

NATIVE VEGETATION INSTITUTIONS, POLICIES AND INCENTIVES

Synthesis Report to Land and Water Resources R&D Corporation and Environment Australia
National Program on Rehabilitation, Management and Conservation of Remnant Vegetation

Carl Binning and Mike Young
CSIRO

CSIRO Wildlife and Ecology

Resource Futures Program

Dynamic Resource Accounting and Policy Evaluation Project

GPO Box 284

CANBERRA ACT 2601

Ph: +61 - 2 - 6242 1600

Fax: +61 - 2 - 6242 1782

Email: Resource.Futures@dwe.csiro.au

Internet: <http://www.dwe.csiro.au/research/futures>

Disclaimer:

The information contained in this report is provided for the purpose of general research and policy development and should not be relied upon for the purpose of a particular matter. Legal advice should be obtained before any action or decision is taken on the basis of any material in this report. CSIRO does not assume liability of any kind whatsoever resulting from any person's use or reliance upon the contents of this report.

CONTENTS

EXECUTIVE SUMMARY	5
Institutional Issues	5
Policy Design – Model Toolkit	7
1. INTRODUCTION	10
2. INSTITUTIONS FOR MANAGING NATIVE VEGETATION	12
2.1 Clarifying Roles and Responsibilities of Government	13
2.2 Role of Non-Government Organisations in Fostering Partnerships	20
2.3 Principles for Institutional Design	28
3. POLICY TOOLKIT	30
3.1 People – Education and Motivational Tools	32
3.2 Finance – Incentives for managing biodiversity	36
3.3 Security – Property right and land use planning tools	43
3.4 Principles for Policy Design	47
4. CASE STUDIES	49
5. KEY POLICY CHALLENGES	56
Institutional Issues	56
Policy Design and Implementation	58
REFERENCES	62

CSIRO PROJECT

INCENTIVES FOR REMNANT VEGETATION CONSERVATION

This report synthesises the outcomes of a three year project undertaken by CSIRO Wildlife and Ecology which has identifying opportunities for the use of incentive based instruments in the conservation of native vegetation. The project is funded by Environment Australia and the Land and Water Resources Research and Development Corporation.

The report is supported by 6 more detailed reports which have been prepared on more particular aspects of the project. These reports are:

Motivating People: Using management agreements to conserve remnant vegetation - addresses the role of financial incentives and legally binding management agreements in promoting the conservation of native vegetation on private land. It develops a conceptual framework for the project by identifying the situations in which different types of financial incentive can be most effectively used to conserve native vegetation.

Beyond Roads Rates and Rubbish: Opportunities for local government to conserve native vegetation – evaluates the role of local government by identifying: strategies for working with local government, the tools they can use, the issues that need be addressed to raise their capacity, and how natural resource management institutions can more effectively engage local government.

Opportunity Denied: Review of the legislative ability of local governments to conserve native vegetation - evaluates impediments to local governments using a range of innovative incentive-based instruments. A number of important legislative barriers to local government playing an effective role in native vegetation management are identified.

Talking to the Taxman About Nature Conservation: Proposals for the introduction of tax incentives for the protection of high conservation value native vegetation - reviews the impact of Commonwealth taxes on the conservation of native vegetation. It is found that conservation activities can in certain circumstances be highly taxed and puts forward proposals to address these situations.

Conservation Hindered: The impact of local government rates and State land taxes on the conservation of native vegetation - evaluates existing exemptions from these taxes and the impact that different methods of land valuation. State and local taxes are shown to have widely varying impacts on conservation activities.

Landscape Conservation and the Non-Government Sector – which identifies opportunities for the community sector, philanthropists, businesses and governments to conserve native vegetation through the creation of markets for environmental services.

The aim of the project has been to address the issue of conserving native vegetation in a way that is relevant to the non-government sector and all spheres of government: Local, State and Commonwealth. Enquiries can be directed to:

Carl Binning
CSIRO Wildlife and Ecology
GPO Box 284
CANBERRA ACT 2601

Phone: (02) 6242 1671
Fax: (02) 6242 1555
Email: c.binning@dwe.csiro.au

EXECUTIVE SUMMARY

Native vegetation is amongst Australia's most precious and valuable natural assets.

Native vegetation underpins the conservation of biodiversity – the variety of all life and the physical environment in which life is found. It also provides many other environmental services including the sequestration of carbon, maintenance of hydrological balances that prevent dry-land salinity, and the purification of water.

But native vegetation is under threat. Land clearing continues to outstrip replanting despite a commitment of over \$1 billion by the Commonwealth government to these activities.

Ultimately on-ground programs are required that target and reward land managers who actively manage areas of native vegetation on their land – be it private or public land. However, the project has revealed that the pathway to this outcome is rather more complex. Rather than focussing exclusively on land managers, it is necessary to understand the economic and social factors that are driving the land-uses and management practices that are causing the continuing loss of native vegetation.

Conserving native vegetation demands that we understand and create markets that value the role of natural systems and ecological processes in sustaining landscapes. Landscapes and the issues embedded within them vary enormously, from the protection of remote wilderness areas to maintaining the productivity of agricultural regions and the quality of life in cities.

This report sets out principles and guidelines for the design of institutions and policies for the conservation and sustainable use of native vegetation.

INSTITUTIONAL ISSUES

Successful approaches to native vegetation require coordinated responses from all scales of management. At a national and state scale broad objectives are set and defined. At regional and local scales these broad objectives are interpreted in the context of local circumstances. Finally at property and paddock scales pragmatic decisions are made about management needs and how these can be dealt with on the ground.

The critical role of regional planning in balancing the need for scientific assessment, leadership and centralised planning from the “top down” with strategies for engaging landholders and local communities from the bottom up is highlighted. Core principles that should guide the development of successful regional approaches include:

1. **Clear definition of roles and responsibilities** – between decision makers, stakeholders, and government and non-government organisations involved in the delivery of vegetation programs.
2. **Maintenance of outcome based legislative frameworks** – that set minimum standards including regulation of broad scale clearing but give flexibility to regions in how they meet these objectives.
3. **Delegation and development of action based regional strategies** – which integrate native vegetation management natural resource issues and focus on achieving well defined outcomes.
4. **Flexible delivery of programs** – including active involvement of the non-government sector in implementing the full range of policy instruments.
5. **Adequate funding** – to ensure regional programs are appropriately funded and resourced to meet the objectives set by higher levels of government.
6. **Monitoring and review** – to ensure regions are accountable and to facilitate institutional learning and adaptive management.

Regional planning is critical, but it does not follow that regional communities should always take the lead. The role of leadership is shown to depend on the capacity of local institutions and the degree of consistency between national and local objectives. Optimal strategies will vary from full devolution in high capacity regions to leadership by State and Commonwealth governments in capacity building, conflict resolution and structural adjustment in more difficult regions. This is a hard truth. The bottom line of needing to address most natural resource management problems at a regional scale can be generalised. Who should lead that process cannot.

Institutional Challenge 1 – Establishing Secure Regional Institutions

The fundamental challenge to policy makers is to move towards the creation of regional structures for natural resources that are: stable, manage adaptively and have adequate resources to address the issues for which they have responsibility.

- State governments have primary responsibility for facilitating improved coordination of existing fragmented legal and organisational structures for natural resource management and resolving their efficient application at a regional scale.
- The forthcoming national natural resource management statement will need to resolve the Commonwealth government's involvement, particularly in relation to providing adequate resources at a regional scale.

Institutional Challenge 2 – Targeting Public Investment

Native vegetation policy requires a committed long term response from Commonwealth and State governments which recognises the need to build capacity and to target priority regions and issues.

- Regional plans will be required in order to be able to assess and quantify the contribution of on-ground works to meeting regional objectives.
- Data bases that record the impact of public investment across all land use tenures on an ecosystem basis are required.

Institutional Challenge 3- Engaging the Non-Government Sector

To facilitate dialogue and on-ground partnerships it is recommended that a forum be established with a mandate to develop a Charter for Community-Business-Government partnerships for landscape conservation that defines:

- a vision for the role and growth of non-government investment in landscape conservation;
- strategies for capacity building covering provision of expertise and networks for information sharing, and programs for organisational learning;
- arrangements for joint funding of large investments in conservation at a regional scale; and
- the development of markets for environmental services that allow urban populations to donate or purchase shares in landscape reconstruction.

POLICY DESIGN – MODEL TOOLKIT

Figure 1 provides an overview of the range of instruments that can be used to implement policies for the conservation native vegetation. The toolbox is divided into the following broad categories (Binning and Young, 1997a).

- **People** - the tools that can be used to motivate and retain landholders support for vegetation programs.
- **Finance** - the incentives that can be provided to share the costs of managing vegetation.
- **Security** - the regulatory, legal and voluntary property right instruments that can be used to provide secure adaptive management of vegetation.

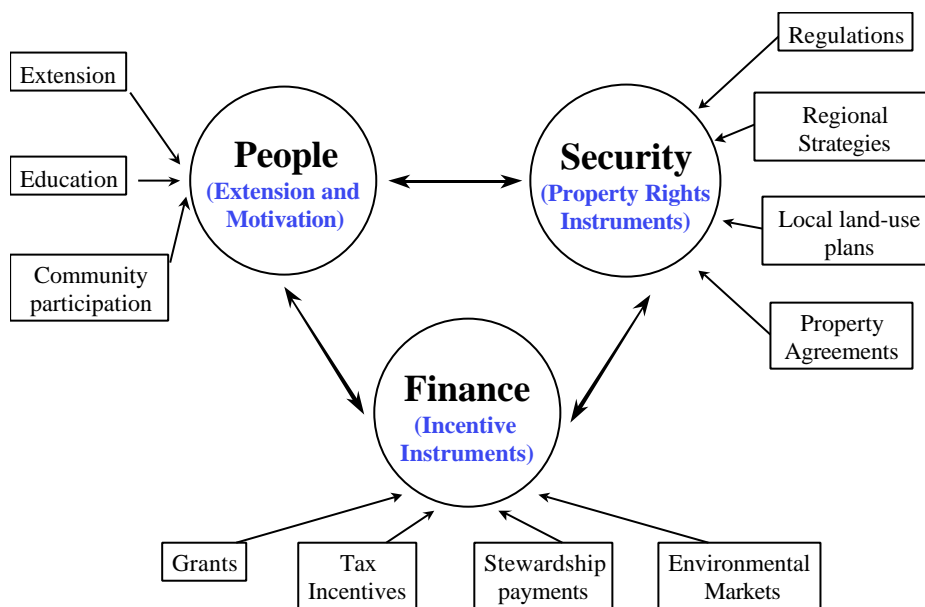


Figure 1: The policy mix

The tools identified in figure 1 provide a powerful framework for the development of policies that translate strategic planning into on-ground action. There is considerable evidence that policies that harness the synergies between: educational (people), regulatory (security) and economic incentives (finance) are likely to be more effective both in terms of cost and environmental outcome.

Policy ordering is, however, important. In general, awareness raising through education is a necessary first step, followed by incentives that reinforce landholder motivation and achieve behavioural change, and then, finally, property right based tools that secure environmental outcomes at an appropriate scale. However, the emphasis and ordering of policy may shift. For example if dramatic structural change is required in a short time frame, regulatory changes imposed by central government coupled with incentive payments that facilitate transition may be justified.

Getting the mix right is essentially about understanding environmental objectives and then addressing distributional issues through appropriate transition arrangements. This requires good judgement.

Policy Challenge 1 – Impediments to the use of policies

Impediments to the use of the full range of policy instruments for native conservation remain at local and regional scales.

- A comprehensive review of existing legislation to redress legal impediments to the use of innovative policy instruments is required in each State.
- Developing model policies for vegetation management and providing financial support and expertise to facilitate their use could resolve policy and cultural resistance to the use of innovative tools.

Policy Challenge 2 – Maintaining extension and education

Extension and education programs are integral to securing resources from decision makers and participation from landholders.

- Extension services need to be coordinated across natural resource management programs and be funded from core government funds.
- Education programs that target decision makers and the general public are also required.

Policy Challenge 3 – Tying incentives to environmental benefits

Incentives should be differentiated and more closely tied to environmental benefits through appropriate cost-sharing frameworks.

Policy Challenge 4 – Facilitating environmental markets

Incentives and markets that link regional and urban Australia are required to facilitate direct investment in native vegetation by non-landholders. There is an ongoing need to facilitate innovation and market creation through:

- further extension of tax incentives for donations including: extension of tax deductibility over 5 years to bargain sales of land, loss of land value from entering a conservation covenant and donation of land with a retained right of occupation;
- extension of the Landcare rebate to works on land covered by a conservation covenant;
- facilitation and research into the creation of markets for environmental services provided by native vegetation including carbon, water purification, salinity mitigation and biodiversity;
- environmental accreditation; and
- vegetation offsets programs.

Policy Challenge 5 – Regulating vegetation clearing

Nationally consistent approaches to the regulation of broad-scale clearing are required to reverse the long term decline in the extent and quality of native vegetation.

- Queensland and Tasmanian frameworks remain inadequate although processes for addressing land clearing in Queensland are being developed.
- In the absence of this minimum standard the effectiveness of community based voluntary programs must be questioned.

Policy Challenge 6 – Integrating native vegetation into regional and local-use planning

The most effective way to secure the conservation of native vegetation is to ensure land is appropriately zoned ahead of development pressures.

- Data on the distribution and quality of native vegetation should be included and taken into account in all strategic land-use planning processes.

Policy Challenge 7 – Expanding access to conservation covenants

To facilitate greater uptake of conservation covenants all States should move to establish independent conservation trusts with the power to enter conservation covenants.

- Trusts should be able to delegate their capacity to enter covenants.
- Covenants should allow for the separation of environmental services from land title to facilitate the creation of environmental markets.

Successful approaches to institutional design and the implementation of policies for sustainable vegetation management take time to develop. They require an adaptive approach that facilitates institutional learning. This is most clearly demonstrated by the case studies reported in the body of the report that reveal that best practice takes in excess of 10 years to achieve.

Many regions have started and are moving towards the achievement of best practice. However, for those who haven't, strong support and leadership from Commonwealth and State government is still required.

1. INTRODUCTION

The management of native vegetation is a complex task that underpins the conservation of biodiversity. Whilst the concept of biodiversity – the variety of all life and the physical environment in which life is found – is simple and all embracing, it is the intersection between native vegetation, biodiversity and human systems that is complex.

Native vegetation and the biodiversity it supports pervades our everyday life to the extent that products directly derived from living organisms feed, clothe and shelter us. Indeed the functions performed by natural systems underpin the production of most of the goods and services that humans value. Examples of the services provided by biodiversity include nutrient cycling in soils, pollination, and the assimilation of wastes to provide clean water. More indirectly biodiversity provides services not as closely associated with the natural world, such as medicines and other high technologies (Daily, 1997). Further, industrialisation and urbanisation have made the connections between our everyday actions and biodiversity increasingly indirect. This is a critical because ultimately the economic and social drivers of society are the cause of the loss of biodiversity.

The term “threatening processes” is used to describe a wide range of physical processes and human activities that cause the loss or decline of biological diversity: that is loss in the diversity of genes, species and ecosystems. It is useful to distinguish between the various pressures or drivers that cause the loss of biodiversity. It is important to differentiate between the actual process that threatens biodiversity, the land-uses that contribute to this process and social and economic factors that drive these land uses. For example, it is land-uses such as forestry or agriculture that are often cited as a threatening process, whereas it is the activities associated with these land-uses that ultimately cause a decline in native vegetation and hence biodiversity. Table 1 distinguishes between different categories of threatening processes drawing on the work of the OECD (1996) and Young *et al.* (1996).

Direct threatening processes: relate to the physical process through which biodiversity values are lost or eroded through time.

Land-uses: identify the human activity that is likely to lead to one of the direct causes of biodiversity loss.

Underlying causes: relate to our ability to reflect biodiversity values in markets and decisions made by governments. A failure to take biodiversity values into account when developing a strategic land-use plan would be an example of a potential policy failure.

Fundamental causes: relate to those factors that are often thought to be beyond our control, but which have a profound impact on the decisions that ultimately drive biodiversity loss.

Table 1: The processes that threaten biodiversity

Fundamental causes	Direct threatening process	Land-use	Underlying causes
<ul style="list-style-type: none"> • population growth • inequality • economic growth • consumption patterns 	<ul style="list-style-type: none"> • habitat modification or destruction • habitat fragmentation • over harvesting of species • environmental change 	<ul style="list-style-type: none"> • urban development • infrastructure • agriculture • forestry • industrial processing 	<ul style="list-style-type: none"> • lack of information • market failure • policy failure

The fact that such a wide range of factors, which operate at different scales, drive biodiversity loss demonstrates that strategies for the management of native vegetation are complex and are linked to our everyday actions and activities.

Indeed in addressing the fundamental causes of biodiversity loss the OECD concluded:

“Policies which attempt to conserve biodiversity without addressing the fundamental pressure that cause biodiversity loss cannot succeed in the long run.” (OECD 1996)

This is particularly relevant in the context of planning for the conservation of native vegetation and biodiversity at a national scale. The first and most important role that policy makers can take to is to address the impacts and pressures that economic production and consumption have on biodiversity. This involves ensuring that impacts on biodiversity are integrated with other policies, including economic and social policies. This is essentially the challenge of sustainable development.

However, a range of the underlying and fundamental causes of biodiversity loss such as population growth and wealth distribution are intractable at a local, regional or even national level. Further, it would be naive to presume that we can work to fully integrate biodiversity into our decision-making and that this might suffice to address the underlying causes. Integrated decision making implies an ability to be able to incorporate consideration of the values of biodiversity into market decisions, or in other terms to “get the price right”. Tensions between economic activity and the objective of protecting natural ecosystems are likely to continue in the long term.

This inherent tension can be alleviated by policies that target the direct pressure on biodiversity, such as vegetation clearance. Successful approaches to the management of biodiversity will therefore need to operate on a number of scales, ranging from national policies that address underlying causes to specific on-ground responses to direct pressures on particular sites.

