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A FULL REPAIRING LEASE

INQUIRY INTO ECOLOGICALLY SUSTAINABLE LAND MANAGEMENT

Report No. 60
27 January 1998

INDUSTRY COMMISSION

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Enquiries

Industry Commission
Level 3
Nature Conservation House
Cnr Emu Bank and Benjamin Way
BELCONNEN ACT 2617

PO Box 80
BELCONNEN ACT 2616

Phone: (02) 6240 3200
Fax: (02) 6240 3311

http://www.indcom.gov.au/

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The Commission also wishes to thank the members of the staff team for the dedication and professionalism which they brought to bear in the preparation of this report.

INDUSTRY
COMMISSION

Canberra Office
Post Office Box 80
BELCONNEN ACT 2616

Level 3
Nature Conservation House
Cnr Emu Bank & Benjamin Way
BELCONNEN ACT 2617

Telephone **(02) 6240 3200**
Facsimile **(02) 6240 3399**

Head Office
Telephone **(03) 9653 2100**
Facsimile **(03) 9653 2199**

27 January 1998

The Honourable Peter Costello MP
Treasurer
Parliament House
CANBERRA ACT 2600

Dear Treasurer

In accordance with Section 7 of the *Industry Commission Act 1989*, I have the pleasure in submitting to you the Commission's final report on Ecologically Sustainable Land Management.

Yours sincerely

Jeffrey Rae
Presiding Commissioner

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ABBREVIATIONS

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ACF	Australian Conservation Foundation
AESP	Australians for an Ecologically Sustainable Population
ANAO	Australian National Audit Office
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZFAS	Australian and New Zealand Federation of Animal Societies
ANZLIC	Australia New Zealand Land Information Council
ARC	Australian Research Council
ASDI	Australian Spatial Data Infrastructure
ATO	Australian Taxation Office
AUSLIG	Australian Surveying and Land Information Group
AWRC	Australian Water Resources Commission
BRS	Bureau of Resource Sciences
CaLP	Catchment and Land Protection
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CCC	Catchment Coordinating Committee
CCWA	Conservation Council of Western Australia
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CMA	Catchment Management Authority

CMC	Catchment Management Committee
CMT	Catchment Management Trust
COAG	Council of Australian Governments
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSO	community service obligation
DCLM	Department of Conservation and Land Management (Western Australia)
DEST	Department of the Environment, Sport and Tourism
DIST	Department of Industry Science and Tourism
DLWC	Department of Land and Water Conservation
DNR	Department of Natural Resources
DNRE	Department of Natural Resources and Environment (Victoria)
DPIE	Department of Primary Industries and Energy
EC	electrical conductivity
EPA	Environment Protection Authority
ESD	ecologically sustainable development
ESLM	ecologically sustainable land management
FMB	Farm Management Bond
FMD	Farm Management Deposit
GAB	Great Artesian Basin
GABCC	Great Artesian Basin Consultative Council
GATT	General Agreement on Tariffs and Trade
Gl	gigalitre
IC	Industry Commission
ICESD	Intergovernmental Committee on Ecologically Sustainable Development
ICM	Integrated Catchment Management

IED	Income Equalisation Deposit
IGAE	Intergovernmental Agreement on the Environment
IGE	intergenerational equity
IPART	Independent Pricing and Regulatory Tribunal (NSW)
IPO	Interim Protection Order
ISO	International Standards Organisation
LEAP	Landcare and Environment Action Program
LEP	Local Environment Plan
LWRRDC	Land and Water Resources Research and Development Corporation
MCFFA	Ministerial Council for Forestry, Fisheries and Aquaculture
MDB	Murray-Darling Basin
MDBC	Murray-Darling Basin Commission
MDBMC	Murray-Darling Basin Ministerial Council
ML	Megalitre
NAFI	National Association of Forest Industries
NCC	National Competition Council
NCPISA	National Collaborative Project for Indicators of Sustainable Agriculture
NEPC	Natural Environment Protection Council
NFF	National Farmers' Federation
NHT	Natural Heritage Trust
NLP	National Landcare Program
NPWS	National Parks and Wildlife Service
NWQMS	National Water Quality Management Strategy
NSWFA	New South Wales Farmers' Association
NVI	National Vegetation Initiative
OECD	Organisation for Economic Cooperation and Development
OH&S	Occupational Health and Safety

PMP	Property Management Planning
PPMFA	Pulp and Paper Manufactures Association of Australia
QGGA	Queensland Grain Growers Association
R&D	Research and Development
RAP	Regional Assessment Panel
RAPI	Royal Australian Planning Institute
RAS	Rural Adjustment Scheme
RCS	Regional Catchment Strategy
RDC	Research and Development Corporation
RMPS	Resource Management and Planning System
RWSC	Rivers and Water Supply Commission
SCARM	Standing Committee on Agriculture and Resource Management
SCMCC	State Catchment Management Coordinating Committee
SEAC	State of the Environment Advisory Council
SEPP	State Environment Planning Policy (NSW)
SOE	State of the Environment
SRMC	Sustainable Resource Management Committee
STP	sewage treatment plants
SWEEP	Strategic Weeds Eradication Project
TCM	Total Catchment Management
TFGA	Tasmanian Farmers and Graziers' Association
TWE	tradeable water entitlement
VCA	voluntary conservation agreement
WAMP	Water Allocation Management Plan
WATC	Western Australian Tourism Commission
WMO	World Meteorological Organisation
WRC	Water and Rivers Commission (Western Australia)
WTO	World Trade Organisation

WWF	World Wildlife Fund

GLOSSARY

beneficiary pays	Pricing principle where those who benefit from an action pay for the portion of the benefits they receive.
biodiversity	The variety of all plants, animals and micro organisms and the ecosystem of which they are a part.
cost benefit analysis	A technique used to compare alternative courses of action by assigning dollar values to all relevant benefits and costs.
covenants	Legal instruments attached to titledeeds of ownership which specify or restrict an owner's use of their property.
Crown leases	Contracts where the government confers upon private individuals specified rights to the use of land belonging to the government for a specified period in return for rent.
de facto	Actually, in fact, or in practice.
de jure	By law or by the statute.
discharge areas	Areas of catchments where groundwater emerges at low points in the landscape (groundwater being the water below the ground surface).
ecologically sustainable land management	Ecologically sustainable land management is essentially about long term viability of the land and its associated natural resources. This includes both economic viability and maintenance of the environment.
economic instruments	Instruments (such as taxes, charges, or property rights) that affect costs and benefits of alternate actions open to economic agents, with the effect of influencing behaviour.
ex ante	Before the event.
ex post	After the event.
externalities	Externalities occur when one person's actions affect another person's wellbeing and the relevant costs and benefits are not reflected in market prices.

information extension	The active dissemination of data and material to improve understanding and awareness of an issue or situation.
inter-generational equity	Development that allows the present generation to meet its needs and aspirations whilst not compromising the ability of future generations to do likewise.
integrated catchment management	Seeks to bring together the various parties and interests in a catchment through regional land and water management plans to achieve whole-catchment improvements.
marginal cost	The increase in total costs resulting from an increase in output of one unit.
market failure	An imperfection in the price system that prevents an efficient allocation of resources.
perverse incentives	An incentive that unintentionally induces behaviour that results in environmental degradation.
point source pollution	Pollution which can be traced to an easily identifiable, single source.
polluter pays	Pricing principle where the source directly responsible for pollution bears the cost of resulting damage.
private cost/benefit	Costs (or benefits) borne by (or accruing to) the individuals involved in a production or consumption decision.
private good	A good which, if consumed by one person, cannot be consumed by another person.
property rights	Rights that govern the use and ownership of a resource — most commonly associated with the use and ownership of land.
public good	A commodity whose benefits may be provided to all people at no more cost than that required to provide it for one person. The benefits are indivisible and no one can be excluded from using it.
recharge areas	Areas of catchments where a significant proportion of water enters into the groundwater systems.
regulation	Institutional measures aimed at directly influencing the environmental performance of polluters by regulating processes or products used, by abandoning or limiting

	the discharge of certain pollutants, and/or by restricting activities to certain times, areas, etc.
regulated river	In NSW, regulated rivers are those where the water supply is controlled by releases from dams and weirs. Most inland rivers are regulated, and all major inland rivers have at least one major dam.
stressed river	In NSW, rivers and water resources are defined as stressed where potential demands are high in relation to the available water at low flows, or where there are clear signs of poor health in the resource. All regulated rivers are classified as stressed.
unregulated river	In NSW, unregulated rivers are those where users depend on natural flows for water supplies. Most coastal rivers are unregulated.
user pays	Pricing principle based on charging the user for the full supply cost of a product/resource.

EXECUTIVE SUMMARY

> *No generation has a freehold on the earth. All we have is a life tenancy — with a full repairing lease.*
>
> UK Prime Minister Margaret Thatcher, 1988.

This inquiry is about the use of Australia's agricultural land and its associated natural resources — particularly surface and ground water, and vegetation. It is also concerned with those natural resources with the potential to be used in agriculture. The sound management of the environment and its natural resources is crucial to both the living standards and the quality of life enjoyed by the community.

The environment is crucial to living standards because it provides the natural resources that are essential to economic activity — such as agriculture, forestry, mining, and some tourism — and absorbs the wastes from that activity. In addition, it is a source of potentially useful plant and animal products — such as bush tucker and bush medicine.

The environment contributes to our quality of life in many ways. Most importantly, it sustains the very basis of all life on our continent and the planet. It is also a source of aesthetic, cultural and spiritual value for all Australians and it plays a central role in Aboriginal communities.

At present, both agriculture and the environment are showing signs of stress.

Many farmers are struggling with poor seasonal conditions and relatively low commodity prices — with little sign of an improvement in sight. The Australian Bureau of Agricultural and Resource Economics expects the gross value of agricultural production to drop by 1 per cent in 1997–98. While variability is endemic to agriculture, the present combination can be financially and personally painful for some farm families.

The stresses on the environment may not be immediately evident, but are profound. The clearing of land and the diversion of water have radically transformed the Australian landscape. These developments have not been due solely to agriculture — urban expansion and other economic activities, such as forestry, mining and tourism, have also contributed.

Although the benefits of economic development are considerable, they have affected the environment. Many of the environmental impacts have not been

welcome and some were totally unexpected. The impacts associated with our agricultural development have included:

- land degradation — such as waterlogging, soil erosion, salinity and acidity,
- weed and pest infestation;
- degradation of creeks, rivers and groundwater aquifers; and
- the loss and fragmentation of vital habitat such as forests and wetlands has contributed to species extinction — more than 20 per cent of our mammals, for instance, have been lost since European settlement.

Some of these impacts adversely affect agriculture — weeds and insect pests alone cost the sector $7.4 billion each year.

Although the contribution of an individual producer to an environmental impact is often very small, the cumulative impact across many producers can be dramatic. Because ecosystems are enormously complex, the nature and severity of the environmental impacts of a given economic development varies widely over time and location. Sometimes the cumulative impacts can be global in their scope, others are national, but in the case of agriculture, most have a significant local or regional dimension. The complexity also means that impacts generally can be very difficult to estimate in advance.

Ecological sustainability

Internationally, public concern with the environmental impact of economic development has led to acceptance of the notion of ‘sustainable development’ — in Australia we call it ‘ecologically sustainable development’.

In essence, ecological sustainability is about ensuring that each generation does not compromise the potential wellbeing of the next. A more elegant description of what it means is quoted at the beginning of this Executive Summary.

The potential wellbeing of each generation is largely determined by the stock of capital — broadly defined — that it inherits from the previous one. Now there are good grounds for being confident that the bequest of man-made capital and knowledge will continue to increase from one generation to the next. However, individuals acting on their own cannot determine the amount and composition of natural capital that should pass to the next generation. Moreover, it is not clear to what extent man-made capital can replace any significant and irreversible loss of natural capital.

Natural capital consists of those natural resources and biophysical systems upon which all life depends — such as the ozone layer, the atmosphere, the oceans, our terrestrial ecosystems and their plant and animal communities. Natural capital differs from other capital and other natural resources, such as mineral deposits, in a number of respects.

Natural capital performs a range of functions simultaneously. Our native forests are a good illustration. They provide a source of timber, generate oxygen for and absorb carbon dioxide from the biosphere, influence soil erosion and water quality in a catchment, and provide a habitat for a wide array of interdependent plants and animals. There are few, if any, man-made substitutes for most of these services.

Natural capital involves complex biophysical systems that change dramatically when disturbed beyond some point, and then are quite resistant to reverting to their previous range of operation There is pervasive uncertainty about when this can occur and its impact. For example, once clear-felled, a mature forest cannot be replaced immediately and often we do not know the full consequences of its removal. Our historical experience with vegetation clearance showed that we did not anticipate its consequences in terms of rising water tables and expanding dryland salinity.

Many of the services of natural capital have the characteristics of a *public good* — a number of people enjoy them automatically and simultaneously but the extent of their enjoyment does not affect that of anyone else. The larger the number of people affected the more difficult it is for individuals to conserve natural capital for future generations, either on their own or in voluntary cooperation with others.

For all these reasons, the market on its own is unlikely to conserve sufficient natural capital for future generations.

The role of government

In such circumstances, only government can ensure a just solution to what and how much natural capital should be left for future generations. This is not to suggest that markets have no role to play or that government has to arrange every aspect of the bequest. It does mean that government must accept the final responsibility for the outcomes but in the full knowledge of the risks and limitations of intervention.

In the past, governments have inadvertently contributed to many of the adverse environmental impacts associated with agriculture. Government sponsored and encouraged much of the irrigation and land clearing for agricultural

development, directly or indirectly — albeit with the best of intentions. In some cases, the environmental consequences were simply not known. In others, evidence of the possible consequences was ignored or discounted. The risks of such errors and omissions re-occurring cannot be eliminated — if only because our knowledge about complex ecological systems is likely to remain highly imperfect.

Even where knowledge is not a constraint, there are limitations to what government can sensibly do. The political system does not encourage full and frank disclosure of the value that each voter places on a public good. Narrow self-interest encourages individual voters to distort or hide how much they would be willing to pay and to exaggerate the benefits to others; in this way they can try to 'free ride' on the rest of the community. In addition, the political system has great difficulty providing incentives for efficient service delivery that are as effective as that of competitive markets.

Both in Australia and overseas there is ample evidence that markets can contribute to environmental protection in a number of ways. Some of the harm caused to the environment is due to the absence of markets for certain natural resources and environmental amenities, rather than their presence. Not all natural capital can be owned and used exclusively by some individuals but much of it can — water, forestry and fisheries provide clear examples. Where markets in the rights to use such resources exist, their prices will rise as they become scarcer, and thus users are encouraged to increase their efforts to conserve them. This helps to reduce any environmental impacts associated with their use.

But the capacity of markets to promote better environmental outcomes is not confined to the conservation of particular natural resources. For instance, they have contributed to nature conservation — the conservation of species, habitats and environmental amenities — through the efforts of altruistic individuals as well as private trusts and endowments. Such possibilities encourage those who create the impacts and those who suffer their consequences to find innovative exchanges that reduce their severity.

The major challenges for government are to ensure that policy does not inhibit market exchanges but promotes them where practical. This requirement includes taking care to minimise the risk of government activity displacing private actions.

While the principle of ecological sustainability is sound, government intervention in its implementation is fraught with practical difficulties and difficult choices. At the end of the day, the limiting factor will be the willingness of the community to forgo what can often be short-term material

advantage, in return for longer-term environmental benefits for themselves and future generations.

The first priority should be to address the on-going causes of environmental degradation, particularly those that are capable of being solved at little or no economic cost. This at least ensures that policy is moving in the right direction even if there is no immediate agreement on how far the economy is from an ecologically sustainable path of development.

The case for change

Much has already been done to advance the ecologically sustainable management of natural resources in agriculture. The efforts have involved all tiers of government. They have also involved extensive cooperation between them to address inter-jurisdictional issues, such as the management of the Murray-Darling river system.

The task has been and remains a challenging one. Nevertheless, to date the incorporation of ecological sustainability into policy has been ad hoc, incomplete and tentative. The central problem is that Australian governments have yet to put in place a comprehensive, integrated and far-sighted way of promoting the ecologically sustainable management of natural resources in agriculture.

On top of this, there are flaws in the design and execution of policies directed at natural resources and environmental protection.

The first response has usually been to ***regulate the resource owners or managers***. Unfortunately, regulation has often not recognised the severe practical limits to what can be achieved with prohibition. Much regulation is ad hoc and too frequently the only response. The number of rules is large and growing, while a 'command and control' approach has been used to prescribe the means to be used — rather than the ends to be achieved. Often the design of the rules has had only limited input from those that have to work under them.

The ***markets for the key natural resources*** — surface and ground water, farm forestry, native flora and fauna — are either non-existent or function poorly. The major flaw is a lack of well-defined, tradeable rights to use these resources. Consequently, landholders have tended to over-use some — surface and ground water — and under-value others — forestry and native flora and fauna.

Most jurisdictions have made little use of positive incentives to promote ***nature conservation on private land*** despite the fact that off-reserve conservation on agricultural land is a high priority for all governments. In addition, the

incentives that are provided are not well coordinated with other natural resource and environmental programs.

The objectives and achievements of many ***natural resource and environmental programs*** are obscure. The Australian National Audit Office found that the objectives of the Commonwealth's programs in these areas were too broad and difficult to measure. This detracts from effective accountability.

Weaknesses in policy design are exacerbated by ***poor implementation of policy***. Major reforms are incomplete some years after their initiation — the 1992 National Forest Policy Statement, the 1994 Council of Australian Governments Water Reform Framework and the 1991 Intergovernmental Agreement on the Environment are cases in point. Admittedly, implementation is sometimes complicated — as in the case of water — but not in all cases — for instance, forestry.

All of the above, are influenced by significant deficiencies in the generation and dissemination of ***environmental knowledge and know-how***. The coverage and quality of the spatial information collected by Commonwealth and State agencies leave much to be desired. Most importantly, much of this information is not particularly useful for management decisions at the regional, local or farm level.

The Commission's proposals

The ecologically sustainable management of natural resources raises many complex issues. There are numerous environmental impacts to deal with, they vary over time and place, and do so in ways that are difficult to predict. Many impacts are specific to particular areas and most are interrelated. Consequently, there is no simple answer or single solution — a comprehensive and integrated package of policy measures that accommodates this complexity is needed.

The Commission's package outlined in this report has been built around three pillars. They are to:

- recast the regulatory regime to ensure resource owners and managers take into account the environmental impacts of their decisions;
- create or improve the markets for key natural resources; and
- encourage conservation on private land.

Underlying, and fundamental to, the effectiveness of the three pillars is a need to ensure that the generation and dissemination of environmental knowledge

and know-how is adequate for the needs of policy makers, land holders and other resource managers. Changes are needed in both areas.

The first of the pillars involves a new approach to the ***regulation*** of natural resources and environmental protection.

Well-designed regulation can only ever make a very limited contribution to progressively better environmental outcomes. But bad design can add considerably to the costs of regulation. In the case of natural resource management there is a need for a comprehensive approach to regulation — one that strikes a better strategic balance between the degree of prescription and the amount of flexibility allowed.

The new approach is based on the idea of a statutory *duty of care* for the environment. Everyone who could influence the risk of environmental harm should be required to take all *reasonable and practical* steps to prevent any foreseeable harm from their actions. This would promote more cost-effective measures to protect the environment — that is, those where the costs of prevention are commensurate with the risk and extent of the potential environmental loss.

A statutory duty of care has been successfully used to address occupational health and safety risks. A more restricted version of the Commission's proposed duty of care for the environment already exists in Queensland, Victoria and South Australia.

The Commission's proposed regulatory approach involves the following:

- a single unifying statute in each State and Territory to set out the principles to be observed in natural resource management;
- as far as possible, voluntary standards and codes of practice to be used to guide duty holders on how to comply with the law;
- mandated standards only to be a last resort — and any mandated standards should, as far as practicable, prescribe the outcomes to be achieved, rather than the inputs or processes to be used.

The single unifying statute in each jurisdiction would replace the various statutes that currently regulate natural resource and environmental management. The aim should be to repeal superfluous laws and ensure that any rules that are retained are modified to conform with the Commission's recommended approach to regulation. A single independent agency in each jurisdiction would be charged with administering the legislation.

The Commission's regulatory approach puts greater reliance on self-regulation — to minimise the deficiencies in 'command and control' regulation. Voluntary

standards (for example, codes of practice and environmental management systems) should be able to be used to show compliance with the mandatory duty of care. Indeed each duty holder should be able to select the voluntary standard that best suits his or her circumstances and there should be no restriction on who could develop such standards. The later would ensure that local stakeholders can develop standards for local application — they have the greatest knowledge of local circumstances.

Duty holders should be allowed to self assess their compliance with the statutory requirements where the administering agency has concluded that the risk of environmental harm is low. Where this option is used, the duty holder should have to document the assessment upon demand by the agency.

The administering agency should assist the development and application of voluntary standards in a number of ways. Firstly, it should publish information about significant hazards or risks of which duty holders or standards developers should be aware. Secondly, it should publish lists of voluntary standards that it considers conform to all the statutory requirements — the use of such standards should constitute *prima facie* compliance. Finally, it should accredit suitably qualified auditors from the private sector to undertake external audits of compliance.

The second pillar of the reform package is to improve the ***markets for natural resources***.

This involves steps to remove specific impediments to the creation or expansion of well-functioning markets for key resources. The resources in question include surface and ground water, farm forestry and native vegetation, and native flora and fauna. The approach to market creation or expansion also applies to waste or discharges from agriculture, for example water pollution.

The measures centre on creating or better defining tradeable rights to use these resources. They include tradeable water entitlements, separating the ownership of trees from the land on which they are grown, guaranteeing forest harvesting rights prior to planting, extending the existing tradeable discharge permits to new sources of water pollution, and creating new permit systems for agricultural discharges — such as salts and nutrients. They also involve pricing reforms to eliminate subsidised use.

These changes will encourage conservation and more efficient use of these resources — thereby reducing the environmental impacts associated with their use. They will reduce the bias in the incentives currently facing farmers to clear vegetation and over-use water. They have considerable potential to direct

privately owned resources into better resource management and its associated environmental benefits — far more so than compulsion.

There is scope to extend the tradeable permit schemes for salinity and nutrient pollution of two rivers in New South Wales, and the salinity credits scheme in the Murray-Darling Basin. The schemes allow dischargers to choose how to contribute to the overall pollution target — thereby lowering the overall costs. The success of the existing schemes opens the way for similar ones elsewhere but each State and Territory needs a strategy to guide their actions.

The final pillar is to expand ***nature conservation on private land***.

National parks and reserves are unlikely to achieve a comprehensive, adequate and representative coverage of the nations' biological diversity. The duty of care would make an important contribution, but only to the point where it does not impose unreasonable costs on land holders — its major contribution is likely to be in bringing vulnerable habitats to public notice. More needs to be done.

Each State and Territory should extend its use of voluntary conservation agreements with selected land holders. Such agreements provide the capacity to protect highly valuable natural assets on private land that are at risk. However, each jurisdiction needs an implementation strategy to get the most out of its investment in this area.

The benefits of this approach would be enhanced by removing impediments to the commercial utilisation of wildlife — for example, by lifting export controls where an appropriate management system or code of practice was put in place — and by recognition of the scope for commercial conservation — for example, Earth Sanctuaries Limited.

Charitable trusts to promote nature conservation — such as the Trust for Nature in Victoria and the Australian Bush Heritage Fund — rely on donations to fund their work. Governments need to ensure that their tax systems encourage environmental altruism as much as any other form of altruism — at present they do not.

To support and complement the three pillars there is a need to strengthen the ***generation and dissemination of environmental knowledge and know-how***. The Commission's regulatory changes should help to a small but significant degree. In particular, the obligations to inform and the complementary rights to know should improve the collection and exchange of such information, both among those who influence natural resource management and environmental protection in the private sector, as well as between the private sector and government.

But the changes need to go much further than this. The Commonwealth, State and Territory governments need to conclude a formal agreement on the management of the spatial information held by their agencies with a view to improving the coverage, quality, reliability and public accessibility of that information.

In summary, the Commission's reform package aims to promote the conservation and use of natural resources and the environment in ways that minimise the risk of significant and irreversible losses of natural capital. The package creates incentives and opportunities for individuals and regional groups to search out and implement cost-effective and timely solutions to environmental problems. Finally, it harnesses the power and flexibility of environmental altruism and market-based solutions to environmental problems.

RECOMMENDATIONS

Chapter 8 — A new approach to regulation

A mandatory duty of care

8.1 The regulation of land and natural resource management and environmental protection in each State and Territory should be built around a statutory *duty of care* for the environment.

Elaboration of the duty of care

8.2 In each State and Territory, the duty of care should apply to everyone whose actions could foreseeably harm the environment. The duty of care should require those responsible to take all reasonable and practical steps to prevent harm to the environment. The duty should cover:

(a) private, Crown and aboriginal land, air, surface and ground water and flora and fauna:

(b) biological diversity and ecological integrity;

(c) terrestrial, coastal and marine environments; and

(d) cultural and aesthetic values.

8.3 In each State and Territory, the general duty of care for the environment should be elaborated by a series of related duties. These should require each duty holder, as far as is reasonable and practical, to:

(a) identify, assess and manage the risks of the duty holder causing harm to the environment;

(b) inform those directly at risk of foreseeable personal or financial harm from the activities of the duty holder;

(c) inform the regulating agency of the risk of foreseeable harm to the environment from the activities of the duty holder; and

(d) consult with those at risk of foreseeable harm.

8.4 The legislation establishing the duty of care in each State and Territory should include a statutory right to be informed on the part of those at risk of foreseeable harm from an environmental hazard or its management.

Chapter 9 — Implementing the new approach

A unifying statute

9.1 The existing legislation regulating the protection of the environment and the management of land and natural resources in each State and Territory should be replaced by a comprehensive set of provisions in a single unifying statute.

9.2 The unifying statute should contain a statement of the principles centred round a duty of care to be applied to the management of land and natural resource and the protection of the environment.

9.3 The Commonwealth should enact a single unifying statute regulating the protection of the environment and the management of land and natural resources in areas within its jurisdiction.

Voluntary standards

9.4 Voluntary standards be the principal means of assisting duty holders to meet their statutory duty of care and related legal obligations.

9.5 As far as possible, the development of voluntary standards should be left to those who have a stake in their application and to independent standard-setting bodies, such as Standards Australia and the International Standards Organisation.

9.6 The agency responsible for administering the unifying statute should, from time to time, publish formal notices about significant hazards or risks that individual duty holders or standards developers should take into account, The response to such notices, including modification or preparation of any voluntary standard, should remain the responsibility of the duty holders and the standards developers.

9.7 The administering agency should publish lists of voluntary standards that it considers conform to the requirements of the proposed unifying statute. The demonstrated application of such standards should be *prima facie* evidence of compliance with the legislation.

9.8 Those with a duty of care should have the option to assess their compliance with the requirements of the unifying statute where the administering agency has concluded that the risk of environmental harm is low. If they choose self-assessment, duty holders should be obliged to document their assessment and to produce the documentation on demand by the agency.

9.9 The administering agency should accredit appropriately qualified private sector organisations to assess the compliance of duty holders against the requirements of the unifying statute.

9.10 Where an external audit of a duty holder's compliance with the requirements of the unifying statute is required by the administering agency, the duty holder should have the choice of any third party auditor that has been accredited by the agency.

Mandated standards

9.11 As far as possible, each jurisdiction should mandate broad environmental outcomes, rather than the inputs or processes to be used in achieving them.

9.12 Wherever possible, jurisdictions should allow functionally equivalent Australian and international standards to be used to meet the objective.

9.13 Any new mandated standards should be developed by a transparent process of consultation with all interested parties.

Review of existing legislation

9.14 Each jurisdiction should review its existing legislation regulating the management of land and natural resources and the environment with a view to harmonising them with the approach recommended by the Commission. The reviews should be completed and their results implemented within five years.

Chapter 10 — Information and research

10.1 The Commonwealth, States and Territories should, as a matter of priority, conclude an agreement on the management of spacial data held by their agencies. Among other things, the agreement should cover:

- determination of agreed standards to facilitate the aggregation and sharing of data between the jurisdictions;
- the terms and conditions for the sharing of data to minimise duplication and encourage common usage;
- the extent of public access to the data; and
- the terms and conditions of access, including the recovery of the costs of access.

10.2 Agencies charging a fee for data provision should review their pricing policies to ensure that, once produced, any additional costs of extracting and formatting data to meet specific user requirements should be recovered from them.

10.3 Data collected by individual landholders under their duty of care, and by groups, should be encouraged, as far as practicable, to be collected in a form that enables relevant elements of the information to be aggregated and compared with data collected by others.

10.4 The Commonwealth should initiate a review of LWRRDC's charter with the aim of extending it to incorporate research into the management of on-farm biodiversity. Included in this review should be an investigation of the most effective way of funding this additional research.

The Commonwealth should also consider making available funding for a Cooperative Research Centre for the Management of On-Farm Biodiversity.

10.5 The States and Territories should review their extension programs with a view to ensuring that they are capable of advising landholders on all aspects of ecologically sustainable land management.

Chapter 11 — Forests and native vegetation

Separate tenure for land and trees

11.1 Where appropriate measures are not in place, each State and Territory should enact legislation to provide for the legal separation of the ownership of trees grown for commercial purposes from the ownership of the land on which they are grown.

Double taxation of forestry profits

11.2 The Commonwealth Government should accelerate action to remove the potential for double taxation of commercial forestry profits. It should announce its intention to remove the anomaly as soon as possible, with retrospective application from the date of the announcement.

Harvesting rights

11.3 Each State and Territory should enact legislation to guarantee the right to harvest and use wood grown on private land for commercial purposes. The right should be available prior to planting.

11.4 Areas regenerated with the intent of harvesting should be subject to the same harvesting rights as plantation forests, so long as the intent to harvest is declared prior to regeneration.

11.5 Changes in the rights to harvest and the codes of practice governing the management and harvesting of plantation forests, regenerated native forests and farm forests should not be implemented without prior agreement of the affected parties and the payment of compensation where rights have been reduced.

11.6 Each State and Territory should sponsor the development of regional codes of practice for the management and harvesting of plantation forests, regenerated native forests and farm forests by the relevant interested parties.

Activities of forestry agencies

11.7 Each State and Territory should:

- complete the corporatisation of the agencies responsible for commercial use of Crown plantations;
- implement corporatisation in a way that promotes competitive neutrality with private plantations; and
- allocate any rights to harvest old growth native forests by competitive public tender, or by any other process that is as transparent and competitively neutral between private loggers and Crown forestry operations.

11.8 The terms and conditions for harvesting logs from Crown forests managed for commercial use, should:

- reflect the full economic costs of growing and harvesting them;
- be free from the need to underwrite other objectives, such as regional development; and
- be fully and publicly disclosed.

Export controls on plantation-sourced wood

11.9 The Commonwealth should expedite the removal of export controls on wood grown and harvested in accordance with appropriate codes of practice.

Carbon sequestration

11.10 The Commonwealth, States and Territories should conduct and evaluate a trial of a system of tradeable credits for the voluntary sequestration of carbon by the private sector in defined and audited sinks in Australia.

Chapter 12 — Surface water

Managing environmental flows

12.1 States and Territories should establish a minimum environmental flow regime for each river system where extraction entitlements exist, commencing with regulated rivers and those unregulated ones at greatest environmental risk.

12.2 In each State and Territory, responsibility for managing all aspects of the environmental flow in each river system should be vested in a single organisation.

12.3 The environmental flow managers in each State and Territory should be given the objective of managing the water entitlements allocated to them so as to maximise the environmental benefits of each river system to the community.

12.4 Each State and Territory should allow its environmental flow managers the ability to trade progressively more of their water entitlements so as to increase the environmental benefit of each river system to the community.

Trade issues

12.5 The Commonwealth Government should actively promote discussion of assistance to water use, in the appropriate international forums, with the objective of reducing and ultimately eliminating distortions in international trade through the provision of subsidies to water and associated infrastructure.

Chapter 13 — Groundwater

COAG reform timetable

13.1 The 1996 Council of Australian Governments' groundwater reforms, as detailed in the *Allocation and Use of Groundwater* (ARMCANZ and SCARM 1996), should form part of the National Competition Council's criteria for the third tranche of competition payments, as intended, under the *Agreement to Implement the National Competition Policy and Related Reforms — 1995*.

13.2 COAG should agree to a set of measurable milestones and timetables for the implementation of all of the COAG principles for groundwater reform. Progress against those milestones and timetables should be monitored by COAG and reported publicly.

Licensing arrangements — existing bores

13.3 Each State and Territory should extend its licensing system to cover all bores in groundwater systems that are under stress from extraction. At the time of licensing, the condition of the bore should be assessed. The costs

of extending licensing should be recovered from the landholders in question.

Review of Great Artesian Basin Rehabilitation Scheme

13.4 A draft report of the committee reviewing the *Great Artesian Basin Rehabilitation Program* should be released for public comment, by the Commonwealth Department of Primary Industries and Energy, prior to its finalisation and submission to government.

Chapter 14 — Water quality

Scope for extension of tradeable permits

14.1 Each State and Territory should develop a strategy to progressively introduce tradeable discharge permits. The strategies should incorporate the following features:

- they should first focus on those pollutants and environments where the potential for reducing environmental damage is greatest;
- each permit system should commence with the more significant point sources and subsequently be extended progressively to other point sources and, where feasible, to non-point sources;
- each permit system should be trialed, then evaluated and modified, as necessary, before being introduced more widely, with each stage being subject to a defined timetable for trialing (say 3 years), extension (say 4 years, depending on the complexity of the extension) and review thereafter;
- all stages in the process of introduction should be the subject of public consultation with interested parties; and
- each new permit system should have the ability to review and modify its structure and performance on an on-going basis, as dictated by either operational experience, new information or further research.

Chapter 15 — Native flora and fauna

15.1 The Commonwealth, States and Territories should facilitate the commercial utilisation and exporting of live native fauna in a manner

which builds public confidence that further utilisation will occur only if adequate and appropriate safeguards exist.

To this end, the Commonwealth, States and Territories should:

- agree to assess applications for the removal of controls on the export of live native fauna on a case-by-case basis;
- make removal conditional upon there being in place a code of practice or management plan that satisfactorily addresses the conservation, animal welfare and cultural issues in utilisation;
- develop and announce measurable performance indicators and criteria to be used in assessing codes of practice or management plans; and
- in cases where there is insufficient information to assess whether the criteria can be satisfied, approve the conduct of a trial for an agreed period to provide the necessary information, with safeguards appropriate for a trial.

Chapter 16 — Encouraging conservation and remediation

Management of reserves

16.1 Each State and Territory should make greater use of local landholders and non-profit conservation organisations by sub-contracting to them, as appropriate, part or all of the day-to-day management of Crown land, including national parks and reserves, particularly in more remote areas.

Environmental altruism

16.2 The Commonwealth, States, Territories and local governments should encourage environmental altruism as much as other forms of altruism and, as far as practicable, treat monetary and in-kind donations equally in this respect. In particular, expenditure on private nature conservation should be eligible for the same income tax treatment as applies to heritage buildings and structures; and the treatment of donations of land to registered charities for conservation purposes should not be dependent on the date of purchase.

16.3 The States and Territories should consider contracting conservation trusts to oversee conservation on Crown and private land. This should be arranged on a contestable basis.

Pursuing conservation agreements

16.4 The Commonwealth, States and Territories should use conservation agreements for the management and conservation of biodiversity and natural heritage on private land holdings. Conservation agreements should:

(a) be offered to landholders on a voluntary basis;

(b) be available for a range of time periods, terms and conditions to allow landholders to choose the combination which suits them best;

(c) pay the landholder for the financial costs of conservation management; and

(d) pay the landholder for forgone economic opportunities where this is necessary to secure the landholder's agreement.

16.5 Local government authorities, and appropriately constituted local and regional land and natural resource management bodies, should be permitted to achieve their conservation priorities by entering conservation agreements with private landholders.

Establishing conservation priorities

16.6 Each State and Territory should nominate a single agency to be responsible for the development of policy for both on- and off-reserve conservation of biodiversity and natural heritage.

16.7 The Commonwealth, States and Territories should develop and publicise strategic and operating plans setting out their priorities for funding on- and off-reserve conservation. These plans should be prepared in consultation with the interested parties, including Aboriginal and agricultural landholders.

16.8 The Commonwealth, States and Territories should agree and publicise their strategic priorities for funding conservation of biodiversity and natural heritage. Commonwealth, State and Territory expenditure on conservation agreements with private landholders should only be for

projects which are consistent with the announced priorities of the relevant government.

16.9 The Commonwealth, States and Territories should each ensure it has access to an independent body to provide objective advice on nominated environmental issues and associated community values. In doing so, the body should use open and transparent processes and allow opportunity for public input. Jurisdictions should consider sharing the same body.

Chapter 17 — Natural Heritage Trust

17.1 The Commonwealth, States and Territories agree to amend the Natural Heritage Trust in the following direction:

(a) as a matter of urgency, to specify the specific landscape outcomes that expenditure from the Trust is meant to achieve;

(b) as appropriate, to specify these outcomes in sufficient detail so that they are capable of being interpreted accurately at the local and regional level;

(c) from time to time, specify the milestones that are meant to be achieved in the progress towards these outcomes;

(d) to be prepared to commit funding to projects for the minimum period that is necessary for successful completion, subject to their realising any milestones specified for them; and

(e) to adopt a risk management strategy to the approval of projects for funding.

Chapter 18 — Diversification in the rangelands

18.1 Upon resolution of native title issues and following implementation of the Commission's proposed regulatory regime, each State and Territory should review its policy and practice on the leasing of Crown land for agricultural purposes with a view to removing any impediments to the efficient diversification of economic activity.

Chapter 19 — Strengthening institutions

The Commission draws attention to its comments on the role of local and regional organisations in promoting ecologically sustainable land management in Chapter 19.

Chapter 20 — Urban encroachment

The Commission draws attention to its comments on the management of urban fringe development in Chapter 20.

1 INTRODUCTION

This chapter provides a brief background to Australia's unique natural environment and its evolution. It describes the contribution made to Australia's economy by agricultural and pastoral industries. It also explains the coverage and conduct of this inquiry.

Australia's natural environment has many unique features. As the recent national State of the Environment Report commented:

> Australia is an old, weathered, eroded landscape, flat and generally dry, with a highly variable climate, especially rainfall. Its unique plants and animals reflect its long isolation from other land masses and their wildlife. (SEAC 1996, p. ES-5)

Australia is one of the twelve most biologically diverse nations in the world, the only developed nation to have this 'megadiverse' status. Many of its plants and animals are not found elsewhere. Australia is the world's driest continent, excluding Antarctica, and has a high degree of rainfall variability from one year to the next. Australia's river systems are long, but slow flowing and there are few permanent wetlands. And its hot summers lead to high rates of evaporation and low run-off compared with other continents. Very few of Australia's soils are naturally suited to agriculture, with most being shallow and low in nutrients. Only 6 per cent of the land is arable. Large areas are naturally affected by salt or acidity. (SEAC 1996)

The evolution of Australia's natural environment reflects the effects of at least 50 000 years of human management. Since the arrival of the Aborigines, their hunter-gatherer activities and use of fire have transformed the environment, and its flora and fauna. European settlement has greatly extended the impacts. For example, the area of Australia's forests has been reduced from 69 to 41 million hectares, and large areas of woodland have been cleared, largely for agriculture (National Association of Forest Industries, Sub. 73, Attachment, p. 1). Also contributing to these changes has been the development of forestry, mining, and tourism industries, and the expansion of cities and surrounding hobby farms as population and incomes have grown.

1.1 Agricultural land use

Agriculture is Australia's most extensive form of land use, occupying around 60 per cent of the total land area. Conservation reserves and land used for forestry comprise around 5 per cent of the land area. (SEAC 1996)

Livestock grazing is by far the largest use of agricultural land. Areas of arid or rugged land held under grazing licences account for 88 per cent of agricultural land use. In the semi-arid and arid zones, livestock mainly graze on native grasses. In addition, about 8 per cent of agricultural land is sown to pastures and grasses for grazing. Less than 4 per cent of Australia's agricultural land is cropped. While the area of land cropped or sown to pastures and grasses had been expanding rapidly, since the 1980s about 10 per cent of Australia's agricultural land has been cultivated each year (ABS 1997, p. 373). Fertilisers are widely used on pasture and cereal crops to overcome the infertility of Australian soils.

Around 2.5 million hectares of land are under irrigation. This represents 6 per cent of land under crops, but less than 1 per cent of the total land used for agriculture. Most irrigated land is within the Murray-Darling Basin. Some 70 per cent of water usage in Australia is for agriculture.

A high proportion of Australia's land remains publicly owned, with only 13 per cent having been converted to freehold title. Most agricultural land is subject to long-term Crown leases. In the rangelands, which occupy about 75 per cent of the continent, only a small area is privately owned. The more fertile regions generally have a much higher proportion of freehold land (SEAC 1996, p. 6-14 and p. 6-34).

1.2 Agriculture's contribution to the economy

Agriculture is a significant contributor to the national economy and, over the long term, has sustained a strong productivity performance.

Agricultural and pastoral industries contributed directly some 3 per cent of gross domestic product and 22 per cent of exports of goods and services in 1995–96. Australia is a significant contributor to world agricultural trade, particularly in wool, beef, wheat and sugar.

Agriculture and services to agriculture employ some 400 000 people, representing 5 per cent of employed persons. Over 140 000 establishments are mainly engaged in agriculture.

The annual rate of productivity growth in Australian agriculture over the four decades to 1989–90 has been estimated at around 2 to 2.5 per cent. This is

substantially higher than that achieved in the rest of the Australian economy and in the agricultural sectors of other developed countries taken as a whole (Chisholm 1995, p. 13). More recent data confirm that this trend has continued into the 1990s, with productivity growth in Australian agriculture in the two decades to 1994–95 averaging above that for the economy overall.

In 1995–96, the gross value of agricultural commodities produced was $27.6 billion. While crops occupied only 4 per cent of agricultural land, they accounted for 56 per cent of its output (mainly wheat, barley, other grains, sugar cane, fruit and vegetables, and wine grapes). Livestock (cattle, sheep, pigs and poultry) and livestock products (wool, milk and eggs) each accounted for 22 per cent (ABS 1997). Agricultural products are also significant inputs to many manufacturing industries.

The Bureau of Meteorology's National Climate Centre expects that an El Niño pattern will persist until mid-summer 1998, with a high probability of El Niño conditions persisting for the first few months of the year. With drier than average seasonal conditions in prospect, the Australian Bureau of Agricultural and Resource Economics (ABARE 1997) has forecast total crop production to fall from the 1996–97 record harvest. However, the gross value of farm production is forecast to decline by only 1 per cent due to expected higher prices for beef, wool and dairy products.

1.3 The inquiry

The Commission has been asked to inquire into the ecologically sustainable management of agricultural and pastoral land in Australia. The terms of reference are reproduced in Appendix A. In particular, the Commission has been asked to review:

- the roles and contributions of governments, landowners, land managers and community groups to ecologically sustainable land management (ESLM);
- the impact of regulatory, taxation and institutional arrangements on ESLM practices;
- the impact of urban encroachment;
- the effectiveness of existing mechanisms, policies and programs relating specifically to ESLM;
- impediments to, or measures to promote, the adoption of ESLM practices; and
- adjustment issues and regional impacts of any recommendations.

For this inquiry, 'land' has been broadly defined to include all natural resources affected by agricultural production:

- land used or suitable for agricultural and/or pastoral purposes;
- publicly or privately owned land;
- land currently or potentially available for economic use;
- associated vegetation; and
- ground and surface water, including rivers, riversides and wetlands.

The terms of reference also ask the Commission to take account of the National Strategy for Ecologically Sustainable Development.

In preparing this report, the Commission has had the benefit of input from a wide range of interests (see Appendix B). Over 340 submissions have been received from Commonwealth, State and Territory governments, industry, community groups and individuals. Discussions were held with over 220 individuals, organisations and government agencies. These included 18 roundtable discussion fora, where the discussion was on the public record. They were conducted in all capital cities and several regional centres during May and June 1997. A public hearing was held in Melbourne in June 1997.

Following the release of the Draft Report for public comment on 16 September 1997, public hearings on the Draft Report were held in all capital cities and Albury during October and November 1997. Further details on public consultation are presented in Appendix B.

The Commission's Act requires it to provide advice on action which can improve the wellbeing of the Australian community as a whole, rather than the welfare of any particular industry or activity under reference, or any particular section of the community. Community wellbeing includes both the measurable material and economic aspects, and (the more difficult to measure) aspects relating to quality of life. The Commission is also required to report on the social and environmental consequences of any recommendations it makes.

In undertaking the inquiry, the Commission has looked at:

- the key environmental impacts associated with the use of agricultural and pastoral land (Chapter 2);
- ecologically sustainable development (Chapter 3);
- the factors that contribute to those impacts and the role of government in addressing them (Chapter 4);
- the current policy responses by governments in attempting to address the problems (Chapter 5);
- the inadequacies of current approaches (Chapter 6); and

- the changes which should be made to existing approaches, as well as new initiatives, to improve the ecological sustainability of land management (Chapters 7 to 20).

2 ENVIRONMENTAL IMPACTS ASSOCIATED WITH AGRICULTURE

The environmental impacts associated with agricultural and pastoral activities are many and varied. This chapter looks at the physical symptoms, their nature and extent, as a prelude to Chapter 4 which synthesises the underlying causes.

The environmental impacts associated with agriculture are generally the result of a complex chain of biophysical and other factors, not all of which involve human activity. There are often many contributing factors, including factors outside agriculture, operating over a long timeframe and wide area. This was emphasised by the Cooperative Research Centre (CRC) for Freshwater Ecology, which said:

> There are a number of things we have done to our aquatic ecosystems that have caused the observed degradation, but these factors are often operating together and interacting. (Sub. 139, p. 2)

There are also large variations in responses to these individual causes. Few impacts have a single cause, few practices have a single impact and the impacts are highly variable. Some of the problems are a legacy of past practices. Others are ongoing. As in the past, some in the future will be the unforeseen consequences of what may now be considered best practice. Many, such as dryland salinity, waterlogging, erosion and loss of biodiversity, can be linked to the clearing of deep-rooted native vegetation.

These environmental impacts and their causes are outlined in the following sections. They draw heavily on the recent State of the Environment Reports of the Commonwealth, State and Territory governments.

2.1 Biodiversity

As a result of its size, relative isolation and many climatic zones, Australia contains about 10 per cent of the world's biodiversity. It is thought to have more than a million species of plants, animals and micro-organisms, though only 15 per cent have been described. A large proportion of these are endemic (around 85 per cent of Australia's flowering plants, mammals, reptiles and inshore temperate zone fish). (SEAC 1996, pp. ES-11–ES-13)

In identifying loss of biodiversity as a serious problem, the national State of the Environment Report (SEAC 1996) drew on earlier studies to assemble a variety of indicators of changes in Australia's biodiversity. Our biodiversity and landscape have been changed by Aboriginal practices over thousands of years. However, the indicators concentrate on the substantial changes which have occurred since European settlement. A sample follows.

- *Ecosystem diversity:* Of Australia's 80 terrestrial biogeographic regions, only five are considered to be largely natural. Natural ecosystems are dominant in a further 19, with no widespread degrading land use, but some disturbance. In 40 of the regions, natural ecosystems are present, but coexist with pastoral and timber industries and alteration has been widespread. Natural ecosystems occupy a very small proportion of the remaining 16 regions (SEAC 1996, p. 4-28). Overall, nearly 70 per cent of all native vegetation has been removed or significantly modified (with as much cleared in the last 50 years as in the previous 150). Of the 9 per cent of Australia covered with forest in 1788, 40 per cent has been cleared, mostly for agricultural and pastoral use. Seventy five per cent of rainforests have been removed (p. 4-6). More than 60 per cent of coastal wetlands in southern and eastern Australia, nearly 90 per cent of temperate woodlands and mallee, and more than 99 per cent of temperate lowland grasslands in south-eastern Australia have been lost (p. 4-26).
- *Species diversity:* Five per cent of higher plants, 23 per cent of mammals, 9 per cent of birds, 7 per cent of reptiles, 16 per cent of amphibians and 9 per cent of freshwater fish are classified as extinct, endangered or vulnerable. Ten of 144 species of marsupials, including the largest carnivorous marsupial, and eight of 53 species of native rodents have become extinct. (SEAC 1996, p. ES-14)
- *Genetic diversity:* The genetic diversity of the northern hairy-nosed wombat, with only one small remaining colony in central Queensland, is less than half that of the southern species. Koala populations restocked from the islands of Westernport Bay in Victoria show severely less genetic diversity than undisturbed mainland populations. (SEAC 1996, p. 4-37)

While most of the above indicators are nationally focused, impacts on biodiversity can be significant at the local and regional levels as well. Many examples were provided by participants to the inquiry. For example, a study provided by the Australian Conservation Foundation (ACF 1991) found that 'Substantial loss of species has occurred in rural Australia' (p. 16). The WA Government said that biodiversity was widely recognised as one of that State's three worst environmental problems:

> Loss of species diversity is widely acknowledged in agricultural and pastoral areas. In pastoral regions, for example, loss of natural plant species diversity is a problem in at least 26 % of the area. ... Up to 50 % of remnant vegetation on private land will be lost to salinity, further hastening loss of species diversity. (Sub. 111, p. 1)

In addition, in commenting on its area of responsibility, the Murray-Darling Basin Commission said:

> More than 30 species of plants and animals have become extinct and another 70 are critically endangered. Over wide areas, less than 9 per cent of native vegetation remains. (Sub. 129, Attachment, p. 2)

There are many physical causes of declines in Australia's biodiversity. However, the destruction and modification of habitat — especially the clearing of native vegetation for agriculture, urban development and forestry — has been identified as a major cause (SEAC 1996, p. ES-13). As well as the direct loss, remaining unaffected areas can become fragmented and isolated, and less capable of supporting existing species.

