

INDUSTRY COMMISSION INQUIRY INTO
ECOLOGICALLY SUSTAINABLE LAND MANAGEMENT

SUBMISSION FROM ENVIRONMENT AUSTRALIA

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Preface

Environment Australia is the Environment Program of the Commonwealth Department of the Environment, Sport and Territories. It is responsible for providing advice and administration to the Commonwealth Government on the Government's environmental policies and programs, in particular those relating to biodiversity conservation, wildlife protection, sustainable land and water use, native vegetation protection, water quality management, greenhouse response measures, environmental information, environmental economics, and natural heritage conservation.

Ecologically sustainable land management (ESLM) is an important subject for Australia, with many complex and interrelated aspects, and is a subject of highest priority as a policy and program issue for Environment Australia. This submission is written to address (ESLM) according to the headings in the Productivity Commissions Issues Paper.

Overview

In developing strategies for ecologically sustainable land management, Environment Australia looks for solutions that will enable the natural and cultural values of the continent to be used in a way that protects these essential values for the benefit of future generations. Wise and sustainable use of our lands requires our policies and programs to be conscious of the broader social and economic contexts in which they operate.

The submission, with attachments, covers:

- **the nature of the ecological challenges arising from the current management of land in Australia, covering biodiversity loss and threats to biodiversity, as well as the costs in terms of degradation of the land and water resource base;**
- **the circumstances that have given rise to the current situation, including the nature of property rights, perverse incentives which have encouraged degradation, and economic circumstances for producers;**
- **government policies, strategies and programs that seek to address ESLM, particularly the Natural Heritage Trust and the National Biodiversity Strategy, and governmental mechanisms and forums to implement these;**
- **views on a range of measures that can be used, including types of regulation, economic instruments and incentives, educational and community involvement measures, valuing of resources, and cost-sharing arrangements; and**
- **information and research activities and needs.**

The main themes and conclusions that arise from the submission are as follows:

- **Australia must change the way it manages the soil, water and vegetation in our agricultural areas, to be more attuned to the Australian climate and natural environmental processes.**
- **Retaining the native vegetation we have is extremely important. For both biodiversity conservation and sustainable production, it is far easier, cheaper and more effective than replanting. Therefore our priorities for native vegetation should be**
 1. **limiting clearing of native vegetation;**
 2. **encouraging protection of significant remnants, both in biodiversity conservation and sustainable production terms;**

3. encouraging appropriate management of remnant native vegetation in order that its quality and ecological value is retained and enhanced; and
4. strategic plantings of native vegetation.

Governments need to take a range of measures to help address the degradation problems and achieve ecological sustainable land management, including:

- **information provision, including research dissemination, awareness raising, technical extension, and education;**
- **planning, including regional natural resource planning, property management planning, and drought preparedness planning;**
- **mechanisms for valuing resources, for example appropriate resource pricing and consideration of non-economic and non-market economic values;**
- **the development of financial incentives including taxation, rating, covenants, and grants;**
- **appropriate and adequate regulation, for example, clearing controls and lease conditions;**
and
- **development and use of assessment processes to assess the net benefits of current and alternative land management, to achieve ESLM while also covering other environmental, economic and social considerations.**

A recommendation from the inquiry should therefore be one that sets out a framework for how assessments on ESLM should be carried out, including who should carry out such assessments. There should also be as summary of measures that can be drawn on which will allow the necessary adjustments to take place, to achieve ESLM.

1: SCOPE OF THE INQUIRY

The Commission seeks views as to what are the most important issues relating to ESLM and to what actions would provide the greatest gains to the community.

Of the issues set down for review in the terms of reference, those seen as priorities for consideration by the Inquiry are:

- the impact of regulatory, taxation, and institutional arrangements on ESLM practices;
- the effectiveness of existing mechanisms, policies and programs relating specifically to ESLM;
- impediments to, or measures to promote, the adoption of ESLM practices, and overall costs and benefits of current and alternative practices and land use patterns.

In relation to this last point, one of the main impediments relates to the emphasis placed on short term financial returns which appear to encourage management practices, such as land clearing, which are not ecologically sustainable. This in turn results in irreversible biodiversity loss, extensive land degradation, and loss of intergenerational equity. It should also be recognised that although population levels in agricultural regions and particularly the rangelands are generally low, the impact on the environment per person can be high.

Damage to ecological processes results when loss and degradation of habitat and loss of biodiversity reach critical levels, but this stage is often not apparent until severe damage has already been done. Damage can take decades to become apparent, although when it is evident, further unsustainable actions can result in more immediate impacts, as a result of the ecosystem's having lost its resilience. Reversing damage is rarely easy, and can be impossible (for example with species extinction). The task of environmental repair will generally take at least as long to achieve as did the damage.

While actions are necessary to educate the community as a whole about the long term costs of many current practices, incentives need to be applied as a matter of urgency to reduce the pressure to continue ecologically unsustainable land management practices. These should not preclude concurrent work to ameliorate the effects of past and present land degradation.

Of the other issues set down for review in the terms of reference, the Murray Darling Basin Commission has recently published a report *Cost-Sharing for On-ground Works* (discussed later). This report along with development of Natural Heritage Trust is looking very specifically at the roles and contributions of governments, landowners, land managers and community groups to ESLM. The Natural Heritage Trust heralds a new era in ESLM. Roles and responsibilities are being redefined within this context and will be in a state of flux until this new operating situation stabilises.

The Commission should also be aware of the House of Representatives Standing Committee on Environment Recreation and the Arts *Inquiry into the extent to which Commonwealth assisted community-based projects contribute to the protection of biological diversity and the maintenance of ecological processes and systems.*

Urban encroachment is a serious issue that needs consideration. It affects a range of ecosystems, including for example, lowland tropical rainforest, predominantly in the coastal zone. However, within the time frame allowed, and given the national scope of this Inquiry, Environment Australia considers that other areas identified within the Discussion Paper are of a higher priority. Adjustment issues and regional impacts of any recommendations are dependent upon consideration

of the other issues and therefore should not be considered a priority until the areas highlighted above have been adequately addressed.

2: ESD OBJECTIVES

The Commission is interested in how these ESD objectives can, in practice, be met when applied to the ecologically sustainable management of agricultural land. What processes are needed to achieve those objectives? How should their success be evaluated?

Before commenting directly on the above questions, it should be noted that the Issues paper provided for comment omits parts of the three core objectives of the National Strategy for Ecologically Sustainable Development, when quoting these. In particular: “to enhance individual and community **wellbeing and** welfare ...”, and “to provide for equity **within and** between generations”.

In relation to the first core ESD objective (‘to enhance individual and community wellbeing and welfare by following a path of economic development that safeguards the welfare of future generations’) in particular, the situation of agricultural producers being price takers may result in unsustainable practices to meet the products and prices of international markets. Prices that are competitive in both domestic and international markets often do not reflect the full cost of providing the goods. For example, the price of water supplied to irrigators does not usually include the capital cost of building a dam, the increased stream salinity from some irrigation practices or the ecological impact of radically altered streamflow regimes. This leads to market failure in the long term.

In addition, traditional agricultural systems such as sheep and cattle production, cropping such as wheat and rice, and dairying may not be compatible with the fragile, infertile soils found in many areas. The soils, as well as the variable climate within a vast majority of the continent means that many agricultural systems need high inputs of fertilisers, irrigation and pest and weed control. Many of these inputs have off-site effects or externalities. Added to this, the high cost of inputs, low prices on international markets and high interest rates mean that in many areas traditional agriculture is under both economic and ecological pressure.

To be ecologically sustainable, we need to:

- use only those lands which have the capacity to support agricultural practices in the long-term;
- target our production of non-native products to those which are better suited to Australian conditions;
- take advantage of niche markets for high-value products; and
- better use and manage the indigenous resources of the country for production where we have a clear competitive advantage.

The processes that are needed to achieve ESD objectives include:

- targeting production to areas that are already developed and most fertile (limit urban encroachment etc.),
- limiting spread of broadacre agriculture to allow preservation of a greater area of native plant communities;
- developing niche markets (particular types and standards of high-value products which are in demand, for example, clean and green, Australian native), in order to create wealth for future generations; and
- developing native foods, fibres and other products, adapted to Australian conditions. This will encourage protection and management of biological diversity, and maintenance of ecological processes.

The above processes will limit the extent of Australia's "mining" of its resources (soil, water, nutrients). There is a need to manage diverse systems and use areas within their productive capacity.

Success can be measured in the short term by:

- an increase in the amount of marginal pastoral and agricultural areas managed for nature conservation or native products rather than conventional production of beef or wool;
- an increase in more intensive, "clever" agriculture on the most fertile areas,

and in the long term by:

- reduced water use by agriculture;
- retention of the soil resource and decreased soil structural decline;
- increased soil formation;
- increased areas of native vegetation through natural regeneration; and
- improved water quality.

In relation to the third core ESD objective ('to protect biological diversity and maintain ecological processes and life support systems') in particular, it is evident that in many landscapes managed primarily for agriculture, biodiversity loss and damage to ecological function are key problems to be addressed in achieving ESLM. The National Strategy for the Conservation of Australia's Biological Diversity (National Biodiversity Strategy) identifies key mechanisms for the conservation of biodiversity in agricultural landscapes (Objective 2.2, Actions 2.2.1 to 2.2.3). Attention is drawn to the concept of "sustainable habitation", and to diversification (as canvassed above) as a method to achieve this. Integral to the success of these mechanisms is their application at the bioregional level, as most of these problems cannot simply be dealt with at the farm scale. In this regard, the concept of Biosphere Reserves is a useful model which can provide for both biodiversity conservation and ecologically sustainable development in a large scale bioregional framework. The pioneering work being done in the Fitzgerald Biosphere Reserve in Western Australia and the Bookmark Biosphere Reserve in South Australia may provide useful practical examples for the inquiry. Publications relevant to the Biosphere Reserve concept are at Attachments B and C.

Cooperation between neighbouring farms and regions is essential to ensuring that individual land managers are responsible for external impacts of their management decisions, but also to ensure that they are not unduly burdened with requirements. (If, for example, conservation of a particular habitat is identified as critical to biodiversity conservation and thus ESLM, rather than each land manager being required to protect a particular amount, it may be optimal to pool the requirement across several adjacent properties.)

Given that the maintenance (and improvement) of environmental quality is a key component of intergenerational equity, this and the protection of biodiversity and ecological processes can be measured by monitoring biodiversity loss and other land degradation (including for example, impact of feral animals, amount of land and water infested with weeds or affected by exotic pathogens (notably *Phytophthora*), amount of land affected by anthropogenic salinity, and amount of land affected by erosion).

Biodiversity loss is not easily measurable, because scant information is available on major biodiversity elements (eg invertebrate and microorganism diversity). The use of surrogates may be too unreliable to allow assessment, and in the absence of more precise data, it must be assumed that biodiversity will survive only if habitat is retained.

3: IMPACTS OF LAND MANAGEMENT PRACTICES

The Commission is interested in information on the range, magnitude and location of problems resulting from past and present land management practices in Australia. What agricultural or non-agricultural practices gave rise to them? How feasible is remedial action?

The problems are extensive, but vary in their magnitude. The situation is made even more complex by the synergistic way in which some of these threats work (eg the effects of land clearance are in many places exacerbated by feral animals such as rabbits (which can prevent recruitment of native species of plants and also and concomitantly increase erosion), in turn leading to greater pressure to clear yet more land).

Threats to biodiversity are identified in Chapter 3 of the National Biodiversity Strategy, the most prominent of which include land clearing, pollution, invasive organisms, inappropriate fire regimes and climate change. The Commission should also refer to the State of the Environment report. (Environment indicators for SoE reporting are discussed below).

Other threats to biodiversity identified in the National Biodiversity Strategy include the widespread use of artificial water sources in the rangelands, which contributes to overgrazing by stock, feral animals, and some native grazers; and threats to refugia for biodiversity (including mound springs which appear to have been generally and badly affected by loss of pressure due to artesian and sub-artesian water supply, as well as trampling by stock). While many of these threats are not immediately apparent, when they are noticed, remedial action can be difficult or impossible. The Commission is referred to Biodiversity Series Papers 4, 6, and 7 (Morton et al, 1995; Biodiversity Unit, 1995, and Graetz et al 1995, respectively), and to the recent release “The Effects of Artificial Sources of water on rangeland Biodiversity” (Landsberg et al, 1997).

Problems with **dryland salinity** affect vast areas of Australia, from the Murray-Darling Basin to the Coorong in SA, and the WA Wheatbelt. Information on these is available from Murray Darling Basin Commission and tabled in the *Western Australian Salinity Strategy*. The Commission should refer also to the Prime Minister’s Science and Engineering Council report *Sustaining the Agricultural Resource Base*. Dryland salinity is frequently associated with excessive vegetation clearance, and thus also with habitat and biodiversity loss. In general, biodiversity decline is not simply measured in terms of species assumed to be extinct (lists of which tend to be highly conservative and restricted to groups of well studied organisms which comprise a fraction of total biodiversity), but also in terms of markedly changed habitat. It is apparent from studies such as that by Graetz et al (1995) that vast areas of the agricultural lands of Australia have been severely modified by man in the last 200 years, with resulting land degradation in many places.

In relation to the agricultural and non agricultural practices, Environment Australia agrees with the impacts listed and asks the Commission to note that these are primarily due to clearing of native vegetation for:

- planting of crops and consequent cultivation practices;
- grazing of stock and associated impacts due to stocking rates;
- navigation of streams;
- transport corridors; and/or
- urban development.

Other problems are due to changed hydrological cycles including:

- reduction of supply of artesian water through pumping of groundwater via bores;
- diversion of streams;

- regulation of flow by dams and weirs; and
- diversion of surface water for irrigation.

