mallee Region review.

Public consultation and review formed an important part of each of the regional planning processes reviewed in the Case Studies. However, the extent of involvement of Aboriginal people varied widely. As the Great Barrier Reef World Heritage Area example demonstrates, differences between Aboriginal and European culture require that specific communication strategies are required to properly involve Aboriginal and Torres Strait Islander peoples and to benefit from their knowledge of each region.

Significant cooperation and information flow between the various levels of government and between agencies appears to have taken place, and continues to do so, in each of the Case Study examples, although in both the SEQ2001 and the Mallee Region examples, State borders limit the completeness of information in a bioregional sense. The extent of involvement of local government and local communities also varies widely from one Case Study to the next. The management of the Great Barrier Reef involves primarily the Commonwealth and Queensland Governments, while local governments and the State Government were the principal players in the SEQ2001 project. In the case of the Victorian Mallee, the focus on public lands limited local government involvement, although the study recognises that responsibility for strategic planning on freehold land within the region rests with local government.

The influence of social and attitudinal factors on bioregional planning for the maintenance of biodiversity in each of the Case Studies is not clearly apparent, this perhaps reflecting the extent to which these factors are not yet an overt aspect of the planning process.

E. KEY ELEMENTS FOR SUCCESS AND CHALLENGES FOR THE FUTURE

The existing body of information about bioregional planning and the experience of the those who have been involved in the various precursors to bioregional planning provide some keys to the potential

success or failure of a national approach to bioregional planning for the purposes of biodiversity conservation.

Key elements for success

Sustainability

Any new approaches to bioregional planning need to be based on principles of ecological sustainability. The National Strategy for Ecologically Sustainable Development has three core objectives in reaching the goal of "development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends". These are

- to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- to provide for equity within and between generations, and
- to protect biological diversity and maintain essential ecological processes and life-support systems (p.8).

The National Strategy for the Conservation of Australia's Biological Diversity notes in its introduction that:

> Maintaining biological diversity is much more than just protecting wildlife and their habitats in nature conservation reserves. It is also about the sustainable use of biological resources and safe-guarding the life-support systems on Earth. Ecologically sustainable management of all of Australia's terrestrial and marine environments is essential for the conservation of biological diversity.

Although the National Strategy for ESD has been agreed by all levels of government and by trades union, industry and environment groups, few targeted strategies are in place and an overwhelming amount of work remains to be done on the ground. In adopting national approaches to bioregional planning in the context of sustainability, it will be necessary to look for "solutions that achieve economic, environmental and social objectives simultaneously" (Municipal Conservation Association, 1994 p. 12). This will be a major challenge for all sectors of the community, including governments, but as suggested by the draft National Strategy for the Conservation of Australia's Biological Diversity

> Integrated policies will also provide the opportunity for all Australians to accept responsibility for the impacts on biological diversity of their activities, including resource consumption, and to participate in achieving ecological sustainability within industries and lifestyles

Community acceptance of responsibility and "ownership" of solutions is fundamental to bioregional planning based on principles of ecological sustainability.

Integration of bioregional and biodiversity considerations into planning from the outset

The maintenance of biodiversity is an underpinning principle in the pathway to sustainability. It needs to be built into planning from the outset - that is, before planning and development decisions are made - rather than being considered afterwards.

Natural resources and environmental assets of value to the community, including biodiversity, are threatened by degradation and loss through changes affecting land and water. These changes can be direct or indirect.[12]

As WBM Oceanics (in preparation) identify,[13] statutory planning processes effectively comprise two closely related processes, each with different functions but similar objectives:

- The Strategic Planning Process; and
- The Development Control Process.

Land use planning and development control responsibilities of government, particularly local authorities, have been traditionally focused on direct on-site effects and their control through the development control process. The strategic planning process is normally addressed through the preparation, implementation and amendment of forward plans to guide development.[14]

As planning objectives have steadily broadened over past decades to include more environmental awareness, strategic land use planning in Australia has incorporated a greater range and depth of environmental constraints, based on a steadily increasing resource database. Adequate definition and

mapping of environmentally sensitive areas assists in appropriate allocation of land for development, and remains the first priority of planning for biodiversity conservation.

However just as infrastructure planning requires a regional approach, environmental planning requires a bioregional framework. Planners themselves play a pivotal role in pursuing more integrated approaches to development as both the work of the Upper Yarra Valley and Dandenong Ranges Authority (1992, 1993, 1994) and that of the SEQ2001 project (see Case Study 1, Section C) demonstrate. Local and regional planning should bring together the identification, monitoring and reporting of biodiversity related issues with the more routine planning processes that need to be undertaken by governments.

While some level of integration across administrative boundaries (eg. for priority wildlife corridors) can be achieved by ad-hoc liaison and joint planning arrangements between adjacent governments, biodiversity conservation requires a more comprehensive planning framework based on bioregions.

Strategic plans are implemented through objectives, specific provisions of planning schemes and other measures under the control of the planning authority. The effectiveness of these measures in achieving biodiversity conservation depends in part on clear and unambiguous objectives relating to environmental protection.

It also depends on the extent to which Strategic Planning and other components of planning schemes are amended to approve specific development projects or to incorporate new environmental information.

An ecologically sustainable approach to landscape planning is “primarily a procedure for studying the biophysical and sociocultural system of a place to reveal where specific land uses may be best practiced” (Steiner, 1991, p. 9). It is not a process which is put in place after those fundamental decisions are made in the context of “environmental impact assessment of specific projects.” (MCA, 1994, p. 13).

A wide range of activities on freehold and leasehold land may be undertaken without application of planning approval. Several of these, such as clearing, construction of houses and sheds and limited discharges have the potential to reduce biodiversity. In some cases, such activities may be controlled by existing regulations (but these may not be enforced or may be triggered only by specific complaints) but many other activities are ‘as-of-right’. Where such activities are detrimental to biodiversity, or have the potential to impact on biodiversity, appropriate planning responses may include education programs, monitoring and enforcing compliance with existing standards or legislative changes.

Many forms of habitat and landscape degradation in Australia, such as erosion, salinity and ground water changes, will continue in particular areas even if no further development or clearing takes place. Continual loss of species is inevitable unless corrective action is undertaken. Traditional planning is most effective in controlling site specific development proposals, and least effective in addressing cumulative, off-site and incremental impacts. This discrepancy is of particular concern in relation to biodiversity where habitat loss and fragmentation is almost always incremental, and can be addressed only by a regional approach to planning based on bioregions, and a key indicator of success is the degree to which planning processes can address these non-specific biodiversity threats.

Flexibility

The need for flexibility is a recurring theme in discussions of planning, as it is in consideration of the protection of biodiversity. There is a need for flexibility in defining the boundaries of communities which are to be involved[15] and in responding quickly and effectively to new information and understanding about biodiversity.[16]

Bioregional boundaries need to have flexibility not merely over time so that they can accommodate newly acquired knowledge, but also over distance.

Increased attention to the state of the world’s biological diversity and associated research have resulted in a rapidly expanding pool of knowledge regarding landscapes, ecosystems, species and their interactions and the gene pools which make up each species. This rapidly changing perspective of our biodiversity, whether at global, national or local level, must also be accommodated.

Just as the boundaries defining a bioregion must be sufficiently flexible to accommodate differing biological needs, so too the management of Australia’s landscape must be sufficiently flexible to allow adaptation to changing knowledge and changing biodiversity needs.[17] Greater integration of scientific

research with the needs of ‘on ground’ land managers will assist in maximising the effectiveness of that management for both biodiversity conservation and resource production.