Policies must also be applied across different land-use tenures, ranging from National Parks, and other public lands, through to leaseholds and privately owned land. There are two reasons why engaging private landholders in biodiversity conservation is a particularly important. Firstly, conservation policy has traditionally focussed on the allocation of public lands and neglected the fundamental role of private individuals; and secondly, private lands contain many of our most threatened ecological communities because they are located on fertile soils with flatter topography where clearing and development has been most extensive (Pressy 1995).

Developing successful policies for the conservation of biodiversity needs to account for this wide range of different conditions. This report addresses the issue of policy development in the four sections, which follow this introduction.

Section 2 addresses institutional issues focussing on clarifying roles and responsibilities between spheres of governments, the private sector and individual landholders.

Section 3 introduces the full suite of policy tools available for conserving biodiversity; ranging through education and motivation, financial incentives and property right based instruments.

Section 4 illustrates the application of the policy tools at different scales using a number of Australian and international case studies.

Section 5 concludes the report by evaluating the current state of play in Australia and identifying priority policy issues and future research directions for further progressing the use of incentives for the conservation of native vegetation and other natural resources.

2. INSTITUTIONS FOR MANAGING NATIVE VEGETATION

This section addresses the issue of designing institutions for the protection of native vegetation.

By institutions we mean the ways in which we (humans) organise ourselves. Institutions have a profound impact on the ability of society to meet its objectives, for example wealth maximisation or sustainable natural resource management.

Institutions are made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behaviour, conventions and self-imposed codes of conduct) and their enforcement characteristics. Institutions thus shape the incentives in human exchange, whether political, social, or economic. Institutions, such as property rights (the structure of rights to resources and the rules under which those rights are exercised) are mechanisms people use to control their use of the environment and behaviour toward each other (Folk 1999).

Institutions have a profound effect on the ways in which native vegetation is managed. For example, the legal framework within which local government operates is a major determinant of how land-use planning and regulation can take place.

What is required is the development of a conceptual framework of how governments can effectively develop partnerships with landholders, community groups and other stakeholders who directly manage native vegetation. Of particular interest is how authority and responsibility can be effectively devolved from central government to regions in a way that empowers and resources local communities and the private sector to take action that is consistent with the strategic objectives of government.

Findings in this section synthesise work undertaken through this project on the role of local government and the non-government sectors (see Binning, Young and Cripps, 1999; Cripps, Binning and Young, 1999 and Binning and Feilman, 2000).

The section is structured as follows:

- First, the roles and responsibilities of governments are explored, placing particular emphasis on the role of action oriented regional plans in bridging the gap between national policy and local communities.
- Second, the critical role of the non-government sector is discussed. This involves developing innovative programs and forging partnerships with individual landholders.
- Third, key principles are developed for devolving responsibility from central government through development of regional natural resource management strategies.

2.1 CLARIFYING ROLES AND RESPONSIBILITIES OF GOVERNMENT

A critical set of questions to be asked in developing successful institutional frameworks for the management to native vegetation are:

- At what scale should different processes and threats to native vegetation be managed?
- Who should bear responsibility for managing native vegetation?
- How should differing capacities for native vegetation management at local and regional scales be taken into account?

2.1.1 The challenge of managing across scales

Figure 2 highlights the different scales at which native vegetation can be assessed and management planned for – from both ecological and institutional perspectives. Conflicts in natural resource management often arise because managers at different scales have differing objectives. For example, a farmer or developer may be seeking to maximise the economic return from their property while a land use planner at local government or state level may be seeking to retain a representative range of the different kinds of native vegetation found within the catchment. Hence it is not possible to plan for the conservation of native vegetation at a single scale because the types of actions required and the individuals and organisations responsible for taking them vary.

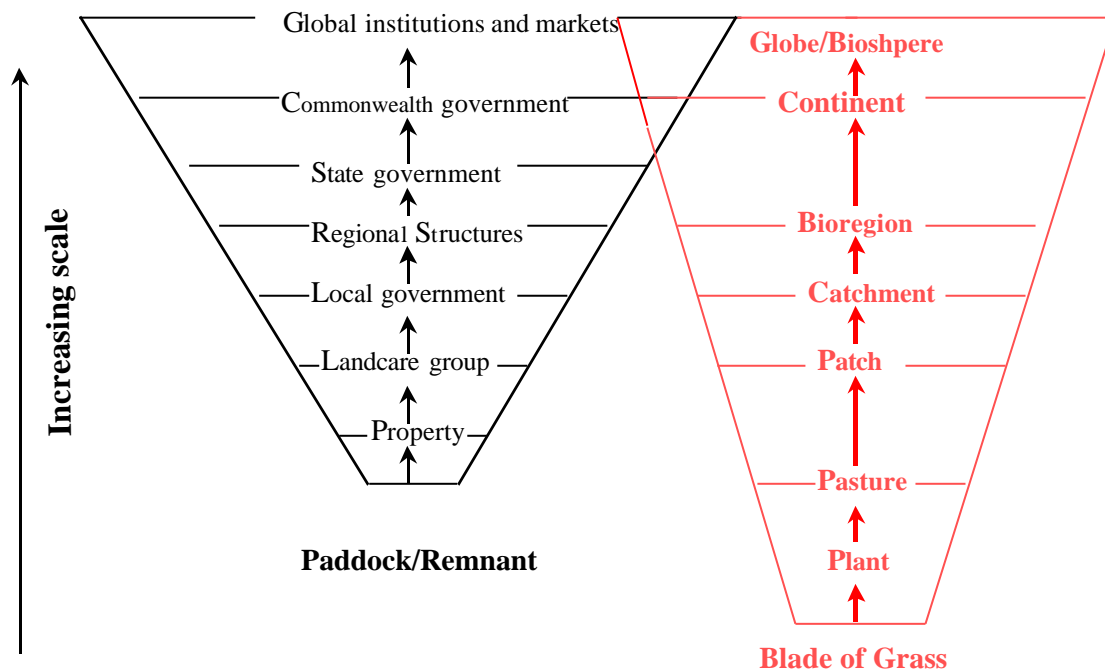


Figure 2: Different scales of ecological and institutional planning

Further, successful planning requires that the interrelationships between different natural resources be explored. For example, in catchments experiencing significant pest and weed problems the management of areas of natural habitat cannot easily be isolated from strategies for pest management. Likewise, in an urban context, planning for the conservation of native vegetation cannot take place in isolation from issues of recreation management and water quality (Binning, Smyth and Catling, 2000). In short, a holistic approach that integrates new

strategies for conservation into existing development and natural resource management programs is more likely to be successful.

Planning and involvement at each scale is necessary; to be effective the outcomes of decisions at different scales should be integrated and reinforce each other.

- At a **national scale**, decisions are made in relation to the objectives of natural resource management and how these are to be balanced and integrated with other social and economic objectives.
- Planning at a **regional scale** provides an opportunity to evaluate natural resources within natural boundaries that are relevant to meeting particular management objectives, for example, catchments for water management or a bioregion for biodiversity conservation. Planning and coordination at a regional scale allow management objectives to be reconciled at a scale beyond that of the individual landholding. For example, maintaining the variety of native plants and animals within a region requires careful planning, particularly when native vegetation is fragmented. Corridors that connect remnants are required, in addition to giving priority to the types of habitat that are rare or required to sustain focal species (Lambeck, 1999).
- At the **local scale** it is possible to interpret the objectives of higher scales and reconcile and apply them to local circumstances. At a local scale the immediate concerns of the community may be most effectively voiced. The implications of regional strategies can be determined and adjusted to meet local needs.
- At the **property and paddock scales**, more pragmatic decisions are made about management needs and how these can be dealt with 'on the ground'. At this scale, management guidelines and prescriptions are more likely to be accepted if they are flexible. This is because different landholders have differing aspirations and imperatives for the management of their land. If flexibility is provided, landholders have the ability to be entrepreneurial and create innovative solutions that strike a balance between conservation of priority areas of native vegetation, and maintenance of the economic viability of the family farm. The critical importance of this scale of management is reinforced by Australia's culture and its legal institutions, which emphasise a landholder's entitlement to autonomously manage their land within a framework of very broad constraints and obligations.

2.1.2 Who should bear responsibility for biodiversity management

The previous sub-section demonstrated that managers at all scales must bear some responsibility for biodiversity management. The challenge lies in developing approaches where the actions of managers at each level are complementary and reinforce one another, rather than being in conflict. This requires coordination and the development of cooperative partnerships.

Binning and Young (1997a) highlight the critical role of **regional coordination** in providing the linkage between **commitments** to biodiversity conservation made at the national and state level and **planning** for and **implementation** of strategies for on-ground works at a local level. It is difficult, however, to develop clear divisions of responsibility as each tier of government has an active interest in the performance of the management regime as a whole.

Young *et al.* (1996) have argued that these tensions can be resolved through the principle of subsidiarity, that is, devolution of management responsibility to the individual or lowest institutional level able to take effective action. Further, they recommend that no level of government be able to reduce standards for management set by another level.

Campbell (1996) distinguishes between different scales of policy development and the role of regional planning by distinguishing between the concepts of regionalism and regionalisation:

... there is a convergence [of policy development] from two directions, meeting at the regional level. The bottom-up phenomenon is *regionalism*, and the top-down move to a regional focus for program delivery is *regionalisation*. This is not an academic distinction, as the imperatives driving them are distinct and different. Regionalism is about autonomy and identity at a regional level, and about ‘scaling up’ to better engage with particular environmental and social issues, driven from below. Regionalisation is about central governments achieving efficiencies and effectiveness by concentrating program delivery at the regional scale, usually while retaining financial control and hence program direction. It is not uncommon for the two forces to be at cross purposes, with regional community leaders having very different aspirations for particular programs from those held by policy makers in Canberra or State capitals (Campbell, 1996).

This is a very important observation as the tensions between regionalism and regionalisation are clearly apparent. Developing institutional structures that balance the need for scientific assessment, leadership and centralised planning from the “top down” with strategies for engaging landholders and local communities from the “bottom up” is clearly critical.

Figure 3 puts forward a conceptual model that illustrates the hierarchy of institutions that have an interest in natural resource management and the roles they may play at different scales. The figure highlights a number of issues and principles for institutional design.

- Management needs to be linked across scales with each tier of management having unique responsibilities within a nested hierarchy.
- Regional coordination and planning has the potential to bridge the gap between “top-down” and “bottom-up” approaches.
- A diversity of partnerships with both government and non-government players is required to develop successful programs with local communities and landholders (we return to this issue in Section 2.2).

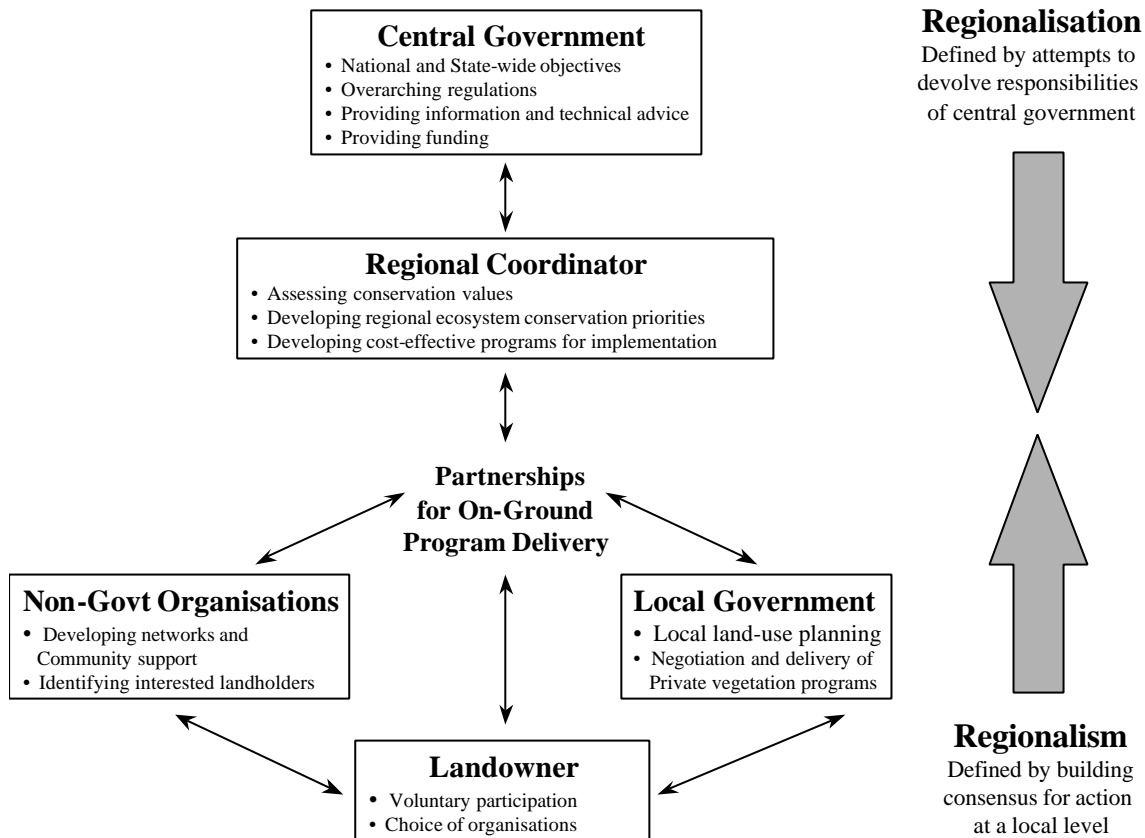


Figure 3: Institutional approaches to natural resource management

It is tempting to use a model of this kind to simply prescribe a universal solution to vegetation management. This implies that:

- central governments would take the lead in developing legislative frameworks and ensuring adequate resources are available at a regional scale;
- regional organisations would take the lead in developing regional strategies and brokering partnerships for on-ground delivery with local government and the private sector; and
- local governments, non-government organisations and private individuals would be actively encouraged to develop and deliver on-ground management programs.

However, it is important to recognise that capacities, willingness and responsibilities of organisations to manage biodiversity vary across Australia. States have differing legislative frameworks (for a review see Cripps, Binning and Young, 1999). Further, regional institutions for vegetation management are only emerging and lack the resources and decision making powers to play a strong coordinating role (Dore, Binning and Hayes, 1999).

Because of differences in capacity and willingness it is important to adopt a flexible approach. A particularly important issue is who should take the lead in developing native vegetation policy and integrating this with other natural resource management issues at the regional scale. The section, which follows, demonstrate that there are a range of different ways of achieving this leadership.

2.1.3 Addressing different capacities for biodiversity management

A framework for evaluating the role of different tiers of government in developing successful regional partnerships for biodiversity conservation is set out in figure 4. The framework was developed following analysis of the following factors (Binning, Young and Cripps, 1999):

- the processes that threaten biodiversity in different regions and how these relate to the **core functions and responsibilities** of different tiers of government;
- the **capacity** of local institutions, as determined by population size and the rate base; and
- the **coincidence** between **local, regional and national** priorities for the conservation of biodiversity.

Variation in the overall ability of local institutions to take the lead in developing responses to natural resource management can be readily identified using this framework.

For example, in addressing the first of these factors a distinction can be drawn between responsibilities of State government based catchment committees/boards and the role of local governments. Catchment committees and boards will tend to have more responsibility in rural regions where the main pressures arise from agricultural activity that threatens the natural resources for which they have responsibility: land, water and, increasingly, native vegetation. On the other hand, local governments may have relatively more responsibility in urban and peri-urban regions where development and sub-division are the main pressure on biodiversity (Binning, Young and Cripps, 1999).

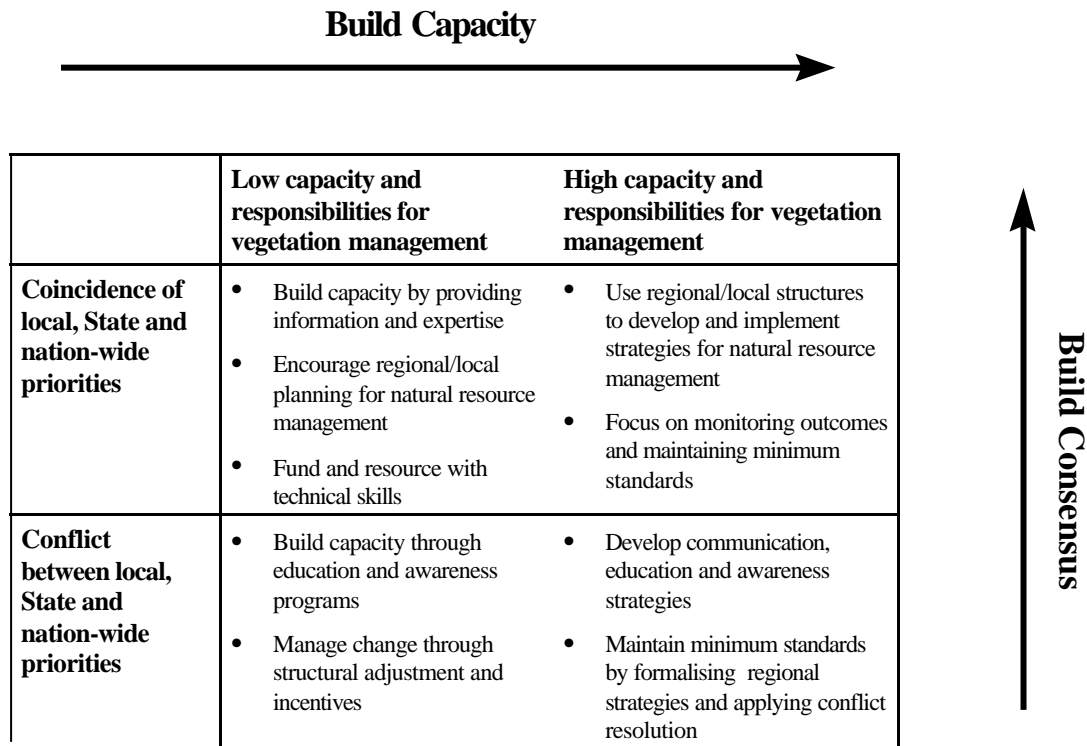


Figure 4: Framework for developing partnerships

In the figure, it is clearly desirable to facilitate transition of regional institutions and local governments to the top right corner over time. This could be described as the key challenge for central government: developing policies and programs that build consensus and the

capacity of local institutions to independently manage natural resources including native vegetation and biodiversity.

