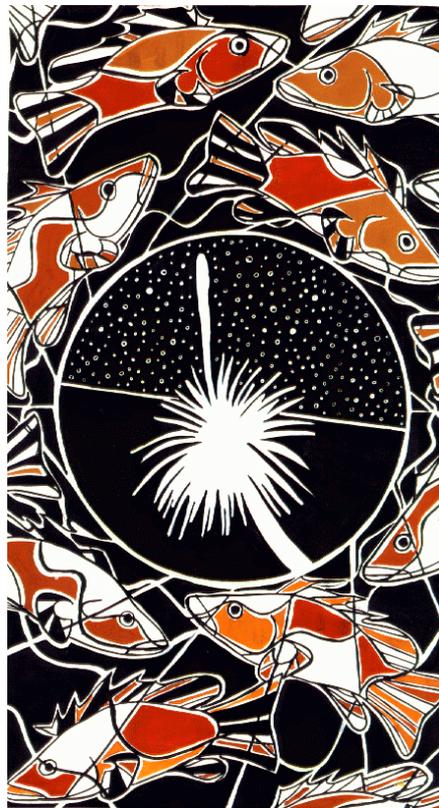


# INCENTIVE POLICIES FOR REMNANT NATIVE VEGETATION CONSERVATION

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**CHARLES STURT**  
U N I V E R S I T Y



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VEGETATION CONSERVATION**

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**SIXTH REPORT OF THE PROJECT**  
*Economics of remnant native vegetation conservation on private property*

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### **Previous reports of the project *Economics of remnant native vegetation conservation on private property***

#### Report 1

Lockwood, M., Buckley, E., Glazebrook, H. (1997) *Remnant vegetation on private property in northeast Victoria*. Johnstone Centre Report No. 94. Johnstone Centre, Albury.

#### Report 2

Lockwood, M., Buckley, E., Glazebrook, H. (1997) *Remnant vegetation on private property in the southern Riverina, NSW*. Johnstone Centre Report No. 95. Johnstone Centre, Albury.

#### Report 3

Lockwood, M., Carberry, D. (1998) *Stated preference surveys of remnant native vegetation conservation*. Johnstone Centre Report No. 104. Johnstone Centre, Albury.

#### Report 4

Walpole, S., Lockwood, M., Miles, C.A. (1998) *Influence of remnant native vegetation on property sale price*. Johnstone Centre Report No. 106. Johnstone Centre, Albury.

#### Report 5

Miles, C.A., Lockwood, M., Walpole, S., Buckley, E. (1998) *Assessment of the on-farm economic values of remnant native vegetation*. Johnstone Centre Report No. 107. Johnstone Centre, Albury.

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## **Preface**

This document is the sixth in a series of reports arising from a project entitled *The economics of remnant native vegetation conservation on private property*. The work is funded by the Land & Water Resources Research & Development Corporation and Environment Australia. The New South Wales National Parks and Wildlife Service and the Victorian Department of Natural Resources and Environment are partners in the project.

The project commenced in June 1996, and is scheduled to be completed in August 1999. The project has four main phases: resource inventory, economic analysis, policy assessment, and communication.

*Resource inventory.* The project focuses on the Northeast Catchment Management Region in Victoria and the Murray Catchment Management Region in NSW. Remnant vegetation on private property will be identified using remote sensing in conjunction with field surveys. Remnants will be categorised into quality classes.

*Economic analysis.* The economic values associated with the remnants identified in the resource inventory will be measured. These values include both market and nonmarket economic benefits and costs.

*Policy assessment.* Policies designed to conserve remnant native vegetation on private property should be consistent with the underlying values affected by such conservation. The results of the benefit cost analysis will be used to recommend and test economic policy instruments for remnant vegetation conservation. Testing will concentrate on the likely acceptability of various policy options to landholders.

*Communication.* Mechanisms such as dissemination of reports and community workshops will be used to communicate the results of the project to stakeholders.

## **Steering committee**

Terry De Lacy (University of Queensland), Jack Sinden (University of New England), Noelene Wallace (Northeast Catchment and Land Protection Board), Roger Good (NSW National Parks & Wildlife Service), Kevin Ritchie, (Department of Natural Resources & Environment), Mark Sheahan (Department of Land & Water Conservation), Ian Davidson (Greening Australia), Leanne Wheaton (Murray Catchment Management Committee), Fleur Stelling (Murray Catchment Management Committee), Judy Frankenberg (Hume Landcare Group),

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## 1. Introduction

Australia has experienced an enormous loss of native vegetation since European contact. In some regions over 93% of the native vegetation has been removed from the landscape (Saunders *et al.* 1991). In 1788 forests covered almost nine per cent of the continent (Commonwealth of Australia 1996a). By the 1980s, about 175,000 sq km of forest had been thinned to woodland or open woodland, and a further 140,000 sq km cleared mainly for grazing, leaving about five per cent of Australia forested (Commonwealth of Australia 1996a). The area of woodland also decreased during this time from 21% to 14%. About 75% of rainforests have been removed, more than 60% of coastal wetlands in southern and eastern Australia, nearly 90% of temperate woodlands and mallee, and more than 99% of temperate lowland grasslands in south-eastern Australia have been lost (Industry Commission 1997). Although clearing has slowed since the 1970s, annual rates of clearing over the last ten years could in fact be greater than 5000 sq km (Commonwealth of Australia 1996a). Between 1991 and 1995, the 1997 *National Greenhouse Inventory* estimated the average annual amount of land clearing in Australia to be over 471,828 ha (Krockenberger 1998). The Industry Commission (1997) reported that the area of native vegetation cleared in the last 50 years has been as much as in the previous 150 years.

Remnant native vegetation (RNV) is the term used to describe those patches of bushland which remain in the rural landscape following this widespread clearance of native vegetation. In addition to clearing, RNV faces incremental degradation from threats such as rising water tables, the impact of grazing, fire or fertiliser, invasion of exotic weeds, and insect attack (Robinson 1993; Price 1995).

The clearance of native vegetation in rural Australia has been identified as a major environmental problem that is associated with dryland salinity, weed invasion, soil erosion, soil structural decline and the loss of species (Nadolny *et al.* 1991; ABS 1992). It is probable that more than two-thirds of Australia's agricultural land is affected to some degree by land degradation, particularly erosion and salinity (Neale 1987; Conacher & Conacher 1995). During the main phase of vegetation clearance in Australia, soil losses have been estimated to be ten to 50 tonnes per hectare per year (ABS 1996). The widespread clearance of deep rooted perennial vegetation in favour of shallow rooted annual crops and pastures has resulted in a changed hydrological cycle in many areas, with an estimated 2,239,000 ha of land being affected by dryland salinity (Land and Water Resources Research and Development Corporation (LWRRDC) 1995). In 1995 the Department of Environment, Sport and Territories estimated that lost agricultural production owing to land degradation was \$1.15 billion annually (Walpole 1996).

The benefits of RNV in rural areas relate to values such as nature conservation, productive capacity of land, catchment health and aesthetics. Research has demonstrated that it is "important for a proportion of all farmland to have some native vegetation for ecological stability, to regulate hydrological processes and for long-term sustainability of farm production" (Jenkins 1996, p.1). The retention and maintenance of native flora and fauna communities is recognised as an important input within the production system, sometimes just as important to production as irrigation, fertilisation, and insecticides (Davidson & Davidson 1992; Swanson 1997). Long-term agricultural

productivity will ultimately depend on maintaining and enhancing RNV in all landscapes (Price 1995).

In the past, conservation considerations of RNV have rarely been taken into account during the development of areas for purposes such as agriculture. Nature conservation has been based almost entirely on the declaration of national parks and large areas of public land in reserves (Binning 1997a). While these areas are critical, bushland on private property is also important, particularly for those vegetation types that are not well represented on public land. At present more than two-thirds of Australia is managed by private landholders (Commonwealth of Australia 1996b; Young *et al.* 1996). This area of agricultural land covers a vast 500 million hectares, in comparison to the 40 million hectares devoted to the reserve system (Young *et al.* 1996). The area of conservation reserves, comprising just over five per cent of Australia, does not provide an adequate representation of our biological diversity (CSIRO 1996).

Underlying causes of biodiversity loss arise in part from “the failure of markets to value all biodiversity considerations, incomplete specification of property rights, poor institutional arrangements, failure to distribute information, inadequate resources allocated for biodiversity conservation, and a general lack of awareness of the value of biodiversity” (Young *et al.* 1996, p. 11-12). To this list we would add inadequate cost-sharing arrangements. It is unrealistic and inequitable that the farming community should be left with the responsibility of paying for what most other Australians aspire to and reap the benefits from, particularly where there is a significant loss of income (Donaldson 1996). There are certainly economic advantages of conserving RNV, but the fact remains that for many landholders the costs of conserving remnant vegetation outweigh the benefits (Miles *et al.* 1998). Landholders do not need, nor are they likely to respond to, further financial burdens which do not directly augment their income.

Many farmers appreciate the value of maintaining native vegetation on farms. However, there are a range of factors including economic, social, cultural, perceptual and situational, which reduce the adoption of appropriate management practices (Vanclay 1992). Barriers to RNV conservation and management may include the individuals’ socioeconomic background, social and political institutions, economic costs and forces, inconvenience (O’Brien 1992; Gardner & Stern 1996), compatibility with the landholder’s style of farming (Chamala 1992; Campbell 1994), relative advantage of innovation change (Chamala 1992), and the social acceptability of engaging in the practice among the farmer ‘sub-culture’ (Vanclay 1992; Goldney & Watson 1995). There is also little understanding of, or information on, the short or long-term economic benefits of investment in RNV conservation. A major purpose of the *Economics of remnant native vegetation conservation on private property* project is to address this issue and provide data on the economic benefits and costs of RNV conservation (Lockwood & Carberry 1998; Miles *et al.* 1998; Walpole *et al.* 1998). The work is being undertaken in two study areas - northeast Victoria and the Murray Catchment in the southern Riverina of NSW.

This sixth report of the project first gives a brief overview of governments’ roles in relation to the economics of RNV. Available policy approaches for the conservation of RNV on private property in Australia are summarised in Section 3, including examples of specific government and non-government programs and mechanisms. The final section of the report outlines a proposed economic incentive policy for RNV conservation based on the economic data gathered in the wider project (see the Preface). This proposal will be assessed over the next year to determine its acceptability to landholders and other stakeholders in the study areas.