Community understanding and involvement

The Landcare program, Integrated Catchment Management programs and programs for the protection of threatened and endangered species are just some of the ways in which community understanding and knowledge of issues relating to the maintenance of biodiversity are being expanded.

It is through development of a ‘sense of place’ or the establishment of ‘communities of common concern’ that community involvement can grow and become a pivotal part of bioregional planning. [18]

Already, community consultation and community participation are a growing feature of government processes. This is particularly the case at the local government level. Brown et al. (1992), considered the differences between local government and the other two spheres of government and observed that local government is community based - “issues of development, conservation and adaptation cannot be isolated from the range of interests and people concerned.” (p.7). The Western Sydney Regional Organisation of Councils (WesROC) has responded to this, and has put in place community workshops and public forums which provide the people of the Western Sydney region with a sense of ‘ownership’ of planning processes in that region. However, until now those processes have not included a biodiversity aspect.

Local knowledge has an important role to play, not only in increasing the expertise available to identify important aspects of biodiversity in a particular region, but also in extending community knowledge of and involvement in biodiversity issues. As noted in the National Biodiversity Strategy rapid biological diversity assessment offers an opportunity for such combined benefits.

> Rapid biological diversity assessment uses a range of methods that facilitate rapid field survey work and classification. The fieldwork normally involves a multidisciplinary team, including experienced field scientists and people with local knowledge, in surveying component groups representative of biological diversity.

Cranston & Hillman (1992) have applied this approach to the assessment of freshwater species within an area of the Murray-Darling Basin near Albury. From that study they conclude that “very effective field collection can take place with minimal supervision and training [of non-specialist workers], given an established sampling protocol” (p.153).

It is through processes such as this that community involvement in and understanding of biodiversity can be increased and at the same time gaps in our knowledge of biodiversity in a particular region can be improved.

The needs of particular sections of the community must be considered carefully. A key indicator for a successful community involvement process is the existence of appropriate mechanisms to overcome obstacles to Aboriginal participation in land use and management. It may be useful in many cases to incorporate traditional Aboriginal land management practices into community approaches to biodiversity conservation as a way of overcoming these impediments.

Aboriginal expertise is also invaluable in the definition and description of regional and local biodiversity, drawing upon oral histories and long-established patterns of resource management to identify habitats and variations in plant and animal communities.

Critical to success will be a recognition of the voluntary labour that is involved in community group participation in bioregional planning, and where possible providing recompense for expenses that are incurred. As the Conservation Council of South Australia observes (Letter dated 17 Jan 1995):

> The principle of paying for the informed and representative input of community groups (made up almost entirely of volunteers), just as industry would be remunerated, is one which we have been putting to the State Government for a while now. As a movement, it is essential that we stress the worth of our input and the need to resource it.

The National Strategy for the Conservation of Australia’s Biological Diversity identifies as actions required in establishing and undertaking bioregional planning units for the maintenance of biodiversity:

> providing mechanisms for genuine, continuing community participation and proper assessment and monitoring processes (Action 1.2.1e); and

providing suitably trained facilitators to help with community participation, facilitate cooperation, and encourage resource managers to pursue ecological sustainability. (Action 1.2.2f)

Again, the recognition that resources will need to be made available to provide suitable facilitators and ensure that mechanisms are inclusive is a key indicator for success.

Appropriate structures and mechanisms

The need for improved integration of the roles of each level of government, the community and industry is a recurring theme in relation to both regional planning and attaining ecologically sustainable development. To date, the mechanisms for ensuring that all levels of government and the community are involved at appropriate levels is in an embryonic state, although the need for their urgent development is increasingly well understood.

The Commonwealth Taskforce on Regional Development (1993), while failing to focus on environmental needs, did propose "new institutional arrangements to support regional development". The Taskforce

> avoided suggesting a fourth sphere of government or the establishment of new layers of bureaucracy, focusing instead on ways of bringing together people with ideas and leadership to promote economic growth (p. 4).

In his Working Nation Statement (1994b), the Prime Minister was similarly reluctant to have the Commonwealth Government "mandate uniform solutions". Instead the 'Working Nation' strategy is "based on partnerships with key local groups and support for effective regional groupings" (p.161).

The need for more integrated working arrangements is also recognised at State government level. For example, a Queensland Government officer asserts that national policies and strategies providing direction for nature conservation and a desire to embrace ecologically sustainable development "will be of limited value unless concerted intergovernmental and community efforts are made to achieve their implementation" (Sattler, 1993).

It is local governments which have greatest control over land development. Local government is already "becoming recognised as the cornerstone of state, national and global sustainability, rather than being bypassed by the other government spheres" (Brown, 1994 p.9).

Local government activities, including strategic planning, the specific provisions of planning schemes and other local planning measures need to include clear and unambiguous objectives relating bioregional boundaries if regional biodiversity is to be maintained.

Auditing processes and mechanisms

It is important to the long-term viability and success of any bioregional planning programs for the maintenance of biodiversity, that mechanisms are established at the outset to enable regular auditing[19] and assessment of performance. Without this, governments may expend substantial resources in ignorance of whether or not the stated objectives of the program are being attained. Community participants are also likely to lose interest if they feel they are involved in a program which is 'going nowhere', and the goodwill between the various stakeholder groups may well be lost.

The importance of a management planning process for protected landscape areas which identifies goals, objectives and priorities, and establishes consultative and participatory processes has been highlighted by a number of observers (Lucas, 1992; Tyldesley, 1992) This is particularly relevant at the local government area. However, as Greening Australia (1994) notes, this needs to be progressed more rapidly:

> Few examples exist of progress reporting on greening strategies across municipalities. Most local governments are still making their initial measurements about the state of their plant cover. (p.116).

Challenges for bioregional planning for the protection of biodiversity

Defining appropriate boundaries

As discussed above, the role of local government is pivotal in bioregional planning. As outlined in earlier sections[20], work by CSIRO and others to define regions compatible with local government Areas has not

been adopted or used by any level of government or by the community. As a nation, we have not yet developed a system of boundaries which is accepted in defining a bioregion and the problems of relating official statistics to 'natural' regions such as river catchments must also be overcome.

Beyond the issues surrounding compatibility of information from one source to another, there are also issues relating to the constitution of the most appropriate 'bioregion' in a particular context. As the Commonwealth EPA observes (1992) "Different regionalisations are likely to be appropriate for different priority issues" (p.14). For instance, while a catchment boundary is almost certainly the most relevant context in which to consider water quality, a vastly different boundary might be ecologically more meaningful to the study of a large migratory bird species.

Issues of scale, methodology and acceptance of change from the current situation all impact on the defining of appropriate unit boundaries which are acceptable to all key stakeholders. The Global Biodiversity Strategy (WRI, IUCN, UNEP, 1992) points out that

> the success of biodiversity conservation will depend on how well the ***overall*** landscape is managed to minimise biodiversity loss. Human needs and activities must be reconciled with the maintenance of biodiversity and protected areas must be integrated into natural and modified surroundings.

In doing so,

> Farms, forests, grazing areas, fisheries and villages belong on the same planning grid as land restoration projects, protected areas and species conservation efforts. The scale of such efforts must be tailored to both ecological processes and the needs and perceptions of local communities (p.97).