Outlined below is a brief description of the key strategies for developing successful approaches in each of the categories identified in the figure.

Low capacity regions with coinciding interests

Regions with a low capacity to manage biodiversity tend to be located in rural regions where there is neither a large population base nor development pressures. Local governments in these regions are unlikely to be actively involved in vegetation management because they lack the resources required to take action outside their key areas of responsibility. However, many of these regions have strong support for improved vegetation management through catchment based institutions, primarily motivated towards the management of land degradation processes.

Regions of this kind are relatively common in agricultural regions where natural resource management problems such as dryland salinity are common. The Murray Catchment in New South Wales and the Blackwood Basin in Western Australia are examples of regions of this kind.

In these regions, the most effective strategy will be for Commonwealth and State government to engage in partnerships with regional organisations to effectively plan for biodiversity. Central government will need to play the leading role in coordinating approaches and providing data and expertise. With this support, these regions will generally have greater capacity to undertake effective regional planning and program delivery. Regional organisations would then be responsible for engaging local councils, and non-government organisations in their role as service providers and land managers .

Key Challenges: Capacity building with resources, knowledge and policy instruments.

High capacity regions with coinciding interests

Regions with a high capacity to manage biodiversity tend to be located in population centres in the coastal zone. Conflicts between local and national interests tend to be minimised because there is a strong diversity of interests within the community. This is then reflected in the composition of local councils, who in turn have responsibility for the management of urban development, the key threat to the management of natural resources, including native vegetation. A key issue in these regions is clarifying roles and responsibilities between local governments and State agencies.

South-east Queensland and the Hunter/Central Coast regions are examples of regions of this kind.

In these regions the preferred strategy would be to give regional and district councils autonomy to coordinate the development of accredited regional natural resource management plans that include biodiversity as a core element.

Key Challenge: Institutional reform to ensure regions have access to the full range of policy tools.

High capacity regions with conflicting interests

Regional and local institutions within regions with conflicting national and local interests may not be in a position to reconcile differences that occur, for example, when high profile developments are proposed on sites of high conservation value.

The clearing of glider habitat within the coastal zone of Queensland for sugar cane development is an Australian example of a case where there are conflicting local and national interests.

In these regions, stronger involvement of Commonwealth and State government will be required to reconcile differences in objectives for the management of biodiversity. Conflict resolution tools will be required. However, attempts should be made to maintain active council and community involvement in any processes developed.

Key Challenges: Capacity building, conflict resolution and ensuring minimum legislative standards are maintained.

Low capacity regions with conflicting interests

Regions fitting this category will tend to be located in rural and remote regions facing declining returns from grazing based industries leading to falling populations and loss of key rural services and infrastructure. Councils in these regions are unlikely to perceive or want responsibility for biodiversity issues. They are likely to have a strong focus on issues of rural decline and landholder rights. Local governments in regions of this kind are quite antagonistic to the notion of being asked to make a contribution to the conservation of native vegetation.

In these regions, approaches that build local capacity and manage structural adjustment are required from the Commonwealth and State government. Regional strategies that are developed through structures that are directly supported and managed by central government are likely to be most successful.

Key Challenges: Capacity building and structural adjustment.

2.2 ROLE OF NON-GOVERNMENT ORGANISATIONS IN FOSTERING PARTNERSHIPS

Up until this point we have largely ignored the role of non-government organisations, i.e. the private sector and landholders, other than to note that these organisations will play a role in the delivery of conservation programs at a local scale.

In addition to this driver, there are also a number of characteristics of the non-government sector that highlight the importance of more active engagement of this sector in developing new approaches to the conservation of native vegetation (Binning and Feilman, 2000).

- The perceived independence of the non-government sector means that it can engage many private landholders that will not deal with government. The experience of Trust for Nature in Victoria, Australia, would suggest this is indeed the case.
- Non-government organisations are often less constrained than government agencies and, hence, are better able to gauge community needs and to develop entrepreneurial solutions. Global experience suggests they are often the source of innovation.
- Free of bureaucratic processes non-government organisations are often able to deliver on-ground outcomes more efficiently than government organisations. This is particularly true at local and regional scales where individual knowledge and networks are often critical.

These points are important when considering the role of partnerships with private landholders in securing conservation outcomes. The initial reaction of many people to strategies for engaging landholders in biodiversity conservation is that they represent the thin edge of the wedge – a form of disguised regulation through which government is seeking to impose land-use restrictions on landholders. However, if these strategies are to succeed they must seek to achieve and retain strong landholder support and commitment (Farrier, 1995; Binning and Young 1997a).

Ultimately landholders must be active stewards of the biodiversity that occurs on their properties. The non-government sector, acting at arms length to government, has the potential to be more effective than government in delivering this outcome (Binning and Feilman, 2000).

A final rationale for involving the private sector is one of mutual obligation within a civil society. The private sector derives benefits from biodiversity and, hence, has a responsibility to contribute towards its sustainable management.

The following issues set an agenda for achieving more effective engagement of the non-government sector:

- Developing successful partnerships with the non-government sector.
- Giving recognition to non-government activities for biodiversity conservation.
- Removing impediments to the non-government sector using a suite of policy instruments designed to fully engage landholders and local communities.

2.2.1 Developing partnerships with the non-government sector

Figure 5 provides an overview of the current range of non-government activity in nature conservation in Australia.

In recent years there has been considerable growth in the range of non-government activity. This perhaps best evidenced by the growth in the number of non-government organisations actively promoting the protection of native vegetation and biodiversity. Organisations such as the Trust for Nature (Vic), the Australian Landscape Trust, The Australian Bush Heritage Fund, National Trust (WA) and the World Wide Fund for Nature have all significantly expanded their role. Further, the New South Wales, Queensland and South Australian governments are actively considering supporting the establishment of independent Conservation Trusts. At a local scale there is a huge range of local and regionally based groups undertaking conservation works both within and outside the Landcare movement.

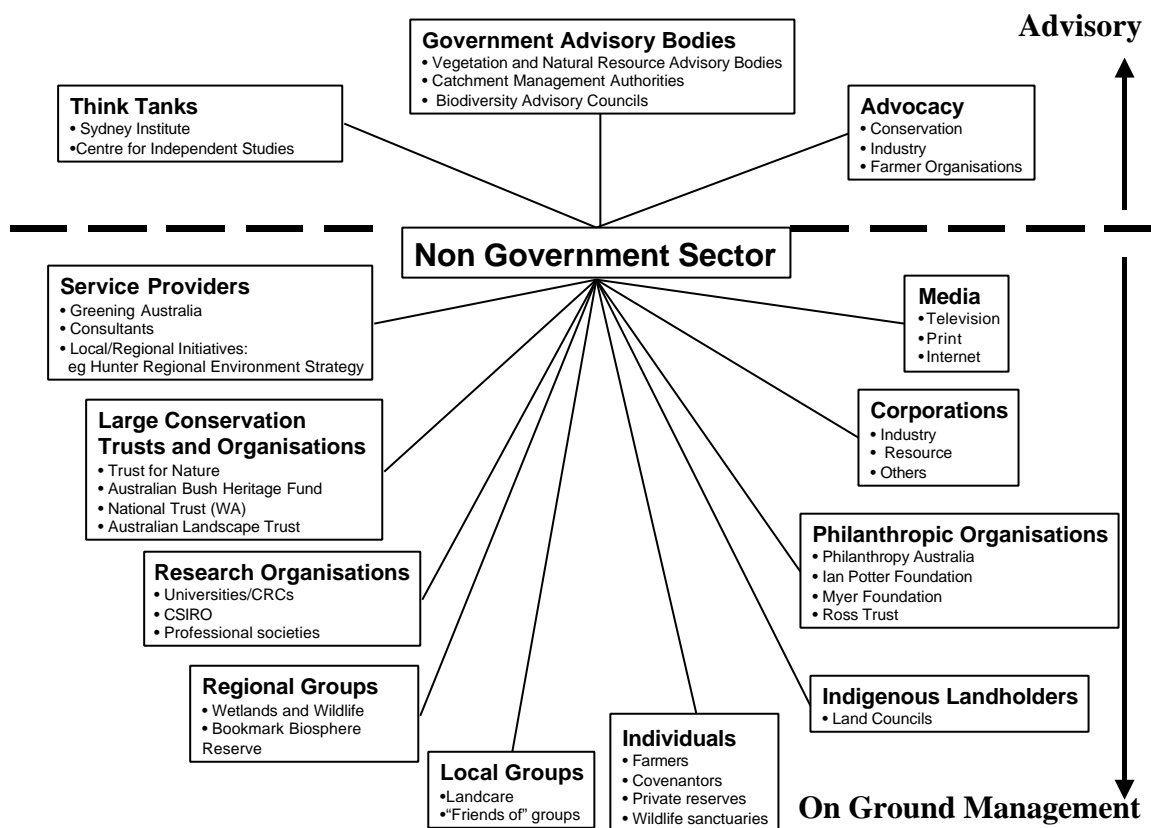


Figure 5: The range of non-government players in Australia

Closer to government, but at arms length from it, organisations such as Greening Australia are actively involved in delivering government programs. Strong linkages between the community and government also exist through advisory bodies and advocacy groups.

Whilst the level and growth of activity is encouraging, the challenge is to identify the mechanisms through which more effective partnerships can be developed between the different categories of organisation represented in figure 5. Too often current conservation initiatives are constrained by only involving a narrow range of organisations. For example, and although there are notable exceptions, local Landcare and catchment groups are often tied to government funding programs and have only limited awareness or connection to business, philanthropic or research organisations with an interest in nature conservation and natural

resource management. If synergies between organisations can be found, particularly ones that provide connectivity between urban and regional centers, it is believed that markets, funding and participation of the non-government sector in conservation activities can be significantly expanded.

The following characteristics of successful partnerships for nature conservation have been identified (Binning and Feilman, 2000):

- the collaboration of several non-government organisations, businesses and government working in partnership to achieve conservation outcomes at a landscape/regional scale;
- an appropriate balance struck between *engagement of local communities* and their aspirations for land management and *leadership in natural resource management* through provision of information, identification of conservation priorities, funding and organisational support;
- acceptance that different organisations have different strengths and weaknesses and hence different niches within which they can effectively contribute in partnership; and
- active promotion of successes and collaboration to secure ongoing community and political support, including funding from both the public and private sector.

If the non-government sector is to actively work with governments, there is a need to establish relationships where power and decision making are evenly shared. Given the differences in the decision-making processes of governments and private organisations and businesses, this is a far from superficial issue.

Mechanisms do exist within Australia for establishing community, business and government partnerships, but they are bureaucratic and administratively cumbersome. The challenge is to engage the corporate and philanthropic sectors to scale up their investment by contributing to larger scale regional programs. A recent workshop of community, business and government leaders in Australia identified the opportunity to facilitate larger scale partnerships for landscape conservation using a Charter for government-business-community partnerships (Binning and Feilman, 2000).

The purpose of the Charter would be to articulate the principles against which large-scale conservation partnerships may be put in place in an administratively efficient manner. The Charter would include:

- a vision for the role and growth of non-government investment in landscape conservation;
- strategies for capacity building covering provision of expertise and networks for information sharing, and programs for organisational learning;
- arrangements for joint funding of large investments in conservation at a regional scale; and
- the development of markets for environmental services that allow urban populations to donate or purchase shares in landscape reconstruction (see Section 3.2.5).

Other key issues for enhancing the role of the non-government sector are expanded upon in the remainder of this section.

2.2.2 Giving recognition to non-government activities

A key issue for coordinating strategies and programs for native vegetation is the capacity to monitor, account and quantify the contribution of government and non-government activities outside of the formal reserve system, and in particular, on private land.

We are not aware of any mechanism for accounting for and quantifying the contribution of the non-government sector to achieving conservation objectives. Lack of institutional recognition means that the contribution of private initiatives cannot be readily quantified. This is important for two reasons. First, it means that the role of private conservation is often neglected in the development of government policy at national, State, regional and local scales. Second, the poor public profile of private conservation impedes its future growth.

The concept of a Conservation Management Network has been developed to address this concern, see figure 6 (Prober and Thiele, 1996, 1999; Binning and Young 1997a). The objective is to develop management strategies that maximise the contribution that each tenure of land can make to the achievement of conservation outcomes. No tenure is considered “superior” to another. Rather management strategies that maximise opportunities for integrating conservation objectives with other land-uses are actively pursued on all land tenures. For example, in the case of rural lands, conservation actions would need to be integrated with agricultural practices and the protection of corridors of native vegetation. The framework is inclusive and acknowledges that conservation objectives will not be met exclusively through formal reserves.

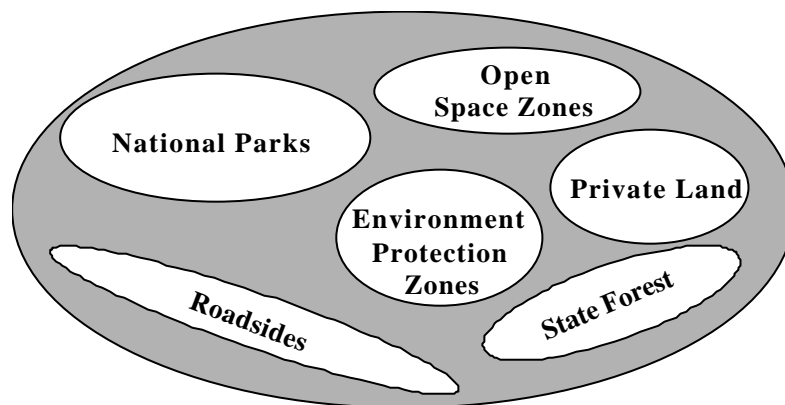


Figure 6: The concept of a conservation management network

It is noted that such a framework is not new and is consistent with the approach used in the United Nations Environment Program’s Biosphere Reserve model, which was initiated in 1972. It also has similarities to the definition of protected areas in the ANZECC *Interim Scientific Guidelines for the National Reserve System* (1997). However, although this concept is not new, there remain significant impediments to its application. Perhaps the most significant of these is the pervasive culture that nature conservation is a public responsibility with little or no role for private individuals.

This culture is changing, as evidenced by the development of biodiversity strategies and associated policies to engage private landholders. However, application of the concept requires that currently fragmented approaches to conservation policy be more effectively coordinated across all government agencies (Binning, 1997).

In addition to engaging private landholders, another challenge is to engage public authorities that manage land but do not have conservation as a primary management objective. For example, in Australia many of the most valuable remnants of temperate woodlands and grasslands are found on vacant crown land, rail easements, travelling stock routes and cemeteries (Prober and Theile, 1996).

Coordination management across tenures could be facilitated by the development of a database that contains:

- the *distribution* of native vegetation by ecological communities within the region;
- the *significance* of specific sites in meeting the region's conservation objectives including, where available, an assessment of site quality; and
- the *security* of management for conservation on the site. For example the land-uses permitted and any commitments entered by the landholder to conservation management.

If such a database was maintained it would be possible to objectively evaluate the status of ecological communities and review management strategies. The database would also provide a baseline against which changes and losses in the distribution of ecological communities could be measured through time.

The database could also record more detailed information on when land managers have been approached, and if they have accessed information or incentive programs from a government agency or local government. This last point is important because, although there are already a wide range of programs available to promote conservation outcomes, awareness of these programs is likely to be low and coordination of their activities is likely to have been poor.

No State or region in Australia currently maintains a database of this kind, a fact that is a significant impediment to the coordination and targeting of conservation programs nationally (Dore, Binning and Hayes, 1999).

A Community Conservation Network, or set of regionally based networks, with supporting databases is the foundation upon which biodiversity conservation can be coordinated on and off-reserve (Binning and Thorman, 1999). The simple existence of this information would enable implementation options for regional strategies to begin to be prioritised. For example:

- public land whose management is currently inappropriate can be identified and the responsible management agency or local government approached;
- private lands of highest significance can be targeted for incentives for voluntary conservation management; and
- land of highest conservation significance that is at immediate risk of development can be targeted for acquisition or re-zoning.

Such a network would enable greater emphasis to be placed on encouraging community and private investment in conservation on private lands outside the formal public reserve system and in meeting the objectives of native vegetation and biodiversity policy.

2.2.3 Removing impediments to partnerships between the non-government sector and landholders

Designing effective policies and programs for engaging private landholders in native vegetation conservation raises a number of significant issues. They:

- require a high level of information on the conservation value and status of individual sites;
- require close cooperation and trust between the landholders and the partnership organisation, who may be suspicious of government involvement;
- are seeking to secure objectives of a very long term nature, and hence the programs themselves require long term support which is often lacking within government;
- are resource intensive in terms of the extension effort and personal contact required; and
- involve complex documentation that often takes a long time to negotiate. For example, it is not unusual for an agency to take up to 5 years to negotiate a covenant.

The government agencies that currently manage off-reserve conservation generally do not have the culture or the capacity to adequately address all of these challenges (Binning, 1997). Non-government organisations could potentially play many of these roles. The broadening of Australian non-government organisations to include organisations committed to on-ground organisations as well as traditional advocacy groups, is encouraging.