Changes in river flows and water quality affect in-stream, coastal and marine habitats (such as on the Great Barrier Reef). The CRC for Freshwater Ecology (Sub. 139), for example, pointed to the construction of dams and weirs, and the use of water for irrigation, as impacting on aquatic ecosystems.

In addition, the provision of permanent water contributes to changes in biodiversity in arid and semi-arid regions. According to Mr Ross Blick:

> ... there is now little formerly dry rangeland further than 10 kilometres from an artificial water source ... about 25 per cent of native plant and animal species are disadvantaged by the presence of artificial water. (Sub. 87, Attachment, p. 4)

Introduced species can consume native flora and fauna, compete with native species for habitat (for example, cane toads and European carp) and sometimes carry diseases. Introduced commercial species can also impact on biodiversity. (For example, grazing is thought to be partly responsible for the extinction of 34 plant species — around 40 per cent of those plant species which have been lost over the last 200 years.) (SEAC 1996, p. 4-12)

Commercial harvesting of natural resources can have adverse effects if property rights are not well established or if the scientific basis for harvesting rates is inadequate (for example, declines in some commercial fish species). Tourism in sensitive ecosystems can pose similar threats if not well managed. (SEAC 1996, p. 4-9)

Other causes of changing biodiversity include: altered fire regimes (fire suppression or more frequent burning due to human intervention); pollution (for example, close to urban areas or where irrigation run-off contains insecticides and fertilisers); and climate change (because of effects on habitat) (SEAC 1996, pp. 4-21–4-22).

Australia has a rich heritage of biodiversity because of its long isolation from other land masses. There is significant public demand to retain the richness of that heritage, but to do so involves a cost, particularly the setting aside (or limiting the use of) significant areas of land to maintain essential habitat. Much of this will need to be in areas currently used for agricultural or pastoral activity. However, the nature of the public demand is such that conservation is not able to be, or is poorly, delivered by the existing market system. Landowners face incentives to use their land for commercial purposes, while there is only a very weak mechanism to reward private use for conservation, even if that use is of great value to society.

2.2 Dryland salinity

Dryland salinity has emerged as a significant problem in various parts of Australia. The clearing of trees, shrubs and deep-rooted perennial grasses to allow for agricultural production has enabled higher rainfall infiltration rates and a rise in groundwater levels. As groundwater rises, accumulated salts within the subsoils and rock profile are dissolved and deposited in the plant root zone. This eventually leads to a substantial reduction in soil productivity for all but the most salt-tolerant plant species. Due to the complexity of hydrological processes that affect groundwater movements, it can take many years before any evidence of salinity becomes apparent.

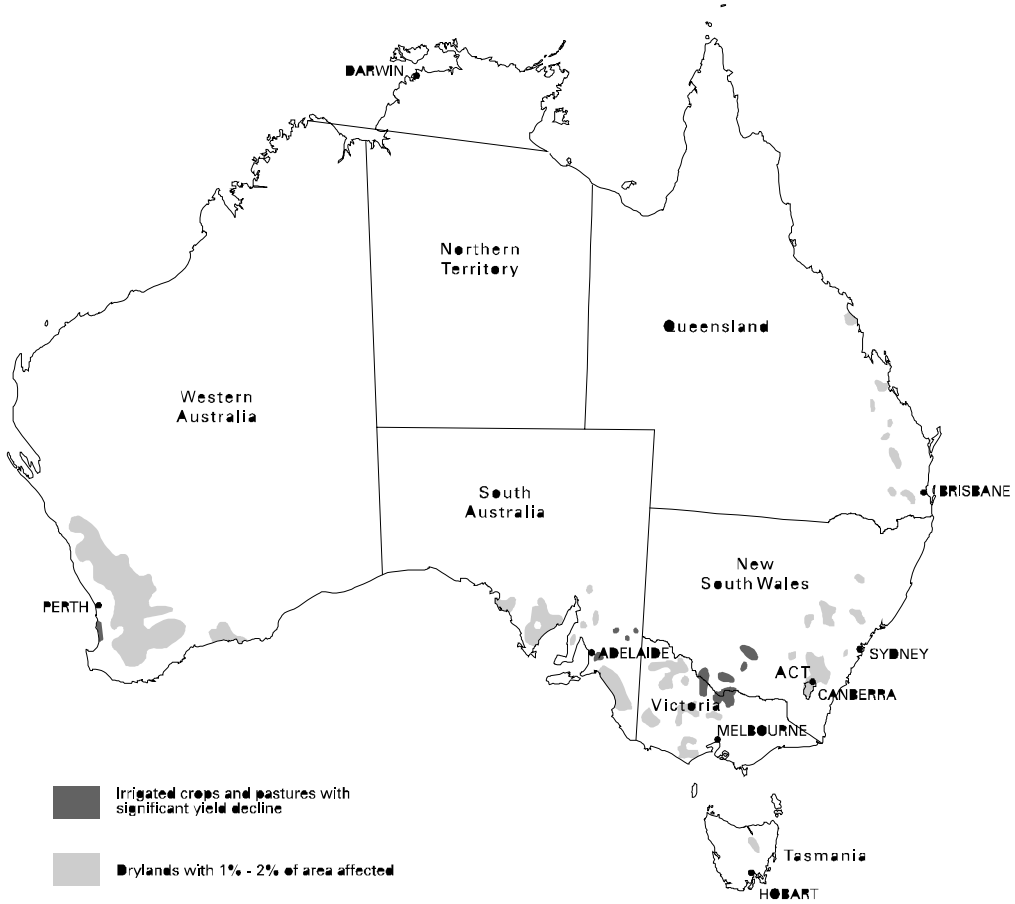
Recent estimates put the area of affected land at 2.5 million hectares nationally, with another 10 million hectares at risk (Western Australian Government 1996). Dryland salinity problems are present within most States. The worst affected area is in the south-west of Western Australia, with a reported 70 per cent of Australia's dryland salinity problem. Much of the affected land in the eastern States is encompassed within the Murray-Darling Basin, with South Australia, New South Wales and Victoria all having significant salinity problems (see Figure 2.1).

The current cost of dryland salinity is estimated to be $243 million per annum in lost agricultural production alone (Hill 1997). While this is the most significant impact, there are many other associated on- and off-farm costs. Other on-farm costs include secondary degradation of saline land, such as greater susceptibility to erosion; increased salinity and silting of on-farm water

supplies; increased fertiliser requirements; and loss of aesthetic values. Other off-farm costs include: damage to buildings and infrastructure such as roads, bridges, sewerage pipes and water supply systems; flood damage caused by increased run-off; reduced service life of electrical equipment; increased water treatment, cooling and steam generation costs; habitat decline (on land and in-stream), with consequences for biodiversity; and loss of aesthetic, recreational and tourism values (Watson et al 1997).

Retention of native vegetation and the strategic use of deep-rooted perennial plant species have been identified as important ways of reducing groundwater recharge and managing rising watertables.

Figure 2.1: **Area affected by dryland salinity in Australia**



Source: Supplied by the Australian Surveying and Land Information Group (AUSLIG).

While there can be significant on-farm effects of the removal of deep rooted vegetation, many effects are off-site, and are the cumulative impact of the decisions of many landowners in a region. While the off-site effects can cause

significant costs on others, there is limited incentive for individual landowners to take this impact into consideration when making decisions on the management of their own land. This can lead to decisions to clear vegetation that may be appropriate from the point of view of an individual landowner, but may be inappropriate when the effects off-farm are taken into consideration.

2.3 Soil acidification

Most soils naturally become more acidic as they weather. Many of Australia's soils, being old, are naturally acidic. But the process is accelerated by some agricultural practices, such as by the use of pastures based on annual grasses and subterranean clover, and by using certain nitrogenous fertilisers on crops.

Soil acidification causes nutritional disorders in plants. On the one hand, certain elements, such as aluminium, can become available to plant roots in toxic quantities. On the other hand, certain trace elements essential for good plant growth can become unavailable. Barley, certain kinds of wheat, and lucerne are particularly sensitive to the nutrient deficiencies caused by acidic soils.

Plants also become more susceptible to soil-borne plant diseases and the thinning of vegetation can allow weeds to invade and take over. The likelihood of wind and water erosion increases as the surface soil becomes more exposed. If the process is not arrested, the subsoil may become affected, and the problem may become virtually irreversible.

Major problems with induced acidity occur in Victoria, southern New South Wales and Western Australia, covering around 29 million hectares in total (SEAC 1996, p. 6-32) (see Figure 2.2). Estimates of the cost, in terms of lost production, vary, ranging from $134 million annually (DPIE 1991) to $300 million annually (CSIRO 1990a).

The main remedial measure consists of the application of lime to affected areas. Liming can be costly, and while it is usually viable in areas used for cropping, it is not always an economic option in the case of pasture land with low carrying capacity. Other solutions include the use of non-acidifying fertilisers and the growing of acid-tolerant plant species.

Figure 2.2: **Areas of Australia susceptible to induced soil acidity**

Source: Supplied by AUSLIG.

There is some limited evidence of off-site effects of soil acidification in the form of increasing acidity of creeks and rivers, with consequent effects on in-stream biodiversity. However, the bulk of the impacts are confined to the land on which it occurs. For that reason, the benefits from addressing the problem will accrue directly and predominantly to the landowner.

2.4 Acid sulfate soils

Acid sulfate soils are the common name given to soils containing iron sulfides. In Australia, they occur mainly along the northern coastline of Western Australia, and the coastlines of the Northern Territory, Queensland and New

South Wales, but patches are also found along the coast near Perth, Adelaide and Melbourne (Sammut 1996).

The iron sulfides are contained in layers of waterlogged soil, which, under natural conditions, are covered by water and colonised by native vegetation.). Undisturbed, and covered by water, iron sulfides are harmless. But once exposed to air, for instance through inappropriate drainage works associated with coastal development, they can go on releasing acid for many years. This can happen when an area containing iron sulfide layers is drained or excavated for agriculture or other kinds of development. The acid produced in this way can affect both soil and water and cause severe environmental damage. For instance, it can make the soil so acidic few plants can survive. It can cause reduced fish hatching and kill fish. Acid sulfate soils reduce farm productivity and reduce the viability of commercial fisheries.

Scientists have estimated that there are more than two million hectares of acid sulfate soils in Australia, containing about 1 billion tonnes of iron sulfides (Sammut 1996).

The preferred management technique for acid sulfate soils is to avoid disturbing or draining the sulfide iron layer. This may be possible by constructing wide, shallow drains, without exposing the iron sulfide layer. Avoiding disturbance may, in some cases, be the only cost-effective management strategy (NSW EPA 1995c). Once the sulfide iron layer is exposed and acid is forming, lime can be used to neutralise the acid, but this can be expensive for large areas (Sammut 1996).

Problems associated with acid sulfate soils have emerged only relatively recently and the Commission has received no information on the extent of any environmental damage. While much of the impact occurs on-site, leaching of acid can pollute creeks, rivers and coastal estuaries. Recent media reports have associated certain coastal developments with a decline in fish nurseries.

2.5 Soil structure decline

Soil structure refers to the physical characteristics of the soil, for instance its friability, its ability to form aggregates, and its air and water permeability. Many Australian soils have poorly developed structures in their natural state. European methods of cultivation, used widely since European settlement, have proved ineffective in maintaining or improving the structure of most Australian soils.

Figure 2.3: **Areas of Australia susceptible to soil structure decline**

Source: Supplied by AUSLIG.

When soil structure breaks down, organic matter is lost, the soil loses the ability to form clods, soil density is increased and the ability to absorb water and air is reduced. Increased run-off will occur, taking nutrients with it, resulting in stream pollution, silting and eutrophication. Compaction by animals and/or heavy machinery can cause wet boggy topsoils and the soil becomes difficult to cultivate. Under such conditions, seeds do not germinate easily, and plants do not reach optimum size and are susceptible to disease.

Areas most affected by soil structure decline in Australia are those west of the Great Divide in Victoria, New South Wales and southern Queensland, and the southern part of Western Australia (see Figure 2.3).

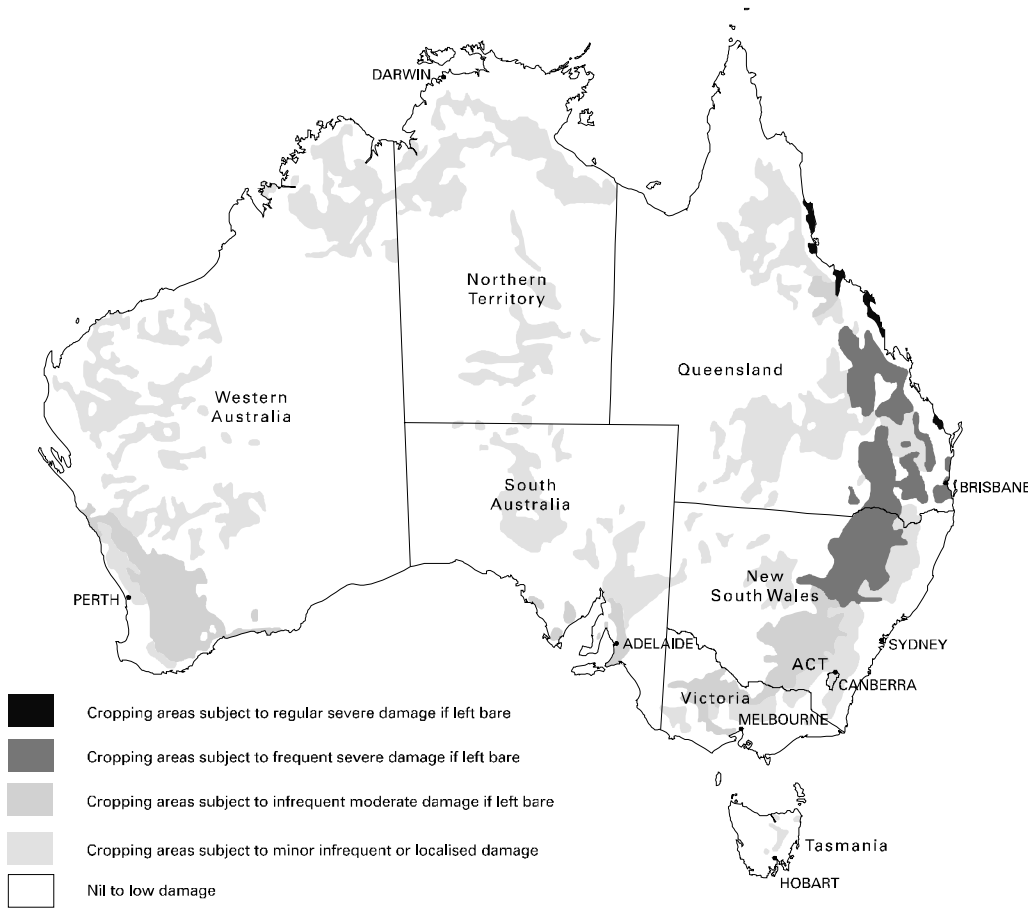
The Centre for International Economics (CIE 1997a) reported studies (Graham 1989, Geeves et al 1995) which indicated that most cultivated soils display some evidence of soil structural degradation. The Land and Water Resources

Research and Development Corporation (LWRRDC 1993) estimated that soil structure decline is costing Australian farmers around $200 million annually in terms of lost production.

A range of measures exist to improve soil structure. These include minimum tillage methods, stubble retention, mulching, contour cultivation, crop rotation, avoiding bare fallows and ensuring a good ground cover of plants. Compaction can be reduced by minimising heavy machinery traffic across paddocks.

Most of the effects of soil quality decline are confined on-site and the costs are borne by the owner of the land. However, soil structure decline can contribute to soil erosion which itself has off-site effects (see below).

Figure 2.4: **Areas of Australia susceptible to water erosion**



Source: Supplied by AUSLIG.

2.6 Soil erosion

Soil erosion is a natural part of the hydro-geological processes of the planet. However, certain land use practices can significantly increase the rate of soil loss. Some of this is an inevitable consequence of the disturbance to vegetation and of the soil as a result of agricultural activities. In Australia, these problems have been exacerbated by the use of European land management practices that were less suited to Australia's dry continent, shallow soils and extremely variable climatic conditions. (Areas of Australia susceptible to water and wind erosion are shown in Figures 2.4 and 2.5.)

Figure 2.5: **Areas of Australia susceptible to wind erosion**

Source: Supplied by AUSLIG.

The cost of soil erosion is difficult to determine. However, the Queensland Government (Sub. 164) estimated that the off-site effects of soil erosion in Queensland may exceed $30 million a year, based on the costs associated with road and rail maintenance, water treatment, dredging and the increased cost of inputs necessary to maintain the same level of agricultural production.

Soil erosion has a number of on-farm effects with a significant impact on yields and farm values. However, in most instances, because of the soil transfer in water run-off from degraded areas to other sites, soil erosion creates off-farm problems. This process can lead to the silting of rivers, waterways and dams and secondary degradation through the pollution of the environment from the transfer of organic matter, fertilisers, pesticides and other chemicals when carried in the water.

Changes in land management practices have made a major contribution towards controlling the problem. These practices include building contour banks to control and reduce water run-off, stubble retention, strip cropping, allowing the land to return to native forest and changes to cultivation or tillage methods to reduce soil disturbance.

2.7 Weeds

Any plant can be a weed under certain circumstances, including native species. The National Weeds Strategy, which was launched in June 1997, defines a weed as ‘a plant which has, or has potential to have, a detrimental effect on economic, social or conservation values’ (ARMCANZ et al 1997, p. 7).

The Australian environment is susceptible to invasion by exotic weed species as a result of a wide range of suitable habitats, climates and soil types and the absence of traditional predators to control spread. Weeds have entered Australia both deliberately and accidentally. The majority of environmental weeds are horticultural species that have escaped from cultivation. The prevalence of weeds can also be a symptom of land or environmental degradation.

Weeds degrade the environment and diminish the conservation value of heritage and other areas. They reduce the value of natural resources (waterways, bushlands and forests) for scientific, aesthetic and recreational purposes. In addition, weeds can damage the habitats of native fauna and flora. Exotic species may also carry diseases.

Aquatic weeds can interfere with water flows, prevent access for fishing and recreation, provide a harbour for diseases, cause deterioration in water quality and increase silting.

The cost to Australia of lost agricultural production, decreased quality and control measures due to weeds has been estimated at $3.3 billion per annum (SEAC 1996, p. 6-23). This excludes the direct costs of associated health issues, lost aesthetic and conservation values, and the off-site cost to the environment. The effect on biodiversity has also not been costed (CRC for Weed Management Systems, Sub. 224).

The CRC for Weed Management Systems said:

> Weeds are arguably the largest threat to biodiversity, after large-scale land clearing. It has been estimated that exotic plants have now displaced 17% of Australia's flora and most of these plants have been intentionally introduced. (Sub. 224, p. 1)

It also said land use needed to consider the extent to which land was disturbed by weeds to protect biodiversity and other values:

> When considering land use, biodiversity and weeds it is then important to conserve the undisturbed areas and limit weed invasion and maximise use of the disturbed sites to take pressure of the partially disturbed land. On partially disturbed areas that have some biodiversity values policies need to aim at optimising use such that native species are retained and used effectively.(Sub. 224, p. 2)

At the Sydney Public Hearing, Heathdon Agricultural Services said:

> ... all of the other ecological concerns in Australia are going to come to nothing, if we let this country just go to weeds. (Transcript, p.1893)

Weeds present a particular problem for landowners in that their effective control is difficult or expensive to achieve on an individual basis over the longer term. Re-infestation can occur from neighbouring land, and thus failure to control weeds on a property can impose significant costs on other landowners. Control requires concerted action by all landowners, including government, both to organise action by individual landowers and as a major landowner in its own right.

2.8 Pests

A pest is an animal which occurs where it is not wanted by humans. This includes domestic animals that have become feral and exotic species introduced to control other pests (for example, cane toads) or for recreation (for example, rabbits). Native species can also become pests, for example where changes in the environment induced by human impacts allow significant increases in the species' population.

Feral animals, insects and other animal pests compete with humans for the products of plant and agricultural production. They also compete with native

species and livestock for space, food and shelter. Pests, particularly those exotic to Australia, often have few natural predators and high reproductive rates; and can impart much damage to pastures and crops. They prey on native species and their constant movement and digging can create erosion problems. Pests can also be associated with the outbreak of disease.

The introduction of the fox, cat, rabbit, goat, donkey and pig to Australia has severely damaged the environment and threatened the existence of a number of native animal species. The rabbit, considered to be Australia's most destructive vertebrate pest, is estimated to cost primary industry in Australia at least $90 million and possibly up to $600 million per year (SEAC 1996, p. 6-20). Feral camels, horses and buffalo also affect the Australian environment, but are fewer in number. In addition, native species such as the kangaroo and some native birds and native rodents have become pests in some areas.

Invertebrate pests, such as insects, also cause major damage to the environment and affect agricultural production. Some of these pests, such as fruit fly, are native to Australia. The annual cost of insect damage in agriculture has been estimated at $3.1 billion and the annual cost of control is estimated at over $1 billion (SEAC 1996, p. 6-21).

In aquatic environments, carp and trout have caused considerable damage to freshwater environments. The introduction of these and other exotic fish has been associated with the decline of a number of common native fish species.

Pests, along with weeds, can reduce agricultural production to uneconomic levels. In total, it is estimated that around 30 per cent of potential agricultural production is lost as a result of weeds and pests (University of Melbourne undated). As a result, control costs are a significant proportion of the total cost of primary production. For example, in orchard management, control costs comprise up to 70 per cent of production costs (University of Melbourne undated).

In general, the management and control of most weeds and pests rests with individual landowners. However, their efforts are sometimes limited by the external/spillover effects of poor control on adjoining properties. The non-control of weeds on a single property, for example, could put a region at risk of invasion by weeds if the property becomes a seed bank. As Heathdon Agricultural Services said:

> Unless the group who is responsible for controlling these invasive weeds has the legal right, the will, and the means to access these seed banks, then any control on productive land will at best result in 'holding the fort'. ...
>
> [There is] no point in farmers controlling Blackberries along their fence lines only to have re-infestation from their neighbour... (Sub. 5, pp. 1-2)

A number of participants in the inquiry, noted the lack of control of weeds on Crown land (particularly in National Parks), which were developing into seed banks and had the potential to affect adjoining landholders (Victorian Farmers Federation, Melbourne Public Hearing; Heathdon Agricultural Services, Sydney Public Hearing; and Twynam Pastoral Company, Sub. 308). Poor pest control in National Parks was also raised (Twynam Pastoral Company, Sub. 308).

Current policies aim to cover the full range of actions associated with control, including quarantine, regulation and control programs, and research and extension. The National Weeds Strategy encourages a national approach to weed management (see Box 5.1, Chapter 5). The National Strategy for Ecologically Sustainable Development also has objectives aimed at weed and pest management. At the State level, strategies are in place to address existing problems and handle emergency responses within existing legislation.

Relevant Commonwealth and State legislation includes: the *Noxious Weeds Act 1964*, the *Rural Lands Protection Act 1985*, the New South Wales *Noxious Insects Act 1934* and the Victorian *Vermin and Noxious Weeds Act 1958*.

Increasing emphasis has been placed on the research and development of integrated weed and pest management and tools based on an increasing range of biological controls. Biological controls, however, involve long-term high-risk research. In the short (and long) term, effective weed and pest management will continue to depend on strategic coordinated regional management using existing control techniques.

Pests present a problem similar to that presented by weeds. That is, it is difficult for landowners to achieve on an individual basis over the longer term, with the threat of re-infestation from neighbouring land. Failure to control pests on a property can impose significant costs on other landowners. Control thus requires coordinated action by landowners, including government which is a major landowner in its own right.

2.9 Exploitation of surface water

Increased demand for water in Australia is placing increasing pressure on the environment of inland surface waters and is contributing to land degradation. For example, irrigation has resulted in land and water salinity from rising watertables, adversely affecting agricultural production. In addition, reduced stream and river flows from water diversion and flood mitigation can reduce water quality and result in loss of biodiversity in aquatic environments.

In parts of both the Murray-Darling Basin, where some 80 per cent of the median flow is currently being extracted from the river system (mostly for

agriculture), and eastern coastal regions, water is grossly over-allocated. This is placing aquatic environments under severe stress in these regions (SEAC 1996, p. ES-21). Recently, the Murray-Darling Basin Commission considered that the over-allocation problem warranted placing a cap on extractions from the river system.

River regulation, together with the increase in consumptive use of water, is resulting in substantial impacts on the health of the riverine environment. Rivers have been altered by significant changes in the volumes of annual flow, in the distribution of flow throughout the year, and in the length of low flow periods. These changes have resulted in: increases in stream salinity; reductions in the frequency of flooding of some wetlands and the permanent inundation of others that would be seasonally dry, each resulting in significant damage to some ecosystems; river conditions which are more suitable for the growth of blue-green algae; and declines in native fish populations.

The provision of water has generally been heavily subsidised. In addition, the methods for rationing that demand and for allowing available supplies to be allocated to the most highly valued uses — including the environment — have been inadequate. Past systems of access rights to water have, to varying degrees, treated surface water as a common good with unregulated access. While such arrangements may be appropriate where water supply is abundant and its harvesting does not create problems for others, this is generally not the situation in Australia. In most areas, water is scarce and a lack of clearly defined rights to it, in addition to its subsidised access and use, have resulted in inappropriate use and over-allocation of the available supplies.

2.10 Quality of surface water

Many activities, including agriculture, use water as an input. When that water is returned to surface waters, its quality is diminished. Also, agriculture and other activities use surface waters as a means to dispose of wastes, or pollutants inadvertently escape into these waters from a range of sources. These drainage sources contribute to reduced water quality in rivers, lakes, farm dams, and irrigation systems. The extent to which water quality is reduced depends largely on the capacity of those waters, and the ecosystems they support, to assimilate pollutants.

Water quality in receiving waters broadly reflects the management of the adjoining land. Management practices, such as the removal of natural vegetation, can have unforeseen effects on the land itself and, as a consequence, on water quality. Run-off of water from agricultural land affected by dryland or irrigation salinity and soil erosion, or with high nutrient sources, impacts on

water quality by increasing salinity levels, turbidity and the nutrients that facilitate blue-green algal blooms. Other pollutants, such as pesticides and trace metals can also enter waterways and add to water quality problems. These effects have implications both on-farm (through irrigation channels and farm dams) and on downstream water users, including the environment.

Agricultural activities generate waste pollutants from both point sources (for example, dairy sheds, cattle feedlots, horticulture tailwaters) and non-point sources. Pollutants from either of these on-farm sources can, once they make their way into waterways, have diffuse off-farm effects. While the extent of impact depends on the type of pollutant and the assimilative capacity of the receiving waters, there is generally little incentive for the impact of pollutants on downstream users to be taken into account in the production decisions of agricultural activities.

2.11 Exploitation of groundwater

Over-use of groundwater resources and the disturbance of recharge/discharge patterns are contributing to land and water degradation.

Groundwater underlies some 60 per cent of Australia, or around 5.2 million square kilometres. In total, it provides about 14 per cent of all water used for human activities. As surface water scarcity increases, demand for groundwater resources is likely to increase for both consumptive and environmental uses. In area terms, human activity in about 60 per cent of the continent is almost totally dependent on groundwater and elsewhere it is used to supplement surface water supplies.

There are in the order of 500 000 wells used for groundwater extraction of which about 100 000 are licensed and represent the major users, principally for irrigation and urban water supply. The national value of groundwater infrastructure assets is in the order of $6.5 billion, the vast majority of which is owned and operated by individuals (SKM 1995, p. v).

Nationally, the amount of groundwater used is estimated to represent about 15 per cent of that available. However, this figure disguises the fact that in many areas of Australia the groundwater resource is already over-developed. Groundwater is being used faster than it is being replenished in at least 13 basins across Australia, including the Burdekin Delta in Queensland, the Namoi Valley in New South Wales and the North Adelaide Plains in South Australia (ABS 1992, p. 171). Over-allocation can lead to ‘mining’ of the resource, rather than sustainable development of a potentially renewable resource. In some basins, depletion of the resource is resulting in seawater intrusion. In

other basins, rising groundwater levels, due to vegetation clearing and irrigation, are leading to waterlogging and increasing the salinity of streams and large areas of land. The availability of permanent water in previously unwatered areas has also impacted on biodiversity and the natural landscape.

As with surface water, groundwater has generally been treated as a common property resource, with unregulated access, poorly defined rights, and 'thin' or non-existent markets in which to establish a value for the various uses of that water, including its environmental value. In addition, inadequate information on groundwater resources and their inter-relationships with surface water systems has contributed to the extent of degradation resulting from groundwater use.

Great Artesian Basin

The Great Artesian Basin (GAB) is the largest artesian groundwater aquifer in the world. It underlies approximately one-fifth of Australia and extends beneath the arid and semi-arid parts of Queensland, New South Wales, South Australia and the Northern Territory. More than 4000 flowing bores have been sunk. By 1990, just over 1000 bores had stopped flowing.

Bore drains reticulate the water flowing from bores in open earthen channels, often through several properties. It is estimated that up to 90 per cent of water is lost in open earth drains due to evaporation and seepage (Batterham 1996, p. 3). Also, there are a variety of other problems associated with the bores and drains.

While discharge from the aquifer currently exceeds recharge, there is sufficient water in the GAB for continued use at current rates of usage over recharge of many thousands of years. However, the heavy draw on the GAB by the large number of freely or mainly freely flowing artesian bores has caused a marked lowering of water pressure levels in some regions. Some previously free-flowing bores now require pumping. The fall in groundwater pressures within a local region means that the use of artesian water by one landholder affects neighbouring landholders. The extent of the effects of any individual bore on the entire GAB is unclear and probably very limited.

The spread of permanent waters away from major river and creek systems facilitated the introduction of domestic stock to previously unwatered areas. This was also accompanied by the spread of feral goats, feral pigs and kangaroos. The increase in animals found in these arid regions meant that the total grazing pressure was dramatically increased and with this began the changes to the native biota and landscapes.

There are also land degradation problems associated with the use of free-flowing artesian bores and open earth drains. During heavy rainfall the bore drains act as an artificial stream and can lead to localised soil erosion. Overgrazing occurs as stock are confined to grazing within a 3 kilometre walking distance from the drains.

2.12 Quality of groundwater

Groundwater is an integral component of the hydrologic cycle. At its source, it is inextricably linked to the surface environment. Any disturbance to that environment can affect groundwater aquifers. These aquifers may be unconfined or confined, and may be further classified as surficial, sedimentary or fractured. They are all susceptible to pollution where they intersect the surface (SEAC 1996, p. 7-24).

Contamination of confined aquifers occurs via their often very limited recharge areas, with the contaminants being carried by lateral flow through the aquifers. Consequently, activities in these limited recharge areas are of critical importance to maintaining groundwater quality. Water quality in unconfined aquifers is more difficult to control, as the recharge areas are much broader and there is significant interaction with surface water systems (DIST 1996, p. 90). The hidden and generally slow moving nature of the groundwater resource adds to the difficulties.

In farming regions, agricultural chemicals such as herbicides, pesticides and fertilisers may enter groundwater through run-off and leaching, with consequent degradation of their quality. Of major concern, from both an economic and environmental perspective, is the increasing salinity of many groundwater systems.

Agriculture is only one of many point and non-point sources of pollutants contributing to reduced groundwater quality. Others include nutrients from septic tanks, organic compounds from petroleum product storages and a range of contaminants from unlined dump sites.

Typically, much remains unknown about the soils, geology and microbial activity in the shallow and deep aquifers through which leachates travel. Ignorance and uncertainty of how groundwater systems ‘operate’ have contributed to the extent of degradation of groundwater quality.

2.13 Impacts of irrigation

Irrigated agriculture has contributed to changes in the water quality and flow in major river systems, affected local and regional watertables, and altered catchment ecology. Two of the major environmental issues facing many irrigation regions, and emerging in others, are salinity and waterlogging. These conditions are undesirable for both native and agricultural plants, and have adverse effects on aquatic and riverine environments.

Salinity in irrigated areas occurs as rising watertables bring saline groundwater into the root zone. This generally happens as a result of leakage from irrigation channels, inadequate land drainage and excessive water use by irrigators. It must be recognised, however, that successful irrigation requires more water to be applied than is needed for plant transpiration so that residual salt is leached beyond the root zone.

Increased salinity may also be caused by subterranean inflow from non-irrigated areas that have been cleared of deep-rooted vegetation. For salinity to occur, it is necessary to have both an increase in water reaching the groundwater system and a source of salt to remobilise to the ground surface. The soluble salts may come from a number of sources including: dissolved salts in the irrigation water; salt in the soil profile that is redistributed in regional groundwater systems through downward water movement; and lateral flow from an impounded source (for example, channels or rice paddies) or pumped from sub-artesian sources. If salt is not available, only waterlogging will eventuate. Over time, and depending on evaporation rates and the degree of flushing, salt concentrations increase until they affect crop yields. Waterlogging on its own can also reduce crop yields.

As an example, more than 250 000 hectares of land in New South Wales are currently affected by high watertables, with some areas affected by irrigation salinity. The impact on agricultural production is significant, with yield losses of up to 30 per cent being common (NSW Agriculture, Sub. 186, p. 5). In the Murray-Darling Basin, the value of production forgone from salinity (and waterlogging) has been estimated at $65 million annually. The downstream cost to urban, industrial and agricultural users has been estimated at $37 million, rising to $57 million per year by 2015 (Young 1990).

Inefficient irrigation practices are a major cause of irrigation salinity and waterlogging. These practices are sometimes exacerbated by the inappropriateness of the site for the form of irrigation being used.

The effects of irrigation-induced salinity and waterlogging of the land are principally confined on-farm or within the irrigation region. However, once the salt is exported to waterways, via run-off (both point and non-point source) or

sub-soil drainage, it can also have diffuse off-site effects which impact on downstream water users, including the environment (that is, in-stream, riparian and wetland ecosystems).

2.14 Urban expansion

The demand for land for urban use can be seen as simply one element of a range of demands for the use of land in Australia. A variety of problems and issues arise where residential and agricultural land use is contiguous or where land is being transferred from one use to another.

Urban expansion increases the price of adjacent rural land, providing benefits to the landowner through the capital gain. But it also increases the rates for rural land, in turn decreasing the returns from agricultural activities. The subdivision of rural land into rural residential or hobby farms is claimed to have a disproportionate impact on the environment from intensive farming and stocking on the smaller parcels of land. The close proximity of rural activity to residential areas leads to conflict between farmers and non-farming residents from the adverse effects of spray drift, dust and odour from farming activities on neighbouring residents. The presence of non-farming residents can also produce adverse effects on agricultural activities, such as dog attacks on stock and poor control of pests and weeds.

The loss of agricultural land is sometimes viewed as a loss to society as agricultural activities are displaced to inferior or distant land. However, the process of converting agricultural land to urban uses does not imply a net loss to society if the higher price paid for land for urban use reflects its value to society.

As the South Australian Farmers Federation said:

> Rural living occurs because of the attractive lifestyle and the lack of profit from agriculture — ie there is demand and the option of sale is more attractive than continuing with the current land use. (Sub. 89, Appendix 2, p. 1)

Certain factors could, however, result in a non-optimal outcome for society as a whole. This may occur when development is subsidised. For example, the underpricing of infrastructure provision may act as an incentive to excessive urban fringe development.

3 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

This chapter discusses the goal of ecologically sustainable development that has been endorsed by Australian governments and is fundamental to ESLM. This involves a discussion of the implications of intergenerational equity. In doing so, the chapter explores the concept of natural capital — or renewable natural resources such as the atmosphere, the oceans and forests — and application of the precautionary principle to public and private decisions with uncertain environmental impacts. It concludes by outlining the nature of biological diversity and its place in ecologically sustainable development.

Economic activity makes a variety of uses of the environment. The environment is the source of the natural resources used by industry — its land, water, timber and minerals for example — and is a sink for its wastes. The economic use of the environment has, in turn, significantly disturbed many ecological systems and processes.

Since the early 1970s, popular concern has grown about the impact of economic activity on the environment. Australians now rate the destruction of habitat and ecosystems, the extinction of species, and the degradation of land and water among their major environmental concerns. In a survey by the Australian Bureau of Statistics (ABS 1996b) of the environmental concerns of Australians in June 1994, the impacts of most concern were air pollution (34 per cent of respondents), pollution of the ocean (27 per cent) and destruction of trees and ecosystems (26 per cent). Freshwater pollution rated fourth (25.5 per cent), with extinction of species seventh (13 per cent) and land degradation ninth (10 per cent). The greenhouse effect rated eleventh (9 per cent).[1]

As Chapter 2 illustrates, many of these impacts are associated, if not exclusively, with agricultural production. As the State of the Environment Report commented:

> Much of Australia's agricultural land is ... under pressure from erosion, loss of vegetation cover and overuse of irrigation water. Problems such as soil salinity, acidification and rising groundwater all appear to be increasing in severity. Soil

[1] Respondents were allowed to identify more than one problem.

> fertility is declining in one-third of all cropped land, more than offsetting the improvement in the fertility of 10 per cent of land. (SEAC 1996, p. 10-17)

Concern about the impact of economic development on the environment has been a worldwide phenomenon. This concern lead to the emergence of the notion of 'sustainable development' that was popularised by the United Nations World Commission on Environment and Development (the Brundtland Commission).

The Brundtland Commission's report, *Our Common Future*, defined sustainable development as 'economic development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987). As the Victorian Government (Sub. 341) pointed out, the report also notes that sustainable development means 'adopting lifestyles within the planet's ecological means' (p. 7).

Perhaps the most elegant description of sustainable development has been given to us by UK Prime Minister Margaret Thatcher. At the British Conservative Party Conference in 1988 she said that:

> No generation has a freehold on the earth. All we have is a life tenancy — with a full repairing lease. (Quoted in Cairncross 1991, p. 6)

Australian governments have embraced sustainable development under the title of ecologically sustainable development (ESD). ESD '... aims to meet the needs of Australians today, while conserving our ecosystems for the benefit of future generations' (COAG 1992a).

3.1 National Strategy for Ecologically Sustainable Development

In 1992, Australian governments adopted a National Strategy for Ecologically Sustainable Development. Its core objectives are to:

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

The National Strategy is concerned with the idea that the actions of the present generation should not compromise the ability of future generations to enjoy at least the same living standards and quality of life as the present generation

enjoys. This is referred to as intergenerational equity. The Intergovernmental Agreement on the Environment (IGAE) elaborates what it means in the following terms:

> the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. (COAG 1992b, p. 14)

The National Strategy defines community living standards and quality of life broadly. They are not confined to those goods and services that are included in national income. The Strategy explicitly includes biological diversity (biodiversity) and ecological integrity.

The related National Strategy for the Conservation of Australia's Biological Diversity defines biodiversity as:

> the variety of all life forms — the different plants, animals and micro-organisms, the genes they contain, and the ecosystems of which they form a part. (Commonwealth of Australia 1996)

Biodiversity has three components: the diversity of entire ecosystems (such as the rangelands of central Australia or the tropical rainforests of north-east Queensland); the diversity of species within these ecosystems; and the genetic diversity within each of those species. Clearly ecological systems and processes are the most important of the three — as the other two depend upon them. Biodiversity also has a spatial dimension. Some ecosystems, species or varieties are found in many parts of the country. Others are confined to one country, region or locality.

Four broad rationales underpin the objective of conserving biodiversity:

- ecosystem processes — biodiversity underpins ecosystem processes which are necessary to maintain or regulate water resources, soil formation, the recycling of nutrients, atmospheric quality and climate;
- economic — plants, animals and ecosystems are potential sources of food and medicines, are tourist attractions and provide resources for industry, agriculture and forestry;
- aesthetics and culture — for example, people can obtain amenity and recreational benefits from biodiversity, and it contributes to Australian, and within it to Aboriginal, culture; and
- ethics — the belief that there is a moral duty to avoid the extinction of other species (which is also related to intergenerational equity). (SEAC 1996, p. ES-13)

3.2 Issues in implementing ESD

Although there is general agreement on the core objectives of the National Strategy on Ecologically Sustainable Development, they do not define what should be done with any precision. Moreover there are significant differences of opinion as to what needs to be done.

The Natural Resources Council of South Australia argued at the Adelaide Public Hearing that the actions required for ESD include the following:

- not to add to natural systems at a rate faster than the capacity of those systems to absorb and recycle the substances that are being systematically added to it by human activities; and
- not to harvest a natural system at a rate faster than the capacity of that particular system to yield a surplus.

Friends of the Earth Australia concluded that ESD should be based on:

> Ecologically sustaining management practices which meet present and future needs of the community by maintaining or enhancing (nor in order of priority):
>
> - protection of biological diversity
> - economic profit of production
> - natural resource base used in production and
> - social equity. (Sub. 201, p. 2)

Young (1993) considers that intergenerational equity '... requires the present generation to live within and only off its income. ... It also requires us to provide future people with an endowment equivalent to that we received' (p. 17).

However, the Meat Research Council pointed to the practical difficulties:

> Intergenerational equity sounds easy enough, and we would all agree in principle that we do not want to limit the 'chances' of future generations. The great problem is that we are very inept at predicting the future, so what makes us think we can predict the needs of future generations — we could limit this generations' development by preserving say oil supplies for future generations only to find they do not need it. (Sub. 264, p. 11)

At the roundtable discussion in Adelaide, Roger Swift of the CSIRO observed that the needs of future generations have yet to be defined, and it is not clear what state the land should be passed on to future generations.

Central to the capacity to maintain or improve welfare over time is the stock of capital, broadly defined, inherited from the previous generation. This includes the endowment of knowledge and know-how, the capital made by human beings

(buildings, machinery, plant and equipment, economic and social infrastructure) and the resources provided by nature.

In the case of natural resources, for the purposes of this discussion it is useful to distinguish between those natural resources that make up the biophysical systems that are necessary for sustaining life and ecological processes — often termed natural capital — and those natural resources that are not — such as mineral and petroleum resources.

Some object to the use of the term 'natural capital' in any discussion of intergenerational equity and ecologically sustainable development. On this point, Mr William Lines felt that the chief conceptual problem:

> ... lies in the notion of 'natural capital' itself — of understanding and valuing nature in the lexicon of economics. (Sub. 228, p. 2)

The Commission considers that the term 'natural capital' is useful because it reminds us that these resources are valuable in that they provide a stream of benefits to present and future generations. It is these benefits that determine the level of welfare and wellbeing of each generation that are the focus of ESD. The use of the term does not imply that all these benefits are only obtained from using the resources to produce goods and services for the economy nor does it preclude benefits of an ethical or intrinsic character. Man-made capital also has non-market benefits associated with it.

Natural capital

Natural capital has a number of features that distinguish it from other forms of capital. It provides *multiple joint services* for the community. For instance, in addition to providing timber, forests provide an important habitat for a wide range of plants and animals; regulate groundwater levels; prevent soil erosion; maintain water quality in river catchments; are a tourist, recreational and cultural attraction; and are a source of potentially useful food, fibre and pharmacological products — such as bush medicine and bush tucker. For example, the value of plant-based drugs produced in OECD countries was estimated at about $43 billion in the mid-1980s (Cairncross 1991, p. 58).

Most natural capital is *common property*. As it is not owned by any one individual, it is not traded between individuals and there is no way to establish the extent of its economic value to them. Equally there is no way to value the effects of the use of the resource on third parties. On the other hand, as the NSW Irrigators' Council observed:

> ... insofar as markets can be brought to bear on resource availability, ... the problem of resource depletion is largely self-correcting because *as resources*

> *become scarce their prices rise, which in turn slows down consumption and encourages the search for substitutes.* (Sub. 263, p. 3, emphasis in original)

Much natural capital has the characteristics of a *public good* (see Chapter 4). For these reasons natural capital is intrinsically difficult to value in economic terms, let alone ethical ones. Where the value of some of the services of natural capital is not evident, individual decisions on its use and conservation will not reflect its total benefit to the community as a whole.

On the measurement and valuation of natural capital, Environment Australia commented that:

> Intergenerational equity cannot be measured by economic methods alone ... 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 intergenerational 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 values are subjective, measurement cannot be fully objective, and economic surrogates are of debatable use. (Sub. 175, pp. 28–29)

Ecological systems and processes are complex, non-linear biophysical systems. Up to a point they are capable of withstanding disturbance but when that limit is exceeded they can undergo dramatic change and can resist returning to their previous states. This can result in *irreversible losses* of natural capital. For example, species can become extinct once their numbers fall below a critical level. Individual habitats cease to function once reduced to levels too small to sustain their complex biophysical relationships. Similarly, if the earth were to lose its ozone layer, it is unlikely to be able to be re-created on a human time scale.

Pervasive uncertainty surrounds natural capital both now and, perhaps more significantly, into the future. Our understanding of ecological systems and processes is extremely poor, so that there is pervasive uncertainty about the point where the loss of natural capital becomes irreversible. Most plant and animal species in Australia have not even been named and described by scientists (SEAC 1996). Many of those that have been have since proven to be valuable to human beings, even if only in indirect ways. Pervasive uncertainty increases the difficulty of valuing natural capital.

The intergenerational bequest

In the pursuit of their own interests, individuals have shown a strong willingness to provide for their descendants. As a result, the stock of knowledge, technological know-how and manufactured capital has increased generation by generation. Each generation has become better off in terms of its material living standards than the previous generation and very substantially better off than the ones before that. This process may be expected to continue of its own accord.

In support, the NSW Irrigators' Council quoted the conclusions of a study of the subject by the Tasman Institute:

> If we leave intertemporal resource allocation to market processes, the evidence suggests that most people will in fact provide for an increased standard of living for the next generation, even though they discount future consumption relative to current consumption. ... The enormous sacrifices of countless immigrants to Australia, the US, Canada, New Zealand and similar countries are testimony to the bequest motive. (Sub. 236, pp. 8–9)

In such circumstances, the overriding issue for ecological sustainability is to promote an efficient and growing economy as this maximises the resources available to individuals to provide for the next generation.

However, there are two key issues for ecological sustainability in relation to natural capital. Firstly, can the increase in knowledge, technological know-how and manufactured capital substitute for any loss of natural capital that may result from the production of man-made capital? Secondly if substitution is not possible, to what extent will individuals take care of the natural capital bequest on their own?

Scope for substitution

There are differing views as to what substitution is possible. The optimistic view of the possibilities is based on a rosier outlook for the technological alternatives to natural capital. On this basis:

> ... 'sustainable development is a situation where a country's per capita aggregate capital stock is non decreasing over time'. Aggregate capital stock is a function of natural, manufactured and human capital. (Hill 1997, p. 9)

Pearce et al (1989) support a less optimistic view. This is summarised in the following way.

> On one view of sustainable development [the] bequest [to future generations] comprises a 'mix' of man-made and 'natural' capital. It is the aggregate quantity that matters and there is considerable scope for substituting man-made wealth for the natural environmental assets.

> Even on this broad view of wealth bequest, sustainable development involves valuing the environment 'properly'. As long as the services of natural and other environments are treated as 'free goods' the wrong mix — from the standpoint of economic efficiency — of natural and man-made capital will emerge.
>
> The broad concept of wealth bequest needs supplementing with a concern to avoid irreversible losses of environmental assets. But there are strong reasons to think of sustainable development as involving a further constraint, namely that the stock of environmental assets as a whole should not decrease. This is consistent with overall wealth increasing through time, but places greater emphasis on environmental conservation than the broad wealth bequest concept. (Pearce et al 1989, p. 48)

According to this view, as long as natural capital is not exploited beyond a critical point, it can be harvested or used on a sustainable basis for all time and does not compromise the welfare of future generations.

As there are no practical substitutes for most, if not all natural capital — for example individual species, the ozone layer, the atmosphere — prevention of irreversible losses is a key element of the actions required for ESD. But to what extent can individuals be expected to act to conserve natural capital for the next generation? It is to this question that we turn to next.

Scope for individual action

The Tasman Institute has pointed out that markets can simultaneously reflect many of the more extreme views on the value of an asset:

> Since the value of an asset hinges on expectations of what others may pay for access in the future, in market economies those investing in future outcomes — often labelled speculators — become the representatives of future generations in today's markets. They are able to perform this function even when the prevailing view of their own generation is that such actions are not worthwhile. For example, a large number of now famous works of art have been preserved over many centuries, despite their contemporary unpopularity [and] private endowments decades ago preserved the nestings of eagles and other birds of prey when both agriculturalists and their contemporary environmentalists saw such actions as harmful. (Moran, Chisholm and Porter 1991, quoted in NSW Irrigators' Council, Sub. 263, p. 8)

Jeff Bennett of the Australian Defence Force Academy has identified a number of reasons why private interests act to conserve natural capital (Bennett 1996). Many individuals do so out of altruism. Some private firms act to show that they are a good corporate citizens or to promote an environmentally responsible image. Groups of motivated individuals join clubs and other not-for-profit organisations dedicated to voluntary conservation.

In support of his conclusions, Bennett cited numerous examples in Australia and New Zealand:

- commercial protection of areas by Earth Sanctuaries Limited;
- forest areas in New South Wales, Queensland and Tasmania owned by the Australian Bush Heritage Fund;
- the Koala Research Foundation raises $3 million each year for research and to support activities in koala sanctuaries;
- the New Zealand Forest Restoration Trust owns six reserves;
- the Victorian Trust for Nature buys, rehabilitates and then sell properties with a conservation covenant on them; and
- a range of clubs and societies such as the Royal Forest and Bird Protection Society of New Zealand with 55 000 members and 1 000 hectares of land.