The National Strategy for the Conservation of Australia's Biological Diversity, also identifies a need to:

> Determine principles for establishing bioregional planning units that emphasise regional environmental characteristics, are based on environmental parameters, and take account of productive uses and the identity and needs of human communities as appropriate. (Action 1.2.1)

Identifying appropriate scales for planning

Planning processes for biodiversity protection will rely heavily on the quality of mapping of biodiversity characteristics. The scale of mapping for various applications must also be such that it enables overlaying of different types of information.

The Commonwealth/State interim bioregionalisation for Australia (Thackway & Cresswell, 1994), tried to define a starting point for work on the use of bioregions within which to identify nature conservation reserve needs across the country. However, the bioregions defined through that process are designed to cover the whole continent. The information is not sufficiently detailed to serve the needs of the local farmer striving to develop a whole farm plan within the context of the region in which s/he lives. It may not even be adequate to define nature conservation needs at a local level. This larger scale level of mapping is going to be needed for the implementation of local bioregional planning, and to ensure the acceptance and understanding of the community.[21]

A particular example of this is seen in the vegetation mapping work completed for the Hobart City Council (Johnson, 1994). While this work provides a sound environmental management database, the Council's Bushland Manager notes that the scale used in vegetation mapping is far larger OR SMALLER than that used for local government planning systems.[22]

Working towards full knowledge of Australia's biodiversity

Whilst it is widely recognised that as an island continent that has long been isolated and has special climatic features, Australia is home to an enormous variety of unique plants and animals (Mummery & Hardy, 1994), our knowledge of that diversity is far from complete. It has been estimated that

> After 150 years of study.....we have identified less than 50 per cent of native species and at the present rate it will take another century for the documentation to be completed (Commonwealth of Aust, Biological Diversity Advisory Committee, 1992 p. 14).

The development of a more complete store of information on biodiversity is the first objective of the National Strategy for the Conservation of Australia's Biological Diversity, which sees this as "essential for its [biodiversity's] conservation and management".

Experience in precursor projects and in the case studies demonstrates that acceptance and understanding of biodiversity by communities is greatly enhanced by understanding of its values, both

economically and ecologically. Work towards increased knowledge has already begun at a variety of levels, but a vast amount remains to be done. There is an extensive storehouse of information available in the minds of 'on the ground' land managers such as farmers, foresters and fishers, and the government extension officers and advisers who work with them. Increased knowledge of Australia's biodiversity will almost certainly best be achieved through the involvement of local people working in collaboration with scientific experts.

Improving awareness and understanding of biodiversity and its value

The economic, cultural and historical experiences of an individual and the context in which each person exists all have a significant influence on the values and attitudes which they hold.

Both evaluative beliefs about the consequences of performing a particular behaviour, and subjective norms relating to the way in which other people will view that behaviour will influence individual behaviour (Eiser, 1986). Past behaviour, attitudes and subjective norms can mutually influence one another. The salience of a belief at a particular point in time also influences attitudes as people with different attitudes tend to regard different aspects of an issue as significant.

Dunlap and van Liere (1978) note that in the USA the "nation's ecological problems stem in large part from traditional values, attitudes and beliefs within our society", an observation which is readily extended to Australia. Cameron & Elix (1991, pp. 211-214) demonstrate that the social dynamics acting in rural communities have a large impact on the character of land management decision making. The way landholders perceive themselves influences their reaction to external pressures, with both political and cultural history and the sense of isolation and community solidarity in rural townships influencing behaviour [23].

Retrospectively rezoning areas from development uses to nature conservation or removing historical expectations of the right to develop are not accepted well by the public. This is one important aspect of the social and attitudinal factors limiting conservation of biodiversity in many instances. If biodiversity is to be conserved, then the attitudes and values which underpin past behaviours must be understood and reshaped.

Studies in social psychology have much to offer in bringing about that change. Zimbardo & Leippe (1991) identify the fact that just as knowledge of human psychology can be used in advertising, marketing and sales, so too can that same systematic knowledge be used "to promote positive and pro-social causes and to give direction to efforts aimed at improving the quality of life" (pp.330-331).

Egger's work in changing health-related behaviours (Egger, Spark & Lawson, 1992) has relevance to changing environmental behaviours in Australia. In the same way that health promotion strategies depend for their success on targeting according to a range of factors[24] so too will behavioural change to conserve biodiversity depend on these factors.

The concept of 'biodiversity' is both complex and broad-ranging. Even the definition outlined in the National Strategy for the Conservation of Australia's Biodiversity (see Section A) is not a simple concept for non-scientific members of the community to grasp, and there are added complications. Across our planet, we know relatively little of the richness of microorganisms which exist, and as Sattler (1993) points out, there may well be an advantage to bioregional planning to add a fourth tier to the pyramid of life's diversity - that of landscape diversity.

An Australian survey of local governments conducted by Brown et al. in 1992 showed that biodiversity was not a high concern for the respondents.[25] This may arise in part from a general lack of knowledge of biodiversity in all its complexity, but it may also be attributed to the lack of information available in appropriate forms. This is reflected in Brown's (1994) observation that "Council staff from all departments were very clear about the difficulties of gaining access to information of use to them even when they knew where the information was held, for instance, in a state or national database" (p. 47).

By contrast, the 'destruction of trees/ecosystems' was one of the highest community concerns in an Australia-wide environmental survey conducted by the Australian Bureau of Statistics (1993). Whether this translates into an understanding of biodiversity and a willingness to work to protect biodiversity is another question. It is unlikely that Australians would differ greatly from US citizens who were canvassed in a recent survey and found to have low levels of understanding about biodiversity and its importance.[26]

Educating the community about biodiversity will be a complex process, and it is likely that a variety of education techniques will be needed, each targeted at different sections of the community. It is also likely that "action" education where people learn about biodiversity as they are involved in its protection will be one of the most effective methods to ensure long-term commitment. As Miller & Lanou (In press) identify, participation through shared responsibility is central to biodiversity strategies and action plans:

> Through communication and negotiation, participants explore their values, perceptions, and interests regarding their ecosystems, resources, economy, and society and debate and agree on goals, objectives and actions. Values are changed or strengthened, and knowledge is imparted. Participants inform others about the strategy.....(p.25).

Improving liaison/information flow between government agencies and between levels of government

As former Prime Minister Keating observed in his 'Working Nation' statement:

> Local prosperity and the quality of life depend on business, government, unions and community groups and the way they work together. The better they interact, the more likely it is that economic and social objectives will be achieved at the local and therefore the national level (Commonwealth of Aust., 1994b p.159).

That is as true for environmental protection and the maintenance of biodiversity as for any other issue affecting the quality of our lives.

Not only are there barriers to information flow between government agencies[27], but people in the community are also confused about the diverse array of information which they receive generally about government policies and programs. All too often, people in the community seek greater coordination between government departments. A 'one stop' shop is sought by those using a variety of government services, and such an approach might well be as necessary in disseminating information about biodiversity as it is about a host of other government functions.

Some of these difficulties are particularly apparent at local government level. There is inadequate transfer of existing environmental information from its origins in environmental science to its application by local government (Brown et al., 1992) and a break down of information transfer within local councils themselves.[28]

At interview, IMROC's Executive Officer commented on the need to bring bioregional concepts and concern for the maintenance of biodiversity into the planning process. This need is reinforced by Dr Phil Price of the Land and Water Resources R&D Corporation, who identifies as one of two "widespread constraints to the planning and delivery of effective conservation of biodiversity throughout Australia .....the lack of any effective process by which biodiversity concerns can be brought into planning processes so that resource use and management options can be compared and alternatives and trade-offs selected". The Municipal Conservation Association (1994) also identifies a need for planners to take an active role "in pursuing a more integrated approach to development" (p.13).