## 2. Government intervention and the economics of RNV

A key policy debate throughout the world is, and has been for many years, how much power the public and private sectors should have, and how they should relate to each other. This debate is of crucial importance for RNV conservation. It influences, among other things:

- who is given the responsibility for managing RNV;
- what resources are allocated to protecting RNV;
- who pays for the costs of protection;
- who has the power to make decisions; and
- how decisions are made.

In Australia, the debate about the relative roles of the public and private sectors has recently been dominated by economic rationalism. In essence, economic rationalism advocates maximising the role of the market as a mechanism for determining the production and allocation of resources. The justification for economic rationalism is based on welfare and micro-economic theory, as well as experience with actual economic outcomes arising from market exchanges. Theory shows that maximising the economic welfare of society can be achieved through economic efficiency. Perfect markets will tend to be efficient, in that goods will be bought and sold until the point is reached where everyone involved in the market can gain no additional benefit from further exchange - that is, benefits have been maximised.

However, a market will function efficiently only when certain conditions are met. The three basic requirements of an ideal market as described by Kneese (1977) are:

- perfect competition between the actors in the market;
- availability of full information relating to the goods being traded and the mechanism of trade; and
- allocation of property rights such that all goods in the market can be exclusively owned by individuals, and 'non-paying consumers' can be excluded.

State intervention may be required to ensure that as far as possible, the conditions of perfect competition and full information are maintained, to ensure price stability, and to address those situations when one or more of the ideal market conditions does not and/or cannot apply. In particular, the public sector is required to provide those social goods and services required by the community where the market is an inefficient producer, and to manage situations where externalities arise that affect social welfare. Both of these functions are relevant for RNV conservation.

Markets under supply public goods such as biodiversity conservation over which individual property rights cannot meaningfully be allocated. Pure public goods and services contribute to the general welfare of society, but cannot be 'owned' by individuals. The private sector is not able to efficiently provide these goods and services because benefits arising from them do not directly accrue to specific individuals. Individuals may use a public good, but may not be willing to contribute to its cost of production or maintenance (Siebert 1992), or there is simply no mechanism in place to capture individuals' willingness to pay (WTP), or to fund the cost. When this

happens the contributions are not large enough to finance an efficient supply of the public good. Under supply of public goods constitutes a failure to maximise economic welfare.

An area of RNV may be owned and managed by an individual for private gain, but the public also receive the benefits of management, or the costs of mismanagement. Public goods associated with RNV may include landscape aesthetics and biodiversity conservation. Economists have termed values such as biodiversity conservation 'non-use' values, because they concern the value people place on the existence of a natural area in a certain condition, regardless of the importance of other values related to consumption, either of products (such as timber), or experiences (such as recreation). Ultimately the private owner of the remnant will determine the level of supply of such values, within any constraints imposed by legislation. Decisions made by individual landholders, based on free market principles, will result in an under supply of RNV conservation. The combined demand for private and public values for conserving RNV is essentially much greater than the private demand for conserving RNV. A landholder will probably have no incentive to fence off an area of RNV if the benefits to himself/herself are small, and the personal costs of building the fence are large. This provides a rationale for government intervention in the form of incentives to conserve RNV on private land.

Clearing of RNV by a particular landholder can produce negative externalities - that is, impose costs on other landholders. The costs from this action are productivity losses suffered by downstream landholders arising from increased salinisation and lowered water quality. Upstream landholders have no incentive to consider these costs as they do not affect their profitability. Private returns therefore diverge from social returns (Tisdell 1984). Those landholders who do take external costs into account will tend to be less economically viable than competitors who do not. Government intervention is therefore justified in order to establish efficient and equitable distribution of costs.

In general, governments can control the trading of natural resource attributes in terms of their quality and quantity, or they can control their prices, either directly by setting prices, or indirectly through charges, taxes, subsidies and other economic incentives (James 1997). Governments can also provide expertise, information, and education to address the lack of appropriate and sufficient knowledge of individuals within the market system.

However, as emphasised by Peterson (1995), the economic case for government intervention to foster RNV conservation depends on the intervention increasing public welfare. Government intervention must lead to improved allocation outcomes over those of the free market and the ensuing benefits should exceed the cost of such intervention, including those of enforcement and market distortions (Panayotou 1992). It is therefore important that policies designed to provide economic incentives and establish cost-sharing arrangements are based on assessment of all economic benefits and costs of RNV conservation.

RNV has both market and non-market economic values. Market values relate to the direct on-farm benefits and costs associated with conserving RNV. Such benefits may include increased stock and crop production due to shelter and shade, increased agricultural production due to land degradation control, and the provision of timber for

firewood and fencing. Costs may include foregone agricultural production from the areas to be conserved, the materials and labour associated with fencing, and the ongoing management of the remnant. Non-market values relate to the community benefits associated with RNV including the conservation of native plant and animal communities, and the provision of scenic amenity.

Unlike market values, non-market values cannot be readily quantified and hence many environmental assets and ecological functions are unpriced and perceived to be 'free'. However, this does not mean that they do not have a value, or that the value cannot be translated into monetary terms and compared with other things that are valued and priced (Markandya & Richardson 1992). If unpriced resources are not owned or do not have price tags, they tend not to be recognised in a market like other assets and there is no incentive to protect them (Beder 1993). Consequently, they tend to be overused or abused, thereby resulting in environmental damage at both regional and global scales (Young 1992). Environmental economists see a part of the solution to environmental problems in terms of ensuring that the environment is properly valued to reflect the relative scarcity of natural resources and assets.

Many of the costs and benefits of RNV conservation have been measured as part of the *Economics of remnant native vegetation conservation on private property* project (Lockwood & Carberry 1998; Miles *et al.* 1998; Walpole *et al.* 1998). The measurement of these benefits and costs of RNV conservation was based on the study areas of northeast Victoria and the Murray catchment in the southern Riverina of NSW. The two study areas were divided into strata based on climate, landform, land use and broad vegetation type of the RNV. Samples of landholders were surveyed in each strata to determine the benefits and costs of RNV conservation on their properties (Miles *et al.* 1998). These data will be used to estimate aggregate on-farm benefits and costs for each stratum. Community WTP for RNV conservation in the study areas was assessed using stated preference surveys (Lockwood & Carberry 1998). Future reports in this series will address the external costs that would be imposed on downstream landholders from RNV clearing, and combine the various economic value components into an extended benefit cost analysis (BCA).

Several scenarios will be assessed in the BCA, including one in which landholders: are not permitted to clear any RNV; fence all RNV; manage the RNV for weeds, feral animals and fire; and only use the RNV for grazing and timber products to the extent that these activities will not significantly effect biodiversity values. With respect to the on-farm values and community WTP, there are several possible outcomes from the analysis.

#### *Outcome 1*

If, for particular strata, on-farm costs of conserving remnant vegetation are less than the on-farm benefits, then conserving remnant vegetation makes economic sense for landholders. If they do not do so, it may be because they are unaware of the economic benefits the remnants contribute to their properties, and information programs rather than economic incentives are appropriate.

#### *Outcome 2*

If, for particular strata, on-farm costs of conserving remnant vegetation are greater than the on-farm benefits, then there is no economic reason for the landholder to conserve the remnants. However, if the on-farm benefits plus the community WTP is greater than the on-farm costs, then a subsidy, paid by the community to the landholder for conserving the remnants, can be economically justified.

### *Outcome 3*

If, for particular strata, the on-farm costs of conserving remnant vegetation are greater than the on-farm benefits plus the community WTP, then conserving remnant vegetation does not make economic sense, though there may be non-economic reasons for conserving the areas.

Based on the BCA results in Miles *et al.* (1998), landholders clearly need policies that economically influence their decision to invest in RNV conservation. The work reported in Lockwood & Carberry (1998) indicates that *Outcome 2* is likely to apply to most strata within the study areas. This preliminary conclusion will be confirmed (or otherwise) in an extended BCA that will be the subject of a future report of the *Economics of remnant native vegetation conservation on private property* project. For the purpose of developing the policy in Section 4, *Outcome 2* will be assumed to apply to all strata in the two study areas. Furthermore, the external effects of RNV conservation on the productivity of downstream properties, though not quantified at this stage, are known to be positive. The cost-sharing arrangements proposed in Section 4 also take into account these external benefits.

## **3. Current RNV policy**

This section reviews the existing policy framework for native vegetation management in Australia. It does not attempt to make an exhaustive list of mechanisms or instruments, but rather describes the variety of conservation approaches, providing examples where appropriate. A more comprehensive overview is given in Young *et al.* (1996).

Current policy approaches to achieve RNV protection on private land have been classified into the following categories: national strategies and programs; regulatory instruments; economic instruments; management agreements; voluntary instruments; and education. This classification has been designed to illustrate the main features of key mechanisms and instruments used to conserve RNV in Australia. Note that some programs or mechanisms may address biodiversity conservation by mixing an array of instruments. Covenants, for example, may incorporate voluntary, regulatory and management agreement components.

### **3.1. National strategies and programs**

A number of strategies in Australia address, sometimes indirectly, the need for nature conservation on private land. These include the: National Strategy for the Conservation of Australia's Biological Diversity; National Strategy for Ecologically Sustainable Development; National Forests Policy Statement; Draft National Strategy for Rangeland Management; National Weeds Strategy; and National Strategy for the Conservation of Australian Species and Communities Threatened with Extinction (Young *et al.* 1996).

The goal of the National Strategy for Ecologically Sustainable Development, for example, is to achieve 'development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends' (Commonwealth of Australia 1992, p. 8). The core objectives of the strategy are:

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

Under this strategy, the Commonwealth and state/territory governments have agreed to encourage voluntary management of native vegetation remnants and to develop a range of measures which focus on the protection of native vegetation on private land (ANZECC 1996).

The 1990s were declared the Decade of Landcare following an agreement reached in 1989 between the Australian Conservation Foundation and the National Farmers Federation on a broad based approach to dealing with the severity of land degradation in the rural sector. The Prime Minister's 1989 Environment Statement, 'Our Country Our Future', saw a Commonwealth commitment to provide over \$320 million for landcare and related tree planting and remnant vegetation programs for the forthcoming decade (French 1996). Successive Prime Ministers have continued to acknowledge that land degradation is the number one environmental issue in Australia (Farley 1993).