The voluntary actions of individuals, not-for-profit organisation and private firms are not likely to be sufficient to prevent each and every irreversible loss of natural capital — the transactions costs will simply be too great. The transactions costs of voluntary collective action are likely to increase with the scale of the habitat or ecological process in question.

Nevertheless, given the cost efficiency and service quality advantages in private provision of such conservation it is clearly important to remove any impediments to such activities.

Precautionary principle

The existence of pervasive uncertainty calls for the adoption of an appropriate approach to risk management. This has been provided by the adoption of the precautionary principle under the IGAE.

The IGAE defines the precautionary principle as follows:

> Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. (COAG 1992b, p. 13)

It goes on to state that:

> In the application of the precautionary principle, public and private decisions should be guided by:
>
> (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and
>
> (ii) an assessment of the risk-weighted consequences of various options. (COAG 1992b, p. 14)

The full implications of the precautionary principle are certainly open to argument. That said, the precautionary principle clearly shifts the 'burden of proof' associated with development projects. The proponent of the development in question must prove that harm will not occur, rather than the opponent prove that it will. This shift does not mean that:

> ... all developments with uncertain ecological impacts should not proceed as that would be to forgo benefits for current and future generations without justification. (Young 1993, p. vi)

But it does mean that:

> ... all options need to be explored when considering a significant irreversible action of unpredictable future consequences. Further, such actions should only be undertaken when large social costs would otherwise be incurred by the current generation. (Young 1993, p. vi)

At the Melbourne Public Hearing, Peter Christoff, a lecturer in the Department of Geography and Environmental Studies at the University of Melbourne, said:

> ... a greater emphasis on the precautionary principle may be the way to draw into focus the need for flexibility in ecological management. (Transcript, p. 2198)

Friends of the Earth Australia also noted the importance of the principle:

> Scientific knowledge is not sufficient to determine at what point ... ecosystems may reach the state of collapsing. Hence, it is vital that the precautionary principle be applied in all land management, but particularly in regions which are especially under stress. (Sub. 201, p. 2)

Population

A number of participants pointed to the conclusion in the State of the Environment Report (SEAC 1996) that population growth, lifestyles and human expectations result in the major pressures on biodiversity.

They went on to propose a population policy for Australia. They argued that such a policy was essential to the ecological sustainable management of land in Australia. These participants argued that ecologically sustainable management of land would not be possible unless there was less pressure for the commercial exploitation of agricultural and pastoral land and that to reduce this pressure, Australia should limit its population growth.

The participants in question included the Animal Societies Federation (Sydney Public Hearing); Australian Conservation Foundation (NSW Branch) (Sub. 268); Australians for an Ecologically Sustainable Population (AESP) (National Office) (Sub. 291); AESP (NSW Branch) (Sub. 278); AESP (Victorian Branch) (Sub. 297); Mr Col Friel (Sub. 215); Mr Geoff Grace

(Sub. 272); Ms Astrid Herlihy (Sub. 286); Melville Conservation Group (Sub. 287); Sutherland Shire Environment Centre (Sub. 273); Mr Paul Trevethan (Sub. 299); and Dr Christopher Watson (Sub. 236).

The Commission considers the linkages between the level of the Australian population and the ecologically sustainable management of land are, at best, weak. Moreover, the issues raised by population growth and any policy to control it go well beyond the terms of reference for this inquiry.

Australian agriculture is highly export orientated and most of its output is sold on world markets. The contribution of the Australian economy to the level of world demand for each of the commodities produced here is insignificant. Any influence of the size of the Australian population is largely confined to the share of Australian production exported. The decisions by Australian farmers on *how* to utilise their land is for all practical purposes unaffected by Australia's population size.

The growth of the population does affects the size of urban areas. However it is, by no means, the only factor that influences on urban expansion. The influence of urban expansion on the ecological sustainable management of land is discussed in Chapter 20.

In the circumstances, the Commission considers that the additional issues raised by participants in relation to population growth would be best considered in another forum.

3.3 Conclusions

Without the intervention of government, the natural capital that is essential to our welfare and wellbeing, and to that of future generations, cannot be protected to the extent that the community would like.

> Pollution, like fraud, is something you impose on others against their will so that you can perhaps gain financial advantage. It is an ill for which the operation of the free market provides no automatic cure. Like the prevention of violence and fraud, pollution control is essentially an activity which the State, as protector of the public interest against particular interests, has to regulate and police. (Ridley 1989)

Protection of the environment is essentially an issue of the distribution of the rights of individuals to the services of natural capital — both within the existing generation and between generations.

Although there is agreement that intervention by government is necessary for ESD, the form and the extent of the intervention is not. Perhaps more

significantly, views on what should be done are likely to change with recent experience of what has been done in the past. In other words, ESD is a continuous and adaptive process, not a particular state for which to aim.

The Department of Defence agreed:

> Society will, and should, demand continual improvement in the way land is managed and ideas about what products are most valuable from land will change as societies mature and refocus their activities. By the same token, as we gain new knowledge about how our natural ecosystems work and our relationship to them, the biophysical goal posts are likely to shift.
>
> ... Sustainability is not a point we intend to achieve, but a goal that we should be working toward and constantly assessing our progress and making adjustments. (Sub. 208, p. 2)

The Natural Resources Council of South Australia said:

> ESD objectives can only be achieved by taking a holistic approach to natural resource management: one that contains all essential elements and can incorporate all natural resource interests. (Sub. 250, p. 2)

Ultimately resolution of what is to be done at any time can only be determined by reference to the preferences of the community. This involves the use of political processes. The achievement of robust decisions from political processes requires an informed debate on the key issues — with input from and consultation with the public. It is not without its risks. Although it is clear that the market will not conserve as much natural capital as individuals are willing to pay for, it is not certain that the political process will deliver a superior result every time or even most times. Indeed, in the past the actions of government have been a major factor in environmental degradation, albeit unwittingly in many cases.

Many participants in this inquiry were concerned with existing processes for the management of Australia's natural resources. They also expressed a desire to ensure that the decisions which emerge are essentially bipartisan — given the long-term nature of the solutions required to improve the ecological sustainable use of our natural resources.

At the Adelaide Public Hearing on the Draft Report, the Natural Resources Council of South Australia said:

> ... it's one thing to be aware of the consequences of environmental degradation, it is an altogether much more difficult and interesting exercise to formulate a framework of principles and policies to ensure that we achieve ecologically sustainable use of natural resources. (Transcript, p. 1555)

At the initial public hearing in Melbourne, the Australian Conservation Foundation said that while there was general acceptance of the principles of ESD, it was extremely difficult in practice. It said:

> We believe that ESD will only work if it's consistent right through all sectors and through all things that can influence outcomes. Anything that undermines basic direction towards ESD will make it so much harder to work and one of the problems I think with land management is there are so many things undermining it in terms of other policies, other funding priorities, subsidies, any measure of things ... (Transcript, p. 899)

The next chapter explores the issues in the role of government in ecologically sustainable land management. In doing so, it addresses the circumstances in which its intervention is likely to contribute to enhanced welfare and wellbeing, and the form of that intervention.

4 THE ROLE OF GOVERNMENT

Governments have a responsibility to ensure that environmental outcomes are compatible with the interests of the community as a whole. However, intervention is not costless, and in every case where governments could intervene to improve outcome, there is a significant risk of them making things worse. Indeed, well meaning but poorly designed and executed interventions have contributed to many of our environmental problems.

Where intervention is warranted it is likely to be to provide well-defined and enforceable property rights; ensure that decisions by individual landholders take account of any costs their actions have on others; provide mechanisms for the provision of public goods; and promote production and dissemination of relevant information.

The discussion in Chapter 2 of the environmental impacts associated with the use of agricultural and pastoral land identified a number of underlying causes that contribute to land management problems and underpin existing government policy responses.

Those causes typically reflect the tendency for individual landholders to overlook the costs that their activities impose on others in the community. In economic terms, landholders' decisions are based only on 'private costs', and ignore the wider 'social costs'. Such divergences are referred to as market failures. As identified in Chapter 2, most of the market failures associated with the use of agricultural and pastoral land can be attributed to one or more of the following factors:

- poorly defined property rights to scarce natural resources;
- the presence of externalities;
- the presence of public good characteristics; and
- a lack of information on the part of governments and market participants.

Where market failures exist, there is the potential for governments to intervene to achieve better outcomes for the community as a whole.[1] But in practice, all

[1] Government action to improve the welfare of the community as a whole is not limited to instances of market failure relevant to this inquiry. It includes action to provide law and order, ensure national security, provide social and economic infrastructure, alleviate poverty, reduce social inequality and other matters which are beyond the scope of this inquiry.

intervention costs the community something and it is not certain that the resultant benefits will always outweigh those costs.

The risk of 'government failure' is inherent in the realities of democratic government. Governments find it difficult to obtain much of the relevant information that markets are able to draw upon. The way that the political system operates discourages disclosure of information held by individuals that does not accord with their self-interest. It also encourages voters to promote and public officials to pursue policies that are in their private interests rather than those of the community as a whole. Finally, the political system has difficulty in providing strong incentives for effective and efficient service delivery by government. As a consequence, there have been numerous examples of past failure of government policy in land management. Those identified by Davidson (1989) are in Box 4.1.

The form of government intervention most likely to be appropriate and cost-effective in a particular situation is usually dependent upon the underlying cause of the market failure. Some of the issues that need to be considered in addressing each of the underlying causes are discussed below.

4.1 Property rights

A well-functioning market ensures that scarce resources are directed to those uses, and among those users, that value them most highly. However, markets that do not function well can lead to outcomes — such as insufficient conservation and excessive usage of the resource in questions — that may have adverse consequences for the community as a whole.

A pre-condition for a well-functioning market is that there is a system of enforceable property rights (see Box 4.2). From an economic point of view, it does not matter whether the rights have been created by law (*de jure* rights) or by custom and practice (*de facto* rights).

Box 4.1: **Problems with land management policy**

Year	*Plan*	*Cause of failure*
1788	State farming	Lack of incentive for convict labourers.
1789	30-acre holdings for expirees	Lack of capital to develop land. These holdings were later purchased by officers and merchants with capital and amalgamated into larger profitable holdings.
1829	Restriction of settlement to the 19 counties	This would have prevented the establishment of the pastoral industry if the squatters had not ignored the regulation.
1860	The land selection Acts give holdings of up to 640 acres at $2 per acre payable over a period of years	Such small areas were unable of providing a living from wool and no market existed for other products. Thirty years later the development of railways, mechancal wheat harvesters and refrigeration made it possible to produce wheat, meat and butter on these farms.
1882	Irrigation on the Murray in SA, NSW and Victoria with land rated to pay for water storage and delivery systems	Additional returns were not great enough to pay the land rates. The state had to pay for the water storages and delivery systems.
1884	Resumption of half the areas of sheep runs in western NSW to provide small runs for non-land holders	Small runs were unprofitable. The resumed areas became a safe haven for rabbits and other vermin. Finally the resumed areas were returned to the original owners.
1890	Closer Settlement Acts	Farms too small to support a family.
1890s	Co-operative settlement	Lack of understanding of human nature.
1913	Irrigation in the MIA in NSW	Additional returns not large enough to pay for storage and distribution structures.
1919	Soldier settlement	Wrong estimates of future product prices; farms too small, many in marginal areas.
1945	Soldier settlement	Mainly successful because planners wrongly concluded that agricultural product prices would decline and because experienced men were placed on good land.
1966	Ord River Project	Planners would not believe that costs in such an isolated area would be double those in the south and eastern Australia and crop yields no higher. The problems with insect control in cotton were known but ignored.
1966	Brigalow land development	Partially successful as planning was limited to research and land distribution.
1966	Esperance land development	Mainly successful as planning was limited to research and original land sales.

Source: Davidson (1989, pp. 79–80).

Box 4.2: **Property rights**

Property rights are the rights to own or use a particular resource or commodity conferred on individuals by law or custom. The specification of property rights is a crucial prerequisite to the efficient exchange of a resource or commodity through markets.

For markets to function effectively, property rights need to be:

- clearly defined;
- completely and exclusively allocated (that is, holders of property rights should be guaranteed exclusive use):
- secure; and
- legally enforceable.

If property rights do not exhibit these characteristics, the development of an effective market will not be possible (for example, it is difficult, if not impossible, to sell an asset which is not well defined and whose ownership could be disputed). Without clear property rights, existing owners have little incentive to manage or use the resource in a way that maximises its longer-term value.

Many environmental issues arise from conflicts over property rights for natural resources. Better definition of property rights can reduce these conflicts, but it is unlikely to eliminate them altogether. The very nature of much natural capital means that individual ownership is not possible for many natural resources (for example, the atmosphere). In others, it may be feasible but not sensible (for example, some common property resources such as certain fisheries).

For natural resource management, property rights and restrictions on their trade are significant issues in relation to:

- the land tenure system;
- the use of surface water and groundwater;
- the harvesting of trees; and
- the commercial utilisation of native plants and animals.

Some of the environmental issues arise because of external costs and benefits associated with the natural resource in question — these issues are discussed in the following section. Other issues relate to the evolution of rights to use a natural resource from a time when the natural resource in question was not originally perceived to be in short supply. For example, access to water has evolved from *de facto* rights to draw on a publicly owned resource that was thought to be effectively unlimited. As usage increased, the scarcity of the

resource and its value to the environment have been highlighted. However, in the absence of clear rights to the water and a mechanism to trade those rights, there has been little incentive either to conserve the resource or redirect it to its most productive use.

There is a role for government to actively create property rights and facilitate the emergence and operation of efficient markets in which those rights can be traded — a well-functioning market will often not evolve on its own.

Once clear property rights have been established, and a market in which they can be traded has been set up, the private market can usually be relied on to function into the future. For instance, water has characteristics that allow it to be well handled by private markets. These include: excludability (that is, others can be excluded from the use of any particular parcel of water); measurability; the ability to be aggregated and disaggregated; and transferability (within a particular catchment).

The nature of the resource will, to some degree, influence the design of the property right. For example, in the absence of uncertainty over the size or quality of the resource, the harvesting or use rights could be specified in terms of quantities — for example, litres of water or numbers of fish. Given the pervasive uncertainty that attaches to much natural capital, this is not sensible as it discourages a long-term perspective to exploitation and conservation — everyone holding such a right has an incentive to catch their allocation as quickly as possible so as not to get left short if there is insufficient stocks of the resource.

Where the stock of a natural resource is highly variable, the rights are more usefully specified in terms of shares of the available resource, with the variability absorbed by all users, and through variability in price.

An example is found in fisheries. Open access to a fishery encourages excessive investment in harvesting and over-exploitation of the stock. Harvesting rights may be necessary to prevent those outcomes. Generally speaking, the population of a fish species and the catch consistent with biological sustainability are uncertain at any time. In these circumstances, the harvesting rights will need to be varied from year to year. To accommodate this variability, the rights are specified in terms of shares of the total annual catch. Decisions on the stock of fish that is to be exploited in any period need to be made collectively by all right holders. If new knowledge emerges indicating that more fundamental change needs to be made, government should buy the rights necessary to affect the change in the annual total. Where compulsory reductions in rights occur, compensation should be offered.

Simply establishing property rights and a market in them will not overcome all

problems. For example, rights specified as shares of a resource require an institutional structure to determine the appropriate level of resource in each period from which the shares are drawn.

Environmental flows in river systems are another area where property rights held solely by the private sector over water will not necessarily result in a level optimal for society. The creation of a system of water rights will allow those voluntary groups in the community, who highly value the environmental values of a river system, to purchase rights in the market place, but not to divert or use the water in question. There may be an ongoing role for government, acting on behalf of rest of the community, to ensure that such voluntary action is sufficient. If not, it would need to supplement any voluntary effort to achieve the desired environmental flow and to manage that flow for the benefit of the environment. However, once an appropriate environmental flow regime has been established, the nature of the market in water has characteristics that allow changes to the environmental flow to be integrated into the market system.

Other characteristics of land do not have attributes that are easily solved by the creation of tradeable property rights. For example, the creation of property rights to remnant vegetation and the biodiversity contained within will not of itself solve the problem of the loss of this resource. This 'good' has public good characteristics. As a result, the private sector will not provide sufficient quantity from the point of view of society as a whole, even in a situation of clear property rights. The issue of public goods and the role for government in their provision is outlined Section 4.3.

4.2 Externalities

Several of the natural resource management problems identified in Chapter 2 are a result of externalities (see Box 4.3). These include: rising watertables because of land clearing; nutrient run-off; salt leaching; chemical overspray; siltation from erosion; and the spread of weeds and pests. Chapter 2 explains how each of these problems has off-site effects which are not accounted for in production decisions.

Box 4.3: **Externalities**

An externality arises when production or consumption by one party entails uncompensated costs or benefits that are not paid for, for others. The classic example is pollution, where the cost of the harm is not taken into account in production decisions. As a consequence, investments and activity may be undertaken that would not be viable if these external costs had to be taken into account. At the same time, because the external effect is not paid for

by the industry concerned, there is no incentive to mitigate those effects or to invest in ways to do so.

There may be a role for government to attempt to overcome the problems caused by externalities. In principle, the objective is to internalise any externalities. That is, to ensure that the activity generating the negative externality bears the cost of the relevant effect so that it is factored into the cost structure of the activity, and thus into decisions being made by those engaged in that activity. The polluter pays principle applies here.

Thus, negative external effects can be a real and significant problem for society, calling on more direct action by government. There is a variety of ways that governments can attempt to internalise such externalities.

One is to create property rights — either a right to generate an externality or a right not to suffer its effects — and then to allow the two parties to come to some negotiated financial agreement. For example, if the party generating a negative externality values the right to do so higher than the value the other party places on avoiding it, then it is efficient for the party generating the externality to compensate the other party to allow the activity to continue. Because the cost of the externality now enters into the decision making of both parties, the party generating the externality has an incentive to find ways to minimise the negative effect, thus minimising payments to the other party. On the other hand, if the cost of compensation is higher than the value placed on the activity by the party generating the negative externality, the activity in question would be terminated.

For such property rights to be effective, certain conditions are necessary. In particular, an exclusive relationship must exist between the two parties to the negotiation. That is, the effect of the activity on the other party must be clear and separable from the effects on others.

In addition to an exclusive relationship between the parties, the costs of concluding any transaction between them must be less than the benefits to be obtained from it. Where they are not, governments may be able to facilitate negotiated outcomes by intervening to minimise the transactions costs to such solutions. For example, where there are large numbers of people involved, there may be impediments to their forming or using voluntary groups to address the issues involved.

In the case of many environmental impacts associated with natural resource management, these conditions for negotiated solutions are not met. For example, the causes and consequences of dryland salinity cannot be partitioned

between those who cleared the land and those who have been affected by that externality. That is, a separate agreement on the appropriate level of vegetation management cannot be concluded with each person affected reflecting the different levels they would contribute or accept.

In situations like this, there is often a role for government to act on behalf of the group of those affected. The intervention may take one of several forms.

In some cases, taxes or charges may be levied on the activity in question to reflect the value that the community places on avoiding the negative externality. Examples are the emission or waste charges levied by most State and Territory governments. Where the person or organisation generating the negative externality values the right to continue more than the tax or charge, it will pay the 'price' and continue. Where it does not, the activity will diminish or cease.

In other cases, regulation of the activity may be appropriate. There is a number of forms that regulation may take, and they have quite different costs and benefits for the community. The most significant is the severe practical limitation on the ability of prohibition to achieve better environmental outcomes and the potentially heavy call regulation makes upon resources for its enforcement.

Minimum standards for pollution levels may be set to reflect the willingness of those affected to accept some of the negative externality. Minimum standards are less flexible than taxes and charges. For example, even were the polluter to value the right to pollute higher than those affected value their freedom from pollution, the polluter cannot undertake such an activity. More practically, for example, the cost to affected users of cleaning up pollution as it reaches them (for example, pollution of water) may be less than the cost imposed on the polluter to avoid the pollution in the first place. Minimum standards, however, do not allow this situation to be resolved in the least cost manner.

Minimum standards can be useful where the effects are likely to be particularly severe (usually relating to public health or safety) or irreversible (as relates to the protection of biodiversity) beyond a certain level. In these cases, the flexibility provided by taxes could lead to socially undesirable outcomes, and a minimum standard would be appropriate.

Market mechanisms can be harnessed productively within a system of minimum standards by allowing trade in the rights to pollute within the standard. This provides an incentive for polluters to find ways to minimise the pollution in the most cost-effective manner. For this to be effective, however, it must be possible to monitor the effect of individual polluters to ensure that the activity of each is in accordance with the agreed levels both before and after trade. As minimum standards are set by government, such monitoring must be undertaken

by, or on behalf of, government. Such a trading system is thus typically more effective with a group of point-source polluters having a similar effect in the same region.

A wide range of nuances exists in this area. For example, where the direct cause of a problem cannot be directly measured in a way that allows the introduction of the appropriate level of a tax or charge, it may be possible to place the tax or charge on an input into the activity. This is likely to be where input use is closely related to the volume of the output. Thus, if nutrient run-off is a severe problem but cannot be directly measured or taxed, taxation of the appropriate fertiliser may be an effective solution in some circumstances.

The formalisation of a duty of care through statute is another means that governments can use to seek to internalise the external effects on others that are not correctly accounted for in private decisions. Essentially, this aims to overcome the high cost of private action under common law, both by clarifying the rights involved, and by transferring the obligation to enforce the right to government rather than private individuals.

4.3 Conservation values and public goods

Apart from producing commodities, agricultural and pastoral land and its associated natural resources provide cultural, historical, recreational and environmental benefits to both current and future generations. The benefits include environmental amenity, the preservation of plant and animal species, and the preservation of ecosystems such as rainforests and wetlands. At the most fundamental level, a healthy environment maintains the basis of all life on the planet.

The values that society places on such natural capital are many and varied. Most are difficult to quantify. Box 4.4 outlines the diverse range of values and provides some examples.

Box 4.4: **Use and non-use environmental benefits**

Benefits derived from physical use of the environment are commonly termed *use values*. These include, for example, the benefits people derive from viewing scenery, visiting a national park or swimming in a river. They also include benefits from the use of environmental resources in productive activities such as agriculture, forestry and fishing, and from the processing of pollutants.

Other benefits stem from keeping open the potential for future use of the environment (rather than actual current use). These are commonly termed *option values*. Apart from

the benefits to an individual from retaining the option for their own future use, people may place a value on preserving the environment for the benefit of other people (*vicarious values*), or for future generations (*bequest values*). In addition, there is the benefit that may be obtained from delaying a use of the environment that would otherwise result in irreversible loss, in the expectation that better information or improved technology may enhance its value, termed*quasi-option value*.

The environment can also provide benefits to people unrelated to its actual or potential use. These *non-use values* are generally referred to as *intrinsic* or *existence values*. These benefits are essentially derived from the knowledge that an environmental attribute exists. For example, people may value the existence of a particular species or wilderness area even if they are unlikely to ever see or make use of it. In part, existence value may reflect aesthetic or ethical values or acknowledgment of the rights of non-human beings.

Source: EPA (1993).

Biodiversity and environmental amenity have characteristics which mean that society's values are not able to be, or are poorly, reflected in the market system. Hence, they are not adequately incorporated in land management decisions. Typically, such natural capital exhibits, to varying degrees, the characteristics of a public good (see Box 4.5).

The non-excludable characteristics of public goods mean that individuals have an incentive not to disclose the benefits they may receive from them but to 'free ride' on everyone else. Consequently, landholders have little incentive to use their land to provide more of these attributes than the private benefit to themselves (say, from increased agricultural productivity) would justify. Because of the lack of effective demand, markets therefore tend to be poor providers of public goods.

Box 4.5: **Public goods**

A public good is characterised by jointness in supply, in that to produce the good for one consumer it is necessary to produce it for all consumers. In many cases, individuals cannot be excluded from the enjoyment of a public good whether they pay for it or not (for example, national defence). Even if exclusion is possible (for instance, from a bridge across a river) to do so violates Pareto optimality, which requires that no opportunity of making one person better off without making anyone else worse off is left unused. Because nobody can or should be excluded from the benefits of a public good, consumers will not freely pay for it; hence, no firms would be able to cover its production cost through the market. The free market will therefore fail to supply a public good, even though the good would contribute to social welfare.

> Public goods are usually produced (or contracted out) by public agencies on the basis of collective decisions and financed from general taxation (as consumers have little incentive to reveal their individual true preference or willingness to pay as they can free ride on provision.)
> *Source:* Panayotou (1993, p. 46).

As a result, public goods have typically been provided by voluntary groups (where the numbers involved and the transactions cost are relatively small) and by governments (where they are both relatively large). There is ample evidence that altruistic individuals and voluntary groups are capable of providing many environmental public goods and have done so for some time. One of the important roles for government is to remove any impediments to private altruism to conserve and protect the environment. The transactions costs of such activity can be affected by government intervention outside the area of the environment (for example, the taxation treatment of altruism) and intervention to protect the environment (for example, measures that 'crowds-out' private conservation activity).

In the environmental area, however, the public goods in question — environmental attributes or conservation values — have often been provided largely fortuitously from the remaining stock of natural capital held as Crown land or as remnant vegetation on private land. As the integrity of this stock declines and the stock diminishes with economic development, the lack of comprehensive mechanisms to provide for present and future generations becomes increasingly apparent.

National parks make a significant contribution to conservation, but are increasingly being seen as incapable of addressing the issue on the scale required. This raises the issues of whether there are ways of filling the gaps and how they should be funded.

The 'in principle' role for government is in determining and organising demand for the public good. That is, in identifying who benefits from the public good and raising, through taxation or similar compulsory charges, the cost of the provision of that good from those who benefit.

In most cases, markets can be harnessed to provide the particular public good or service once the level of demand has been established by government. This is observed in current moves to contract out a range of government services. The decisions on what is purchased and the collection of funds to pay for the service remains within government, but the production of the good or service is provided competitively by the private sector.

Traditionally, governments have addressed the failure of the market to provide such public goods by both raising the revenue necessary to pay for that public good and managing production through government owned and managed national parks and reserves.

In part, government management of national parks, as well as funding them, is an historical accident. National parks have been primarily created out of lands remaining under the ownership of the Crown — typically those lands not deemed useful for agricultural or pastoral activities. Governments could thus create national parks without any capital expenditure, simply by reclassifying Crown land, with the only significant cost being involved in their subsequent management. A consequence of this is that national parks are unrepresentative of the range of biological regions in Australia, with biological regions in valuable agricultural or pastoral areas being poorly represented or not represented in the national reserve system (see Section 2.1 and Chapter 16).

While government funding is necessary to marshal the funds to protect biodiversity and habitat, the nature of the public good does not inherently dictate a role for government in their subsequent management. Markets could be harnessed by means of contracting out, under a competitive tendering process, the management of parks according to the conditions and outcomes specified by government.

The level of government which is most appropriately involved depends, to a large degree, on judgements about the principal beneficiaries of public goods. For example, if a public good primarily benefits a particular region, such as a small park or recreation area, it is most appropriately funded by local government. If the benefit is primarily state-wide, it is most appropriately funded by State governments. Where the benefit is national or international, Commonwealth funding is appropriate. Similarly, where the decision is made by a higher level of government then some funding by the relevant higher level of government would be appropriate.

There are dangers in imposing the burden of cost on the wrong level of government. For example, if the principle assistance for conservation on private land were to be undertaken primarily through rate relief, there is a danger that local governments would become hostile to such conservation. Those local governments that were ‘unfortunate’ enough to have large areas under conservation would, in effect, be subsidising the benefits derived by the wider community and the nation. They would become reluctant to become involved in such conservation beyond the level of clear benefit to the local area.

In many cases, however, there will be a mix of local, State and national benefits, so that, in practice, negotiation between the various levels of government to work out cost-sharing arrangements may be necessary.

The challenge facing the community is to determine the natural capital to be conserved and to ensure that this is adequately taken into account when resource management decisions are being made. While governments can overcome the 'free rider' problem, they face the same information problems as face market participants in obtaining disclosure of individual and community preferences. Hence, procedural and institutional initiatives will be required to provide the basis for sound decisions. This is a task for all three levels of government as some environmental benefits are of national significance, while the demand for others may be limited to a State or Territory, a region or a local area.

4.4 Information

Information often has public good characteristics, notably the difficulty of excluding those who do not pay from benefiting from the information once it is generated. This has led to a significant degree of government involvement in its generation and dissemination. This is especially true for agriculture and for the environment. Governments have responded to this problem by establishing the patent system — a temporary monopoly that allows the researcher to charge those who benefit and thus generate funds to reward research and development. However, this can only easily be done when the research results can be embodied in products or processes that can enter the private market. Much research, particularly basic research, cannot be accommodated in this fashion. There is a role for government in funding such research, though not necessarily a role in directly undertaking the process of research. Markets can be harnessed by contracting out the research on a competitive tendering basis to the private sector.

The benefits of research are not always spread across the wider community. Some research primarily benefits particular industries of groups. To the extent that this is the case, government funding through general taxation revenue is not appropriate. In practice, however, much research involves a mix of private and wider benefits, and governments have responded to such situations by establishing mechanisms for the levying of the beneficiary group (usually an industry), with the funds being used for research of primary benefit to that group, supplemented to varying degrees by public funds.

Much agricultural activity in Australia is being undertaken in areas without a long history of use, and in a unique environment where its effects are not well

understood and may take decades to appear. Often this means that overseas experience and research cannot be directly translated to Australian conditions.

Even with adequate research and development, there will inevitably be an element of trial and error in land management practices, with unexpected and adverse consequences appearing until a more complete understanding of the Australian environment is developed. Practices suitable in one location often need to be adapted using local knowledge to be appropriate in another. In this situation, the rapid dissemination of information and experience is important to ecologically sustainable land use.

In the area of biodiversity research, this is being conducted in an area where the results are applicable to a public good that is itself not well encompassed by private markets. Patents, even if technically applicable, would generate little revenue as the markets for biodiversity and similar public goods are not well developed. Governments have a role as the provider of funds for such research and a role as the consumer of the results through its establishment and management of national parks and reserves.

Governments also play a direct role by undertaking research and development and disseminating its results. They also assist the private sector in performing such activities. In this inquiry, the Commission has not revisited the question of the role for government involvement in research and extension, or the overall level of expenditure or support. Rather, it has concentrated on areas where the focus of activity may be inappropriate, or where important areas of research are not adequately covered by the existing system (see Chapter 10).

5 CURRENT POLICY RESPONSES

Australian governments are actively involved in policies aimed at better land and natural resource management and environmental protection. This chapter provides an overview of the extensive nature of that involvement in the management of agricultural and pastoral land.

The current policy responses to the impacts of activities on land and associated resources used or useable for agricultural and pastoral purposes and their underlying causes, which are outlined in the previous two chapters, are a mix of Commonwealth, State and Territory initiatives. This reflects the divided responsibilities under Australia's federal system of government.

While the basic powers and responsibilities for land and natural resource management reside with the States, the Commonwealth has considerable influence over them as a result of its constitutional powers and responsibilities for trade and commerce; corporations; taxation; and external affairs. This influence is enhanced by its financing of specific national programs; coordination and leadership role on issues of national significance; and as a major landowner. At the State level, many important powers and responsibilities that influence ESLM have been devolved to local governments.

To provide a coordinated approach to environmental matters, the three tiers of government signed the Intergovernmental Agreement on the Environment (IGAE) of 1992 to define the roles of each level of government and reduce intergovernmental environmental disputes to provide better protection for the environment.

This chapter aims to sketch out current government frameworks which influence ESLM. It outlines Commonwealth, State and Territory policies and programs and administrative arrangements that influence ESLM as a prelude to the next chapters which asses their effectiveness and propose changes to the existing arrangements.

5.1 Role of the Commonwealth

The major Commonwealth policies, programs and administrative arrangements related to environmental policy are outlined below. The Commonwealth Government takes responsibility for: Australia's international obligations;

coordinating responses across all levels of government; leadership in issues of national significance (including national programs and strategies); and its own land.

Income tax issues as they influence ESLM and other related activities, such as environmental altruism, are discussed in Section 16.2 and Appendix F.

International responsibility

Australia is a signatory to 56 multilateral treaties related to the environment. These include:

- the Convention on International Trade in Endangered Species of Wild Fauna and Flora (1 July 1975);
- the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) (21 December 1975);
- Convention for the Protection of the World Cultural and Natural Heritage (17 December 1975);
- the Convention on Biological Diversity (29 December 1993); and
- the United Nations Framework Convention on Climate Change (21 March 1994).

These commit the Commonwealth to protecting Australia's environment in the interests of the global environment. Domestically, many of Australia's obligations are reflected in 17 Commonwealth Acts (for example, the *Endangered Species Protection Act 1992*, the *Wildlife Protection (Regulation of Exports and Imports) Act 1982*, and the *World Heritage Properties Conservation Act 1983*).

Australia is also a signatory to Agenda 21, the global action plan for sustainable development, which was adopted at the United Nations Conference on Environment and Development in June 1992.

Coordination between levels of government

Many natural systems are unbounded and therefore, the solution to some environmental problems requires coordinated action between governments. The Commonwealth has a role to play in ensuring a coordinated approach to environmental matters and in ensuring an appropriate standard of environmental programs is carried out by these governments.

While the Commonwealth is involved in environmental issues of national significance, or which cross State borders, the States and Territories generally

are responsible for implementation as the basic powers and responsibility for land and natural resource management rest with them. This coordinating role is seen to be of considerable benefit in dealing with environmental matters. As the Queensland Government said:

> Coordination by the Commonwealth, of matters involving several states, is of considerable value. This is highlighted by the current approaches on matters such as the management of the Murray-Darling catchment. (Sub. 164, p.5)

Legislation may also encourage coordination on land and natural resource management issues across State borders. The National Committee for the Environment said:

> ... the Commonwealth legislation *Natural Resources Management (Financial Assistance) Act 1992* ... brings forward the concept of close interaction between the Ministers responsible for Primary Industries and for the Environment, and stimulates activities in support of sustainable natural resources management. (Sub. 295, p. 2)

Intergovernmental Agreement on the Environment

The IGAE of 1992 seeks to facilitate a coordinated approach by the three tiers of government. The IGAE aims to:

- define the roles of each level of government;
- reduce intergovernmental environmental disputes;
- provide certainty in government and business decision making; and
- provide better protection of the environment. (Yencken and Wilkinson 1996)

It operates on four main principles:

- the precautionary principle;
- intergenerational equity;
- conservation of biological diversity and ecological integrity; and
- improved valuation, pricing and incentive mechanisms. (Yencken and Wilkinson 1996)

The IGAE established a Ministerial Council, the National Environment Protection Council (NEPC). The NEPC is committed to national goals and standards in environmental management and environmental impact assessment. The NEPC sets environment protection standards, goals and guidelines related to: air quality; marine estuarine and fresh water quality; noise; site contamination; hazardous wastes; re-use and recycling of used materials; motor vehicle noise and emissions (Yencken and Wilkinson 1996).

Establishing a coordinated approach to environmental policy between the Commonwealth and the States has also been the function of other intergovernmental Ministerial Councils and Standing Committees. The other councils and committees related to land management include:

- Council of Australian Governments (COAG);
- Intergovernmental Committee on Ecologically Sustainable Development (ICESD);
- Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ);
- Australia and New Zealand Environment and Conservation Council (ANZECC);
- Murray-Darling Basin Ministerial Council (MDBMC); and
- Ministerial Council for Forestry, Fisheries and Aquaculture (MCFFA).

Council of Australian Governments

COAG comprises Heads of Government from the Commonwealth, States and Territories and the President of the Australian Local Government Association. It meets at least once a year. Its primary focus in relation to ESLM has been on issues relating to the management of water (see Chapters 12,13 and 14).

Intergovernmental Committee on Ecologically Sustainable Development

The ICESD is responsible for overseeing the implementation and review of the IGAE, the National Greenhouse Response Strategy and the National Strategy for Ecologically Sustainable Development (ESD). It represents an amalgamation of the previous Ecologically Sustainable Development and National Greenhouse Steering Committees. The first meeting of the ICESD was held in March 1994.

The Committee is required to report every two years to COAG on matters which may require a decision in relation to environmental and natural resource issues, or the agreements above.

In undertaking its activities, the ICESD is required to recognise the role of other Ministerial Councils. It shares a working interest with ANZECC, ARMCANZ, the Australian and New Zealand Minerals and Energy Council, the NEPC and the MCFFA.

The ICESD commenced a review of the environmental powers of the Commonwealth with COAG in March 1997 for the Senate Environment, Recreation, Communications and the Arts References Committee. The Committee is to report in February 1998 on:

- the powers of the Commonwealth in environmental protection and ecologically sustainable development in Australia;
- the adequacy of existing Commonwealth mechanisms and legislation to promote the national interest and to achieve compliance with the principles of ecologically sustainable development; and
- the most appropriate balance of powers and responsibilities between Commonwealth, State, Territory and local governments and mechanisms for implementing treaties, conventions and strategies to ensure consistency between all levels in achieving environmental protection.

At the November 1997 meeting of COAG, the Council gave in-principle support for a 'Heads of Agreement' on responsibilities for the environment. The Agreement would provide the following:

> Commonwealth responsibilities and interests to be focussed on matters which are of genuine national environmental significance;
>
> Significant streamlining, greater transparency and certainty in relation to environmental assessment and approval processes;
>
> Rationalisation of existing Commonwealth/State arrangements for the protection of places of heritage significance through the development of a co-operative national heritage places strategy;
>
> Improved compliance by the Commonwealth and the States with State environment and planning legislation; and
>
> Establishment of more effective and efficient delivery mechanisms and accountability regimes for national environmental programs of shared interest. (COAG 1997)

The Commission notes there are also a number of other Commonwealth, State and Territory government inquiries related to the environment.

ARMCANZ

ARMCANZ was formed from the merging of the functions of the former Agricultural Council of Australia and New Zealand, the Australian Soil Conservation Council and the Australian Water Resources Council in October 1992. The responsibilities of the Rural Adjustment Ministers' Meeting was added to the Council in June 1993 (ARMCANZ 1996).

The objective of the Council is to develop policies, strategies and practices for integrated and sustainable agricultural and natural resource (land and water) management. For example, ARMCANZ was instrumental in the development of the National Water Quality Management Strategy.

Membership of the Council consists of Commonwealth/State/Territory and New Zealand Ministers responsible for agriculture, soil conservation, water resources and rural adjustment. ARMCANZ is supported by the Standing Committee on Agriculture and Resource Management. Its membership comprises of Chief Executive Officers of all Commonwealth, State, Territory and New Zealand government agencies responsible for agriculture, land, water and rural adjustment issues.

ANZECC

ANZECC was formed in July 1991 through the amalgamation of the former Australian and New Zealand Environment Council and the former Council of Nature Conservation Ministers. It provides a forum to exchange information and experience and to develop coordinated policies in relation to the national and international environment and conservation issues (ANZECC 1995).

The Council is supported by two permanent Standing Committees: the Standing Committee on Environment Protection and the Standing Committee on Conservation. The Council is in turn advised by a number of Working Groups and Task Forces set up for specific purposes. One of these is the National Rangeland Management Working Group.

Murray-Darling Basin Ministerial Council

The Murray-Darling Basin Ministerial Council comprises Commonwealth and State Ministers responsible for water, land and the environment. It is one of the institutional arrangements under the Murray-Darling Basin Initiative which brings together the Commonwealth, New South Wales, Victorian, South Australian and Queensland Governments to address the Basin's natural and cultural resource management problems.

Environment Australia commented on the role of the Council and the Murray-Darling Basin Commission as follows:

> The Murray-Darling Basin Ministerial Council and Commission play a significant role in the management of the resources of a large area (1/7th) of Australia with a large productive capacity ... [it is] a model of cooperation between the Commonwealth and the States. (Sub.229, p. 4)

Under the Natural Heritage Trust (NHT), the Murray-Darling Basin Commission has been allocated $320 million, over five years, to repair environmental damage.

National leadership, programs and strategies

On matters of national significance, there is a role for the Commonwealth Government in the management of the environment. This role has involved providing leadership on significant environmental matters through the development of national programs and strategies.

The Department of Primary Industries and Energy (DPIE) considered:

> ... the major role for the national government can be characterised as that of leadership on key issues with national public good characteristics which are not confined within the borders of any one State ... for example, in cooperative activity with the States, or in articulating the broader national interest where more than one State, or the State and the Commonwealth, have issues to resolve. The cooperative activity has, for example, resulted in the formulation of the national strategies that sit under the umbrella of the National Strategy for Ecologically Sustainable Development ... where the Commonwealth role consists in articulating a national vision, and coordinating a consultative process to ensure a timely outcome. (Sub. 202, p. 10)

As part of its involvement, the Commonwealth has sought a central role in environmental monitoring (for example, through the national State of the Environment Report), as well as in education and R&D (for example, through the Land and Water Resources Research and Development Corporation).

The Commonwealth's role includes facilitating the dissemination of the results of R&D at the catchment and farm level. According to the DPIE:

> The Commonwealth ... has a significant leadership role to play in the national education and research effort, including workplace training, and information dissemination, in conjunction with the States/Territories, and often in cooperation with industry/the community. (Sub.202, p. 10)

The Commonwealth also has a role, in conjunction with the States and Territories, in developing national environmental policies which are also implemented by the States and Territories. A number of the Commonwealth policies in the environmental area have been translated into national programs and strategies (see below).

National strategies

In 1992, the Commonwealth committed itself along with the States and Territories to achieving ecologically sustainable development (ESD) in Australia through the National Strategy for Ecologically Sustainable Development. In relation to land use, the strategy states the Commonwealth's aim is to develop an economic and social framework which encourages optimal land management. This includes:

- establishing mechanisms (such as property rights) which facilitate social and economic exchange, and encourage the sustainable use of resources;
- modifying policies and programs which encourage land degradation;
- improving the operation of social and market systems, through R&D, information exchange, education and technology transfer; and
- establishing standards and sanctions which discourage or prevent inappropriate land use.

Environment Australia noted that progress had been made in implementing the Strategy. It said:

> 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. (Sub.175, p. 33)

Various other national strategies and policies have been adopted. These include:

- National Strategy for the Conservation of Australia's Biological Diversity;
- National Greenhouse Response Strategy;
- National Water Quality Management Strategy;
- Murray-Darling Basin Natural Resources Management Strategy;
- Conservation of Australian Species and Ecological Communities Threatened with Extinction — a National Strategy;
- COAG Water Reform Agenda (see Chapters 12, 13 and 14);
- National Forest Policy Statement;
- Draft National Strategy for Rangeland Management (see Chapter 14); and
- National Strategy for Conservation of Australian Species and Ecological Communities Threatened with Extinction.

One of the most recent strategies, the National Weeds Strategy, released in June 1997, aims to deal with weeds of national significance. The principles which form the basis of the National Weeds Strategy (see Box 5.1) could equally apply in an approach to most land management problems. These principles follow.

- Weed management is an essential and integral part of the sustainable management of natural resources and the environment, and requires an integrated, multidisciplinary approach.
- Prevention and early intervention are the most cost effective techniques that can be deployed against weeds.

- Successful weed management requires a coordinated national approach which involves all levels of government in establishing appropriate legislative, educational and coordination frameworks in partnership with industry, landholders and the community.
- The primary responsibility for weed management rests with landholders/land managers but collective action is necessary where the problem transcends the capacity of the individual landholder/land manager to address it adequately. (ARMCANZ et al 1997)

The National Weeds Strategy has been allocated $19 million under the NHT. The strategy sets a framework for priorities to be established. It also sets out the roles and responsibilities of government, industry, land managers and the wider community — which responds to participants requests in this inquiry for an integrated approach to control to be developed. The current responses of the States are discussed in Section 5.2.

National programs

Much of the Commonwealth's involvement in environmental management has recently been reformulated and coordinated under the umbrella of the newly formed NHT (see Appendix D). The NHT was established by the Commonwealth Government in May 1997. Under the Trust, funding of $1.25 billion is to be provided over five years from 1996–97. The objectives of the NHT are to:

- provide a framework for strategic capital investment to stimulate additional investment in the natural environment;
- achieve complementary environment protection, natural resource management and sustainable agricultural outcomes consistent with national strategies; and
- provide a framework for cooperative partnerships between communities and all levels of government. (Commonwealth of Australia 1997a, pp. 2–3)

Box 5.1: National Weeds Strategy

The National Weeds Strategy, which has been in the development stage since 1991, was released in June 1997. The strategy has three goals:

- to prevent the development of new weed problems;
- to reduce the impact of existing weed problems of national significance; and
- to provide the framework and capacity for ongoing management of weed problems of national significance. (ARMCANZ et al 1997, p.iii)

The strategy recognises that while the primary responsibility for weed management rests with individual land managers, collective action is required where the problem is beyond the land manager's ability to control it. It sets out recommended roles and responsibilities of government, industry, land managers and the wider community.

Amongst other things, the strategy recommends that:

- States and Territories develop and implement legislation which will be supported by a national contingency plan against newly recognised weeds;
- for new weeds that cannot be eradicated, legislation and regulation be implemented at State and Territory level to control and prevent weed movement within and between States;
- the Northern Australian Quarantine Strategy serve as a model for an awareness and early warning system;
- a screening process should be developed which acknowledges the precautionary principle of the National Strategy for Ecologically Sustainable Development;
- a code of practice be developed to evaluate a plant's weed potential prior to its commercial release;
- funding for community weed management be channelled through the National Landcare Program; and
- research, education and training in weed management be integrated and coordinated across Australia.

The National Weeds Strategy suggests that for agricultural weeds that are still spreading or environmental weeds, suitable incentives for control might include:

- rate rebates and tax incentives for land managers to control weed invasion;
- startup funding and free distribution of equipment and materials; and
- the provision of environmental or land protection officers to assist land managers with weed programs.

Source: ARMCANZ et al (1997).

The NHT is administered by Environment Australia (Department of the Environment) and DPIE. The States and Territories are involved in the delivery of programs (see Box 5.2) through partnership agreements.

Box 5.2: **Natural Heritage Trust programs**

The NHT focuses on five main areas: land; vegetation; rivers; coasts and marine; and biodiversity. It includes funding for a wide range of programs. The ***land resources***

strategy allocates funds to the National Landcare Program, National Land and Water Audit, National Weeds Strategy, National Feral Animal Control Strategy and Property Management Planning.

The ***vegetation*** programs funded are Bushcare (a renamed National Vegetation Initiative) and Farm Forestry. Funding for ***rivers*** covers the Murray-Darling 2001, National Rivercare Initiative, National Wetlands Program and the Tasmanian Regional Environment Remediation Program. Funding for ***coasts and marine*** covers the Coasts and Clean Seas program. Funding for the National System of Reserves and the Endangered Species Program is covered under ***biodiversity***.

In addition, the Waste Management Awareness Program is funded by ***human settlements***, the ***atmosphere*** funds Air Pollution in Major Cities and the ***Australian heritage*** provides funding for the World Heritage Areas.

According to DPIE:

> ... an important new emphasis under the NHT is to concentrate on the adoption of sustainable practices, whether in terms of on-ground works and farming techniques, or of improved farm business decision-making. (Sub202, p. 20)

An evaluation framework for the Trust is being developed by a working group of representatives from Environment Australia, DPIE and the Department of Finance (Environment Australia, Sub. 229).

Various other Commonwealth programs impact on land management. These include funding for rural adjustment and drought relief. In addition, there are taxation concessions for capital expenditures on conserving water and controlling land degradation (see Appendix E).

Management of Commonwealth land

The Commonwealth has a responsibility to manage its own land and activities on this land in an environmentally sensitive manner. In addition to managing Commonwealth land across Australia, the Commonwealth is also responsible for the management of its offshore territories, such as Norfolk Island, the Cocos Islands and Macquarie Island.

The management of activities on Commonwealth land has, in part, been achieved through its powers to enact legislation. The Department of Defence said:

> The Commonwealth already has a comprehensive set of environmental legislation governing its activities (including the *Environment Protection (Impact of*

> *Proposals) Act 1974* and the *Australian Heritage Commission Act 1975*). (Sub. 208, p. 4)

Of its own activities, the Department said:

> ... Defence is actively extending and developing its own internal environmental regulatory guidance and procedures. These include Defence Instructions made under the Defence Act 1903, environmental management plans (EMPs) for Defence establishments across the country and a corporate environmental management system (EMS) being developed in accordance with the principles of ISO 14000. (Sub. 208, p. 4)

The following section looks at the current responses of State and Territory governments to issues in ESLM.

5.2 Role of State and Territory governments

As the Australian Constitution does not explicitly deal with environmental matters, most of the basic powers and responsibilities for land and natural resource management rest with the State and Territory governments. As a result, State and Territory governments have a significant role in the management of land, and natural resources and water use, and of environmental protection. In addition, State and Territory governments are major landholders in their own right through their holdings of Crown land, Crown forests and national parks and reserves.

While the severity and extent of the problems vary across jurisdictions, they generally have similar land and natural resource management and environmental legislation and programs. The current legislative and policy responses used to manage land and natural resources as well as the specific approaches to protect biodiversity, manage weeds and pests and catchment management are discussed below. The current policy response to managing water resources are discussed in more detail in Chapters 12, 13 and 14.