None of the threats to biodiversity or ecological processes is easily fixed, but most are being addressed to some extent by Commonwealth, and State and Territory Governments. It is apparent that current agricultural (including pastoral) practices are ecologically unsustainable in many parts of Australia, and in some cases, economically unviable. Diversification may offer some hope of “sustainable habitation” in some cases, and many activities, notably tourism and ecotourism are in many cases being actively explored.

The feasibility of remedial action is also influenced by the allocation of responsibility for land management to the States under the Constitution. Across the States and Territories there are a wide range of policy and regulatory responses. Mechanisms for coordination/cooperation between States and Territories include the Murray Darling Basin Ministerial Council and Commission, the Australian and New Zealand Environment and Conservation Council, and the Agriculture and Resources Management Council of Australia and New Zealand.

While it is possible to limit the extent of clearing of native vegetation, (for example, South Australia has restricted broad acre clearing), for any regulation/policy to be effective there needs to be the political will and the commitment of the community. Allocation of funding could, dependent on the circumstances, be used to limit clearing in areas. For example Natural Heritage Trust funding could be provided for remnant native vegetation protection. It is far more cost effective to limit the removal of native vegetation than it is to revegetate the land and restore the ecological processes. The time factor also needs to be taken into consideration. For example, it takes only a few hours to clear a hectare of land. It may take at least 30 to 40 years for re-established vegetation to reach maturity and for ecosystem processes and hydrological balances to be restored, if indeed that is possible.

Actions such as protecting and managing native vegetation remnants and replanting indigenous vegetation, particularly on recharge areas, steep areas and stream margins, need significant investments in terms of both labour and materials. Any investment should address the underlying causes rather than addressing the symptoms and will need long-term commitment from landholders, communities, local government, the State and Territories and possibly the Commonwealth. The National Vegetation Initiative and other Natural Heritage Trust Programs are a significant step in addressing land degradation but will need to be supplemented to achieve ESLM in the long term.

Environment Indicators for State of Environment Reporting

The State of the Environment Advisory Council which oversaw the production *Australia: State of the Environment 1996* report (Commonwealth of Australia, 1996) has sent the Commission a copy of that report. This part of the submission refers on the role of Environment Australia in developing a national set of consistent and scientifically-credible environment indicators for SoE reporting.

The national SoE reporting process has highlighted three important objectives that need to be met as part of the goal of achieving Ecologically Sustainable Land Management (ESLM).

1. There is a need for better scientific information on ecological processes within terrestrial, aquatic and marine ecosystems, and the impacts of different land-management practices on those processes.
2. The lack of nationally compatible data across different jurisdictions is a major obstacle to achieving efficient land management practice.

3. There is the need to take an ecosystem-based approach to land management, and to explicitly account for off-site impacts of land management practices on adjacent habitats and other ecosystems.

Environment Australia, through the national SoE Reporting process and environmental database activities is contributing to the achievement of ESLM through:

- providing scientifically-credible and relevant information that can underpin policy formulation and decision-making processes;
- developing a set of scientifically-credible environmental indicators that can be used to measure Australia's progress towards ecological sustainability. These indicators will
 - generally permit a more directed use of resources and effort in monitoring changes in the condition of our environment;
 - help environment monitoring programs at the different levels of government to avoid duplicating their resources and effort, through information sharing; and working towards common objectives with interested stakeholders;
 - be developed for the following environmental themes: land; biodiversity; estuaries and the sea; inland waters; atmosphere; cultural and natural heritage; and human settlements- all of which are relevant to ESLM; and
 - be developed in cooperation with the States and Territories through the ANZECC SoE taskforce, and with local governments and communities through the Australian Local Government Association (ALGA).
- developing national environmental databases through a range of policy programs which will contribute to the overarching information framework established by the SoE Reporting process and associated development of environmental indicators; and
- providing broad access to environmental databases, which will assist in the management and of the environment, and the determination of major information gaps.

Report On 'Water Quality Monitoring In Australia'

This report released in October 1995, surveyed monitoring activities for drinking, inland, ground, estuarine and coastal waters and recommended ways to improve efficiency and effectiveness of monitoring. A follow up annex on Water Quality Monitoring in Australia's EEZ is nearing completion. If the recommendations of these reports were adopted, monitoring would be considerably improved with lower costs.

The report found that there are around 1,800 water quality monitoring programs in Australia costing nearly \$100 million each year. About 65 per cent of monitoring is by State, Territory or local governments. The rest is by the Commonwealth, community organisations, universities and private companies.

Monitoring can provide information to:

- . underpin environmental protection policies, including catchment management programs and state of the environment reporting systems;
- . facilitate water resources management and pollution control; and
- . enable development of water quality standards and guidelines, and testing compliance.

The report's recommendations to improve water quality monitoring include better design, coordination and reporting of monitoring programs and a greater focus on national approaches and community involvement.

National River Health Program

The need for proper national and regional systems for assessing ecological health of Australia's rivers and effective water quality monitoring was emphasised in the 1996 national State of the Environment Report, which highlighted the National River Health Program (NRHP) and Waterwatch as important programs.

The NRHP, launched during 1994, is jointly funded and managed through Environment Australia and the Land and Water Resources Research and Development Corporation with strong support from State and Territory agencies. In future, both the NRHP and Waterwatch are expected to be part of the National Rivercare Initiative under the Natural Heritage Trust. The NRHP comprises nationally coordinated State and Territory biomonitoring programs, supporting research and development projects for rural, urban and estuarine waters, and studies on environmental flow requirements of rivers.

A major outcome of the NRHP will be the AUSRIVAS (Australian River Assessment Scheme) predictive computer model based on macroinvertebrates that allows effective assessment of pollution. AUSRIVAS is being used for the first Australian and continental scale assessment of the ecological health of rivers.

AUSRIVAS will effectively assess pollution, assist water quality management, facilitate assessment of catchment remediation and assist State of the Environment Reporting and National Land and Water Audit processes.

AUSRIVAS will also help target funding under the Natural Heritage Trust, through identification and prioritisation of rivers at risk.

4: UNDERLYING CAUSES OF IMPACTS

Property rights

The Commission is interested in receiving information and comments on the existing system of 'property' rights that affect the use of natural resources and the extent to which they enhance or detract from ESLM objectives.

Property rights

In several cases, States and Territories have placed restrictions upon land management activities (such as clearance controls). In some cases, this has proved ineffective because of inadequate community consultation, and in some cases little land was left to protect. In still others, restrictions do not apply on privately owned land, and land clearance continues unabated.

Property rights need to be identified as a broader issue than simply land tenure and ownership of land. Private ownership, once seen as an exclusive use right is now underpinned by a series of regulations restricting the use of the land to take account of the 'common good' which includes the protection of biodiversity. Management of land is likely to have greater impact on ESLM than ownership.

Property-right mechanisms seek to compensate for, or address market failure to protect biodiversity. The aim is to alter private costs and benefits so that any unaccounted social costs can be internalised to ensure the desired environmental improvement.

The following 'property' rights are likely to effect ecologically sustainable land management and the conservation of biodiversity:

- easements, covenants and management agreements.
these are contractually binding management agreements between cooperating parties, pooling resources to achieve mutually beneficial outcomes. They establish conditional use. They could be used more widely in Australia;
- ownership rights
the separation of resource control rights and land ownership provides the framework to create incentives for resource owners to maintain their asset;
- use rights. There is a variety of types of use rights;
 - A. leasehold land provides an opportunity for cooperative management arrangements with government to improve potential for biodiversity conservation;
 - B. exclusive use rights - controversial as to whether exclusive use does lead to biodiversity conservation although there are undoubtedly examples where it does (Young et al, p115)
 - C. bioprospecting contracts - a particular example of exclusive use aimed at valuing the resource;
 - D. communal ownership - a system of cooperative agreements about the use of land commonly encountered in indigenous cultures. Use in this type of social system usually includes provision for the common good over the desires of the individual.
- Leasing and licensing.

The regulation of resource use to restrain the actions of resource users engaged in maximising profits at the expense of biodiversity which appears to have little observable value.

There may be limits in the application of tradeable property rights for the protection of remnant native vegetation, although such rights may offer an opportunity for biodiversity conservation in other areas such as tradeable fishing permits.

Remnant vegetation is heterogeneous and different pieces have differing value/priority for conservation depending on various scientific criteria. Quotas for rights to clear native vegetation would trade at values that were related to the economic opportunity cost to the individual farmer of foregone agricultural production from uncleared native vegetation. Thus the value placed on a particular piece of remnant vegetation would not be related to its conservation value. Although the opportunity cost of foregone production is a factor in society's decision on whether or not to conserve a piece of vegetation, the opportunity cost should not "drive" the conservation decision as it would in a tradeable quota scheme.

Under common law private landholders are presumed to have the right to shape their own environments. Some rights, including those relating to subdivision and building on land, and to changes in landuse, are now controlled by planning legislation, but the right to make other management decisions remains with the land owner (Bates 1992).

There are significant differences between private goods and public goods. Freehold land is generally considered to be a private good and has clearly defined individual property rights, accordingly, owners can exclude potential consumers and freely trade the goods in competitive markets. In contrast, the biodiversity inherent in native vegetation and the ecological processes that vegetation on freehold land provides could be considered public goods. For example vegetation provides a service through filtering of sediment and is often considered the lungs of the planet because of its role in the carbon cycle. The biodiversity on freehold land can be considered to be both a private and public good. For example, if the vegetation provides timber for firewood it can be considered a private good, but when it provides habitat for native fauna species it could be considered a public good. Therefore while freehold land is considered a private good, the public retains an interest in how that land is managed.

When vegetation is viewed as a public good it can produce external costs and benefits (externalities). An externality is defined as a situation where actions of one party affect the well-being of another party, who has no influence over the first party's decisions (Randall & Peterson 1984). If the effect on the third party increases their utility then an external benefit is said to exist, whereas if the utility of the third party falls then this result, is an external cost (Brown & Jackson 1982). This is the situation over much of Australia where the retention of native vegetation on private land is likely to increase the utility of a third party and its removal is likely to decrease the utility of that same party. In the presence of externalities, market failure occurs and government intervention may be warranted.

Effective management of land is needed to sustain long-term productivity and natural ecosystems. Management actions such as chemical fertiliser use, pesticide use, poor tillage methods and clearing of native vegetation affect both natural and agricultural ecosystems within and beyond a property. In spite of the off-site effects, the right of the private landholder to effect such changes is regarded as sacrosanct at common law (Bates 1992). Bates (1992) recognises that "the sound management of private land may have to be encouraged by law, either positively through the provision of assistance and the promotion of taxation incentives for beneficial land management practices such as attending

to land degradation problems; or negatively, by restriction or tax disincentives on the over-use or negligent use of certain practices, such as vegetation clearance and pest control."

For example, the current system of freehold property rights gives the general right to individual farmers to manage their land in any manner they consider appropriate. Where land management practices have led to off-site effects such as dryland salinity or loss of the soil resource through erosion, governments have intervened and developed legislation restricting the individual's property rights. Most significant in this regard is government intervention in relation to land clearing. Clearing restrictions, if applied, need a clear and accountable assessment process with well defined criteria, and should be considered in light of both economic and environmental costs and benefits.

However, the level and timing of intervention can be problematic and lead to inequities. If, for example, a certain percentage of native vegetation cover retention is set by a government for a region when land degradation reaches a point where government intervention is necessary, equity problems may arise. Some landholders will have cleared the majority of their land over a number of years, while other landholders will have retained a large proportion. If in later years, landholders are not permitted to clear because as a region the threshold has been reached the one landholder will be disadvantaged, not by their own land management practices but by those practices of others. There are a number of mechanisms that could be used to ameliorate the effects of these inequities. For example, some local governments have a differential rating system which benefits landholders who have set aside land for conservation purposes.

Furthermore, the system of land tenure may have an impact on the attitude to use of the resources, For example, freehold land, operated as family farms may be managed in such a way as to retain options and resources for children and descendants (as long as adequate information is available to make decisions on sustainable management). In contrast, other properties are managed for short-term profit. While there is an incentive for family farms to be managed for the long term, it is often the larger holdings owned or operated by Agribusiness or corporate holding who have the level of resources to be able to manage their resources sustainably.

Leasehold land may have conditions imposed in the lease which influence the sustainability of the enterprise. For example, in past years leaseholders have had to clear land as part of the lease conditions, and some leases still specify minimum stocking rate conditions. Certain lease agreements may make it difficult for diversification and for quick reaction to market changes. Leasehold land has the potential to be managed sustainably through the inclusion of specific clauses, however, unless resources are committed to support monitoring of compliance and the will to enforce regulations then the type of tenure has no effect.

In conclusion, it is important that all land whether freehold or leasehold is managed within the context of both long and short time frames and should be managed within the matrix of the regional landscape. The public good nature of biodiversity and ecological services that landscape systems provide need to be recognised. Marginal lands or properties with high levels of debt may not be able to managed sustainably in either the short or long term.

Information problems

The Commission is interested in comments on the appropriate role of government in generating and disseminating information on ESLM. How well do the existing institutions operate. Is research relevant, cost effective, and communicated efficiently. How are research priorities set? How is research funded? Is the current mix of funding appropriate? What actions could be taken to improve R&D and its use in this area?

Existing R&D institutions

Agricultural product R&D corporations (part-funded by producers) have an interest in funding development of their own product. This can assist those products and management systems to become better adapted to the Australian environment and therefore achieve more sustainable production. Most of the research being undertaken by industry funded R&D corporations is aimed at increasing the productivity of rural lands and the long term viability of rural industries. The public good nature of research into biodiversity and the ecological services that native vegetation performs is therefore not likely to be a priority for these corporations although the Rural Industries Research and Development Corporation and the Land and Water Resources Research and Development Corporation have funded a relatively small number of projects on non-commercial management or alternative crops and management systems (including native species) and the management of remnant native vegetation. In the absence of Industry funded research the government may need to take responsibility to fund research of this nature.