Landcare is a term used by both state and commonwealth programs which aim to encourage community participation in land conservation planning and the adoption of sustainable farming practices at a local level (Young *et al.* 1996). The National Landcare Program (NLP) represents a 'grass roots' approach to achieving the long term sustainability and management of natural resources. Essentially the NLP is an umbrella program which includes a variety of other programs largely administered by Environment Australia. These have included:

- Save the bush;
- One billion trees;
- Drought Landcare;
- 21C Greenhouse Action Plan (the National Corridors of Green and Urban Forests Programs);
- Grasslands Ecology;
- River Murray Corridor of Green; and
- Natural Resources Management Strategy.

The NLP Program has now been subsumed into the Natural Heritage Trust (NHT) which is 'the foundation of the Howard Government's program to conserve our native vegetation, land, biodiversity, water resources and seas' (Commonwealth of Australia 1997, p. 3). The Natural Heritage Trust is a \$1.25 billion fund that is used to support a number of programs. Major programs encompassed by the NHT (and the approximate dollars allocated by the Commonwealth to each program for the next five years) include

Bushcare (\$328 million); NLP (\$264 million); Murray Darling 2001 (\$163 million); Coasts and Clean Seas Program (\$106 million); National Rivercare Program (\$97 million); National Reserves System Program (\$80 million); National Land and Water Resources Audit (\$37 million); National Weeds Program (\$24 million); Farm Forestry Program (\$22 million); Endangered Species Program (\$16 million); National Feral Animal Control Program (\$16 million); and National Wetlands Program (\$11 million) (Lyle pers. comm.). The \$328 million Bushcare program is directed towards revegetation of cleared areas and protection of RNV (Commonwealth of Australia 1997).

### **3.2. Regulatory instruments**

Government regulation in the past has been one of the contributing factors towards biodiversity loss in Australia. For example, up until the 1970s, clearing native vegetation was a tax deductible expense, effectively rewarding people for clearing the land. With the change in attitudes towards environmental issues, legislation and regulatory mechanisms now endeavour to influence private behaviour in order to conserve what is left. In many parts of Australia, clearing without a permit is now an offence (Milne 1995).

Regulatory or legislative instruments are often referred to as ‘command and control’ measures, and have traditionally been favoured by governments to carry out environmental policy. Essentially these instruments are institutional measures aimed at directly influencing the environmental performance of resource users by regulating processes or products used. This is achieved by abandoning or limiting the use of resources and/or restricting use through such methods as licensing, setting of standards, and zoning (OECD 1989). Regulatory instruments which effect the clearance of RNV on private land include land use zoning, environmental protection regulations and restrictions attached to leases (Wills 1987).

Young *et al.* (1996) have commented that regulatory instruments provide an essential safety net. If other policy approaches such as voluntary instruments were to fail, then there is always the deterrent of regulation to reduce undesirable behaviour resulting in environmental damage. Regulatory measures alone, however, are insufficient (Nadolny *et al.* 1991; James 1997). Insufficient implementation and enforcement of regulations is widespread, especially for a geographically dispersed good such as RNV, where enforcement resources are meagre, and regulation is not supported by the local community (Young 1996). Administrators may know too little about the situations faced by individual firms or landholders, and as a result may impose inappropriate and costly constraints over them (Hodge 1991).

The basis for regulatory control is generally some form of legislation. The body of land management and environmental legislation in Australia is substantial. About 80 Acts are administered by the Department of Land and Water Conservation (NSW); 109 by the Department of Natural Resources and Environment (DNRE) (Victoria); about 40 by the Department of Natural Resources (Queensland); 48 by the Department of Environment and Land Management (Tasmania); 27 by the Department of Lands Planning and the Environment (NT); and about 20 by the Department of Urban Services (ACT) (Industry Commission 1997, p. 41). The majority of Australian states and territories have legislative controls aimed at protecting native vegetation on private land.

The variety of relevant legislative controls may range from simple coercive strategies such as prohibition through law, to consensus strategies such as agreements or contracts between landholders and public authorities (Farrier 1992).

There are significant differences in approaches to vegetation management across the states and territories (Table 1). No state has totally banned clearing of native vegetation, but stringent controls exist in states such as South Australia and Western Australia. Tasmania and the Northern Territory do not have any legislation or mechanism in place to control clearing of native vegetation (Young *et al.* 1996; Binning & Young 1997).

**Table 1. Current legislative restrictions on clearance of native vegetation** (*from Binning & Young 1998a, p. 20*)

<b>State or Territory</b>	<b>Legislative controls</b>
<b>Tasmania</b>	Minimal controls through Forests Code of Practice and local government planning schemes.
<b>Victoria</b>	Broadscale control through vegetation overlay of the planning provisions of the <i>Planning and Environment Act 1987</i> .
<b>South Australia</b>	Broadscale controls through the <i>Native Vegetation Act 1991</i> .
<b>Western Australia</b>	Broadscale controls in agricultural regions through a Memorandum of Understanding between Commissioner for Soil and Land Conservation, Environmental Protection Authority, Department of Environmental Protection, Agriculture Western Australia, Department of Conservation and Land Management and the Water and Rivers Commission.
<b>Queensland</b>	Regulation of leasehold land through permit system. No control on freehold land except where local government controls exist.
<b>New South Wales</b>	Broadscale clearing controls in place since 1995, with recent introduction of controls under the <i>Native Vegetation Conservation Act 1997</i> .
<b>Australian Capital Territory</b>	Tight controls implemented via controls on lease conditions.
<b>Northern Territory</b>	Some controls implemented via controls on lease conditions.

The NSW government has recently introduced the *Native Vegetation Conservation Act 1997*, and repealed the State Environmental Planning Policy No. 46 (SEPP 46). The main reason for these changes is to put in place community driven, regional vegetation planning (Harriss pers. comm.). It is intended that proposals to clear land must be consistent with regional vegetation management plans, which are a key element of the new Act. The plans are expected to minimise the need for landholders to seek development consent for clearing with a more regional and community driven approach to vegetation management (DLWC 1997a). The regional community has the opportunity to develop these management plans via regional vegetation committees. Following this, the Minister for Land and Water Conservation will consider approval of plans after a period of public consultation. The Native Vegetation Advisory Council has been established to advise the Minister on the development of strategic native vegetation policies. In addition, a Native Vegetation Management Fund will provide

\$15 million for incentives over three years, to assist landholders to manage native vegetation on their properties (DLWC 1997b).

In 1989 the Native Vegetation Retention Planning Control Program was introduced in Victoria. This program requires a permit under the *Planning and Environment Act 1987* before any clearing greater than 10 hectares is undertaken. The controls have been devolved to the regional level and have reduced the annual clearing of native forest by over half (Young *et al.* 1996). Similar controls and restrictions on certain land use practices can be implemented under the *Catchment and Land Protection Act 1994*. In mid 1997, nine Catchment Management Authorities were established to implement the Regional Catchment Strategies developed by the now superseded Catchment and Land Protection Boards. The Catchment Management Authorities are responsible for identifying priority activities and work programs under the Regional Catchment Strategies, providing advice to the state and federal governments on resourcing priorities and negotiating with the DNRE on regional service delivery (DNRE 1998).

### **3.3. Economic instruments**

Economic instruments that operate through market processes or other financial mechanisms have the ability to signal true resource scarcities to users, creating economic incentives for rational resource management (James 1997). Economic measures can reduce environmental destruction and promote conservation by increasing returns from conservation activities and increasing the cost or lowering the return to activities that damage ecosystems (OECD 1996). There are two major applications of economic instruments: financial burdens imposing costs to resource users, and financial incentives in the form of subsidies and monetary rewards for reducing environmental impacts (OECD 1989). From an economic efficiency viewpoint, the 'stick' and the 'carrot' are equally effective instruments for controlling land degradation (Chisholm 1987).

The increasing emphasis being placed on economic instruments as a means of addressing environmental problems is due to the recognition that they offer more scope and cost effective ways for achieving environmental objectives than traditional regulatory mechanisms (James 1997). This shift is reflected, for example, in national strategies such as the National Strategy for Ecologically Sustainable Development which includes amongst its guiding principles development of cost effective and flexible policy instruments, such as improved valuation, pricing and incentive mechanisms (Council of Australian Governments 1992).

While legislation is aimed at directly changing the behaviour of landholders by prohibiting or limiting certain practices, economic instruments such as price-based measures can make environmental damage more costly, thus encouraging higher quality environmental management. Attaching a price to an activity which has an adverse environmental effect may influence the behaviour of individuals simply because it can make environmental best practice the most cost effective alternative (Young *et al.* 1996). This approach may help address the externalities that arise when there is no pricing mechanism to reflect the incidental effects one landholder's activities may have on others - for example, the effects of RNV clearing on the productivity of downstream properties.

It has been recognised by many authors (Chisholm 1987; OECD 1989; Young 1992; Beder 1993; Milham 1994; Gowdy & O'Hara 1995; MDBC 1996; and OECD 1996) that one solution to overcoming externalities is for governments to internalise external benefits and costs. Internalisation will help equate private and social costs, thereby improving the likelihood that a socially optimal rate of resource use will occur. Resource users will have an incentive to minimise environmental damage (Young 1992; Milham 1994; OECD 1996). Internalising externalities can be achieved through the use of charges for environmental damage, or prices paid for providing environmental benefit (OECD 1989; Eckersley 1991; Beder 1993).

One of the ways to implement charges is under the polluter pays principal. The basis of this principle is that landholders are required to bear the costs associated with their production of negative externalities. The polluter pays principal is generally applied to tangible catchment problems which have some point-source component, such that the 'polluter' can be directly identified (MDBC 1996).

The beneficiary pays or the beneficiary-compensates principle requires that beneficiaries of high quality environments compensate resource users for the ongoing costs of maintaining these areas (Young 1992). Under the beneficiary compensates principle, anyone who receives benefits from conservation measures should contribute to the costs of maintaining the supply of these benefits. Two aspects of the beneficiary pays principle are:

- user pays, whereby supply costs are paid for by those who derive a direct benefit such as increased farm productivity; and
- beneficiary compensates, whereby supply costs are paid for by those who derive an indirect or intangible benefit, such as maintenance of biodiversity or aesthetic values (Donaldson 1996).