However, because conservation policy and legislative structures have not been developed with active involvement of the private sector in mind, many significant impediments exist to accessing the full range of conservation tools may exist. Key examples of the type of impediment that exist are:

- **Capacity to establish independent conservation trusts and organisations:** arrangements are required which allow for the efficient establishment of organisations committed to developing programs and funding on-ground conservation works at national, State, regional and local scales. These organisations should enjoy equivalent tax treatment to other charitable organisations.
- **Access to covenanting powers:** all regions should have in place arrangements for Conservation Trusts to enter conservation covenants that have a statutory basis, are registered or noted on land title, and are binding in perpetuity.
- **Taxation treatment of private reserves:** secure private conservation reserves should enjoy the similar treatment to primary producers who can, for example access tax deductions for management costs (these issues are addressed in detail in section 3).
- **Institutions for the creation of environmental markets:** non-government organisations are limited in their capacity to promote and secure land use change through markets for environmental services such as markets for carbon sequestration or markets for the conservation of streamside buffers that limit rapid run-off and hence maintain water quality. One example is that to create markets for environmental services would require a mechanism that allows separation of ownership of environmental services from land, as is the case in forestry where ownership of trees/timber and land can be separated. Further separations could be permitted to allow for the establishment of separate markets for environmental services such as carbon, biodiversity and water purification. It is noted that a conservation covenant, tied to a once off payment equivalent to the value of the environmental service provided, may be one mechanism for achieving this outcome.

New South Wales is the first Australian State to pass legislation that allows for the separation of carbon rights from land.

These are examples of potential institutional and policy impediments to the non-government sector, which should be able to promote biodiversity conservation on a “level playing field” with the government sector. Principles of competitive neutrality highlight the potential of a thorough review directed at enhancing these capacities.

A potential model for securing non-government involvement sector involvement is outlined in figure 7.

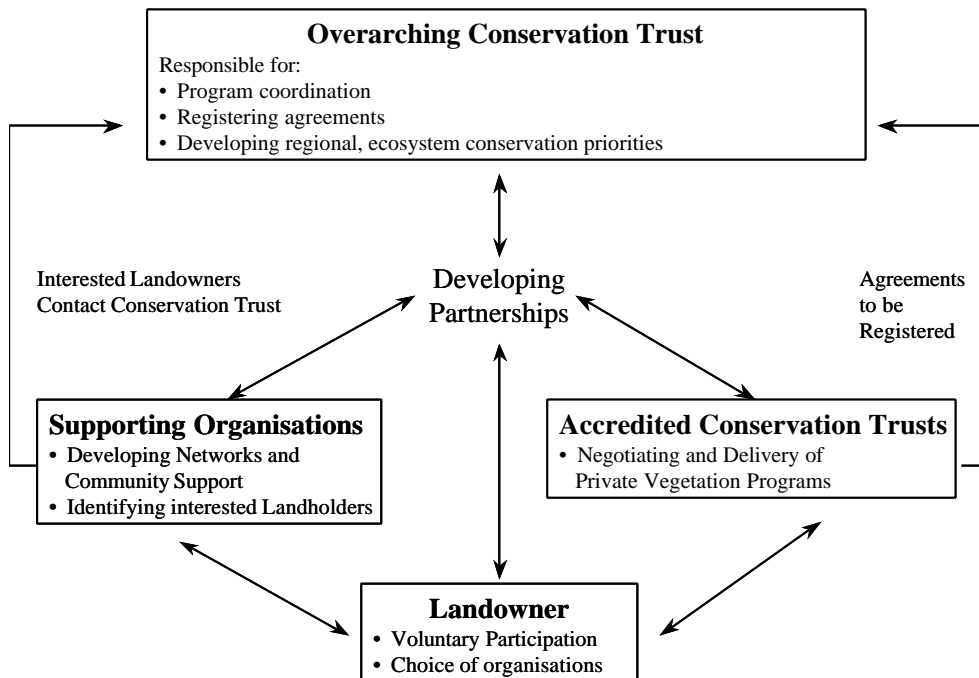


Figure 7 – Empowering the non-government sector to deliver on-ground programs

In the figure an overarching Conservation Trust provides support and builds the capacity of regions to undertake conservation works. It can accredit local and regional trusts to deliver conservation programs. The model outlined earlier, which analysed the role and responsibility of government in devolving responsibility to a regional scale (section 2.1.2), has parallels with the institutional structure described here.

To give effect to this vision legislation is required that enables Conservation Trusts to be established. They would be registered as environmental organisations for tax purposes and be able to enter conservation covenants. Covenants could be used to either secure conservation outcomes or to separate ownership of key environmental services such as carbon sequestration.

No state in Australia meets all of these requirements. Victoria comes closest where the *Trust for Nature* has operated at arms length from government to establish in excess of 250 conservation covenants that secure in excess of 8000 hectares of high conservation value native vegetation. However, even in this case the Trust’s capacity to develop regional partnerships for delivering the Trust’s programs has been limited.

Until 1998 no other state in Australia had an equivalent independent Conservation Trust. Since then the *National Trust of Australia (Western Australian)* has launched an independent covenanting program. Further, New South Wales and Queensland are in the process of developing equivalent organisations. As noted earlier, NSW is the first State to put in place legislation which allows property rights for environmental services to be separated from title to land (Binning and Feilman, 2000).

The model of enabling legislation for the establishment of Conservation and Land Trusts has been drawn from the United States where in excess of 1500 Land Trusts have been established. In this case, an umbrella organisation – the *Land Trust Alliance* – supports the work of individual Trusts, coordinates activities and provides supporting knowledge and training programs that build organisation capacity (Binning and Young, 1999c).

The experience of the U.S. Nature Conservancy is described in Case Study 6.

2.3 PRINCIPLES FOR INSTITUTIONAL DESIGN

The following six key principles for successful natural resource management at a regional scale were developed to assist in identifying the role of local governments in native vegetation management (Binning, Young and Cripps, 1999).

Principle 1: Clear definition of roles and responsibilities – the development of regional strategies requires clear distinction to be maintained between the following roles and responsibilities:

- decision-making associated with the performance of statutory functions including land-use approvals;
- the provision of expertise, advice and stakeholder input to the development of programs, policies and regulations developed under the statutory process; and
- the delivery of natural resource management programs through a diverse range of structures, including partnerships with the non-government sector.

Principle 2: Maintenance of outcome-based legislative framework – a legislative framework that takes account of biodiversity and facilitates regional planning should be in place. This framework should establish clear minimum standards for the maintenance of biodiversity, e.g. through requirements to conserve a comprehensive and adequate range of different ecological communities.

Principle 3: Delegation and development of action based regional strategies – regional strategies that meet minimum standards should be accredited and management responsibility devolved. Core elements of a regional strategy are described on the following page (Box 1).

Principle 4: Flexible delivery – regional plans should involve diverse partnerships with both government and non-government organisations for delivery policies and programs across all land tenures. Implementation programs include the full suite of policy tools ranging through education and motivational tools, regulations and property right based instruments, and financial incentives (see discussion of model toolkit in the section 3).

Principle 5: Adequate resources – funding information and expertise required to meet required minimum standards should be secured for the region.

Principle 6: Monitoring and review - performance indicators and accountability measures should be in place and include provision for regular review of outcomes and the appropriateness of existing standards.

Note that these principles relate to natural resource management planning at a regional scale. Native vegetation conservation is only one element of natural resource management. Hence, strategies for native vegetation conservation will need to be integrated with other natural resource management strategies, including land-use planning, water quality and pest control strategies. Indeed the management of vegetation retention is often integral to the achievement of these objectives.

Box 1 – Key elements of a regional natural resource management strategy

Establishment of a coordinating body: A local or regionally based body is given responsibility for overall coordination and strategic development of the regional strategy. This body will require a balance of expertise and skills. It is important to note that the coordinating body need not be a part of government or perform statutory functions, it may for example be an advisory board of relevant experts and stakeholders. Its role is to bring the various interests together at an appropriate scale for natural resource management planning. It should have defined relationships to other regional agencies.

Memorandum of Understanding on statutory processes: A formal Memorandum of Understanding will be required between the agencies with statutory responsibilities and other parties with a role in delivering the regional action plan. The purpose of the memorandum of understanding is to outline how each agency or organisation with statutory responsibilities will interpret and apply the legislation under their control within the region. A key objective is to streamline existing approval processes and the delivery of on-ground programs.

Integrated land use plans: All statutory land use planning should be integrated into a single coordinated land use planning framework that forms the basis of regional natural resource, economic and social planning. For the purposes of biodiversity planning mapping of the distribution of indigenous biodiversity within the region on the basis of agreed ecological communities across all land tenures is a critical step. Key threats to biodiversity and appropriate management responses will also need to be identified. Any tensions in the land use planning responsibilities of statutory agencies will be resolved through the Memorandum of Understanding.

Implementation program: An implementation program drawing on the full range of policy tools will be developed that is consistent with priorities identified in the planning phase.

Funding and resourcing partnership agreement: All tiers of government will agree resources for the strategy with a minimum 5 year commitment to the implementation program.

Accountability criteria: As regions are given greater flexibility in achieving defined outcomes, these must be measured and accountability procedures put in place.

3. POLICY TOOLKIT

This section of the report provides a brief overview of the full range of policy instruments available for the protection and management of native vegetation. The toolkit has been derived from best practice examples around Australia and our analysis of policies for biodiversity management at national, regional and local scales.

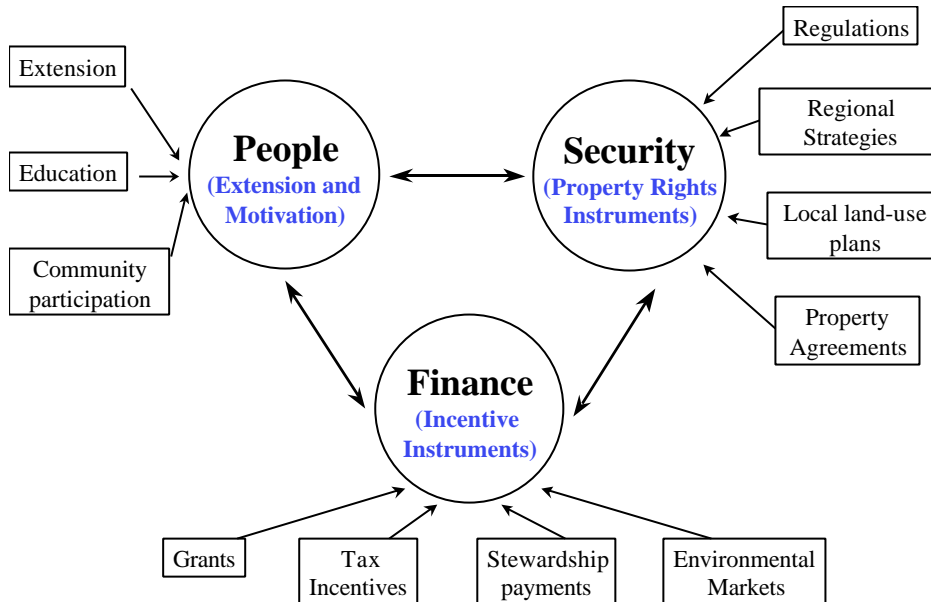


Figure 8: The policy toolkit

Figure 8 provides an overview of the range of instruments that can be used to implement policies for the conservation native vegetation. The toolbox is divided into the following broad categories (Binning and Young, 1997a).

- **People** - the tools that can be used to motivate and retain landholders support for vegetation programs.
- **Finance** - the incentives that can be provided to share the costs of managing vegetation.
- **Security** - the regulatory, legal and voluntary property right instruments that can be used to provide secure adaptive management of vegetation.

These categories provide a powerful framework for the development of action based implementation programs for on-ground works associated with higher level regional strategies that were the primary focus of the analysis of institutional issues in the previous section.

The concept of sustainable development highlights that policy approaches to natural resource management will be more effective if strong linkages are drawn between social, economic and environmental drivers. This process is mirrored in policy design where there is considerable evidence that policies that harness the synergies between: educational (people), regulatory (security) and economic incentives (finance) are likely to be more effective both in terms of cost and environmental outcome (Farrier, 1995; Young et.al, 1996; OECD, 1996, Binning and Young, 1997a).

This insight is critical because policy makers are generally biased to one type of instrument based on their disciplinary training and professional experience. For example, lawyers and planners tend to prefer regulation and land-use planning, economists incentive instruments, and social scientists education and participatory processes. A critical management issue in developing successful implementation strategies is to bring these differing perspectives together and to seek out complementarity.

A key challenge for governments is to facilitate understanding of the range of tools available, remove impediments to their use, and actively promote their adoption through the development of model policy instruments and the provision of catalytic funding to local and regional organisations to support the implementation of new policies (Cripps et.al. 1999).

In the remainder of this section the range of tools available within each of these categories is discussed to provide background for a number of case study examples that are used to derive a range of key principles for policy design and instrument selection.

3.1 PEOPLE – EDUCATION AND MOTIVATIONAL TOOLS

Education and motivational tools are required to develop understanding and the willingness of local communities and landholders to adopt new management practices for the conservation of biodiversity.

These tools are designed to raise awareness and shift the willingness of the community to take action to conserve native vegetation.

3.1.1 Landholder extension

A critical relationship is that between the landholder and the government or non-government organisation seeking to promote the conservation of biodiversity.

A particular priority is to develop an ethic of environmental stewardship by landholders (Farrier, 1995). Stewardship has two critical attributes: first a willingness and commitment of the landholder to sustainable management; and second, a strong relationship with third parties who provide advice and incentives for improved land management.

The first of these attributes is relatively common and the second relatively rare. Successful approaches to landholder extension to secure landholder stewardship are set out below.

Community extension

In Australia community based extension for sustainable land management was pioneered by the Landcare movement (Campbell, 1995). This movement has been credited with raising the awareness of landholders of sustainability issues.

Few dare to argue against the efficacy of the Landcare movement. It undoubtedly has strengths in its grass roots nature and its commitment to learning through community participation in group based activities. The movement has a commendable history.

Criticisms and shortcomings can however be identified. First, Landcare does not connect with many landholders who are individualistic and wary of group interactions. Second, with increased funding from the Natural Heritage Trust it has been argued that Landcare groups have stopped discussing issues and simply become a mechanism for bidding for and managing funds. Third, Landcare was initially focussed on sustainable production with little attention paid to conservation and biodiversity issues, and it has proved difficult for approaches to biodiversity to penetrate this culture. Finally, community based conservation is often criticised as lacking strategic direction and suffering from the difficulties of spreading scarce resources over many groups rather than focussing on key priorities.

All of these criticisms are valid but still do not detract from the power and influence of the movement and its role in group learning. Landcare is the foundation stone of community extension in Australia. However, in itself it is not sufficient.

Individual extension

Evidence suggests that little if anything can replace the need for face to face contact with trained extension officers on site.

A review of programs in Australia reveals that individual extension is the most effective educative tool in delivering both attitudinal and behavioural change in landholders, particularly when combined with catalytic or cost sharing incentives (Williams, 2000). This is because a true dialogue is generated and concepts can be readily transferred into plans for action that can be implemented.

A number of successful programs have operated on this basis of which *Land for Wildlife* is the most notable example (see box 2). Other programs which have successfully used individual extension services include fencing grants by Greening Australia (see case study 3) and the use of locally employed extension officers in the *Taking Action Now* program protecting the highly fragmented Grassy White Box Woodlands of the western slopes of NSW.

Key lessons from these programs suggest (Lambert and Elix, 1998):

- one-on-one communication is an essential element of successful landholder extension;
- extension officers employed from the local community are likely to be better accepted and hence more effective; and
- non-government delivery of extension services is often more acceptable, better targeted and more cost effective.

Box 2 – Land for Wildlife

Land for Wildlife is an extension program that was initiated by the Victorian Department of Conservation and Natural Resources and the Bird Observers Club of Australia. The objective of the program is to encourage and assist landholders to conserve native flora and fauna on their property, even though the property may be managed primarily for other purposes.

The program is analogous to the Landcare program which provides advice on sustainable agriculture to rural landholders, with two important differences. Firstly, it is focused on achieving nature conservation objectives. Secondly, it is focused on providing one-to-one advice to land managers rather than providing information through group based extension and demonstration.

The program is entirely voluntary and does not bind landholders in any way. It represents the first step in engaging landholders and securing their interest in nature conservation. It is critical that a program of this kind be completely divorced from any regulatory or land-use planning functions of the local Councils in the region.

The program essentially supports a network of landholders who have an interest in conservation on their properties. It has the three following elements.

- **Provision of Management Advice:** *Land for Wildlife* extension officers provide free advice on the protection and management of native vegetation to any landholder that seeks assistance from the program. This process involves a site visit to assess native vegetation found on the property and its condition. Strategies for ongoing management, rehabilitation and (where appropriate) revegetation may be established.
- **Support Network:** Participating landholders are kept engaged in the program through a range of ongoing support mechanisms. Information is distributed via a low cost quarterly newsletter *Land for Wildlife News*. Field days and local projects are also sponsored by the program.
- **Property Registration:** Landholders may choose to register their property as part of *Land for Wildlife*. In this case property and habitat details are recorded on a centralised database. Registration is entirely voluntary and non-binding. The landholder can withdraw from the program at any time. Registration is acknowledged by provision of a certificate and sign, both of which serve to advertise that the property supports the program and provides community acknowledgment to the landholder.

The program provides the foundation for a successful voluntary conservation program on private lands. The extension and motivational support provides a base from which landholders may enter more binding agreements for the conservation of native vegetation on their properties.

However, individual extension is resource intensive. A major challenge is to build the capacity of existing extension networks to advise on the management of indigenous biodiversity (Williams, 2000; Dore, Binning and Hayes 1999). Another is to retain government funding for extension, which often has intangible results. As discussed in the case study on fencing assistance by Greening Australia, this problem can be addressed when extension is tied to catalytic incentives (see section 3.2.1).

3.1.2 Education

Education is critical to securing support for biodiversity conservation. The importance of awareness of the significance and importance of biodiversity in the general community cannot be over-emphasised as it is from these quarters that political will, funding and other resources are ultimately derived.

Decision makers and community leaders.

A key target for education programs is the key decision-makers in both the government and non-government sectors. Within central government decision-makers are critical to achieving institutional recognition and change. The development of the New Zealand Biodiversity Strategy is evidence that this process is well in train.

At a local level leadership is equally critical in developing on ground action. In our analysis of the role of local government in biodiversity conservation (Binning, Young and Cripps, 1999), we identified the critical role of champions at the local scale in developing successful programs. They are characterised by:

- having a clear strategic vision;
- they are able to build consensus between competing organisations;
- they embrace new ideas; and
- they have continuity and long term involvement in the development of programs (often in excess of 10 years).