Communication

Many Government institutions have been instrumental in generating and disseminating information on ESLM. However better communication of research results and a more coordinated approach is needed, to get both existing and new information out to land managers who have responsibility for land under their control. Research journals can be useful in this regard but are generally targeted to other researchers rather than land managers. To get relevant information to land managers requires a range of methods including:

- developing a wide network facilitators/extension officers in the field;
- use of nature conservation and primary industry agency staff;
- extensive community networks;
- use of demonstrations and field days,
- development of partnerships between researchers and land managers;
- local government;
- Greening Australia, and other non-government delivery agents such as the Australian Trust for Conservation Volunteers;
- the Department of Primary Industries and Energy Rural Book;
- property management planning;
- articles in farm journals (for example, Sustainable Agriculture);
- articles in newspapers (The Land);
- active use of community groups such as Landcare (38% of broadacre farmers, according to ABARE survey);
- innovative communication networks such as the Internet; and
- a range of case studies showing the economic benefits of ESLM.

The Commission should recognise that land managers may have an extensive knowledge of the biodiversity and ecological function of land under their care. The collective knowledge of land owners is vast and therefore any communication should include a two way flow of knowledge, primarily through community/landholders partnerships with researchers and research institutions. What is particularly important is that the management regimes of individual properties which are considered to be managed sustainably and which have conserved biodiversity and ecological processes are documented.

Priorities

Priority setting is of primary importance in allocating the scarce resources available for research. In the area of remnant native vegetation valuable work has been done under the joint Environment Australia/Land and Water Resources Research and Development Corporation Remnant Vegetation R&D Program on ecological and socio-economic issues. There are several joint publications from

Environment Australia/Land and Water Resources Research and Development Corporation that outline this research including:

1. *Socio-economic Aspects of maintaining Native Vegetation on Agricultural Land: Occasional Paper 07/95*
2. *National R&D Program on Rehabilitation, Management and Conservation of Remnant Vegetation: Occasional Paper 11/96*
3. *Remnant Vegetation in the rural Landscape: A consultancy report: Occasional Paper 04/93.*

Further work is needed in the area of revegetation to ensure that expenditure on replanting is leading to the establishment of viable and self-reproducing ecosystems which contribute to biodiversity conservation and thus sustainable production. Other areas which could be considered a priority are the development of industries based on use of native species.

In the area of native vegetation the soon to be formed Council for Sustainable Vegetation Management could be an appropriate body to consider priorities for research. Other avenues include workshops by stakeholders including government, research institutions and landholders which in concert develop priorities for research. This approach was taken in developing priorities for the Socio-economic component of the joint Environment Australia/Land and Water Resources Research and Development Corporation Remnant Vegetation Research and Development Program.

Funding

Scientific knowledge that results from research is needed to underpin government investment of land management. Research provides a quality assurance service, ensuring that public money is invested wisely. In relation to research many large corporations invest up to five percent on research and development. It could be argued that this is seen as an essential component of profit, with resulting innovation from this investment, increasing company profit.

With the move for research organisations such as CSIRO and universities to become self funding, the focus of research will move to commissioned research for industry that will generate profits. In this case there is a risk that research without a clear commercial gain will not be done. This is particularly relevant for many areas of biodiversity management and ESLM. There is a clear role for government funded research where the nature of the research involves a public good.

External effects

The Commission seeks information on the range, magnitude and location of externalities associated with common land management practices (that is those which have an effect on others which the landowner or manager does not have an incentive to take into account).

(Refer also to 'Property Rights' section earlier.)

It is probably safe to state that externalities apply to all agricultural land, because no matter the size of the land parcel, land management decisions are likely to have some effect on anthropogenic climate change. In the case of very large properties, this effect could be significant (for example, relating to fire regimes, land clearance etc.)

Negative externalities associated with common land management practices are widespread and well documented. Management practices such as land clearing, irrigation, use of pesticides and fertilisers, stocking rates, the introduction of agricultural and aquaculture species with the potential to become invasive species are some examples where negative externalities arise. Such impacts can be both localised and widespread, and they may take a long time to show up.

There are also positive externalities which are associated with common land management practices such as the replanting of trees, control of erosion in riverine environments and weed and pest control. In some instances land management practices such as the retention of native vegetation are seen to have both positive externalities such as providing habitat for species which prey on agricultural pests and negative externalities associated with harbouring vermin.

The range of externalities includes:

- the loss of biodiversity;
- impacts on biodiversity which result directly from clearing for agriculture, infrastructure (for example, roads), weed and pest control, etc;
- impacts on native communities which result indirectly from clearing, for example, where loss of vegetation in recharge areas results in rising water tables/salinity elsewhere with consequent adverse effects on vegetation communities (including those in reserves);
- groundwater rises and salinity due to clearing in upper catchment, impacts occur in lower part of catchment;
- soil erosion;
- loss of environmental water flows - the needs of the environment are often not considered when streams are dammed and flows regulated for irrigation (this changes flows, temperature, depth, nutrients etc.) which impact on flora, fauna (bird and fish feeding and breeding), microbiology (leading to algal blooms); and
- impacts on the marine environment of terrestrial management practices (eg such practices may lead to fluvial changes, pesticide and sewage pollution, which impacts in the marine environment).

While the decisions of one land manager may in general have little effect by themselves, when many managers adopt practices with similar effects, the total impact on the environment may be ecologically unsustainable. When environmental limits have been reached or exceeded, every impact, no matter how small, is more noticeable. A clear example is provided in the wheatbelt of south western Western Australia, where overclearing has resulted in rising saline water tables.

The existing degradation in Australia's agricultural lands is to a large measure due to past practices which took some time to become evident. Overgrazing and overclearing have very noticeable effects on the properties on which they occur, but damage to ecological processes can be difficult to detect.

The range, magnitude and location of the externalities is documented in part in the State of Environment report. The best scale at which to document and manage these externalities is at the regional scale. Aggregation of externalities to State or National scales is problematic and much of the detail lost. The solutions lie in the micro management at the property level but within its regional context. Responses such as property management planning and regional catchment planning are best suited to managing externalities. The inclusion of biodiversity and the value of ecological processes into regional resource accounting frameworks is a further option that could be explored.

The non-inclusion of environmental values.

Which environmental attributes are most relevant to the ecologically sustainable management of agricultural land? How should such attributes be identified and valued? What could governments do to ensure that these attributes are included in the land management decision making process?

At the broad level, the environmental attributes most relevant to ESLM on agricultural land are:

- Maintenance of ecological processes (including evolutionary processes)

If ecological processes deteriorate, not only will biodiversity be affected, but agriculture will itself become economically unviable in the long term.

- Maintenance of biodiversity

The maintenance of biodiversity is a key element of ensuring that ecological processes are maintained

- Maintenance of suitable habitat (ie relevant proportion of indigenous vegetation and ground cover)

Maintenance of habitat is in turn vital to biodiversity conservation (particularly given that most of our biodiversity is still unknown). Depending on the land use patterns, it may be appropriate for patches and corridors between remnants to be developed and managed for biodiversity conservation. In the case of extensive grazing, the maintenance of patches and corridors of ungrazed or lightly grazed indigenous vegetation would appear to be vital to the maintenance of regional biodiversity, and could be achieved by controlling water points (Landsberg et al, 1997).

- Maintenance of soil integrity

When soil integrity is disturbed, (which includes litter layers and lichen cover, soil fauna and microfauna and flora) its ability to function normally is impaired.

Overgrazing, overclearing, trampling by ungulates and vehicular traffic can result in soil compaction and as a result, or independently, lead to erosion.

The addition of nutrients, through fertilising or from the excreta of increased numbers of grazing animals, may also disturb ecological processes, for example by encouraging increased pasture scarabs, which not only feed on grass roots, but also defoliate trees. The flow-on effects of soil disturbance can be ecologically very significant.

- Maintenance of water quality

Land management directly affects water bodies eg through eroded sediments, nutrient export and chemical runoff. Poor water quality often indicates poor land management.

While most water quality management and monitoring is by State and Territory agencies, national and regional approaches, often involving State, Territory and Commonwealth governments, are being developed including:

Related but more specific attributes that are relevant to ecologically sustainable management of agricultural land relate in particular to the environmental services that native vegetation provides including:

- role in carbon cycle and gas exchange, including sequestration of greenhouse gases;
- nutrient cycling;
- the role of vegetation in hydrological cycles and its influence on water flow regimes and environmental flows, including maintenance of water quality through filtering of run-off (by riparian vegetation), and amelioration of salinisation;
- essential to conservation of biodiversity at the genetic, species and ecosystem levels, and including soil diversity. Indigenous vegetation provides food and habitat for fauna, and

vegetation communities include many complexly interacting species of plants, animals and microorganisms;

- the role of vegetation in structural changes to soil layers, including amelioration of erosion;
- commercial value for wood, fibre and floral attributes, including real and potential commercial values for pharmacology and related industries;
- aesthetic, recreational and tourism values; and
- contribution to property values;

How identified and valued

Environmental attributes need to be identified and valued at a range of scales (national, regional, local). The location and type of attribute can be identified through a range of techniques including remote sensing and land-based surveys. Techniques for valuation include a range of economic analysis tools including resource pricing, demand analysis and non-market economic valuation techniques. It should be noted that native vegetation has both market and non market value.

Labour, technology, equipment and machinery and native species combine to produce a wide variety of commercial products including food, timber and clothing (McCollum & Bergstrom 1992). Commercial value is the only value of biological resources that is reflected in national income accounts and under-valuation of wildlife resources may result (McNeely 1988). However, economic benefit can also be measured through analysis of the choices an individual makes. These choices, which are an expression of the individual's preferences, are defined as the individual setting one good over another, because one good is considered better (Brown 1984). In making a choice the individual is assumed to maximise their utility in relation to their preferences, under the constraint imposed by their available budget (Green 1990).

Value has a number of manifestations. The most commonly used in economic valuation is assigned value. Typical expressions of assigned value are market prices, and election or survey results. An individual will "assign" a value to an object depending on their perception of the object and all other relevant objects, their preferences and the context of the valuation. Price, therefore, is an "assigned" value that reflects many individuals' valuation. The value of price as a measure of assigned value is that price reflects actions in relation to scarcity and reflects actual behaviour. The economic perspective of value associated with production, consumption and exchanges of goods and services in markets pervades current western thinking (Brown & Manfreda 1987). Economic values are of prime consideration in resource allocation decisions. If for example, native vegetation or other wildlife is considered to have no financial value it becomes difficult to compare it to other values such as those associated with development of land for agriculture.

There are, however, values that are not classed as economic values. These values are often called inherent, intrinsic or ecological values in the literature. Many conservationists and others believe that environmental phenomenon such as wildlife (both plant and animal) have value in their own right and independently of human preferences (Holland & Cox 1990, Rolston 1991). Doelman (1990) and McKenney & Fox (1989) argue that economics alone fails to supply a perfect measure of environmental values because of the anthropocentric nature of economics. Anthropocentric values are based on the view that only humans are important and are not concerned with the welfare of wildlife unless the welfare of humans is involved. A non anthropocentric (or non economic) approach is one that is rated from the point of view of non human beings (Doelman 1990). Conflict over resource use is often the result of the rival ethical systems used by different groups. For example, conservation groups operate from a naturalistic ethic that seeks to extend the obligations of human beings to nature while development groups operate from an anthropocentric view where value is defined in terms of the experience and satisfaction of human beings (Cox & Waring 1992).

The value of native vegetation, apart from its use as a timber resource, is similar to native fauna species whose value is less tangible than other goods, making measurement difficult. In recent years economists, sociologists, psychologists and wildlife managers have all attempted to develop methods of measuring wildlife values as it is necessary to evaluate wildlife to compare the measurements with those of other resources (Gilbert & Dodds 1992). A number of classifications of wildlife values are included in Attachment D.

A basic conceptual issue surrounding wildlife concerns the benefits involving the ecological functions of wildlife. These concerns centre on whether ecological values of wildlife are adequately understood by people and reflected in their behaviour. Some ecological functions are essential for human survival, however, it is usually only those functions that enrich the human experience that result in explicit valuation of the resource (Shaw 1984). Prior to the 1970's a materialistic view predominated economic thinking which has been increasingly replaced by biological and ecological issues (Tisdell 1990). This change is associated with doubts about the validity of Gross Domestic Product as a comprehensive measure of economic welfare (Tisdell 1990). These less tangible values of native vegetation need to be included in any economic analysis.

The value and attributes of native vegetation and its contribution to ecological processes can be determined and be included in decision-making through:

- use of non-market economic analysis;
- natural resource accounting;
- pricing of natural resources including non-market values as well as market values;
- use of tradeable rights;
- the full environmental and economic cost of agricultural produce being reflected in the price;
- the introduction of minimum environmental requirements in regional planning for Natural Heritage Trust grants;
- conditions on leasehold land reflecting the public benefits; and
- non-market values being included in cost-benefit analysis.

A useful reference on valuation in relation to ESLM is 'Techniques to Value Environmental Resources - An Introductory Handbook' by the Department and others (see reference list).

What are the costs and benefits of maintaining a particular environment? Which environments should be targeted and how should priorities be set? Under what circumstances can essential environmental values be maintained in conjunction with other uses? What weighting should be given to maintaining the pristine nature of some environments?