Legislation

The amount of land and natural resource management and environmental legislation in each jurisdiction is substantial. For example, around 80 Acts are administered by the Department of Land and Water Conservation (NSW); 109 by the Department of Natural Resources and Environment (Victoria); around 40 by the Department of Natural Resources (Queensland); 48 by the Department of Environment and Land Management (Tasmania); 27 by the Department of Lands, Planning and Environment (NT); and around 20 by the Department of

Urban Services (ACT). A myriad of regulations and by-laws accompany this legislation and other relevant Acts administered by other departments.

All jurisdictions have legislation concerning land use planning, water quality and management, environmental protection, soil conservation, noxious weeds, conservation agreements and the protection of flora and fauna. Some jurisdictions are moving towards combining a range of natural resource legislation under a single piece of legislation. For example, the Queensland Government (Sub. 164) is in the process of replacing, in whole or in part, legislation dealing with water resources and soil conservation under a proposed natural resources bill. In the ACT, an environmental protection bill has been introduced to the Legislative Assembly which will bring together legislation covering air, water, noise and pollution issues.

A significant proportion of the legislation in each jurisdiction is, however, specific or 'one-off'. For example, in Queensland there is the *Starcke Pastoral Holdings Acquisition Act 1994*; in Western Australia, the *Argentine Ant Act*; and, in Tasmania, the *Wellington Park Act 1993* and the *Salt-water Salmonoid Culture Act 1985*.

Land and natural resource management

All jurisdictions have in place controls and programs to promote better land and natural resource management. Development controls are generally included under planning legislation. Land and natural resource controls are implemented through a range of legislation and programs to provide information on their management to private landholders. In addition, State and Territory governments are responsible for managing large tracts of Crown land, state forests, national parks and reserves and Crown leaseholds.

All States and Territories have specific departments, usually natural resources, agriculture and/or land and water resources departments, with a responsibility for land management (see Table 5.1). Also, National Parks and Wildlife Services in each jurisdiction are responsible for managing national parks and reserves.

Table 5.1: **Departments with land and natural resource management responsibilities, by jurisdiction**

State/Territory	*Department*
New South Wales	Land and Water Conservation
	Urban Affairs and Planning
	Agriculture
Victoria	Natural Resources and Environment
Queensland	Natural Resources
	Primary Industries
	Environment
Western Australia	Agriculture WA
	Conservation and Land Management
	Water and Rivers Commission
South Australia	Environment and Natural Resources
	Primary Industry
Tasmania	Environment and Land Management
	Primary Industries and Fisheries
Australian Capital Territory	Urban Services
Northern Territory	Lands, Planning and Environment
	Primary Industry and Fisheries

These departments often also operate advisory and research services on land degradation. For example, the Queensland Department of Natural Resources is involved in research into land degradation and rehabilitation at a number of research stations. It also monitors land conditions and provides technical advice on soil conditions to primary producers.

These services have been successful in certain areas as a significant number of producers have adopted soil conservation farming practices. According to the Queensland Government:

> Conservation cropping practices are now used on at least 70% of Queensland's sloping cane lands, and almost half of the erosion susceptible crop-land has been treated with runoff control measures. (Sub.164, p. 12)

In addition, nearly all jurisdictions have legislation that enables soil conservation agencies, or the relevant department, to direct landholders to undertake specific soil conservation activities. For example, the Northern Territory has its *Soil Conservation and Land Utilisation Act 1995*. Under this

Act, a soil conservation order may be issued to a private landowner requiring certain activities to be undertaken. These may include reducing stock numbers and ceasing activities that reduce vegetation cover.

Most jurisdictions have some form of vegetation management regulation which is discussed in more detail in a following section of this chapter.

In other areas, remedial action is being undertaken. For example, in response to the adverse effects of excessive previous removal of vegetation, the Western Australian Government's Salinity Action Plan aims to plant another 3 million hectares of trees and shrubs and protect and maintain the remnant vegetation in the agricultural areas (Agriculture Western Australia 1996).

State and Territory governments also play a coordinating role in Landcare. For example, the Department of Natural Resources in Queensland is responsible for setting up and coordinating consultative mechanisms. These involve government departments and community stakeholders, such as the Queensland Landcare Council and the State Catchment Management Coordinating Committee.

All jurisdictions providing leases on Crown land use lease terms to set out land management conditions. For example, in New South Wales, Queensland, South Australia and the Northern Territory, lessees are required to maintain the land to prevent degradation. Conditions are set on such activities as clearing of vegetation and sometimes on stocking rates.

The relevant State and Territory departments also undertake monitoring through the State of the Environment reporting process. For example, in Queensland the Department of the Environment is required to produce a State of the Environment Report by 1998. Others, such as New South Wales, Tasmania and the ACT, have released their initial reports.

The monitoring process has provided information and an awareness among landholders of the need for sustainable land management practices. As the Northern Territory Government said:

> It is firmly believed, based on anecdotal evidence that, this aspect of the Monitoring Program has had a significant and positive effect on the attitude of resource managers, by shifting an economic or financial perspective to an environmental approach to sustainable agricultural pursuits. That is, an invigorated interest in the environment has shifted the production focus down from the animal's back to the ground. (Sub. 188, p. 4)

Land use planning

All States and Territories apply land use planning instruments to designate land for particular purposes. Most use zoning to designate land usage. Zoning land as rural, rural residential or urban, specifies the range of activities that can be undertaken in that particular zone. Many of these land use planning instruments, such as zoning, have been delegated to local governments with the State governments retaining overall control of planning policy. For example, the use of zoning by local government authorities is illustrated in Chapter 20.

In most jurisdictions, project or development controls are attached to planning legislation. Their aim is to ensure that the environmental impacts likely from a proposed development meet certain standards. An environmental impact assessment is usually required as part of the development process.

State land use planning controls generally have broad objectives. For example, the *Planning and Environment Act 1987* (Victoria) is aimed at the fair, orderly, economic and sustainable use and development of land. In Tasmania, the Resource Management and Planning System contains initiatives to support sustainable development in the State, such as integrated development pathways, common appeal processes and inter-linkages of statutory portfolios. The system is implemented by planning instruments at the local government level.

General environmental protection

A number of jurisdictions have broad environmental protection legislation. Under this legislation a general duty of care to the environment is specified. For example, in Queensland the *Environment Protection Act 1993* requires all persons to take reasonable and practicable measures to prevent or minimise harm to the environment.

In South Australia, under the *Environment Protection Act 1993*, a similar duty is in place in relation to pollution of the environment.

Environmental protection in all jurisdictions takes a broad focus covering not only land, but also water, air and wastes. For example, the Victorian Environment Protection Authority (EPA) provides advice to water authorities on water re-use opportunities and ways to minimise nutrient inputs into waterways. The EPA has also provided information to dairy farmers on best practice environmental management of wastes. The Queensland Department of the Environment manages agricultural and industrial wastes and potential pollutants through the development of codes of practices and licensing of relevant activities.

All States and Territories have specific departments and/or agencies with a responsibility for environmental protection (see Table 5.2).

Table 5.2 **Departments/agencies with environmental protection responsibilities, by jurisdiction**

State/Territory	*Department*
New South Wales	Environment Protection Authority
	Urban Affairs and Planning
Victoria	Natural Resources and Environment
	Environment Protection Authority
Queensland	Environment
Western Australia	Environment Protection
South Australia	Environment and Natural Resources
Tasmania	Environment and Land Management
Australian Capital Territory	Urban Services
Northern Territory	Lands, Planning and Environment
	Primary Industry and Fisheries

Protection of biodiversity

State and Territory governments protect biodiversity through the use of endangered species listings, nature reserves and voluntary conservation agreements with landowners. Endangered wildlife is protected by legislation in each jurisdiction. For example, in New South Wales endangered wildlife is protected under the *National Parks and Wildlife Act 1974*. After an area is declared a critical habitat, any damage to that habitat is an offence under the Act.

In Queensland, under the *Nature Conservation Act 1992*, the Minister for the Environment can compulsorily declare a nature refuge on private land. Also, the Minister can issue an interim conservation order over a wildlife habitat or area.

In Tasmania, the *Threatened Species Protection Act 1995* provides for temporary intervention on private land. The Minister for Environment and Land Management can issue an Interim Protection Order (IPO) to protect a critical habitat of a threatened species. The IPO specifies the activities or use of

land within the habitat and can direct landowners to undertake any work specified in the order. The IPO is valid for 60 days on Crown land and 30 days on private land. An IPO is seen to be a last resort to allow time for further negotiation in situations where the State government and the landowner have failed to reach a voluntary management agreement to protect the habitat.

The States and Territories, often in conjunction with the Commonwealth, have taken an active role in protecting threatened species. For example, in Queensland to protect the mahogany glider and other species at risk from sugar cane expansion, the Queensland Government and the Commonwealth signed the Sugar Coast Environment Rescue Package. The rescue package involves acquiring core habitats, establishing nature refuges on private land and cooperating with the sugar industry to preserve habitats. (Queensland Government, Sub. 164)

In Australia, conservation covenants have generally taken the form of a voluntary agreement between the landowner and the relevant Minister. As with covenants, these agreements can be attached to the title of the land and detail various conditions. For example, the landholder may be required to manage the land having regard to particular values such as vegetation or wildlife. In Victoria, a statutory trust (the Trust for Nature) has been established to pursue conservation agreements with private landholders. Further details on the use of conservation covenants or agreements is provided in Chapter 16.

Control of weeds and pests

Current policies aim to cover the full range of actions associated with control, including quarantine in conjunction with the Commonwealth, regulation and control programs, and research and extension. In each State and Territory, strategies are in place to address existing problems and handle emergency responses within existing legislation.

The control of noxious weeds and animal pests is carried out in a number of jurisdictions under specialist structures. These include the WA Government's Agricultural Protection Board and the Queensland Government's Rural Land Protection Board. These bodies make recommendations to the relevant department on the control and classification of weeds and animal pests. In most jurisdictions, the relevant department oversees control of programs.

In general, the management and control of most weeds and pests rests with individual landowners. However, individual efforts are sometimes limited by the external/spillover effects of poor control on adjoining properties.

In many cases a cooperative cross-border approach is being undertaken to control weeds and pests. As the ACT Government said:

> ... stakeholder interest in weeds extends beyond the ACT borders, and therefore liaison with Councils and Shires, other government agencies and the community surrounding the ACT, is an important aspect of successful weed control on either side of the ACT border. (Sub. 107, p. 6)

Similarly, within jurisdictions cooperative arrangements have also had some success in the control of weeds and animal pests. As the Queensland Government said:

> Partnership arrangements for feral animal and weed control are proving effective. More than 40 % of local authorities have Pest Management Plans in place. Success is being achieved where landholders, Landcare, local government and DNR [Department Natural Resources] Strategic Weeds Eradication and Education Project (SWEEP) have co-operated to identify and implement strategic catchment-based projects. (Sub. 164, p. 13)

Legislative controls on certain weeds have also been effective. As the Cooperative Research Centre for Weed Management Systems said at the Canberra Public Hearing:

> The other extreme is something like Parthenium Weed coming into New South Wales where the noxious weed legislation has been extremely effective. We had the first outbreak in 1982 and we've managed to control every outbreak since then so it can be effective in some situations. (Transcript, p. 1709)

Water management

All States and Territories are involved in managing water quality and have measures in place to control water harvesting. For example, the New South Wales *Water Administration Act 1986* provides for the Department of Land and Water Conservation to control the use and flow of water, and to take measures necessary to conserve and protect water quality. The Queensland *Water Resources Act 1989*, the South Australian *Water Resources Act 1990*, the Victorian *Water Act 1989* and the Tasmanian *Water Act 1957* provide similar powers. In addition, a number of jurisdictions have clean water legislation in place to control water pollution.

The management of water is discussed in detail in Chapters 12, 13 and 14.

Vegetation management

The management of native vegetation is regulated in all jurisdictions. The controls used range from comprehensive in Victoria and South Australia to the

more indirect controls used as part of commercial forestry legislation in Tasmania.

New South Wales

In 1995, the NSW Government introduced comprehensive controls on the clearing of native vegetation through a *State Environment Planning Policy — SEPP 46: Protection and Management of Native Vegetation* — under the *Environment Planning and Assessment Act 1979*.

Under *SEPP 46*, consent is required to clear vegetation in areas greater than two hectares and applications are assessed according to biodiversity values, soil erosion, salinisation and catchment effects, and aboriginal sites, along with the likely economic and social consequences of refusal, or consent, for clearance.

The Government recently announced its intention to put in place a new *Native Vegetation Conservation Act* which will have jurisdiction over the whole State. It will also repeal *SEPP 46* and provisions relating to native vegetation conservation and management in various other Acts, including the *Soil Conservation Act* and *Western Lands Act*.

The proposed objectives of the new Act will be to:

- develop and implement regional vegetation management plans as Regional Environmental Plans under Part 3 of the *Environmental Planning and Assessment Act 1979*;
- establish and define the functions of regional vegetation committees;
- develop and implement Property Agreements;
- implement a development consent system for native vegetation clearing under Part 4 of the *Environmental Planning and Assessment Act 1979*;
- identify, and provide for the identification of, exemptions;
- establish and define the functions of the Native Vegetation Advisory Council; and
- provide for compliance with the Act.

It is expected that Regional Vegetation Management Plans will minimise the need for landholders to seek development consent for clearing. However, the *Native Vegetation Conservation Act* will provide for development consent for clearing, where it is appropriate. Landholders will be able to undertake clearing in accordance with either an Regional Vegetation Management Plan, an exemption or a development consent granted by the Minister for Land and Water Conservation.

Victoria

Controls on clearing of native vegetation on freehold land were first introduced in 1989 through an amendment to the *Planning Act*. Clearing of native vegetation on Crown land is governed by the *Land Act 1958*.

In Victoria, under the State Planning Scheme, a permit is required to remove, destroy or lop native vegetation, if the area involved is larger than 0.4 hectare. Applications for clearing must be submitted to the local council which, if the area involved is more than 10 hectares, must refer the application to the Department of Natural Resources and Environment. The 'responsible authority', *inter alia*, must consider the following:

- government policy on native vegetation retention and re-establishment;
- the conservation and enhancement of the area;
- the role of native vegetation in:
  - conserving fauna and flora;
  - protecting water quality;
  - providing shade and shelter;
  - preventing land degradation; and
- adverse effects on groundwater recharge.

There is a range of circumstances where a permit is not required. These include where the native vegetation has been planted for timber production, agroforestry, shelter belts, woodlots, street trees, gardens, horticultural purposes and the like. Another example is where the removal is necessary for the construction of a farm structure, or where the native vegetation is proclaimed as a noxious weed.

The responsible authority concerned has a duty to implement and enforce its planning scheme, including monitoring and controlling illegal clearing. Councils may request the assistance of the police or of authorised officers of the Department in carrying out enforcement actions. Any person concerned that clearing may be occurring without a permit should notify the local council as soon as possible. Maximum fines are $4000 (for a first offence) plus $400 per day for a continuing offence.

Queensland

Legislation regarding vegetation clearance in Queensland is based on the land tenure arrangements. Vegetation clearance on freehold land is subject to different regulatory arrangements from leasehold land.

Tree clearing on leasehold land is regulated primarily under the *Land Act 1994*. Under the legislation, a lessee is required to obtain a clearing permit prior to any clearing on leasehold land. Permits are not required to carry out clearing for routine management purposes.

When assessing an application for a tree clearing permit, the Department of Natural Resources is required to take into account any local clearing guidelines and a number of other factors. These include the protection of areas of high conservation value, any economic and social benefit of the land to increase or maintain primary production, the extent of the proposed clearing and the proportion of the land already cleared.

Local clearing guidelines are developed in consultation between the Department of Natural Resources, industry and conservation groups that recognise the biodiversity and degradation issues relevant to that region. However, despite this detail, any local guidelines in place must not be inconsistent with the Act and the regulations on tree clearing.

There have been six convictions recorded for illegal tree clearing under the Act since 1992 (Queensland Government, Sub. 164).

Various legislation applies to tree clearing on freehold land such as the *Nature Conservation Act 1992* concerning rare and endangered species and habitats and the *Water Resources Act 1992* for tree clearing within the bed and bank of water courses. The major controls over tree clearing on freehold land in Queensland are administered by local government.

The legislative power for local governments to administer clearing controls on freehold land is provided by the *Local Government Act 1993* and the *Local Government (Planning and Environment Act) 1990*.

However, regulations on tree clearing have only been adopted by 30 of Queensland's 130 local government authorities. Only 14 of these have tree clearing regulations in place applying to rural areas with the remaining 16 applying to urban areas where the emphasis is on protecting trees along streets and vegetation on land subject to urban development (Queensland Government, Sub. 164).

Most local government regulations, where they exist, include a definition of the vegetation to be protected, the area affected, exemptions and the need for approval by the local government authority prior to any clearing. Local government regulations on tree clearing are required to be approved by the Queensland Government. However, there is no requirement under any state legislation for local government authorities to prepare regulations on vegetation clearance.

South Australia

Initial controls on the clearance of native vegetation were first introduced in 1983 through regulations under the *Planning Act 1982*. This was followed by specific legislation aimed at controlling land clearance, the *Native Vegetation Management Act 1985* (that set up the Native Vegetation Authority to make decisions on clearance applications).

If approval was not granted, landholders were encouraged to enter into a Heritage Agreement with the government. This entitled landholders to the cost of fencing the relevant area and to 'financial assistance' according to a set formula — essentially compensation. The financial assistance excluded income forgone, but included recompense for the difference between the value of the uncleared productive land and that of the non-productive land, as assessed by the Valuer General.

Problems with landholders applying for consent to clear, in the expectation that approval would be denied and compensation paid, led to new legislation, the *Native Vegetation Act 1991* which does not provide for automatic compensation. This established the Native Vegetation Council with responsibility for making decisions on the conservation and clearance of native vegetation. Its seven members come from the SA Farmers Federation, the Local Government Association, the State Soil Conservation Council, the SA Conservation Council, the Commonwealth Government, and two appointed by the Minister — a presiding member and a person with extensive knowledge of preservation and management of native vegetation.

Landholders are required to obtain approval from the Native Vegetation Council before clearing can occur. Generally, conditions may be attached to any consent to clear. No broadacre clearance applications have been approved under the Act. Where consent is granted to clear isolated plants or scattered trees, conditions are attached requiring revegetation. These usually require the environmental benefits of the revegetation to outweigh that lost by about 10 to 1. Regulations attached to the Act permit native vegetation up to 5 metres either side of fence lines for a fire break, or a vehicle track of up to 5 metres in width, to be cleared without consent (provided the land is not under Heritage Agreement).

Western Australia

In Western Australia, landholders seeking to clear in excess of 1 hectare of native vegetation are required to have approval from the Department of Agriculture (Binning and Young 1997).

In May 1995, a new policy introduced under the *Soil and Land Conservation Act 1945–1988* on clearing native vegetation was announced. This effectively restricts clearing on a property where there is less than 20 per cent remnant vegetation or equivalent deep-rooted perennial vegetation or where the property is located in a shire where there is less than 20 per cent total remnant vegetation. Applications for clearing on properties where there is more than 20 per cent vegetation will still be determined on land degradation criteria.

Tasmania

Tasmania does not have legislation directly controlling clearing of native vegetation. However, a range of controls under the *Forest Practices Act 1985* do apply as part of commercial timber harvesting operations. These controls only apply during commercial forestry operations. Local governments are able to place restrictions on the clearing of native vegetation under planning legislation (Binning and Young 1997).

Northern Territory

In the Northern Territory, clearing controls are in place over pastoral leasehold land, Crown land and freehold land. Under the *Pastoral Land Act* a pastoral lessee may undertake clearing of vegetation only with written consent.

Clearing applications for Darwin and Litchfield Shire are considered under the Urban Control Plan and the Litchfield Control Plan administered by the Department of Lands, Planning and Environment. Where a landowner wishes to clear more than 50 per cent of his/her block, written consent is required. The application is considered in terms of the potential for land degradation, drainage problems etc and is advertised to give neighbouring landowners the opportunity to object. The application is referred to a number of different departments for consideration.

A pastoral lessee wishing to clear native vegetation in order to construct fences or roads, firebreaks or yards etc ('fixed improvements') is not required to submit a formal application to the Pastoral Land Board, provided the clearing is undertaken within the Guidelines for Clearing Pastoral Land. Lessees are, however, encouraged to seek advice from the Pastoral Lease Division within the Department of Lands, Planning and Environment.

Apart from fixed improvements, formal approval is not required for the selective clearing of woody weed encroachments over small areas, and for clearing of noxious weeds. However, the principles outlined in the Guidelines must still be followed.

More extensive clearing applications, for instance for cropping or pasture development, must be submitted to the Pastoral Land Board. The potential for land degradation and biodiversity losses are some of the factors considered in determining whether the application will be approved. If it is, guidelines are then issued to the lessee on how to conduct the clearing operations.

The penalties for breaking lease conditions, such as not clearing without written consent, and not taking all reasonable measures to conserve and protect features of environmental, cultural, heritage or ecological significance, are $10 000, and $500 for each day the offence continues. Except in the case of perpetual leases, the lease may be forfeited.

Australian Capital Territory (ACT)

As all land in the ACT is leasehold, clearing restrictions and controls are contained in the lease conditions. As part of the lease conditions, rural lessees are required to develop a property management agreement with the ACT Government in which specific consideration is given to the conservation value of native vegetation on the property (Binning and Young 1997).

Catchment management and regional strategies

Most jurisdictions have put in place integrated catchment management or similar regionally-focused strategies. These are aimed at coordinating and managing land, water and other natural resources on a regional basis.

Integrated catchment management provides a framework for fostering cooperation and coordination between the landholders, government and non-government agencies involved in the use and management of land and water resources where the effect of landholders on resource use has spillover effects on others.

As the NSW Department of Land and Water Conservation said:

> The traditional 'develop and modify' resource paradigm has shifted. Allocation of scarce government funds has been shifting in emphasis from building 'solutions' to problems, for example, constructing dams, building levees, constructing gully control structures — to integrated planning and to supporting community initiatives (Landcare, Rivercare). In essence it is a shift from directing and undertaking resource management to facilitation. (Sub.90, p. 10)

The New South Wales' catchment management system — called Total Catchment Management (TCM) and established under the *Catchment Management Act 1989* — consists of a network of Catchment Management

Committees (CMCs), coordinated by a State Catchment Management Coordinating Committee (SCMCC).

CMCs develop regional catchment strategies that contain detailed action plans to address resource management issues. The strategies provide the basis for coordinating activities of landholders and other resource users, community groups, local government and state agencies. The legislation allows any individual or government agency in the state to initiate a CMC. To assist in their activities, groups established to address catchment management issues are eligible for competitive funding grants and technical assistance from government departments. In August 1995, there were 33 CMCs in New South Wales.

The New South Wales legislation also provides for the establishment of catchment management trusts on the recommendation of a particular Minister. The trusts have the additional ability to generate funds for the implementation of catchment management strategies. Trusts may levy a catchment contribution on landowners to fund specific programs in a catchment. The levies can be collected as part of local government rates.

The SCMCC provides the central coordinating mechanism for the implementation of TCM throughout the State. The Committee is made up of community members and representatives of government agencies involved in natural resource management in New South Wales.

In Victoria, the *Catchment and Land Protection Act 1994* established the Catchment and Land Protection (CaLP) Council and 10 Regional CaLP Boards covering the entire State. The CaLP Council is the peak advisory body to government on statewide catchment management, land and water condition, and protection priorities. The CaLP Boards in turn advise the State government on progress with, and priorities for, implementing natural resource management programs in their catchments.

Following a review in March 1997, the Victorian Government announced the amalgamation of existing groups within a catchment to form a single Catchment Management Authority (CMA). Each CMA will integrate the roles of current community-based advisory groups (including CaLP Boards, salinity plan integration groups, water quality working groups and sustainable regional development committees) and community-based service delivery groups (waterway management authorities).

CMAs will have operational responsibility for salinity control, flood plain management and in-stream river management. The CMAs also play a role in the National Landcare Program's Regional Assessment Panel process, they advise both the State and Commonwealth governments on priority areas for

funding landcare works programs in relation to regional catchment strategies. The role of the CaLP Council will be expanded to provide advice on research and investigation priorities and community awareness programs.

In Queensland, the integrated catchment management program is guided by the SCMCC which reports directly to the Minister for Natural Resources. Membership of the SCMCC is drawn from Catchment Coordinating Committees (CCCs), industry and community groups, and government agencies. The CCCs are made up of stakeholders in the local community and government. They deal with regional catchment management issues. The CCCs provide the forum for community input. The base for this integrated catchment management is the catchment care groups. These are informal community groups formed to address land and water issues in a catchment or sub-catchment.

The regional approach to land management in South Australian is undertaken through District Soil Conservation Boards established under the *Soil Conservation and Land Care Act 1989*. As part of this approach, it also established the Soil Conservation Council, the District Soil Conservation Boards, the District Plans and Three Year Action Program.

The Soil Conservation Council provides a leadership role on land management issues and supports the District Soil Conservation Boards. It advises the minister on the administration and operation of the Soil Conservation and Land Care Act. It monitors and evaluates the condition of land degradation and its implications, and advises the Minister of priorities for research and strategies for the conservation and rehabilitation of land.

There are currently 27 District Soil Conservation Boards in operation in South Australia. Their role is to promote community awareness and understanding of land management issues and to develop or support programs for land conservation and rehabilitation that the community can participate in.

Each Board is required to develop a District Plan for the region it covers. District Plans identify existing land degradation problems and the practices and means of implementation to overcome these problems. Each plan is currently set for a period of three years. Eighteen Plans have been prepared to date.

In Western Australia, land management at the regional level has been facilitated through designated Land Conservation Districts. There are 150 Land Conservation Districts, which cover most of the State. An amendment to the *Soil and Land Conservation Act 1945* provides the legislative basis for the creation of these Committees.

The decision to form a Committee is decided by the community. The Land

Conservation District Committees represent the interests of landholders, producer groups, local government and conservation groups. They are active in disseminating information on ESLM principles and perform an administrative function for Landcare. Most Committees have their own Community Landcare Coordinator.

5.3 Summary

Australian governments have made some progress in developing and implementing effective policies aimed at land and natural resource management and environmental protection. However, there is still considerable room for improvement in the performance by government to achieve ESLM. As Environment Australia said:

> 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. (Sub. 175, p. 33)

The following chapter addresses the need for change in the response by Australian governments to land and natural resource management problems.

6 THE CASE FOR CHANGE

Community concern about the impact on the environment of land management practices has increased over the last decade. In response, governments have modified policies, programs and institutional arrangements. However, there are still many shortcomings in these areas which severely limit the capacity of governments to efficiently address environmental land management problems. This chapter illustrates the nature and extent of these shortcomings.

As indicated in Chapter 3, there is growing community concern about the nature and extent of the impact(s) of economic activity on the environment. This ranges from concern about individual impacts to the overall state of the environment and the long-term ecological sustainability of certain economic activities. Many of the concerns relate to agricultural and pastoral activities and their use of natural resources — the focus of this inquiry.

There have been many responses to these concerns by individuals, industry and community organisations. And governments at all levels have introduced measures to safeguard the environment and promote environmentally sustainable outcomes. Many of these responses have been directed at the management of natural resources in agriculture.

Despite these efforts, the core problems remain, and there is a distinct likelihood that the severity of some will increase.

Bradd and Gates (1995) found that, in the absence of broad scale changes in land management, up to 5 million hectares of land in New South Wales alone has a moderate to high probability of becoming saline in the near future.

Groundwater continues to be used faster than it is replenished, resulting in increasing seawater intrusion in some basins. In other basins, vegetation clearing and irrigation are contributing to rising groundwater levels, and consequent waterlogging and salination problems.

The State of the Environment Advisory Council (SEAC 1996) reported that problems such as soil salinity, acidification and rising groundwater are increasing in severity. It said that soil fertility is declining in one-third of all cropped land. SEAC commented that:

> The loss of biological diversity is perhaps our most serious environmental problem ... the destruction of habitat, the major cause of biodiversity loss, is continuing at an alarming rate. (1996, p. ES-14)

and:

> More than one hundred mammal species are considered endangered, vulnerable or potentially vulnerable. (1996, p. 4-33)

The growing severity of many of these environmental problems suggests shortcomings in government responses. This view is reinforced by the findings of recent studies and inquiries, as well as by comments from participants in this present inquiry. The following discussion, which illustrates some of the shortcomings, draws upon this material. The discussion is presented in terms of policy, implementation and institutional issues.

6.1 Poor policy responses

To date, the incorporation of the principles of ecologically sustainable development into government policy has been ad hoc, incomplete and tentative. This inquiry has identified that Australian governments have yet to realise a comprehensive, integrated and far-sighted way of promoting ecological sustainability in agriculture, in all its various dimensions.

The Commission's diagnosis does not imply that little effort has gone into recasting policy in this area — all jurisdictions have and continue to put a great deal of effort into redesigning policy frameworks, developing policy strategies and measures, and reforming their agencies and institutions. Nor should the diagnosis be interpreted as suggesting that the task is necessarily easy. In fact, it is immensely challenging and cannot be completed quickly because of the community involvement that is essential to success.

There is also a range of shortcomings with individual elements of the current policy responses that have been developed by jurisdictions (discussed below). Underlying these shortcomings is a lack of relevant information, despite the considerable efforts of governments in this area.

Information

Natural resource management involves highly complex and greatly extended biophysical systems. 'Best practice' management of such systems puts great demands on environmental knowledge and know-how in the hands of the managers and policy makers. Although there are numerous government and private organisations involved in generating and disseminating such knowledge

and know-how for the use of those involved in the various facets of natural resource management, the Commission found significant deficiencies in the results obtained.

Environmental knowledge

State of the Environment reports are produced by the Commonwealth, States, Territories and local government in some States. Although these reports are a useful resource for governments and the community in understanding and managing the environment, they reveal the inadequacy of the knowledge base. The Commissioner for the Environment, in Victoria's 1991 State of the Environment Report, said:

> At present the scarcity of appropriate environmental data is universal, and is the subject of comment in almost all State of the Environment Reports. (Office of the Commissioner for the Environment 1992, p. 7)

By 1996 little had changed. The development of environmental indicators, which will provide measures of environmental health and/or the sustainability of natural resource management practices, is hampered by the lack of relevant information on the state of the environment. The South Australian Government, speaking about the National Collaborative Project for Indicators of Sustainable Agriculture, said that project had:

> ... shown up some significant deficiencies in our national data collection systems both in terms of gaps in the range of data collected and in the usefulness of some of the data sets ... (Sub. 84, p. 47)

More importantly, most existing reporting does not provide information in sufficient detail for management decisions at the regional or local level. The Local Government and Shires Associations of NSW said councils have certain obligations under the *Threatened Species Conservation Act 1995*, but that:

> The biggest problem councils have had in implementing the Act, is that there simply is not enough information on threatened species and on species and habitat distribution, particularly at the local and regional scale. (Sub.276, p. 4)

Often the information collected by the various reports is not in a standardised form and does not allow for aggregation or comparison. Environment Australia said:

> The lack of nationally compatible data across different jurisdictions is a major obstacle to achieving efficient land management practice. (Sub175, p. 7)

There is often no clear understanding or definition of each collection agency's responsibilities, leading to overlaps and gaps. For instance, the Department of Conservation and Land Management, Western Australia was critical of the work undertaken by the Australian Surveying and Land Information Group

(AUSLIG), Australia's national agency providing national land and geographic information:

> ... almost everything that AUSLIG does is duplicated, but done far more accurately, by State agencies. (Sub. 225, p. 4)

There are problems in finding and obtaining access to the information that has been collected by the various agencies. The South Australian Government said:

> The data may exist but finding where it is or who has it may be a task. (1997a, p. 1)

Environmental know-how

In the area of environmental know-how, there are major gaps in the generation and dissemination of information to landholders and other managers of natural resources. There are gaps in the research effort into on-farm biodiversity and the farm management practices to integrate agricultural and pastoral activities on the one hand with the conservation of remnant vegetation and biodiversity on the other. Moreover, there appears to be a shortage of effective extension of such know-how, as well as confusion and uncertainty about who should undertake this extension, and what it should cover.

Regulation

The first response to environmental problems by jurisdictions has often been direct regulation of the activities concerned. Unfortunately, the use of regulation has been largely ad hoc and all too frequently the only response.

For example, despite the fact that off-reserve conservation on agricultural land has been identified as a high priority by the Commonwealth, States and Territories, the responses to conserve biodiversity on private land have focussed almost exclusively on regulating land clearing, even though it can only make a small contribution on its own and, in some circumstances, can be 'high cost' in terms of development opportunities forgone.

Design of regulation

Much of the regulation currently in place is fundamentally flawed. This is reflected in an undue reliance on prescribing in detail the inputs or processes to be used — command and control regulation — in preference to prescribing the broad outcomes desired and leaving open the manner by which they are achieved. The present approach also tends to focus on physical safeguards and to ignore non-physical ones — for example, regulating the process of harvesting

a forest rather than requiring a performance bond to be posted before harvesting as a guarantee of harvesting outcomes.

A major drawback with command and control regulation is its lack of flexibility. For example, in some cases, polluters have no choice about the way in which they comply with the regulation. Thus, there is no incentive to search for better and less costly solutions. And unless the regulation is regularly reviewed, there is a danger that producers will be locked in to inefficient and outmoded technologies.

The Northern Territory Government acknowledged the widespread use of prescriptive command and control regulation and commented:

> Specific prescriptive regulation may not be appropriate due to a number of problems such as physical circumstances changing over time and between properties. Also it may not be workable nor economically efficient, even if politically acceptable. (Sub. 188, p. 14)

James summarises well the shortcomings for the community of such regulation as follows:

> ... governments have relied heavily on direct regulations ... they tend to be inflexible and can impose high costs on the community. They can also be expensive to administer. (1997, p.13)

The inflexibilities and costs of much existing regulation are exacerbated by the often large variability of individual problems across jurisdictions and over time.

Volume of regulation

Despite increasing attempts by jurisdictions to integrate their natural resource and environmental legislation, the volume of regulation in these areas is large and growing. For instance:

- Walker (1997) lists over 100 Commonwealth Acts administered by 13 separate portfolios which have (or have had) a potential bearing on rural land use in Australia;
- although six key Acts control land and natural resource management, and environmental protection in Victoria, the Department of Natural Resources and Environment administers over 100 separate Acts dealing with natural resource management[1]; and
- the Department of Land and Water Conservation in New South Wales administers around 80 Acts.

In its submission to this inquiry, the Northern Territory Government stated:

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[1] Derived from information contained in Bates (1995).

> In the Territory, there is a vast number of Acts which contain land use provisions ... (Sub. 188, p. 14)

Concerns about the continued growth in legislation were reflected in participants' comments. For instance, the Tasmanian Farmers and Graziers Association (TFGA) referred to:

> ... political pressure amongst all parties to put in place measures which are aimed at improving the management of our resource base. In most instances, these measures are regulatory in nature and have led to a plethora of new legislation ... (Sub. 95, p. 2)

The large volume of regulation creates two basic problems. The first is the difficulty to comprehend its breadth and to comply with it, especially for small farmers and other landholders. This makes enforcement more difficult, thereby undermining public confidence in the regulatory regime. The second problem is that it is difficult for governments to keep integrated, up to date and relevant.

Lack of consultation

Concerns about the quality and quantity of regulation have manifested themselves in criticisms by participants about the lack of consultation on, or input into, the development of regulation. For example, the TFGA said:

> While SDAC [the Sustainable Development Advisory Council][2] takes seriously its responsibilities for consultation, TFGA is concerned that SDAC may be limited in its ability to appropriately consult with farmers ... (Sub. 95, p. 5)

The Queensland Grain Growers Association said:

> ... serious shortcomings in client service remain ... Part of the problem lies in the inability of key civil servants to facilitate positive community consultations. (Sub. 61, p. 22)

The NSW Farmers' Association said:

> A major reason for the poor policy response to sustainable land management is due to the lack of genuine consultation with the key stakeholders before regulatory reforms are introduced and implemented. It is not uncommon in many jurisdiction for government agencies responsible for introducing legislation to limit their contact with farmers during consultation processes. This attitude reinforces the lack of confidence landholders have in government. (Sub317, p. 4)

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[2] The Commission notes that the Sustainable Development Advisory Council was replaced by the Resource Planning and Development Commission on 1 January 1998. The Commission will assume the functions of SDAC, the Public Land Use Commission and the Land Use Planning Review Panel.

As a consequence of the lack of consultation, the quality of regulation is often poor.

Market-based measures

There has been an over-reliance on regulation to the detriment of other policy measures that have far greater potential to improve environmental outcomes in a cost-effective manner. Markets and market-based policy measures (economic instruments) are widely acknowledged as being superior to command and control regulation in many instances (James 1997).

To date, government actions to remove impediments to well-functioning markets and make greater use of market-based measures for managing key natural resources have been tentative and limited. These shortcomings have been most pronounced in the persistence of poorly-functioning, or the complete absence of, markets for some key natural resources — surface water and groundwater, farm forestry and native flora and fauna.

The NSW Irrigators' Council pointed out that:

> ... insofar as markets can be brought to bear on resource availability, ... the problem of resource depletion is largely self-correcting because *as resources become scarce their prices rise, which in turn slows down consumption and encourages the search for substitutes.* (Sub. 263, p. 3, emphasis in original)

The major impediments to the emergence of more efficient markets for the key natural resources are the lack of well-defined, secure and tradeable rights to use those resources — especially water and forests. Although all governments are taking steps to address these impediments, much remains to be done and there appears to be insufficient recognition of the urgency to extend and complete these processes.

Harnessing market forces in the decisions about the management of these key natural resources would facilitate recognition of both the environmental and commercial values of these resources, and promote better environmental outcomes than those attainable through direct regulation.

Finally, most jurisdictions have made very little use of voluntary agreements with landowners to conserve critical habitat where the risk of loss of biodiversity is greatest. The use that has been made of such agreements does not seem to be coordinated with other Commonwealth, State and Territory programs on natural resources and the environment.

Environmental programs

The objectives and achievements of many natural resource and environmental programs are obscure. In its investigation of the Commonwealth's programs in these areas, the Australian National Audit Office (ANAO) found that:

> The audit found that across all programs examined in DPIE [Department of Primary Industries and Energy] and Environment Australia, program objectives are broad and difficult to measure. ... There were few cases found where objectives were concise, realistic and measurable outcomes-oriented statements of what the program aimed to achieve. (1997, p.24)

The two agencies are implementing modifications to the programs as part of the implementation of the Natural Heritage Trust (NHT).

The Trust and its predecessors have had considerable success in raising awareness among land holders about the environmental impacts of natural resource management and in mobilising them to address those impacts. As Mr Alex Arbuthnot (Sub. 305) observed, Landcare operated successfully within 'a large continent, with many issues and a range of solutions' (p. 2).

Nevertheless, a wide cross-section of participants were critical of many of its features and were not sanguine that the deficiencies would be remedied. For example, the Tasmanian Government argued that:

> ... there is a need for review of the structure of the NHT, the separation of programs under the Trust, and the funding arrangements within and between programs. (Sub. 319, p. 8)

And the Australian Conservation Foundation felt that:

> When we talk of Landcare or the Natural Heritage Trust, there is still no sense of any real objective at the end of the day. (Sub.105, p. 25)

AACM International diagnosed the essence of the problem at the public hearing in Adelaide on the Draft Report:

> At the moment most of the programs focus on investing money to help people purchase some inputs for ESLM, whether that's catchment planning or on-ground works or whatever; it is focused on inputs rather than outcomes. We believe that governments could invest their money in sustainable land management using some form of a market for environmental services; in other words, actually paying for the outcomes and making that a clear economic message rather than having complex programs to focus on inputs. (Transcript, p.1512)

The WA Farmers' Federation agreed:

> There needs to be a clear statement from the Commonwealth about what is expected by way of outcomes from NHT funding. (Sub.230, p. 5)

Environmental programs are not well served by ill-defined objectives and outcomes. Success in determining precise objectives in terms of realistic and measurable outcomes is important, especially given the size of the Trust. Ill-defined objectives and outcomes mitigate against transparency and accountability. Such implementation problems are discussed in Section 6.2.

Other policies

Poor program design is also reflected in perverse outcomes resulting from some government policies.

An example is the tax concessions related to land and land clearing. The Commonwealth used to provide tax concessions for land clearing. While these were in place, they encouraged over-clearing, which subsequently contributed to dryland salinity and dieback among remaining stands of trees. James contends that land tax policies in the States can still lead to perverse outcomes:

> Land tax policies in some States still act as a possible inducement for land clearing, accentuating the risks of adverse habitat modification, species loss and ecological damage in local areas. (1997, p. 98)

The NSW Farmers' Association disagreed:

> With regard to state land tax, while in NSW private agricultural land is exempted from such tax, there is no evidence to suggest nor confirm that this was the cause for massive land clearing in the past. Also the degree to which land tax or council rate rebates will provide a perverse incentive, depends on whether or not there is a land clearing control regime in place. (Sub.317, p. 4)

Mr Alex Arbuthnot (Sub. 305) considered that not all clearing should be branded as 'wrong'. 'The real issue is how the land is managed', he said (p. 2).

Other current policy measures which can have perverse incentives include the on-going subsidisation of irrigation water and certain components of the existing Rural Adjustment Scheme (RAS). The latter include drought assistance provided under the RAS exceptional circumstances provisions. This assistance encourages farmers to maintain stocking levels, rather than scaling back activities and reducing the pressure on the land at times when it is relatively vulnerable to damage.[3] In this context, the ACF said:

> The ACF is concerned that in many ways, governments' roles in agriculture continue to contribute to environmental degradation and serve as obstacles to ecological sustainability. (Sub. 105, p. 9)

[3] The Government is presently considering a review of the RAS scheme.

The NSW Farmers' Association (Sub. 317) did not accept 'that funds from the Rural Adjustment Scheme would encourage over stocking' (p. 4). As noted above, the Commission's comment refers to certain elements of the RAS, not the totality of the scheme.

6.2 Implementation problems

Policy weaknesses are frequently exacerbated by poor implementation of policy. Often strategies have been enunciated, but have not been supported by the timely implementation of concrete programs.

In some cases this is because the strategies, although sound in principle, are simply too generalised to be of much assistance in helping to define the concrete actions that are needed. Indeed, there is a plethora of such strategies at the national level. They do little for public confidence.

In other cases, the initiatives constitute a significant improvement over previous policies but they have been undermined by the failure of governments to implement them expeditiously. For example:

- The National Forest Policy Statement was agreed between the Commonwealth, State and Territory governments in 1992.[4] More than five years later, major proposals (eg the establishment of forestry rights, the removal of taxation impediments and the lifting of export controls on unprocessed wood) have still not been fully implemented.
- Major Council of Australian Governments water reforms (eg the progressive implementation of pricing structures that reflect supply costs and the clear specification of water property rights) have progressed, but the timetable for some of the reform will not be met.
- The 1992 Intergovernmental Agreement on the Environment — which is intended to facilitate consultation and coordination of environmental regulation and processes between different levels of government (see also Chapter 5) — has not been fully implemented. For example, there is still no systematic approach to accreditation of environmental regulation.

The failure by government to quickly and effectively implement policies unnecessarily defers the benefits of reform. It also creates uncertainty, and discourages new investment.

Implementation problems are also manifest in poor performance monitoring and limited effective program evaluation in relation to environmental programs.

[4] Tasmania did not become a signatory until 1996.

The ANAO (1997) found that the performance of the States/Territories under the National Landcare Program Partnership Agreements had not been assessed against the original performance indicators. However, the ANAO commented:

> ... the Partnership Agreements allowed States/Territories to submit annual reports for each schedule to the agreements (ie 'the original performance indicators') **or** each project. ... the States/Territories preference for the latter option 'substantially reduced the value of the schedules (and the included performance indicators)' as a means of assessing program outcomes. (Sub.205, p. 1, emphasis in original)

The ANAO (1997) also confirmed an earlier assessment of Department of Primary Industries and Energy (DPIE) and Environment Australia programs that 'data collection is often inadequate to monitor performance or undertake strategic planning' (p. 33). The ANAO concluded that:

> Overall, programs in both DPIE and Environment Australia fall short in terms of appropriate monitoring of projects, evaluation and reporting of outcomes. (1997, p. 69)

The Commission notes that a Working Group on Natural Heritage Trust Performance Reporting has been established to develop an evaluation framework for the Natural Heritage Trust. Four key result areas have been agreed to: 'integration and institutions', 'environment', 'sustainable production' and 'people'. The recommendations of that working group and their implementation will be important to establishing publicly the nature of any net community benefit from the large expenditure of public funds in this area.

6.3 Institutional weaknesses

There are two aspects to the institutional weaknesses of existing arrangements. One, is the limited devolution and capacity of local and regional institutions to deal with environmental problems, given the importance of local dimensions to most of them. The other, is the coordination of responsibilities among agencies with responsibility for natural resources and the environment. The following sub-sections deal with each of these.

Local and regional institutions

A fundamental weakness with the present institutional arrangements is the limited devolution of natural resource management to local and regional organisations and the lack of capacity for them to effectively handle such devolution.

As environmental land management problems are typically regional in character, these organisations are usually best placed to assess problems and develop effective solutions. However, with some exceptions (for example, catchment management in some jurisdictions and the National Landcare Program), such organisations currently play a limited role.

The present situation reflects a number of factors, including the limited powers of local/regional bodies and resource constraints. This was recognised by Martin and Woodhill:

> Regional and catchment planning, while varying from State to State, generally lack resources and have little coordinative capacity. (1994, p. 287)

The Royal Australian Planning Institute (Sub. 251) added that because of these limits, care should be taken in devolving responsibilities for resource management activities to local or regional bodies so that local and regional strategies are developed that are in keeping with State, Territory and Commonwealth priorities. Using catchment management committees (CMCs) as an example, it said:

> ... because of their community status, CMCs seriously lack administrative assistance and expertise to carry out systematic strategic planning and target their programs accordingly. Where funding is solely directed at project proposals from local residents, regional, state and national priorities (such as dryland salinity) can be overlooked. (Sub. 251, p. 6)

Similarly, Professor A and Mrs J Conacher said:

> It is vital to encourage and retain community goodwill and sense of empowerment if policy ends are to be fully realised; and to ensure that those who 'administer' are adequately qualified to do so. (Sub.219, p. 10)

The capacity of local government to contribute to natural resource management is also limited. For example, while recognising that local government has an important role and stake in the achievement of ESLM in Western Australia, the Soil and Land Conservation Council commented:

> Their limited financial resources means that local governments have few staff, particularly in professional areas, which limits their skills and knowledge base necessary for undertaking their functions in ways which contribute to ESLM principles. (Sub. 153, p. 11)

And Thorman contends:

> ... Local Government's role in natural resource management is patchy, and there are some major challenges ahead before there is widespread effective Local Government involvement. (1996, p. 1)

The Local Government and Shires Association of NSW (Sub. 276) said that while the lack of resources does contribute to councils' limited environmental

performance, 'often the smaller councils with fewer resources ... have achieved the greatest environmental results' (p. 1). It cited the example of the Kiama Council which has developed a comprehensive strategy on biodiversity. It said:

> This is just one example of the impressive environmental initiatives councils have been able to implement despite a shortfall in resources. (Sub276, p. 1)

The Association said a number of councils had shown initiative in raising resources to fund environmental programs. It referred to the Bushland Preservation Levy of the Brisbane City Council levied on all ratepayers to fund the acquisition of bushland considered to be 'at risk'. However, it added that such initiatives were hampered in New South Wales by rate pegging.

The Association also said:

> Local councils have, over the past century, moved from becoming public utilities to become the primary strategic manager of the land and environment within their boundaries and, indeed, across their boundaries in a regional, often bioregional sense. They have a fundamental role to play in land management not only through their development assessment functions, but also because councils themselves manage significant areas of land and water and can also impact on the environment through their own activities. (Sub.276, p. 1)

The ACF (Sub. 105), which strongly supports an increased role for community participants as a means of improving natural resource management, expressed serious misgivings about existing models of community participation, funding programs and support programs.

Coordination of responsibilities

At present there are also significant problems in the way government bodies — at all three levels of government — interact on natural resource management issues. The problems include: overlapping and poor coordination of functions between agencies — both between and within jurisdictions; fragmentation of responsibilities; and the requirement for some bodies to perform regulatory as well as management and/or service provision functions.

To some extent, these problems reflect the large number of government bodies involved in natural resource management. For example, DPIE said:

> ... there can be a plethora of agencies representing up to three tiers of government, plus local/regional and even national interest groups, plus the regional community, to be taken into account in forming planning and implementation bodies. (Sub. 202, p. 16)

The National Commission of Audit identified the inter-jurisdictional problems this can cause:

> ... the lines of responsibility have increasingly blurred with greater reliance of States on Commonwealth resources.
>
> The key problem areas in the interface between the Commonwealth and the States in service delivery are in the overlapping of programs between the two jurisdictions ... (1996, p. 75)

Mr Alex Arbuthnot said:

> what happens in practice is that between departments in Canberra little integration occurs in a functional sense. We continually see the promotion of ministerial programs that are tops down, short term and without community ownership. eg Coastcare, Bushcare, Rivercare. This confuses Australia's international image that has recognised our major land management program as Landcare. (Sub. 305, p. 1)

The ANAO (1997) identified Landcare programs as a significant area of overlap between jurisdictions. It found a lack of clarity about Commonwealth roles and responsibilities which:

> ... increased the scope for DPIE to overlap, rather than complement, the roles of States and Territories. (1997, p. xv)

The large number of government agencies involved in land and natural resource management also leads to overlaps and duplication *within* jurisdictions. For instance, the Royal Australian Planning Institute said:

> ... the plethora of State agencies, often with overlapping and contradictory responsibilities, are often ineffective in policing the regulatory regimes that are in place. (Sub. 131, p. 7)

Fragmentation of responsibilities exists even within those jurisdictions which have undertaken rationalisation in recent years. For instance, while the functions of three organisations in Western Australia were combined in a new body following a 1995 review — Agriculture Western Australia — there is still considerable fragmentation (see Box 6.1).