How is such leadership generated? A clear priority is to raise awareness of managers, chief executives and elected representatives. A biodiversity information kit was prepared for Australian decision-makers and has enjoyed limited success. A more effective strategy may be to sponsor key leaders in biodiversity conservation to give targeted presentations to audiences of decision-makers.

Landholders

Extension as a core education strategy for landholders is addressed separately (above).

Other education strategies involve including natural resource management in property planning courses and providing relevant technical information to landholders through various media. Some success has been experienced through developing conservation and natural resource management modules in property management courses. A good example is the *Farming for the Future* Program in New South Wales that has successfully taken this approach.

A recent review of materials including planning kits, technical notes and how-to pamphlets revealed a vast amount of literature in Australia aimed at providing relevant information on native vegetation management to landholders. However four main weaknesses in this material were cited (Morton, 1999):

- a) much of the information is shallow, offering advice of only a generalised fashion;
- b) information in the area of the financial cost of changing management is rarely offered;
- c) information available to urban landholders is very limited; and
- d) the backup/extension support required to complement printed material is rarely forthcoming.

Thus care needs to be taken to clearly target information to landholders and closely align this information to extension networks.

Schools

A key longer term strategy is to raise the awareness of biodiversity issues within the broader community. An important element of this approach is the development of programs within schools to educate children on the role and function of biodiversity. In Australia there are numerous programs aimed at involving schools in environmental education. There is, however, no well-established curriculum for environmental management, including native vegetation and biodiversity conservation.

An important opportunity would be for State governments to engage Education Departments to develop a formal curriculum on environmental issues. This could be supported by bushland projects and may even include a “Biodiversity and Schools” program with schools competing for annual “Landcare” and/or “Biodiversity” conservation awards.

Community and voluntary involvement

One view is that communication and learning about the values of native vegetation is most effectively achieved through direct involvement with the management of natural areas. Examples of programs that engage voluntary assistance from members of the community are outlined below:

- A range of monitoring programs that involve community and school groups has been developed in Australia, the most notable of which is *Water Watch* which involves hundreds of groups across the country monitoring water quality at regular intervals.
- A number of local councils involve community groups in voluntary management of bushland areas. Activities can range from simple working bees to establishing community committees to oversee the management key Council reserves. Ku-Ring-Gai Municipal Council and Brisbane City Council are leading examples in this area.
- Volunteer and compulsory “work for the dole” programs involve young people and the unemployed in environmental management. It is hoped that self reliance and a work ethic can be developed through the programs. The Australian Trust for Conservation Volunteers is a central player in this field in Australia.

Community involvement is a highly effective education strategy. It does, however, require dedicated resources. In interviews with local government, resistance to involving the community was often expressed in terms of inefficiency, legal liability and misaligned objectives with Council (Binning, Smyth and Catling, 2000). These are all valid concerns, but must be weighed against the benefits of developing strong community networks at the local scale.

3.2 FINANCE – INCENTIVES FOR MANAGING BIODIVERSITY

Financial incentives play a critical role in securing voluntary uptake of conservation programs. They can also assist landholders in meeting the costs of transition to a new regulatory standard.

There is much debate over when and how much landholder should be paid to take action to conserve biodiversity or address natural resource management issues. A distinction can be drawn between:

- the **Duty of Care** for sustainable land management faced by a landholder; and
- the provision of non-marketable **Public Conservation Service** by landholders managing vegetation to meet conservation objectives.

Determining where “duty of care” stops and “public conservation service” begins is a difficult issue. It is suggested that the dividing line should be drawn between those management practices required to achieve land-use objectives at a landscape or regional scale and any additional practices required to sustain sites of unique conservation value. Hence, a public conservation service is provided when the community’s interest lies in securing active and ongoing management of a particular site (Binning and Young, 1997a).

The design of effective financial incentives depends on their relationship to regulatory and motivation programs. Different models of financial incentives are outlined below although many others exist. As will be demonstrated, different cost burdens can be justified in different circumstances. Rather than confining payments to one level it will be more effective to define the rules and situations under which different levels of incentive can be justified.

3.2.1 Grants

Community grants

These are grants provided to community/landcare groups to undertake conservation works. They are the foundation of the \$1.3 billion Natural Heritage Trust. They facilitate group learning and can assist landholders to scale up and address natural resource management issues at a sub-catchment scale (ie the scale of a Landcare group/network).

Criticism has been made that existing grant based programs are being poorly targeted and are of insufficient a scale to make an impression on land degradation issues (Dore, Binning and Hayes, 1999). A key issue is determining how to strategically invest larger amounts in high priority areas, hence leaving other regions with less funds.

Catalytic incentives and grants

Catalytic incentives are used to reinforce existing landholder motivations and to secure behavioural change. Catalytic incentives are characterised by being small payments that meet a proportion of the costs of on-ground works. They typically require a substantial landholder contribution, at least 50% in the case of the Natural Heritage Trust. They are highly effective in regions where landholder awareness and participation in conservation programs is high.

An excellent example of a catalytic incentive is the Greening Australia Fencing Assistance program described in the third case study in the fourth section of this paper.

Cost sharing grants

Cost sharing incentives provide funding for on-ground works on the basis of a calculation of the relative proportion of public and private benefits associated with that work (MDBC, 1996). These payments are typically larger than catalytic incentives, but have the advantage that payment can be more effectively targeted at strategic priorities. A good example of this approach is the Coorong Salinity Action plan that provides funding for on-ground works on the basis of the contribution made to meeting strategic objects for both salinity control and biodiversity conservation. Payments vary from \$40 ha for establishment of lucerne pasture to control ground water levels to \$1500 ha plus fencing costs for natural habitat of high conservation value (Coorong District Committee, 1997).

3.2.2 Stewardship payments

Stewardship payments can be defined as ongoing annual payments for conservation management of natural areas. They are typically paid at a rate near the full opportunity cost of conservation management. Payments of this kind are typically restricted to areas of outstanding conservation value that are protected by a binding conservation covenant. They can be argued to represent a cost effective alternative to public acquisition and management, particularly for ecological communities that are highly fragmented. Experience with the use of stewardship payments is limited in Australia to the \$30 million private forest reserves program that resulted from the Tasmanian Regional Forest Agreement that identified in excess of 90 000 ha of private forest required to be managed for conservation (Tasmanian Government, 1998).

The use of stewardship payments is widespread in the United States and Europe, where subsidies for environmental management are increasingly being substituting for production based agricultural subsidies. For example, in the United Kingdom landholders are paid full annual rental for the management of Sites of Scientific interest, including sites of biodiversity value (Young et.al, 1996).

3.2.3 Transition incentives

Incentives are paid to encourage compliance and transition to a new regulatory standard, for example restrictions on the right to clear and/or sub-divide land. Transition payments can be justified on the basis of compensation for foregone land-use opportunities or on the basis of assisting compliance. The latter approach is generally associated with smaller payments targeted at on-ground management. Examples in Australia cover this full range from compensation requirements for involuntary re-zoning by local government to the modest \$15 million incentives fund associated with the introduction of broad-scale clearing controls in NSW in 1997 (Cripps et.al, 1999).

South Australia's experience with transition arrangements following the introduction of clearing controls is described in Box 3.

Box 3**Managing the transition to clearing controls in South Australia**

Like the majority of States, both the South Australian and Federal governments encouraged clearance of native vegetation into the 1970's. Indeed, many Crown leases include a standard condition requiring clearance.

In 1977 a committee established to investigate the extent of clearance found that over 75% of land in agricultural regions had been cleared and a significant number of regions had less than 10% of their original vegetation.

To combat this problem the SA government introduced the *South Australian Heritage Agreement Scheme* in 1980. At that time entry into a Heritage Agreement [covenant] was voluntary and based on the conservation value of the land in question.

By 1982, it was clear that voluntary action would not meet vegetation objectives as only 0.75% of existing vegetation was covered by an agreement. To address this problem regulations were introduced in 1983 with no prior warning. Debate over clearance controls led to the *Native Vegetation Act* being introduced in 1985 which tied refusal to clear to the gaining of financial assistance to enter a Heritage Agreements. \$70 million was invested in incentives to landholders who enter Heritage Agreements following refusal to clear land.

The current *Native Vegetation Act 1991* ceased financial assistance but maintained strict controls over land clearance. In rare circumstances where minor clearing is approved it is to conditions requiring replanting or other equivalent conservation works and the development of a management plan.

The scheme has been very successful in halting clearance. There are now 550 000 ha covered by 1050 Heritage Agreements (only 650 properties received compensation but all 1050 are eligible for assistance with fencing costs).

The scheme, however has done very little to promote active conservation management. Many landholder feel disenfranchised by the process and perceive that the government is now responsible for the land. Further, no distinction is made between the quality of vegetation between various sites.

(Source: Young, E. SA Department of Environment and Natural Resources 1997)

3.2.4 Tax incentives

Conservation is one of the most highly taxed land-uses in Australia, particularly on private land that is not used for primary production and therefore cannot access business related tax entitlements including deduction of management costs and negative gearing. Binning and Young (1999a, 1999b and 1999c) have identified a wide range of impediments created by the taxation system and opportunities to provide incentives for private investment in nature conservation.

Tax incentives are often argued to be a blunt and poorly targeted policy instrument. However they are also an efficient way to market conservation to non-landholders who may be willing to make philanthropic donations to conservation. They may also facilitate private investment in dedicated private conservation reserves. Because they use an existing administrative structure they can represent the most effective means in engaging a wide range people in conservation activities. Tax incentives do, however need to be carefully targeted (Binning and Young, 1999a).

Property rates and taxes

Property rates and charges are annual charges on land ownership and are generally based on a fixed proportion of property value. In Australia property rates are applied by both local government, in the form of rates, and by State governments in the form of land tax.

Exemptions to these taxes are often given to land-uses associated with the provision of public goods. For example, exemptions are given to charitable organisations, sporting clubs and religious bodies. On this basis, a similar case could be made for land covered by a legally binding conservation covenant as proposed in Binning and Young (1999b). Indeed a number of State and local governments have moved recently to introduce exemptions of this kind - including New South Wales and Western Australia. Legal impediments remain, however, in some States to local government pursuing rate rebate programs.

The Australian analysis of these taxes revealed that the financial impact of property rates and land taxes varies widely ranging from as little as \$2 - \$25 per hectare in rural regions to in excess of \$635 per hectare in one cited case on coastal Queensland (Binning and Young, 1999b). Hence the incentive provided by exemptions to property based taxes will vary, ranging from a purely symbolic gesture in remote rural regions to a significant financial incentive in urban and peri-urban areas where land-use pressures, and hence values, are high.

Donation of property

Donations of property to registered environmental organisations have not always been tax deductible. Indeed, until recent amendments to taxation laws were made only money donations deductible and then only in the year of donation.

In order to generate debate on how greater donations for environmental philanthropy could be achieved an analysis of the Australian treatment of environmental donations was compared to that of the United States (Binning and Young, 1999c). On the basis of that analysis the following policy options were identified:

“To facilitate the establishment of private conservation reserves, allow all donations of property to conservation trusts to be tax deductible over five years and exempt from capital gains tax. The definition of property for the purposes of this recommendation could be extended to:

- All land, physical and financial assets.
- Conservation covenants – that is any loss in land value from entering a conservation covenant.
- Bargain sales of land – that is the gap between sale price to the conservation trust and the full market value of the land.
- Donations of land with the retained right to occupation of the existing owner.
- Donations of assets for which a limited lifetime annuity is paid.”

(Binning and Young, 1999c)

-

In May 2000 the Australian parliament passed legislation allowing donations of land to be tax deductible over 5 years. Options relating to conservation covenants, bargain sales and donations with a retained right of occupation are to be further considered during the course of 2000.

Management of private conservation reserves

Private conservation reserves, secured by a conservation covenant, cannot access tax deductions for the costs of management unless an income generating business, such as primary production, is also being undertaken on the land. This has been identified as a key impediment to the creation of private reserves, particularly on the coastal zone nearby major urban centres and where many of Australia’s most vulnerable ecological communities are located (Howard and Young, 1995; Pressy 1995).

To address this concern Binning and Young (1999a, 1999c) have identified the following options for land secured by a binding conservation covenant:

- access to tax deductions, or the 34 % Landcare rebate, for costs associated with managing land covered by a conservation covenant; and
- allow private conservation reserves to be negatively geared and give their owners primary producer status.

The first of these options represents an extension of an existing special incentive in tax law and is readily implementable. The second is more problematic as it involves extending business related tax arrangement to non-income earning activities. Arguments of precedence and conflict with tax policy principles mitigate against any serious consideration of this proposal, although it can be justified on public good grounds.

However, this raises an interesting issue related to using environmental markets to derive income for the provision of environmental services such as biodiversity or carbon (see below). If an income stream was generated, then business related tax deductions would become available.

3.2.5 Environmental markets

An alternative approach to direct payments is to create markets for environmental services. In these cases environmental values are internalised by using regulations or property right measures to cap resource use sustainable levels and then allowing markets to determine the most efficient land-use allocation.

Revolving funds

A revolving fund which purchases land on the open market, places an in-perpetuity covenant on the land, and then re-sells the land provides an innovative alternative to acquisition programs where the capital value of the land and its ongoing costs of management must continue to be met in perpetuity. As the property right is changed via the covenant, it is more likely that a landowner committed to vegetation management will purchase the land. In this way the market works to put a “willing” landholder in the place of an “unwilling” landholder.

Revolving funds are attractive because they are cost effective and also because they may be more ecologically dependable. As Farrier (1995) notes, it is difficult, if not impossible, to get a resistant landowner to change their management practices. This is irrespective of the approach taken: regulations, information or incentives. By acting in the open market, a dependable landholder identifies themselves through market. Moreover, because the seller is usually keen to sell, there is no need to offer more than market value to secure a remnant.

In this case a market is created for land that has had additional land-use restrictions placed upon it. Rational economic behaviour would suggest some loss in resale of the property to be experienced. However, the Victorian Trust for Nature’s experience suggests otherwise.

The Trust is the only organisation in Australia with extensive experience in operating a revolving fund, through which they have purchased, covenanted and resold approximately 15 properties in the last 3 years. The experience of the Trust is useful, as the costs of operating a revolving fund will vary depending on the marketability of the land purchased. The Trust experienced some losses in the initial operation of their program due to transaction costs and loss in the market value of the land. However, as they have learnt they have generally made a profit by identifying land that could be readily re-marketed as a conservation property (Brian Whelan, per.com, 1997-1999).

However, even if modest losses are experienced the attraction of a revolving fund is that much of the capital base can be recovered to be reinvested in future land acquisitions. Further, ongoing liabilities associated with managing the site can be minimised.

Revolving funds are attractive because they are cost effective and also because they may be more ecologically dependable in terms of final results for biodiversity conservation. As Farrier (1995) notes, it is difficult, if not impossible, to get a resistant landowner to change their management practices. This is irrespective of the approach taken: regulations, information or incentives. By acting in the open market, a dependable landholder identifies themselves through the market. Moreover, because the seller is usually keen to sell, there is no need to offer more than market value to secure an area of native vegetation.

Through the Bush for Wildlife component of the Bushcare program, the Commonwealth government is committed to the introduction of revolving funds in all Australian States. Through this process a number of non-government organisations have recently been provided with Commonwealth funding to establish funds of this kind.

Tradable permits

Tradable water rights and fishing rights are examples of market based mechanisms that are actively being used to regulate resource use in Australia. These schemes involve setting an overall cap on resource use and then allowing rights to that resource to be traded to achieve efficient allocation between competing resource users.

From an environmental perspective the critical part of this process lies in regulating an appropriate cap on overall resource use. The market mechanism is somewhat incidental to the outcome, although it may facilitate acceptance of the program. A challenge associated with tradable permit schemes is to ensure that there is capacity to refine and adapt the regulatory cap through time as scientific knowledge and community values change.

This is particularly important as tradable permit schemes are often introduced as a measure of last resort once significant degradation of a key resource is already occurring. In these cases it may be important to gradually restrict overall allocations over a number of years until sustainable levels of use are re-achieved.

Environmental certification

Certification and labeling of sustainably produced goods has been put forward for some time as a way of developing market niches. Accreditation could take place under generic management system approaches such as ISO 14 000 (International Standards Organisation, 1996) or specific industry based standards such as those established for forestry by the Forest Stewardship Council.

Certification and labeling is having its greatest influence in Europe, particularly in response to genetically modified foods, which has assisted in driving the market share of organically grown foods over 10% in Britain for the first time (Radio National ABC, April 2000). It will be interesting to see if consumer demand is able to sustain a significant price differential.

Markets for environmental services

New markets for environmental services are starting to emerge. The first carbon and salinity trades in Australia have been recently negotiated by State Forests of NSW in partnership the Sydney Futures Exchange (carbon) and Macquarie Food and Fibre (salinity) (Bob Smith, 2000). In both of these cases the beneficiaries of environmental services have been provided a market through which they can invest in on-ground works. The carbon example is particularly interesting as companies seek to hedge risk associated with the Kyoto Protocol by investing in carbon sinks.

Markets for native vegetation management can also be imagined. For example, the Golbourn-Broken Catchment in Victoria is contemplating marketing investment in the rehabilitation of floodplains by marketing conservation shares in Melbourne. Likewise the Australian Bush Heritage Fund purchases properties of high conservation value with funds raised through donation.

Internationally, wetland banking in the United States creates markets for the rehabilitation of degraded wetlands (see case study 4). Further, the US Conservation Reserve Program involves holding auctions for the provision of conservation services, with government assistance being provided to those who bid to provide services at the lowest cost. In this way all rents are extracted from the suppliers of conservation services (Stoneham and Chaudhri, 2000).

Further opportunities lie in other areas such as water purification. In one celebrated case the services of water filtration and purification provided by ecosystems in the catchment for New York City were estimated to be worth at least US\$8 billion, which was the difference between the cost of repairing the ecosystems and building artificial filtration facilities to replace the degraded capacity of the ecosystem services (Chichilnisky and Heal, 1998). This study has been used as the basis for investing in on-ground works to restore the catchment. In a study of Melbourne's water catchment, recommendations for timber harvesting regimes were based partly on avoiding or minimising the costs of decreased water or timber yields under a range of scenarios (Read Sturgess and Associates 1992).