Costs and benefits

Cost-benefit analysis is a valuable economic analysis technique designed to ensure scarce resources are allocated efficiently. Cost-benefit analysis aggregates, in monetary terms, the gains and losses of individuals and expresses them as net social gains or losses. This allows projects or developments to be compared and evaluated in monetary terms to determine if the projects are justified on a welfare economic basis (Sant 1992). Generally cost-benefit analysis has been used to analyse various public policies and investment in capital projects. Net benefits generated by any development or investments are distributed over successive periods of time, so the total value of the stream of net benefits in each time period needs to be reduced to its present value through the use of discounting (Brown & Jackson 1982). Problems therefore arise in any analysis of the benefits and costs of retaining native vegetation as not only is it difficult to decide which costs and benefits should be included in the analysis, techniques to value the public benefit of for example biodiversity conservation or retention of remnant native vegetation are not well accepted. Further

difficulties arise through a lack of knowledge about the role of native vegetation in providing essential environmental services. It is also difficult to measure and include in a cost-benefit analysis, the future value that native species may provide in the development of pharmaceutical products or alternative food and fodder resources. Choice of discount rate is also problematic where ecological time frames are much larger than those generally used in cost-benefit analysis.

Benefits include biodiversity conservation which provides options for new resource industries in the future, the maintenance of ecological processes (water flows and quality, nutrient cycles, soil formation, air quality) and the commercial benefits of native vegetation, such as timber or for grazing of domestic stock. An ecologically sustainable agricultural landscape can better include a diverse economic base, including, for example, tourism and bush tucker, but can also be critical for less tangible benefits. These can include not only continuation of ecological services upon which all humans as well as their industries depend, but also maintenance of aesthetic values and culture. The importance of a healthy environment to the sense of identity of all Australians is clear, and the particular importance of the natural environment to the culture and well being of Aboriginal and Torres Strait Islander peoples has also been recognised. Additional benefits arising from the recreation and tourism opportunities should of course be weighed against the costs of providing additional infrastructure to support these activities.

Costs may relate to alternative uses foregone (now and/or in the future), the costs of management for environmental values and commercial use (for example, fencing, pest and weed control, fire management) and agricultural and pastoral income forgone by retention of native vegetation. Costs may also arise in relation to restoration work needed to ensure both ecological sustainability and economic viability in the many agricultural landscapes which have already become severely degraded.

Assessment Processes for Decision-making in ESLM

In view of the difficulty of measuring many aspects important to ecologically sustainable land management in a conventional cost-benefit framework, there is a need for the use of broader assessment techniques by governments, where appropriate. In some circumstances, conventional cost benefit analysis will be adequate to decide that a form of activity is not of net benefit, and environmental damage can be avoided, without the need to weigh up environmental or other non-market values. Broader assessment techniques include scenario analysis and multi-criteria analysis.

Assessment approaches which governments might use are usefully summarised in “Methods for Analysing Development and Conservation Issues: the Resource Assessment Commission’s Experience’ (see reference list). This sets out the principles which were to guide the RAC in its work, and a range of techniques and assessment frameworks which governments can use in arriving at decisions on optimal and sustainable outcomes for society, which involve economic, social and environmental issues, such as ESLM.

Application of assessment approaches to ESLM

Much agricultural and pastoral activity in Australia is of marginal economic viability even for the landholders. Farm incomes are often very low, and returns to capital often minimal. As well as market-based activity in regions, there are non-market activities by governments, and external environmental effects. When all the costs and benefits are taken into account, therefore, current forms of activity may well be either uneconomic in terms of cost-benefit analysis, or not of net benefit to society using other assessment approaches. There may be alternative forms of land use which would be better.

However, effective policy responses must recognise the economic and social costs of change and provide acceptable adjustment strategies to effect necessary change.

Targeting

In a general sense, those ecosystems most at risk, or containing plants and animals at risk should perhaps receive top priority. Ecosystems and areas containing significant biodiversity (including threatened species, species of scientific and/or economic importance and unique/endemic species etc) should also receive priority.

Examples of priority ecosystems are lowland rainforests and many other coastal ecosystems which have suffered particularly heavy impacts, Salmon Gum Woodlands in Western Australia and White Box woodland in the central west of New South Wales, where there is little remnant vegetation left (<10-20% of original). In these areas it is important that clearing is suspended and a high priority given to the protection and management of what remains. Large remnants, particularly those not well represented in reserves should be targeted in all ecosystems, particularly those which have little remaining. The size of remnant needed to maintain viable ecosystems is likely to vary between regions and because of the degree of threat. Scientific information relating to minimum size needed to maintain viable ecosystems and ecological processes is required.

Environment Australia, in conjunction with other Commonwealth Departments and States and Territories has developed a methodology for assessing the environmental attributes of forest regions as part of the development of a sustainable management system for Australia's native forests. This methodology is described at Attachment E. Similar methodologies could be used to develop criteria for the preservation of biodiversity in non-forest ecosystems.

Maintenance of values in conjunction with other uses

Essential environmental values can be maintained in many cases where development occurs with sensitivity. Some uses have much lower impact than others: ecotourism for example can often be low impact, mining has major impacts, but in many cases on relatively small areas, pastoralism can, if managed correctly, have low environmental impacts.

There are many levels to which environmental values can be maintained, across the range of uses from broadscale intensive cropping and grazing (few values maintained) to protected areas (most values maintained). For example:

	<u>Intensive</u> <u>Agriculture</u> (few values maintained)	←		→	<u>Protected</u> <u>Area</u> (most values maintained)
Forest	fully cleared and cropped		forested remnants retained	agroforestry, alley farming harvesting of native products from forests	forest reserve
Woodland	heavily grazed and mostly cleared		scattered woodland species and heavily grazed	large-sized remnants some light grazing and some extraction for firewood harvesting of woodland native products, and activities such as honey production along roadsides and remnants	woodland reserves

Grassland	improved pasture	heavy grazing of native pastures	planted monocultures of saltbush	light grazing by introduced herbivores	grazing by native herbivores only
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Pristine

Very few if any Australian ecosystems could be regarded as “pristine”, but there are examples of many which are still functioning well. It should be remembered that most Australian environments were managed by Indigenous Australians before European settlement, and even “pristine” environments will continue to require management (including fire, and weed/feral animal control). However, it is considered undesirable to change those environments which are still ecologically sound in ways which would impact negatively on their ecological integrity or biodiversity.

A range of environments (grassland, heathland, mangrove, woodland, forest) should be protected and managed for their “pristine values”. Governments and landusers need to consider alternative means of increasing production and wealth from Australia’s resources in ways that do not impact adversely on these areas (alternative products, more intensive production, value-adding etc.).

Biodiversity

What are the key elements in biodiversity? How should they be measured? What mix of instruments should be used to maintain biodiversity? What role do national parks or their expansion, play in protecting environmental attributes? To what extent can other land, such as Crown, aboriginal or private land, be managed to maintain biodiversity objectives? If so, how?

Key elements

Biodiversity is the variety of life forms, including plants, animals and microorganisms, and is generally considered at three levels: genetic, species and ecosystem. The National Biodiversity Strategy describes the concept in greater detail. This submission concentrates on the conservation of Australia’s indigenous biodiversity, although it is recognised that diversity is also important within commercial crops and pastures.

Measurement

Biodiversity is difficult to measure. Techniques to facilitate measurement of genetic diversity are in an early stage of development; never the less, there is some possibility of measuring for example soil fungal diversity with quick biochemical surveys. Genetic diversity of other organisms is currently measured as resources allow and priorities demand (for example understanding the population structure of endangered species may require assessment of genetic diversity).

Species diversity for all except vertebrates and vascular plants can be very difficult to estimate, and is far from complete for even the better known groups. It is apparent that taxonomic surrogates for biodiversity are generally unreliable, and in the absence of better estimates, habitat conservation may offer the best solution. This should of course not preclude use of good data where these are available.

Ecosystem diversity has not been well documented as such at a national level, although much is known.

The ANZECC Working Group on National Parks and Protected Area Management has recently commissioned a study on State and Territory natural resource monitoring and performance standards. While the project has a protected area focus many of the findings are likely to be relevant to agricultural land. The scope of the project is attached for the information of the inquiry (Attachment F).

Instruments

A variety of instruments is necessary to maintain biodiversity, from agreed policy such as the National ESD and National Biodiversity Strategies, to Commonwealth, State and Territory legislation, local Government regulations, and incentives to land owners and managers.

Two projects, *Reimbursing the future: An evaluation of motivational, voluntary, price-based, property-right, and regulatory incentives for the conservation of biodiversity* (Young et al 1996) and *Opportunities for the use of incentives to conserve remnant vegetation*, a project currently being undertaken by CSIRO for Environment Australia and LWRRDC, address the mix of instruments available to conserve biodiversity. The first project looked at the range of measures while the second project is looking at how to implement some key instruments.

The ANZECC Working Group on Nature Conservation on Private Land has also looked at the range of measures that can be used for nature conservation on private land. These include:

- cooperative management mechanisms, which include voluntary non-binding programs such as Land for Wildlife and voluntary but binding on current or future landholders such as the New South Wales Conservation Agreements;
- statutory protection of wildlife habitat such as the South Australian clearing controls under the South Australian *Native Vegetation Act 1991*; and
- the provision of assistance, which could be through financial assistance to community groups or landholders, or in the management assistance through the provision of technical or management planning advice through extension services.

These mechanisms are linked and can be delivered in tandem with other mechanisms. For example, the South Australian Heritage Agreement Scheme links cooperative management agreements to a regulatory mechanism to protect remnant habitats. More often, the provision of assistance is linked to either a statutory or cooperative approach to nature conservation.

Role of National Parks

National Parks and other protected areas have a central and primary role, but will never be sufficient to conserve biodiversity or adequately address sustainable management of natural resources at the broadscale because of their small size in some instances, the lack of coverage of all environments, a lack of resources to effectively manage, lack of resources (and community resistance) to acquire more land.

The current system of protected areas was never intended to represent each type of conservation reserve. National Parks were mainly declared over land that was considered of little use for other purposes, in areas with high recreation value or on sites which could be acquired at little cost. Private land, including leasehold land and Aboriginal land, contains some elements of biodiversity that are not contained in any formal reserve. In addition to this, Crown land managed for purposes other than nature conservation and land managed by trust, for example roadside reserves, catchment protection areas and cemeteries often contain remnants of native vegetation in extremely good condition.

Other land

Australia's urban development and rural land uses have, since European settlement, changed many natural ecosystems. Most of the remnant urban bushland occurs on public land, managed as part of the conservation reserve system or by local government. In contrast, large tracts of the remaining bushland in rural areas occurs on private land or on Crown lease land. While some rural land has been managed sustainably, many other areas have become degraded, due in part to a lack of understanding about bush management, the agricultural policies of earlier governments and also because many past decisions were affected by short term economic influences. Although many ecosystems are conserved within the protected area estate, others are not represented and only occur on privately managed land. As over two-thirds of Australia (approximately 500 million hectares) is managed by private landholders there is a need for a consistent and integrated approach to nature conservation on leasehold, freehold and other crown lands (*National Strategy for the Conservation of Australia's Biodiversity* Commonwealth of Australia 1996).

It has become increasingly obvious that the protected area reserve system is not adequate if Australia is to retain current levels of biodiversity and meet its obligations under the Biodiversity Convention. The National Biodiversity Strategy recognises the need for conservation of biodiversity on private land given that the threats to biodiversity extend across administrative and tenure boundaries. The Strategy notes the need for increasing the standards of management and protection and the levels of financial and technical assistance. It highlights the need for adequate, efficient and cost effective incentives to conserve biological diversity. Priority areas for action under the Strategy include those important for:

- migratory species;
- threatened indigenous species;
- remnant vegetation;
- wetlands; and
- corridors between protected areas.

The Strategy recognises the need to establish voluntary wildlife refuges and to negotiate conservation covenants and heritage agreements between owners, managers and governments, noting that sufficient resources, including trained facilitators, need to be provided on a regional basis to assist in the implementation scheme.

In addition to the National Biodiversity Strategy a number of other documents have reflected the need for nature conservation on private land. The Ecologically Sustainable Development Strategy (Commonwealth of Australia 1992) encourages the voluntary protection of native vegetation remnants. Under this Strategy, the Commonwealth and State/Territory governments have agreed to encourage voluntary management of native vegetation remnants and to undertake cooperative development of a range of measures to better protect native vegetation on private land. The Intergovernmental Agreement on the Environment (Governments of Australia 1992) also notes the need for protection of species and habitats outside of reserves land use programs and cooperative arrangements.

The management of native vegetation on private land for nature conservation will help to retain biodiversity and protect habitats in the landscape. Many rural landholders and communities are becoming increasingly aware that protecting remnant vegetation and increasing the amount of natural or semi natural habitats on their farms can add to the long term economic viability of their farms through decreased soil erosion, conservation of water and biological pest control (Thackway & Stevenson 1989). However, the benefit of land protection measures accrue, not only to the

landholder, but also to the local community, other groups within the catchment and to the wider society.

In many instances it is possible to maintain values in conjunction with other uses, with appropriate management. Active management needed in many areas, includes fencing, control of grazing, weed and pest control or prescribed burning. In addition, targeted management for particular species is sometimes required to stimulate breeding of animals and to generate availability of specific food requirements for animals. Other management techniques may include enhancement of remnant vegetation through extended plantings and buffers, re-introduction of indigenous species, selective grazing, biomass management or nutrient management. There is, however, an urgent need for information and understanding of species responses to disturbance and to management, the management needs, minimum viable areas, threatened species etc.

How

There are a number of methods that can be used to promote the long term protection of biodiversity on private land. These are detailed in the ANZECC Working Group on Nature Conservation on Private Land Report entitled *Nature Conservation on Private Land: Commonwealth, State and Territory Legislation and Programs: A report of the Working Group on Nature Conservation on Private Land prepared for the Australian and New Zealand Environment and Conservation Council, Standing Committee on Conservation* (Attachment G) and include:

- Leasehold lease conditions,
- Regulation;
- Crown local and State government agency staff policies and procedures;
- Commonwealth Defence etc. procedures;
- Memorandums of Understanding for management of joint resources or those crossing jurisdictional boundaries;
- Industry Standards;
- Codes of practices;
- Conservation agreements;
- Management agreements;
- Voluntary agreements with indigenous owners; and
- Stewardship payments.