Providing appropriate and equitable compensation

Any approach by government to conservation measures on private land is strongly influenced by considerations of compensation and equity. Community demands for protection of natural areas and ecological processes on freehold or leasehold land inevitably involve inequitable restrictions on clearing and other activities. The expectation that governments will pay compensation to landholders for changing the status of property from existing or potential commercial production use to a conservation use is a significant impediment to the conservation of biodiversity.

Ecologically Sustainable Development requires that "individual and community well-being and welfare are enhanced by following a path of economic development that safeguards the welfare of future generations" (Commonwealth of Aust., 1992a p. 8). If this is to be taken into account economically, then the stock of natural capital present on our land and in our seas should be maintained. That this can have both economic and ecological benefits is beginning to be recognised in the rural community, but it is a long-term perspective which many in the community find difficult to accept, particularly in difficult economic times.

Questions about who should pay the costs of maintaining areas for the conservation of biodiversity, and the extent to which individuals share a responsibility for this are hotly debated across a range of

resource uses and levels of government. It may be that property valuation methods, local government rating schemes and the taxation system should all be modified to ensure greater incentives for the conservation of biodiversity, without the need for direct financial compensation for perceived loss of profits in the short-term.

For example, the Queensland Nature Conservation Act (1993) provides for gazettal of Nature Refuges on private land, and for negotiated Government financial assistance with fencing and other management. However, the provisions of the Act with respect to local government rate reductions have to date not been willingly implemented by local councils.

F. DISCUSSION

There is a wide spectrum of views relating to the most effective way of establishing a society based on the principles of ecological sustainability. At one end is the "small is beautiful" visions of cooperative market gardens, poultry and fish production, banks and "business incubators" (to facilitate the start up of small businesses) proposed by "deep" green economists such as Trainer[29]. At the other end we find the comments adopting the rhetoric of sustainability, but leaving the "ecological" out of ESD or changing the term to "economically" sustainable development. ESD for some is not much more that a synonym for development with some token gestures towards environmental clean-up. If Australia is to become an ecologically sustainable society, it must integrate ecological issues into everyday planning and development at all levels and in all sectors.

The Federal Government is endeavouring to find a path somewhere between these two extremes, and in adopting the three parallel principles of ESD, the Convention on Biological Diversity, and the National Strategy for the Conservation of Australia's Biological Diversity, has committed itself to consider the protection of biodiversity at an equivalent level with the goals of economic well-being and social equity.

However, as indicated in Section C, the intellectual and political exercise of putting the principle of biodiversity protection into action is proving very difficult. The ESD process lasted more than a year, produced voluminous quantities of paper, and yet the vast majority of its recommendations, including those concerned with biodiversity, have yet to be put into action. Environmental protection in general is still seen to be an "add-on", which gets considered in development processes as the optional extra of environmental impact assessment.

Scientific work in the area of bioregional planning has focussed on mapping exercises, at varying degrees of scale. These have provided the basis for discussion among those concerned with the protection of biodiversity, but have so far failed to provide a framework which is consistent with the socio-political property ownership boundaries that have emerged historically and are well entrenched and understood at all three levels of government.

Regional planning on the other hand is becoming well established in Federal Government policy making, and as a funding priority. Section B outlined a number of significant Federal Government programs which focus on regional planning processes. The view that economic growth for Australia will be driven from a regional base has taken hold in many parts of Federal Government decision making. Some of these regional planning documents do incorporate references to environmental protection in their mission statements. In large part, however, environmental protection is considered in the context of the protection of a natural productive resource base, important primarily for the ongoing viability of industries and local, regional and national economies dependent on these industries. The Regional Development Program which has received significant public attention and funding fails to place significant emphasis on environmental protection in its mission statements or guidelines.

Separate exercises, coordinated by different parts and different levels of government encourage planning at a catchment level, and work towards the involvement of local land managers. Total or Integrated Catchment Management programs provide the opportunity to move towards bioregional planning, but are currently focused on the productive aspects of land management, and are again, not well coordinated in a planning sense, across local and State government boundaries.

In this discussion paper, we have called those activities which have the potential to develop into bioregional planning for biodiversity conservation, precursor activities. Given the significant number of precursor activities identified, the existing strategies and government policy documents and the large

amount of scientific research which has already occurred in this area, there is a strong base on which to build new Federal, State and local government initiatives in the area of bioregional planning for biodiversity conservation.

Lessons can be learned from the successes and failures of previous attempts to introduce bioregional planning, and from the successes of nation wide projects such as Landcare in involving people in the community in unified action for that community.

But most importantly, the Federal Government can play a leading role in recognising the importance of the involvement of the community, and of government at all levels, in any meaningful attempt to work within a bioregional planning framework to protect biodiversity.

The World Conservation Union (IUCN) and the International Institute for Environment and Development (IIED) have developed ten guiding principles for biodiversity planning (See Miller & Lanou, In press)- principles which are designed to be applicable to developing and developed countries. These international principles give a clear directive that any process which requires actions from individuals and communities facing a plethora of environmental problems across a wide and varied landscape, must be driven from the community level, albeit encouraged and guided by government intervention.

The first three principles reinforce the policy context into which Australia's bioregional planning for biodiversity conservation must continue to fit. For a developed country like Australia, facing serious species extinction and other biodiversity problems, the "productivity and diversity of ecosystems" must at least be taken into account equally with the "improve[ment]" of the "well-being of people".

The second three principles reflect the decades of experience of these international organisations in working with developing countries towards environmental objectives, and are fully consistent with government philosophy and current land management programs such as Landcare and TCM/ICM.

Encouraging the community to initiate and support bioregional planning processes for biodiversity conservation will not be a simple task. In many cases it will be a seemingly altruistic activity (as opposed to land management for productive purposes). It will require a more sophisticated and resource intensive approach to community consultation/participation than is currently in operation in this country. The case studies show that the changes in resource management and decision making necessary to ensure biodiversity conservation are more effective and long lasting with genuine and widespread community support. Changes imposed by government have immediate effect and help create the climate for attitudinal change, but without community support such reforms are unlikely to be sustainable.

"Ten Guiding Principles for Biodiversity Planning

1. Biodiversity strategies, action plans, or programs should improve and maintain the well-being of people and the productivity and diversity of ecosystems.
2. They should contribute to the larger goal of sustainable development.
3. Objectives should be selected from the full scope of the Biodiversity Convention
4. The biodiversity-planning process must be adaptive and cyclical.
5. The process should be as participatory as possible.
6. Communication and negotiation must be the lifeblood of a biodiversity-planning process.
7. Biodiversity planning's success depends on decision making and action.
8. The biodiversity-planning process should be integrated into each country's decision making system.
9. The capacity for biodiversity-planning process needs to be built at the earliest stage of the process.
10. External agencies should be 'on tap', not on top.

Miller & Lanou (in press), Adapted from Carew Reid *et al*. 1994

A major element in gaining community support is the dissemination of information regarding trends in biodiversity and the implications of such trends continuing. For example, when Brisbane City Council publicised data showing that Brisbane was losing several football fields of bushland every week, public support for vegetation protection measures was assured. Similarly, the growing body of scientific information indicating that the major threat to the Great Barrier Reef is now potential water pollution from mainland land use activities is creating a climate of public concern conducive to change.

However, these expressions of community concern need appropriate participatory planning processes to become effective agents of change. Community driven planning processes have proven their value in the two-way ("top down" and "bottom up") communication between agencies and the public, and in facilitating genuine change.