Markets of this kind are only beginning to emerge in Australia. They have great potential but will require regulatory and property right structures that create scarcity and hence demand for these services.

In rural landscapes a particular challenge is how to bundle or package services associated with re-establishing areas of native vegetation. Table 2 alerts us to the potential by speculating on what a diversified farm business might look like in 20 years time. In the table, traditional agricultural business outputs account for 55% of total output. Areas of land rehabilitated provide benefits through timber, carbon credits, salinity mitigation, water filtration and biodiversity. These benefits are sold to different clients in a mature market place that has defined and quantified the flows of valued services from the farm.

Table 2: Example of commodities produced by a farm business in 20 years

Commodity	Share of farm business (Net Present Value)	Client
Wheat	40%	World market
Wool	15%	World market
Timber	10%	Pulp wood Specialty timber merchants
Carbon Credits	7.5%	Japanese steel company
Salinity Credit	7.5%	Catchment Management Authority – cost sharing fund
Water Filtration Credit	15%	Water Board
Biodiversity Credit	5%	Philanthropic trust

To achieve this vision, methods that can account for the various environmental services flowing from on-ground works are required. Further mechanisms for separating the ownership of environmental services from land are required.

3.3 SECURITY – PROPERTY RIGHT AND LAND USE PLANNING TOOLS

At any point in time, responsibilities for land management are defined through the policies and legal institutions that regulate land management practices. Land ownership can be described in terms of a series of entitlements and obligations, such as the right to graze and controls on clearing native vegetation. Property rights are not only defined by legislation but also by the implementation programs and enforcement regime associated with legislation. It is not uncommon for regulations and land-use plans to fail because they are never implemented or enforced (Brasden, 1991).

It is important to note that property rights can be defined at any scale ranging from national legislation to individual property agreements that may only affect a small portion of a block of land. Further, property right mechanisms are not always regulatory in nature and may be entered into willingly, as is the case with voluntary conservation covenants.

However, as has been noted, regulatory structures have a fundamental role in the policy mix in terms of establishing minimum standards for environmental management.

Key examples of regulatory, land use planning and property right-based instruments are outlined below. The potential for complementarity between these tools in appropriately defining property rights at different scales should be noted.

3.3.1 National and State regulation

National and State legislation establishes the over-arching framework for native vegetation and natural resource management.

The Commonwealth government has recently consolidated its environmental legislation within the *Environment Protection and Biodiversity Conservation Act 1999*. The bill contains a number of provisions relevant to the management of native vegetation. It provides a framework for moving forward through the further development of bilateral agreements with State/Territory governments. However, regardless of the legislation, the development and implementation of robust bilateral agreements that deliver against the objective of sustainable natural resource management remains a critical challenge. The legislation has put in place a more formalised framework through which there is the potential to consolidate and build upon existing cooperative structures.

Under the Australian constitution, States have primary responsibility for land management and this is reflected in a plethora of legislation in each state. Cripps, Binning and Young (1999) provide an overview of this legislation. To illustrate, Table 3 provides a summary of the most relevant Acts in NSW, but there are many more. Whilst this legislation provides a reasonably comprehensive framework for natural resource management, the relationships between the various pieces of legislation are often confusing making interpretation and application at regional and local scales difficult. Binning, Young and Cripps (1999) conclude that consolidation of these Acts may not be necessary at a State wide level where sectoral policy development can be justified, particular under an adversarial Westminster system of government. However, mechanisms for interpreting how legislation is to be coordinated, interpreted and applied at a regional scale are essential.

Table 3 – Key natural resource management legislation in NSW

	Legislation	Agencies with statutory functions
Land -use planning and environment protection	<ul style="list-style-type: none"> • <i>Environment Planning and Assessment Act 1979</i> • <i>Local Government Act 1993</i> • <i>Catchment Management Act 1989</i> 	<ul style="list-style-type: none"> • Department of Urban Affairs and Planning • Department of Local Government • Local Governments • Catchment Management Committee
Rural land management	<ul style="list-style-type: none"> • <i>Catchment Management Act 1989</i> • <i>Crown Lands Act 1989</i> • <i>Native Vegetation Act 1997</i> • <i>Rural Lands and Protection Act 1989</i> • <i>Western Lands Act 1987</i> 	<ul style="list-style-type: none"> • Department of Land and Water Conservation • Environment Protection Authority • Catchment Management Committees • Proposed Committees for water reform • Regional Vegetation Committees • Rural Lands Protection Boards • Soils Conservation Commissioner
Nature conservation	<ul style="list-style-type: none"> • <i>National Parks and Wildlife Act 1974</i> • <i>Threatened Species Conservation Act 1995</i> 	<ul style="list-style-type: none"> • New South Wales Parks and Wildlife Service

The role of national and State legislation in establishing minimum standards remains critical, however. Legislative controls relating to vegetation clearing are a clear example where the progress achieved through voluntary and community based programs can easily be undermined by clearing elsewhere. This is indeed the case with clearing rates in Queensland (where there have been no clearing controls in place on freehold land) exceeded the amount of vegetation re-established across all States and Territories (Bureau of Resource Sciences, 1999).

3.3.2 Regional and local scale regulation

A wide range of tools is available to plan for and regulate land-use at local scales. These tools are, of course, familiar and essential to planners. A useful distinction can be drawn between strategic planning, local planning and tools for rezoning land. Table 4 outlines a number of local and regional planning tools used in Australia.

Table 4: Examples of regional and local planning tools

Strategic Planning	Local Planning	Re-zoning
<ul style="list-style-type: none"> • Development and settlement planning • Regional policy statements • Pest and fire management • Off-sets policies 	<ul style="list-style-type: none"> • Tree and Vegetation Protection By-laws • Open space, local reserve and recreation management • Development incentives 	<ul style="list-style-type: none"> • Voluntary • Back-zoning • Acquisition • Revolving funds

(Binning and Thorman, 1999)

Particular challenges in adapting existing planning frameworks lie in the following areas:

- integrating biodiversity values into existing strategic natural resource management and land-use planning processes that have traditionally focused on development, infrastructure, recreation and land management issues;
- ensuring native vegetation on public land is appropriately managed;
- developing land-use plans that effectively conserve sites of significant biodiversity through appropriate zoning ahead of development pressures; and
- developing mechanisms to cost effectively rezone land that is inappropriately zoned whilst ensuring landholders are treated equitably and fairly.

Strategic planning

Effectively integrating biodiversity into existing strategic development planning processes is perhaps the most significant challenge facing planners at local and regional scales. It is at the strategic level that the fundamental and underlying causes of biodiversity loss can be most effectively addressed. For example, in the Hunter and Central Coast regions of NSW the key pressure on biodiversity is from population growth, currently in excess of 3% per annum, and associated urban development. Addressing the impact of population growth requires careful planning that ensures that the design of future urban areas and rural subdivisions take explicit account of biodiversity by setting aside appropriate areas for conservation (Binning and Thorman, 1999).

In practice this means that the distribution of different types of native vegetation must be mapped and included as data layers in geographic land-use planning databases, and that rules for taking account of these values are developed. Further, training in conservation planning may be required for planners who may also be required to shift their culture.

A wide range of tools are available for spatial biodiversity planning. Examples include *Bio-Rap*, a set of tools developed by CSIRO and the Centre for Resource Ecology Studies at ANU for mapping, assessing and setting priorities for biodiversity conservation and *Local Greening Plans*, a guide developed by Greening Australia for developing local biodiversity plans (Greening Australia, 1995).

A related strategic issue is taking biodiversity and conservation values into account in other planning processes that impact on native vegetation including fire, pest and weed management (Binning, Smyth and Catling, 2000).

Whilst strategic planning involves significant up-front costs it has the potential to significantly reduce the costs of regulating land-use to protect biodiversity. If land is appropriately zoned from the beginning there is less scope for conflict and more scope to streamline approval processes and give greater certainty to developers.

Local planning instruments

Local planning laws are critical to interpret higher scale regulations and apply them to local circumstances. Often discretion is allowed at a local level, making the development of appropriate local plans critical to their on-ground interpretation and implementation.

Examples of local planning tools commonly used in Australia include tree preservation orders, habitat corridor and linkage policies, development control plans regulating clearing of endangered species and communities, and recreation management (Binning and Thorman, 1999).

Other more innovative tools may include offset and development incentive policies. Offset policies require impacts on biodiversity to be offset by other works in the region that yield a

net benefit to the environment. An example of an offsets program, wetland banking, from the United States is described in case study 6.

The impact of development on native vegetation can also be achieved through development incentives, e.g. higher density development is permitted when other land is set aside for conservation or open space.

Cessnock City Council (NSW) have taken this approach by using their Local Environment Plan and associated Development Control Plans (DCP) to allow high density development provided that vegetation corridors or other strategically positioned vegetation plantings are established and maintained in perpetuity. The DCP fosters a policy of no vegetation loss. Similarly, we have been advised that Gosford Shire Council has a development incentive program aimed at protecting natural habitat. However no details on this policy have been provided.

The Gold Coast City Council in Queensland is another interesting case study where higher density development is permitted to compensate for setting other land aside as open space within their hinterland. This policy has had mixed success as the resulting small cluster developments have lead to increased infrastructure costs and pressures.

3.3.3 Property scale tools

Property agreements, management agreements and conservation covenants are all terms for formal agreement between a landholder and a third party, usually government, to manage an area of privately owned land for conservation. An agreement secures conservation outcomes by defining management objectives for the land and sets out those land-uses that are permitted and those that are excluded, in much the same way as is done through land-use zoning. Provision may also be made for the development of a management plan (Binning and Young, 1997a).

Management agreements can be distinguished from local planning instruments because they generally entered into voluntarily.

Management agreements can be of varying levels of security ranging from non-binding, as is the case with the Land for Wildlife program in Australia, through to covenants that are binding in perpetuity. All State governments in Australia have the capacity to negotiate conservation covenants. However, with the exception of Queensland, local governments do not have this capacity. Impediments also exist to non-government organisations accessing covenanting powers (see Section 2.2.3).

A critical issue in designing management agreement programs lies in achieving an appropriate balance between securing change in property right entitlements and administrative cost. Covenants are complex agreements that cost in excess of \$3000 to negotiate. Further they place obligation on both the landholder and the covenanting organisation. For example, it is recommended that a qualified extension officer visit covenanted properties at least every 2 years (Binning and Young, 1997a). These costs suggest that the use of covenants should be limited to high conservation value sites where active stewardship is required from the landholder. On the other hand a simple binding 10-year contract may be sufficient when providing catalytic incentives such as fencing grants.

An interesting application of management agreements in Australia has been their increased use by local governments who encourage voluntary rezoning by landholders committed to conservation through incentives such as rate rebates. This option is often taken up by those landholders that fear rising land values and local rates that will ultimately force sub-division of their land.

3.4 PRINCIPLES FOR POLICY DESIGN

An overview of a wide range of policies and programs that can be used to achieve on-ground actions that conserve native vegetation has been reviewed in this section of the report. In the next section of the report a number of Australian and international case studies are used to demonstrate how these tools can be mixed and applied at different scales of management.

Before doing this it is important to draw attention to a number of important design principles.

First, as already noted, there is a need to ensure that a mix of educational, incentive and regulatory based mechanisms is used;

Second, there is an issue of ordering policy development. Awareness raising through education is a critical first step, but is demonstrated to have little influence on short term behavioural change. Likewise, financial incentives are likely to be ineffective until awareness is raised and landholder attitudes shifted toward positive management of biodiversity. Regulations have also been demonstrated to fail in the absence of strong community support (Brasden, 1991). This suggests that an ideal policy approach involves: awareness raising to shift attitudes, financial incentives to assist in meeting the transition to more sustainable management, and regulations to secure the community's investment in improved management.

Of course this policy ordering can be changed in certain circumstances. For example, when seeking to quickly achieve significant changes in behaviour it may be more effective to regulate than educate. A celebrated case is that of imposing regulations requiring seat belts in cars or, perhaps less famously, the introduction land clearing controls. The process creates debate and may succeed in shifting community preferences. Whilst undoubtedly successful in some circumstances, such approaches are riskier and require greater political capital.

Third, related to policy ordering, are principles that guide the emphasis placed on each of the different categories of instrument. If dramatic structural change is required in a short time frame regulatory changes imposed by central government coupled with incentive payments that facilitate transition by compensating landholders may be preferred. However, strategies for achieving incremental change ideally place greater emphasis on education backed by incentives to achieve greater awareness and uptake.

Fourth, successful approaches to biodiversity management are complex and hence require time to develop, secure resources, implement and gain community acceptance and uptake. The most successful regional approaches we are aware of have taken in excess of 10 years to develop and are characterised by strong leadership and continuity in key staff (Binning, Cripps and Young, 1999). Stable regional structures that are able to learn and adapt are critical to achieving this outcome.

Fifth, an adaptive approach to biodiversity planning and implementation policies is required. Action should be taken whenever there is confidence that a substantial contribution to regional conservation objectives can be achieved. However, improvements to the information base and feedback from ongoing monitoring are essential elements of any successful approach (Holling, 1978; International Standards Organisation, 1996a, 1996b). The process of adaptive management applied to developing successful approaches to native vegetation management is described in Box 4.

The approach outlined in the Box serves to draw together and link the key lessons learnt from the separate discussions of institutional design and policy tools. It also provides a useful backdrop to the six case studies that are presented in the next section.

Box 4: Elements of a successful approach to managing native vegetation

A successful approach to native vegetation management will require each of the following elements (see below).

Commitment amongst all interested parties at different scales to the objectives of sustainable natural resource management, including, inter alia, the protection and management of vegetation.

Planning to achieve the objective of sustainable natural resource management

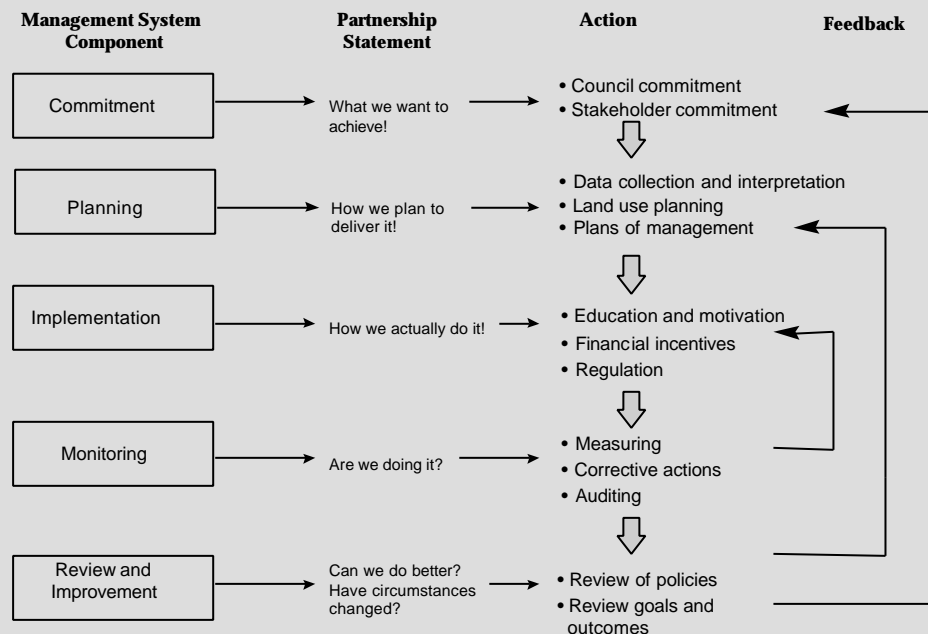
- understanding and prioritising natural resource management issues within a holistic framework, for example, integrating salinity and biodiversity
- mapping an inventory of the status and distribution of different types of vegetation and other natural resource issues within a
- undertaking strategic land use planning which takes account of the need to conserve a representative range of the different types of native (ecological communities) found within the region;
- developing ongoing plans of management for the use of natural

Implementation of programs that put planning into action across all tenures

- establish priorities for the use of scarce public
- provide information and education on the need for sustainable management;
- secure sustainable management of public lands;
- provide incentives to promote voluntary conservation activities on private land;
- where necessary, regulate land use through planning

Monitoring the outcomes of the regional

Review and improvement by establishing performance indicators and regularly reviewing progress and identifying ways in which actions for biodiversity conservation can be



Adapted from Davey et.al 1997

4. CASE STUDIES

Case Study 1 – Australian National Policy Approaches to Vegetation Management

The Commonwealth government is committed to an objective of reversing the long term decline in the quality and extent of Australia's native vegetation by June 2001. This is an ambitious target that is unlikely to be achieved.

A complex range of policies and programs are in place to promote the achievement of this goal including the following (ANZECC, 2000):

- national and State regulations, policies and institutions including land clearing and threatened species legislation in most States;
- planning and assessment frameworks for inventory, data mapping, assessment and planning for biodiversity conservation;
- creation of a comprehensive, adequate and representative national reserve system that may, where appropriate, include private reserves;
- communication and capacity building strategies for both planners and landholders to take account of biodiversity values;
- financial incentives underpinned by grants available through the \$1.3 billion Natural Heritage Trust; and
- monitoring and evaluation strategies that assess the quality and extent of native vegetation.

Through the Natural Heritage Trust the government has invested in the full range of activities. The increase in investment has yielded many benefits with biodiversity effectively being raised to the profile of other natural resource management issues.

However challenges remain. Clearing of native vegetation still outstrips revegetation and rehabilitation activities, with Queensland a particular hotspot. Regional structures for natural resource management remain poorly resourced and are generally not effectively integrated into other decision-making structures. Impediments to the use of the full suite of policy instruments identified in this report remain, particularly for the non-government sector. Grant programs need to be more effectively targeted to high priority on-ground works and tied to appropriate property right instruments (Dore, Binning and Hayes, 1999).