Leasehold land

Crown land legislation provides the basis by which controls can be placed on the occupation of Crown lease lands. Under some leases, a form of environmental management is required of the occupants, which could include pest control, fencing, erosion control and other improvements. Leaseholders may also be subject to conditions relating to grazing management, clearing control, and frequency of cropping and cultivation. These controls are designed primarily to protect the economic viability of the land in production (Bates 1992), but may also provide environmental benefits.

Covenants

There are generally two types of covenants - common law and statutory. Common law covenants are those where persons not in possession of a parcel of land may be able to exercise some legally enforceable rights over it. Generally these rights (easements and covenants) exist if they benefit neighbouring property of the person seeking to enforce them. Easements commonly confer rights

to do something on someone else's land, or can restrict the way in which a landowner can use the land. Covenants are generally restrictive (Bates 1992). In contrast, statutory covenants can be set up under Acts of Parliament, and are binding on future owners irrespective of whether or not there is a benefit to a neighbouring property.

In Oregon, in the USA, local governments and charitable institutions are able to acquire conservation easements limiting development in a certain area. The benefits of this are that local government conserves open space inexpensively and the local landholder reduces tax liability through severance of development rights. Financial incentives are at the heart of this method of preserving environmental quality and therefore application to conservation in Australia would probably depend on similar incentives (Bates 1992).

In Australia, agreements concerning land generally take the form of statutory covenants which restrict what a person may or may not do on the land in possession. Covenants may restrict development on the land and can only be enforced by and against future possessors of that land. They cannot affect parties who do not claim any proprietary interest (Bates 1992). Covenants have been a useful tool which enable various trusts (such as the National Trust) and State government departments (including those concerned with wildlife and heritage protection) to enter into agreements with private landholders to protect specific wildlife habitats and ecosystems. Covenants are attached to the land title and therefore bind future successive owners of the land, restricting use inconsistent with the purposes for which the covenant was taken. Heritage agreements entered into under legislation, operate in a similar manner to covenants (Bates 1992). Unlike common law restrictive covenants the heritage agreement (also called conservation agreements) may contain either positive or negative obligations. For instance, most agreements will prohibit subdivision of the land subject to the agreement and all will require the landholder to manage the area having regard to the particular values of the land (Wells *et al* 1995).

The Victorian Conservation Trust has advised that covenants can take from 1 to 5 years to be put on the property from the time the covenantor first approaches the Trust. The Trust aims to visit each covenanted property once every 3 years. When a property is covenanted the Trust seeks a once-off donation of about \$3,000 per property for the "stewardship fund" which aims to provide ongoing management support for the covenanted properties. The Trust currently has 15 properties waiting to be included as reserves under the Department of Conservation and Natural Resources system and has current assets of \$3-4 million.

Covenants are problematic because, although they provide long term security for nature conservation, landholders need to be very committed and even when they are, problems can occur if land use changes around them. Because of the scarce resources available for covenants and conservation agreement programs, sometimes only those properties with high conservation values are considered. In Queensland, for example, conservation agreements are a compulsory instrument which are only entered into for areas with high significance for nature conservation because of the costs associated with implementing them.

This means that landholders without significant remnants on their properties but who would like what is left to be retained for future generations are not able to enter into agreements. This problem is likely to be compounded if the scarce resources available are used for ongoing management of existing agreements, through the provision of monies for weed and pest control or maintenance, which has been identified as a significant need of landholders in protection of habitats on private land.

It is not enough to fence off the area and leave it to look after itself - the protection of remnant vegetation on private land requires significant effort on behalf of the landholder, in both time and

money, to manage it so that its ecological character is not degraded through non-management. Therefore, covenants and conservation agreements should be seen as a long term measure, with a long term commitment to resourcing in order that remnants are protected, rather than a catalytic measure which will get the community and individual landholders involved in nature conservation.

Remediation

Under what circumstances should community resources be devoted to the rehabilitation of land and other natural resources that have already been degraded? Under what conditions should attempts be made to recover lost biodiversity? How can the need for action be evaluated, and who should be responsible for this activity?

Anomalies in the current system of land management allow individuals to cause or contribute to land degradation and biodiversity loss for which society as a whole must pay, very often generations after the damage was caused. Two clear examples include the introduction of exotic weeds, and erosion caused by overgrazing. In both cases, there are many areas where rehabilitation of the land is economically impossible, and perhaps not even technically feasible.

Nevertheless, the difficulties should not preclude efforts at remediation. The problem to both the grazing industry and environment conservation posed by the rabbit are a case in point, and the recent release of Rabbit Calicivirus Disease one more step in control of damage.

Much of the land degradation in Australia has occurred without knowledge of the long-term effects of these practices. The Australian public has benefited as a whole from these practices through low prices for produce and natural resources. It is therefore appropriate that community resources are used for rehabilitation of land and other resources. However, this should be done in partnership with landholders who also may have benefitted and who need to contribute to the solution. The Murray Darling Basin Commission has funded work which looks at the issue of cost sharing for on-ground works (discussed later in submission).

There are some cases where ex-situ conservation has been necessary and practical, and reintroductions of endangered species have occurred. While costly, these are seen as important adjuncts to in-situ conservation, (which must be seen as the primary aim of environment conservation activities). The success of reintroductions cannot be readily quantified.

The question of under what conditions should attempts be made to recover lost biodiversity is a difficult one. There are some in the community who would argue that attempts should be made to recover all biodiversity whatever the cost. There are of course others who would argue that any attempts are not worth funding and that society should spend public money on more worthy causes. A more pragmatic approach to this question might be to use a system of triage, leave those species which are considered beyond help and those whose condition is not at present under threat. In this situation, those which can be helped within the current level of resources should be given priority. This argument suggests a strategy for prioritisation within any level of resourcing. The concept of triage also depends upon constant re-evaluation of the relative merits of action within current proposals.

The need for action and responsibility for evaluation is dependent upon the scale that is being considered. For example, at the national scale the Commonwealth Government assumes responsibility, through a range of mechanisms including Ministerial Advisory Councils. In contrast, at the property level the land holder is responsible for making land management decisions on a daily basis. In this instance advice and guidelines which can aid the land holder in their decisions are extremely important. At local government, catchment, regional and State scales

decision making occurs either through elected officials, through expert community councils or by technical experts within government departments. All of these mechanisms have some validity, an approach which integrates all these approaches is more likely to have wide support and to be effective.

Uncertainty and irreversibility

How should uncertainty be taken into account in land management decisions when there is a chance of irreversible effects? Is some 'serious' damage acceptable if it is reversible? Is some irreversible damage acceptable if it is not 'serious'?

Uncertainty will always be a factor in land management decisions. Where there is a chance of serious or irreversible environmental damage, the precautionary principle should be invoked, consistent with the IGAE and other national policy statements including the National ESD and Biodiversity Strategies.

Some serious damage might be acceptable if it were fully reversible, but most such damage cannot be shown to be reversible, and much can be considered irreversible. Reversibility might be contingent upon unrealistic assumptions (eg no further disturbance); the time scale may be too long (some ecosystems take thousands of years to develop, and many other systems require hundreds of years to recover from serious disturbance).

Serious damage must also be viewed in the context of proportion (if a major proportion of a habitat or ecosystem is to be subjected to serious disturbance, this would be untenable, whereas a minor proportion might be acceptable), and the current fragmentation of ecosystems. Where many smaller fragments of an ecosystem survive, their ecological integrity will often have been compromised by edge effects, and they will consequently be more fragile than ecosystems where larger areas are relatively intact. It must be remembered when assessing damage and potential damage to habitats and ecosystems that much damage is incremental, and must be viewed in a broad context of a healthy ecosystem that is stable in the long term.

Valuing the future

To what extent do differences in valuing the future contribute to unsustainable land management practices. In what circumstances would differences in valuing the future warrant government involvement? If so, what would be the nature of that involvement, and how would such involvement be evaluated

It would appear that while lack of understanding of consequences has to a large extent been responsible for unsustainable land management practices (given the long lead time for consequences to become apparent), there are still some significant differences in the valuation of the future. Farmers may be looking for profitability over the next 5-10-20 years or may be looking at longer term viability in order to hand over the farm to their children and grandchildren. Farm business enterprises may be looking at short-term markets and profits. Many individuals, and perhaps some community sectors, appear to have less regard for the future than others, and among many industry sectors, 25 year forward planning is considered far-sighted. That this is insufficient for achieving ecologically sustainable land management is indisputable. Most environmental/natural resource outcomes are over long time-frames, for example, resource degradation has occurred over decades, and will take decades to reverse, if this is actually possible. For some land degradation problems such as extreme salinity in the Murray-Darling Basin or desertification reversal may be impossible. In these situations alternative industries, preferably based on native species could provide an alternative.

It could thus be argued that financial and economic forces are significant driving factors in unsustainable practices. Without lead from Government, this is unlikely to change: many land managers feel that they are compelled to continue with practices which they know are unsustainable because they have immediate financial commitments to meet.

While the policies of the Commonwealth and all State and Territory Governments have accepted the principles of intra- and inter-generational equity, individuals and institutions have often not.

Government involvement

Government involvement is required at all levels to ensure biodiversity considerations are taken into account in management decisions.

Mechanisms could include

- regional planning with input by all stakeholders, and effective back-up community education;
- influence of environmental interests on State and local government policies;
- environmental agencies contributing to development of priorities for Natural Heritage Trust funding;
- representation on Regional Assessment Panels and State Assessment Panels for Natural Heritage Trust grants;
- legislation and regulations limiting use;
- reservation of land in protected areas; and/or
- development of long term management plans.

How should inter-generational equity be measured and how should it be related to land management? What does this imply for the mix of assets, including environmental assets, to be passed on to future generations? What consideration should be given to the role of technological change in reducing scarcity and enhancing the productivity of resources?

Intergenerational equity cannot be measured by economic methods alone. The concept implies a longer time scale than is generally applied in current economic techniques (ie longer than 25 years). One clear measure could be the degree to which current biodiversity levels are maintained, accepting that in many cases, habitat retention is the most realistic way of achieving this.

Other measures of inter-generational equity include:

- extent and quality of natural resources over time;
- options available for use of resources; and
- continued productivity of agricultural land.

Full valuation of assets to measure intergenerational equity must also include potential, and this cannot be measured, but can be estimated for significance. As most of Australia's biodiversity is unknown (notably fungi, and invertebrates other than insects), its potential in economic terms alone is also unknown, but is likely to be high. Trading this for known limited short term benefits may be unwise, and inconsistent with the principle of intergenerational equity.

As values are subjective, measurement cannot be fully objective, and economic surrogates are of debatable use.

Role of technological change

In situ and *ex situ* conservation are two foci of conservation effort. *In situ* conservation refers to the management of natural resources on site. *Ex situ* or off site conservation includes the storage of seed in seedbanks and herbaria, storage of germplasm, zoos and botanic gardens and seed orchards. In both types of conservation technological change is important. In *ex situ* conservation, technology provides techniques for management of natural resources in alien and human designed systems such as zoos and botanic gardens. Technology is also providing information on techniques for regeneration of native species which has sometimes proved difficult in the past. For example, a project funded under the joint EA/LWRRDC Remnant Vegetation R&D program is looking at smoke stimulated germination technology which uses food smoking chemicals as a low cost - no risk alternative to prescribed burning as a regeneration tool.

The role of technological change in reducing scarcity and enhancing productivity of resources should be recognised. In addition, while economic modelling may incorporate the benefits of future technology, there appears to be little account taken of the costs of this technology. If, for example, increased reliance is placed upon genetically engineered crops and domestic animals, there is an increased risk of both loss of genetic variability, and of damage to ecosystems and human health from these technologies.

A major constraint to the development and adoption of new technologies to assist land holders in the conservation of biodiversity and ESLM is a level of funding for research and research dissemination.

The adverse impact of regulation, taxation and assistance

The Commission is interested in receiving information on the regulation of land management (both freehold and leasehold) the impact of that regulation on ESLM, and any potential improvements.

Legislation relating to nature conservation on private land varies from state to state but generally relates to five major areas - land clearing and land degradation, heritage agreements, nature conservation, planning controls and Crown Land leases.

South Australia, Western Australia, Victoria and New South Wales are the States which have, at present, comprehensive legislation relating to broad scale clearing. Western Australia has extended controls on clearing from the consideration of land degradation potential to include impacts on nature conservation, with specific restrictions applying where less than 20% remnant vegetation occurs. The financial cost to the South Australian government of its scheme has been approximately \$75m over a ten year period, and the offsetting value of benefits (eg reduced land degradation, reduced impact on biodiversity) have not been included in arriving at this costing.

The area of taxation has been reviewed by the Australian Bureau of Agriculture and Resource Economics (ABARE) in relation to the provisions of Sections 75b and 75d of the *Income Tax Assessment Act 1936*.

Perverse incentives to biodiversity conservation have also been identified in Young et al (1996).

The Commission is also interested in the impact of other government measures on ESLM, particularly the extent to which assistance for the rural sector may encourage or 'underwrite' unsustainable land management practices. What changes are warranted?

The Commission should be aware of submissions to the review of the Rural Adjustment Scheme.

The following are further examples of the impact of past government policies.

- Subdivision into small, uneconomic properties through for example soldier settlement schemes, has resulted in intensive use of areas, beyond the capacity of the environment to support it. Adverse effects are particularly evident during droughts.
- Land clearing controls in South Australia have been effective in regulating clearing, but at financial costs.
- Proposals for limiting clearing on leasehold land in Queensland have not yet been implemented.
- The establishment of bores in arid areas has increased grazing pressure on native grasses, and resulted in damage to these fragile environments.
- The development of dams, irrigation and other infrastructure has had significant impacts on riverine environments (changing flows, flooding etc.) and on groundwater levels and salinity.
- Past drought assistance may have contributed to support for unsustainable management practices.