Box 6.1: **Land management responsibilities in Western Australia**

The Conservation Council of Western Australia considers that the legislation and agencies in that state are inadequate. It said:

> Attempts to deal with issues such as clearance of native vegetation and drainage have been hampered in WA because the issues of who does what have not been resolved by the Government agencies involved nor is the legislation adequate to deal with many issues. (Sub. 177, p. 7)

According to the Council, responsibility for land management in Western Australia is shared by:

- Agriculture WA — agricultural land under various acts including the Soil and Land Conservation Act and the Agriculture and Related Resources Act;
- Water and Rivers Commission — rivers, waterways under the Waterways Conservation Act;
- Department of Conservation and Land Management — conservation estate, state forest and flora and fauna;
- Department of Environmental Protection — pollution and environmental protection under the Environmental Protection Act; and
- Department of Land Administration — administration of pastoral lands under the Lands Act.

Source: Conservation Council of WA (Sub. 177).

The Task Force for the Review of National Resource Management and Viability of Agriculture in Western Australia commented on the present institutional arrangements in that State in the following terms:

> There is a plethora of State-based regional structures (including at least two within the Agriculture portfolio — the six Sustainable Rural Development Programs regions and eleven Agriculture Protection Board Zones Control Authorities) that have been set up for a specific advisory, management and support purposes, all of which work to a different set of regional boundaries. (WA Task Force 1997, p. 13)

Another weakness with the current institutional arrangements is the combination in the one government agency of functions which can lead to conflicts of interest. Conflicts can arise if, for example, an agency is required to discharge regulatory functions as well as management and/or service provision functions.

Separation of functions has occurred in some government agencies with environmental responsibilities. For example, the WA Water Authority has been separated into the Water and Rivers Commission and the Water Corporation.

In other cases, government agencies with environmental responsibilities continue to perform functions which are potentially in conflict. In some States, the one agency is responsible for both regulation and commercial log supply — for example, the Department of Conservation and Land Management in Western Australia. Similarly, there is the potential for conflicts of interest in the conservation of biological diversity. For instance, the New South Wales National Parks and Wildlife Service performs both regulatory and management functions.

6.4 Scope for reform

The problems sketched out above are not intended to be an exhaustive critique of weaknesses in government responses to land management problems. Nor are they intended to deny the considerable progress made by governments in some areas. Rather, they are intended to illustrate the considerable scope available to improve upon responses to current environmental land management problems and achieve better outcomes. Details of the Commission's proposals to achieve these objectives are outlined in the following chapters.

7 PROPOSALS FOR CHANGE

A comprehensive and integrated approach is required to efficiently address ecologically sustainable development and environmental land management objectives. This requires collaborative action by individuals, community groups, industry and government, with responsibilities devolved as far as is practicable. The main elements of the Commission's preferred approach are briefly outlined in this chapter. Further detail is presented in the subsequent chapters.

Consideration of the principles for managing land and other natural resources in an ecologically sustainable manner raises complex issues. The problems are numerous, varied and often location specific — and many are interrelated. Consequently, there is no simple answer or single solution. Instead, a comprehensive and integrated package of mutually reinforcing measures that recognises this complexity is required.

The policy package proposed by the Commission is designed to overcome shortcomings inherent in the present arrangements and deliver to the community better environmental outcomes at lower cost. At the most general level, the package is intended to husband and efficiently allocate scarce environmental resources in a way that maximises their value to the community as a whole.

The package seeks to achieve this by creating incentives for individuals and groups in regional communities — in collaboration with governments where appropriate — to actively incorporate and promote environmental goals and to do as much as is reasonable to develop least-cost solutions to environmental problems. Complementary action by governments would encourage environmental altruism and exploit synergies available from private markets.

The Commission's package outlined in this report has three pillars. They are to:

- recast the regulatory regime to ensure resource owners and managers take into account the environmental impacts of their decisions;
- create or improve the markets for key natural resources, and where practical, to use economic instruments in preference to direct regulation; and
- encourage environmental altruism and conservation on private land.

Underlying, and fundamental to, the effective operation of all these pillars is a need to generate and disseminate adequate environmental knowledge and know-how. Information in these areas is essential to the successful implementation

and operation of each of the three pillars of the reform: for land managers to discharge their duty of care for the environment; for the efficient operation of the key natural resource markets; for the design and operation of policy initiatives, especially economic instruments; for selecting conservation projects; for accounting to the public for the expenditure of public funds; and for management generally.

7.1 Regulatory reform

The first of the pillars involves a comprehensive and balanced approach to the regulation of natural resources and environmental protection (see Chapter 8).

This approach is built around a duty of care for the environment, backed up by voluntary standards to the maximum extent possible and mandatory ones only where they are essential.

The proposed duty of care would require everyone who can influence the risk of environmental harm to take all *reasonable and practical* steps to prevent such harm. While everyone would have such a duty, the primary focus will be on land managers, both private and government, and the impact of their management practices on the sustainability of agricultural and pastoral activities and on the environment. A more restricted duty towards the environment already exists in Queensland, Victoria and South Australia.

The Commission's proposes to implement its approach to regulation by means of a single unifying statute in each State and Territory to set out the principles to be observed in land and natural resource management. These principles would be based on and derived from the duty of care for the environment (see Chapter 9).

In each case the single unifying statute in each jurisdiction should replace the various ad hoc statutes that currently govern land and natural resource management and environmental protection. A review in each jurisdiction is necessary to maximise the potential benefits of the streamlined regulatory approach. These reviews should aim to repeal superfluous law and ensure that any rules that are retained conform to the Commission's recommended approach to regulation.

The proposed regulatory reform places greater reliance on self-regulation — to minimise the deficiencies in 'command and control' regulation. As far as possible, voluntary standards (codes of practice and environmental management systems) would be used to show compliance with the mandatory duty of care.

Such standards should be able to be developed by local stakeholders — those who have the greatest knowledge of the local situation and circumstances (see Section 9.2). They should replace as many of the mandated standards as possible. Mandated standards would only be used as a last resort — when the risks of environmental damage are particularly high — and then to prescribe the desired *outcomes* as far as practicable.

7.2 Markets and related measures

The second of the pillars is to improve the markets for natural resources and where possible to use economic instrument***s*** in preference to direct regulation.

This involves steps to remove specific impediments to the creation or expansion of well-functioning markets for key resources. The resources in question include surface and groundwater (see Chapters 12 and 13), farm forestry and native vegetation (see Chapter 11), and native flora and fauna (see Chapter 15).

The approach to market creation or expansion applies equally to waste or discharges from agricultural activities into the environment — for example, water pollution associated with agriculture. It is also applicable to the diversification of the commercial uses of agricultural land, particularly the rangelands (see Chapter 18). Realisation of these possibilities, however, will require reform of the system of pastoral leases.

The measures centre on creating better defined, secure and tradeable rights to use these resources and pricing reforms to eliminate subsidised use. They include completing the introduction of tradeable water entitlements agreed by Council of Australian Governments (see Section 12.3), separating the ownership of trees from the land on which they are grown (see Section 11.1), guaranteeing forest harvesting rights prior to planting (see Section 11.3), extending the existing tradeable discharge permits to new sources of water pollution, and creating new permit systems for agricultural discharges — such as salts and nutrients (see Section 14.2).

These changes will encourage conservation and more efficient use of the resources in question — thereby reducing the environmental impacts associated with usage. In particular, the proposed changes will reduce the bias in the financial incentives currently facing farmers to clear deep-rooted vegetation and over-use water. They have considerable potential to direct privately owned resources into better resource management and its associated environmental benefits — far more so than compulsion.

There is scope to extend the use of economic instruments for the control of ecological damage. Currently tradeable emission permits have been used

successfully to address salinity and nutrient pollution of two rivers in New South Wales, and salinity in the Murray-Darling Basin. They allow the dischargers to choose how to comply with their environmental responsibilities — the flexibility lowers the overall costs of doing so.

The success of these schemes opens the way for similar schemes in other jurisdictions and for other pollutants. The Commission proposes that each State and Territory should develop a strategy to do so (see Section 14.3).

7.3 Private conservation and environmental altruism

The third of the pillars is to expand nature conservation on private land (see Section 16.4). This applies specifically to the protection of our biological diversity and natural heritage. On their own, national parks and reserves are unlikely to achieve a comprehensive, adequate and representative coverage of the nation's unique and internationally-prized biological diversity (see Section 16.1).

The duty of care would make an important contribution, but only to the point where it does not impose unreasonable costs on landholders — its major contribution is likely to be in bringing vulnerable habitats to public notice. More needs to be done, though, for the combination of on- and off-reserve conservation to become comprehensive, adequate and representative.

The Commission proposes that each State and Territory should extend its use of voluntary conservation agreements with selected landholders (see Section 16.4). Each agreement should establish the conservation outcomes to be achieved by the landholders and the financial consideration to be paid by the government. Such agreements provide jurisdictions with the capacity to protect, after careful consideration, those highly valued natural assets on private land which are at greatest risk. However, each jurisdiction needs to develop a strategy to enable it to get the most out of its investment in this area.

The benefits of this approach would be enhanced by the removal of any impediments to the commercial utilisation of wildlife — for example, by lifting export controls where an appropriate management system or code of practice was put in place (see Chapter 15).

Charitable trusts to promote nature conservation — such as the Trust for Nature in Victoria — also use conservation agreements with private landholders to achieve their objectives. They rely on public donations to fund this work. Governments need to ensure that their tax systems encourage environmental altruism as much as any other form of altruism — at present they do not (see Section 16.2).

7.4 Environmental knowledge and know-how

Information and particularly adequate environmental knowledge and know-how are crucial to the implementation of the Commission's recommendations, and indeed for successful land and environmental management generally (see Chapter 10). For land managers and users to be able to carry out their duty of care they need to have access to up-to-date knowledge about the environmental impact of various land management practices.

Markets work best when market participants and policy makers are in possession of the available information they need for making decisions. The markets for natural resources are no exception. The state of their natural resources and the local environment is not always obvious to even a well-informed landholder. Timely and relevant information on these issues can contribute to better decisions by the owners and managers of the resources.

The Australia New Zealand Land Information Council (ANZLIC) — consisting of the chief executive officers of the land information agencies of the Commonwealth, States, Territories and New Zealand — is in the process of developing an Australian Spatial Data Infrastructure (ASDI). Under the ASDI proposal, the agency which originally collected the information will remain its custodian but it will maintain it to agreed standards so that it can be merged, aggregated or compared with similar data held by the other agencies.

The ASDI could overcome many of the information problems identified by the Commission. To ensure that the appropriate solutions are implemented and as quickly as they are needed, the Commission recommends that the governments in question should conclude a formal agreement on the management of spatial information held by their agencies.

The information necessary for well-functioning markets in natural resources is not confined to that about the condition of the resource base or the local environment. It can be as simple as information about the operation of the markets for the key natural resources. The lack of public information on prices received for saw logs from Crown plantations increases the uncertainty of investment in farm forestry and plantation forestry on farm land. This discourages more environmentally friendly uses of farm land.

7.5 Institution building

Finally, institutional change will be necessary (see Chapter 19). Local organisations may need to be strengthened to advance local solutions to local problems — similarly at the regional level. There is a need to separate resource

management and regulatory functions in government agencies to promote transparency and accountability.

7.6 Conclusion

The focus of the above has been on outlining the main elements of a comprehensive and integrated framework in which *future* decisions on land and associated natural resources can be made that will result in better production and environmental outcomes in the future. Given the legacy of environmental impacts from *past* decisions, it is appropriate to consider how this framework will deal with the necessary remediation of the natural resource base.

In some ways, the issues involved are clearer. Where the benefits are largely confined to individuals, then the decisions can be left to them. However, most involve benefits to others and often the benefits have a public good character. In such circumstances it is appropriate that the project or program is subject to cost-benefit analysis, before it is undertaken, to ensure there is a net social benefit.

Establishing a framework in which sound decisions will be made in the future is fundamental, and the first priority. It is the primary focus of this report. But it will not correct the legacy of past decisions. Such analysis can only be done on a case-by-case basis and on the best information to hand. This requires considerable effort to do well. Where remediation is worthwhile, it is reasonable to expect the beneficiaries to contribute to the costs in proportion to the benefits they derive, as far as is practical. The issue of cost sharing for remediation work has been reviewed recently by the Murray-Darling Basin Commission (MDBC 1996) (see Box 7.1).

This report has focused on ensuring that future decisions more completely reflect the impact of those decisions on the environment and on ecologically sustainable land management, rather than on the issue of repairing the effects of past decisions. Unless future decisions are placed on a sound basis remediation, no matter how well resourced, could become a war of attrition that we must eventually lose.

Box 7.1: **Cost Sharing for On-Ground Works: MDBC**

The intention is that the cost-sharing framework would only be activated in the following situations:

- The stakeholders involved in developing ICM plans have examined the full range of options for addressing water, vegetation, soil and other natural resource management issues in their region and have decided that on-ground works are necessary.
- It is not feasible to apply the *polluter pays* principle to cost-sharing for the works. Where it is cost effective to identify and regulate polluters, such as those discharging waste into streams at point sources, then the polluters should be required to fully fund the cost of the on-ground works to ameliorate the problem.
- Governments have decided that it is appropriate that public funds be invested to achieve public benefits. In some regions, for some issues, competing priorities may dictate that the level of public benefit is insufficient to attract government investment. (MDBC 1996, p. v)

The following cost-sharing principles for government programs have been adopted by the Council of Australian Governments (COAG):

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

Source: MDBC (1996).

8 A NEW APPROACH TO REGULATION

The Commission proposes that each State and Territory introduce a comprehensive regime to regulate the use of natural resources. Each regime should impose a statutory 'duty of care' for the environment on everyone whose actions influence the management of land and other natural resources. The duty should require them to take all reasonable and practical steps to prevent harm to the environment.

A duty of care seeks to have natural resource managers meet the cost of protecting the environment where and when it is expected to be economically efficient to do so. Although regulation based upon a duty of care will promote better environmental outcomes, on its own it is incapable of correcting all the adverse environmental impacts associated with agriculture. The other measures that will be needed are the subject of later chapters.

Many environmental problems are due to conflicts between individuals about what they see as their rights. Some landholders feel they have the right to clear their land as and when they see fit. Those who live downstream feel they have a right to potable water. If enough landholders clear their land, they lower the quality of the water in the lower catchment.

The fact that the legal basis of some of these rights may be debatable does not change the underlying issue. Regardless of whether the rights have any basis in law, the economic, environmental and social conflicts are very real. One of the roles of government is to help to resolve such conflicts in socially advantageous ways.

In the past, governments have generally begun with regulation. As Chapter 6 has shown, the quality and the quantity of the regulation is critical. Inappropriate regulation is costly to the economy and may not help the environment. In extreme cases, it can even harm the environment.

This chapter proposes a new, comprehensive and integrated approach to the regulation of environmental protection and the management of land and natural resources. This is in contrast to the existing ad hoc approach in most States and Territories that is built around a rather heavy handed use of 'command and control' forms of regulation.

The Commission's approach involves legislating the general principles for environmental protection and natural resource management that would apply in all cases at all times. The central obligation should be a duty on everyone to take care of the environment. As far as practicable, voluntary standards should be used to guide duty holders on the application of the general principles to particular cases or at particular times. Where standards have to be mandated, regulation should prescribe the broad outcomes desired, whenever possible, rather than the inputs or processes to be used.

The chapter discusses the key conceptual issues in this approach to the regulation of environmental protection. The issues in its implementation are canvassed in the following chapter (Chapter 9). They include those related to the use of voluntary and mandated standards to better define the requirements of the duty of care in particular cases.

8.1 An environmental duty of care

The centrepiece of the Commission's approach is a statutory *duty of care* for the environment. The proposed duty would require everyone who influences the management of the risks to the environment to take all 'reasonable and practical' steps to prevent harm to the environment that could have been reasonably foreseen.

The duty would not be confined to landholders. It would also cover those who manage any other natural resources — such as water and vegetation — and others who indirectly influence the risks of environmental harm that resource managers confront.

The Commission's proposal represents an extension and codification of the common law duty of care. The common law duty of care is concerned with minimising any harm that one person may cause another. The duty requires each person to take every practical and reasonable step to avoid causing foreseeable harm to another. It is enforced by civil action in the courts.

The Commission considers that the codification of this duty will clearly establish in the minds of all concerned, that protecting the environment is a continuous legal and social responsibility. By doing so, codification forms the foundation of a regulatory framework in which duty holders are encouraged to adopt a more pro-active approach to environmental protection and to do so at the earliest stage of an activity — namely during initial design when the greatest gains in managing risks and reducing the costs of risk management may be made.

The extension of the common law duty of care for the environment would make explicit that the duty not only applies to harm that might be caused to those who are living at the present, but also to those who are yet to be born. Doing so emphasises that land holders are 'stewards of the land' and that land is held in trust for subsequent generations.

Three States have already moved to codify a duty of care in their natural resource or environmental regulation (see Box 8.1). Typically, these duties are narrower in scope than the Commission is proposing but broader than the duty of care in the common law. With the exception of the Queensland legislation, they are mostly confined to preventing pollution and land degradation. The Queensland law is very close to what the Commission proposes.

Explicit extensions of land management legislation to protect biological diversity or ecological integrity have not been prominent to date (Farrier 1995 and 1996). This is in line with the narrower aims of most natural resource legislation. The ACT Legislative Assembly is currently debating codification of a general environmental duty. In Western Australia, the Task Force appointed to review natural resource management in the State recently proposed the codification of the broader duty of care towards the environment similar to that proposed here by the Commission (WA Task Force 1997).

Who should be responsible?

The Commission proposes that everyone who influences the management of land and other natural resources should have a duty of care. Clearly this would include agricultural landholders. However the proposed duty should not be confined to that group simply because much of the existing legislation focuses on the agricultural and pastoral areas of Australia.

Many others are involved in the management of natural resources and their environmental impacts. Those impacts do not respect man-made boundaries between agricultural and other land uses. There is no sound reason why landholders in other industries, those who manage natural resources other than land or those who indirectly influence the management of natural resource use, should not contribute to minimising the adverse consequences of their actions.

Box 8.1: **Duty of care in resource and environmental regulation**

Victoria

The *Catchment and Land Protection Act 1994* states that landowners must take all reasonable steps to:

- avoid causing or contributing to degradation to another's land;
- conserve soil;
- protect water resources;
- eradicate regionally prohibited weeds;
- prevent the growth and spread of regionally controlled weeds; and
- prevent the spread of, and as far as possible, eradicate established animal pests.

Queensland

The *Environmental Protection Act 1994* imposes a duty of care on everyone to take all reasonable and practicable measures to prevent or minimise environmental harm. There are no legal consequences for not fulfilling the duty. The legislation is intended to encourage industry self-regulation through codes of practice.

South Australia

The *Environmental Protection Act 1993* includes a general environmental duty of care. It requires that a person must not undertake an activity that pollutes or might pollute the environment unless that person takes all reasonable and practicable measures to prevent or minimise any resulting harm.

The *Soil and Landcare Act 1989* states 'It is the duty of an owner of land to take all reasonable steps to prevent degradation of the land'. The *Water Resources Act* is to be amended along similar lines.

Western Australia

In its Draft Report, the Task Force appointed to review natural resource management in Western Australia recommended codifying a duty of care as follows:

> It is the duty of an owner of land to take all reasonable steps to:
>
> . protect natural resources and sustainably manage the land; and
>
> . avoid causing or contribution to land degradation which causes or may cause damage to land of another land owner. (WA Taskforce 1997, p. 32)

The Report observed that 'a duty of care for the land presumes every person's obligation to take positive and pre-emptive steps to ensure that health of the land. This is defined in its broadest sense to include biological diversity and ecological integrity'. (WA Task Force 1997, p. 8)

Source: WA Task Force (1997).

For a duty of care for the environment to be effective, *everyone* must have such a duty to the extent of their influence, *wherever* that occurs within Australia. Thus, the duty of care should apply also to those who have a direct or an indirect influence on the management of natural resource use — their obligation would, of course, be in proportion to the degree of influence that they exercise.

Those affected would include, for example, farm contractors and consultants, suppliers of plant, equipment and materials used by farmers, irrigation managers, earth moving operators, tourist operators and visitors. A similar approach has worked well in the application of the duty of care to regulation of products and of occupational health and safety.

The duty should apply to all landholders, regardless of the nature of their legal title to the land they manage. The environmental impacts associated with a given agriculture practice do not depend upon who manages the land, or upon their legal obligations to its owner.

The Commission considers it essential that State and Territory governments and their agencies are bound by the duty of care. Equally, the provisions that apply to Crown land owned by the States and Territories should, as far as practical, be the same as those applied to Crown land owned by the Commonwealth.

The provisions that apply to land covered by native title should be the same as those that apply to other land — at present there is uncertainty about the application of natural resource regulation over Aboriginal land in the Northern Territory (Northern Territory Government, Sub. 188, p. 14).

A corollary of the requirement that the environmental regulation of land should be independent of land tenure is that the States and Territories should not administer Crown leases so as to impose environmental standards or restrictions on leaseholders — for example, restrictions on land clearing or obligations to clear the land — that do not apply to freehold land that is equally at risk. To do so is both inefficient and inequitable. This issues is discussed further in Chapter 18.

The South Australian Government strongly argued that:

> ... land cannot be successfully managed according to tenure and all land should be managed under the same land management principles. (Sub. 84, p. 28)

The South Australian Farmers Federation agreed:

> Land management obligations (or a ‘duty of care’) should apply uniformly to all kinds of land tenure and to all owners of land. (Sub. 89, p. 5)

The National Farmers' Federation considered that it is:

> ... essential that the principles of duty of care should apply to all landholders including National Parks, Crown Lands, State Forests and Aboriginal land. There should not be a conflict of interest in assessing whether Government agencies have complied with their duty of care. (Sub. 294, p. 2)

In relation to the latter point, the Inverell Shire Council:

> ... considered that Crown activities should be monitored by an independent body rather than internally by the land holding department concerned. (Sub293, p. 2)

During the course of the inquiry, the Commission received numerous criticisms about the poor management of much Crown land and its adverse impact on other landholders. The problems faced by private land holders in managing environmental problems, such as weeds and pests, were often magnified when the management of the Crown estate — national parks, state forests, road and rail reservations — was not subject to the same requirements.

What is environmental harm?

The Commission has proposed that everyone have a duty to avoid harming the environment. What constitutes the environment and harm to it thus become important questions.

Environmental duties of care have been written into law in a number of jurisdictions in Australia. Such laws have had to address these definitional issues. One of the most recent examples is the Queensland *Environmental Protection Act 1994* which elected to use very broad definitions (see Box 8.2).

Although a comprehensive definition of what constitutes the environment is unlikely to be clear cut, the key elements would include ecosystems and all the natural resources that are critical to their integrity. The definition used should avoid focussing exclusively on land and water resources — as much contemporary legislation concerned with natural resource management does — to the exclusion of the other natural resources, particularly vegetation and habitat. Its focus should also extend beyond terrestrial impacts and include impacts on coastal and marine environments.

Such a definition concentrates on the biophysical aspects of the environment. Existing legislation, such as Queensland's Environmental Protection Act, includes a range of psychic or metaphysical attributes of the environment, usually described as social, aesthetic and cultural attributes.

Box 8.2: Queensland *Environmental Protection Act 1994*: definition of environmental harm

"Environmental harm" is an adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value and includes environmental nuisance.

The Act then goes on to define "environmental value" as

(a) a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or

(b) another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation.

and defines the "environment" as including

(a) ecosystems and their constituent parts, including people and communities; and

(b) all natural and physical resources; and

(c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or harmony and sense of community; and

(d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).

There is no 'in principle' reason why they could not be included. Such attributes can be as real and as valuable to people as the biophysical aspects already outlined. However, they are much more difficult to quantify and include in the risk management decisions of duty holders.

It is similarly difficult, to define precisely the nature of the harm that may be done to the environment. To some extent this will evolve with changes in our knowledge and understanding of the impact of economic development on the environment, and with changing community attitudes to such impacts.

Environmental harm would include such things as: land degradation (such as soil erosion and decline in soil structure); air pollution; water pollution (including by salt, agricultural chemicals and nutrients); weeds and pests; noise; the destruction of ecosystems and habitat; and loss of species.

Effect of 'reasonable and practical'

The Commission proposes that the duty of care require the duty holder to take all 'reasonable and practical' steps to avoid harming the environment. The main effect of 'reasonable and practical' is that the requirements for a particular duty holder will vary with the circumstances of each case. Because of this flexibility, compliance costs under a duty of care are potentially lower than those under a regulatory regime based upon 'command and control' methods.

The qualification balances the risk and severity of any harm that might be caused against the cost and inconvenience of preventing it. The duty holder can choose the least costly means for managing a risk from the available alternatives — the 'hierarchy of control'.[1] Changes in technology and knowledge only have to be incorporated when it is cost-efficient to do so.

What is reasonable and practical is determined by applying the test of what a 'reasonable person' would require. At the end of the day, this test reflects community attitudes and expectations, and the stringency of the test changes with those attitudes and expectations. For example, land management practices (such as land clearing) that may have been accepted without qualification in the past are no longer seen in the same light. This feature means that the standards required by the duty of care evolve with community attitudes and expectations.

The 'reasonable person' test is widely understood and applied in many areas of regulation, including occupational health and safety. In its application, the 'custom and practice' in an industry or situation are usually influential in determining what should be done — in the absence of a specific determination by the relevant industry organisation or a competent standard-setting body.

The starting point for determining what needs to be done is the *present* state of the environment — not one that existed in the past or might be desired now. The duty is about preventing harm *being caused* or *about to be caused* to the environment. It would *not* require the remediation of harm caused by past actions — even if those responsible could be identified which, in many cases, is unlikely given the long lead and lag times associated with most environmental damage.

The issue of remediating past environmental damage is addressed by the Commission in Chapters 4 and 16.

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[1] The 'hierarchy of control' refers to the range of feasible options for managing an environmental hazard. The hierarchy ranges over the following: *elimination* of the hazard; *substitution* of the hazard with a less harmful version; *redesign* of the hazard; *engineering control* of the hazard; *isolation* of the hazard; *safe management practices*; *redesigning management systems*; and *personal protective equipment* for those exposed to the hazard.

This was echoed by Environment Australia, which said:

> Where a standard of care addresses the correction of environmental damage resulting from actions prior to the introduction of the duty it may be inappropriate to require land managers to comply with the duty without technical and/or financial assistance. The application of the duty of care would therefore need to be prospective rather than retrospective, in recognition of the wider community responsibility for unsustainable practices and actions of the past. (Sub. 229, p. 5)

The extent and timing of what needs to be done is defined by applying the test of 'reasonable and practical'. There is likely to be more scope to act the longer the time horizon. In the very short term, very little may be required. As the time horizon lengthens, more options will qualify as machinery wears out, new knowledge is gained or other production possibilities become feasible — different crops or different patterns of rotation, for instance.

What needs to be done also reflects what is reasonably foreseeable. Our knowledge about the impact of human activity on the environment is changing. Research is continually adding to our understanding of the impact of agricultural and pastoral activities. The responsibility of a duty holder would reflect the state of knowledge at the time. That is, adverse environmental impacts would have to have been reasonably foreseeable at the time that the decisions of the duty holder were made. A duty holder would have to take all reasonable and practical steps to be informed of the likely effects of his or her actions and to take all reasonable and practical steps to manage the risks uncovered by this investigation. Having done so, however, the duty holder could not be held responsible for any subsequent harm that might befall the environment.

An illustration might be a small farmer wishing to clear bush on his property to plant pasture. First, the farmer would have to get some idea of the likely consequences — contact with the relevant government agencies, industry bodies and other farmers in the district with experience of clearing would be good ways to start. These sources should be able to direct the farmer where to go or who to see next, as well as what should be done to minimise the consequences to others and to the environment. When it comes to selecting the combination to be used and when, a good test is for the farmer to ask himself what he would expect his neighbour to do in the same circumstances.

In *absolute* terms, the consequences of the duty of care for landholders are likely to vary considerably. Those whose environmental management is at best practice levels in their industry are unlikely to be affected at all. Those who will be most affected are the minority whose management is at the worst practice end of the spectrum in their industry.

By definition, the absolute effect on the average landholder will not be unreasonable, but this does not mean that it would be insignificant. If the risk of harm and its consequences are both substantial — that is, the expected cost to others or the environment is high — then a correspondingly substantial cost to avert that harm would be reasonable if no other option was feasible.

The *relative* effect of replacing the existing regulatory regimes with ones based upon a duty of care will depend upon how restrictive the current regimes are. This is an empirical issue and cannot be resolved *a priori*.

Either way the economic circumstances of an individual duty holder are not relevant. The fact that the business of an individual duty holder may not, in the short term, be operating at a profit is irrelevant to whether a cost is reasonable. The appropriate standard is that of the relevant group, such as a region or industry.

Reactions of participants

A wide cross section of participants in the inquiry endorsed the concept of a duty of care for the environment.

The South Australian Government expressed strong support saying:

> The proposal to base a system of ESLM on general objectives is strongly supported. (Sub. 324, p. 3)

The Queensland Government said:

> The principle of "duty of care" as the basis of regulation of natural resources and the environment has merit, although there are many questions as to how it would be operationalised particularly in relation to enforcement provisions. (Sub. 342, Attachment 1, p. 1)

The Tasmanian Government commented:

> The Commission's proposal for a general duty of care for the environment, imposing rights and obligations on managers of natural resources, holds many attractions. (Sub. 319, p. 2)

The New South Wales Government said:

> Instituting principles of 'duty of care' is a reasonable approach, as are moves towards more innovative and 'persuasive' environmental regulation. (Sub. 325, p. 2)

The Victorian Government conceded that:

> There is a strong common sense, ethical basis for recognising a general duty of care for persons to protect, or act as stewards for, the environment. (Sub. 341, p. 4)

Agriculture Western Australia said:

> This concept which already applies in common law is a useful philosophical underpinning for natural resource management. (Sub. 227, p. 1)

For the South Australian Farmers Federation:

> The thrust towards a common "duty of care" is strongly supported. It is a valid approach, and one that has good prospects of success. (Sub. 222, p. 1)

The Queensland Grain Growers Association (Sub. 207) felt that the duty of care is an acceptable concept for land, water, biodiversity and on all tenures.

Many participants, including those quoted above and others who supported the principle of a duty of care, expressed a number of reservations about the Commission's proposals to apply the duty of care that were put forward in the Draft Report.

For the Victorian Government, the principle of the duty of care:

> ... is supported but the Commission's proposed mechanism for its implementation is not accepted. (Sub. 341, p. 4)

The Queensland Government said:

> While several pieces of Queensland legislation, viz. the *Land Act 1994*, and the *Environmental Protection Act 1994* (EPA), contain duty of care provisions or requirements, the Commission's proposal that duty of care should form the centrepiece of the regulatory framework for natural resource and environmental management through unified legislation is a matter which would require careful consideration through the Queensland policy development framework which involves extensive consultation with stakeholders.
>
> It is noted that [the] Commission's approach to the general duty of care for the environment would require those responsible (natural resource owners, managers and users) to take *all reasonable and practical steps* to prevent harm to the environment, which in principle, is a practical approach. Issues at stake are how far duty of care expectations should extend, the extent of the associated obligations and what are the means of enforcing [the] duty of care or taking action where it is breached. (Sub. 342, p. 1)

The Tasmanian Government commented:

> However, in exploring this proposal, there may be a need for further clarification. Issues that arise include: what is the coverage of this proposal; are obligations only imposed on resource managers; and how are those obligations and rights defined? Also, who would be able to bring action under the proposed system; the affected land-owner, interested parties, Government bodies, or an independent agency administering the Act? A further question is whether the duty of care should be enforceable. (Sub. 319, p. 2)

The New South Wales Government said:

> However, the Inquiry's approach underestimates the value of regulatory mechanisms and the need for a strong regulatory framework to support these instruments. (Sub. 325, p. 2)

The South Australian Government said:

> The effectiveness of relying on a general 'duty of care' depends on a clear expression of what that duty would entail in particular instances. (Sub. 324, p. 3)

The Natural Resources Council of South Australia (Sub. 250) said that the duty of care concept is a fundamental principle for achieving sustainability, but considered that greater consideration needs to be given to the implications of its application.

A number of farm organisations opposed codification but did support a voluntary duty of care. They included: the National Farmers' Federation (Sub. 294); the WA Farmers' Federation (Sub. 230); the NSW Farmers' Association (Sub. 317); and the Tasmanian Farmers and Graziers Association (Sub. 303). Their reasons varied and included the potential for litigation and the loss of management control.

The Commission considers that these concerns are capable of being averted by its detailed proposals for the implementation of the duty of care. These proposals and the issues relating to implementation are discussed in the following chapter (Chapter 9).

The remainder of this chapter canvasses the key conceptual issues in the approach proposed by the Commission.

Consideration of the issues

As we have seen in Chapter 4, there are a number of economic problems underlying the environmental impacts flowing from the use of many natural resources. A key consideration is the failure to bring to account all the costs imposed upon the community by such resource use. Although the internalisation of the 'excluded' costs — or externalities — will benefit the community, it incurs a cost — the transactions costs of arranging and maintaining the relevant changes.

Key issues for public policy in the internalisation of external costs generally are whether the benefits of government intervention exceed the transactions costs and how to minimise the transactions costs of intervention. Indeed, the transactions costs of a voluntary solution may be lower than for an enforced solution. In such cases, intervention to specify who should meet the external costs in question may not be in the interest of the community as a whole. As the NSW Irrigators' Council observed:

> ... having a statute predetermine the assignment [of liability] could place a needless hurdle on the road to achieving a least cost solution, and of again shifting to a new one if changes in costs and prices demanded it. (Sub.263, p. 27)

In the case of the environmental externalities associated with the use of natural resources, the transactions costs of voluntary solutions both for individuals and groups of individuals are generally high. In large part, this is due to the difficulty of isolating the contribution of each resource user to a given environmental impact and the potentially large numbers of people affected by an impact. There are several reasons for this.

Ecosystems are complex biophysical systems where the relationships often extend over large areas and long periods of time. The scientific knowledge of ecosystems is generally quite poor. The impact of a particular use of a natural resource on an ecosystem extends over considerable distances and time periods. Moreover, the impact is often highly variable, both over time and space, and its nature and extent depends upon the extent of such practices in the past.

Landholders and other resource users usually adopt a variety of ways of managing their natural resources. The information available about what is done by individual landholders is, at best, patchy and, at worst, non-existent. Moreover, the costs of collection are relatively high, even admitting the possibilities being opened up by information and remote sensing technologies.

As the link between individual cause and effect is difficult to establish and the cost of collecting what is known is relatively high, the scope for those affected by the use of natural resources to negotiate with individual landholders to reduce the impacts is quite limited. And as the numbers affected increase, the incentive to free ride on the efforts of others rises accordingly.

As Chapter 16 will show there is an emerging market in private conservation of natural resources and environmental amenity. Even if the impediments to its development are removed, however, it is unlikely to be capable of addressing the impacts on all geographical or temporal scales.

While it would be costly for individual landholders to establish the benefits from reducing their environmental impacts, they are in the best position to determine how to reduce them and what it would cost their businesses. In these circumstances, it makes sense to expect landholders and other natural resource mangers to meet at least some of the external costs of their environmental impacts, provided the means of internalising these costs allows them to do so in the most cost-effective manner.

The proposed duty of care fulfils this requirement. It seeks to internalise environmental externalities but only to the extent it is economically efficient to do so. It is therefore consistent with the ‘polluter pays principle’ that has been

widely endorsed and adopted, including by the OECD internationally and the Council of Australian Governments domestically. However, by determining the economic limit to the duty of care, through the requirement that actions be reasonable and practical, it thereby defines the point where the 'polluter pays principle' ends and the 'beneficiary pays principle' begins. *Prima facie*, the cost of going beyond what the duty of care requires should not be borne by the duty holder — but by those who benefit from going further.

The common law duty of care currently applies to actions that lead to environmental impacts which harm other people. Accordingly, it might be expected that the prospect of being sued for negligence would encourage those responsible for natural resource management to reduce their environmental impacts to avoid causing harm to others.

In its inquiry into *Workers' Compensation in Australia* (IC 1994), the Commission found that common law was not a cost-effective means to promote the prevention of work-related injury and disease. There were several reasons. Firstly, the time lag between an incident and the resolution of any civil action by the courts would considerably lessen the prevention incentives. Secondly, the legal costs were high — they constituted up to 70 per cent of common law settlements.

The Commission considers that both of these factors would be present in the use of the common law to remedy environmental impacts as diffuse and as uncertain as those associated with natural resource management. For this reason, it entertains strong doubts about the wisdom of relying on the common law to encourage prevention of environmental harm.

The common law duty has been successfully codified previously — for example, in the area of occupational health and safety. One of the reasons for its success there is that it complements the principles of quality management — indeed, the two now have much in common.

The Commission has reiterated the application of the duty of care to occupational health and safety in its recent report *Work, Health and Safety* (IC 1995a). In that report, the Commission also proposed that Australian governments consider extending the principle to environmental regulation (see Box 8.3).

Box 8.3: **The environment and occupational health and safety**

Although there are clear differences between human resource management and protection of health and safety on the one hand, and natural resource management and protection of the environment on the other, the parallels are striking. In both cases:

- there are complex systems with many variable factors at work, long lead times and lags;
- costs are shifted from the resource owner or manager to the community;
- the local situation and circumstances vary considerably;
- local knowledge and know-how are critical to successful risk management;
- many of the solutions involve relatively small costs for the managers but relatively large benefits for others.

In *Work, Health and Safety*, the Commission found that government policies on occupational health and safety (OH&S), public health and safety, and the environment have similar objectives but are regulated under separate statutes. They each differ in regulatory approach, despite the similarities noted above. Indeed, many companies have integrated management systems to deal with all three areas. As a result, there were inconsistencies in regulation of the three areas. For example, in most States and Territories, the duty of care for occupational health and safety did not extend to the environment, even though non-compliance could often lead to environmental damage.

Some States have sought to reduce the inconsistencies by combining programs and agencies. In Victoria, the Best Practice Regulation Program at the Altona petrochemical complex coordinates a number of areas of regulation, including OH&S, the environment, and natural resources. Similar programs exist in New Jersey, Canada, the Netherlands, Singapore and Japan.

The Commission concluded that there would be benefit in governments considering the adoption of a duty of care approach to public health and safety and to environmental protection. This approach involves:

- a duty of care;
- the use of voluntary standards, as far as practical, to guide the application of the duty to particular circumstances, as far as possible; and
- the use of mandated standards to be kept to a minimum and to be expressed as outcomes, as far as possible.

Source: IC (1995a).

Recommendation 8.1

The regulation of land and natural resource management and environmental protection in each State and Territory should be built around a statutory *duty of care* for the environment.

Recommendation 8.2

In each State and Territory, the duty of care should apply to everyone whose actions could foreseeably harm the environment. The duty of care

should require those responsible to take all reasonable and practical steps to prevent harm to the environment. The duty should cover:	
(a)	private, Crown and Aboriginal land, air, surface and ground water and flora and fauna;
(b)	biological diversity and ecological integrity;
(c)	terrestrial, coastal and marine environments; and
(d)	cultural and aesthetic values.

8.2 Elaboration of the duty of care

The relevant statute needs to set out the general principles that have to be followed to fulfil the environmental duty of care. Such an elaboration would help to make explicit that everyone needs to take a broader and longer-term view of their roles and responsibilities — not just those farmers who currently behave as stewards of the land.

To do so, the Commission proposes that the duty of care be elaborated by a series of subordinate duties to:

- identify, assess and manage the risks of harming the environment;
- inform those directly at risk of foreseeable personal or financial harm by the activities of the duty holder;
- inform the regulating agency of the risk of foreseeable harm to the environment by the activities of the duty holder; and
- consult with those at risk of foreseeable harm.

The duty to inform should be complemented by rights to be informed on the part of those at risk.

These rights and obligations would not be open ended but limited by the duty of care. In other words, they would be limited to what was ‘reasonable’, ‘practical’ and ‘foreseeable’. Those responsible would not be expected to collect information that they themselves would not need, or to find out about problems which could not be reasonably foreseen by them.

The effects of these obligations will vary with the situation and circumstances of each case. For instance, an aerial spray operator would have to inform his farmer clients of any risks associated with the pesticide being used or its

particular application.[2] The farmer in turn would have to inform any neighbours at risk of exposure to spray drift. If an incident or accident were to occur, the farmer would have to inform the appropriate agency. For the short term, the farmer would be expected to adjust the timing or the amount of chemical used to minimise any damage to neighbours or more generally. For the longer term, he needs to be aware of opportunities to use another chemical or a non-chemical method of insect control — and to take advantage of them when the cost of doing so is not unreasonable.

For these reasons, the duty to inform would not require those likely to be affected to be told each and every time that a duty holder wished to do something. In most cases, the publication of the code of practice or standard to be applied would be sufficient. Only where the risks or consequences were particularly substantial would a duty holder be expected to inform those affected each time a change was proposed.

In situations where the consequences are diffuse and those affected are unable to be identified with any reasonable accuracy, the practical requirement of the duty to inform would be for the relevant regulatory body to be advised of the particular risk of environmental harm or the proposed means of managing it.

The Commission's proposed elaboration of the duty of care is based upon the principles successfully used to regulate the management of occupational health and safety. They are also consistent with the principles of quality management in that they encourage and sustain the formalisation of 'feedback' mechanisms that are part and parcel of all good management systems. Such mechanisms are critical to the adaptive management of natural resource and environmental issues. Adaptation is essential to progressively better management.

Even if the Commission's regulatory reforms did nothing else, the generation and dissemination of appropriate information about the nature and scale of the environmental impacts of farm management practices would be very valuable. That information would be invaluable to farmers themselves and other natural resource users. It would also be valuable to others who are affected by the consequences of their actions, as well as those in government who are responsible for regulating natural resource use.

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[2] The company that supplies the pesticide to the operator already has a statutory obligation to inform its clients about these matters. Indeed, the legislation governing hazardous substances in each jurisdiction requires each supplier to prepare and distribute a Material Safety Data Sheet on each hazardous substance.

Recommendation 8.3

In each State and Territory, the general duty of care for the environment should be elaborated by a series of related duties. These should require each duty holder, as far as is reasonable and practical, to:

(a) identify, assess and manage the risks of the duty holder causing harm to the environment;

(b) inform those directly at risk of foreseeable personal or financial harm from the activities of the duty holder;

(c) inform the regulating agency of the risk of foreseeable harm to the environment from the activities of the duty holder; and

(d) consult with those at risk of foreseeable harm.

Recommendation 8.4

The legislation establishing the duty of care in each State and Territory should include a statutory right to be informed on the part of those at risk of foreseeable harm from an environmental hazard or its management.

9 IMPLEMENTING THE NEW APPROACH

The Commission proposes that each State and Territory introduce a single unifying statute to implement the approach to regulation proposed in the previous chapter. Similar legislation would be required in the Commonwealth's jurisdiction.

Each unifying statute should set out the principles to be applied to the management of land and associated natural resources and environmental protection. The central principle to be applied by all managers should be the proposed duty of care for the environment.

As far as possible, voluntary standards should be used to indicate the means of fulfilling the duty of care in particular circumstances. Mandatory standards should only be used as a last resort. Where mandatory standards are used, they should be expressed in terms of outcomes as far as possible.

While the proposed regulatory regime will promote better environmental outcomes, on its own it is incapable of correcting all the adverse environmental impacts associated with agriculture. The other measures that will be needed are the subject of later chapters.

The Commission proposes that its approach to regulatory reform should be implemented by each State and Territory enacting a single unifying statute to regulate the management of land and natural resources and environmental protection. Each unifying statute should replace the various ad hoc statutes in each jurisdiction. The Commonwealth would need similar legislation for its jurisdiction.

Each unifying statute should set out the general principles for the management of land and associated natural resources, particularly the rights and obligations of all concerned, as proposed in the previous chapter. The central obligation should be the duty of care for the environment.

The general statement of principles in each statute should be supported and complemented by both mandated and voluntary standards. As far as practicable, voluntary standards should be the preferred means of establishing the operational requirements of the duty of care. Where standards are to be mandated, regulation should prescribe broad outcomes wherever possible, rather than the inputs or processes to be used. Both voluntary and mandatory

standards should be developed with full input from those who have a stake in their application to land and natural resource management.

Finally, there should be a review by each jurisdiction of all its existing natural resource and environmental legislation. The aim of the review should be to retain on the statute books only those provisions that fully accord with the approach proposed by the Commission. Legislation that does not fully accord with the approach proposed by the Commission should be repealed, amended or replaced. Those provisions that remain should be re-expressed in terms of broad outcomes, as far as practical. It should be possible to repeal many process and technical requirements.

A detailed discussion of the major issues raised by the Commission's proposed reforms occupies the rest of this chapter.

9.1 A unifying statute

The Commission proposes that each State and Territory adopt a more unified and integrated regime to regulate the management of land and natural resources and the environment. In addition, the Commonwealth should adopt a similar approach within its areas of responsibility.

Adoption of such a regime would provide each jurisdiction with an opportunity to streamline the regulatory rules that operate in each jurisdiction. It would also allow the design of the remaining rules to focus on those areas and approaches where the environmental outcomes would be of greatest benefit to the community as a whole. As far as possible, the unifying statute should replace the various ad hoc statutes that regulate the management of land and natural resources and protection of the environment.

The unifying statute in each State and Territory should set out the general principles for managing land and natural resources and for protecting the environment. In particular, these principles should include the general rights and obligations of all those who have an influence on, or face the consequences of, the management of land and natural resources and the environment (see Chapter 8). The central obligation should be a duty of care for the environment.

Each State and Territory should charge an independent agency (referred to as the administering agency) with the task of administering the proposed statute and enforcing the duty of care for the environment.

The statute and its subordinate legislation should be readily intelligible to those responsible for resource management. Together, they should provide a framework that is constructive rather than prohibitive. Practical activity

undertaken on a voluntary basis at the industry and local level is one of the most fruitful avenues for ecologically sustainable management at the farm level. It is important that self-generated and self-generating activities not be inhibited by unnecessary intervention by government.

Queensland and the ACT have already moved in the direction proposed by the Commission. Queensland proposes to replace its six existing resource management Acts with a single statute. The Queensland Government (Sub. 164) says the *Natural Resource Management Bill* will provide an integrated and comprehensive approach to the management of natural resources. An *Environment Protection Bill* has been introduced into the ACT Legislative Assembly to repeal and replace five existing pieces of legislation.

The Australian Conservation Foundation (ACF) (Sub. 296) expressed support for a single unifying statute but subject to the inclusion of some clear policies governing particular issues such as vegetation clearing. Most other participants were concerned about the practicalities of a single statute.

The Victorian Government said:

> ... it would be counter productive to replace our existing mix of environmental and land management legislation and practice with new legislation based on the [draft] report. (Sub. 341, p. 4)

The South Australian Government acknowledged the need for better coordination of legislation but, for practical reasons, preferred its existing solution to the problem:

> ... the current approach is to link natural resource, land management and development statutes. (Sub. 324, p. 2)

Reservations were expressed by the Queensland Government:

> Relevant Queensland legislation has already undergone major revision or development in the past few years ... Any consolidation of all natural resource and environmental protection legislation into a single statute would be a major undertaking with large resourcing requirements. (Sub. 342, p. 5)

Environment Australia questioned the practicality of a single unifying statute:

> It is not necessary in any jurisdiction to have a single unifying statute in order to apply a common set of principles to natural resource management. This could be achieved by separate suites of natural resource and environmental legislation both having such principles as ecologically sustainable development as their objectives and principles. It would also be possible to incorporate in both suites of legislation concepts such as duty of care. (Sub. 229, p. 7)

While strongly supporting its underlying principles, the South Australian Farmers Federation did not support a single statute:

> There should be common structures to legislation and common approaches adopted, but each State has a myriad of legislation reflecting their individual history and circumstances. It would be too much to expect all to fit under one Act - although encouraging all States to develop a common framework for their individual expression would be supported. (Sub. 222, p. 2)

Similarly, the Royal Australian Planning Institute (RAPI) said:

> At this stage of change, RAPI supports natural resource legislation which is complementary but separate. (Sub. 251, p. 2)

The Institute's reasons included:

- that major reforms of planning law are already in train in some States;
- the overlap between natural resource laws and environmental laws, as well as planning laws, would mean a 'mammoth' task if integration were pursued; and
- the option of interlinking natural resource, environment and planning laws is available through cross referencing, or incorporating common goals.

The Commission accepts that there will be significant transitional costs in implementing a single statute to regulate resource use and environmental protection, and that it would be sensible to minimise those costs in the implementation process. Nevertheless, New Zealand has shown that a single statute is technically feasible and capable of realising significant reduction in the burden of statute law (see Box 9.1).

The Commission also accepts that many of the benefits of a single statute — common objectives, minimisation of conflicts in objectives, and clarity and universality of the principles to be applied — can be achieved in other ways — for example, the use of over-arching legislation. The risk in the legislative alternatives is that the desirable degree of integration and rationalisation of the legislation will not be achieved. This outcome needs to be judged against the reasonable needs of those who are expected to abide by the regulation not those who administer it. A set of rules that is incapable of being easily understood by the average landholder detracts from environmental protection and public confidence.

For these reasons the Commission believes that its proposal for a single statute remains a sensible and desirable medium term objective. There is no reason why it has to be realised immediately.