In looking at rural land management, including the protection of biodiversity, in 1991 Cameron and Elix commented that "Any discussion of mechanisms to achieve change in rural land management must consider whether landholders would change their behaviour as a result of the implementation of these mechanisms". The same holds true for any other sector of landholders and land managers - that is, "Any discussion of mechanisms to achieve change in the forestry industry must consider whether forest industry executives, unions and employees will change their behaviour"; "Any discussion of mechanisms to achieve change in the urban environment must consider whether government officials, businesses and residents will change their behaviour."

Of course, in considering all the landholders and land managers across Australia who have the potential to impact on biodiversity, there is a vast multitude of factors which influence their behaviours. There is no one program of bioregional planning for biodiversity protection which is going to be able to influence more than a section of the population.

Aboriginal and Torres Strait Islander communities will, for example, require different approaches to bioregional planning than will predominantly European communities, or communities where there is a high percentage of migrants or people from non English speaking backgrounds.

The success of the Landcare movement in mobilising activity in rural areas is considered to be unprecedented, although there is to date little proven evidence of the extent to which these activities actually achieve the goals of ameliorating land degradation. It has been considered to be successful as a "bottom-up" approach, providing government support for community initiatives, providing opportunities for leadership by example. It is seen to be based on principles of social change which would work in Australia's independent-minded rural communities. It has provided resources for programs which in a majority of cases were aimed at improving productivity in the long term, and it is well funded compared to programs which had less production oriented aims. It stands today as a significant precursor for bioregional planning, but it may not be the approach which would be successful in convincing the forestry industry to change its forest management practices, or local government officials in inner West Sydney to undertake and fund natural environment protection programs.

Hollick (1990) contended in the case of Australian landholders that their decision making reflected far more than the rational scientific goals and objectives that form the basis of policy making. For example, factors such as a desire for independence, qualitative rather than objective interpretation of environmental degradation, and desire for stability, are important in influencing the behaviour of landholders in land management. Quite different factors are likely to influence the decision making of urban dwellers, the managers of resource based industries or the developers of new tourist resorts. And quite separate factors are likely to influence the decisions of Aboriginal people in rural areas of Australia.

Due to the pervasive and varied nature of programs needed to bring about bioregional planning for the protection of biodiversity, there is a need for targeted mechanisms to bring about attitudinal and behavioural change - targeted at those people who have the ability to bring about change, and based on the knowledge of the factors which are important to those people in different parts of Australia, and in different biogeographical regions. And these mechanisms will need to be considered in conjunction with the plethora of other programs, policies, government priorities and actions that are currently in place, and are outlined in this discussion paper.

The Principles above reinforce the view that a fundamental aspect of that targeting needs to be involvement, participation and a sense of "ownership" among communities which are being asked to be involved in bioregional planning for biodiversity conservation. The problems are too widespread, the solutions too diffuse and varying, and the communities and populations involved too different from each other to respond well to a uniform national approach of any description.

Principles 7-10 define a government role for bioregional planning for biodiversity conservation. An issue highlighted earlier in this report is the ubiquitous nature of biodiversity. It is not an issue which falls easily within one portfolio area, and its protection needs to be considered in any decision which will impact on the natural environment, including those taken by Federal Government resource, trade and

economic portfolios, State government land management decisions, and local government decisions across a wide variety of areas.

While there is clearly a role for inter- and intragovernment cooperation and information exchange, in order that this occurs efficiently, there is a need for a well-resourced lead agency to monitor government decision making at all levels, and to provide general input and direction at strategic points, and general advice on priority projects. Given the technical environmental expertise and national overview needed, it is logical that the Federal Environment portfolio should take on this role.

This would necessitate a 'process oriented' approach to biodiversity protection, shared between the Federal Government, the non-government sector, and local and State governments, to integrate biodiversity protection within existing programs, rather than establishing new programs.

This approach would have the added benefit of introducing biodiversity protection as a concept into a wide variety of decision making bodies at all levels. As this report indicates, "biodiversity" is sometimes a difficult concept for the non-scientist to grasp. Practical demonstration, by showing how biodiversity can be protected at an individual program level, could be an effective educational tool.

If biodiversity is to be protected, pragmatic decisions will need to be made about how to inject efforts at the appropriate levels, and at the appropriate times. Prioritisation will be inevitable, with priorities to be set at a number of levels. Some broad biogeographic regions (eg. the Mitchell Grass Downs in western Queensland) will be priorities over other less well conserved biogeographic regions. Within broad bioregions, specific habitats , such as wetlands, native grasslands and rainforests, will deserve priority. Also of importance will be the establishment of mapping at local and regional scales in ways which are consistent and able to form part of a national database. Priority setting might be guided by

- geographical areas where regional planning processes are already occurring (precursor programs)
- areas where there are demonstrated high levels of interest in environmental issues;
- demographic groups where interest in environmental issues is highest;
- areas where biodiversity threats are highest;
- areas where biodiversity qualities are highest.

There is a strong scientific basis for choosing to target national efforts in areas where the levels of biodiversity are highest or most significant. However, it may be that given the low levels of community understanding of biodiversity, the goals of demonstration and community education dictate prioritising programs with high public profile and levels of interest from outside the Environment portfolio. The balance between perceived scientific needs of biodiversity and the importance of stimulating public awareness and participation will vary with the context in which they are assessed, and each will have to be weighed carefully in allocating resources.

For example, given the strong interest in environmental issues among young people (95 per cent were "Very Concerned" or "Quite Concerned" about Australia's environment according to a recent Newspoll [Australian, January 21-22 1995]), projects which interest and involve young people may be considered a priority.

Another criterion that will need to be considered in this process-oriented approach will be the level of advancement of the precursor regional planning process. Earlier in this discussion paper it was noted that biodiversity and sustainability goals were most likely to be achieved if planning for the protection of biodiversity was incorporated from the outset of an overall planning process. Thus, biodiversity is considered along with economic and social considerations in the development of a land management plan for a particular bioregion, and development proposals emerge which represent compromises between varying interests. This compares with the prevailing approach to environmental protection which considers the impacts on the environment of a proposed development after that proposal has passed through several stages of consideration.

The Federal Department of Environment might therefore consider that it is a priority to direct efforts into emerging regional planning processes, rather than those which are well advanced. Again, this prioritising process may not lead to the protection of lands with the highest levels of biodiversity, but instead may lead to successful integration of biodiversity protection into precursor regional planning processes. This may prove to be demonstrative of important principles which can later be adopted in other localities

Earlier in this report the lack of understanding of biodiversity throughout the community was noted. Political decision making is as affected by this problem as decision making in other parts of the community. While funding to this area should clearly increase as an understanding of the issues grows, it is likely that the most effective use of limited resources will occur by building on, and supplementing the precursor programs which already exist and are working effectively.

This approach, one of complementary program development and integration, compares favourably with the risk of establishing a completely new framework for biodiversity protection. Such an alternative would ignore the reality that there is significant work happening on the ground which, with effort and injections of resources, could be enhanced to bring about the protection of biodiversity.

Principle 10 also reinforces the role that government experts, particularly scientific experts might play in bioregional planning for biodiversity conservation. As shown earlier in this report, a major focus on bioregional planning to date has been the discussion of potential bioregional boundaries and the first step should be a decision on boundaries according to scientifically based criteria. The discussion of boundaries is important, but it now needs to be used in such a way as to enhance an understanding of biodiversity protection. Further scientific research in this area needs to be encouraged and resourced, but the debate and the research should be targeted and focused on regional programs adopted as priorities for the integration of biodiversity protection. In other words, such debate and research should be used as educative tools in an effort to improve community understanding and acceptance of biodiversity protection.