The Drought Landcare Program

The Drought Landcare Program in 1995/96 and 1996/97 heralded a new era of assistance to drought. Rather than providing handouts, the Drought Landcare Program provided funds for works which would better prepare landholders for future drought. The Drought Landcare Program provided cash flow to farms (through payments to rural people for work undertaken in eligible projects) and supported landcare works to prepare farms for future droughts; and provided assistance for stock piling fodder and establishing water storages. The approach, involving some commitment on behalf of the landholder in terms of labour and equipment, may be better than direct assistance to those in drought-declared areas. An evaluation of the Drought Landcare Program is currently being undertaken by the Department of Primary Industries and Energy. Evaluation of the environmental elements of the Drought Landcare Program is also pending.

Other factors contributing to unsustainable land management practices

Primary production technologies to date could be perceived as having taken inadequate account of the peculiarities of Australian ecosystems and environmental parameters. For much of Australia, including large parts of the rangelands, rainfall is unreliable, soils are thin and poor, relative to much of the northern hemisphere, and fire is a major element in the landscape. The biota have adapted to these factors, but many of the plants and animals used in current agricultural practices are intolerant of them. In addition, harvesting methodologies are often inconsistent with ESLM. The development of agricultural systems which can be integrated into the unique Australian environments has still to occur, and should receive a high priority.

5: RESPONSES TO THE PROBLEMS AND THE ROLE OF GOVERNMENT

State and Territory governments

The Commission is interested in receiving information on the policies, programs and instruments of State and Territory government relating to the broad scope of land management, such as their land tenure systems, their regulation of private land use and of the environment, and their management of Crown land.

Recently there has been a significant increase in off-reserve nature conservation effort by State/Territory agencies. The ANZECC Working Group on Nature Conservation on Private Land recently undertook a review of the various mechanisms which encourage nature conservation on private land. These mechanisms include covenants, management agreements, Land for Wildlife, and rate relief for areas set aside from agricultural production. A copy of this report is at Attachment G.

The Commission is also interested in receiving information on the institutions that have been developed to give effect to these policies and programs. In particular, the Commission is interested in the rationale, aims and objectives of institutions' policies and programs, and how they are targeted and evaluated. What impact do they have on ESLM practices? Can they be improved and, if so, how?

The National Landcare Program and now the Natural Heritage Trust have set up a regional infrastructure through which funding for ESLM can be delivered. In response to the need for developing and assessment of projects in a regional context, and in recognition of the value of local knowledge, many States have developed regional committees to address ESLM. These regional institutions include:

- Total Catchment Management Committees in New South Wales;
- Catchment and Land Protection Boards in Victoria;
- Integrated Catchment Management Committees; and
- Land Conservation District Committees in Western Australia.

Of programs considered to be extremely successful, such as the River Murray Corridor of Green and Victorian Land for Wildlife Scheme, the employment of regionally based on-ground facilitators has been seminal in the success of these programs. The facilitators provide advice to landholders on the necessary management of habitat and coordinate on-ground activity in regions. The graph in Attachment H dramatically shows the effect employment of facilitators had on uptake of the Land for Wildlife Program and the subsequent protection of habitat through the program.

The ANZECC Working Group on Nature Conservation on Private Land Report (Attachment G) sets out information relating to the various legislation, programs and policies within the States and Territories.

Are there any lessons in regulation or other government action, both positive and negative, that can be learnt from recent experience?

Information should be available from the South Australian government in its submission to the inquiry and at the public hearings on the lessons that can be learnt from the introduction and further development of legislation limiting vegetation clearing.

Local governments

The Commission seeks information on the nature and significance of urban encroachment for ESLM

Urban expansion is recognised as a direct threat to biodiversity in the national Biodiversity Strategy, but is also an indirect threat, in that it sometimes occurs on prime agricultural land, thus placing increased pressure to undertake productive activities on more marginal land. As urban expansion occurs primarily on the coast, many coastal ecosystems are disproportionately affected. The Commonwealth Coastal Policy (Living on the Coast) recognises that some 86% of Australia's population lives along the coast, with urban expansion in non-metropolitan areas particularly evident in the southeast, southwest WA and the far north of Queensland.

The Commission is interested in receiving information on the role that local governments play in land management, their experiences in the administration of land management regulations, and the nature and extent of the impact of land management practices on local government activities.

The National Biodiversity Strategy explicitly recognises the importance of local government in biodiversity conservation.

Local government can play an important role in biodiversity conservation through appropriate management of roadside reserves (often a valuable haven for rare and threatened plants and animals) and can encourage landholders to set aside native vegetation for conservation through providing rate relief (i.e. not charging productive land rates for such areas). Young et al (1996) identified incentives within the local government areas and *Opportunities for the use of incentives to conserve remnant vegetation*, the project currently being undertaken by CSIRO for EA and LWRDC, is investigating methods for further developing some of these.

By including local governments as partners in developing land management strategies, there is a greatly increased chance of having these strategies implemented. Local government is responsible for landuse planning at the local scale and can contribute to ESLM through zoning and planning. Local Government Local Greening are one tool which local governments can use to manage resources within their jurisdictions in a sustainable manner. Greening Australia has prepared a guide "Local Greening Plans: A Guide for Vegetation and Biodiversity Management" which can assist local governments in preparing such plans.

Local governments' ability to contribute to ESLM depends on:

- their rating base ("wealth" of the local government area);
- the skills and interest of councillors;
- the skills and interest of the community; and
- support from State and Commonwealth governments.

Commonwealth Government

The Commission seeks information from participants on the nature and extent of, rationale for and effectiveness of Commonwealth involvement in promoting ESLM.

The Commonwealth's major contribution to ESLM is through the development of policies and strategies and through the provision of financial assistance. With the adoption of relevant international and national policy instruments, including the Convention on Biodiversity, and the

National Strategies for ESD and Biodiversity in particular, the Commonwealth has a clear role in the promotion of ESLM.

In August 1996, the Commonwealth Government announced the establishment of the Natural Heritage Trust (NHT), which is to be the foundation for the conservation of biodiversity and the ecologically sustainable management of Australia's land and water resources. The NHT will provide a framework for strategic capital investment in the natural environment, achieve complementary environmental, natural resource management and sustainable agriculture outcomes consistent with agreed national strategies and will foster partnerships between the communities, industry and all levels of government.

The NHT comprises a number of programs, including the National Landcare Program (NLP), the National Vegetation Initiative, Murray-Darling 2001 and the National Rivercare Initiative, and these provide a broad platform for achieving ESLM. Prior to the NHT, the NLP was the primary Commonwealth program for achieving sustainable management of natural resources. The National Landcare Program is an umbrella program which includes the Community Grants components of the One Billion Trees and Save the Bush Programs which relate primarily to nature conservation.

In terms of effectiveness, to date, it cannot be stated that ESLM is widely practiced in Australia's agricultural lands. However, progress has been achieved, and communities are now far more aware of the necessity for ESLM. The Report on the Implementation of the National Strategy for ESD (Intergovernmental Committee for Ecologically Sustainable Development, 1996) points out that progress has been made in integrating government policies and programs, and in fostering community based approaches. The development of catchment/(bio)regional approaches, as are being used in implementation of the NHT, are significant steps forward.

There have been numerous reviews of the Commonwealth's vegetation programs which have included the Save the Bush, One Billion Trees, and the River Murray Corridor of Green. These programs had small funding levels, were designed to be catalytic and were effective in mobilising the community in vegetation efforts. The on-ground effectiveness of these programs is difficult to determine in the short term as the benefit of these works may take a number of years to be fully realised.

To what extent do the various domestic and international agreements, strategies, treaties, conventions etc., constrain or enhance the achievement of the ecologically sustainable management of agricultural land and its associated natural resources.

The international "Convention on Biological Diversity" (CBD) recognises the importance of ecologically sustainable agriculture through its objective to conserve biological diversity and the sustainable use of its components.

Article 6 of the Convention requires countries to "integrate as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies." Article 8 stresses the importance of in-situ conservation, and 8(c) stipulates that Contracting Parties should "Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use".

The Convention further states that conditions need to be created to ensure the compatibility between present uses and the conservation of biological diversity and the sustainable use of its components. Specific measures are delineated in Article 10, while Article 11 stresses the importance of incentives for the conservation and sustainable use of biodiversity.

The Convention encourages sustainable use through research, education and training and the introduction of new technologies. Consequently the Convention is consistent with the principles of Ecologically Sustainable Land Management.

The National Biodiversity Strategy was developed as the primary method for implementation of Australia's obligations under the Convention on Biological Diversity.

The National Biodiversity Strategy recognises the need for conservation of biodiversity on private land given that the threats to biodiversity extend across administrative and tenure boundaries. The Strategy notes the need for increasing the standards of management and protection and the levels of financial and technical assistance. The strategy highlights the need for adequate, efficient and cost effective incentives to conserve biological diversity. Priority areas for action under the Strategy include those important for:

- migratory species;
- threatened indigenous species;
- remnant vegetation;
- wetlands; and
- corridors between protected areas.

The Strategy recognises the need to establish voluntary wildlife refuges and to negotiate conservation covenants and heritage agreements between owners, managers and governments, noting that sufficient resources, including trained facilitators, need to be provided on a regional basis to assist in the implementation scheme.

NWQMS Water Quality Monitoring And Reporting Guidelines

With respect to appropriate instruments and institutions the National Water Quality Management Strategy (NWQMS) was introduced in 1992 as a response to growing community concern about the condition of the nation's water bodies and the need to manage them in an environmentally sustainable manner.

The main policy objective of the Strategy comes from ESD principles, namely: *to achieve sustainable use of the nation's water resources by protecting and enhancing their quality while maintaining economic and social development.*

It applies to all water systems, namely drinking, fresh (surface and ground), estuarine and marine waters.

The Strategy envisages that both regulatory and market based approaches will be used in developing water quality management plans. Regulation may include licensing the quantity and quality of effluent that may be discharged. Market based measures seek to influence behaviour by having differential costs which depend on the quantity and the quality of the discharge.

To this end a series of national Guidelines are being produced which will set a framework for a nationally consistent approach to the management and protection of the nation's water resources.

At the same time guidelines for the implementation of the Strategy have been developed based on the total catchment management concept.

A list of the NWQMS documents, and their current status is at Attachment I. They address issues relevant to ecologically sustainable land management, as it relates to ground and surface water, including rivers, riversides and wetlands, such as effluent management for agriculture industries - wineries, intensive piggeries, tanning, wool scouring, dairy sheds and dairy processing plants - groundwater management, water quality monitoring and reporting, and water quality guidelines for fresh and marine waters.

Community views will form a crucial part of the Strategy, the community being involved during both the development and the implementation of the Strategy, which is envisaged will occur at State level.

It is expected that State Environmental and Resource Management agencies, when developing water quality policies, will base these policies on the NWQMS, and where appropriate adopt the relevant NWQMS document in full, or with modification to take account of local conditions.

For example the NWQMS Australian Water Quality Guidelines for Fresh and Marine Waters, 1992, have been successful in establishing a framework for establishing acceptable levels for physico-chemical parameters, toxicants etc for a particular water resource. With the revision of these guidelines now underway it is expected that a risk based approach to establishing acceptable levels for toxicants etc will be used. The revised guidelines are also expected to focus on the desired outcome that is trying to be achieved by setting a particular value for say toxicants, rather than setting a value for its own sake.

There continues to be a role therefore for national guidelines for water quality which allow for flexibility in their implementation by individual jurisdictions, to take into account site specific factors for the particular water resource under consideration.

With respect to which environmental attributes are most relevant to the ecologically sustainable management of agricultural land, maintenance of water quality is an essential attribute, and one approach to this is the development of the NWQMS, as described above.

It is noted that undervaluing of the economic cost of supply of water to rural constituencies has led to unsustainable water management practices. The COAG Water Reform Framework is addressing this issue.

As has been mentioned, there is a raft of other national and Commonwealth strategies and agreements which are either largely driven by the CBD, or are consistent with it. These include:

- the National Strategy for Ecologically Sustainable Development - this encourages the voluntary protection of native vegetation remnants. Under this Strategy, the Commonwealth and State/Territory governments have agreed to encourage voluntary management of native vegetation remnants and to undertake cooperative development of a range of measures to better protect native vegetation on private land; and
- the Intergovernmental Agreement on the Environment (Governments of Australia 1992) (IGAE) also notes the need for protection of species and habitats outside of reserves land use programs and cooperative arrangements.

Others are, the National Forest Policy Statement, the National Weeds Strategy, National Feral Animal Control Strategy, and the Commonwealth Coastal Policy.

The development of the draft National Strategy for Rangeland Management is also of relevance and significance.

A more complete list of international instruments is attached (Attachment J).

Where international treaties have led to the development of National Strategies, these have provided an agreed framework for action across the States and Commonwealth commitment and implementation has been variable.

Intergovernmental agreements and organisations

The Commission is interested in receiving information on the role and effectiveness of intergovernmental institutions. What problems do they face? How can their effectiveness be improved?

The Australian and New Zealand Environment and Conservation Council (ANZECC)

ANZECC consists of Australian Federal, State/Territory and New Zealand Ministers responsible for environment protection and conservation policy. It provides a valuable forum for member governments to exchange information and experience, and develop coordinated policies in relation to national and international environment and conservation issues. ANZECC is supported by two standing committees, comprising heads of relevant government agencies: the Standing Committee on Conservation and the Standing Committee on Environment Protection. ANZECC and its Standing Committees are significant elements of Government processes for achieving environmental outcomes. It works in conjunction with other Ministerial Councils.