Recommendation 9.1

The existing legislation regulating the protection of the environment and the management of land and natural resources in each State and Territory should be replaced by a comprehensive set of provisions in a single unifying statute.

Recommendation 9.2

The unifying statute should contain a statement of the principles centred around a duty of care to be applied to the management of land and natural resources and protection of the environment.

Recommendation 9.3

The Commonwealth should enact a single unifying statute regulating the protection of the environment and the management of land and natural resources in areas within its jurisdiction.

Further integration of legislation

The idea of a single unifying statute to regulate land and natural resource management and environmental protection has already been attempted with some success in New Zealand. In the process, 167 statutes were repealed and replaced by the *Resource Management Act 1991* (see Box 9.1). The New Zealand legislation covers planning and regulation in relation to natural resource management, land use, the environment and pollution control.[1]

A number of jurisdictions use their system of land use planning and regulation to control a number of natural resource management practices. For example, Victoria uses the *Planning and Environment Act 1994* to regulate the sustainable use and development of land and environmental protection. Queensland uses its *Local Government Planning and Environment Act 1990* in a similar fashion.

[1] Land use regulation seeks to control land development by designating each parcel for a principal use (for example, rural residential, light industrial, recreational, agricultural). Natural resource regulation seeks to control the management of each parcel of land and its associated natural resources *within* a designated land use.

Box 9.1: **New Zealand Resource Management Act**

The *Resource Management Act 1991* was enacted in response to concerns that the existing resource management system was fragmented, complex and inadequate in achieving its environmental goals. That system was also characterised by duplication of functions, and conflicting rules as a result of its piecemeal and reactive evolution.

The legislation:

- sets up a single, comprehensive legal and administrative system;
- covers natural resource management, land-use planning and environmental protection;
- sets the goals of sustainable resource management, protection of the environment and maintenance of vital ecosystems;
- sets up an integrated system of local and regional government based on catchment boundaries and standardised regional planning and policy processes;
- allocates clearly defined responsibilities for each level of government;
- replaces 167 separate Acts with a single Act; and
- abolishes approximately 700 statutory or semi-government agencies.

The *Resource Management Act 1991* amalgamated all planning, water, air and soil legislation to simplify the regulation of the allocation and use of natural resources. Public consultation is specified within the Act itself.

The roles and responsibilities of all levels of government are delineated by the Act. The central government is charged with direct management, monitoring, standards, national policy, use of economic instruments and power of intervention. Local and regional councils are responsible for town planning and subdivision.

Thirteen regions were established to conform as far as practical with catchment areas. Regional councils were established to handle matters relating to their region or catchment. These councils are responsible for the management of water, soil, geothermal resources and pollution control. They must develop regional policies and plans that set the objectives for the integrated management of resources in their area. Planning and policy decisions must be consistent with national priorities and matters of national significance as defined by the Act.

The *Resource Management Act 1991* legislates standardised and integrated consent processes covering land and water use, subdivision of land, coastal waters, environmental discharge, heritage issues, appeal provisions, monitoring and enforcement.

Source: Alexandra (1994).

Tasmania has adopted some elements of the New Zealand *Resource Management Act 1991*, with its Resource Management and Planning System.

This System is implemented by planning instruments at the local government level. The Tasmanian Government considers that it:

> ... provides an integrated policy, statutory and administrative framework for the pursuit of sustainable development in the State. (Sub.88, p. 1)

Participants expressed reservations about the practicality of the New Zealand approach in Australia's federal system. They also noted that the New Zealand legislation was voluminous, and was still subject to teething problems. Despite these reservations, participants stressed the links between land management and environmental legislation and the planning system. The need to coordinate approaches in the three areas was widely acknowledged.

The New Zealand approach is more comprehensive than that proposed by the Commission, in that it incorporates land use planning and regulation as well as its administration by local government. While this broader approach should have potential benefits in the Australian context, the Commission believes that most of the benefits from integration will come from the integration of environmental and land and natural resource regulation. Moreover, there are likely to be significant adjustment costs in restructuring the land use planning system and local government along the lines adopted by New Zealand.

9.2 Voluntary standards

As outlined in the preceding chapter, the proposed duty of care is expressed in very broad terms. For the duty to be effective in improving resource management, duty holders will need guidance, from time to time, on how to comply with the duty. Given the complexity of the problems, it would be unrealistic to expect individual duty holders to have all the relevant information at their finger tips or to know where it can be accessed and be able to do so.

The traditional approach to this sort of problem has been to prescribe in some detail the processes and inputs to be used. But to do so in this case would merely reintroduce the problems of 'command and control' regulation that were outlined in Chapter 6.

Those who have a duty of care should be allowed to select the standard or standards to be applied by them to demonstrate their compliance with their legal obligations. Such standards include voluntary codes of practice and environmental management systems.

Voluntary standards have considerable scope to provide duty holders with greater flexibility in how they comply with their legal obligations. They are likely to be far more intelligible to duty holders and more easily adapted to

different industries, circumstances and localities. Moreover, they can handle better any changes in any of those factors, as well as in technology and knowledge. Backed by the duty of care, they are far better at promoting best practice management than 'command and control' forms of regulation.

For these reasons, the Commission proposes that there should be no regulatory impediment to either the development or the application of voluntary standards by duty holders. Indeed, their development and application should be actively encouraged by replacing mandatory standards by voluntary ones, as far as possible.

Reactions of participants

The use of voluntary standards in land and natural resource management was supported by a diverse range of participants. They included Australian Paper (Sub. 57), the Minerals Council of Australia (Sub. 176), CSIRO (Sub. 128) and Mr Ian Bell of the Irrigation Association of Australia (Sub. 100).

The Commonwealth Department of Primary Industries and Energy said that it:

> ... supports the concept of individual responsibility being complemented by codes of practice, backed by appropriate performance audits and linked to appropriate sanctions. (Sub. 329, p. 7)

Environment Australia observed that:

> Codes of practice are useful as they are implemented through peer pressure rather than government regulation. (Sub. 175, p. 40)

Agriculture Western Australia said:

> Voluntary Codes of Practice. Agriculture WA considers there is merit in promoting these codes of practice. However, some regulatory underpinning may need to accompany these codes. (Sub. 227, p. 1)

The Queensland Grain Growers Association said that:

> ... motivation and voluntary adherence to a Code of Practice in land management are the cornerstones of improved farming programs .... (Sub.61, p. 17)

Some, however, expressed reservations about the replacement of mandatory standards with voluntary standards. These included the Conservation Council of the SE Region (SA) (Sub. 257) and the Conservation Council of Western Australia (Sub. 315). For example, Mr Col Friel said:

> It is clear that we need stronger mandatory requirements than we have had in the past, not weaker ones with a voluntary component. (Sub. 215, p. 3)

Similarly, Mr William Lines (Sub. 228) said 'Voluntary codes of practice are the means by which industry avoids responsibility' (p. 3).

While voluntary standards should be the principal means by which landowners meet the proposed duty of care, that duty and its related principles should be mandatory. In addition, a range of mandatory 'safety net' standards would remain in areas where the likelihood, and the potential cost, of environmental damage is particularly high.

However, as Chapter 6 has shown, there are severe limits to the ability of regulatory prohibitions to achieve progressively better environmental outcomes. In that sense, the Commission considers that the community has little choice — voluntary standards offer by far the best opportunity to achieve better outcomes. Strong mandatory standards that cannot be enforced are simply undermining the regulatory system and public confidence in it.

The proposed use of mandatory standards and the issues in regulatory enforcement are outlined later in this chapter.

Development and use of voluntary standards

The nature and extent of environmental impacts of land management practices can vary greatly by region or locality. The practical means of managing them also vary greatly, by industry and by location. Local and regional interests — farmers, Aboriginal communities, other landholders, conservation groups and others — between them generally know what works best in their area. For these reasons, local interests should be allowed to devise and apply those measures that best suit their circumstances.

The inclusion of a mandatory duty of care in the proposed statutes would create incentives for duty holders to ensure that they know in advance how to meet their statutory obligations. Application of an appropriate voluntary standard would give them a greater degree of certainty than is possible by following one's own ideas on how to manage the hazard in question. These incentives would be reinforced by appropriate enforcement of the duty of care (see Section 9.5).

An example of the application of the Commission's approach in the area of vegetation clearing is outlined in Box 9.2.

Box 9.2: **Vegetation clearing — the Commission's approach to regulation**

Vegetation clearing can have multiple and inter-related impacts on the environment. The clearing of vegetation involves loss of habitat that can adversely affect biological diversity. When on a large enough scale it can lead to the loss of whole ecosystems.

Clearing changes catchment hydrology — taken far enough it leads to waterlogging and dryland salinity. The salts mobilised by these changes can be leached into creeks and rivers, reducing water quality downstream both for water users and aquatic ecosystems. Clearing can increase rainfall run-off so that soils erode further — carrying nutrients and agricultural chemicals into river systems, lowering water quality downstream. The impacts can extend to the coast and to the marine environment where they can adversely affect fishing and tourism.

These impacts generally vary over time and place — on the farm where the clearing has taken place, elsewhere in the catchment, as well as further afield. The scale of many of the affected biophysical systems can be enormous. For example, the Murray-Darling river system drains about one seventh of the continent. Some species only breed once a generation. Even where the overall impact is large, the individual ones can vary greatly.

Such complex and multi-faceted problems do not admit simple, universal solutions. A universal ban on land clearing would be a case in point. It would not differentiate between high risk clearing and that with little risk associated with it. It would not allow clearing that would be beneficial for the environment — for example to plant salt-tolerant vegetation to treat dryland salinity. In some areas, a ban may not constrain agricultural operations much at all, especially where the land has already been cleared. In other cases, a ban could be a severe constraint. For example, where clearing merely 'harvests' the annual regrowth of vegetation for stock feed, especially during drought.

Voluntary codes of practice developed by those knowledgeable of local circumstances should be able to achieve the broad environmental objectives which underlie a ban on clearing. They do so, however, at lower cost in terms of production foregone and incentives to innovate. They could even achieve superior environmental outcomes by promoting native revegetation sympathetic with or beneficial to agricultural production.

In certain circumstances, voluntary codes of practice may need to be accompanied by mandatory standards on clearance. But they should only be used as a last resort and only in areas of high conservation value that are at a significant risk of excessive clearing. As far as possible such controls should tackle the issue on an area-by-area basis to allow individual landholders as much flexibility as possible within an overall constraint.

The administering agency in a jurisdiction should be able to sponsor or to assist the development of voluntary standards. For example, the agencies that monitor the state of the environment and the environmental impact of management practices could, from time to time, publish formal notices about particularly significant hazards or risks that individual duty holders or standards developers should take into account. The appropriate response to such notices, including modification or preparation of any standard, should remain the responsibility of the duty holders or the standard developers as appropriate.

As the Australian Vegetable and Potato Growers Federation noted:

> ... codes need to be developed in consultation with industry to ensure that targets are realistic and achievable. This also provides a sense of ownership and commitment which will encourage adoption and compliance. (Sub. 96, p. 7)

Similarly, the North Queensland Conservation Council said:

> All development of codes of practice and voluntary standards for the unifying statute and duty of care must be transparent and community groups must have access to all information and be allowed to be part of the discussions. (Sub. 270, p. 2)

The ACF (Sub. 296) also raised the issues of interest group involvement and independent third party review of any standards being developed.

Greening Australia Northern Territory said:

> Any code of practice needs to be dynamic rather than prescriptive to be viable for the longer term and applicable to the very variable range of conditions to which it might be applied. (Sub. 288, p. 6)

The South Australian Government commented on the need for:

> ... recognition to the timeframe involved in developing codes of practice and to the demands on resources of those charged with developing them. Adequate resources must be available to support community development of codes of practice. (Sub. 324, p. 4)

The Commission proposes that any individual, group of individuals or organisation should be able to develop voluntary standards. Participation by the relevant stakeholders should be encouraged rather than mandated. The Commission accepts that some form of assistance — either financial or expertise or both — may be necessary to support the development of locally or regionally based standards in certain circumstances.

Duty holders should, nevertheless, always have the option to choose how to comply with their legal responsibilities. This could involve a duty holder selecting one — or none for that matter — of the available standards that are relevant to the duty holder's situation. The standard could take the form of a

code of practice that has been developed for a particular locality, industry or a combination of the two. Alternatively, it could involve an environmental management system customised for a particular duty holder. Each of these approaches is addressed in turn.

Codes of practice

Most States and Territories have made provision for the use of codes of practice in land and natural resource management. Victoria has codes for timber production and cattle feedlots developed in consultation with key interest groups (Victorian Government, Sub. 172). Tasmania has a forest practices code that is backed up by the *Forest Practices Act 1985* (Tasmanian Government, Sub. 88).

The Queensland Farmers' Federation (Sub. 146) and the Queensland Pork Producers' Organisation (Sub. 40) are developing codes of practice under the Queensland *Environmental Protection Act 1994*. The Canegrowers (Sub. 199) are preparing guidelines for sugar cane growers to complement the Queensland Farmers Federation code of practice. The Queensland Act also has the potential for the development of regional or catchment approaches (Queensland Government, Sub. 164). New South Wales has mandated an environmental code of practice for timber harvesting under its *Timber Plantations (Harvest Guarantee) Act 1995*.

A number of these codes of practice have been mandated by law. This makes these codes equivalent to 'command and control' regulation whose shortcomings were canvassed in Chapter 6. Indeed, mandating removes the very flexibility and adaptability that gives a voluntary code its key advantage over 'command and control' regulation.

In South Australia, the *Soil and Landcare Act 1989* authorises District Soil Conservation Boards to develop guidelines for landholders in their district on how to fulfil their duty of care under the Act (South Australian Government, Sub. 84). The Commission considers that such local or regional bodies with land and natural resource management responsibilities would be well placed to sponsor development of the codes of practice envisaged in the Commission's proposals.

In recognition that what constitutes sustainable land management will vary widely throughout Australia, there should be scope for codes of practice to be developed on a local, regional or industry basis. The choice should be one for the originators of a code. Thus, as far as possible, the development should be left to the local or regional stakeholders or to independent standard-setting bodies such as Standards Australia and the International Standards Organisation

(ISO). Support and assistance could be provided by the regulating agency, the relevant industry association and other interested groups.

The duty holders or code developers may need access to advice from outside experts. Again the duty holders are best placed to decide whether and how to apply such advice. In this regard, CSIRO commented:

> The research community has much to offer a process of standard setting, guided perhaps by the international ISO 14000 series, reflecting best management practices in ESLM. (Sub. 128, p. 24)

Similarly, the Australian Heritage Commission (Sub. 282) commented that the guidelines contained in the Australian Natural Heritage Charter could assist anyone with an interest in the conservation of natural heritage.

Environmental management systems

Codes of practice are unlikely to satisfy those individuals and organisations who aspire to best practice in environmental and land and natural resource management. They need to be able to adopt more sophisticated approaches to fulfilling their legal obligations. One such approach is a formal environmental management system for the organisation or business in question.

The most promising approaches to best practice management are based upon the principles of quality management. These principles treat environmental impacts as one form of waste and treat all forms of waste as costs to the organisation in time, money and reputation. The principles seek to identify, assess and minimise waste in all its forms by a continuous, systematic and scientific approach. While they originated in manufacturing, these principles are capable of being applied in all sectors, including agriculture, and to all forms of waste, including environmental harm.

The Commission proposes that each State and Territory should allow individual landholders and other resource managers to develop and apply their own environmental management system that meet the legal requirements recommended by the regulatory requirements. Those who do so should be encouraged to adopt the principles underlying the ISO's quality standards for environmental management — the ISO 14000 series (see Box 9.3). While the costs of gaining certification to such standards can be significant, they can offer the considerable benefits of a fully customised solution.

ISO 14000 does not replace regulations and legislation with which an organisation has to comply. Rather it provides a system based on the principles of ecologically sustainable development for monitoring, controlling and improving performance against such requirements. The suite does not establish

performance standards, but requires progressive environmental improvement and offers international recognition.

Application of an environmental management system certified to ISO 14000 would not necessarily prove that the proposed duty of care was being met. A duty holder would still have to demonstrate that the system was relevant to the situation, that it addressed all relevant risks and that it was demonstrably in operation — just as he or she would under a voluntary code of practice.

Box 9.3: **ISO environmental management standards**

The International Standards Organisation is a federation of national standards bodies from 100 countries, including Standards Australia. It was formed to 'facilitate the international co-ordination and unification of national standards'.

ISO 14000 is a suite of standards for environmental management:

- Environmental Management System Certification Standard provides the requirements for developing and implementing an environmental management system for certification or registration by a third party, as with ISO9000.
- Environmental Performance Evaluation is a process to measure, analyse, assess and describe an organisation's environmental performance against agreed criteria for appropriate management purposes.
- Environmental Auditing provides general principles and guidelines for auditing environmental management systems, and qualification criteria for auditors.
- Life Cycle Assessment is for evaluating the environmental attributes of a product, process or service over its entire life — from raw material extraction, through manufacturing, distribution and transportation, use, recycling, to final disposal.
- Environmental Labelling gives the criteria to determine appropriate labelling.
- Environmental Aspects in Product Standards recommends the use of life cycle assessment and recognised scientific methodologies in developing product standards that incorporate environmental aspects.

Following along the lines of ISO 9000, ISO 14000 requires a management system aimed at: setting environmental policy and defining environmental goals; establishing a program to meet the goals and implementing that program in day-to-day operations and emergency situations; measuring performance in achieving those goals and taking action when the targets are not met; and, finally, progressively improving the system by repeating the cycle. Management systems are verified by audit and the result is an official certificate.

Unlike codes of practice, environmental management systems can be used as a substitute for existing mandated process regulation as currently occurs in some areas of environmental protection. Those who seek to use them in this way should have their performance audited against the environmental management system by an independent, third party auditor. The auditor should not necessarily have to be the regulating agency, but the agency would have to be able to certify, and where necessary audit, the competence of those who performed the system audits.

As with quality management systems generally, individual environmental management systems are more likely to appeal to the larger and better resourced farm businesses. The needs of most small farms may be best served by codes of practice and voluntary standards. This is not to deny that some smaller farmers may be successful in developing and applying an individual environmental management system.

The Queensland *Environmental Protection Act 1994* goes some way in the direction proposed by the Commission. The Act provides for businesses to develop their own environmental management programs. Compliance with a program approved by the Queensland Department of the Environment provides complete legal protection.

Recommendation 9.4

Voluntary standards be the principal means of assisting duty holders to meet their statutory duty of care and related legal obligations.

Recommendation 9.5

As far as possible, the development of voluntary standards should be left to those who have a stake in their application and to independent standard-setting bodies, such as Standards Australia and the International Standards Organisation.

Recommendation 9.6

The agency responsible for administering the unifying statute should, from time to time, publish formal notices about significant hazards or risks that individual duty holders or standards developers should take into account. The response to such notices, including modification or preparation of any voluntary standard, should remain the responsibility of the duty holders and the standards developers.

Legal status of voluntary standards

By definition, the flexibility given to those with a duty of care under the regulatory regime proposed by the Commission means that duty holders face a degree of uncertainty in demonstrating compliance. Moreover, as there may well be many codes of practice on offer, it may not be clear to a duty holder which ones are likely to meet his or her legal responsibilities.

To reduce this uncertainty, the Commission proposes that the administering agency in each jurisdiction should publish lists of voluntary standards that it regards as conforming to all the requirements of the unifying statute. These lists should include the standards published by independent standard-setting bodies such as Standards Australia and the ISO.

The Commission also proposes that the demonstrated application of such recognised standards by a duty holder should be *prima facie* evidence of compliance with the legislation.

A number of participants felt that the Commission's proposals did not provide enough certainty to duty holders. They felt that the administering agency should have the capacity to formally approve those standards in question. In their view, application of such standards should constitute proof of compliance.

The South Australian Farmers Federation said:

> We would like it to be that if you are operating in accordance with some approved guidelines then you should be free from prosecution under environmental protection legislation. (Transcript, p. 1580)

The Commission considers that unconditional approval by the administering agency is highly undesirable. It would effectively reverse the whole thrust of the proposed regulatory reforms. In effect, the agency would be responsible for determining, in considerable detail, the acceptable land management practices — this would constitute a return to 'command and control' with all its attendant costs and rigidities. There would be no incentive for the agencies to innovate and they would be likely to adopt conservative positions on sensitive issues. Finally, it would encourage those regulated to behave as though the regulators, and not themselves, were responsible for improved land and resource management and environmental outcomes.

The Commission's preference for voluntary standards does not represent a watering-down or relaxation of the level of control that is economically and socially appropriate. The fact that standards are voluntary does not mean that compliance with the duty of care is optional. Duty holders would be bound by the statutory duty whether they complied with a recognised standard or not.

The final responsibility for ensuring that a recognised standard complies with all the relevant legal requirements must rest with the duty holder. For this reason, duty holders must be liable when a recognised standard that they are using is found to be inadequate. In practice, however, prosecution in such situations should be rare, for several reasons.

The administering agency would be expected to concentrate its enforcement resources on monitoring those who were most at risk of non-compliance. Those operating under recognised standards would, by definition, not fall into this category. In addition, where a recognised standard was found to be inadequate, the priority should be to have the standard changed — not to prosecute those who had no reasonable basis to believe the standard in question was inadequate. The issues in enforcement are discussed in more detail in Section 9.5.

To ensure that the development of voluntary standards keeps pace with the evolution of our knowledge of the impact of human activity on the environment, the Commission proposes that the administering agency should (as outlined in Recommendation 9.6), from time to time, publish formal notices about particularly significant hazards or risks that individual duty holders or standards developers should take into account.

In encouraging voluntary codes, the Commission seeks to apply a given level of regulatory control in a more flexible and discriminating way. This ensures that the costs of compliance are kept to a minimum. It stimulates awareness and encourages innovation and commitment to environmental protection. Finally, it allows mandated standards to concentrate on the areas where they are most needed and likely to be most cost-effective.

Recommendation 9.7

The administering agency should publish lists of voluntary standards that it considers conform to the requirements of the proposed unifying statute. The demonstrated application of such standards should be *prima facie* evidence of compliance with the legislation.

Demonstrating compliance

Effective and credible means for demonstrating compliance with voluntary standards are essential if the shift to the Commission's proposed regulatory system is to be successful. Regular audits of the performance of duty holders, against the standard that they have chosen to observe, would be essential.

The National Farmers' Federation questioned who would pay for auditing compliance and expressed concern that this would lead to:

> ... a whole new bureaucracy, or to lucrative consultancies, paid for at either the farmers or taxpayers expense. (Sub. 294, pp. 4–5)

The Commission does not envisage that all audits would be financially or administratively onerous for duty holders or for governments. Rather, the stringency of the audit process needs to reflect the environmental value that is at risk of harm. Specifically, the stringency should vary with both the risk and the extent of the potential harm to the environment that are associated with the type of activities being undertaken by a duty holder. The latter needs to take account of both the activities of other duty holders in the area in question and the state of the environment in the location.

Where the risk and the extent of the potential harm are low, self-assessment by the duty holders would be appropriate. In such cases, the duty holders should be obliged to document fully their assessments and produce them upon demand by the administering agency. To ensure that self-assessments were robust, the agency in each jurisdiction should conduct a series of on-going random audits of the assessments. Such an approach has been used successfully used by other regulatory authorities and by the Australian Taxation Office for the administration of income tax law. It is the approach that the Therapeutic Goods Administration proposes to adopt for the regulation of medical devices in Australia (IC 1996c).

Only where the risk and extent and potential environmental harm are high should external third party audits be required on a frequent basis. Although the cost of these would be the responsibility of the duty holder, the Commission proposes that they be conducted on a contestable basis as a means of containing the cost. To this end, the agency should accredit all suitably qualified private sector organisations to undertake such audits. Duty holders should be able to choose an auditor accredited by the administering agency to meet their requirements for external audit. There are already a number of large private sector organisations operating in Australia that audit environmental risk management systems for commercial clients — for example, the Societe Generale de Surveillance.

Enforcement of the provisions of the statute by the agency charged with administering the legislation is discussed in Section 9.5.

Recommendation 9.8

Those with a duty of care should have the option to assess their compliance with the requirements of the unifying statute where the administering agency has concluded that the risk of environmental harm is low. If they choose self-assessment, duty holders should be obliged to document their assessment and to produce the documentation on demand by the agency.

Recommendation 9.9

The administering agency should accredit appropriately qualified private sector organisations to assess the compliance of duty holders against the requirements of the unifying statute.

Recommendation 9.10

Where an external audit of a duty holder's compliance with the requirements of the unifying statute is required by the administering agency, the duty holder should have the choice of any third party auditor that has been accredited by the agency.

9.3 Mandated standards

Under the Commission's proposals, some mandated standards would need to be retained by each jurisdiction. But they should only be used as a last resort, after voluntary standards are inadequate to the task. Where standards have to be mandated, they should prescribe the broad outcomes desired wherever possible, rather than the inputs or processes to be used. Mandated standards should be developed with full input from those who have a stake in their application to land and natural resource management.

Mandated standards are most likely to be necessary where the community considers that the risks or the damage to the environment are unacceptably high, or lacks confidence in the alternative means of managing the risks — for instance, drilling for oil on the Great Barrier Reef.

Mandated standards are likely to take one of three forms. The first would be general environmental standards — for example, a requirement to notify the regulating agency of the occurrence or risk of significant environmental damage. The second would deal with particularly risky universal hazards — for example, the maximum level of a hazardous agricultural chemical that is

allowed to enter a river system. The third would be for a particular industry (such as nuclear power) or a region that was particularly under threat.

A number of participants commented on particular aspects of existing mandatory standards, questioning how they would be handled under the Commission's proposals.

The Meat Research Corporation (Sub. 264) suggested that, where there is a risk of irreversible loss (as in the case of threatened species), there is a need for an underpinning regulatory safety net.

Similarly, the Cooperative Research Centre for Weed Management Systems said that:

> With weed management, it would be difficult to obtain desired outcomes simply by establishing industry codes of practice. Such codes would need to be backed by a regulatory framework, especially for noxious weeds. Suitable incentives eg. via the tax system, would be important to encourage compliance. (Sub. 224, p.7)

Mandated standards are more likely to be cost effective where:

- the duty of care, on its own, does not require the resource user to meet enough of the costs that are directly attributable to use;
- there is significant uncertainty about the environmental risks associated with natural resource use and their management;
- there is significant uncertainty about the costs and benefits to the community of those environmental impacts;
- there is a high risk of significant environmental damage that is irreversible (such as the protection of rare and endangered species);
- rapid and coordinated action is necessary (such as in the case of disease epidemics);
- the damage to the environment is the cumulative result of individually negligible impacts of a large number of landowners; and
- there are high search costs in individuals determining the appropriate solution on their own.

In such circumstances, the individual duty holder is unlikely to be able to decide what is in the best interests of the community as a whole. Collectively mandated decisions can achieve better outcomes, at least in some cases, but it does not follow that they will. A major factor in determining whether they succeed is the inherent limitation of enforcement — due to the complexity of the issues, the number of people involved, the geographical and temporal range of the environmental impacts, the cost of obtaining the necessary evidence and the limited resources available for enforcement.

For this reason, mandated solutions must be adequately assessed to ensure that they are likely to yield a net benefit to the community and to be the best of the practical alternatives. This is most likely to be achieved when there has been full public consultation upon and input into the development of new mandatory standards.

It is not possible to list the areas where mandatory standards should remain, nor the form that they should take. In the first instance, the existing mandated standards would need to be progressively reviewed with a view to making them conform to the regulatory principles proposed by the Commission.

In 1995, the Council of Australian Governments (COAG) endorsed a set of principles and guidelines for the development of national standards and regulations (see Box 9.4). The COAG principles and guidelines have implications for the design and review of mandated standards for natural resource management. The implications are as follows:

- An assessment of a proposed standard requires an adequate evaluation of its economic and social costs and benefits. Such an evaluation is best conducted prior to the design and implementation of the standard.
- Mandated standards are most likely to be efficient where the management of the environmental risks does not vary greatly. If they do, the hazard is probably best tackled by a code of practice.
- There should be a direct link between achievement of the standard and the reduction in the risk of environmental damage.
- As far as practicable, mandated standards should be expressed as broad outcomes, in preference to processes, inputs or technical requirements.
- Measurable and audited standards are more easily enforced. Those that cannot be enforced discredit the regime.

Victoria has sought to embrace performance-based regulation through its Accredited Licensee Scheme. Industries that are associated with significant environmental risks — such as the intensive livestock industries — must be licensed and obtain regulatory approval for significant changes to production processes. (Victorian Government, Sub. 172)

RAPI indicated that it:

> ... has been advocating, with some success, that there needs to be a more performance based approach to development controls focussing on outcomes. Its view is that planning should not be too caught up in technicalities. (Sub. 251, p. 3)

Recommendation 9.11

As far as possible, each jurisdiction should mandate broad environmental outcomes, rather than the inputs or processes to be used in achieving them.

Recommendation 9.12

Wherever possible, jurisdictions should allow functionally equivalent Australian and international standards to be used to meet the objective.

Recommendation 9.13

Any new mandated standards should be developed by a transparent process of consultation with all interested parties.

Box 9.4: **COAG principles for national standards and regulatory development**

On 11 April 1995, COAG endorsed the principles and guidelines for the development of national standards and regulations recommended by the Commonwealth-State Committee on Regulatory Reform, for use by Ministerial Councils and regulatory bodies.

The principles are intended to achieve the following:

- Minimisation of the adverse impact of regulation.
- Minimisation of the impact on competition.
- Predicability of outcomes.
- Compatibility with international standards and practices.
- Not restrict international trade.
- Regular review of regulation.
- Flexibility of standards and regulations.
- Standardise the exercise of bureaucratic discretion.

Source: COAG (1995).

9.4 Review of existing regulation

The total volume of regulation in Australia that relates to land and natural resource management and the environment is daunting. This is particularly true of the mass of subordinate legislation. Accordingly, the Commission was

unable to review the detail of the existing law in the nine jurisdictions on this subject. However, the way forward is clear.

Each jurisdiction needs to ensure that it has reviewed all of its legislation related to land and natural resource management and the environment. The aim should be to ensure that the legislation is either repealed or amended to conform to the preferred approach proposed by the Commission. Some jurisdictions have made steps or are moving in this broad direction. But much more needs to be done.

The consequences of not doing so are well illustrated in the occupational health and safety area. Following the Robens Report (Robens 1972), governments in the United Kingdom and Australia were relatively quick to embrace its principles and recommendations. Most implemented the legislative architecture recommended by the Robens Committee centred on a unifying statute. But they were very much slower to remove archaic or outdated law. As a result, the Commission (IC 1995a) concluded that there was an urgent need to complete the process of streamlining the legislation, more than a decade after the reforms had been begun in Australia.

The National Farmers' Federation (Sub. 294) questioned whether State governments would be willing to undertake such a comprehensive review, and commented that the review timetable proposed in the Draft Report [2 years] was unrealistic.

The Commission acknowledges that the process of reviewing existing legislation could be a difficult and time consuming task. The most important considerations are to ensure that these reviews are thorough, comprehensive and expeditious, rather than that they conform to what is an arbitrary deadline. Nevertheless, a tight but sensible timetable helps to sustain the sense of urgency that needs to enliven the review process.

Recommendation 9.14

Each jurisdiction should review its existing legislation regulating the management of land and natural resources and the environment with a view to harmonising them with the approach recommended by the Commission. The reviews should be completed and their results implemented within five years.

9.5 Enforcement

Enforcement seeks to improve environmental outcomes by ensuring compliance with the legal obligations contained in the proposed statute.

The immediate objective of enforcement — compliance — is subordinate to the ultimate goal of reducing environmental damage. Therefore, the effectiveness of enforcement is determined by the extent to which compliance with the regulation prevents environmental damage, and the degree to which enforcement induces compliance.

Generally, there are two approaches to regulatory enforcement in industrialised countries — deterrence and persuasion. As explained by Ayres and Braithwaite, the choice between them is contentious:

> ... there is a long history of barren disputation ... between those who think that corporations will comply with the law only when confronted with tough sanctions and those who believe that gentle persuasion works in securing business compliance with the law. (1992, p. 20)

Advocates of *deterrence* argue that compliance is driven by the probability and severity of punishment — that is, the expected penalty. Tietenberg posits that the elements necessary for deterrence are:

> ... (i) a credible likelihood of detection of the violation; (ii) swift and sure enforcement response; (iii) appropriately severe sanction; and (iv) that each of these factors be perceived as real ... Deterrence is viewed in practice as creating a multiplier effect for each enforcement action, the magnitude of which depends on the strength of these factors. (1992, p. 23)

Those who favour *persuasion* believe cooperation is more likely to be successful as compliance depends upon non-economic values. Tietenberg explains:

> The behavioural school of compliance theory argues that, at least for corporate compliance, individuals within a firm are motivated less by conscious decisions based on profit/loss than by motives of personal advancement, by fear of corporate sanction, or by social influence through an individual relationship with the regulator/inspector, peers, and or social norms ... enforcement is not cost effective because of high transactions costs and ... is really not necessary in most instances, given the inherent willingness to comply with the law. (1992, p. 24)

The current thinking is that a mix of deterrence and persuasion is likely to be more effective than either one or the other. Gunningham makes the point:

> Most contemporary specialists on regulatory strategy point to the severe limitations of both pure deterrence and pure compliance [persuasion] strategies, and argue, on the basis of considerable evidence from both Europe and the USA, that a judicious mix of compliance [persuasion] and deterrence is likely to be the optimal regulatory strategy. (1994, p. 35)

It is clear that deterrence is essential to effective enforcement. On its own, persuasion cannot ensure a commitment to compliance where compliance is not in the economic interests of those concerned. Governments regulate environmental and natural resource management because the 'natural' incentives to reduce risks are inadequate in many cases. Although some voluntarily comply, others need an incentive (or expected penalty) to do so.

Nevertheless, there are limits to the effectiveness of enforcement. Deterrence can destroy the scope for cooperation. As Gunningham observed:

> While there are strong arguments for retaining effective penalties and for relying on deterrence as part of a broader regulatory strategy (Gunningham 1984, Ayres and Braithwaite 1993) there is also evidence that an over-reliance on deterrence can be counter-productive and produce a culture of regulatory resistance ... (Bardach and Kagan 1982). (1994, p. 34)

Braithwaite and Grabosky refer to the research of Bowles, suggesting that compliance by the majority depends on deterring the recalcitrant minority:

> Bowles suggested that about 20 per cent of all firms will comply unconditionally with any rule, about 5 per cent are always going to disobey, and about 75 per cent are also likely to comply, but only if the threat of punishing the incorrigible 5 per cent is convincing. It follows to the extent that these figures are even vaguely correct that voluntary compliance by the largest percentage of firms depends on deterring the incorrigible minority. (1985p. 81)

If legal responsibilities are not enforced, some producers are more likely to face perverse competitive pressures. The work of Porter suggests that vigorous enforcement of standards can enhance the competitive advantage of all businesses:

> National advantage is enhanced by stringent standards that are rapidly, efficiently, and consistently applied. These play the same role as a demanding buyer. Slow or uncertain application of standards, conversely, both wastes resources and undermines innovation. (1990,p. 649)

Enforcement and the proposed regime

The Commission's proposals for the reform of environmental and land and natural resource regulation should provide a better basis for the effective enforcement, by the administering agencies, of the duty of care and its related obligations.

With traditional command and control regulation, enforcement assumes a major challenge to the regulating agency. Enforcement of land and natural resource and environmental protection regulation has to overcome some major hurdles — the limited resources available to the regulating agencies, the sheer size of the

agricultural zone, and the low density of farmers and other landholders over most of the zone.

The duty of care, complemented by voluntary standards and backed by appropriate performance audits, constitutes the only effective way of regulating the behaviour of duty holders in the majority of cases.

The ACF (Sub. 296) expressed concern about the enforceability of the duty of care, saying that it must be expressed in meaningful terms, and it must be legally enforceable. In particular, the ACF said:

> We believe that a Duty of Care approach is likely to achieve little or nothing unless it is (i) legally actionable by a third party, and (ii) it includes some capacity to independently monitor its implementation. (Sub296, p. 7)

The Commission notes that, in the area of occupational health and safety, the jurisdictions have, in recent years, consciously refocussed their enforcement efforts on the duty of care. Their experience has been that the duty of care can be successfully enforced in its own right and does not need to resort to breaches of prescriptive regulation (IC 1995a). The Commission can see no reason why the same success cannot be obtained with an environmental duty of care.

Voluntary standards developed by local stakeholders will be more likely to be broadly accepted in the local community where they are meant to be applied. Such codes will be easier to enforce for two reasons. First, there will be peer pressure on everyone to comply. Second, in those minority of cases where the regulating agency would be expected to apply sanctions, the local community would be more likely to accept or support such action.

There will, of course, always be situations where mandated standards will continue to be appropriate. However, these need to be kept to an absolute minimum so as to ensure that they may be capable of being enforced, given the practical limitations of enforcement and the limited resources that will be available to the regulating agency for that purpose.

Transparency in enforcement of the proposed regulatory regime is critical to both the effectiveness of the new regime and confidence in its fairness by both the public and the duty holders.

A public statement of the approach to be taken would inform the community on how the agency will approach enforcement. It would contribute to community debate on enforcement policy and practice. It would help to reassure all parties that their treatment will be fair and that enforcement powers will not be abused. All concerned would be given notice of any changes in policy, thereby allowing time for those responsible to adjust their behaviour — it would be unfair and

unreasonable to implement significant changes while most of those affected were ignorant of the implications.

Enforcement of the proposed unifying statute should involve both persuasion and deterrence. The key element of persuasion is advice on the development and modification of voluntary standards and the formal recognition of selected codes by the administering agency as meeting the duty of care. Deterrence would be by prosecution of breaches of the statutory duty of care for the environment.

In the initial stages following enactment of the unifying statute, it would be reasonable for there to be a strong weighting towards persuasion, until duty holders become sufficiently familiar with the nature of the duty, and develop an understanding of how voluntary standards can assist them to meet that duty.

The Tasmanian Farmers and Graziers Association said:

> The TFGA believes that there is a role for regulation, but that it be targeted at the 5-10% of industry that are 'non compliers.' The TFGA believes that the remaining 90% of industry will respond positively to education and incentive based approaches. (Sub. 303, p. 9)

Where this is the case, enforcement is generally targeted at the small minority of the community that refuses to comply. The majority of duty holders, so long as they comply with well-constructed codes of practice, should be free to operate with contact with the administering agency limited to the provision of information and advice.

Enforcement will involve a hierarchy of responses. (Box 9.5 outlines the hierarchy used in occupational health and safety.) This is particularly important as an important element of the proposed system is encouraging preventative action rather then waiting for harm to occur before action is taken. Thus, there needs to be a range of responses available for the responsible agency reflecting the degree of risk involved and the uncertainty inherent in taking action before harm has occurred.

A similar hierarchy of responses would be appropriate in relation to enforcing the environmental duty of care. For example:

- advice (suggested changes are made if *prima facie* breach is identified);
- a formal direction to modify land management practices or the prohibition of certain activities;

Box 9.5: **Hierarchy of enforcement in occupational health and safety**

In occupational health and safety, a typical hierarchy of responses is as follows:

- advice;
- formal direction;
- an improvement notice;
- a prohibition notice;
- an on the spot fine (NSW only);
- a formal warning of prosecution; and
- a prosecution through the courts.

Occupational health and safety inspectorates generally draw on these measures in a two-stage process. For the majority of offences, persuasion in the form of advice and compliance notices is used when non-compliance is detected. Only when these fail do the inspectorates consider prosecution. Prosecution is typically only used as the first response in the case of a fatality or a serious injury.

Source: IC (1995a).

- prosecution if changes contained in a formal direction are not implemented within a certain time (though duty holders would still have the option to argue to the court that what they were doing did meet their duty and that the regulator was wrong); and
- prosecution if damage to the environment occurs.

The question of prosecution also raises the question of who can take action where a breach of the duty of care is detected. In its report into *Work, Health and Safety*, the Commission discussed the issue of a right to bring private action under occupational health and safety legislation:

> This right would provide individuals adversely affected by breaches of OHS [occupational health and safety] legislation with an 'option of last resort' where inspectorates are unable or unwilling to take action. (IC 1995a, p. 123)

The Commission recommended that a right to bring private actions be made available. However, private action was considered by the Commission in the area of occupational health and safety because of the much tighter focus of the effect of breaches of the duty. Typically, an individual or only a small group of individuals are at risk and thus would be better able to take private action.

In the case of harm to the environment, those potentially at risk may be very diverse and widely dispersed, and individual effects may be small, though significant in aggregate. At the same time, the wide range of effects, and the uncertainty inherent in environmental impacts would make private action difficult.

Thus, the Commission considers that the right to bring private action under the proposed duty of care for the environment should be limited to those areas where the person or organisation bringing such action is directly harmed. In other words, third party standing should be limited to those cases involving the existing rights under the common law duty of care. Action in relation to indirect or diffuse impacts — for example, on future generations — should be brought by the administering agency. The agency would also be able to initiate action in areas where private action was also possible.

The Commission envisages that final enforcement of the duty of care under the proposed statute be through the existing court system. However, the area of environmental impact is one involving considerable uncertainty and where a wide range of specialist knowledge is relevant. In some jurisdictions, specialist tribunals, such as the Land and Environment Court in New South Wales, have been established to enable those hearing cases to build up a degree of expertise in the field.

The Commission considers that the establishment of such a pool of expertise would greatly assist the quality of cases under the proposed statute, and thus that each jurisdiction should consider establishing a panel of judges within an existing court system. Members of that panel could be drawn from to hear cases arising under the proposed statute. This would allow panel members to develop a degree of understanding of the issues and technical detail of environmental effects.

10 INFORMATION AND RESEARCH

The generation and use of a great deal of information is required to enable land to be managed in an ecologically sustainable way and to enable monitoring of the state of the environment. This chapter looks at the processes involved and focuses on inadequacies in data collection and availability. It identifies areas where a greater research effort appears necessary. It also looks at how the information which is available is disseminated to land managers and notes comments received on education and training.

Information and knowledge about Australia's environment and natural resources are critical for the achievement of ecologically sustainable land management, and the availability of, and access to, information and knowledge are fundamental to the implementation of all the Commission's recommendations.

The public good characteristics of information and research reduce the demand for information and research, and it will therefore not be produced in socially useful levels. While this has led to significant involvement by Australian governments in generating and disseminating knowledge about the management of natural resources through agricultural research and extension, until recently this was mostly directed at increasing productivity in agricultural commodities, not at increasing productivity of *both* agricultural commodities *and* environmental health.

As the adverse environmental impacts of agricultural land uses took some time to emerge and be considered important, significant research into ecologically sustainable resource management was not undertaken until much more recently. This research, while important, did, and often still does not, strategically address the issues involved. It is also often carried out in an ad hoc and piecemeal fashion.

With regard to information, the Commission has found that users of data are experiencing severe problems associated with data availability, access and comparability. For example, the Centre for International Economics (CIE), in attempting to estimate the extent and severity of soil degradation, found:

> ... data gaps, noncompatibility of data from different sources, lack of an accepted national methodology for estimation of the extent of the various forms of degradation, a lack of correlation of individual types of degradation with both on-site and off-site damage or loss of productivity and different approaches to estimating the costs of both on-site and off-site impacts. (CIE 1997a, p. 17)

The Commission does not intend to review the overall framework for government involvement in research and the dissemination of knowledge that may be relevant to ESLM. Information relevant to that may be found in the Commission's previous report on *Research and Development* (IC 1995b). Rather, the emphasis is on perceived gaps in current effort and government involvement that have been brought to the Commission's notice during this inquiry and on measures of addressing them.

10.1 Information on the state of the environment

Many aspects of ESLM require a good deal of information. Identifying the land degradation problems to be addressed, setting priorities for research, and performing the research, all require information on the state of the environment. And without accurate information it is not possible to judge whether efforts to achieve more ecologically sustainable land management are successful.

A number of organisations are involved in collecting information about Australia's environment. These include:

- the Bureau of Resource Sciences (BRS), which is developing a number of environmental data sets in digital format for use within Geographic Information Systems, including tree cover for the intensively used agricultural zones in Australia, and tree clearing and planting in this zone. The BRS will shortly commence work on a Biomass Inventory, which aims to measure, model and map the above and below ground carbon sinks of forests and woodlands;
- the Australia Bureau of Statistics (ABS), which is developing a system of environmental accounts for some of Australia's natural resources, which are to be linked to the national accounts (see Box 10.1);
- the Australian Surveying and Land Information Group (AUSLIG), which collects and maps national land and geographic information for use by government agencies, industry and the general public for a number of purposes including environmental monitoring and management; and
- the Bureau of Meteorology, which collects climate statistics, important for understanding the impact of climate and weather on ESLM.

Box 10.1: **Moving to environmental accounting**

The requirement for environmental accounting has been expressed in the National Strategy for Ecologically Sustainable Development and Agenda 21. As Australia's national

statistical agency, the ABS is developing a system of environmental accounts for some of our natural resources and will link these to the national accounts. The proposed system will account for: the depletion of natural assets; expenditure on environmental protection and repair; and degradation of the environment.

Over the four-year planning period from 1995–96 to 1998–99, the ABS plans to:

- provide estimates of environmental protection expenditures;
- develop physical accounts for resources, materials and wastes/emissions; and
- publish monetary estimates of natural assets which provide economic benefits.

The Energy Accounts (ABS Cat. No. 4604.0) are the first in a series of physical accounts being developed. Accounts for water, fish, forestry and minerals are currently also being developed. The Water Account will include a water stock table (to describe changes in stocks of water) and a water flow table based on an input-output framework (to describe the usage of water by industry and households). Similarly, the Forest Account will include stock and flow tables, and monitor plantation and native forests. The Water and Forest Accounts have links to the National Land and Water Audit and State of the Forest Report respectively. The first Minerals Account is likely to be available in early 1998, followed by Water, Fish and updated Energy Accounts by the end of 1998. The ABS aims to produce Accounts for Forests, Material Flows and Waste, and Landuse/landcover and Biodiversity by the end of 1999. Scoping papers for Minerals, Forests, Fish and Water are currently available.

For each physical account, national data will link the flow tables to the national accounts. The spatial parameters for stock table information will depend on the spatial disaggregation available in the data. For example, stock data for the Water Account will be at the basin level.

The ABS currently publishes environmental information in a number of forms. It publishes balance sheets for selected resources (Cat. No. 5421.0); Australians and the Environment (Cat. No. 4601.0); People's Views and Practices related to the Environment (Cat. No. 4602.0); Expenditure on Protecting the Environment (Cat. No. 4603.0); Energy Accounts (Cat. No. 4604.0); Transport and the Environment (Cat. No. 4605.0); and Agriculture and the Environment (Cat. No. 4606.0). It also produces a Compendium of Environmental Statistics (Cat. No. 4140.0). The results of the Agricultural Census and Agricultural Finance Survey are used in a number of these publications.

Source: Information supplied by the ABS.

In addition, in recent years, most of the Commonwealth and the States have produced State of the Environment Reports. In New South Wales, under the *Local Government Act 1993*, local governments are also required to prepare annual State of the Environment reports. These reports contain, among other things, information about the level of land degradation, and the condition of

waterways. They are intended to be a useful resource for governments and the community in understanding and managing the environment. However, while they contain a wealth of important information, they also reveal the inadequacy of the knowledge base on which decisions about managing and rehabilitating the environment are made. The Commissioner for the Environment, in Victoria's 1991 State of the Environment Report, said:

> At present the scarcity of appropriate environmental data is universal, and is the subject of comment in almost all State of the Environment Reports. (Office of the Commissioner for the Environment 1991, p. 7)

In 1996 little had changed. The State of the Environment Council, in the Australian State of the Environment Report, said:

> Australia lacks the integrated national systems and databases to measure environmental quality, manage it and evaluate the effectiveness of that management. (SEAC 1996, p. ES-5)

and:

> Our lack of knowledge and understanding of environmental issues emerges again and again in the report as a major obstacle to sound environmental management. (SEAC 1996, p. ES-5)

A study by Hamilton and Attwater (1997), found that nearly 30 per cent of users of environmental statistics believed that their needs were poorly or very poorly satisfied. The survey also asked respondents to indicate the reasons for their dissatisfaction. It found that:

> Of those who responded, 41 per cent of reasons given related broadly to the lack of *availability* of statistics, and 59 per cent related to problems with the *usefulness* of the available statistics. (Hamilton and Attwater 1997, p. 82, emphasis in original)

In addition, the Commission received evidence from participants that the data available is not adequate. The Australian Conservation Foundation (ACF) said:

> Information systems are, at best, primitive, and are seriously lacking in any real capacity for performance measurement, evaluation and review. (Sub. 105, p. 3)

The Department of Defence said:

> Much of the information that will be required to make the difficult choices about sustainable land management that we are faced with does not exist, and the framework for those decisions is poorly defined. (Sub. 208, p. 5)

It went on to say that it is:

> ... currently undertaking a three-year research program, in conjunction with the [Land and Water Resources Research and Development Corporation], to develop a basis for a more sustainable land-use and management system. (Sub. 208, p. 5)

New and recent initiatives

A number of new initiatives in data collection have been announced under the Natural Heritage Trust (NHT). They include the National Land and Water Audit which is aimed at providing a nationwide appraisal of the state of Australia's natural resource base (Commonwealth of Australia 1997a). In addition, a number of organisations have been charged with providing data to help improve government decision making. These include CSIRO, the Australian Geological Survey Organisation, the Australian Bureau of Agriculture and Resource Economics and the BRS.