Through extensive work over recent years, the Federal Environment portfolio has made major contributions to the development of a national bioregional map, which is now largely agreed across the States and Territories as a tool for designing a national reserve system. This continental scale mapping needs to be brought down to the local level, for the education and use of land managers, at a regional, and even individual property level. There is an important role for the Federal Environment portfolio, and other departments working in this area to facilitate local bioregional mapping through the provision of expertise and assistance on the ground.

In practice this would mean, for example, that for any particular regional planning exercise, bioregional mapping experts would research relevant bioregional boundaries for threatened biodiversity, establish potential regional boundaries at a scale compatible with local planning processes and understanding, and work with the local community to promote these as part of the integration and education processes. Some precursor regional planning process boundaries (eg the Commonwealth Department of Housing and Regional Development's Green Triangle) do not relate in any way to medium to large scale bioregional boundaries, but may incorporate numerous smaller bioregional boundaries which can be understood and used by local land managers. Others (eg SEQ2001) have made efforts to establish smaller environmental regions, and these may be able to be linked successfully within communities to bioregions.

Further scientific discussion of boundaries needs to occur in the context of practical land management for biodiversity protection, and will be a major contributor to overcoming some of the technology transfer difficulties referred to earlier in this report.

G. CONCLUSIONS

As identified in the Introduction to this discussion paper, its purposes are to:

Provide a framework for bioregional planning and how it can be implemented in Australia in ways which will assist in the conservation of our rich biological diversity

and

Put forward proposals that will facilitate the use of a bioregional approach in developing regional planning which involves all levels of government, industry, environment groups and local communities.

A number of key concepts have emerged throughout the discussion:

1. **Scientific research** to define appropriate regional boundaries and to expand biodiversity identification and mapping now needs to **occur as the first step in bioregional planning and land management activities** of communities, local and State governments. The scientific and mapping information

currently available at broad scale provides a sound base on which to move forward to direct actions and decision making in a local and regional context.

2. **Community involvement** is essential at all stages in bioregional planning for biodiversity conservation. Successful examples of bioregional planning and its precursors have involved consultation with community representatives and have involved local and State government from the beginning of their planning processes.
3. **The coordination and integration of actions by the three levels of government** is necessary to ensure appropriate definition of bioregional boundaries for each particular region and the development of common goals and objectives for biodiversity conservation at the regional level. Within each bioregion, it will also be necessary to delineate sub-regions within which local governments and the community can plan and implement biodiversity conservation measures.
4. Planning is an important beginning to the protection and sustainable use of biodiversity within each bioregion, but expertise, resources and mechanisms for **ongoing management** of land, water, infrastructure and human activities, as well as the administration of each region must also occur at the bioregional scale.
5. **Flexibility and adaptability** should be the hallmarks of any national approach to bioregional planning for biodiversity conservation, in response firstly to the variety among the communities and individuals who need to be involved, and secondly, to the growing knowledge and understanding of biodiversity problems which need to be addressed.
6. **Resourcing of national approaches** to bioregional planning for biodiversity conservation needs to include significant funding if approaches to communities, local and State governments are to be successful. Interagency cooperation and interpersonal communication with communities and individuals are critical to the success of the Federal Government taking a lead role in this area, and these should be resourced at meaningful levels. Interest and stakeholder groups need to have the opportunity to participate in bioregional planning processes, and therefore sufficient resources need to be made available for these processes to be accessible to a wide range of people.
7. **Prioritisation** of resource allocation is imperative, and in prioritising there is a need to consider the competing claims of areas with existing programs (which may be considered to be precursors to bioregional planning), areas with high biodiversity value, areas with significant and immediate threats to biodiversity and areas and communities which have high demonstration potential.
8. The establishment of **performance indicators** against which to measure levels of success is essential, both in order to monitor the recovery or maintenance of biodiversity values, and to encourage ongoing involvement and enthusiasm of communities, local and State governments.

Establishment of a national framework

The National Strategy for the Conservation of Australia's Biological Diversity sets the overall directions for a bioregional planning approach, establishing the goal of "protecting biological diversity and maintain[ing] ecological processes and systems". It also lays out clear objectives and actions. Bioregional planning for biodiversity conservation is a mechanism for achieving the goal and objectives, and for "enacting" the actions. It should have three components:

1. An initial and primary focus on the goal of "protecting biological diversity and maintain[ing] ecological processes and systems", rather than on the potential competing mechanisms for its achievement.
2. The development and implementation of a model planning process for protection of biodiversity, which is capable of being adapted to a wide variety of bioregions throughout Australia and which involves the regional community and local and State governments at each stage.
3. Sufficient resourcing to allow the implementation of the model planning process throughout Australia according to national priorities.

The experience to date in planning exercises of this sort indicates that one of the difficulties of processes which involve communities, industries and government is the conflict that is created by the clash of entrenched positions and ideologies around environmental issues. Although the research in this area is limited, and the Commonwealth Government will be breaking new ground, it seems clear that focusing on

the desired outcomes in the early stages of planning provides an opportunity for outcomes to be agreed upon. Using experts to provide advice at relevant stages is important to providing an objective information base. These two factors, agreed objectives and objective information, make rational decision making more likely and less conflict ridden than is possible under existing planning processes. It is the prevailing wisdom that decision making at a local level, where participants have a real and direct interest in an agreed outcome, is likely to be less plagued by ideology and entrenched positions than are such discussions at a State or national level.

Bioregional mapping can suggest the boundaries of a planning process. Defining a bioregion should take place through scientists working with State and local government representatives and interested members of the local community to bring together a "community of interest" on a sufficiently large scale to allow bioregional planning for a number of biodiversity values.

A model process which would be capable of being adapted to the variety of circumstances might have the following components:

a. definition of an appropriate bioregion, based on scientifically identified boundaries

Ecologists, mapping experts and those concerned with water catchment and other scientific research would work with State and local governments to define the most appropriate natural boundaries upon which to begin bioregional planning and implementation of programs for the identification and maintenance of biodiversity.

b. identification of the biodiversity to be protected within a "community of interest"

A public involvement campaign would clearly define and interpret the concept of biodiversity, at the same time as it invited participation in identifying key elements of biodiversity in the region. Community groups, industry representatives, relevant State agencies and local government officials (who together represent a "community of interest") would be approached to provide input, probably to a government funded detailed survey of biodiversity values within the bioregion. Working with relevant scientists, individuals and interest groups within the community would then use agreed methods to collect information about the biodiversity of the region, thus completing a 'rapid biodiversity assessment'. It is likely that partnership agreements may be struck between one or more levels of government.

c. identification of the threats to biodiversity to be protected within the "community of interest"

Once biodiversity values have been identified, focus groups would be held to discuss threats to that biodiversity. The focus would be upon the actual threatening processes, rather than any particular mechanism which might be adopted to halt the threat.

d. expert advice sought on the best means of combating the threats

Focus groups would work with experts provided by scientific institutions, and all three levels of government to ascertain what needs to be done to stop the threats degrading biodiversity values.

e. community agreement on a vision for the future of biodiversity in the region and the best strategies to combat the threats

Focus groups would be helped through experienced facilitation and dispute resolution where necessary, to reach agreement on how to use the expert advice, and the information they have collected themselves, to protect the biodiversity in their region. Achievable targets on the way to achieving their goals would be agreed.

f. incorporation of strategies into ongoing activities and existing planning processes

Local and State government officers, who have been involved in the planning process through focus groups, incorporate the strategies into their work plans and strategic plans. Local landholders and industries are encouraged to incorporate the strategies in their day-to-day activities.

g. ongoing monitoring and reporting

Local and State government officers would incorporate consideration of the agreed targets in their annual reporting, and support community biodiversity "watchdog" groups which would monitor the effectiveness of the strategies, and initiate their amendment as necessary. The "watchdog" group would

also take account of new information about biodiversity values, and maintain a watching brief on biodiversity values. The results of ongoing biodiversity monitoring would be reported regularly through State of Environment or other reports by local, State and National governments.