The proposed Murray-Darling Basin Commission's Cost-sharing for On-ground Works program recommends that external costs should be internalised where possible, applying both the polluter pays principal and the beneficiary-compensates principle, while specifying the role of public funding where broader community benefits are involved (MDBC 1996; James 1997). Essentially the program addresses market failure through recognition of the true distribution of benefits between individual landholders and the general public. The aims of the program are to ensure that landholders pay costs associated with private benefits, and communities contribute to landholders' resource management activities which yield public benefits. The proposed Cost-sharing for On-ground Works program applies the following cost-sharing principles:

- the full cost of providing services to specific identifiable beneficiaries or polluters should be recovered by way of charges to them;
- costs of public benefits or impact management which are unable to be attributed and charged to specific beneficiaries or polluters should be treated as community service obligations; and
- where costs are subsidised by government, they should be defined explicitly so that unsustainable precedents are not established (MDBC 1996, p. 7).

Proposed implementation of these cost-sharing principles is through catchment and sub-catchment action plans. It is suggested that the process of developing action plans

involve thorough consultation procedure with all stakeholders, the identification of benefits and costs, and the allocation of costs based on the amount of benefit received by each stakeholder. Action plans would be designed to obtain funds from sources ranging from government programs to landholders. In particular state programs such as Salt Action (NSW) and the Salinity Program (Victoria) could be expected to contribute. Other examples of government programs relevant to cost-sharing for on-ground works include: NHT programs (Commonwealth); Land Protection Incentive Scheme (Victoria); Integrated Catchment Management (Queensland); Total Catchment Management (NSW); and Section 10 Works Agreement (NSW) (MDBC 1996). Table 2 summarises practical cost-sharing principles suggested for use with on-ground works to achieve desirable outcomes for the Murray-Darling Basin.

**Table 2. Practical cost-sharing principles for different on-ground works (MDBC 1996, p. 23)**

Type of on-ground works	'Polluter' pays	Beneficiary pays	
		User pays	Beneficiary compensates
<b>Improving water quality:</b> Riparian zone buffer plantings and associated fencing			✓
Structures associated with drainage programs	✓	✓	
Structures associated with environmental flows		✓	✓
Effluent management	✓	✓	
<b>Dryland salinity:</b> Revegetation of recharge areas and associated fencing		✓	✓
Revegetation of discharge areas and associated earthworks and fencing		✓	
<b>Pest animal control:</b> Fencing and ripping		✓	✓
<b>Conserving biodiversity:</b> Remnant vegetation fencing and rehabilitation		✓	✓
Wetland rehabilitation		✓	✓
<b>Community change process:</b> Works for community education			✓
Extension and demonstrations		✓	✓
<b>Controlling soil erosion:</b> Earthworks for sheet and wind erosion control	✓	✓	✓
Earthworks and revegetation and fencing for gully and tunnel erosion control	✓	✓	✓
Works to control soil structure decline	✓	✓	
<b>Integrate regional economic development with natural resource management:</b> Works associated with rural adjustment		✓	✓

Best practice environmental management of RNV can be costly to the landholder. Expenses incurred may include the opportunity costs of not enhancing productivity of the property through clearing, fencing, and eradicating pest plants and animals. Financial or economic incentives are potentially a crucial mechanism to help promote RNV conservation. There have been relatively few financial incentives for encouraging biodiversity conservation (Young *et al.* 1996; Binning 1997b; James 1997). The range of incentives which do exist generally focus on the provision of funds for the encouragement of sustainable land use (Young *et al.* 1996). Financial incentives

include direct financial grants, local government rate relief, taxation incentives, soft loans (reduction of interest rates), and concessions to estimates of land value (Breckwoltd 1986; OECD 1989; Young *et al.* 1996).

### *Grants*

Grants are non-repayable forms of financial assistance, provided if certain measures are taken to reduce environmental impact. An example of this approach is the Fencing Incentive Program run by Greening Australia in NSW. Financial assistance of \$1200 per kilometre of fencing is provided to farmers within the Murray catchment to fence out areas of RNV. This program began in November 1996 and has been very successful, with over 400 applications and 1039 hectares of RNV being fenced (142 kilometres) within 6 months of its inception (Wheaton pers. comm). Similar programs have now been developed in other catchments.

Over the past decade, most of the funds for environmental management in rural Australia have been provided through the NLP. Other schemes with particular relevance for biodiversity conservation have included Tree Victoria, the Land Protection Incentive Scheme (Victoria), Community Salinity Grants (Victoria), Salt Action (NSW), the Tasmanian Soil Management Assistance Fund, and National Estate Grants (Young *et al.* 1996). The Bushcare program, funded through the NHT, is the most recent national program offering landholders grants to protect remnant vegetation and revegetate rural areas.

### *Tax policy*

Tax incentives are an indirect form of financial assistance (Roberts 1995). Currently the Commonwealth provides taxation incentives to assist landholders to undertake landcare activities. However, there are few Commonwealth tax incentives, or rebates, available to encourage private landholders to protect the natural values of their properties (Francis 1997). Although there have been proposals to amend the *Income Tax Assessment Act 1936* to include provisions for expenditures on RNV protection, a recent review of tax laws (August 1996) did not give rise to such amendments (TPLUC 1996).

Tax incentives for landcare have only been introduced in recent years (Huthwaite 1995). Tax deductions are available for expenditure incurred in attending short training courses in property management planning promoted under the NLP (Crosthwaite 1995). Sections 75B and 75D of the *Income Tax Assessment Act 1936* provide incentives for landholders to undertake landcare activities to prevent or combat land degradation (Mues 1996; Mues *et al.* 1996). Section 75B provides for accelerated depreciation over a three year period of capital expenditures by primary producers for conserving or conveying water (Donaldson 1991; Mues 1996). As of 1 July 1997, concessionary deductions, rebates or credits of 34 cents in the dollar can be made for items such as dams, tanks, bores, wells, pipes and pumps (Industry Commission 1997, p. 306). Section 75D provides a 100 per cent deduction in the year of expenditure for capital works which treat or prevent land degradation (Mues 1996; Mues *et al.* 1996). Eligible expenditures include eradication of pest plant and animals, fencing for specified purposes and tree and shrub establishment (Industry Commission 1997). Section 75D also offers a choice between concessionary deductions, rebates or credits.

Several authors (Peterson 1995; TPLUC 1996; Young *et al.* 1996) have made critical comment on the current tax incentives for landcare activities. Allowable measures under section 75B of the Act such as the construction of dams and irrigation channels may encourage resource development rather than conservation. Furthermore, the installation of waterpoints may lead to overgrazing, and in turn may result in claims through section 75D to correct land degradation, or call for government assistance for drought and adjustment assistance. Even though land degradation may be similar across a range of taxable income levels, tax incentives are not. They tend to favour those with larger holdings and higher incomes, hence provisions do not apply to 'hobby' farmers. There are limited concession for owners of native vegetation, as current tax relief is primarily an aid to owners of cleared land, or those undertaking basic land protection works. Curtis (pers. comm.) viewed taxation as a crude instrument because land degradation issues vary from region to region and there is no mechanism that reflects the relative priorities for action.

Another tax based incentive is a rebate that can be fully or partly deducted from gross tax payments to determine net tax payable. Existing rebates which may be familiar to primary producers are the spouse, medical expenses and zone allowance rebates. If the amount of the rebate exceeds the amount of tax payable, then this amount is forfeited since a rebate cannot be carried forward under the current provisions of the *Income Tax Assessment Act 1936* (Mues *et al.* 1996). Of course tax rebates do not provide benefits to individuals who pay no tax in the year of expenditure. The benefit the taxpayer receives is also independent of their marginal tax rate (Peterson 1995).

Refundable tax credits are another means of providing incentives to undertake landcare works. Tax credits are not a general feature of the Australian taxation system and their introduction may result in additional monitoring and enforcement costs (Young *et al.* 1996). Credits which can be directly refundable or carried forward allow benefits independent of marginal tax rates for all eligible individuals, irrespective of whether or not they pay tax in any given year (Peterson 1995).

An investment allowance allows a tax payer to claim more than 100 per cent on the nominal cost of investment (Mues *et al.* 1996). An example is the proposal to attach a 10 per cent investments allowance to section 75B up until the 1st July 2000 for expenditure of up to \$50 000 a year for fodder and water storages for livestock, water conveyancing and minimum tillage equipment (Peterson 1995, p. 167).

Tax mechanisms can also be used to encourage people to contribute to biodiversity conservation on private land, since cash and land donations to approved organisations are generally tax deductible (Young *et al.* 1996).

#### *Local government rates and state land tax*

Many local governments in Australia have rate exemptions or reductions for land set aside or managed for conservation purposes, though these vary considerably (TPLUC 1996). For example, the City of Greater Bendigo has a rate rebate scheme for the revegetation of high groundwater recharge areas. This scheme provides a 100 per cent rebate on the rates calculated on the improved site value of the land that is taken out of production and revegetated. The rebate is given for one year for the planting of

perennial pastures and ten years for the establishment of trees. The scheme is targeted at land used for genuine farming purposes, and only applies to areas on a general farm rate (Loddon-Campaspe Regional Planning Authority 1994).

In South Australia, farmers who enter into a heritage agreement are directly reimbursed that proportion of their rates which relate to the area of land retained for RNV protection (Coates 1987). However, the present rating scheme in Australia generally provides little incentive for land owners to keep RNV on their properties. In NSW for example, farmland is rated at a lower level than land kept for nature conservation purposes (Young *et al.* 1996). Most rating systems in Australia are based on unimproved capital value, which is generally assessed by “deducting the value of improvements necessary to maximise its profitable use from the market value of an area of land” (Young *et al.* 1996, p. 126). This approach could be seen as a perverse incentive for people to clear land. There is a strong case for either revising the valuation systems of many local governments or offering a rebate for land that has not been cleared.

Exemptions for nature conservation from state government charges (land tax) are not as readily accessible as rate rebates. An example of state land tax exemptions is the NSW scheme where land that is used primarily for the maintenance of endangered species can be land tax exempt (Rosen 1995). However, most states provide land tax exemptions for land under primary production - a perverse measure that reduces the effectiveness of any local government incentives for primary producers to conserve RNV (Young *et al.* 1996).