One important initiative is the work currently being undertaken by the Australia New Zealand Land Information Council (ANZLIC), the membership of which consists of the chief executive officers of the land information agencies of the Commonwealth, the State governments and New Zealand, and which is funded jointly by all jurisdictions involved. ANZLIC is in the process of developing an Australian Spatial Data Infrastructure (ASDI).

Under the ASDI model, the agency which originally collected the data will remain the custodian of the data. However, the data will be maintained according to previously agreed standards, able to be merged, aggregated or compared with similar data held by other agencies. The BRS supported the concept of custodianship by collecting agencies, saying that:

> collection, management and dissemination, must reside with the relevant subject specialists ... the major users, who will ensure that 'their' data is kept as up to date as resources will allow. (Sub. 329, pp. 20–21)

Each State will maintain a directory, providing key information about the databases including where the data is held, and how it can be accessed. The Commonwealth will maintain a national directory.

While the current focus is on land use and topographical date, ultimately the system will be able to accommodate all types of spatial data, including data about vegetation cover, flora, fauna, water resources and climate. With regard to the data held by custodian agencies, ANZLIC will shortly propose to a national meeting of Ministers, that an Intergovernmental Accord on Spatial Data Management be prepared. It said that the Accord will address the following principles for the management of spatial data:

- **Availability of information**: Ensuring that fundamental spatial data are available to all members of the community.
- **Access to information**: Ensuring that community access to fundamental data is made easy, equitable and at a cost that does not inhibit their use.

- **Quality of information**: Ensuring that fundamental data is of high enough quality to meet user needs.
- **Sharing information**: Ensuring that data are shared between agencies and jurisdictions to minimise duplication, encourage the use of common data and maximise utilisation of data resources.
- **Conformity of standards**: Ensure that fundamental data conforms to agreed standards in order to enhance its useability and quality and to facilitate sharing.
- **Industry development**: Promote government partnership with industry to develop industry skills, encourage the development of a value-adding industry, maximise the utilisation of data and improve decision making in both the public and private sectors. (Sub. 283, pp. 3–4)

During discussions with the Commission, ANZLIC said it expects a compliance protocol to be finalised before the end of the 1997–98 financial year. It also said the Land and Water Audit has recognised the importance of the ASDI and are consulting on developing accredited data standards. Standards are also being developed for criteria to be used for funding under the NHT.

A number of the States (Victoria, Queensland, South Australia) are currently developing their component of the proposed ASDI. Western Australia has already had its WALIS system in place for some years. ANZLIC (Sub. 283) said trials with a national directory prototype have been commenced through the Department of Primary Industries and Energy (DPIE), and the Department of Environment has commenced trials to investigate the technology required to implement a national network of directories via the Internet.

Environmental indicators

Around the world, including in Australia, a significant amount of work is currently being undertaken to develop indicators which will provide measures of environmental health and/or the sustainability of natural resource management practices. Much of the work done is concerned with environmental indicators for agriculture. For instance, the OECD (1997) is in the process of developing what it calls ‘agri-environmental indicators’ which will:

- provide information to policy makers and the wider public on the current state and changes in the conditions of the environment in agriculture;
- assist policy makers to better understand the linkages between the causes and effects of the impact of agriculture and agricultural policy on the

environment, and help to guide their responses to changes in environmental conditions; and

- contribute to monitoring and evaluation of the effectiveness of policies in promoting sustainable agriculture.

The Meat Research Corporation (Sub. 264), and the Tasmanian Farmers and Graziers Association (Sub. 303), the latter in partnership with the State Department of Primary Industry and Fisheries and the Tasmanian Rural Industry Training Board, reported they are involved in developing sustainability indicators. A plethora of other taskforces, agencies and voluntary organisations are also undertaking work of this nature (Environment Australia, Sub. 229).

Environment Australia (Sub. 175) reported it has been charged with developing a national set of consistent and scientifically-credible environmental indicators for State of the Environment (SOE) reporting. A National Workshop on Indicators of Catchment Health was held in Adelaide in December 1996. Environment Australia said that there is a need for the work on the development of indicators to be coordinated.

Another important project currently underway in Australia is the National Collaborative Project for Indicators of Sustainable Agriculture (NCPISA) established by the Standing Committee on Agriculture and Resource Management.

The SA Government said the NCPISA had:

> ... shown up some significant deficiencies in our national data collection systems both in terms of gaps in the range of data collected and in the usefulness of some of the data sets ... (Sub. 84, p. 47)

At the Canberra Public Hearing, Environment Australia pointed out that one of the difficulties associated with the development of indicators, is that it is much easier to measure the numbers of trees planted, or the kilometres of fencing established than the outcomes of policies, which often do not show results for many years.

Scale and scope of data

While useful in providing an overview of the condition of land and water resources, most existing data collection does not provide sufficient detail for management decisions at a regional or local level, or for evaluating progress over time. The NSW Irrigators' Council said:

> There is a marked lack of catchment data to assist informed debate about the current state of catchments and the priority of real (as opposed to perceived) problems. (Sub. 140, p. 1)

The Australian Conservation Foundation (ACF) (Sub. 105) criticised SOE reporting as lacking in data, particularly low-resolution data, and as irrelevant or unworkable for detailed regional planning and implementation. It said if SOE reporting is to be of any practical use in land and environmental management, it must, amongst other things, develop:

> ... different layers of resolution, where local data on a wide range of indicators is collected and collated for interpretation at the property, local, bio-regional and national level. (Sub. 105, p. 30)

The Victorian Government said scale is a problem with the ABS's system of environmental accounts. It said the ABS favours the concept of collecting data at 'agro-ecological' regions, but that:

> These regions are too broad and spatially large to be of any use for the practical implementation of ESLM. In order for the ABS's environmental accounting processes to be of value their data must be collected at much finer scale than Agro-Ecological Regions; and geocoded. (Sub. 341, p. 21)

The Local Government and Shires Associations of NSW said councils have certain obligations under the *Threatened Species Conservation Act 1995*, but that:

> The biggest problem councils have had in implementing the Act, is that there simply is not enough information on threatened species and on species and habitat distribution, particularly at the local and regional scale. (Sub. 276, p. 4)

The Commission is concerned about the lack of data on the state of individual catchments and local areas. Such data is particularly important if catchment and community groups are to operate effectively. Without detailed data to enable appropriate monitoring, the effectiveness or otherwise of programs designed to address land degradation cannot be known with certainty. Nor can it be known whether changes to programs are required to make them more effective.

The enhanced role of land managers in collecting on-farm information, that is proposed as part of their duty of care, is discussed later in this chapter.

Comparability and standardisation of data

Much of the data collected in Australia related to the physical condition of natural resources lacks comparability and uniformity. The Victorian Catchment and Land Protection Council, which has a statutory requirement to report annually on the condition of Victoria's land and water resources, said it has not yet been able to satisfactorily fulfil that obligation. Its 1994–95 Annual Report states:

> Although a large number of organisations have collected a vast array of data on the condition of Victoria's land and water resources, little attempt has been made to ensure its uniformity or comparability. As a result, Council is not yet in a position to make definitive statements about the condition of our land and water resources, or whether or not the current management has led to further degradation or improvement. (Victorian Catchment and Land Protection Council 1996, p. 14)

Environment Australia said:

> The lack of nationally compatible data across different jurisdictions is a major obstacle to achieving efficient land management practice. (Sub. 175, p. 7)

The South Australian Government (1997b) said that while there are signs of improvement, more commonality in data standards is required across Australia. It said problems also arise where the format of the data is incompatible with the user's system.

The Queensland Grain Growers Association said standardisation across regional and state boundaries is very important but that trying to achieve it:

> ... could lead to seemingly unending rivalry between proponents of alternative protocols ... (Sub. 207, p. 4)

Ms Jane Huzzey of the Albury Wodonga Environment Centre said:

> There is a great need for consistency in measurement. We cannot compare apples with oranges. (Sub. 289, p. 3)

Sometimes, those relying on information provided by data collection agencies find that some of the information sought is available, but not in a form which is relevant to their needs. For instance, the South Australian Government said data sets often describe land use in terms of the predominant use of the land, for instance 'dairy farm', but ignore the fact that such descriptions imply:

> ... a range of activities such as paddock rotations, effluent disposal, paddock layout, stocking rates etc. It is these activities and how they relate to different land types which has a major influence on sustainability. (1997b, p. 1)

Greening Australia Northern Territory said sustainable land management is constrained by:

> ... the *fragmentary and generally locally irrelevant nature of specialist information and the difficulty of obtaining information about* the system (which the farmer is concerned with) as a whole. (Sub. 161, pp. 6–7, emphasis in original)

Lack of comparability of data means no meaningful comparison is possible between different land management practices and significantly reduces the usefulness of the information collected. It also means that data is not able to be aggregated. The Commission believes there is a hierarchy of data needs, and

that it is important that, as far as practical, the data collected should be capable of aggregation. Data collected at farm level should be relevant to the farmer's needs, and be able to be aggregated to provide the information needed by Landcare groups covering a wider area. In their turn, catchment groups need data aggregated for their catchment. Further aggregation is likely to be needed by State government agencies, with the highest level of aggregation at the national level. Researchers are likely to have a need for data at various levels of aggregation. The Department of Defence supported this notion. It said:

> There should be a hierarchical approach to information dissemination that reflects the relevance of research to the nation, state, catchment and the individual property. (Sub. 208, p. 5)

In order to permit aggregation, the data collected needs to be, as much as possible, in standardised forms, or at the very least in forms which are meaningful and able to be converted into standard forms for comparing results. ANZLIC (Sub. 283) said it has been conscious, for some time, of the need to standardise data, and, as discussed earlier, one of its aims in developing the ASDI, is to ensure that data conforms to agreed standards.

Coordination of data collection

As discussed above, a number of public agencies collect environmental data. Where climate and weather data is concerned, the Director of Meteorology has certain responsibilities in connection with *international* coordination and collaboration, through his position as Permanent Representative of Australia with the World Meteorological Organisation (WMO). The WMO Agricultural Meteorology Programme provides meteorological and related services to the agricultural community to:

> ... help develop sustainable agricultural systems, to improve production and quality, reduce losses and risks, decrease pollution by agricultural chemicals, decrease costs, and conserve natural resources. (Bureau of Meteorology, Sub. 110, p. 10)

With regard to Australian data, there is often no clear understanding or definition of each agency's responsibility, leading to overlaps and gaps. For instance, AUSLIG is the national agency providing national land and geographic information for Australia. It undertakes a number of activities relevant to ESLM, including remote sensing and mapping, and its National Data Centre acts as a repository for Australia's archive of mapping data and aerial photography. However, some State agencies are also involved in similar activities. The Department of Conservation and Land Management, Western Australia, said:

> ... almost everything that AUSLIG does is duplicated, but done far more accurately, by State agencies. (Sub. 225, p. 4)

ANZLIC (Sub. 283), which sees part of its role as being to improve coordination between agencies to reduce duplication of effort, said coordination arrangements for some fundamental data sets had already been established or commenced. It said:

- the Intergovernmental Committee on Surveying and Mapping has accepted responsibility for coordinating the fundamental geodetic framework and cadastral data;
- a national forum has been conducted to determine coordination arrangements for marine and coastal data; and
- it is building linkages with key national coordinating bodies to determine coordination arrangements for other fundamental data.

Access to data

Participants spoke about problems of access to information, both in terms of difficulty of access and of cost.

Locating data and difficulty of access

Some participants said they found it difficult to find out who or what organisation to approach for specific information. The South Australian Government said:

> The data may exist but finding where it is or who has it may be a task. (1997a, p. 1)

Mr Peter Baulch of the Etheridge Landcare Group, at the roundtable discussion in Cairns, said:

> A lot of information has been collected on a broad scale but it's all fragmented. It's very difficult to obtain information and I've rung just about every government department or private research organisation that I can think of. (Transcript, p. 317)

The ACF (Sub. 105), when speaking about SOE reporting, said that for it to be of practical use in land and environment management, there should be unrestricted access to SOE information databases. It said that currently:

> ... the public has a very limited capacity to access information of any practical relevance to their region. (Sub. 105, p. 30)

and:

> ... SOE processes fail to transfer information to those who could best make use of it. (Sub. 105, p. 30)

The Department of Defence said that:

> ... the process of accessing much of the information is not achievable for individual landowners and managers. (Sub. 208, p. 5)

The Department of Conservation and Land Management, Western Australia (Sub. 225), however, said that in Western Australia it is not difficult to find out where data exists. It said that in Western Australia a system providing a data directory (the WALIS system) has been in place for several years.

Cost of data

With regard to cost, the Cooperative Research Centre (CRC) for Soil & Land Management said it is inappropriate for organisations whose research is funded by government to then have to:

> ... pay market prices (or cost recovery prices) for expensive data sets which possibly have been produced under government funding when the outcome of the research is for use for the public good. (Sub. 99, p. 3)

It went on to say that:

> AUSLIG data is particularly difficult for us to obtain at a reasonable cost. When compared to prices paid by other researchers such as CSIRO, our buying price is excessive and restricts our capacity to undertake our work. (Sub.99, p. 4)

Professor A and Mrs J Conacher (Sub. 219) also said that ease of access and the cost of data often present problems. They said that university researchers, in effect, end up paying twice for data.

The Commission's assessment

Clearly, those making decisions about the ecologically sustainable management of land and associated natural resources are facing significant difficulties obtaining the necessary data. Sometimes the data does not exist, at other times it may exist, but be incomplete, or not in a useable, or easily accessible form. The Commission sees merit in the development of an ASDI. Work of this nature has the potential to overcome many of the problems experienced by users of information. However, the Commission is concerned that the developmental work is not proceeding at the rate indicated by the urgency of the need. It would like the governments involved to set a timetable for implementation, with additional resources provided to reflect this urgency.

Once the developmental work is completed, the Commonwealth Government will need to determine which agency is to be the custodian of the national

directory. In the draft report the Commission suggested that the ABS, as an extension of its existing environmental accounting processes, might be the appropriate agency to undertake that role (as well as undertake some wider functions associated with the collection of environmental data). A number of participants had reservations about the Commission's draft proposal. These included the BRS (Sub. 329), Environment Australia (Sub. 229), the Lockyer Resource Management Group (Sub. 312), the National Farmers' Federation (NFF) (Sub. 294), and the Victorian Government (Sub. 341). Reservations were based mainly on a perceived lack of expertise within the ABS but also concerned with funding. The Victorian Government (Sub. 341) pointed to forthcoming funding cuts to the ABS as an impediment to an expanded role for the organisation. Concerns by the ABS itself (raised at the Canberra Public Hearing) related to the capability of its current program and the additional resources it would need to take on the proposed new role.

There are likely to be several Commonwealth agencies with the necessary technical skills, and which also already maintain specialised databases. ANZLIC (Sub. 283) said trials of a national directory prototype have been commenced through DPIE. Expertise in this area also resides with the National Resource Information Centre, which has been operating a National Directory of Australian Resources since 1989. This directory currently contains descriptions of about 4500 datasets and related information on Australia's natural resources.

Recommendation 10.1

The Commonwealth, States and Territories should, as a matter of priority, conclude an agreement on the management of spatial data held by their agencies. Among other things, the agreement should cover:

- determination of agreed standards to facilitate the aggregation and sharing of data between the jurisdictions;
- the terms and conditions for the sharing of data to minimise duplication and encourage common usage;
- the extent of public access to the data; and
- the terms and conditions of access, including the recovery of the costs of access.

With regard to charging for data, the Commission acknowledges that government agencies producing data generally do so using public funds. However, once produced, there may be additional costs extracting and

formatting the data in the form the user has requested. The Commission considers that it is appropriate to recover that additional expense from the user.

Recommendation 10.2

Agencies charging a fee for data provision should review their pricing policies to ensure that, once produced, any additional cost of extracting and formatting data to meet specific user requirements should be recovered from them.

Implications of proposed regulatory regime

The regulatory regime proposed by the Commission would affect the collection and dissemination of information about land and natural resource management and its impact on the environment (see Chapter 8). Resource managers would be specifically obliged to identify, assess and manage environmental hazards associated with their operations. This would require each manager to collect enough information to satisfy his or her duty of care obligations, but only to the extent that it would be reasonable and practicable to do so. In other words, those responsible would not be expected to collect information that they themselves would not need, or to find out about problems which could not be reasonably foreseen by the person responsible. An obligation of this nature already exists in the Northern Territory, where under the *Pastoral Land Act*, lessees have a duty to 'participate to a reasonable extent' in the monitoring of the environmental and sustained productive health of the land.

The Commission has also proposed that land and natural resource managers be obliged to inform others who may be affected by the environmental hazards associated with their operations, or with the management of those hazards — again those responsible would not be expected to do so to an extent that would be unreasonable or impracticable. The effects of these obligations will vary with the situation and circumstances of each farmer or natural resource manager.

Some participants pointed to difficulties associated with a duty on landowners to collect information on and about their land. Environment Australia said:

> It would be difficult to ensure that adequate information is collected on off-site environmental effects of farmer actions, particularly if these are not recognised. (Sub. 229, p. 18)

The South Australian Government said:

> ... [it] is concerned the Commission has unrealistic expectations of the capacity of landowners and their local groupings to articulate information needs and generate quality information. (Sub. 324, p. 8)

And the Tasmanian Government (Sub. 319) was concerned about the reliability of information that is compulsorily acquired. The Commission believes, however, that as the information will be equally useful to those collecting it, it will be in the landowners' interest to ensure it is accurate and reliable.

The BRS (Sub. 329) said it supported the recommendation that individual land managers play a part in collecting natural resources information. It said a framework for collecting natural resources information by individual land managers already exists in the ABS Agricultural Census. It said that, subject to the availability of funds, it proposes to:

> ... work with ABS to geocode farm level survey data and to combine this with remotely sensed information to produce an Agricultural Land use/Land management digital data set. (Sub. 329, Attachment A, p. 21)

The Commission sees merit in extending existing data collection where this is practical and feasible and in line with the information to be collected under its proposed regulatory regime. The agencies involved should ensure that any data so collected will be incorporated into the proposed ASDI system.

With regard to the duty to inform, under the Commission's regulatory proposals this duty would be universal. That means the information should be made available to all those who have a need for it, but only to the extent that it would be reasonable and practical to do so. Some examples are discussed below.

Land purchasers

Some land degradation problems are not immediately obvious to a prospective purchaser of agricultural land. Concerns have been raised at various times that the market for agricultural land does not accurately reflect the condition of the natural resources contained within it. Reliable and timely information about the condition and productivity of agricultural land would help to improve the efficient operation of the market for agricultural land. Epps and Crittenden said:

> If an intending purchaser were required to be presented with an assessment of land condition in much the same way as a purchaser of urban land receives an indication of its zoning, the market price for land would adjust accordingly to its degree of degradation. Owners who carefully manage their lands would benefit, while those who effectively erode the value of their properties would relinquish an equivalent margin from the capital value of their asset. (1992, p. 20, Attachment to Department of Geography and Planning, University of New England, Sub. 28)

Greening Australia said:

> The establishment of a land assessment system that highlights degradation problems would reduce the market price of properties adopting unsustainable practices, and accordingly reduce unsound management practices, such as excessive clearing. There are many buyers of land, particularly urban buyers, unaware of land and water degradation issues which should be considered before purchase. (Sub. 174, p. 5)

The Department of Geography and Planning of the University of New England (Sub. 28) said that there is a significant role for governments in a system which ensures that true prices are placed on all our natural resources. With regard to agricultural land, NSW Agriculture said that one way to introduce a system of disclosure for prospective land purchasers was to implement an idea by Thomas (1997). Thomas suggested the introduction of a 'pink slip', similar to the requirement in New South Wales for used cars to undergo a 'pink slip' inspection to substantiate their road-worthiness as a condition of sale. NSW Agriculture said such a system would:

> ... provide information to prospective buyers on the state of the natural resource base, and consequently, lead to a more efficient land market by making individual landholders financially more accountable for any deterioration in the natural resource base during ownership. (Sub. 186, p. 27)

However, Mr Peter Simpson did not consider landowners could be expected to provide information on degradation problems on their land if that information would be used to determine land prices. He said:

> How naive can you be to expect the current generation of landholders to shoot themselves in the foot, as you suggest? The only way you will be able to obtain this information on a macro scale down to district scale, I believe, will be based on independent mapping and classification. (Sub. 212, p. 2)

Nevertheless, the Commission's regulatory proposals would help to generate more reliable and timely information on the condition and productivity of agricultural land. Again, this would be because landowners themselves would need the information in order to carry out their obligations under the duty of care. It would do so without imposing unreasonable costs on those who would have to collect and disseminate the information. In these circumstances, the Commission suggests that consideration of any additional measures be deferred. Once the proposed changes have had sufficient time to work through, it may be appropriate to assess whether any additional measures would be cost effective.

Providers of finance

Amongst the factors taken into account by financial institutions, when weighing the risks associated with financing landowners, is likely to be the condition of the land as reflected by the status of its natural resources. Financial institutions are therefore increasingly getting involved in the assessment of the

environmental impacts of agricultural and pastoral activity. In a joint submission to the inquiry, Landcare Australia and Westpac Banking Corporation said:

> ... customers can borrow a higher percentage of the value of land in good condition, compared with land which shows significant degradation. (Sub. 119, p. 5)

and:

> Current credit application procedures seek to identify land which is degraded and apply different underwriting standards to it. (Sub. 119, p. 5)

Landcare Australia and Westpac (Sub. 119) said currently financial institutions subjectively assess the adoption of sustainable farming practices when making credit decisions, but they are investigating the possibility of developing farm-based sustainability indicators. They said this would help place an economic value on farm sustainability. The information collected by farmers about their farms under the Commission's regulatory regime will assist the development of such indicators. It might also reduce the costs to farmers associated with applications for finance.

Recommendation 10.3

Data collected by individual landholders under their duty of care, and by groups, should be encouraged, as far as practicable, to be collected in a form that enables relevant elements of the information to be aggregated and compared with data collected by others.

10.2 Gaps in ESLM research

Australian governments support research and development relevant to ESLM in several ways (see Box 10.2). The research and development effort is spread across many organisations, from those undertaking basic research to those more concerned with the implementation of ESLM.

ABS statistics indicate that around $574 million was spent on research related to the environment in 1994–95 (see Box 10.2). This may not include all environmental research, because, as the Australian Research Council (ARC) said, many fields of research contribute to ESD objectives. It said:

> ... many of the research projects funded by the ARC, while not appearing to be ESD related, may still have significance with regard to ESD. (Sub. 115, p. 1)

Some research organisations undertake commissioned research, but others, receiving government funding, have processes in place to identify priorities for research.

Consultation with stakeholders is a feature of most priority setting processes. For instance, the Land and Water Resources Research and Development Corporation (LWRRDC), established to provide a national focus for research into natural resource management, and to improve levels of coordination and collaboration, has developed a process of consultation with organisations such as the ACF and the NFF. It also consults with researchers, other research funding bodies, rural industry groups and local governments.

The Commission finds that LWRRDC fulfils a useful complementary role in focusing on research into land and water management issues with prospects of high public benefits. As stated by Environment Australia:

> [LWRRDC] is not associated with and funded by any specific industry group, but undertakes research on issues which would otherwise not be privately funded, often in partnership with other research corporations. It has a good reputation for consultation, management of research, getting results and disseminating information. (Sub. 229, p. 18)

Box 10.2: **Government involvement in research into ESLM**

Total spending on environment research in Australia in 1994–95 was estimated to be $574 million, representing nearly 8 per cent of total spending on research of $7321 million. Of the $574 million, $80 million (14 per cent) was spent by business enterprises, $248 million (43 per cent) by the Commonwealth, $122 million (21 per cent) by the States and $121 (21 per cent) by higher education institutions (ABS 1996c, Cat. No. 8112.0).

The Commonwealth's major research facility is CSIRO. In 1993–94, CSIRO spent around $144 million on research related to the environment (IC 1995b). As part of the Natural Heritage Trust funding, CSIRO is to undertake projects related to Australia's biodiversity, totalling $13.5 million, research related to the management of pests, weeds and diseases amounting to $4.4 million, and sustainable tourism research amounting to $0.4 million. Other Commonwealth research establishments undertaking research related to ESLM include the Australian Nuclear Science and Technology Organisation, and the Australian Institute of Marine Science.

The Commonwealth has an established system of R&D corporations (RDCs) to encourage farmers and pastoralists to undertake applied research. The RDCs are funded through levies on output at farmgate, matched dollar for dollar by the Government up to 0.5 per cent of the gross value of production. Total expenditure by the commodity-based RDCs is around $200 000 annually. It is difficult to know to what extent this research incorporates issues related to ESLM. In addition to the industry RDCs, the LWRRDC, undertakes

research related to ESLM. It is wholly funded by the Commonwealth and receives around $10 million annually.

The Commonwealth also funds Cooperative Research Centres, where industry, universities and government research organisations undertake collaborative research. Of the 61 centres, 15 are classified as agriculture and rural-based manufacturing CRCs and 12 as environment CRCs. Combined, they received 47 per cent of the total funding in 1995–96 of $127 million.

Research into ESLM is also undertaken by universities, including the Key Centres of Teaching and Research, and the Special Research Centres funded by the Australian Research Council.

Private research by business enterprises is encouraged through taxation concessions, grants and the patent system.

The State governments operate their own research facilities and undertake about half the rural research performed in Australia.

Sources: ABS (1996c); IC (1995b).

The Commission does not support the recommendation of the Mortimer report (Commonwealth of Australia 1997b) that LWRRDC be wound up. The Commission considers there may be scope for extending the work of LWRRDC (see below).

Other organisations performing ESLM-related research also employ consultation processes to determine their research priorities. Such processes help to ensure that as environmental problems arise, and as the community becomes more aware of the importance of ESLM, research priorities adjust accordingly, and funding is directed towards the most beneficial research. Nevertheless, a number of participants expressed concerns about various aspects of research. The Liverpool Plains Land Management Committee (Sub. 192) said there was insufficient consultation and research programs were developed without consultation with farm communities. It said:

> Farmers are often only involved in research as end users. Only when farmers are included at the beginning of the research process can institutions hope that the research is appropriate to ecological sustainability ... (Sub. 192, p. 1)

Mr Harry Whittington was concerned about the relevance of current research:

> Research is falling behind what is actually occurring in the soils. What is and has been researched by various institutions and authorities is not completely relevant. (Sub. 25, p. 3)

The CRC for Freshwater Ecology was concerned about the quality of some research:

> I am aware of a number of environment research projects that I believe are second rate science, and anyone believing the results could make a major mistake. (Sub. 139, p. 10)

Others pointed out specific areas which are falling between the cracks. CSIRO identified:

> ... core aspects of soil chemistry, soil biology, aquatic ecosystem functioning, hydrogeology and biodiversity maintenance ... (Sub. 128, p. 25)

The Inland Rivers Network (Sub. 191) said funding is currently insufficient for issues related to freshwater ecology. Mr Peter Webb (Sub. 32) said more research is needed on weed control, and the Office of National Tourism (Sub. 141) said Australia would benefit from more research into the value placed by consumers on the attributes which contribute to the appeal of natural heritage.

In more general terms, LWRRDC said:

> There is a serious tendency among the natural resource management bureaucracy to think that the necessary research and development to underpin on-ground work decisions has been completed or substantially exists. In many cases, this is far from the truth ... (Sub. 204, p. 1)

The NT Government (Sub. 188) was less concerned about the focus of research than about the level of funding.

It is not easy to determine how much should be spent on research, nor which areas should receive priority. Research priorities, in particular, vary depending on the stakeholders consulted. However, from the information received, the Commission has distilled two major areas which may not have received adequate attention and funding. One is biodiversity, and in particular the joint management of on-farm biodiversity and agricultural production, which probably incorporates elements of all the gaps identified by participants. The other is a lack of knowledge by land managers about best management practice.

On-farm biodiversity management

Maintaining biodiversity is one of the keys to achieving ESLM. Farmers are well aware that biodiversity is not a concept that is confined to national parks and reserves. The Queensland Farmers' Federation said:

> ... the current National Parks system cannot preserve the total biodiversity of this country. There is a role for other landholders, particularly farmers, to maintain Australia's biodiversity. (Sub. 146, p. 2)

The South Australian Farmers Federation said:

> ... the protection of biodiversity can be considered as a spectrum of protection opportunities, ranging from national parks through to individual landowners ... (Sub. 89, p. 6)

However, at least until recently, the state of biodiversity, the management of biodiversity, and especially in conjunction with agricultural production, does not appear to have been a high-priority area for research.

There is evidence that landowners, as well as governments, are beginning to recognise the importance of biodiversity and the public benefits associated with biodiversity research. For instance, the Western Australian No-Tillage Farmers Association said it believed that it will be an emphasis on biodiversity which will allow farming to be sustainable and when undertaking biodiversity research:

> It is paramount that economic production be considered at the same time, for it is inevitable that change is easiest to implement when the farmer can see an economic gain to be made. (Sub. 337, p. 2)

And, in 1995, the Australian Research Council (Sub. 115) established the Key Centre of Biodiversity and Bioresources at Macquarie University, with funding to date of approximately $904 000. As part of the NHT, the Commonwealth Government has committed $2.1 million for an Australian Biological Resources Study in 1997–98. And CSIRO is to be allocated funding for a number of biodiversity-related projects, totalling more than $13 million in 1997–98 (Commonwealth of Australia 1997a).

Being fundamentally basic research, these projects will be helpful in increasing our knowledge about Australia's biodiversity in general. The information resulting from these projects is not likely to directly assist land managers to incorporate biodiversity goals into their management practices. Research conducted for that purpose falls, in any case, more in the category of applied research, with relatively high benefits to landowners, and landowners should therefore be prepared to contribute to its funding.

Farmers already contribute to research through levies on farm production, paid to the Research and Development Corporations (RDCs) (see Box 10.2). They have considerable input into what kind of research is funded and many recognise the need for research into environmental issues. However, the RDCs are based on commodities and most of the research they commission relates to their industry.

The RDCs collaborate on research when the issues involved cut across more than one industry, and they have formal as well as informal mechanisms to ensure this. In its report into *Research and Development* (IC 1995b), the Commission found, that while there was some scope for improvement, the

RDCs had been successful in increasing the financial contribution of farmers to rural research and that the research done appeared to be carefully assessed and directed to industry needs. The Commission does not support the recommendation of the recent Mortimer report (Commonwealth of Australia 1997b) that they be consolidated into a single R&D corporation. Consolidating the RDCs would be likely to create an unwieldy, centralised bureaucratic structure, with reduced diversity of foci and opinion, and a loss of the perception of 'ownership' by individual agricultural industries.

Nevertheless, because of the wider public good benefit of biodiversity, such arrangements are unlikely to provide an adequate incentive for research into biodiversity within the context of agriculture. Under the Commission's proposed regulatory regime, there would be an increased demand for such research. The Commission believes this should be recognised explicitly and special arrangements put in place for such research to be undertaken.

While there are a number of institutions which could facilitate research into the management of on-farm biodiversity, the most obvious options seem to be an explicit extension of the functions of LWRRDC, the establishment of a separate CRC, or both. An advantage of extending the functions of an existing organisation would be that it avoids the costs of establishing a new organisation. In addition, the establishment of a separate CRC would raise the issue of which would be the appropriate organisations to sponsor it.

Consideration would also need to be given to how the research would be funded. There are a number of options. If the preference was for LWRRDC to undertake the research, additional government funding could be provided in recognition of the public good benefits of biodiversity. The funding could be drawn from existing environmental programs, such as expenditure under the NHT. This would sit easily with the existing charter and operations of LWRRDC. It would rely on LWRRDC project selection procedures which involve consultation with the NFF, an organisation which represents all agricultural industries, and the ACF, which is Australia's peak environmental organisation. If a new CRC was seen as more appropriate, the funding could be allocated to the lead agencies involved.

A second option would be to explicitly tax, or hypothecate, a share of the funding for the RDCs. This would ensure a contribution from levy payers. If such funding was provided to LWRRDC, farmers would again be represented in project selection procedures by the NFF. It raises the issue of whether this would adversely influence LWRRDC's ongoing cooperation with other RDCs. Inter-agency concerns may not be such an issue with a separate CRC.

A third option would be to explicitly extend LWRRDC's charter and rely on the resulting reallocation of priorities to ensure research into biodiversity in conjunction with agriculture. However, this would not guarantee a specific level of such research.

The Commission received very few comments in response to its request for participants' views on which option would be most effective. The Western Australian No-Tillage Farmers Association (Sub. 337) said it encouraged the establishment of a CRC for Sustainable Crop Rotations. Environment Australia (Sub. 229) saw drawbacks in all three options and considered a combination of all three could be pursued, the advantages being:

- it would allow for some funding to be quarantined from existing environment program funding, without significantly affecting other priority areas for funding;
- a low level of taxing may be acceptable to other RDCs without the full burden falling on them; and
- a change to LWRRDC's charter would ensure that biodiversity research was given adequate consideration when assigning priorities.

Research into biodiversity is receiving greater prominence, from both privately and publicly funded research. However, the Commission considers that specific and explicit recognition should be given to research into integrating biodiversity with the management of land used for agricultural or pastoral purposes. The three options proposed in the draft report are by no means mutually exclusive.

At the very least, the Commission considers that the functions of LWRRDC should be extended to incorporate research into the management of on-farm biodiversity. It would be useful to establish a view to determine whether this would require additional funding, from whatever source, or whether funding should be drawn from existing environmental programs.

New CRCs come into being when the Commonwealth Government announces funding for a certain number of new CRCs and calls for applications from participating organisations. The research topics around which the CRCs are built are initiated by the applicants and assessed on their merit. Although it would reverse the process, there appears to be no reason why the Government should not be able to invite applications for a new CRC for the Management for On-farm Biodiversity.

Recommendation 10.4

The Commonwealth should initiate a review of LWRRDC's charter with the aim of extending it to incorporate research into the management of on-farm biodiversity. Included in this review should be an investigation of the most effective way of funding this additional research.
The Commonwealth should also consider making available funding for a Cooperative Research Centre for the Management of On-Farm Biodiversity.

Lack of knowledge of best management practice

In discussions with participants, and from its roundtable meetings, the Commission found many landowners ready to embrace the concept of ESLM, and to work towards achieving it as a 'joint product' with agricultural production. Both the NFF (Sub. 190) and the Cattlemen's Union of Australia (Sub. 150) stressed the need for improved management skills in agriculture. The South Australian Farmers Federation said:

> For agriculture to be sustainable requires profitable management practices that maintain the environment and critical natural cycles. (Sub. 89, p. 5)

However, it became clear to the Commission that most land managers lacked the knowledge and information required to undertake the necessary measuring, monitoring and remedial action.

This information does not appear to be available. Environment Australia commented on:

> ... the problem of lack of scientific information and lack of information that is useable in a form that will assist improved management. (Sub. 200, p. 6)

The SA Government said:

> The linkages between paddock level problems and opportunities and the overall R&D effort is not strong. Much of the Commonwealth investment in research and development is either directed towards defining the problems (inventory type applications) or is not directly aligned with the needs of the land manager. (Sub. 84, p. 48)

And the CRC for Soil & Land Management said:

> ... there is considerable research knowledge that could be broadly described as pertaining to land management issues. Integrating and adapting this knowledge into sustainable land management systems and practices is currently lacking. (Sub. 99, p. 2)

Under the regulatory regime as proposed by the Commission it will be necessary for landowners to have access to knowledge about best management

practices — particularly about how to integrate agricultural and pastoral activities with the care and maintenance of remnant vegetation and biodiversity.

At a National Conference entitled *Landcare Changing Australia*, held in Adelaide in September 1997, there was a focus on best practice. In addition, Environment Australia (Sub. 229) said the Australian and New Zealand Environment and Conservation Council Working Group on Nature Conservation on Private Land and the Council for Sustainable Vegetation Management are examining best practice in off-reserve nature conservation. It said the RDCs are also undertaking research in this area and disseminating results to landowners.

The Commission believes that jurisdictions can assist these initiatives by encouraging farmers, industry organisations and other groups to collect and disseminate information, and provide advice to their members.

10.3 Extension

An important issue is how the results of research are extended to users. Without extension, the new knowledge resulting from research will not be able to be effectively implemented. In addition, extension activity enables useful feedback from research users to the research providers.

Extension of rural research results has traditionally been the role of State governments. In recent years, however, some State government extension services have been wound back significantly. The Conservation Council of Western Australia said:

> While in the past ... Agriculture WA has maintained a strong role in research and information dissemination, they are cutting back the level of activity. (Sub. 177, pp. 4–5)

Landcare facilitators have taken on some of the functions previously carried out by extension officers. Some participants were supportive of this change. The CRC for Freshwater Ecology said:

> The landcare model uses a whole variety of local pressures to take people along, and these pressures from neighbours cannot be ignored in the way an agency extension officer could be ignored. (Sub. 139, p. 10)

Ms Liz Abel, a Catchment Planning Facilitator with the Department of Land and Water Conservation in New South Wales, said:

> Communication from a local representative ... is the most effective method of communicating results. (Sub. 60, p. 1)

However, the Conservation Council of Western Australia said support for information dissemination through the Landcare movement was also winding back. It said:

> More resources are urgently needed for dissemination of information and extension of ESLM. (Sub. 177, p. 5)

In the legislation establishing the RDCs, dissemination of research results is specifically mentioned as one of their functions. Consequently, many of the RDCs have developed communication strategies and employ full-time technology transfer officers. LWRRDC has in place a Communication Program, in addition to the specification that each research project must have built into it, and usually funded as part of the project, an effective pathway for communication and adoption of the results.

Nevertheless, some participants said that research results are not reaching land managers to the extent that they should. For instance, Professor Stork of the CRC for Tropical Rainforest Ecology and Management said at the Cairns roundtable that one of the things:

> ... that ha[s] become clear to me ... is that ... a lot of research [has] been done but there's been very poor flow of information. (Transcript, p. 313)

A similar view was expressed by the CRC for Soil & Land Management:

> We argue that there is considerable research knowledge that could be broadly described as pertaining to land management issues. Integrating and adapting this knowledge into sustainable land management systems and practices is currently lacking. (Sub. 99, p. 2)

A further issue, raised by the SA Government (Sub. 84), is that those needing to change their land management practices may not be aware of the need to change. The Land Conservation Centre of the Faculty of Environmental Sciences at Griffith University was also of that view. It said:

> Although there has been considerable advance in assisting farmers to recognise erosion and other degradation problems occurring on their land, farmer perceptions, definition of erosion and action remain problematic. (Sub. 74, p. 7)

The SA Government said that in such circumstances information needs to be actively communicated to potential users, as institutions set up purely to be responsive to client demand will not be adequate in such cases.

CSIRO commented on the low level of real understanding of the processes involved in the environmental impact of agricultural land use, especially amongst land managers, and said that:

> New approaches to the extension of environmental understanding and information in urban and rural communities need to be developed and supported. (Sub. 128, p. 25)

The Liverpool Plains Land Management Committee was critical of the way research and extension efforts:

> ... treat all farmers as an homogenous group. The appropriateness of extension methodologies must be questioned against the characteristics of the audience. Group processes increase awareness, however one on one extension may still be required for adoption to take place. (Sub. 192, p. 1)

Not all participants were critical of current extension services. The NT Government said:

> Extension methods are now directed at self-development and empowerment of individual producers and families through education and skills training techniques. Evidence to date indicates that these approaches are likely to be highly effective in achieving ESLM ... (Sub. 188, p. 23)

A number of participants considered governments were the appropriate bodies to undertake extension. The Western Australian Farmers' Federation said:

> The Federation considers that a significant role exists for Government agencies to ensure that research, technology and practical application of the many different approaches are communicated to all involved. (Sub. 113, p. 4)

Mr Greg Hayes and Mr Alistair Watson said:

> ... we see a major role for government in generating and disseminating information on ESLM. (Sub. 121, p. 5)

Communicating research results to users in a form they are able to use is essential if the research is to be worth the resources devoted to it. However, there appears to be a shortage of effective extension services, as well as confusion and uncertainty about which groups or agencies should undertake extension.

The Commission is concerned that in some cases the extension services available to farmers are aimed predominantly at improving productivity and that advice in relation to the ecologically sustainable management of their land is treated as a separate issue. For instance, the Queensland Grain Growers Association said:

> In some branches of some departments in some States, the ESLM approach is very well integrated into specialist advice on crop or animal production. But right next door in another branch (same department, same State) a narrow short term production focus still rules. (Sub. 207, p. 4)

The Commission believes that general extension services available to landowners should cover both productivity and ecologically sustainable land

management in an integrated way. Such an approach would not only be more efficient in terms of resources devoted to extension, but also help to avoid and/or eliminate the perception held by some landowners that improved environmental management and higher productivity must always involve a trade-off.

The Commission believes that it would be beneficial for agencies and/or groups currently undertaking extension services to review their activities, and perhaps to coordinate them with Landcare activities. There may also be scope for those agencies to coordinate their efforts to ensure that the appropriate level of group or agency is providing the service, and that those services are provided at the local or regional level as needed. The Department of Defence (Sub. 208) said that catchment based information centres had also been demonstrated as an effective tool in extending information.

Recommendation 10.5

The States and Territories should review their extension programs with a view to ensuring that they are capable of advising landholders on all aspects of ecologically sustainable land management.

10.4 Education and training

Training land managers

Education and training programs for land managers have been funded by the National Landcare Program and its predecessor the National Soil Conservation Program since the early 1980s (Queensland Grain Growers Association, Sub. 61).

Training for landowners is also provided through Property Management Planning (PMP) workshops. The National Property Management Planning Campaign was launched in 1992 as a joint initiative between the Commonwealth and State and Territory Governments, funded through the National Landcare Program, and is now seen as an important tool for the management of agricultural land. PMP is a total farm management process that involves the integration of all decision making including risk management. It is built around small group training, using participative workshops, with the cost of the workshops shared between the Commonwealth, the States and Territories, and farm families.

In 1995, the Prime Minister established the Land Management Task Force to 'examine the situation facing Australian farmers and their ability to manage their business in what is a rapidly changing environment' (Commonwealth of Australia 1995, p. iii). The Task Force recommended that the National PMP Campaign, which was launched in 1992, be:

> ... extended for a further five years beyond 1995–96 and expanded with additional funding from government. (Commonwealth of Australia 1995, p. 4)

PMP is encouraged in all the States and most have programs in place to assist landowners in preparing such plans. The Department of Primary Industries and Energy (Sub. 202) said the number of PMP workshops conducted between August 1992 and January 1995 was close to 3000 nationwide, involving more than 35 000 participants. A National Strategy for PMP is currently being developed.

In addition, as part of water reform programs, the State governments have in place a number of education programs aimed at improving the management of water (see Appendix C).

In the case of training for landowners, inevitably there are likely to be areas of overlap between extension (discussed above) and education and training. Nevertheless, some participants specifically noted that training of land managers was important.

Greening Australia (Sub. 174) said training of landholders is essential to achieving the goals of ESLM. It reported findings by Kirkpatrick (1996) who found that of the farmers who attend training courses, 64 per cent make a change to their farming practice as a direct influence of the course.

The NFF (Sub. 190) also referred to Kirkpatrick (1996), saying it had identified the need and demand for training by farmers. The NFF said government training funds should be made available to farmer organisations which can utilise their credibility in the farm sector to deliver relevant and appropriately structured training.

With regard to formal education, *A Pilot Study on the Relationship Between Farmer Education and Good Farm Management* (Bamberry, Dunn and Lamont 1997), commissioned by the Rural Industries Research & Development Corporation, found that the literature on farmer education:

> ... reflected little conclusive evidence of a strong relationship between levels of formal farmer education and agricultural productivity and, in turn, good farm management. (RIRDC 1997, p. 3)

The Meat Research Corporation (Sub. 264), which has funded the development of a training course in pasture and animal assessment skills (PROGRAZE), was

critical of some training systems. It said it had recently investigated course and training accreditation, and had found that:

> What has become apparent is the complex and convoluted systems in place in the education sector. (Sub. 264, p. 17)

It also said:

> Training on its own may not achieve change unless it is part of an ongoing learning process. If land managers do not implement something from the course, then the value of the training course has to be questioned. Without an evaluation system in place to measure the impact of training, counting the number of land managers trained will not help achieve ESLM. (Sub.264, p. 17)

Certainly, land managers should not be overloaded with training courses, and evaluation of existing courses is important, to ensure they achieve their objective. Nevertheless, the development or availability of new training courses for landowners and employees etc may be a useful component of the new system and assist them in developing relevant codes of practice. As Greening Australia Northern Territory said, better educated land managers will be better able to:

> ... ensure that the 'reasonable and practical steps' they take in the exercise of their duty of care are wise ones. (Sub. 288, p. 5)

Community and professional education

More generally, raising community awareness about environmental issues is important if there is to be wide participation in the debate about what needs to be done to address land degradation problems, and a willingness to contribute to the cost of remedial action.

Many universities and TAFE colleges offer courses in natural resource management. Such courses often cut across disciplines and typically include subjects such as ecology, hydrology, biodiversity, land evaluation, recreation management, and natural resource economics.

The Australian National Training Authority is currently conducting an 'Environmental Scoping Project' in response to suggestions that there is a need to further develop vocational training for environmental functions. The study aims to identify gaps in vocational education and training in the environmental area; develop a protocol that links environmental competencies to Industry Training Packages; and to develop guidelines for stakeholders. This review covers all industries, including the agriculture sector.

Increasingly, schools in Australia, both at primary and secondary levels, include environmental studies in their curricula. The Geography Teachers Association

of New South Wales said that the curriculum area Human Society and its Environment, taught in primary schools, includes:

> ... simple understandings of the elements of the physical environment and the promotion of values concerning appreciation of natural features, of the ways in which resources are produced and consumed and recognition of the need to use them wisely. (Sub. 68, p. 1)

and that:

> An understanding of ecological concepts and processes is a central feature of the study of geography at the secondary school level. (Sub. 68, p. 1)

Some school programs have practical components. Some State government departments involved in natural resource management visit schools to present educational programs, or involve students in environmental monitoring or revegetation projects. The WA Department of the Environment has developed *Airwatch*, a hands-on monitoring program for schools and community groups, and *Teaching among the Trees*, an aid for schools wishing to develop environmental projects. In Victoria, the Department of Natural Resources and Environment recently organised a competition for primary school students to design a calendar on a 'clean and green' theme. And the ACT Government has recently launched *Stormwater: Catchment Management and Landcare*, an education resource kit for schools and the community.

11 FORESTS AND NATIVE VEGETATION

The focus in this chapter is on factors which are inhibiting private forestry development that could contribute to the ecologically sustainable development of agricultural and pastoral land. Governments are aware of many of the problems and have announced intentions to fix them, but progress has been slow. More action is needed.

Vegetation management is central to many land management problems. The removal of deep-rooted vegetation is a major contributor to problems as diverse as loss of biodiversity, dryland salinity and wind and water erosion. There is considerable potential for landholders to contribute to better vegetation management by growing trees for log and timber production, as well as for its environmental benefits. For example, NSW Agriculture said:

> ... a farm tree planting program can assist a property's long-term sustainability.
>
> Windbreaks can increase the productivity of crops, pastures and livestock: shade trees can increase livestock productivity by reducing heat stress. Other benefits provided by farm trees include the protection of soil from erosion, amelioration and prevention of salinity and provision of timber and fodder. (Sub186, p. 9)

A number of factors reduce landholders' incentives to engage in these types of activities. As a result, decisions on vegetation management by agricultural and pastoral landholders are being driven primarily by the potential to increase returns by expanding grazing and conventional cropping activities. This has encouraged clearing of trees and other deep-rooted vegetation. The National Association of Forest Industries (NAFI) said:

> The overall regulatory structure has created a situation whereby property holders are frequently reluctant to allow and encourage the expansion of tree cover ... (Sub. 73, p. 4)

The major factors which reduce commercial incentives for wood production on private land relate to:

- difficulties in separating the ownership of trees and land;
- the potential for double taxation of forestry profits;
- uncertainty about harvesting rights;
- non-commercial operations of government forestry agencies; and
- export controls on unprocessed wood.

These impediments are not new — governments, landholders and other stakeholders have been aware of them for many years. They have been addressed in some detail in previous public inquiries, such as those undertaken by the Resource Assessment Commission (RAC 1992) and the Industry Commission (IC 1993a). The National Forest Policy Statement, which was agreed in 1992 between the Commonwealth and all State and Territory Governments (except Tasmania, which became a signatory in 1996), proposed specific strategies to address impediments to private forestry. However, as outlined below, government commitments have not been translated into actions. Most impediments remain. The lack of action has created uncertainty, discouraged the management of vegetation on private land in a manner which would both advance landholders' commercial interests and government environmental goals, and deterred private investment.

The following sections examine each of the above factors in turn. It does not deal with the totality of forestry issues as some, such as Regional Forest Agreements, are beyond the scope of this report. A more detailed discussion of impediments to commercial wood production can be found in the Commission's report into *Adding Further Value to Australia's Forest Products* (IC 1993a). The final section explores the possibility of carbon sequestration encouraging landowners to maintain and develop vegetation on private land as a means of offsetting greenhouse gas emissions.

11.1 Separate tenure for land and trees

Under existing law in most jurisdictions, owners of land are deemed to also own the trees on the land. This lack of separability impedes the capacity of landowners to sell the rights to develop, manage and harvest trees on their land, independent of the land itself. Given the very long time frames between planting and harvesting trees, this lack of separation from the land title can substantially reduce landowners' flexibility (eg their ability to liquidate their investment before harvest) thereby increasing the risks associated with investment in farm forestry.