H. RECOMMENDATIONS

1. **That** the Commonwealth Government seek to achieve conservation of biodiversity through cooperative work with other government agencies and communities on a bioregional basis through
- partnership arrangements with local and State governments on bioregional projects for biodiversity conservation;
- the work of biodiversity officers located in areas prioritised for biodiversity conservation through bioregional planning;
- the work of ERIN and other scientists supporting the conservation of biodiversity by providing on the ground expert advice at an appropriate scale for incorporation into bioregional plans, and
- education and promotion of biodiversity.

2. **That** a model process for bioregional planning for biodiversity conservation be developed incorporating the following elements:
- identification of the bioregion, based on appropriate natural boundaries;
- identification of the threats to biodiversity to be protected within the "community of interest";
- expert advice being sought on the best means of combating the threats;
- community agreement on a vision for biodiversity in the region and the best strategies to combat the threats to it;
- incorporation of strategies into ongoing activities and existing planning processes, and
- ongoing monitoring and reporting.

3. **That** the Commonwealth Government encourage State and local governments to incorporate regional biodiversity conservation objectives and guidelines into their policy formulation and planning processes.

4. **That** the Commonwealth Government undertake practical research into community participation and education methods for increasing involvement in biodiversity conservation.
5. **That** Commonwealth Government initiatives focused on regional development include an emphasis on the use of bioregional boundaries appropriate to the conservation of biodiversity, and the inclusion of biodiversity considerations in their working plans.
6. **That** through the Australian local government Association and Municipal Conservation Associations, Regional Organisations of Councils (ROCs) be encouraged to include the conservation of regional biodiversity among their priority objectives
7. **That** in undertaking the work of spearheading bioregional planning for the protection of biodiversity, the Commonwealth Government ensure that adequate resourcing is provided both for the process as a whole, and to sufficiently support community involvement in that process.
8. **That** the planning professions ensure that strategic plans, policies and land use controls incorporate biodiversity conservation as a high priority objective. This should occur within a bioregional framework established and maintained with community participation as well as interagency and intergovernmental cooperation across administrative boundaries.

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[1] The Strategy was initially drafted by an Advisory Committee involving representatives from Commonwealth and State governments, forestry, farming, mining, fisheries, and tourism industries, conservation organisations and scientists. It was developed and finalised by the ANZECC Taskforce on Biological Diversity. This Taskforce committee included representatives from the Australian and New Zealand Environment and Conservation Council and five other Ministerial Councils.

The Strategy was signed by the Commonwealth, and all State and Territory Governments, in February 1996.

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[2] Several of the Schedules to the InterGovernmental Agreement on the Environment also place emphasis on the maintenance of biodiversity. Under schedule 2 (Resource Assessment, Land Use Decisions and Approval Processes), clause 3(ii) includes "the assessment of the regional cumulative impacts of a series of developments". The whole of Schedule 6 (Biological Diversity) is relevant to this Discussion Paper, but is now superseded by the National Strategy for the Conservation of Australia's Biological Diversity. Schedule 9 (Nature Conservation) is also of direct relevance to land use decisions affecting flora and fauna, but it is primarily aimed at measures for 'significant species' rather than the biodiversity of entire regions.

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[3] The Australian Bureau of Statistics, in its 1992 publication 'Australia's Environment: Issues and Facts' also identifies the need for regions for the purposes of national environmental reporting.

> The statistical geography which underpins most of the ABS socio-economic data series is based on administrative boundaries...
>
> For the purposes of environmental analysis however, other geographic regions are frequently more useful. ...The issue to be pursued at a national level is to define a set of regions that will be used for environmental analysis, but incorporating socio-economic analysis. Once agreement has been reached, then all owners of data sources would ideally arrange for their data to be aggregated to these boundaries (pp. 345-346).

Also, the Discussion Paper on Development of a National State of Environment Reporting System (CEPA, 1992) highlights the need to relate official statistics to 'natural' regions in State of Environment reporting.

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[4] Interest group representatives included a local primary producer, a nominee from local organisations, a representative of the Victorian Conservation Council, and a nominee from each of the Ministers responsible for forestry, conservation, and social welfare and a representative of the Melbourne and Metropolitan Board of Works (the Melbourne planning authority).

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[5] A computer search of literature in both Australian university libraries and selected overseas libraries using the key words 'bioregions' and 'planning' identified only a relatively small number of relevant publications. This search was supplemented by perusal of relevant sections of the University of New South Wales library catalogues. Written requests were made to relevant Commonwealth and State government agencies, the Australian Local Government Association, the Municipal Conservation Association, through the 'CouncilNet' computer bulletin board and through contact with academics, non-government organisations and consultants known to have interests in bioregional planning, biodiversity conservation and related areas.

[6] The Inner Metropolitan Regional Organisation of Councils (IMROC) brings together ten inner metropolitan Sydney Councils to "cooperate to share resources and further the interests of its members and their communities" with the long-term goal of developing "sustainable and involved communities, having access to services and facilities which fulfil their needs". The Executive Officer of IMROC commented at interview that biodiversity is an issue only among Environment Officers working within the Councils involved. It does not appear as an issue either in the IMROC 1993/94 Annual Report or in the Strategic Plan.

[7] One of the CSIRO team members comments that:

> The integration of nature conservation and ecologically sustainable development in agricultural regions is dependent upon the development of strategies which simultaneously account for economic, agricultural, social and conservation objectives. ...The success of such a program will depend upon the co-operation and collaboration of a large number of individuals from a range of backgrounds and organisations. Responsibility for conserving Australia's unique natural heritage must increasingly be shared between Government agencies, community organisations and individual land holders. (Lambeck, 1994).

[8] The strategy (1994) aims:

> ...to promote the sustainable use of the Murray-Darling Basin's resources, through coordinated and cooperative Community and Government actions. The strategy has identified responsibilities of action:
> - at the Regional level where community initiated activities are supported by government, and
> - at the Basin-wide level where Government action includes community involvement as appropriate.

[9] In its 1995-96 guidelines for funding applications, the National Landcare Program stresses that the Commonwealth places "particular importance" on projects which:

- "improve the ability of communities and resource managers to manage land, water and related vegetation in a sustainable manner;
- address the causes of environmental and resource degradation, rather than the symptoms, and
- promote integrated approaches to catchment or regional planning and management....." [emphasis added].

[10] As discussed by Buhrs & Bartlett (1993),

> The restructuring of national environmental administration, the comprehensive reorganization - indeed, virtual re-creation - of local government in New Zealand, and the comprehensive reform of environmental statutes through the Resource Management Act 1991 are three profound and remarkable reforms. ...The Resource Management Act and Local Government Amendment Acts assigned major responsibilities for environmental policy ... to newly created local and regional councils. Together with the reorganization of national environmental administration, these reforms established a comprehensive new framework for management of water, land, and other resources... (p. 113).