### **3.4. Management agreements**

Management agreements which seek to achieve and retain strong landholder support and commitment through the use of incentives are one of the ways in which conservation can be achieved on private property (Binning & Young 1997). Essentially, a management agreement is a contract between a landholder and a third party regarding the use and management of their land. This third party can be a government agency, local government, non-government organisation or Trust. Although usually established under legislation, entry into management agreements is generally voluntary (TPLUC 1996; Binning & Young 1997). In relation to the management of RNV, management agreements play two important roles.

The first concerns modifications to a landholder’s property rights. An owner of a resource with a well-defined property right has a powerful incentive to use that resource efficiently, because a decline in the value of that resource represents a personal loss. Tooth (1995) claimed that biodiversity conservation will only be possible when an effective system of property rights exists which allow the landholder to benefit from biodiversity. An essential starting point for addressing vegetation issues, is the clear definition of the property rights and associated entitlements and obligations tied to land ownership. Ownership of land consists of a ‘bundle of entitlements’ which a landholder has a right to exercise (Binning & Young 1997). A management agreement limits or changes a landholder’s ability to exercise one or more of these entitlements. For example, vegetation disturbance can be limited, and specific management practices prescribed for RNV.

Second, defining plans of management can have a significant impact on management of RNV covered by the agreement. Such plans typically outline detailed management strategies, actions and performance indicators (Binning & Young 1997).

Management agreements can be binding or non-binding. Agreements which bind the landholder either for a fixed period or in perpetuity are generally registered on the title to land through a legal instrument called a covenant. Participation in a covenant is a voluntary process, but once entered into they bind all future landholders to the conditions made by the landholder originating the agreement (Industry Commission 1997). Covenants can come in two forms: common law, generally restricted to negative action (for example - 'you shall not clear the land'); and statutory covenants, which prescribe both positive and negative actions (Binning & Young 1997). Covenants used for nature conservation in Australia are generally statutory (ANZECC 1996). Organisations that could currently enter into a binding agreement for RNV conservation are given in Table 3.

Non-binding agreements are voluntary in nature and fundamentally rely upon ongoing landholder support and participation. Examples include conservation management agreements, stewardship agreements, conservation easements, contracts and leases (TPLUC 1996). Where the impetus for agreements is purely voluntary, even with incentives such as rate rebates and fencing costs, these schemes are less effective than where they are combined with some form of legislation or significant financial incentive to encourage landholders to enter into agreements (TPLUC 1996).

The South Australian Heritage Agreement program is one of the best known covenanting systems in Australia. The extent of the large scale clearing of native vegetation in South Australia has been substantial (Prescott & Bishop 1992). In 1980, legislation providing for heritage agreements was proclaimed, providing for the conservation of natural and cultural features on private properties (Wotton 1982). A voluntary Heritage Agreement Scheme was established whereby a legally binding agreement between the state government and the land owner was arranged, involving the provision of incentives for rate relief, fencing subsidies and management advice (Coates 1987). This scheme was found to be unsuccessful in solving the problem of land clearing, with only 120 agreements (less than 30 hectares each) being made in three years, and clearing continuing at about 40,000 hectares per year (ANZECC 1996, p. 26). In May 1983, regulations under the *Planning Act 1982* were introduced to control broad scale clearing. Further difficulties with this Act, principally over the lack of compensation for those landholders who were refused permission to clear (TPLUC 1996), led to the *Native Vegetation Management Act 1985*, which set up the Native Vegetation Authority to make decisions on applications to clear native vegetation (ANZECC 1996).

The *Native Vegetation Management Act 1985* offered a financial package to landholders who were refused permission to clear. About 94 per cent of the total area for which applications were made between 1986 and 1989 involving broadacre clearing, was protected by an outright refusal (Farrier 1995, p. 348). Where activities such as grazing were not exempt, owners of land could generally insist on the Minister entering into a heritage agreement under the *South Australian Heritage Act 1978*. This would entitle a landholder to a payment which related to loss in the market value of the land resulting from the Authority's decision (Farrier 1995).

**Table 3. Organisations that could administer binding agreements** (adapted from Binning & Young 1998a)

<b>State or Territory</b>	<b>Organisation</b>	<b>Legislative capacity to enter conservation covenant</b>	<b>Number/area covered</b>	<b>Comments/incentives</b>
<b>NSW</b>	NSW National Parks and Wildlife Service Department of Land and Water Conservation	<i>National Parks and Wildlife Act</i> (s69C) - voluntary conservation agreement <i>Native Vegetation Conservation Act</i> (s42-44) - property agreement	40 covering approximately 5000 ha	Discretionary Fund (\$200 000)  Potential access to Incentives fund from Native Vegetation Conservation Act
<b>Queensland</b>	Department of the Environment	<i>Nature Conservation Act</i> (s51) - conservation agreements can be noted in the Administrative Advice File	11 - some of which bind successors in title	Funding for priority regions and rate relief in some areas
<b>Victoria</b>	Trust for Nature  DNRE	<i>Victorian Conservation Trust Act</i> (s3A) - covenants can be entered with the Victorian Trust Conservation, Forests and Lands Act (s69) - land management agreements (s71 and s72)	230 covering over 8000 ha	No incentives
<b>South Australia</b>	Department for Environment, Heritage and Aboriginal Affairs	<i>Native vegetation Act 1991</i> <i>Heritage Act</i> (s34)- Heritage agreement must be noted on title	1050 covering over 550 000 ha	Assistance payment, fencing, and management fund. 650 received payment in recognition of reduced property rights at a cost of approximately \$70 million
<b>Western Australia</b>	National Trust of Western Australia Department of Conservation and Land Management	<i>Soil and Land Conservation Act</i> (s30B) - conservation covenant and agreements to reserve can be registered	None	Both the National Trust and CALM are currently developing programs
<b>Tasmania</b>	Department of Environment and Land Management	<i>National Parks and Wildlife Act</i> Part V A (s37A - s37H) conservation covenants may apply to land for which approval is sought for a timber harvesting plan	None	No incentives currently
<b>Northern Territory</b>	Department of Lands, Planning and the Environment	Leasehold conditions	2 covering 11 000 ha	unknown
<b>ACT</b>	ACT Parks and Wildlife Service	Leasehold conditions	Unknown	Mechanisms for ensuring the protection of high conservation value sites are currently being developed for rural leases

In response to landholders applying for consent to clear in the belief that consent would not be granted and that they would receive compensation, the *Native Vegetation Management Act 1985* was replaced by the *Native Vegetation Act 1991* (ANZECC 1996). Under this new Act, the Native Vegetation Council is responsible for making decisions regarding the conservation and clearance of native vegetation. In most cases, landholders are required to set aside land for conservation, however allowance is made for some clearing for management purposes only (ANZECC 1996). The major changes arising from the *Native Vegetation Act 1991* as outlined by the Government of South Australia (1993), include: an increased emphasis on protecting both wildlife and soil conservation values; rejection of large-scale clearing; eligibility to enter into a heritage agreement without first needing to apply for clearance; and suspension of financial assistance (often called compensation by the rural community) for refused clearing applications.

The areas set aside for heritage agreements under previous legislation still remain under the *Native Vegetation Act 1991*, but there is a greater emphasis on the effective management of these areas (TPLUC 1996). There is no change to the status of any existing heritage agreements and owners of these agreements are eligible to apply for the management assistance. When a heritage agreement is placed over an area of RNV, the main land use for that area is for wildlife conservation, with fencing being provided to prevent grazing of domestic stock (Government of South Australia 1993).

Voluntary involvement in nature conservation on private land may be seen as a more flexible and adaptive approach than the severity of regulations or other binding agreements. It has the benefits of low administrative costs, high community and political acceptability, and minimal equity implications (Platt & Ahern 1995a; Young *et al.* 1996). Where landholders have a genuine interest in protecting biodiversity, voluntary mechanisms are an effective strategy, particularly for encouraging and advising landholders. Uncommitted landholders however, may require assistance from other mechanisms. Victoria's Land for Wildlife program attempts to address this issue by providing skilled extension officers to raise awareness of uncommitted landholders on the social, environmental and economic benefits of conservation (Platt & Ahern 1995b).

Land for Wildlife is a very successful voluntary program initiated in Victoria in 1981 (Whelan 1996; Binning & Young 1997). The Land for Wildlife program involves a non-binding agreement between the Victorian DNRE, in conjunction with the Birds Observers Club of Australia and landholders (ANZECC 1996; Whelan 1996). Essentially the program encourages and assists landholders to manage their land for wildlife or integrate nature conservation with other management objectives (Platt & Ahern 1995b).

Once registered as a Land for Wildlife member, advice is provided to landholders via a team of extension officers supported by DNRE staff and volunteers, newsletters, technical notes and field days. Registration is acknowledged by a certificate and a metal sign which advertises that the property supports the principles of Land for Wildlife. There are no financial incentives associated with this program, however landholders may be directed to sources of funding by DNRE staff. Once landholders have registered their properties under the Land for Wildlife program, they can

withdraw from the register at any time, although such withdrawals are rare. In May of 1997, 4,000 properties covering 455,000 hectares were registered with the voluntary Land for Wildlife program (Standard 1997, p. 1), making it the most successful program of its type in Australia, in terms of participation (Platt & Ahern 1995a).

Other states in Australia including Tasmania and NSW are actively considering the initiation of the Land for Wildlife program, based on the success of the Victorian scheme (Binning & Young 1997). Platt and Ahern (1995a) believed that this voluntary approach to nature conservation on private land could be used as a model throughout all of Australia and perhaps elsewhere. However, while voluntary programs are an essential step to achieving vegetation management, they are unlikely in themselves to change behaviour, and usually require a safety net of other approaches such as economic incentives and regulation.

Although some management agreements in Australia are voluntary in nature, there are also other voluntary programs which do not require any commitment to participation for any set period of time. Such programs rely upon the enthusiasm and goodwill of the landholder, sometimes incorporating the use of financial inducements. Others such as South Australia's Private Sanctuary Scheme and Queensland's Fauna Sanctuary Scheme have no financial benefits attached to the agreement. Voluntary membership schemes coupled with active extension programs, such as 'Friends of' groups are other examples of voluntary approaches (Young *et al.* 1996).

Management agreements are emerging as a popular approach towards conserving Australia's remnant vegetation. This may be owing to the fact that management agreements are a voluntary contract and are therefore a very flexible instrument which can be tailored to the needs of individual sites and landholders (Binning & Young 1997). Furthermore, management agreements can include voluntary, regulatory, economic and educative components, thereby enable design of a policy mix that addresses the weaknesses in each individual approach.