A Working Group on Nature Conservation on Private Land, which reports to the Standing Committee on Conservation, is of particular relevance to ecologically sustainable land management. This Working Group has examined financial incentives and best practice measures to encourage conservation of biological diversity on private land, and has achieved a degree of cooperation, coordination and information-sharing between State and Commonwealth agencies.

The Biological Diversity Advisory Council reports to ANZECC on implementation of the National Biodiversity Strategy.

The Intergovernmental Committee for Ecologically Sustainable Development (ICESD)

The Intergovernmental Committee for Ecologically Sustainable Development (ICESD) is a committee of senior officials from the Commonwealth, State and Local Governments which reports to the Council of Australian Governments. It oversees the implementation of the National Strategy for Ecologically Sustainable Development (NSES) and the National Greenhouse Response Strategy, and provides a forum for consultation between governments on the Intergovernmental Agreement on the Environment (IGAE) and a forum for processes on international environment agreements, and action of relevant Ministerial Councils and individual jurisdictions relevant to environmental and resource issues which are whole of government in nature.

As well as being the only committee which has its basis in integrated decision making at the whole of government level, an advantage of ICESD over some ministerial councils is that local government is a member.

Further more detailed information on the role of ICESD can be provided by the Commonwealth Department of the Prime Minister and Cabinet which chairs this Committee.

Murray-Darling Basin Ministerial Council

Cooperative arrangements between Commonwealth and States have made significant progress in moving towards more sustainable practices in the Murray-Darling Basin eg tradeable water rights and salinity credits, cross-border projects.

Intergovernmental Agreement on the Environment (IGAE)

The IGAE (Governments of Australia 1992) sets out the roles of the Commonwealth, State, Territory and local governments and establishes the ground rules under which the parties will interact on the environment. It includes a broad set of principles to guide the development of environmental policies, and a series of schedules which sets out cooperative arrangements on a wide range of specific issues.

An underlying premise of the Agreement is that “it is vital to develop and continue land use programs and cooperative arrangements to achieve sustainable land use and to conserve and improve Australia’s biota, and soil and water resources which are basic to the maintenance of essential ecological processes and the production of food, fibre and shelter;...”.

As a guiding principle, the signatories agree that “the adoption of sound environmental practices and procedures, as a basis for ecologically sustainable development, will benefit both the Australian people and the environment, and the international community and environment...”.

In Schedule 2 the parties agree that it is the role of government “to establish the policy, legislative and administrative framework to determine the permissibility of any land use, resource use or development proposal having regard to the appropriate, efficient and ecologically sustainable use of natural resources (including land, coastal and marine resources).”

The IGAE was reviewed in 1995 - no textual changes to the Agreement were recommended.

The Agreement provides a framework within which particular arrangements are negotiated, for example the Partnership Agreements between the Commonwealth and the States for delivery of Natural Heritage Trust funding.

Partnership Agreements for Natural Heritage Trust

These Agreements are being negotiated between the Commonwealth and each of the States and Territories throughout the first half of 1997. The Partnership Agreements will be based around a nationally consistent set of accountability and administrative arrangements together with agreed attachments for each State and Territory. The attachments will guide partnership investment in environment, sustainable agriculture and natural resource management, and include details of how programs and activities will be evaluated.

The National Environment Protection Council (NEPC)

NEPC is a Ministerial Council with the power to establish, for participating state and territory and the Commonwealth governments, national environment protection measures (NEPMs) such as standards, guidelines, goals and protocols for, among other things, ambient water quality. Monitoring will be important for developing and evaluating the effectiveness of NEPMs.

Community Groups

What roles should be assigned to community groups? On what basis should they receive funding? What transparency and accountability issues need to be addressed? How should their performance be assessed?

Community groups have a key role to play in achieving ecologically sustainable land management. The National Strategy for the Conservation of Australia's Biological Diversity seeks:

“increasing community involvement in research and management activities related to protected areas and vegetation remnants and in biological diversity programs, particularly those involving survey, revegetation and rehabilitation”

Their value lies in the following areas:

Local knowledge: Where community groups operate at a local level, the local knowledge of members may give the group a great advantage in effectively targeting, implementing and monitoring sustainable land management activities.

Access to private land: Many elements of Australia's biological diversity are found largely on private land. Management of this land is primarily up to the landowner, but the involvement of farmers and other landholders in community conservation groups such as Landcare can help to facilitate sustainable management. Such groups recognise that the effects of management do not stop at the edge of the property, and they can facilitate action across property boundaries, as well as on public land.

Cost effectiveness: Community groups can be very cost effective, because their members are often self motivated to achieve outcomes of benefit to their own properties, environment and community. Work may be completed by voluntary labour, largely without external funding, and where funding is provided for coordination, materials, or education and extension, much may be achieved for a relatively small cost to the funding agency.

Further, by contributing money, a government may have effective leverage to see voluntary community activities targeted to achieve government objectives. Targeted funding of community groups for land management activities can extend and complement both land management activities undertaken by state and local governments, and management of private land by individual landowners. There is general benefit in involving the community in this way in that the fact of involvement itself inculcates a philosophy of involvement in the community, and is recognised as integral to the success of biodiversity conservation.

Roles

Specifically the community plays a number of roles in achievement of ecologically sustainable land management, including:

- undertaking on ground action, eg targeted activities aimed at protection of specific species and habitats. This could involve invasive species control, fencing, and track construction. Examples of successful groups of this type include the Australian Trust for Conservation Volunteers, and action groups established under the National Threatened Species Network;
- networking, which encompasses sharing information, skills, management techniques etc;
- planning;
- developing technical expertise;
- monitoring;
- organising group action;
- seeking funding support; and
- promoting Commonwealth and State programs.

Funding

Important factors which need to be considered in determining funding for community group projects include:

- transparency of assessment and allocation processes;
- adequacy of documentation of proposals;
- group's ability to achieve specific objectives;
- appropriate assessment and prioritisation of projects;
- objective setting, monitoring and evaluation of projects, including milestones and reporting; and
- financial accountability.

Transparency/Accountability/Performance

The vast majority of community projects administered by Environment Australia relating to ecologically sustainable land management will be projects under the NHT. Projects under the NHT will be selected through agreed processes in each State, generally involving assessment by a Technical Review Panel (for large projects), a Regional Assessment Panel, a State Assessment Panel, and the Commonwealth, which will provide advice on eligibility. Final approval of projects rests with the Natural Heritage Trust Board (the Commonwealth Ministers for Environment and Primary Industries). Assessment will be based on project documentation from proponents, and will be on the basis of eligibility criteria, which are likely to include:

- features of the proponent group - eg incorporated, competent to perform the work;
- level of relevant community support;
- level of public benefit;
- appropriate goals and objectives (which are in accord with Commonwealth and State objectives and priorities);
- includes measurable outcomes/performance indicators and evaluation methods;
- technical feasibility;
- costings and cost-sharing arrangements; and
- project activities - deals with causes not symptoms, contributes to long-term regional catchment/regional/landscape goals, includes commitment to on-going management.

Performance will be assessed against program/project outcomes and will:

- include analysis of what was achieved for the funds spent;
- be based on agreed outcomes, performance indicators and time-frames (including milestones); and
- include reports on achievement of outcomes assessed by State and Commonwealth.

In addition, a random selection of projects are intended to be assessed, on-ground, by a team of relevant stakeholders.

Appropriate Instruments and Institutions

*What is the role for direct regulation of land management practices to meet ESLM objectives?
What can be done to ensure that such regulation is cost-effective, well targeted and well managed?
Could the adoption of statutory 'duties of care' and codes of practice help to promote more cost effective environmental protection?*

Direct Regulation

Direct regulation should be used where other (incentive) measures have failed for example, to control indiscriminate clearing. Direct regulation can also however be used fruitfully in conjunction with other incentive measures. The ANZECC Working Group on Nature Conservation on Private Land Report (Attachment G) sets out information relating to the various legislation, programs and policies within the States and Territories.

The issue of regulation of land management practices is also covered in Young et al (1996).

Any legislation to limit vegetation clearance, for example, would need to have all proposals to clear submitted, assessed against specific agreed and public criteria, decisions made, and penalties applied for clearing without permission.

Codes of practice are a useful tool in ESLM. They are most appropriate for industries with broad support within their agricultural community. For example, a code of practice for a particular industry sector would be developed by agricultural/pastoral industry associations and agreed by member farmers. Codes of practice are particularly valuable if we are trying to promote a clean, green image for our industries and products.

Industries which have or could adopt codes of practice include the mining industry in relation to environmental protection, the timber industry, and any of the horticultural, pastoral or agricultural industries (eg sugar , dairying, grain, cotton or rice industries). Codes of practice are useful as they are implemented through peer pressure rather than government regulation. Organisations such as Landcare Australia Limited can play a valuable role in linking business and government.

Economic instruments

The Commission is interested in participant's views about the performance of economic instruments currently being used and trialed, and any lessons that can be drawn. What are their relative advantages and disadvantages? What ESLM problems are amenable to the use of economic instruments? What impediments are there to the extension of the use of economic instruments to address these problems? How should any such economic instruments be specified? What do governments need to do to ensure that they operate effectively?

The usefulness of economic instruments for the protection of biodiversity and ecological processes, one of the aims of ESD, varies for the following reasons:

- the economic value of biodiversity is largely unknown and therefore difficult to quantify;
- the use of some economic instruments, such as charges, will not necessarily reduce the undesirable outcomes of biodiversity loss where the end products are sufficiently profitable eg woodchips, cotton;
- tradeable credits are only likely to work where the resource is scarce and someone defines a limit which may not be exceeded. eg recreational fishing, beyond commercial quotas, can have a severe impact on some fisheries;
- the use of tradeable credits may actually encourage unacceptable practices at a regional and subregional level;
- there are often no markets for the environmental values being offered as a trade;
- targeting of incentives to particular geographic areas or policy objectives can be difficult when general instruments such as taxation are used;
- rate rebates are more acceptable where there is a sufficiently large rating base, where foregone income from rebates is only a small proportion of total revenue;

- environmental taxes and levies are more effective and may be acceptable to the community if they are quarantined for environmental activities rather than going to General Revenue, although hypothecation does severely restrict fiscal flexibility;
- determining suitable levels and prices would be difficult in the establishment of resource pricing and tradeable rights for public goods.

In terms of the land management areas identified in the Issues paper, the following comments are provided.

Land clearing

In any analysis of options to limit land clearing the question of equity needs to be considered. For example, an inequitable situation can arise where some landholders have already cleared and others have not. While the retention of vegetation has some benefit to the property owner, a significant part relates to other properties within the catchment, representing a public benefit. Equity issues also arise between small family landholders and large agribusiness enterprises, with their differing access to capital and expertise.

ESLM is dependent on maintenance of both biodiversity and ecological function. Simple prescriptions of percentage cover which should be retained will in general be inappropriate. To a large extent, it could be argued that which areas retain their indigenous vegetative cover is more important than what percentage. Determinations of which areas should maintain their vegetative cover will need to be made on the bases of biodiversity and ecological function data, at a regional level using quality criteria.

Even if a particular percentage of cover was adopted as the minimum necessary for ESLM, there is a need to determine the basis of this and whether this level is the minimum at the property, catchment or region levels or at all levels. The minimum cover to achieve ESLM is dependent on the type of the environment, the extent of past clearing and the extent of the land degradation problems.

Another complicating factor to implementation of regulation of land clearing is the question of how to treat secondary growth that is the result of previous permission to clear. This raises the question of whether permission to clear is given for perpetuity or for a once off occasion.

Water table management

The impact of vegetation on hydrological cycles is difficult to quantify, however it can generally be considered to be beneficial. Management of vegetation resources needs to be on a catchment basis if hydrological cycles are to reach equilibrium. For example, areas of recharge are often high in the catchment, while areas of discharge occur lower in the catchment. In at least some cases, such as the wheatbelt of WA, the impact of revegetation measures on hydrology is extremely localised, and needs to be determined at the farm level.

Taxes or subsidies to encourage vegetation retention or establishment also provide benefit to management of the water table, but there would be more strategic and achieve more effective outcomes if action were more targeted, perhaps through instruments such as grants and management agreements.

Economic Exploitation

See Departmental submission to the Senate Inquiry into Sustainable Use of Wildlife (Attachment K)

Carbon Sequestration

As well as addressing a range of land degradation problems and contributing to the retention of biodiversity, native vegetation also has significant benefits through the sequestration of carbon dioxide. A carbon offsets system could be introduced which could offer industry a carbon credit to offset their emissions in return for provision of funding for revegetation. There is a need to consider the long-term greenhouse benefits. For example if harvested, the benefit would decrease, quite apart from the biodiversity losses which might arise from harvesting. In addition, infrastructure needs to be developed to support large scale plantations and there needs to be suitable land and to be located near markets. Before large scale plantations can be established the necessary resources such as seeds and nursery stock need to be identified as the timing of planting is often crucial. To optimise the benefits, vegetation projects focusing on carbon sequestration should include biodiversity conservation as one of their primary aims.

Other Issues

The ANZECC Working Group on Nature Conservation on Private Land identified a need for a range of mechanisms to conserve nature on private land because different landholders have different circumstances, including financial situations, purposes for which they use their land, management problems according to the area they are in and plans for the future of their properties. As there are a range of landholders with different problems and situations it is unlikely that any one program will have all the answers and a mechanism that works well in one area will not necessarily work well in others. The Working Group needs to develop strategies for increasing landholder participation in nature conservation on private land. Long term agreements with landholders need large commitments of funds from government to service the agreements. In addition the emphasis needs to shift from providing compensation to rewarding farmers and other landholders for good management. Mechanisms should be judged by their effectiveness; efficiency; social acceptability; the ease of monitoring; and their cost.