[11] As discussed by Alexandra (ACF, 1994)

> **The difference between the unitary system of government in New Zealand compared with the duality of Australian Federal system of government makes the direct transfer of the New Zealand model impossible. However, Australia needs to examine the New Zealand precedent and investigate how it may be applied, especially considering the magnitude of our resource and environmental management problems. (p.22).**

[12] Direct on-site effects include:

- planned land use changes and developoment;
- clearing and other changes for 'as-of-right' land uses;
- continuing detrioration from past activities;
- natural perturbations such as fire, flood and climate change.

Indirect and off-site effects result from surrounding land use changes, 'as-of-right' uses and deterioration, and cumulative or incremental effects.

[13] In a consultancy on biodiversity conservation in urban and semi-urban areas, currently being prepared for the Federal Department of Environment, Sport and Territories.

[14] The major generic 'tools' for this role are:

- Acquisition and/or reservation of high priority conservation areas as nature reserves;
- Strategic Planning to allocate particular types of land (and water) use to those areas best suited for each broad type of activity to meet community objectives;
- Zoning to control land uses and activities mainly to separate incompatible uses. Conservation and protection zones are increasingly being used to protect environmental values on freehold land, and activities allowable on rural and rural residential zones can also be reviewed and amended to take biodiversity protection into account;
- Development control measures, such as regulatory mechanisms, and conditions applicable to specific development proposals or types. This may include park contributions and easements for wildlife movement or remnant vegetation, restrictions on habitat removal and fencing, environmental impact assessment and management plans etc.;
- Impact Assessment Studies undertaken as part of development applications. The Terms of Reference for such studies, which in general should be triggered by and based on specific objectives and performance criteria in planning schemes, can require site specific investigations to be broadened to include biodiversity and bioregional considerations, and
- Environmental Management Plans, which are often required as part of initial impact assessment. On site management of development activities such as clearing, fragmentation, erosion and other pollution, and of pre-existing site degradation, can not only reduce detrimental impacts on habitat and biodiversity but can offset some of these impacts by rehabilitation. However, the effectiveness of these commitments can be substantially enhanced by consistency of priority requirements and management throughout each catchment and bioregion, and by adequate monitoring and enforcement.

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[15] The Municipal Conservation Association (1994) notes that "In aiming for sustainability, we need to form some picture, however murky, of a sustainable local community. Uncertainty surrounds both the ultimate goal and even many of the strategies for moving towards it. Under these circumstances, the approach used has to be a flexible one, so that it can be adapted to changing needs" (p.13).

[16] The House of Representatives Standing Committee on Environment, Recreation and the Arts (1993) reports that "Scientific experts and land managers point out that environmental regionalisations are not immovable, their borders generally being the averaged midpoint of a gradient of environmental and biological variables, and as new knowledge becomes available temporal and spatial flexibility is required". However, it goes on to caution that "Whilst there is some flexibility in methodologies, these must be scientifically credible, explicit and at an appropriate regional scale...." (p.15). Also, Thackway & Cresswell (1992) in an opening discussion of the need for environmental regionalisation commented ".... it is hardly reasonable that a single regionalisation of ecosystems would suffice for all land use planning and management applications. Rather, what is needed is the development of repeatable methods and flexible approaches for classifying environmental data into integrated regions, depending on the requirements of decision makers. Basic to these requirements is that such approaches must be understandable, explainable and defendable" (p.1).

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[17] The need for this flexibility is recognised in action 1.2.1g of the National Biodiversity Strategy:

> incorporating flexibility, to allow for changes in land use allocation, including multiple and sequential uses of particular locations, and to accommodate improvements in knowledge and management techniques and changes in institutional arrangements.

[18] The Municipal Conservation Association (1994) notes:

> Sustainability cannot be achieved, nor significant progress towards it made, by governments alone..... There will be a need [however,] to ensure that all key stakeholder groups have the opportunity to be involved in creating a shared vision of a sustainable local community and in developing strategies for attaining it. In most communities, this will require current processes of consultation to be extended and improved.....In addition to their roles in consultation processes, members of the community are essential to achievement of sustainability because of their activities as consumers, workers, educators and managers... (p.14).

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[19] The Municipal Conservation Association (1994) describes auditing as:

> a process of assessing the effectiveness of a system in achieving stated objectives, including legislative and regulatory requirements.....Environmental audits can be applied to organisational structures, administrative and operational procedures, work areas, operations, processes or documentation and record-keeping (p.18).

The National Strategy for the Conservation of Australia's Biological Diversity recognises this need in that one of the actions for achieving management for biodiversity on a bioregional basis is:

> providing mechanisms for genuine, continuing community participation and proper assessment and monitoring processes. (Action 1.2.1e)

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[20] See Section B and Dept. Arts, Heritage & Environment, 1983

[21] Dr Phil Price (LWRRDC - Letter dated 5 Jan 1995) notes in his correspondence:

> It will be essential to build effective linkages between planning for conservation of biodiversity at a bioregional scale, and the mechanisms for delivery of improved resource allocation and management which will operate at the smaller scales of paddock, property, rural towns, sub-catchment or catchment.

[22] Brown (1994) also observes that in a survey of local governments responsible for coastal management, information most important to their work was not available to them at an appropriate scale.

[23] Dr Phil Price (Letter dated 5 Jan 1995) identifies a reluctance to change when he states:

> It is my belief based on my own observations....that the majority of people living in rural communities are not yet ready to accept action based only on the need to conserve biodiversity.
> That reluctance stems in part from a lack of adequate information, but it also relates to an inherent resistance to change.

[24] "1. the characteristics of the target group and their needs;
2. the type of intervention required;
3. the timeframe of the project;
4. the goals of the organisation sponsoring the project; and
5. resources available, both financial and human" (p.119),

[25] The lack of priority given to loss of biodiversity is reflected in the observation that the Inner Metropolitan Regional Organisation of Councils does not include biodiversity needs in its 1994-97 Strategic Plan, and in the absence of biodiversity among priority issues being addressed by the Western Metropolitan Regional Organisation of Councils (S. Crawford, pers. comm.).

[26] Savage (1993) begins an article in the US magazine 'Defenders' with the words:

> What do people know about biodiversity and how its loss is likely to affect their lives? The answer is not much according to a nationwide survey. (p. 32).

[27] In addressing where we are now with respect to the maintenance of biodiversity, the intersectoral issues paper (Commonwealth of Aust., 1992b) produced within the Ecologically Sustainable Development process states that:

> "Issues of interagency disputes in relation to land management objectives, lack of coordination between institutions within States and across State and Territory borders, conflicting objectives, and lack of uniformity of management, planning and research arrangements, all contribute to an unsatisfactory system." (p.28).

[28] In her later work, Brown (1994) identifies an "isolation of occupations and [of] councils" as significant in limiting information flow and communication necessary for integrated environmental management. She notes that:

> "If the different occupations within local government are to gain access to the resources of the key policy sectors, there must be effective communication channels within and between local government and the other policy sectors.....In practice, of course, transfer must be negotiated between power blocks of stakeholders, specialised skill territories, and parallel communication channels respectively.

[29] Trainer comments in a recent article that:

In many academic and practical fields there is now a most important distinction between two world views and development paths. The old 'strive for more growth and higher living standard' path is still very dominant but against it there is now a large literature, and many groups and projects emphasising that a sustainable society has to be based on simple material living standards and highly self-sufficient, small scale, participatory and local economic systems. (Trainer, 1994 p. 6)