### **3.5. Education**

Education is one of the few long-term strategies used to conserve RNV on private land. Environmentally responsible behaviour is far more likely to result when people have a basic knowledge of the issues at stake (Milham 1994; Young *et al.* 1996). Education can increase awareness of conservation issues and knowledge of management options (Crosthwaite 1995). A survey of landholder attitudes to native vegetation in the wheatbelt of Western Australia (Jenkins 1997) indicated that the greatest factor retarding bushland management was a lack of available information on appropriate management practices.

Environmental education programs embrace a wide spectrum of activities, from the locally based initiatives to regional and global approaches sponsored by the United Nations and other agencies (Smith 1990). The nature of education campaigns will obviously differ with the type of problem and the target audience involved. Federal and state governments may provide services such as information kits to schools.

Information specific to a particular area may be disseminated by local governments or other regional bodies (Young *et al.* 1996).

Joint projects between organisations such as schools, environmental departments and shire councils are taking place. In Victoria over 300 schools are involved annually in recording salinity levels as part of the Saltwatch program (DNRE 1997). Farming for the Future is a whole farm planning program run by agencies with an interest in land management in NSW. The NSW National Parks and Wildlife Service runs the nature conservation components of this program which aim to encourage farmers to consider nature conservation issues in their farm planning (Binning & Young 1997). Another example is the joint South Australian Education Department and the South Australian Department of Agriculture program 'Kids for Landcare' (Golding 1990).

Loss of RNV on private property can be partially attributed to a lack of access to information regarding the important values of RNV (Price 1995; Alexander 1995; Nadolny *et al.* 1995; Siepen 1995; Wells 1995). Price (1995) claimed that there is also a poor understanding of the value of RNV amongst land managers and advisers, hence an inadequate transfer of biological and economic information about the status of RNV to stakeholders. One of the major issues raised at the Melbourne Bushcare Forum, held in August 1997, was the allegedly poor skills, lack of political will and insufficient knowledge held by local government representatives throughout Australia.

As with voluntary measures, education, while being an important ingredient for the future management of RNV, is not sufficient in itself. Additional approaches such as economic incentive measures and law enforcement are also important for effective long term conservation and management of RNV.

#### **4. A proposed incentive policy for RNV conservation**

Individual mechanisms and instruments vary considerably in their approach to achieving conservation objectives for RNV on private land. Each instrument has advantages and disadvantages, so their success will depend in part on the circumstances in which they are applied. A mix of instruments can counteract the deficiencies and weaknesses in individual approaches. Most of the literature reviewed in this report has emphasised the dependence of individual approaches on other policy mechanisms in order to achieve a satisfactory outcome.

This section presents a proposed incentive policy for RNV conservation in the two study areas of northeast Victoria and the Murray catchment of NSW. The proposal is based on the preceding review of literature; preliminary outcomes from the BCA discussed in Section 2; stakeholder views reported in Appendix 1; a policy discussion meeting of several key stakeholders held in June 1998; and a set of general performance criteria (see below).

Young *et al.* (1996) assessed the value of individual policy approaches according to the following criteria:

- economic efficiency;
- continuity;
- equity;
- dependability or certainty;
- precaution;

- administrative feasibility and cost; and
- community and political acceptability.

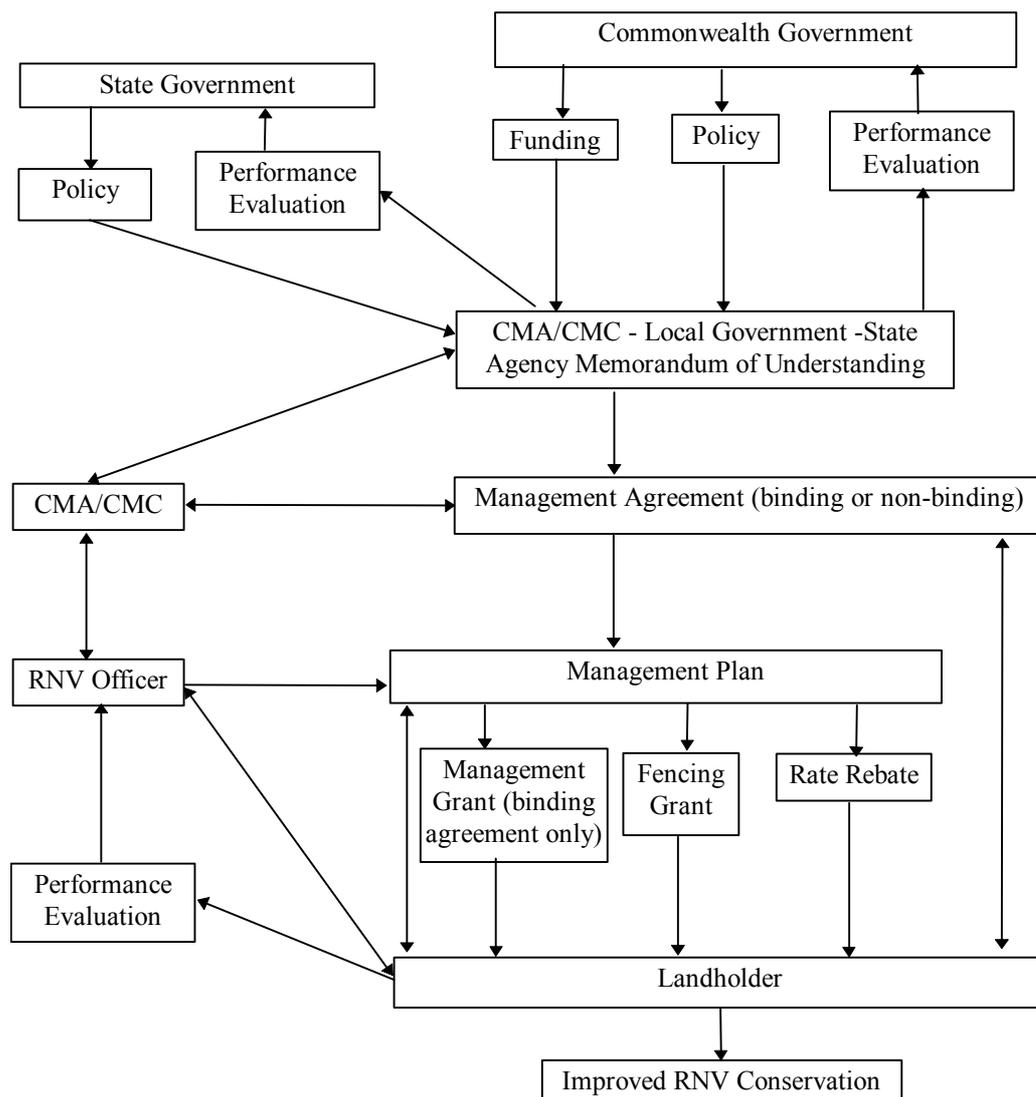
We used similar criteria to assist development of policy options for RNV management in the two study areas. Economic efficiency, for the purpose of this study, includes consistency with the preliminary BCA results. Dependability and certainty include the likelihood that benefits of RNV conservation will be realised and maintained. We assume community acceptability requires transparency of processes, congruence of policy components with landholders' aspirations, and community participation in decision making. Equity requires that incentives be accessible to all landholders, although allocations also need to take into account RNV conservation priorities. Equity also demands fair distribution of the costs and benefits of RNV conservation. The precaution criterion is not relevant for our purposes, since the policy is designed to address known problems associated with the loss and degradation of RNV. To the above list, we add facilitating a change from passive mismanagement into active best practice management of RNV.

The components to the proposed policy package are indicated in Figure 1. Key elements of the proposal are:

1. Non-binding management agreements that include:
  - RNV management plans;
  - direct grants of \$1,200/km to contribute towards fencing costs; and
  - 100% rate rebates for the area of RNV under the management agreement, with a minimum payment of \$250 per annum.
2. Binding management agreements that include:
  - RNV management plans;
  - direct grants for fencing materials and labour up to \$5,000/km;
  - 100% rate rebates for the area of RNV under the management agreement, with a minimum payment of \$250 per annum; and
  - annual payments for RNV management costs (such as control of weeds and feral animals), based on the mean cost per study area as determined by Miles *et al.* (1998), calculated as an annuity over 5 years.
3. Employment of RNV Officers for the two study areas with responsibility for:
  - encouraging and administering applications for management agreements;
  - assessing the quality of RNV sites;
  - developing management plans with landholders;
  - providing information and technical advice on best practice RNV management; and
  - assessing performance against criteria set down in the management agreements.

Specific aspects of these three components, as well as other elements of the package, are detailed below.

**Figure 1. Structure of the proposed policy package**



**Recipients**

For reasons of equity, as well as community and political acceptability, any landholder with RNV in the two study areas would be eligible to enter into either a binding or non-binding management agreement. The regional catchment management plan and biodiversity action plans (NSW), the benefit and cost data reported in Miles *et al.* (1998), together with the following priorities, should be used by the RNV Officer to rank landholder applications for entry into agreements:

- landholders with high quality RNV;
- landholders with RNV containing a vegetation type that has a relatively high private land/public land ratio;
- landholders with RNV that links with other areas of native vegetation such as those on adjacent public land; and
- landholders with RNV containing any rare, threatened or vulnerable plant or animal species.

The rankings should be used to assist decisions concerning the merits of each potential agreement, and to allocate resources where they are likely to have the most benefit for RNV conservation. Regardless of their entry into an agreement, all landholders would be able to seek advice from the RNV Officer.

### ***Management agreements***

The popularity of management agreements as an effective tool to protect and enhance RNV was apparent in the stakeholder policy discussion meeting. Participants of the discussion group felt that landholders should be given the option of entering into a binding or non-binding management agreement. This is consistent with the conclusions we drew from the literature review. We have therefore designed an incentive package that provides landholders with the option of entering into either type of management agreement.

Both types of agreement are necessary to address the criteria. The weakest aspect of non-binding agreements is a lack of certainty that the anticipated benefits of RNV conservation will be realised. Binding agreements, on the other hand, will maximise the probability that benefits will be maintained. Of course the long term supply of benefits cannot be guaranteed. Best practice management may not achieve the anticipated results in the short to medium term. Events such as fire and flood can prevent effective implementation of a RNV management plan. Nonetheless, binding agreements are the most effective mechanism for delivering benefits with a degree of certainty.