In summary a package of mechanisms could include:

- education services;
- extension components to provide technical assistance;
- an assistance component, to provide, for example, stewardship fees or funds for fencing; and
- a process for monitoring and evaluation.

The ANZECC Working Group on Nature Conservation on Private Land has identified the following impediments to undertaking conservation measures on private land, based on consultation with landholders to include:

- the high cost of fencing remnants;
- the difficulty in getting funds for works if not part of a community group;
- the lack of relief from rating for land which is not used for production and for land dedicated to conservation;
- the potential for decreased property values if land is covenanted;
- that donations of property are not tax deductible for properties other than those on the Register of the National Estate and within twelve months of purchase;
- that landholders need to get something back from undertaking nature conservation, for example some type of reward;
- the ethos of Landcare is focussed mostly on sustainable use of resources rather than nature conservation and as a result some landcare groups are hostile to nature conservation; and
- there are very few facilitators working with landcare groups on nature conservation.

The ANZECC Working Group on Nature Conservation on Private Land has identified some of the direct costs to landholders of undertaking conservation works on private land. These costs are generally related to fencing, weed and feral animal controls and other maintenance activities. Indirect costs relate to the loss of production from not using the remnant vegetation, productivity decreases from increased competition from native species and no relief from rating for land taken out of production. The benefits to landholders are varied but can include increased productivity through natural control of insect pests, shelter for crops and stock and increased productivity of land through mitigation of land degradation problems. It should be noted that there is some ambiguity about costs and benefits. For example some landholders see remnant vegetation as a cost because land is not available for production while others see it as a benefit because remnants can mitigate problems such as soil erosion and salinity. Similarly, some landholders see remnants harbouring wildlife, such as cockatoos, as a cost, whereas remnants harbouring, for example insectivorous birds are seen as a benefit. Some case studies have been undertaken and further research possibilities for this area are currently being investigated.

Costs to government agencies in promoting nature conservation on private land relate to the provision of infrastructure and resources to support management planning, technical advice, provision of information packages and provision of networks through extension officers and education material such as newsletters. Costs could also relate to the loss of revenue through provision of taxation and rate relief incentives and the more direct cost of support for landholder activities such as fencing and other on-ground management activities.

How specified

In determining what incentives should be used there is a need to determine who should be responsible (Commonwealth, State, local government), where measures would be applied (geographically) and who should pay (governments, beneficiaries, polluters etc.). The specification of adequate incentives is difficult and for any incentive to be effective consultation with stakeholders is of prime importance. Young et al (1996) lists the criteria by which incentives could be judged. A number of projects funded by the Environment Australia/LWRRDC remnant vegetation R&D Program are designed to operationalise particular incentives to achieve particular policy outcomes. These projects are reviewed in *National R&D Program on Rehabilitation, Management and Conservation of Remnant Vegetation: Occasional Paper 11/96*. To ensure that incentives operate effectively a good scientific basis is required for their operation, there needs to be cooperative action between governments and there needs to be an awareness of incentives within community.

Relevant references on the topic of economic instruments include:

- *Reimbursing the future: An evaluation of motivational, voluntary, price-based, property-right, and regulatory incentives for the conservation of biodiversity* (Young et al 1996).
- *Opportunities for the use of incentives to conserve remnant vegetation* (in progress CSIRO - Mike Young).
- *ABARE Landcare Taxation Review*.
- ANZECC Working Group Report *Nature Conservation on Private Land: Commonwealth, State and Territory Legislation and Programs: A report of the Working Group on Nature Conservation on Private Land prepared for the Australian and New Zealand Environment and Conservation Council, Standing Committee on Conservation. (Attachment G).*

Environmental Incentives - Australian Experience with Economic Instruments for Environmental Management. A report to Environment Australia, by Dr David James, Ecoservices Pty Ltd (unpublished).

Level of government

Are existing arrangements and institutions well structured to accommodate the spatial distribution of the various ESLM problems? If not, how could they be improved?

Local government is not necessarily responsible for a whole catchment or an area suitable for regional resource planning. Some States have introduced regional structures, such as the Victorian Catchment and Land Protection boards. With the advent of the Natural Heritage Trust, regional organisations such as, Voluntary Regional Organisations of Councils, will examine issues on a regional basis, develop plans and projects. Federal funding will be directed via the State agencies to regional organisations. Regional Assessment Panels and State Assessment Panels will be used to assess and prioritise projects on a regional and state basis. Technical Review Panels will be used to assure the environmental quality and technical merit of projects.

While past management of ESLM problems cannot be regarded as effective, current policies and programs, driven by the necessity to find urgent solutions, offer better opportunities for solutions. Many ESLM problems cover vast areas of Australia, and many problems occur in related although different ways in different regions (for example the salinity problems in the WA Wheatbelt and those of the Murray-Darling Basin have similar results, but slightly different sets of causes).

Commonwealth leadership, and the emergence of catchment/(bio)regional scale land management and planning are proving critical in addressing these large scale problems.

Paying for ESLM

Who should bear the cost of action to ensure ESLM? In what circumstances can the polluter pays principle be applied, and in what circumstances are other measures necessary? If there is cost-sharing, on what basis should this be done? What institutional structures would be necessary to ensure transparency and accountability?

There is considerable debate on the cost sharing principles governments should adopt. For a good recent discussion, see the conceptual framework section of *Opportunities for Expanding the Use of Management Agreements for the Conservation of Remnant Vegetation*, Binning and Young, draft report, May 1997. Which cost sharing principles are adopted will, of course, have a major impact on the rate of implementation of works to address land degradation and on government expenditure.

The Murray-Darling Basin Commission's 1996 report *Cost-Sharing for On-ground Works* (referred to earlier) advocates the use of the Beneficiary Pays principle (BP) where the Polluter Pays principle (PP) is not feasible so as to achieve greater implementation of on-ground works.

Important issues that governments must consider in developing cost sharing frameworks include:

- Frameworks should contain careful definitions of where and how the different cost sharing principles should be applied, and particularly what property rights 'baseline' should be used to determine/define social benefits/costs
 - there should not be too much reliance on the BP principle as all sectors of the community need to play a part in efforts at reversing land degradation
 - practical options for applying the PP principle, such as regulations and charges to fund works, should be fully explored
 - where governments decide to use the BP principle, they should only share costs in excess of the value of the private benefits that landholders will derive from the works

- if governments apply the BP principle on the basis that degradation has been caused by historical use or past government policy failure, then the BP principle should be applied only to works addressing *past* degradation while the PP principle is applied to works addressing *ongoing* degradation where feasible;
- Governments should make sure that any departures from a standard cost sharing approach be explicitly acknowledged and justified in each case to avoid setting precedents for use of the BP principle over the PP principle in other areas of the economy;
- Governments should share costs (or provide subsidies) only on certain conditions, including that government contributions not cover private benefits, that government contributions be directly applied to works, that the works be maintained, and that contributions only be short term if paid on the basis of a landholder's lack of financial resources;
- Frameworks should include how the benefits and costs to different parties for cost sharing are to be calculated
 - benefit-cost analysis is one method, but will not be cost effective for small projects
 - another method is the development of guidelines which set out fixed shares for the different parties (landholders, local government, State government, Commonwealth government, etc) for different kinds of on-ground works that are pre-agreed and applied to all similar projects;
- Frameworks should include how to keep cost sharing arrangements negotiated between parties (ie, dollar amounts) in line with the actual incidence of estimated benefits and costs.

6: OTHER ISSUES

In preparing their submissions, participants are asked to address, where possible, any adjustment issues and regional impacts which they see arising from any proposals they make.

Rangelands

The Commission should note the *Draft National Strategy for Rangeland Management*. Structural adjustment is required in the rangelands, particularly in “soldier settlement scheme” areas in the western division of New South Wales, south-west Queensland, the Eyre Peninsula in South Australia and in the Western Australia wheatbelt. In the rangelands there is a need for larger properties and diversification under lease conditions. Landholders need the ability to move stock between areas to manage climatic risks. Property rights for kangaroo harvesting could have a positive impact on ESLM in the rangelands.

The Commission seeks information and views on how this could be achieved?

Adjustment Issues and Regional Impacts

In order to achieve ecologically sustainable land management within the Australian environment, it may be necessary for land managers to cease production or radically change their products or management practices, where current practices are not sustainable in the long term. This could include areas such as:

- salinity prone areas of the Murray-Darling Basin and the Western Australian wheat belt;
- marginal rangeland or cropping areas;
- areas on urban fringes which are subject to urban spread or the proliferation of hobby farms; and
- production of commodities where the inputs required (in terms of water, fertilisers, pesticides etc) are not justified in relation to economic output.

Changes in products or management practices could be brought about through regulation (which may require associated compensation or adjustment arrangements) or through a range of financial or other incentives, which have been discussed earlier in this submission. The best mechanism to be used and the necessary adjustments can only be determined after a careful assessment of:

- the full costs and benefits of the current activity (including environmental costs);
- possible alternative products and management arrangements (including infrastructure, markets, information, skills etc);
- the socio-economic situation in the region;
- the range of regulatory and incentive mechanisms available; and
- the views, interests and responsibilities of the Commonwealth, State and local government and the community.

Impacts on some regional communities may be significant, and a range of types of assistance from the Commonwealth and State governments may be required.

Developing Guidelines to Promote Ecologically Sustainable Land Management

The Commission is unlikely to have the time or resources to develop detailed guidelines for ecologically sustainable land management. However, it may be able to provide a useful framework for such guidelines by developing a set of principles, based on strategies such as those for Ecologically Sustainable Development, Conservation of Biological Diversity and the Murray-

Darling Basin Natural Resources Management Strategy, as well as the outcomes of its inquiry. These principles would be valuable in the development of more detailed guidelines on a regional or industry sector basis.

Examples of such guidelines could include regional strategies for natural resource management, which are being developed by regional communities and State/local government, and which are required for Natural Heritage Trust funding for regional projects.

Another example could be the development of guidelines or codes of practice by agricultural/pastoral or agribusiness sectors. This could be undertaken by industry associations, with the guidelines to apply to their members, but with adoption by the broader farming community to be encouraged. Adoption of sustainable practices could be linked to labelling of food and fibre products, and promotion of such products to consumers. Issues to be addressed in these guidelines or codes of practice could include:

- property management planning;
- retention/planting of native vegetation;
- water use and management;
- chemical use and management; and
- promotion of use of native species.

Financial Viability of Agriculture

A crucial issue in addressing ecologically sustainable land management (ESLM), is the link between the long term ecological viability and long term financial viability of agricultural enterprises. An enterprise's financial viability depends on, among other things, its ecological sustainability. Both ecological and financial viability are necessary to maintain the natural and financial capital that supports ESLM.

These issues and declining financial performance were addressed in relation to the pastoral industry in ABARE's Final Situation Statement prepared for the National Strategy for Rangeland Management, entitled *Agriculture in the rangelands: a study of economic viability*, dated November 1995. The paper noted:

‘Declining terms of trade for agricultural producers, land degradation and increasing public concern for the rangelands habitat may all affect the economic viability of pastoral production and create the need for restructuring.’ abstract

‘For pastoral enterprises in the rangelands, sustaining economic returns has been made difficult by the declining terms of trade for agricultural and pastoral industries ... Over the decade to 1994-95, this has adversely affected the financial performance of the agricultural sector, despite continued improvements in farm productivity.’ p5

‘... economic returns from pastoral agriculture are tied to the underlying productivity of the resource base.’ p11

The ABARE paper makes a valuable contribution to the debate by its discussion and analysis of various issues of financial viability from a national perspective, given the limitations of the available data. However, the paper does not fully explore the link between land degradation and financial viability. The Productivity Commission may find an examination of the ABARE paper and its data useful.

Some pastoral enterprises are likely to be financially viable but not ecologically viable in the present, and they may face declining financial viability over the long term.

Other enterprises are neither financially nor ecologically viable. The consequences of non-viable enterprises continuing to operate are: further degradation and financial losses, further erosion of productive capacity and financial capital, and inevitable business failure. A range of policies and programs may be necessary to encourage enterprises to restructure or exit the industry.

Degradation occurs over time spans of many decades, and there can be localised or episodic declines. Also, there is important variability amongst properties, as economic viability and ecological viability may vary dramatically from one property to the next (depending on the history of management, etc). Therefore analysis of the long run viability of agricultural enterprises must include bio-physical as well as financial data, must use time series long enough to fully pick up any trends caused by bio-physical changes, and must include information on regional variability in financial, production and ecological variables.

ATTACHMENTS

Attachment A	List of References
Attachment B	<i>Biosphere Reserves in Australia: A strategy for the Future</i> ANCA 1993
Attachment C	<i>Calperum and the Bookmark Biosphere Reserve: A model for the Future</i> ANCA 1995
Attachment D	Classification of wildlife values
Attachment E	Methodology for assessing environmental attributes of forest regions
Attachment F	Scope of <i>Natural Resource Monitoring and Performance Standards</i> study
Attachment G	Report of ANZECC Working Group on Nature Conservation on Private Land <i>Nature Conservation on Private Land: Commonwealth, State and Territory Legislation and Programs</i>
Attachment H	Graph showing effect of employment of facilitators on uptake of Victorian Land for Wildlife program.
Attachment I	Documents of the National Water Quality Management Strategy
Attachment J	List of International Agreements
Attachment K	Departmental submission to the Senate Inquiry into Sustainable Use of Wildlife

- ANZECC Working Group on Nature Conservation on Private Land (1996) *Nature Conservation on Private Land: Commonwealth, State and Territory Legislation and Programs: A report of the Working Group on Nature Conservation on Private Land prepared for the Australian and New Zealand Environment and Conservation Council, Standing Committee on Conservation* Australian Nature Conservation Agency, Canberra.
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