These challenges highlight the need for central government to achieve a balance in the range of activities in which they are involved. It is not effective to simply invest in on-ground works whilst other processes that degrade biodiversity continue. A balanced approach by central government requires investment in the following areas.

- **Institutional reform** – including establishment of minimum standards, clarification of roles and responsibilities, funding and removal of impediments to the use of the full suite of policy instruments.
- **Capacity building** – including education, inventory and mapping, and provision of expertise in biodiversity planning, program implementation and monitoring.
- **On-ground works** – provided funding to targeted investment in high priority on-ground conservation works.
- **Monitoring and adaptive management** – measuring progress, learning and adapting.

The Federal government has invested in all of these areas but many challenges remain. This emphasises the role of central governments in leading the development of effective approaches to the conservation of native vegetation.

Case Study 2 – Regional Planning – Brisbane City Council

Brisbane City Council has an impressive vegetation management program in place. This is designed around the combined objectives of maintaining open space and hence amenity in the City and conserving biodiversity.

The range of mechanisms used by Brisbane City includes the following.

- **Strategic Town Planning** which includes explicit planning through the development of District Open Space Plans which take account of biodiversity values.
- **Vegetation Protection Orders and Non Urban Zoning** are the regulatory and statutory processes used to protect native vegetation within the city. Vegetation Protection Orders (VPOs), that have the effect of making vegetation clearance a development that requires approval by the council, were introduced in 1991 and targeted at key natural areas and sites. In addition, land within the city may be zoned into one of three non-urban conservation zones.
- **Environment Levy** of \$30 per rate payer per annum is used to **acquire** key sites within the city. Rate payers subject to a VPO are exempt from the levy. Initially funds were borrowed against the Levy to facilitate the purchase of significant sites. The levy now funds repayments of the loan and purchase of additional sites. The fund is managed separately from Council revenue and enjoys strong community support.
- **Management of Council Land** is a high priority task within the council. The council is developing management plans for major natural areas within the city, with a commitment to extensive public consultation and ongoing participation.
- **Voluntary Conservation Agreement (VCA)** are used to encourage private landholders to set aside and manage land for nature conservation. Two types of agreement are offered: A General Agreement, which involves entering a Deed of Agreement to manage the land for conservation; and a Higher Agreement which involves both a Deed of Agreement and rezoning the land to a non-urban conservation zone. Land for Wildlife also provides landholders with the option of a non binding way of participating in nature conservation activities within the city.
- **Financial Assistance** is available to landholders entering VCA's. It is calculated as a proportion of the value of the property up to a set maximum of \$1000 and \$1500 per annum for General and Higher Agreements respectively. Assistance is essentially in the form of a rate rebate, however the council has taken the important step of tying assistance with the costs associated with ongoing management.
- **Community grants** are provided to groups to undertake management works.
- **The Council has introduced monitoring of vegetation loss.** In the eight years prior to 1991 when VPOs were introduced the city lost one fifth of its vegetation. Since that time the rate of clearance has been significantly slowed.

Officers at the Council strongly emphasised that a strong mix of instruments is required, as the circumstances where a particular instrument is appropriate will vary. The planning processes identify key habitats, remnants and corridors requiring protection. However, successfully engaging the landholders has required a range of policy options to be developed through which conservation objectives can be satisfactorily met.

Another lesson that can be learnt is the importance of stable institutional structures that allow complex conservation programs to be developed over time. Notably Brisbane City is Australia's only major city to be covered by a single regional Council and this undoubtedly facilitates achievement of special programs. It has resources in excess of \$1 billion annually. It has developed its conservation program progressively over 10 years with a small unit of committed staff.

Case Study 3 – Property Scale Programs – Greening Australia Fencing Assistance

Greening Australia, a non-government organisation committed to re-establishing native vegetation, administer a program that assists landholders to fence remnant vegetation within several catchments in Australia. Key elements of the program are shown in figure 9.

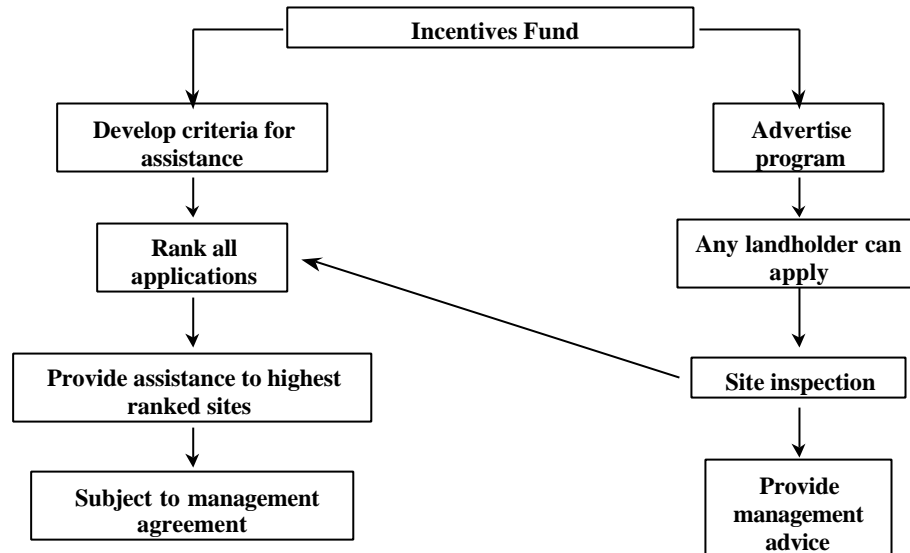


Figure 9 Greening Australia Fencing Assistance: An example of a targeted incentive.

The program is very simply structured and involves the following:

- an incentives fund is created which is available to all landholders in the region;
- access to the incentive fund is broadly advertised promoting its objectives and administrative simplicity;
- landholders apply by simply expressing interest in the program via a phone call or one page form lodged with Greening Australia;
- all landholders who express interest in the program are visited by an extension officer who assesses potential sites on the property, provides free management advice and, if requested develops an application for funding on-site;
- all applications are ranked on the basis to which they contribute to catchment and biodiversity objectives;
- funding is approved to the highest ranked sites and provided by the extension officer at a rate of \$1200 per kilometre of fencing; and
- landholders enter a 10 year management agreement to maintain the fences and manage the site for nature conservation.

The attraction of this kind of program is that a relatively small incentive is used as a catalyst to encourage landholders to take conservation activities on their properties. It demonstrates that small, simple and administratively efficient programs can be developed at a property scale that still achieve an appropriate mix of policy instruments. This is achieved by combining individual extension, financial incentives and property right instruments, in the form of a management agreement.

Variations of this type of agreement can easily be envisaged. For example, larger cost-sharing or stewardship payments may be coupled to entry into binding conservation covenants. Similarly transition incentives tied to extension services may promote acceptance of changes in land-use regulation.

Case Study 4 – Environmental Markets – Wetland Banking in the United States

Wetland banking has been in place in the USA since the mid-1970s. It allows for developments that affect wetlands to be offset by off site remediation works. By 1992 in excess of 40 banks were operating in the USA that had facilitated the rehabilitation of about 20 000 acres of wetland. There are now several hundred wetland banks in operation throughout the United States (Pacific International Engineering, 1999; Brumbaugh, 1999; Environment Law Institute, 1993).

In recent times the concept of mitigation banking has been extended to the protection of habitat for species listed under the USA's Endangered Species Act.

Wetland mitigation involves protection, restoration, creation and/or enhancement of wetlands for the purpose of compensating for unavoidable loss of wetlands in advance of development actions when such compensation cannot be achieved at the development site or would not be as environmentally beneficial.

A wetland bank is created when a sponsoring organisation undertakes a major restoration task. Once the restoration project is completed credits are provided for the value of the work undertaken. Different credit rates can be given for creation, restoration, or protection of wetlands. These credits can then be used to offset adverse impacts on other wetland areas caused by development. New developments that affect wetlands must buy credits to satisfy a prescribed impact rate. Hence a combination of the credit and impact rate determines the ratio between the area restored and the area affected by development. A committee, constituted of representatives from relevant regulatory authorities, generally sets both credit and impact rates on a project by project basis. Net rates can vary widely from 1:2 (i.e. development of one hectare of wetland requires an offset of 2 hectares of remediation work offsite) to as high as 1:20 (Pacific International Engineering, 1999).

Key features of wetland banking include:

- wetland banking has no impact on regulatory approval processes for environmental projects;
- mitigation works have to be completed prior to credits being drawn upon; and
- large scale and strategically targeted conservation works can be undertaken that provide much greater environmental benefits per dollar invested than small scale on-site remediation activities.

Wetland banking has facilitated large scale rehabilitation works that would otherwise not have been possible. The process has proven highly profitable for a number of environment rehabilitation companies who are able to on-sell to developers seeking to off-set impacts prior to development being approved. Benefits have also been provided to developers who now have greater certainty and a mechanism for offsetting adverse impacts.

The application of this type of model to a catchment or region in Australia or New Zealand would be extremely challenging. Rules for assigning credits for conservation works would need to be developed. Likewise rules for assessing the impact of approved developments would also have to be calculated. An example of a set of rules is set out in Table 5.

Key lessons that can be learnt from wetland trading are that regulations coupled with market mechanisms can be used to achieve least cost solutions to environmental problems. In this case the polluter pays and, if rehabilitation works are strategically targeted, a net improvement to the environment delivered.

Care does need to be taken however to ensure that trading is not used to justify irreversible loss of core environmental assets. A second concern relates to ensuring that the transaction

costs associated with creating markets do not outweigh improvements in environmental outcomes and economic efficiency.

Table 5: Example of possible vegetation credit and debt ratios[#]

Vegetation Credits	Indicative point ratio*	Comments
Planting individual trees	3:1	A high rate because planting of individual trees does little to restore habitat. The majority of the benefits derived from planting of this kind is associated with landscape amenity.
Revegetation and habitat reconstruction in an area not identified in a Regional Conservation Plan.	2:1	A moderate rate because although the works create habitat they are not strategically located within the landscape and hence are of lesser value to biodiversity conservation.
Revegetation or rehabilitation of strategic sites identified through a Regional Conservation Plan.	1:1	A low rate because the project is strategic in its nature and makes a direct contribution to the Conservation Plan.
Protection of currently unprotected sites identified as having high conservation value (eg by rezoning).	2:1	A moderate rate chosen to reflect that fact that although a strategic site has been protected, no additional habitat has been established, hence making trading for vegetation loss in other areas problematic
Vegetation Debits		
Removal of isolated trees.	1:1	A low rate as removal of isolated trees has limited impacts on biodiversity although impacts on local amenity may be high.
Disturbance or removal of a vegetation community represented at greater than 30% pre-European distribution.	1:1.5	A low to moderate rating as the vegetation is well represented within the shire, but nevertheless is likely to provide habitat at a landscape scale.
Disturbance or removal of a vegetation community identified as of high conservation value in the Conservation Plan.	1:3	A high rate reflecting the fact that areas of strategic importance to biodiversity conservation within the Shire are being affected. Hence the offset needs to be set at a relatively high level.
Disturbance or removal of an endangered vegetation community or community known to contain endangered species.	1:5	A very high rate justified on the grounds of the high cost to the community of losing critical habitat to development. It is assumed that such developments would only be approved following stringent approval process that demonstrated outstanding value of the development to the community. It is assumed there are significant economic rents associated with the development that should be returned to the community.

[#] The ratios presented in this table are indicative and are derived from those put forward by Pacific International Engineering (1999) for wetland trading in the USA. The ratios presented here are a guide only and may be varied according to the contribution/impact of rehabilitation works/development on project by project basis.

*The credit ratio is the quantity of remediation required to earn a single vegetation credit; the debt ratio is the cost of a quantity of impact (eg acres cleared) in credits.

Case Study 5 – Regional Planning - The Hunter and Central Coast Region

The Lower Hunter and Central Coast Region have been developing a Regional Biodiversity Strategy for several years. To date emphasis has been placed on collecting data on the distribution and condition of different ecological communities within the region.

The region, north of Sydney, is one of Australia's fastest growing population corridors and is experiencing extreme development pressures, particularly in the lowland coastal areas that contain the region's most threatened ecosystems.

Options for developing an implementation program have been developed and address the full range of institutional issues and policy instruments identified in this report (Binning and Thorman, 1999).

- It was proposed that a board of management be established to coordinate actions across 3 key State agencies and 9 local councils.
- A balance of planning tools was identified that seeks to integrate biodiversity into strategic planning decisions, audit and improve the management of public land, facilitate rezoning of high priority sites, and implement offsets policies for clearing native vegetation.
- A voluntary conservation program for encouraging conservation of private land was designed placing emphasis on the provision of extension support, management agreements and financial incentives.
- Communication and education programs were also identified
- The need for monitoring programs was highlighted to facilitate adaptive management.
- Funding strategies were identified and discussed.

In all over 50 priority actions were identified with a potential cost of \$70 million. To address the potentially unacceptable cost, three options were put to the region: status quo, a planning based approach and full implementation.

The region is struggling to act on the basis of this advice, even in relation to the highest priority recommendations. This is primarily because of the resources required and the potential impact on development interests. The key lesson is that well designed programs do not emerge instantaneously, but rather take time to develop.

Small programs that enjoy modest on-ground success are required to demonstrate the importance of taking action and thereby securing greater resources and political will to take a larger step. Adaptive approaches to policy development are required not just for environmental reasons but also to address social and economic impediments.

The lesson to be drawn is that regional programs may have long start-up lead times and may well gain impetus from smaller short term linking programs which successfully implement outcomes that have a high community visibility.

Case Study 6 – Engaging the Private Sector - The Nature Conservancy

The Nature Conservancy is a non-profit organisation established in the United States. The Nature Conservancy uses non-traditional market based solutions to protect land that is of high conservation value. The mission of the Nature Conservancy is ‘to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and water they need to survive’.

The Conservancy currently operates the largest private system of nature sanctuaries in the world with more than 1600 preserves in the United States. Originally, the Conservancy achieved its goal by simply purchasing land of high conservation value from willing sellers. However to increase effectiveness and to extend its role, the Conservancy now protects land through gifts, exchanges, conservation easements, management agreements, debt-for-nature swaps, and management partnerships (See the discussion of mechanisms).

The Nature Conservancy now protects more than 9 million acres of ecologically significant land in the United States.

The Conservancy places primary importance on developing partnerships with landholders, businesses, academic institutions and government. Some examples are:

- Aluminium Company of America (Alcoa) and The Nature Conservancy signed a cooperative agreement in January 1996 that will result in the conservation and management of 1058 acres in Arkansas, USA;
- A partnership was established in 1996 between the New Jersey Chapter of The Nature Conservancy and a utility company called Public Service Electric and Gas Company (PS&G). Under contract the Conservancy is required to manage 16,000 acres of land owned by PS&G, which is home to 376 rare plants, animals and natural communities. 101 of these are listed by the State of New Jersey as endangered;
- Microsoft co-founder Paul G. Allen pledged to donate \$5 million to The Nature Conservancy of Washington in January 1997 in the form of a Challenge Grant donated through the Paul G. Allen Forest Protection Foundation. The Foundation will donate \$1 for every \$2 donated to the Conservancy until the \$5 million limit is reached. Allen’s intention is to spur additional private donations to a total of \$15 million.

Through innovative programs of this kind the Conservancy has become one of the top 10 charities in the United States. This demonstrates the increased importance of nature conservation to individuals and corporations, who between them provide 80% of funding for The Nature Conservancy. Whilst The Nature Conservancy is limited by a reliance on donations and investments, this has encouraged innovative ways of expanding the program. Today annual turnover exceeds \$US450 million.

The US experience highlights the largely untapped potential of the non-government sector in New Zealand and Australia. It provides a model for developing partnerships between community-based organisations, businesses and government.

Non-government organisations may have greater capacity to develop links and markets between values of urban populations and regional communities that are the stewards of biodiversity.

5. KEY POLICY CHALLENGES

This paper has provided an overview of the principles that underpin the design of institutions and policies for the management of native vegetation and biodiversity. It has also sought to provide a practical interpretation of these principles, including through the case study examples.

Ultimately on-ground programs are required that target and reward land managers who actively manage areas of native vegetation on their land – be it private or public land. However, it has been revealed that the pathway to this outcome is rather more complex. Rather than focussing exclusively on land managers, it is necessary to understand the economic and social factors that are driving the land-uses and management practices that are causing the continuing loss of native vegetation. Policy responses to these socio-economic drivers require the values of native vegetation to be integrated into markets and with government responses to other natural resource management issues. The role of institutional design in translating broad strategies into targeted on-ground policies and programs for vegetation management has been highlighted.

We conclude by reflecting on the current state of play of native vegetation management in Australia and identifying a number of key challenges for the development of future policy in this area.

INSTITUTIONAL ISSUES

Regional planning and integration of natural resource management policy

In general Australia has poorly defined regional structures for natural resource management. Regional structures are characterised by fragmented responsibilities between economic policy, social development and natural resource management. Legislative responsibility is typically divided between a significant number of government Departments who administer an even larger number of Acts and regulations (for a review see Cripps, Binning and Young).

Duplication of responsibilities is mirrored at a regional scale where decision-making structures are confused with multiple committees being established to advise governments on natural resource management reform.¹ Catchment management structures are generally constituted of community based volunteers who are poorly resourced to provide advice to government, have limited expertise, and often conflict with elected local government representatives. Local government is generally uncertain of its role and feels excluded from regional institutions established by State governments

Regional approaches to biodiversity and vegetation management are only emerging, with assessment of conservation values being patchy.

For these reasons the clarification of roles and responsibilities for vegetation management at a regional scale is the primary institutional challenge confronting governments in Australia. The Commonwealth and all State jurisdictions have recognised this challenge and are actively seeking to address it. Approaches vary from seeking to coordinate and adapt existing institutions in South Australia, to the bolder reforms undertaken in Victoria to establish Catchment Management Authorities (Dore, Binning and Hayes, 1999).

¹ For example New South Wales has in the last 5 years established separate regional committees to advise on native vegetation management, river management and catchment management. In turn these bodies have limited interaction with regional development committees and local councils.