Binding agreements, because of their restrictive nature, tend to be less accepted by landholders. They may also pose administrative problems in that they tend to be more complex than non-binding agreements, and require more active monitoring to ensure that conditions of the agreement are being met.

As Binning & Young (1997) emphasised, to be successful, management agreements must seek to achieve strong landholder support and commitment. There is a strong case for developing a partnership between the landholder and the contracting organisation. Terms of agreements need to be binding on both the landholder and the contracting organisation (NPWS 1996).

We suggest that both types of agreement should be of five years duration. This time period should be sufficient for short term management objectives to be achieved, while providing a limit on the duration of government support. Renewal of agreements should be based on satisfactory performance as measured against the objectives of a management plan.

Currently in Australia there are non-binding management agreements which provide financial incentives to landholders to protect RNV - for example Greening Australia's Fencing Incentive Program. However, Binning & Young (1997) emphasised the need for financial incentives to be tied to entry into binding management agreements in order to secure permanent protection of RNV. Essentially, practices which result in long-term public benefit need some binding agreement to ensure that the community's investment is justified and to guarantee that the investment produces the expected

benefits in the long-term. We recognise that binding agreements may not draw the same number of landholders as non-binding agreements, due to their restrictive nature. In the longer term, if landholder support can be gained through non-binding agreements, the RNV Officer may be able to encourage some to progress to binding agreements.

### ***Institutional arrangements***

We advocate an administrative arrangement in which the Commonwealth Government, state government agencies, local governments, the appropriate regional catchment authority, and landholders have key roles (Figure 1). In Victoria the appropriate regional authority is a Catchment Management Authority (CMA) and in NSW a Catchment Management Committee (CMC). In the two study areas under consideration, the relevant bodies are the Northeast CMA and the Murray CMC.

We propose that the CMA/CMC be responsible for employment of RNV Officers and direct administration and delivery of the policy. CMAs/CMCs generally comprise Ministerial appointees from agencies and regional communities. These bodies can provide the important regional perspective necessary to manage issues, and satisfy demands for accountability of money expended from the NHT (Curtis & Lockwood 1998). In Victoria, for example, CMAs have operated as independent boards responsible directly to the Minister for Natural Resources and Environment. They now operate under a business plan, employing staff and purchasing services to implement catchment strategies. Under this ‘purchaser-provider’ model, the CMA/CMC establishes regional priorities for RNV conservation, and uses the management agreements and associated economic incentives as a means of purchasing the desired outcomes from landholders.

CMAs/CMCs can be constituted so that they represent the range of local and regional groups with an active interest in natural resource management. In addition, because they generally have limited statutory powers and regulatory functions, they may be more positively perceived than statutory bodies such as local government. This may assist them in the delivery of natural resource management programs in a manner acceptable to landholders (Binning & Young 1998b).

There is a need to integrate these arrangements with the responsibilities of local government. The recent trend for state governments to establish regional institutions such as CMCs and Vegetation Management Committees in NSW, and CMAs in Victoria, has led to tensions between the roles and functions of these organisations relative to local government. There is concern amongst local governments and others about potential confusion and conflicts with respect to statutory functions, the uncertain longevity of these new regional bodies, and since they are generally not elected, their potential to diminish local governance (Binning & Young 1998b). In addition, while some regional catchment organisations such as the Murray CMC and the Northeast CMA can provide the energy and expertise required to deliver RNV conservation, others are functioning in a less satisfactory manner. Though the quality of local government is also variable, their existing statutory responsibilities and administrative structures provide a less problematic basis for development of binding management agreements than establishing these powers for a CMA/CMC.

We therefore suggest that the management agreements be jointly entered into by the landholder, CMA/CMC and local government, with the latter having the statutory responsibility for binding agreements. There are no technical impediments for the various parties to enter into non-binding agreements. A binding agreement can simply be a contractual arrangement, which can be entered into by all local governments. Alternatively, a binding agreement could take the form of a covenant. In NSW, such an arrangement would require clarification that RNV conservation can be included within a covenant under the Section 87A of the *Conveyancing Act 1919*. In Victoria, the *Local Government Act 1989* would need to be amended to allow a local government to enter into a covenant with a landholder (Cripps *et al.* 1998). We prefer the contractual option for binding management agreements, since they allow for greater flexibility, and opportunity for modification and review.

As suggested by Binning & Young (1998b), the respective roles of local governments and state government agencies, and their relationship with the CMA/CMC, can be specified in a Memorandum of Understanding (MOU). Where organisations such as Greening Australia are already providing fencing incentives, they could also become a partner in the MOU. This would help avoid unnecessary duplication of effort and overlapping of responsibilities. For our Victorian study area, the relevant agencies and organisations include the Northeast CMA, DNRE, Alpine Shire, Indigo Shire, Rural City of Wangaratta, Towong Shire and Rural City of Wodonga. For our NSW study area, the relevant agencies and organisations include the Murray CMC, Department of Land & Water Conservation, National Parks & Wildlife Service, Greening Australia, and the Shires of Wakool, Murray, Berrigan, Corowa, Hume, Albury, Holbrook, Tumbarumba Windouran, Conargo, Jerilderie, Urana, Lockhart and Culcairn. The MOU should, amongst other things, specify which body has the power to enter into management agreements, and indicate how the body exercising this authority (generally a local government) will relate to the body responsible for delivering the policy (generally the CMA/CMC).

The CMA/CMC should have responsibility for overall coordination, planning and program delivery. Each CMA/CMC should be given a NHT budget under a MOU to manage and to achieve outcomes identified in their regional catchment plan and biodiversity action plan (NSW), including our proposed RNV program. These plans also provides a mechanism for matching the priorities within a CMA/CMC area with state and national policies. The majority of NHT funds and programs are being delivered through CMA/CMC Regional Assessment Panels and State Assessment Panels. Applications are also assessed by the Commonwealth Government by a Ministerial Board comprising the Minister for the Environment and the Minister for Primary Industries and Energy. We see no need for direct state or commonwealth agency involvement in the assessment of individual landholder applications for undertaking a RNV management agreement. Such applications can be adequately handled by the CMA/CMC Regional Assessment Panels, with advice from the RNV Officers.

However, the states and the commonwealth do need to ensure that the RNV policy is being managed and delivered in a manner that is consistent with state and national priorities. We recommend that MOU partners deliver an annual report on their performance in relation to the RNV policy. This report should be based on a standard

format provided by state and commonwealth governments that enables each CMA/CMC to demonstrate the relationship of its work to state and national priorities. As noted above, the regional catchment plan should also be used as an instrument to guide resource allocation under the proposed RNV policy. The ability of each MOU partnership to enter into new management agreements should be contingent on state and commonwealth acceptance of the annual report.

We propose that RNV Officers be responsible for developing management plans with landholders, under guidelines provided by the CMA/CMC. Currently in the NSW study area, there are fencing incentive officers (Greening Australia) and a native vegetation project officer (CMC) who could potentially take on the role of RNV Officer. Similarly, in the Victorian study area there is a Bushcare officer, a revegetation officer, and a farm tree extension officer (all DNRE). It may be possible for these officers to undertake the proposed RNV management duties. However, it may not be viable to appoint extra duties to these existing officers, hence the appointment of new RNV Officers will probably be required. The roles and responsibilities of professional personnel involved in RNV management, and the (hopefully complementary) relationships between them, should be specified in the MOU.

Delivery of the actual RNV conservation activities (fencing, weed control etc) would be the responsibility of the landholder, with support from a RNV Officer. The role of the RNV Officer would be to provide management support, advice, and information on best management practices for RNV. The best conservation managers are those landholders who are active and interested in nature conservation (Binning & Young 1997). An important priority for the proposed management agreements is to motivate landholders and to maintain their long-term interest in conservation. As well as the RNV Officer and CMA/CMC, landcare and other community education organisations will continue to have an important role in this regard.

### ***Funding sources***

The proposed source of funds for the incentive components and employment of the RNV Officers is the Commonwealth Government, through Environment Australia and the NHT. In the longer term, depending on factors such as the longevity of the NHT and the Howard government's proposed changes to Australia's tax system, alternative funding arrangements may have to be made. Federal funding of the program is consistent with the fact that these aspects of the policy are primarily directed at improving RNV management, thus providing public good benefits associated with biodiversity conservation, water quality and aesthetic amenity. Taxpayers are willing to pay for securing these benefits through their taxes (Lockwood & Carberry 1998).

RNV conservation also provides external benefits to downstream landholders. Ideally, these landholders should also contribute to the cost of RNV conservation. Unlike biodiversity values, the external benefits would largely be maintained regardless of the RNV management regime, as long as the vegetation is not cleared and is not suffering incremental decline. The major costs to landholders in this regard are the opportunity costs associated with not being permitted to clear RNV for some alternative land use. The work of Miles *et al.* (1998) showed that these

opportunity costs are considerable. Since the benefits of not clearing RNV accrue to both the general community and to downstream landholders, any offset of landholders' opportunity costs should be shared by both groups of beneficiaries.

However, at present the relative size of the benefits enjoyed by downstream landholders and the general community is not known. A model is required that quantifies the physical impacts removal of RNV from the upper catchment has on the productivity of downstream properties. Given the large number of intervening factors between productivity of downstream properties and the existence of a particular hectare of RNV in the upstream catchment, development of such a model is a major challenge. The extent of this challenge, and the work required to meet it, will be the subject of a future report of the *Economics of remnant native vegetation conservation on private property* project. In addition, based on the results of (Lockwood & Carberry 1998), it is unlikely that community WTP for RNV conservation would be sufficient to cover a significant proportion of landholders' opportunity costs.

Given both the inadequacy of existing data, and probable shortfall in community WTP, we recommend that in the short term, cost-sharing arrangements not be established with respect to landholders' opportunity costs associated with clearing restrictions. This effectively means that the costs of prohibiting RNV clearing falls exclusively onto landholders. If this is considered an inequitable distribution of costs, this position could be reviewed over the next five years when (and if) the data required to support an economically efficient allocation of costs become available. An alternative argument is that given existing clearance regulations, landholder opportunity costs should be treated as 'sunk costs'. This would effectively mean an acceptance of the position that landholders only have limited property rights over RNV, and that these rights do not extend to clearing the vegetation. Landholder views on this issue will be gathered as part of the assessment we will be undertaking of this proposed policy package.

### ***Level of funding***

An essential part of the proposed management agreements is the provision of financial incentives. There are a range of direct management costs associated with RNV protection (Miles *et al.* 1998). These include the cost of erecting fences, maintenance of fences and tracks, weed and feral animal control, and fire management. According to the BCA undertaken by Miles *et al.* (1998), most landholders in the two study areas will experience a net loss when management regimes are introduced to enhance conservation values. It is therefore an aim of the management agreements to offer financial assistance to landholders to undertake best management practices.

Direct funding to landholders under non-binding agreements will be limited to a contribution that will cover part of the costs of fencing RNV (\$1,200 per km), plus a rate rebate. The fencing contribution is consistent with the level of funding provided under NHT programs for non-binding agreements. The lower level of financial support attached to non-binding agreements reflects the relative uncertainty that the anticipated benefits would be delivered. As an added incentive to secure the long-term protection of RNV, the level of financial assistance will increase for binding agreements. Funding would be available to cover the full costs of fencing, including

labour, for a cattle proof fence. Since these costs depend on property specific factors such as topography, the grant should be based on actual fencing costs for each property. Quotes from fencing contractors we contacted, as well as Victorian Department of Agriculture estimates (Boord & Trapnell 1993), suggested that these costs are generally between about \$3,000 and \$5,000 per km. We have therefore placed a \$5,000 per km cap on the grant. Landholders committing to binding agreements would also be covered for any increase in costs arising from implementation of the management plan.

Although rate rebates may not be a large financial incentive for landholders, they are a symbolic way of recognising landholders' efforts to manage RNV. Since rates are levied by local government, this proposal would require coordination between local government and the CMA/CMC under the MOU. The legislative basis for local councils offering rate rebates for conservation purposes is described in Cripps *et al.* (1998). We propose that the local governments provide a 100% rebate on rates levied on RNV for those properties covered by either type of management agreement, with a minimum payment of \$250 per annum being made to all landholders entering into an agreement. This minimum payment is required because small rebates give no incentive to landholders, and may be seen by them as a waste of time, or even an insult. If required, the NHT funds could be used to reimburse councils the foregone revenue. In this case, reimbursement would place the costs of providing the rebate on the general community. Local government may also consider foregoing the additional rate revenue without requiring any transfer payment from the NHT funds, effectively allocating costs of the rebate to the local community.

The level of funding available to support programs under the NHT is currently set through the political process. While this is a legitimate mechanism, it may result in inefficient funding allocations, such that the investment in some projects may exceed the benefits obtained, while other projects that could reap large net benefits may not be funded. In other words, the political process does not necessarily maximise the economic welfare benefits that can be gained from expenditure of public money. In terms of economic efficiency and maximising economic welfare, the maximum amount of funding available to each catchment area under the program should be the level at which the marginal community WTP is equal to the marginal cost of RNV conservation. The work reported in Lockwood & Carberry (1998) and Miles *et al.* (1998) provides an initial basis for establishing this funding level for the Northeast CMA and Murray CMC. However, given that (i) the policy should apply throughout Victoria and NSW; and (ii) a diminishing marginal WTP would be expected for additional catchments, further work is required to establish a suitable funding cap. Of course, it would still be a political decision as to the extent this funding would actually be made available.

Distribution of funds within catchments should take into account the net costs faced by landholders in improving the conservation management of RNV. Using the work of Miles *et al.* (1998), these net costs can be determined for each strata within the two study areas.

### ***Management plans***

Development of management plans as part of binding or non-binding agreements will be a joint responsibility of RNV Officers and landholders. Plans should include measurable objectives and indicate the actions required to achieve these objectives. These property specific management plans should also be consistent with higher level plans such as the regional vegetation management plans and catchment wide biodiversity action plans in NSW, and the regional catchment management strategies in Victoria.

Given the lack of definitive best practice guidelines for RNV management, an adaptive approach should be used. Adaptive planning treats management as an iterative processes of review and revision, not as a series of fixed prescriptions to be implemented. Management interventions are regarded as a series of successive and continuous adaptations rather than a set of rigid prescriptions. The approach emphasises flexibility, requires willingness to learn through experience, and may require sacrificing present or short term gains for longer term objectives (Briassoulis 1989). The emphasis is on learning how the system works through management interventions which are both issue oriented and experimental (Dovers & Mobbs 1997). Adaptive planning recognises that there is often considerable uncertainty about the outcomes of any particular action. This uncertainty is built into plans so that information about the actual results of actions are used to inform, and where necessary modify management practices. It is a process of learning by experience.

As described in Miles *et al.* (1998), the two study areas have been stratified according to broad vegetation type, landform, climate and land use. For northeast Victoria, the combination of all four land characteristics resulted in a total of 55 strata that contained RNV. For the Murray catchment in NSW, there are 79 strata containing areas of RNV. Each property will have specific management needs depending on these local environmental characteristics and other factors such as past uses of the RNV. While the general structure and format of plans can be standardised, specific objectives and actions will probably need to be developed for each property. Such a considerable planning effort will require the commitment of, and effective working relationships between, the landholders, RNV Officers and CMA/CMC. Some indication of the willingness of landholders to be involved in property planning is given by the fact that, in 1995, 24% of Victorian Landcare group members were participating in property planning activities (Curtis 1996). These participation rates were in the absence of the economic incentives to be provided as part of this proposed policy package. The willingness of landholders in the two study areas to commit to the development of RNV management plans will be assessed during the next phase of the *Economics of remnant native vegetation conservation on private property* project.

### ***Monitoring and enforcement***

Effective RNV management requires that landholders feel they are being rewarded for sympathetic management (encouragement) and not have rigid management regimes imposed on them (hindrance) (Binning & Young 1997). Although the emphasis in the proposed policy is on providing incentives rather than controls, some mechanisms are required to: (i) ensure appropriate expenditure of the funds provided; (ii) monitor

whether the objectives of the management plans are being achieved; and (iii) review the effectiveness of the program.

Funds allocated according to management agreements should be provided to landholders on a contractual basis, with the RNV Officers responsible for determining that the terms of the contract are honoured. Monitoring of performance against the management plan objectives would also be the responsibility of the RNV Officer. The approach in dealing with any deficiencies in plan implementation should be the provision of information, technical advice and encouragement, rather than sanctions.

The program should be subject to an initial evaluation after three years. This evaluation should avoid targeting individual properties, though assessments will need to be made of a sample of properties, but rather aim to form an overall view on the success of the program for achieving both property specific and catchment wide objectives for RNV management. The continuation of the program should be dependent on a positive evaluation report. The evaluation should be conducted by an independent consultant to the CMA/CMC.

## **5. Conclusion**

The issue of RNV conservation can be addressed through an incentive policy that is an integrated package of: non-binding management agreements; binding management agreements; property based RNV management plans; direct grants for fencing; annual payments to cover increased management costs; and rate rebates. The policy would be funded by the Commonwealth Government, and managed and administered by local governments in partnership with CMAs/CMCs under a MOU, and with the support of RNV Officers. The proposed policy may require new resources to be identified or existing resources to be reallocated. The extent of the required changes in funding will be clarified once the BCA being conducted as part of the *Economics of remnant native vegetation conservation on private property* project has been completed.

The proposed policy is consistent with the three interdependent aspects of designing successful management agreements with landholders identified by Binning & Young (1997): people, security and finance. With respect to people, a partnership is developed between the contracting organisation (local government), the delivery agency (CMA/CMC) and the landholder; and information and advice is delivered to landholders, developing stewardship. With respect to security, obligations of landholders, CMAs/CMCs and local governments are specified in the agreements. With respect to finance, the costs of managing RNV are shared amongst the beneficiaries.

As noted in the introduction, the proposal outlined in this report will be assessed over the next year to determine its acceptability to landholders and other stakeholders in the study areas. This will assessment will enable further development and elaboration of the ideas presented here.

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## Appendix 1. Landholder preferences for RNV policy options

The landholder surveys conducted in northeast Victoria and the Murray catchment of NSW (see Miles *et al.* 1998 for details) included questions regarding landholder preferences for various RNV policy approaches and incentives. This appendix briefly summarises these responses.

Landholders were asked whether they wanted incentives to conserve their RNV and what type of incentives they would prefer. Sixty-six percent of the 100 Victorian participants, and 69% of the 122 NSW participants, wanted incentives to conserve their remnants. These participants who wanted incentives were asked to specify which incentive options they would or would not support. This question used a five point Likert scale from one (would not support) to five (would strongly support) for a number of policy options. All incentive options were supported by participants, with the majority of mean scores all above three (Table 4). Grants and subsidies were the incentive most supported by landholders in both study areas. Schemes to provide employment were the least supported option by landholders in both study areas.

**Table 4. Support for different incentive types**

<i>Incentive type</i>	<i>Mean score</i>	
	<i>Northeast Victorian participants<sup>1</sup> (n = 69)</i>	<i>Murray catchment participants<sup>1</sup> (n = 85)</i>
Grants and subsidies (eg. for fencing)	4.52	4.41
Local government rate rebates	3.84	3.84
Taxation rebates and concessions	3.65	4.09
Non-binding agreements (voluntary involvement in nature conservation)	3.65	3.51
Greater education / information workshops	3.61	3.68
Management agreements (eg. covenant)	3.30	3.25
Schemes to provide employment	3.19	2.67

<sup>1</sup>Mean calculations on a scale from one (would not support) to five (would strongly support)

The participants who wanted incentives were also asked whether or not they would support various RNV management options. The majority of participants supported all of the management options, with the most favoured option being the fencing of RNV, with grazing permitted (Table 5). Participants were less inclined to support the fencing option with grazing prohibited. Overall, Victorian landholders were more supportive of RNV management activities than NSW landholders.

**Table 5. Support for RNV management options**

<i>Management option</i>	<i>% support,</i>	
	<i>Northeast Vic. participants (n = 66)</i>	<i>Murray catchment participants (n = 84)</i>
Fence off remnants (grazing permitted)	77	58
Attend information workshops	76	58
Establish and implement RNV management plan	74	52

Cease clearing remnants	69	57
Fence off remnants (conservation purposes only)	53	48

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