However, funding and resources for regional natural resource management remain a major issue. Investment in natural resource management should be viewed as a core element of government business requiring ongoing commitment, akin to health and education. To achieve this outcome there is an urgent need to clarify the criteria through which responsibilities for program management to be allocated, shared or devolved between Commonwealth, State, Territory and Local governments and other regional or catchment based organisations.

Institutional Challenge 1 – Establishing Secure Regional Institutions

The fundamental challenge to policy makers is to move towards the creation of regional structures for natural resources that are: stable, manage adaptively and have adequate resources to address the issues for which they have responsibility.

- State government have primary responsibility for facilitating improved coordination of the fragmented legal and organisational structures for natural resource management and resolving their efficient application at a regional scale.
- The forthcoming national natural resource management statement will need to resolve the Commonwealth government's involvement, particularly in relation to providing adequate resources at a regional scale.

Targeting of public investment

Through the *Natural Heritage Trust* in excess of \$1.3 billion is being in natural resource management nationally. Over \$350 million of the Trust's funds are being directly invested in native vegetation conservation, rehabilitation and revegetation through the *Bushcare* program. The primary focus of these programs has been on providing catalytic funding to regional and local scale programs through the "One-Stop-Shop" application process.

The Natural Heritage Trust has done much to consolidate the Commonwealth's delivery of assistance for on-ground environmental works. However, much of the work being undertaken remains poorly linked to regional planning processes that identify priority areas for investment. Further, it must be recognised that many regions do not have regional strategies that allow the contribution of proposed on-ground works to meeting regional objectives to be quantified. There are of course exceptions, the Coorong Regional Action Plan being a good example of a well targeted program (Coorong District Committee, 1997).

It must be recognised that targeted use of resources means that some regions and issues will receive greater funding than others. This is necessary given the scope of natural resource management problems in Australia and the need to adopt a long term response which addresses issues of highest strategic importance first and continues to build capacity.

A related issue is being able to quantify the contribution of government investment to meeting the objectives of conserving native vegetation. The concept of a Conservation Management Network that coordinates management of ecological communities across all land tenure would enable the relative contribution of all government programs to be quantified. The challenge is to resolve intergovernmental and inter-agency rivalry to achieve this outcome.

Institutional Challenge 2 – Targeting Public Investment

Native vegetation policy requires a committed long term response from Commonwealth and State governments which recognises the need to build capacity and to target priority issues.

- Regional plans will be required in order to be able to assess and quantify the contribution of on-ground works to meeting regional objectives.
- Data bases that record the impact of public investment across all land use tenures on an ecosystem basis are required.

Engagement of the non-government sector

Engagement of the non-government sector in on-ground conservation is increasingly recognised as a key challenge in successfully delivering policies for native vegetation conservation. As has been noted, the Landcare movement has generated unpredicted engagement with local communities and individual landholders in the last 10 – 15 years (Campbell, 1995). The challenge remains, however, to effectively engage the urban population, where the wealth of the nation is increasingly focussed, through strategic partnerships and markets for environmental services.

Considerable progress has already been made in this area. The Commonwealth government's commitment to facilitate the use of revolving funds and the provision of tax incentives for environmental philanthropy are encouraging. Likewise, State government initiatives to establish independent conservation Trusts will do much to achieve strategic engagement of non-government sector.

The challenge is to build on these successes and increase the over-all contribution of the non-government sector. A goal of strategic engagement by in numerous landscape scale programs and the establishment of 2500 private conservation reserves has been set for the non-government sector (Binning and Feilman, 2000). To achieve this markets for conserving native vegetation will have to be significantly expanded.

Institutional Challenge 3- Engaging the Non-Government Sector

To facilitate dialogue and on-ground partnerships it is recommended that a forum be established with a mandate to develop a Charter for Community-Business-Government partnerships for landscape conservation that defines:

- a vision for the role and growth of non-government investment in landscape conservation;
- strategies for capacity building covering provision of expertise and networks for information sharing, and programs for organisational learning;
- arrangements for joint funding of large investments in conservation at a regional scale;
- the development of markets for environmental services that allow urban populations to donate or purchase shares in landscape reconstruction.

POLICY DESIGN AND IMPLEMENTATION

Removal of impediments to use of the full range of policy instruments

There is increased recognition of the need to use a mix of instruments to manage natural resources and native vegetation ranging through education and motivation, incentive, regulatory and property right based instruments.

However, impediments remain. Regional institutions, local governments and the non-government sector are still not able to access the full range of conservation tools. For example, Cripps, Binning and Young (1999) have identified significant impediments to local governments using incentive based instruments for vegetation conservation. The impediments are both legislative, as in the case of local government's inability to enter conservation covenants, and policy oriented, for example in the case of poor support by State agencies for the design and implementation of incentive programs by local government.

These impediments are being redressed to some extent through provision of support to regional and local institutions to introduce new and innovative programs through the Natural Heritage Trust. One indicator of this success has been the growth of local government initiated *Bushcare* projects to in excess of \$6.5 million in 1998/99.

However, much remains to be done, particularly at State level. A comprehensive review of existing legislation to redress legal impediments to the use of innovative policy instruments is required in each State. Further, developing model policies for vegetation management and providing financial support and expertise to facilitate their use could resolve policy impediments.

Policy Challenge 1 – Impediments to the use of policies

Impediments to the use of the full range of policy instruments for native conservation remain at local and regional scales.

- A comprehensive review of existing legislation to redress legal impediments to the use of innovative policy instruments is required in each State.
- Developing model policies for vegetation management and providing financial support and expertise to facilitate their use could resolve policy and cultural resistance to the use of innovative tools.

People – capacity building through education and extension

As has been noted Australia has a strong reputation for community and landholder engagement in natural resource management through the Landcare program.

Awareness of land and water issues, including the importance of native vegetation management, is undoubtedly higher than it was prior to the establishment of Landcare. However, it is questionable whether the broad community (rural and urban) has an adequate appreciation of the size, scale and long time lags associated with of the many natural resource management issues, many of which are related to native vegetation. To secure future resources and effect change more effective engagement of the broader community particularly the urban population are required (Dore, Binning and Hayes, 1999)

Many people are involved in providing extension services to landholders. Coordination of existing networks across the full spectrum of programs relevant to the management of native vegetation – ranging from commercial forestry, agro-forestry, biodiversity conservation and environmental plantings is one challenge. Extension officers employed by government should be able to deliver, at least at a general level, across all relevant natural resource management programs.

Other challenges relate to the decline in State agency based extension services and potential cost shifting onto Commonwealth government funded programs including Bushcare and Landcare and more recently Land for Wildlife. One-on-one extension remains one of the most effective tools for securing change in landholder behaviour but is resource intensive and requires core government funding.

Policy Challenge 2 – Maintaining extension and education

Extension and education programs are integral to securing resources from decision makers and participation from landholders.

- Extension services need to be coordinated across natural resource management programs and be funded from core government funds.
- Education programs that target decision makers and the general public are also required.

Finance – incentives for vegetation management

Incentives for vegetation management have been significantly increased through the *Bushcare* program. Bushcare has significantly increased on-ground activity and facilitated innovation in the design and deliver of incentives.

One key issue is that of targeting incentives to areas of highest priority (see above). This implies the need for clear guidelines through which differential payments on the basis of environmental benefit can be justified. Cost-sharing frameworks represent an important step in this direction.

However, cost sharing and catalytic incentives are not large enough to secure rapid rehabilitation of degraded landscapes. An emerging challenge is to continue to facilitate the creation of markets that facilitate direct investment in native vegetation by non-landholders, particularly urban Australians. A range of opportunities have been identified including:

- expansion of philanthropic markets: particularly through tax incentives for donation of land and covenants;
- the creation of private conservation reserves by providing equivalent tax treatment to primary production;
- facilitating the creation of markets for environmental services such as carbon and water purification;
- environmental accreditation and certification, and
- markets for offsetting the environmental impacts of development.

Activity is occurring in all of these areas. The establishment of markets for carbon by the Sydney Futures Exchange is but one example. Many issues remain as to the most effective design of these new market structures. The challenge is to continue to facilitate the process of innovation.

Policy Challenge 3 –Tying incentives to environmental benefits

Incentives should be differentiated and more closely tied to environmental benefits through appropriate cost-sharing frameworks.

Policy Challenge 4 – Facilitating environmental markets

Incentives and markets that link regional and urban Australia are required to facilitate direct investment in native vegetation by non-landholders. There is an ongoing need to facilitate innovation and market creation through:

- further extension of tax incentives for donations including extension of tax deductibility over 5 years to bargain sales of land, loss of land value from entering a conservation covenant and donation of land with a retained right of occupation;
- extension of the Landcare rebate to works on land covered by a conservation covenant;
- facilitation and research into the creation of markets for environmental services provided by native vegetation including carbon, water purification, salinity mitigation and biodiversity
- environmental accreditation; and
- vegetation offsets programs.

Security – property rights and land-use planning

Landholder responsibilities, their duty of care, for vegetation management remains blurred particularly at regional and local scales.

Legislative regimes are critical to establishing minimum standards for vegetation and natural resource management. At a National and State scale the overwhelming issue remains regulation of land clearing that still outstrips replanting despite unprecedented government investment. Legislative regimes in Queensland and Tasmania remain inadequate with Queensland remaining a particular hotspot for clearing. NSW has been grappling with this issue for some time and implemented effective broad scale controls through the *Native Vegetation Conservation Act 1997*. However, the application and enforcement of these standards remains problematic (Dore, Binning and Hayes, 1999).

Regional and local planning has the capacity to interpret State-wide controls and refine the definition of landholders duty of care. The critical issue here remains integration with other strategic planning processes and ensuring appropriate zoning of land prior to the advent of development pressures. Native vegetation values are only just beginning to be taken into account in these processes in the most forward thinking local Councils.

Property scale regulation should in general be limited to exceptional circumstances. However, enhancing the capacity of landholders to voluntarily enter conservation covenants remains a key challenge. Victoria and Western Australia remain the only states where organizations at arms length from government have this capacity. Proposals are being developed in New South Wales and Queensland but are yet to be put in place.

Policy Challenge 5 – Regulating vegetation clearing

Nationally consistent approaches to the regulation of broad-scale clearing are required to reverse the long term decline in the extent and quality of native vegetation.

- Queensland and Tasmanian frameworks remain inadequate although processes for addressing land clearing in Queensland are being developed.
- In the absence of this minimum standard the effectiveness of community based voluntary programs must be questioned.

Policy Challenge 6 – Integrating native vegetation into regional and local-use planning

The most effective way to secure the conservation of native vegetation is to ensure land is appropriately zoned ahead of development pressures.

- Data on the distribution and quality of native vegetation should be included and taken into account in all strategic land-use planning processes.

Policy Challenge 7 – Expanding access to conservation covenants

To facilitate greater uptake of conservation covenants all States should move to establish independent conservation trusts with the power to enter conservation covenants.

- Trusts should be able to delegate their capacity to enter covenants.
- Covenants should allow for the separation of environmental services from land title to facilitate the creation of environmental markets.

REFERENCES

- ANZECC (2000) *National Framework for the Management and Monitoring of Australia's Native Vegetation*, Environment Australia, Canberra
- ANZECC (1997) *Interim Scientific Guidelines for the National Reserve System*. Environment Australia, Canberra.
- Binning, C E and Feilman (2000), *The role of Non-Government Sector in Landscape Conservation*, CSIRO Wildlife and Ecology Working Paper
- Binning, C E and Thorman, R (1999) *Decision Points for Biodiversity: Partnerships and options for implementing the Lower Hunter and Central Coast Regional Biodiversity Strategy*, CSIRO Wildlife and Ecology
- Binning, C E and Young, M D (1999a), *Talking to the Taxman about Nature Conservation: Proposals for the introduction of tax incentives for the protection of high conservation value native vegetation*, National R & D Program on Rehabilitation, Management and Conservation of Remnant Vegetation, Environment Australia, Canberra
- Binning, C E and Young, M D (1999b), *Conservation Hindered: The impact of local government rates and State land tax on the conservation of native vegetation*, National R & D Program on Rehabilitation, Management and Conservation of Remnant Vegetation, Environment Australia, Canberra
- Binning, C E and Young, MD (1999c), *Philanthropy – Sustaining the Land*, The Ian Potter Foundation
- Binning, C E and Young, M D (1997a), *Motivating People Using Management Agreements to Conserve Remnant Vegetation*, Paper 1 / 97, National R & D Program on Rehabilitation, Management and Conservation of Remnant Vegetation, Environment Australia, Canberra
- Binning, C E and Young, M D (1997b), *Biodiversity: Incentives and Local Government*, Paper to Pathways to Sustainability International Conference, Newcastle
- Binning, C E (1997), *Beyond Reserves: Options for achieving nature conservation objectives in rural landscapes*, in *Frontiers in Ecology: Building the Links*, Eds Klomp, N and Lunt, I, Elsevier Science, Oxford
- Binning, C E, Young, M D and Cripps (1999), *Beyond Roads Rates and Rubbish: opportunities for local government to conserve native vegetation*, National R & D Program on Rehabilitation, Management and Conservation of Remnant Vegetation, Environment Australia, Canberra
- Bradsen J (1991), *Perspectives on Land Conservation*. Environment and Planning Law: March 1991
- Campbell (1994), *Landcare: Communities Shaping the Land and the Future*, Allen and Unwin, Australia
- Campbell, A (1996), *Regionalism, regionalisation and natural resource management*, Centre for Resource and Environmental Studies, Working Paper, Canberra
- Chichilnisky, G and Heal, G (1998), *Economic Returns from the Biosphere*, Nature 391:629-30
- Coorong District Committee (1997), *Local Action Plan*, Coorong Shire Council
- Cripps, E, Binning, C E and Young, M D (1999), *Opportunity Denied*, National R & D Program on Rehabilitation, Management and Conservation of Remnant Vegetation, Environment Australia, Canberra

- Crompton J. (1990) *Protecting Park and Natural areas Without Purchasing Term: A Review of Methods Adopted in the USA*. Vol 13 Journal of Society and Leisure, Quebec.
- Daily, G and Walker, B (2000) *Seeking the great transition*. Nature 403:243-245.
- Daily, G (1997) *Nature's Services - Societal Dependence on Natural Ecosystems*. Island Press, Washington.
- Dore, Binning and Hayes (1999), *Review of Best Practice Native Vegetation Management and Monitoring*, Unpublished paper to ANZECC.
- Environment Law Institute, 1993 - From Wyong XXXX
- Farrier D (1995), *Off-Reserve Management and the Conservation of Biodiversity, With Particular Reference to the Management of Land in Private Ownership*. Report to the Tasmanian Forests and Forest Industry Council, Tasmania
- Folk, C (1999), *The Fit Between Institutions and Resilience*, Beijer Institute, Stockholm
- Greening Australia (1995), *Local Greening Plans*, Greening Australia, Canberra
- Holling, C S, (ed), (1978), *Adaptive Environmental Assessment and Management*. Wiley, New York.
- Howard, B. and Young, M.D. (1995) *Can Australia Afford a Representative Reserve Network by 2000?*. Search, Vol.27, No.1: 22-26
- International Standards Organisation (1996a), *ISO 14001 Environment Management Systems - Specification with guidance for use*, International Standards Organisation, Geneva
- International Standards Organisation (1996b), *ISO 14004 Environment Management Systems - General guidelines on principles, systems and supporting techniques*, International Standards Organisation, Geneva
- Lambeck, R (1999), *Landscape Planning for Biodiversity Conservation in Agricultural Regions: A case study for the wheat belt of Western Australia*, Biodiversity Technical Paper No. 2, Environment Australia
- Lambert and Elix (1998), *Grassy White Box Woodlands: More Than Just the Odd Tree*, Report to LWRRDC and Environment Australia
- MDBC (1996) *Cost-Sharing for On-ground Works*. Murray Darling Basin Commission, Canberra.
- Ministerial Council on Biodiversity, (2000) *Bio-What – Addressing the effects of private land management on indigenous biodiversity*, Department of Conservation, Wellington
- Morton, S (1999), Questions and answers relevant to emerging strategies: in *Exploring the Future Requirements of Managing Australia's Remnant Vegetation*, LWRRDC, Canberra
- New Zealand Government, *The New Zealand Biodiversity Strategy: Our Chance to Turn the Tide Whakakohukihukitia Te Tai Roroku Ki Te Tai Oranga*, Department of Conservation, Wellington
- OECD Expert Group on Economic Aspects of Biodiversity (1996), *Making Markets work for Biological Diversity: The role of Economic Incentive Measures*. Organisation for Economic Cooperation and Development, Paris
- Pacific International Engineering (1999)
- Pressy (1995) *Conservation Reserves in NSW: Crown Jewels or Leftovers*. Search, Vol.26, No.2, March 1995.
- Prober and Thiele (1996), *Reserve Concepts and Conceptual Reserves: the Grassy White Box Woodlands and Beyond*, Unpublished paper

- Prober and Thiele (1999), *A preferred model for the grassy white box woodland Community Conservation Network*, Unpublished paper
- Read Sturgess and Associates (1992), *Evaluation of the Economic Values of Wood and Water for the Thomson Catchment*. Consultancy Report prepared for Department of Conservation and Environment and Melbourne Water. 1992. Kew, Australia, Read Sturgess and Associates.
- Tasmanian Government (1998) *Strategic for Private Forest Reserves Program*, Department of Environment, Tasmania
- Williams, J (2000) *Recent Findings of the LWRRDC/Environment Australia National Program on Rehabilitation, Management and Conservation of Remnant Vegetation*, Draft paper, LWRRDC, Canberra
- Young, M.D, Gunningham, N, Elix, J, Lambert, J, Howard, B, Grabosky, P. and McCrone, E. (1996), *Reimbursing the Future: An evaluation of motivational, voluntary, price-based, property-right, and regulatory incentives for the conservation of biodiversity*. Department of the Environment, Sport and Territories Biodiversity Unit Biodiversity Series Paper No. 9