In New Zealand, the problem was overcome by extending the notion of *profit a prendre* to encompass a forestry right in the *Forestry Rights Registration Act 1983*. *Profit a prendre* is the right to enter upon the land of another and take away soil or its produce. This effectively separates rights to the trees from the land. As a result, it widens the range of options for landholders and investors. For example, plantations which are legally separate from the land can be mortgaged, and investors can establish plantations without acquiring an interest in the land.

The problem was explicitly recognised in the National Forest Policy Statement. It foreshadowed action by governments to:

> ... establish a sound legal basis for separating the forest asset component from the land asset for the purpose of selling timber. (Commonwealth of Australia 1992, p. 30)

The Commission proposes that States and Territories provide for legal separation of the ownership of trees grown for commercial purposes from the ownership of the land on which they are grown.

The New South Wales Government claimed that specific legislation separating tenure for land and trees is not necessary in New South Wales:

> Investors in commercial plantations can already be accommodated by amendments made to the Conveyancing Act and the Real Property Act in 1987. The NSW legislation provides for registration of a 'forestry right' and 'forestry covenants' and for registration of these rights and convenants as an interest in the land under the Real Property Act. (Sub. 325, p. 12)

However, while the NSW legislation improves forestry rights, it does not facilitate third party investment in plantation forestry to the degree allowed for under a *profit a prendre.*

By contrast, in Victoria, the *Forestry Rights Act* 1996 enables the establishment of an agreement between an owner of the land and another person which grants that person the right to plant, maintain and harvest trees on the property or to give ownership of trees on that land to another person. The forest property, agreement is attached to the title of the land and continues with the new landowner if the property is transferred.

Specific legislation giving effect to the objective in the National Forest Policy Statement has been passed in only two States — Tasmania and Victoria.[1] Both jurisdictions followed the New Zealand model.

Participants recognised the value of providing for separate tenure for land and trees. As the Western Australian Farmers' Federation stated:

> The Federation fully supports the enactment of legislation to provide for the legal separation of ownership of commercial trade plantations from the ownership of land on which grown. (Sub.230, p. 3)

This view was supported by a cross-section of participants, such as the National Farmer's Federation (Sub. 294), the Institute of Foresters of Australia (Sub. 226), and the Department of Conservation and Land Management (WA) (Sub. 225).

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[1] Western Australia has a form of tree tenure, but it is only available to the State itself.

Recommendation 11.1

Where appropriate measures are not in place, each State and Territory should enact legislation to provide for the legal separation of the ownership of trees grown for commercial purposes from the ownership of the land on which they are grown.

11.2 Double taxation of forestry profits

Under existing income tax law, there is a potential taxation problem associated with the *profit a prendre* concept which could deter investment in plantations and farm forestry.

Under the capital gains tax provisions, the grant of a *profit a prendre* constitutes the disposal of an asset. This gives rise to a liability to capital gains tax, even if no consideration was received by the grantor at the time of the granting of the *profit a prendre*. At the time the timber is actually harvested and paid for, the proceeds of the sale constitute income to the grantor of the *profit a prendre*, and is liable to income tax. Thus, there is the potential for the one transaction to be subject to both capital gains and income tax.

The Commission understands that the problem came about as a result of the way the capital gains tax provisions were drafted. The Australian Taxation Office is aware of the anomaly and has recommended a legislative amendment to eliminate the problem (CIE 1997b). This needs to be implemented as soon as practicable.

Recommendation 11.2

The Commonwealth Government should accelerate action to remove the potential for double taxation of commercial forestry profits. It should announce its intention to remove the anomaly as soon as possible, with retrospective application from the date of the announcement.

11.3 Harvesting rights

In most jurisdictions there is some uncertainty about private landholders' capacity to harvest trees on their properties. No automatic right to harvest

exists, even for trees planted by the landholder for subsequent sale. This creates considerable uncertainty. For example, according to NAFI:

> In many areas of Australia, if livestock numbers are reduced, native forests will regenerate naturally and provide many important biodiversity values. However, the property owner who allows this to occur runs a very high risk of not being able to harvest timber or clear land if he subsequently decides to carry out some other form of agricultural production or land use. (Sub.73, p. 4)

During the roundtable discussions in Canberra in June 1997, the Executive Director of NAFI said:

> I've got plenty of members who have grown plantations and then haven't been allowed to cut them down. (Transcript, p.680)

The situation differs considerably between jurisdictions. For example:

- In Victoria, there is no explicit right to harvest. However, there are few restrictions on landowners' capacity to harvest, provided they adhere to a legislated code of practice.
- In New South Wales, a legislated code of practice also applies. The right to harvest is only granted for existing plantations, and to landowners that have gained accreditation as a private forest reserve. However, as the NSW Government stated:

  > Recent amendments to the Act proposed by the Government will allow for the provisional accreditation of land proposed to be established as a timber plantation provided the land was already cleared at August 1995 or certain consents have been obtained. (Sub.325, p. 13)

- In Tasmania, a private forest reserve, which can be established on any private land through application to the relevant authorities, carries with it an automatic right to harvest. The right exists irrespective of whether the land is, or is not, planted at the time of application.

The differences in regimes create varying degrees of uncertainty for landowners and potential investors in forestry. For example, in Tasmania and Victoria, landowners face few restrictions on harvesting so long as they apply to the relevant authorities or adhere to the appropriate legislated code of practice. In other States and Territories, no such guarantee exists.

In all cases, the processes of obtaining harvesting rights vary. For example, in Victoria, landholders must adhere to a legislated code of practice, while in Tasmania, landholders must obtain approval from the relevant authority. In both cases, approval can be sought at any stage in the growing cycle. The situation differs in New South Wales, where landholders must obtain a provisional accreditation prior to planting.

The Commission proposes that to reduce unnecessary uncertainty, there should be an explicit right to harvest plantations grown for commercial purposes.

Recommendation 11.3

Each State and Territory should enact legislation to guarantee the right to harvest and use wood grown on private land for commercial purposes. The right should be available prior to planting.

Participants noted that while the right to harvest plantations has been clarified and recognised, harvesting rights as they related to managed regeneration remain uncertain. Specific examples were given by Mr Ian Mott, State Councillor for the Australian Forest Growers, at the public hearing in Brisbane in November 1997:

> I've got a number of sites on my property where they are ideally suited for assisted regeneration. ... The best ecological outcome for that is to remove the weeds ... so you'll end up with a complete regeneration of that site.
>
> That's the lowest impact, produces the greatest biodiversity, and produces the highest composition of endemic native species. ...
>
> But if I were to do that, I get no guarantee that I can harvest it. It will be treated as an untouched forest ...
>
> So I really have no choice but to buy in seedling stock from elsewhere ... so we've got integration of non-endemic species ... I end up with now — probably a monoculture or at best, two or three different species in it, and generally, I have a lower — a poorer ecological outcome, because the existing vegetation management tools don't appear to recognise that you can actually create a native forest. (Transcript, p. 1367)

The Commission endorses the need for clarification of harvesting rights as they apply to areas of managed regeneration. The Commission proposes that the right to harvest such an area be recognised provided that, at the commencement of regeneration, the affected area was notified to the appropriate authority in each jurisdiction.

Recommendation 11.4

Areas regenerated with the intent of harvesting should be subject to the same harvesting rights as plantation forests, so long as the intent to harvest is declared prior to regeneration.

Sovereign risk

The risk that governments will change policy settings (so-called 'sovereign risk') affects investment decisions in all areas of the economy. However, it is of particular concern to investors in forestry where investments are typically of a very long-term nature. For example, the time between planting and harvesting can be more than 30 years. In this context, one concern for private investors in plantations is the possibility that changes in harvesting rights or in harvesting codes of practice during the maturation period will prevent harvesting or impose conditions which significantly reduce the landholders' expected returns. The higher is the perceived risk, the less likely it is that investment will occur.

Investment decisions will always have to be made in the face of some sovereign risk (eg the risk that government will change official interest rates or depreciation allowances). However, a stable and predictable investment climate helps to remove any systematic bias against investment in longer-term projects. In this light, the Commission's Draft Report proposed that changes in harvesting rights or in harvesting codes of practice should not have retrospective effect on holders of those rights, unless the change has their support or compensation is offered.

The majority of participants supported the recommendation by the Commission in the Draft Report. As the Pulp and Paper Manufacturers Federation of Australia (PPMFA) notes:

> The PPMFA strongly supports these recommendations and considers the logic that underlies them to be incontestable. ... In particular, the implementation of these recommendations is essential to reduce sovereign risk, and to ensure the continuing, long-term fibre security of the pulp and paper industry. (Sub. 279, p. 1)

Similarly, the Queensland Government (Sub. 342) stated that this recommendation is a fundamental principle which should guide most policy.

Recommendation 11.5

Changes in the rights to harvest and the codes of practice governing the management and harvesting of plantation forests, regenerated native forests and farm forests should not be implemented without prior agreement of the affected parties and the payment of compensation where rights have been reduced.

In taking action to reduce sovereign risk, there is clearly a need for government action to ensure that harvesting itself does not create environmental problems and that landowners undertake appropriate restoration of harvested areas. This is achieved in some jurisdictions with legislated codes of practice. Such codes of practice could be combined in legislation guaranteeing harvesting rights in jurisdictions where it does not already exist.

Voluntary codes of practice

As noted above, legislated codes of practice regulate forestry harvesting practices in some States. Examples are the *Forest Practises Code* in Tasmania, the *Timber Plantations (Environment Protection) Harvesting Code 1997* in New South Wales and the codes in Victoria under the *Forest Act 1958*, *Conservation and Forest and Lands Act 1987* and *Planning and Environment Act 1987*.

Mandated codes of practice generally prescribe in some detail the harvesting practices to be observed across the jurisdiction. The more detailed the prescription, the less flexible and adaptable are the rules. The same rules apply irrespective of the considerable differences in local circumstances and risks of environmental damage. By doing so, they allow little scope for innovation and do little to encourage it. This increases the costs of compliance without improving the extent of environmental protection.[2]

The Commission considers that it would be preferable if voluntary codes were developed and adopted on a regional basis by the relevant stakeholders as the means of meeting the recommended duty of care for the environment (see Chapter 8). Such codes would be more flexible and adaptable than legislated codes and could better reflect local environmental conditions and harvesting circumstances.

As noted by the Victorian Government:

> Voluntary codes developed by stakeholders and assisted by State agencies are likely to introduce an increasing level of compliance on private land as industry becomes more adoptive of emerging international and national certification requirements. (Sub. 341, p. 16)

Recommendation 11.6

[2] As noted by James (1997), performance bonds could also be used to help ensure appropriate harvesting, rehabilitation and restoration.

Each State and Territory should sponsor the development of regional codes of practice for the management and harvesting of plantation forests, regenerated native forests and farm forests by the relevant interested parties.

11.4 Activities of forestry agencies

There has been controversy about many aspects of the activities of State government forestry agencies for some years. There have been numerous government inquiries and many studies carried out.

Of particular relevance to this inquiry are concerns expressed about prices charged by forestry agencies for logs from crown forests (both native forests and plantations) (see IC 1991b and 1992b, RAC 1992, ABARE 1990, CIE 1990 and Cameron and Penna 1988). Logs supplied by these agencies compete with those from privately managed forests and farms.

The major concern is that log prices charged by government agencies do not reflect all costs of supply. Allied with this are concerns about the systems used to allocate logs to users. Allocations have often been at the discretion of forestry agencies. And their sale has frequently been conditional on end use.

To the extent that Crown logs are underpriced and this lowers market prices, the returns achieved by private wood supplies are reduced — as is the incentive to invest in private plantations and farm forestry.

The capacity for government forestry agencies to underprice logs reflects advantages stemming from government ownership. Traditionally, they have not been required to operate in a commercial fashion (eg to recover all costs and pay a dividend to government). They have benefited from concessions not available to private wood suppliers (eg exemptions from a range of government taxes and charges). Some have been required to price logs to promote government regional policies.

The National Forest Policy Statement recommended pricing policies for government wood allocations which, amongst other things, would result in prices at least covering the full cost of efficient management and a return to the community for the use of a public resource.

In recent years, most jurisdictions have taken steps to place their forestry bodies on a more commercial footing. For example, New South Wales State Forestry has been declared a Government Trading Enterprise, the Victorian Plantations Corporation has been established as a State Owned Enterprise and the

Queensland Forest Service has been transformed into a commercial agency. However, in most jurisdictions progress has been slow.

Against this background, there is still considerable uncertainty about the extent to which state forestry bodies currently provide logs on a fully commercial basis. For instance, according to James, in Queensland:

> More commercial pricing practices have been difficult to implement for native forest products. The native forest sector has an inherited industry structure with small scale producers, strong socioeconomic links with regional communities, traditional approaches and mechanisms for pricing and allocation, and prospects of a shrinking resource base. (1997, p. 81)

And in Victoria:

> In Victoria, industry development is a stated aim of government policy. The main guidelines for implementation of pricing and allocation policies are contained in the 1986 Timber Industry Strategy.[3] (1997, p. 81)

The issue remains clouded because a high proportion of Crown logs are sold under long-term supply agreements, with prices determined administratively rather than by an auction or tender process. This leads to a lack of transparency, as in most jurisdictions the prices paid are confidential. For example, NAFI said:

> - Most log sales from these [state owned] corporations are tied up in confidential, long term, take or pay contracts with processors.
> - These contracts may be only vaguely related to wider market price outcomes. (Sub. 73, CIE Attachment, p. 44)

The Department of Conservation and Land Management (WA) said that the issue of the commercial use of Crown forests lay outside the Commission's terms of reference:

> As such land [Crown forests] is, by definition, not agricultural or pastoral land, the IC should delete those recommendations entirely. (Sub225, p. 2)

The Commission considers that the management of Crown forests (both plantation and native forests) is an important issue in ecologically sustainable management of agricultural and pastoral land. As well as being potentially available for economic use as outlined in the terms of reference, the management of Crown forests for timber, both plantation and native forests,

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[3] Under this strategy, the Victorian Government has pursued a log allocation policy which provides preferential allocation of higher quality sawlogs to firms which engage in adding the greatest value to unprocessed wood. This does not necessarily maximise the value of the unprocessed wood and, in effect, may be used to lower prices for unprocessed wood so as to subsidise the subsequent processing.

competes directly with forestry activities on private land, and can significantly impact on the incentives for revegetation.

Full corporatisation or, where appropriate, privatisation, of government bodies that sell logs is being pursued by governments in Australia. It should ensure that prices reflect full costs and help achieve competitive neutrality between public and private suppliers and increase the efficiency of Australia's wood markets. The Tasmanian Government recognises some additional benefits:

> The Tasmanian Government, through Forestry Tasmania, is pursuing a partial sale of its softwood plantations, into a joint venture, as a means of stimulating private investment in the sector and as a base for significant industry growth in Tasmania. (Sub. 319, p. 6)

However, the Australian Conservation Foundation expressed concern that:

> ... corporatisation of forestry agencies on the one hand, and increased private sector involvement on the other, will be implemented in ways which facilitate neither competitive neutrality nor ecological sustainability. (Sub296, p. 20)

The New South Wales Government commented that the goal of ecologically sustainability will be protected through the move towards a commercialised environment:

> State Forests of NSW is a commercialised government business ... However, the NSW Government's Forestry Reform package balances the twin objectives of the establishment of a comprehensive, adequate and representative reserve system and the maintenance of an ecologically sustainable, saw-log driven timber industry.
>
> This has required a strategic refocussing of the State Forests' activities to ensure effective delivery of both the commercial and ecologically sustainable forest management outcomes expected by the community. (Sub325, p. 13)

The PPMFA commented:

> state forests remain a public resource, and it is therefore entirely legitimate for governments to take decisions in relation to that resource in order to achieve wider social and economic benefits beyond simple cost recovery. (Sub279, p. 2)

Other participants also commented on the role of native Crown forests in contributing to biodiversity and other ecological goals, as well as forestry. The Institute of Forest Growers of Australia said:

> ... commercial Crown native forests must, in addition to wood production, be managed for biodiversity, environmental and other 'public good values' ... (Sub. 226, p. 4)

The appropriate management of Crown forests will depend on the type of forest and the objectives being pursued. Where the forest has been established predominantly for commercial reasons, corporatisation or privatisation should not present significant difficulties, and should be pursued by governments.

Reform is more complex where native forests are managed for multiple objectives, involving conservation and commercial forestry activities. This issue can be addressed by separating the process of deciding on the balance between conservation and forestry, from the management of the agreed quantum of commercial forestry activity. For example, with native forests where some logging is allowed, a government agency could be charged with deciding the area to be opened up to logging in each harvesting period and any constraints that may be necessary to preserve its ecological values. Placing the subsequent logging activity out to public competitive tender would ensure that these operations are undertaken in an open and transparent manner. This would eliminate any disadvantages suffered by the private sector in competing with Crown agencies for logging Crown forests. In this way, such activity could contribute to the development and operation of commercial forestry. The issue of cost apportionment between commercial and conservation objectives would remain as an important issue for the management of such forests to achieve their multiple objectives.

11.5 Export controls on plantation-sourced wood

Under the *Export Control Act 1982*, the Commonwealth has used a licensing system to control exports of logs and woodchips from private forests and plantations. This has discouraged wood production on private land for two reasons. First, it has reduced the size of the export market. Second, wood that otherwise would have been exported has been diverted to the domestic market and depressed log prices.

Recommendation 11.7

Each State and Territory should:

- complete the corporatisation of the agencies responsible for commercial use of Crown plantations;
- implement corporatisation in a way that promotes competitive neutrality with private plantations; and
- allocate any rights to harvest old growth native forests by competitive public tender, or by any other process which is as transparent and competitively neutral between private loggers and Crown forestry operations.

Recommendation 11.8

The terms and conditions for harvesting logs from Crown forests managed for commercial use, should:

- reflect the full economic costs of growing and harvesting them;
- be free from the need to underwrite other objectives, such as regional development; and
- be fully and publicly disclosed.

The 1992 National Forest Policy Statement foreshadowed the removal of export controls over unprocessed plantation wood — logs and woodchips. However, progress in lifting the controls has been slow.

In its 1995 Wood and Paper Industry Strategy, the Commonwealth Government stated that it intended to remove export licence controls on unprocessed plantation wood, subject to the protection of environmental values through State codes of practice. It stated that this:

> ... will help free up the log market and attract further investment in plantation establishment. (Forests Taskforce 1995, p. 14)

Under the *Export Control (Unprocessed Wood) Regulations (Amendment) 1996*, the Commonwealth Minister may decide to remove export controls from wood sourced from plantations in a State. The decision may be taken following a CSIRO examination that the State's codes of practice on harvesting are found to satisfactorily protect environmental and heritage values (Department of Primary Industries and Energy (DPIE), Sub. 329).

At this stage, export controls have been lifted only on exports from plantations in Victoria, Tasmania, South Australia and Western Australia (Anderson 1997a, DPIE, Sub. 329). Controls still apply in other jurisdictions and will be lifted following the approval of the respective codes by the CSIRO. DPIE reported that:

> The Minister for Primary Industries and Energy is expected to consider CSIRO reports (and consequently, removal of export controls) for New South Wales, the ACT and Queensland before the end of 1997. (Sub.329, p. 11)

Recommendation 11.9

The Commonwealth should expedite the removal of export controls on wood grown and harvested in accordance with appropriate codes of practice.

As noted above, the need for legislated codes of practice would be largely obviated under the Commission's proposals and be replaced by voluntary codes that can more appropriately address regional differences.

11.6 Carbon sequestration

There is concern over the build up of greenhouse gases and their effect on climate change. Recently, Australia and other industrialised countries agreed to implement measures aimed at reducing emissions of greenhouse gases into the atmosphere as signatories to the United Nations Framework Convention on Climate Change.

In 1995, the Commonwealth Government introduced the Greenhouse Challenge Program to reduce domestic greenhouse gas emissions. The aim of the program is to encourage firms to enter into voluntary cooperative agreements with governments to reduce greenhouse gas emissions. While this largely focuses on efforts to improve energy efficiency by firms, the Greenhouse Challenge Office has also explored opportunities for firms to invest in carbon sequestration activities. Environment Australia noted:

> Greenhouse gas emissions are already being offset through recognition of domestic sequestration by the Greenhouse Challenge Office, despite the lack of a system of tradeable credits. In addition, several Australian companies (for example, Westfarmers and Australian Newsprint Mills) have already planted trees as greenhouse offsets. (Sub.229, p. 12)

The Commission recognises the large range of options that can be used to reduce greenhouse gases. These may focus on energy efficient practices by firms, or on encouraging carbon sequestration. In a study of options for reducing greenhouse gas emission in the transport sector, the Bureau of Transport and Communications Economics concluded that:

> Planting trees is the only measure that can (eventually) absorb all of the carbon dioxide emissions (about 1600 million tonnes) produced by the [Australian] transport sector from 1996 to 2015. (BTCE 1996, p. xxviii)

As noted by the PPMFA:

> The PPMFA and the majority of its member companies are active participants in the Greenhouse Challenge Program, and their agreements under the Program already take account of sink activity. Trialling a system of carbon credits is a significant development beyond what is already occurring in relation to sinks ... (Sub. 279, p. 2)

The agricultural sector in particular has the potential to contribute to meeting both national greenhouse gas targets and the commercial carbon sequestration

requirements of individual firms. This could be achieved through the sequestration of carbon in a variety of biomass carbon sinks. In particular, there is the scope for synergies between expanding vegetation, particularly native vegetation, for land management, biodiversity protection, and the sequestration of carbon (see Box 11.1).

Australia is likely to have a competitive advantage as a source of carbon sinks, with large land areas with low opportunity cost (especially in the rangelands), well developed rural infrastructure, and skills.

The current global focus on meeting greenhouse gas targets, has provided an international interest in the voluntary use of carbon sinks. Business and industry are interested in the use of carbon sinks as part of a system of internationally tradeable carbon credits while there is support for using native vegetation sinks to meet greenhouse gas requirements.

As outlined in a Commission Staff Research Paper (Cornwell, Travis and Gunasekera 1997), the issues involved in establishing a tradeable permit scheme include definition of the product, allocation of the permits and administering the scheme. The difficulties involved highlight the need for caution in establishing some standard for carbon sinks which could be available to be traded. In this regard, the NSW Government commented:

> NSW supports in principle the establishment of a trial system on a national basis for tradeable carbon credits for all carbon emissions. However, there are technical issues regarding the carbon sequestration value of forests and policy issues about the framework in which any trade in carbon credits would take place which require resolution before such a trial could commence. (Sub. 325, pp. 14–15)

There is increasing interest in commercial circles in developing the methodology for estimating and monitoring carbon sinks and providing reliable certification of any activity undertaken. This would involve:

- investigating the extent to which different biomass contribute to carbon sequestration;
- establishing parameters for earning credits;

Box 11.1: **Improved rangeland management and its implication for carbon sequestration**

Australia's rangelands make up nearly 70 per cent of Australia's land mass. Their improved management could provide a carbon sink and contribute to reducing greenhouse gas emissions.

The loss of grasses in the rangelands not only reduces carbon sequestration, but increases the risk of soil erosion and further carbon loss from the carbon in the soil. Improved grazing management practices which allow the recovery of the rangelands may have significant implications for carbon sequestration.

To restore the rangelands, grazing pressure would have to be lowered. This would involve not only domestic animals, but also native and feral animals. Not only would vegetation increase, but methane gas emissions would be reduced. Where degraded rangelands are taken over by woody weeds, the increased woody weed populations may sequester more carbon then the pasture vegetation they replaced.

Ash, Howden and McIvor estimated that:

> Based on recent estimates of the area of northern Australia in various land condition classes, we calculate that adoption of grazing management strategies to increase the perennial grass component could sequester approximately 320 Mt of organic carbon into the top 10 cm of soil. Rehabilitating degraded land, if achievable, could store a further 140 Mt of organic carbon. (1995, p. 19)

and:

> The conversion of deteriorated rangelands in northern Australia to a desirably sustained condition, if undertaken over a 30 year period, would result in an average annual carbon sink equivalent to 6.5% of the Australian total net emissions in the year 1990. Carbon sinks of this magnitude, if included in the National Inventory, would make a major contribution to the achievement of agreed emission reduction targets by Australia over the period of restoration. (1995, p. 20)

Source: Ash, Howden and McIvor (1995).

- establishing systems of auditing sequestration activities; and
- establishing a system for documenting credits earned, and for recording changes in ownership.

In light of the interest expressed during the inquiry in the voluntary sequestration of carbon, the Commission considers that there would be advantages in attempting to establish the extent of likely institutional demand for such services in Australia and its potential economic benefit to the nation. To that end, the Commission proposes that Australian Governments should conduct and evaluate a suitable trial. Such a trial would also contribute to a better understanding of the issues in any system of internationally tradeable carbon credits which Australia might be party to in the future.

Recommendation 11.10

The Commonwealth, States and Territories should conduct and evaluate a trial of a system of tradeable credits for the voluntary sequestration of carbon by the private sector in defined and audited sinks in Australia.

12 SURFACE WATER

The issues associated with agriculture's use of surface water relate principally to its exploitation and efficiency of use. Over-allocation and excessive use of water has had significant environmental and economic costs, both on-farm and downstream. Implementation of the Council of Australian Governments' water reforms are appropriate and important for ecologically sustainable land management. But there are doubts that the States and Territories will meet the timetables for them, particularly the creation of transferable water entitlements and the institutional reforms.

The Commission recommends a strategic and progressively tradeable approach to allocating and managing water for the environment. It also recommends that environmental flows be vested in a single organisation which has an objective of maximising the environmental benefits of each river system to the community.

This and the following two chapters discuss the Commission's proposals for:

- establishing the preconditions for markets in water resources;
- removing obstructions to the efficient operation or development of such markets; and
- using market mechanisms to manage waste and pollution associated with agriculture, and incorporate environmental water flows.

The remainder of this chapter outlines policies relevant to surface water use, while Chapters 13 and 14 look at those relating to groundwater use and water quality, respectively.

12.1 Reform of exploitation of surface waters

There are 245 river basins in Australia's 12 drainage divisions (see Figure 12.1). As a result of its topography and climate, rivers in Australia generally carry low, slowly moving and highly variable volumes of water. These are some of the reasons why Australia has the highest dam capacity per head of population in the world. Some 70 per cent of all surface water used is for irrigation (AWRC 1987). The nature of the resource is summarised in Table 12.1.

Figure 12.1: **Australia's lakes, rivers and drainage divisions**[a]

a The drainage divisions shown on this map conform with the information provided in Tables 12.1 and 13.1. Subsequent to 1987, the names of some of the drainage divisions were changed as follows: Indian Ocean → (now) North West Coastal; Timor Sea → Northern Coastal; Gulf of Carpentaria → Northern Gulf; South Australian Gulf → Southern Gulfs; and, Bulloo-Bancannia Basin → Bulloo River Basin. Also, in all instances, 'Coast' became 'Coastal'.

Source: Supplied by Australian Surveying and Land Information Group.

COAG water reform framework

For the reasons outlined in Chapter 2, the existing systems of surface water allocation and management are unsustainable. Accordingly, in February 1994, the Council of Australian Governments (COAG) endorsed a strategic framework for the efficient and sustainable reform of the Australian water industry to be implemented by 2001 (see Box 12.1). In essence, the reforms involve:

- pricing reform for rural surface water based on 'user-pays' and full cost recovery, the reduction or elimination of cross-subsidies and making the remaining subsidies transparent by 2001;
- tradeable water entitlements by 1998;

- infrastructure investment and institutional reforms by 1998; and
- environmental allocations to stressed rivers by 1998.

These reforms are a formal requirement of the national competition policy reforms. Each State and Territory has to implement them to be eligible for the second and third tranches of the payments to be made by the Commonwealth, in 1999 and 2000 respectively, under the national competition policy agreements.

The Australian Conservation Foundation (ACF) (Subs. 105 and 296), the Cooperative Research Centre (CRC) for Freshwater Ecology (Sub. 139) and the Inland Rivers Network (Subs. 191 and 332), among others, have queried whether the rural water reforms go far enough, fast enough, and especially in relation to the implementation of water pricing structures that more accurately reflect the opportunity and social costs of providing and using water.

Progress on implementation

A summary of the progress by each State and Territory, and the Murray-Darling Basin Commission (MDBC), in implementing the COAG rural water reforms is provided in Appendix C. This information, based on official reports on progress to the end of 1996 (Working Group 1995; Task Force 1996, 1997), indicates that all jurisdictions are progressing rural water reforms.

The Commonwealth Department of Primary Industries and Energy (Sub. 329) claimed that significant further progress has also been made during 1997 — for example, it pointed to the New South Wales Government's recent release of a comprehensive water management package that includes a strategic approach for managing water allocations and property rights. In February 1998, the Task Force on COAG Water Reforms is due to report on progress made during 1997.

While the commitment to proceed is clear, other information suggests that the details of the changes implemented or in progress, may not always be in line with the spirit of the COAG reform agenda and/or its timetable for implementation.

The ACF (Sub. 296) recently made a submission to the National Competition Council (NCC) expressing concern about the direction and pace of water reforms in general, and in Queensland in particular. As a result, in December 1997, the NCC wrote to the Queensland Government to obtain additional information on certain matters relevant to its next assessment of Queensland's progress with water reforms, due in 1999. The NCC had not received a reply by the time this report was finalised.

Box 12.1: **COAG Water Reform Framework**

In the area of rural water services, the key reforms are:

- **Pricing reform**: consumption-based pricing and full cost recovery (including positive rates of return on the written-down replacement cost of assets); the reduction or elimination of cross-subsidies; and making remaining subsidies transparent — for urban water services by 1998 and rural water supply by 2001;
- **Investment reform**: investment in new rural water supply schemes or extension to existing schemes to proceed only if appraisal indicates it is economically viable and ecologically sustainable;
- **Water trading**: implementation of comprehensive water allocation systems or entitlements, including allocations for the environment, with rights separated from land title, and with trading in allocations or entitlements by 1998 (including interstate trading where feasible); and
- **Institutional reform**: the adoption of an integrated water catchment approach, separating the roles of water resource management, standard setting and regulatory enforcement no later that 1998, and further development of interagency performance comparisons.

The 1995 report by the *Expert Group on Asset Valuation Methods and Cost Recovery Definitions* (Expert Group 1995) recommended that the economic approach to pricing and cost identification be used within the Australian water industry. It defined full economic cost as including: operating and maintenance expenses; administrative costs; externalities, such as for salinity control; depreciation on a replacement cost basis; and the opportunity cost of capital. Progress in implementing the report's recommendations specifically forms part of the criteria for the second tranche of competition payments under the *Agreement to Implement the National Competition Policy and Related Reforms 1995* — which seeks, in part, "implementation of ... the future processes as ... embodied in the *Report of the Expert Group on Asset Valuation Methods and Cost Recovery Definitions, February 1995.*" (COAG 1995, pp. 38–39)

In its *1996 Report on the Stocktake of Progress in Microeconomic Reform*, the Productivity Commission recommended, in relation to water and sewerage, that:

> Governments should ensure effective implementation of the COAG water agreement. They should give priority to:
> – resolving asset valuation and cost recovery issues for both urban and rural water;
> – identifying CSOs applying in the irrigation sector;
> – facilitating interstate trade in water; and
> – progressing arrangements for allocating water to the environment.
>
> They should also consider extension of the reform process to include groundwater and wastewater management. (PC 1996, p. 13)

The Commission notes that the States and Territories did not complete the surface water reforms required by 1 January 1998, particularly the creation of transferable water entitlements and the institutional reforms. It doubts that these reforms will be completed by 31 December 1998.

As the Commission's *Stocktake of Progress in Microeconomic Reform* (PC 1996) noted, there are a number of important water reform issues still requiring substantial work before the agreed reforms can be considered fully implemented. These include the key issues of cost recovery and pricing, tradeable water entitlements and water for the environment. These issues are discussed further in the following sections. The chapter concludes with a discussion of some of the implications of water reforms for international trade in agricultural products.

12.2 Cost recovery and pricing

An agreed and consistently applied definition of what constitutes cost recovery for the irrigation sector is still a long way off. According to Environment Australia (Sub. 229), effective pricing regimes and cost recovery have been inhibited by the lack of capacity to establish environmental costs and values.

In New South Wales, a recent report by the Independent Pricing and Regulatory Tribunal (IPART 1997) was critical of bulk water pricing practices and information on cost recovery in that State. The Tribunal said:

> The DLWC's [Department of Land and Water Conservation] budget estimates reveal a substantial shortfall between revenue from water charges and costs incurred in providing services. ...
>
> The DLWC remains unable to provide full details of the actual costs incurred, including key performance standards and efficiency targets. The DLWC has yet to provide an acceptable basis for deciding who benefits from its services and by how much. (IPART 1997, Foreword)

In regard to COAG's requirement for full cost recovery for rural water supplies by 2001, IPART said that, in New South Wales:

> Some regions have a significant array of major dams, yet relatively few users over which to spread costs. These regions will require an ongoing CSO to supplement commercially viable levels of water pricing. It remains uncertain whether CSOs will be included as revenue in assessing full cost recovery...[for Federal compensation payment purposes] ... This may delay the attainment of full cost recovery in some regions. (IPART 1997, p.23)

Even in the Murray and Murrumbidgee irrigation districts, where the irrigation authorities are fully recovering their own operating and maintenance expenses,

they pay the same price as everyone else for bulk water supplies and their prices do not include a return on capital nor do they account for externalities.

The situation seems little different in the other States and Territories (see Appendix C).

12.3 Tradeable water entitlements

Clearly defined entitlements to water that are separate from a land title are essential to developing an efficient water market, which will provide the following benefits:

- improved information on resource utilisation;
- increased autonomy and flexibility of users to manage water;
- reduced conflict between water users;
- increased productivity as water is traded from low to high value uses; and
- more efficient use of water as water users are exposed to the economic value of water (that is, the market price) (Doolan and Fitzpatrick 1995).

Macquarie River Food and Fibre said that:

> There is no doubt that the establishment of a system of water property rights would be of major benefit both to the environment and industry. In this regard it could lead to more long term certainty in irrigation farming communities and you could expect the behaviour of farmers to be more in tune with long term sustainability. (Sub. 77, p. 3)

In its 1995 report on *Water Allocations and Entitlements — A National Framework for the Implementation of Property Rights in Water*, the Task Force on COAG Water Reform (Task Force 1995) proposed seven principles to be used as a strategic framework for jurisdictions to implement tradeable water entitlements (TWEs) within the 1998 timeframe set by COAG. The principles were subsequently agreed by the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) — see Box 12.2.

Defining water entitlements

In most States and Territories, there are problems with both the definition of the water entitlement and the terms on which it can be traded. Even so, the scope for market development is substantial. For example, in New South Wales, a substantial water market has developed involving an estimated $1.5 billion in regulated flow entitlements despite the limitations of existing entitlements.

Box 12.2: **ARMCANZ principles for the implementation of property rights in water**

1. That all consumptive and non-consumptive water entitlements be allocated and managed in accordance with comprehensive planning systems and be based on full basin-wide hydrologic assessment of the resource.

2. That water entitlements and institutional arrangements be structured so as not to impede the effective operation of water markets and such that, as far as practicable, trading options associated with property rights in water reside with the individual end users of water.

3. That water entitlements be clearly specified in terms of:
   - rights and conditions of ownership tenure;
   - share of natural resource being allocated (including probability of occurrence);
   - details of agreed standards of any commercial services to be delivered;
   - constraints to and rules on transferability; and
   - constraints to resource use or access.

4. That acceptable rules on the holding and trading of environmental flow entitlements be resolved by jurisdictions at the same time as determining the appropriate balance between consumptive and non-consumptive uses of water.

5. That, where interstate trading of water entitlements is possible, jurisdictions cooperatively develop, on a catchment-by-catchment basis, compatible approaches for (or at least clear conversion mechanisms between):
   - planning systems and basin-wide hydrologic assessment methods;
   - water entitlement specifications;
   - pricing and asset valuation arrangements;
   - water entitlement trading arrangements; and
   - provisions for environmental and other in-stream values.

6. That, in implementing and initialising property rights in water, jurisdictions call on water users, interest groups and the general community to be involved as partners in catchment planning processes that affect the future allocation and management of water entitlements.

7. That governments give urgent priority to establishing the administrative and regulatory arrangements that are necessary to implement and support the strategic framework.

Source: Task Force (1995).

As explained by Collins and Scoccimarro:

> Despite the considerable investment in river storage and distribution infrastructure, the rights to use 'regulated' supplies in the major river systems remain attenuated. Access (rather than private property rights) has been granted to water users through various licences, regulation and river management policies. While most licences have been expressed in volumetric terms over recent years, and in some instances are transferable, the reliability of these allocations is uncertain and open to administrative change, tenure is unclear and quality rarely defined. (1995, p. 243)

According to Fitzgerald (1994), the deficiencies in New South Wales include:

- a licence which does not clearly define the supply to which a user is entitled;
- exclusive use is not solidly protected;
- transferability rights are not incorporated into the licence; and
- the property rights do not cover the full range of river flows, such as the right to high flows as off-allocation water.

Temporary and/or permanent transfers of water have been allowed in most jurisdictions for some time now, although, in most instances, their volume has been constrained by poorly specified entitlements.[1]

The Queensland Government indicated that it was in the process of establishing trials in permanent transferability, but noted that:

> There are a number of impediments to a full system of transferability, most significantly in Queensland's case, the availability of reliable hydrological data to be used as a basis for fully specified property rights. (Sub. 342, p. 3)

The National Farmers' Federation (Sub. 294) strongly supported the implementation of clearly defined and secure property rights to water.

Similarly, the NSW Irrigators' Council (Sub. 263) considered that genuine unattenuated property rights in water were a pre-condition for a well-functioning water market. The Council proposed:

> ... a framework for water reform which would see farmers and irrigation groups committing to shared funding of a water use efficiency program. They would give up part of their existing entitlements and be provided with an unattenuated property right to the remainder. Water saved through efficiency measures would be reallocated by the government to the environment or auctioned for other uses. (Sub. 263, p. 5)

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[1] For detailed historical information on the transferability of water in New South Wales, Victoria and South Australia, see Appendix C in the 1995 Report by the Committee of Inquiry into the Winegrape and Wine Industry in Australia (Committee of Inquiry 1995).

Conversely, the ACF (Sub. 296) and the Inland Rivers Network (Sub. 332) argued that there is no valid case for permanent property rights over water. To this end, they supported limited tenure rights, principally to maintain:

> ... the need for flexibility in the management of our water resources and river systems. (Sub. 296, p. 10)

The ACF (Sub. 296) suggested that water access rights should have strong conditions on use, including: the preparation of irrigation and farm management plans; minimum efficiency of water use; water metering, drainage management and water re-use; regular progress reports against licence conditions; monitoring run-off quality and effluent standards; moves to best practice pest management; and, enforcement and penalties for non-compliance.

Macquarie River Food and Fibre felt that:

> Water property rights are currently being dealt with slowly as part of the COAG/'Hilmer' reforms. We would welcome them being expedited. (Sub. 77, p. 3)

The Tasmanian Farmers and Graziers Association (TFGA) (Sub. 303) believed the completion of tradeable water entitlements in Tasmania by 1998 was not realistic. It said that the Tasmanian Government had only just released a discussion paper for comment, which meant that there was too little time left for stakeholders to gain an understanding of, and to successfully resolve, the range of issues raised.

The Commission considers that flexibility in the management of water resources and river systems can be met in more efficient ways than by clinging onto administrative discretion. To this end, it sees that better specified entitlements to water — with the 'environment' as an active participant (buyer and seller) in the market — will ensure that trading proceeds to the maximum extent possible, thereby facilitating the movement of water to its highest value uses, as intended by COAG.

Trading in water entitlements

There is little doubt about the feasibility of implementing TWEs within a catchment, where the river system can be used as the means of carriage. However, it will be more difficult to establish trading across catchments in a basin. As well as schemes operating within States, there is potential for permanent interstate trading in water — temporary interstate trade is already possible.

The New South Wales Government (Sub. 325) pointed to its already long history of both temporary and permanent trading of surface water (commenced

in 1983 and 1989, respectively). It said that while some fine tuning of legislation will occur during 1998, many of its recent water reforms have focussed on removing impediments to trading water entitlements, such as:

- clarifying water sharing arrangements between water users and the environment;
- freeing up market arrangements;
- establishing water markets in unregulated streams and groundwater systems where they do not currently exist; and
- developing interim trading measures on these streams and systems until markets are fully established.

The South Australian Government said there were no legal impediments under its new *Water Resources Act 1997* to the trade of water entitlements in South Australia. Nevertheless, it observed that trade was not equally effective in all areas where a market had been established:

> These differences reflect a number of variables including the physical characteristics of different catchments, the length of time over which the market has been established, the degree of acceptance of market measures, ready access to information, and the availability of meters to measure actual diversions. (Sub. 324, Appendix 1, p. 1)

The Murray-Darling Basin Ministerial Council recently endorsed a set of rules and procedures for a trial for interstate trading of water property rights in line with the COAG water market policy (MDBC 1997). The trial, which commenced officially on 1 January 1998, encompasses the mainly horticultural Mallee border regions of New South Wales, Victoria and South Australia, on the River Murray downstream from Nyah to its mouth. According to Parish (1997), the trial is to test solutions to a number of impediments to efficient interstate water trade, such as:

- differences in State water pricing policies — to ensure that the direction of trade is not distorted by these differences (ideally, any differences in State water pricing should reflect real cost of supply differences);
- the need for exchange rates for transferring water upstream and downstream — to ensure that other existing irrigators or the environment are not disadvantaged by the process;
- rules for determining how transfer water is accounted for under the MDB Agreement, the ‘water cap’ and the salinity and drainage strategy;
- differences in standards and requirements under State water licences for new or extended irrigation developments — to ensure that they are appropriate and do not unnecessarily influence the direction of trade;

- procedures for applications, assessment and approval of interstate water transfers — to ensure there is an auditable trail of water movements; and
- procedures for accounting, adjusting flows and monitoring following the approval of transfers.

To avoid some of the complications that would arise from trading water with different levels of security during the trial, trade will initially be limited to private users with 'high-security' water. Transfers will also be subject to rigorous environmental clearance processes, to ensure that interstate transfers of water entitlements do not result in increased levels of salinity, reductions in environmental flows or degradation of the natural environment (MDBC 1997).

If the trial is successful, the intention is that eligibility to trade interstate would be progressively widened to include other types of water entitlements and wider areas of the basin — all within the overall timeframe for adoption of the totality of COAG water reforms, that is by 2001.

Issues in trading

Some participants were concerned about possible 'constraints to trade'. In this regard, the National Farmers' Federation (Sub. 294) suggested they may include:

- the need to impose limitations on transfers, from time to time, to avoid over-commitment or under-utilisation of the water resource;
- the capacity of the water delivery structure;
- where trade will have a significant impact on water quality or threaten minimum environmental conditions;
- matters of equity and social justice; and
- as far as interstate trade is concerned, differing levels of cost recovery and systems of defining entitlements.

The Queensland Grain Growers Association (QGGA) (Sub. 207) sighted the following impediments to completion of tradeable water rights, namely:

- the validation of present entitlements with the requirements of environmental flows;
- defining the boundaries within which an entitlement would be tradeable;
- whether the size (volume) of an entitlement would remain unchanged if used much further down the same system; and
- determining whether ground and surface water could be traded and under what conditions.

The CRC for Soil & Land Management (Sub. 274) and the National Committee for the Environment (Sub. 295) suggested that full market development would be dependent somewhat on reversing the current poor understanding and appreciation of tradeable rights by individuals in the communities affected — by way of a national publicity campaign on their benefits.

Local councils in established irrigation areas, such as the Griffith City Council (Sub. 321), generally opposed the separation of water rights from the land title. Their opposition is based on concerns that water transfers would increase overheads on the existing irrigation infrastructure and would shift wealth to other local government areas.

Ms Rosalind Stafford (Sub. 318) had major reservations about the proposed expansion of trading in water entitlements on the grounds that it would:

- put pressure on the system for increased water extraction, as more sleeper licences are activated and traded; and
- lead to greater environmental pollution, in that the best prices for TWEs are likely to be paid by those who receive the greatest return on their investment, such as cotton growers, whose crops require high nutrient input, large quantities of water and frequent applications of pesticides.

Commission's assessment

The Commission considers that there are clear benefits to the community from trading in water entitlements, especially within the irrigation sector. They include:

- the movement of water to its highest value uses;
- the incentives it provides for irrigators to improve their water use efficiency; and
- the provision of an automatic adjustment mechanism for marginal irrigators — for example, it would provide them with compensation for the benefits they previously enjoyed from irrigating.

Box 12.3: **The Murrumbidgee River at Michelago**

> Our property fronts the Murrumbidgee River at Michelago. The following description is based on our experience of changes over the last 10 years.
>
> Ms Rosalind Stafford (Sub. 318, p. 8)

The Murrumbidgee River was described to me by an old-timer as a deep, clear, fast-flowing river with an abundance of native fish such as yellow belly, Murray cod, Macquarie perch etc. The wife of a local farmer used to go down to 'our' waterhole and bring back a sugar bag of native fish whenever she wanted to.

The construction, as part of the Snowy Mountain Scheme, of the Tantagara Dam in the high country on the headwaters of the river, collected much of the snow melt and directed it westwards. Further down stream water is extracted for irrigation. The result is a much diminished river.

By ten years ago, the native fish were much reduced. The species which seemed to hang on longest was the Macquarie perch. We last caught one about five years ago. Because they are now on the endangered list, we no longer fish for them, so we don't know whether they are still present.

About nine years ago the turbidity of the water increased markedly. The explanation for this only became clear several years later when a Council officer found one of the companies extracting sand and gravel upstream from us was ignoring environmental regulations and sending their fines down the river. They were required to draw up an Environmental Impact Statement but, having done so, they abandoned the site, leaving it unrepaired. Following this, the turbidity was much reduced, at least when the river was low.

At this time, the aquatic plants (eel grass, water-melfoil and epiphytic algae growing on them) re-established themselves in the shallower waters and shrimps were numerous. There were still good populations of platypus, water dragons, and eastern long-necked tortoises, the occasional native water rats (delightful, playful animals) and the now uncommon Murray River crayfish in the river; although trout had largely replaced the native fish. The variety of macro-invertebrates was reduced. One of the more pollution sensitive species, the mayfly nymph, has long since disappeared from this section of the river. Mayfly nymphs are normally one of the most abundant aquatic insects. Could the problem be pesticides washed down from the large vegetable growing operation on the river flats upstream?

Then came the carp! The turbidity of the 'river' immediately increased as they fed in the mud and uprooted the waterweeds and associated algae on which the aquatic ecosystem depends. The shrimp and other macro-invertebrates are scarce. We haven't seen water dragons or water rats in the river for two or three years. Platypus and tortoises are only seen occasionally. Waterbirds eg ducks, grebas, swans are less common or absent. Their food sources have gone.

In summary, the natural aquatic ecosystems have all but gone and we fear for those animals that are still hanging on.

Source: Ms Rosalind Stafford (Sub. 318, pp. 7–8).

While there may be some natural constraints to the extent of trading, the Commission is unaware of any institutional or regulatory impediments to the further development of water markets and trading.

The Commission considers that the potential to operate trading schemes between different industries and sectors should also continue to be explored, as they are likely to provide even greater benefits than the further development of permanent transfer markets within the irrigation sector. Of course, appropriate measures may be necessary to ensure that such transfers did not lead to adverse environmental impacts. Assessment of the likely impacts of such trades could be undertaken by catchment management authorities.

12.4 Water for the environment

In the past, water to maintain the environmental health of waterways has been treated as a residual to that allocated for urban, commercial and agricultural use. As allocations and diversions of water have increased, residual flows have decreased both in quantity and quality, to the extent that we can no longer rely on the flow of residual water to guarantee the environmental health and aquatic biological diversity of many river systems (see Box 12.3).

Decisions on water for environmental flows now must be made against a background where much of the water has already been allocated, and where management of regulated river flows reflects the needs of urban centres and user industries. Thus, it is useful to consider ways in which water flows for environmental purposes could fit within a system which is increasingly being structured around tradeable private property rights over water usage.

All States, Territories and the MDBC have started to address the issue of flow regimes for the environment. To this end, ARMCANZ and the Australian and New Zealand Environment and Conservation Council (ANZECC) have endorsed a set of national principles for the provision of water for ecosystems (see Box 12.4). In 1995, ARMCANZ endorsed a framework for the holding and trading of environmental flow entitlements (see Box 12.5).

A recent (draft) paper by the Bureau of Resource Sciences on *Impediments to Managing Environmental Water Provisions* (Allan and Lovett 1997), pointed to the likely challenges and impediments. In summary, they are:

- *policy impediments* — definition of environmental flow, selection of environmental values to be maintained, nature of environmental water provision, interstate management, integrated watering, external water management, politics, corporatisation and water markets;

Box 12.4: ARMCANZ principles for providing water to ecosystems

Basic premise of principles

Principle 1 River regulation and/or consumptive use should be recognised as potentially impacting on ecological values.

Determining environmental water provisions

Principle 2 Provision of water for the environment should be on the basis of the best scientific information available on the water regimes necessary to sustain the ecological values of water dependent ecosystems.

Provision of water for the environment

Principle 3 Environmental water provision should be legally recognised.

Principle 4 In systems where there are existing users, provision of water for the environment should go as far as possible to meet the water regime necessary to sustain the ecological values of aquatic ecosystems whilst recognising the existing rights of other water users.

Principle 5 Where environmental water requirements cannot be met due to existing uses, action (including reapplication) should be taken to meet environmental needs.

Principle 6 Further allocation of water for any use should only be on the basis that natural ecological processes and biodiversity are sustained (ie ecological values are sustained).

Management of environmental water allocations

Principle 7 Accountabilities in all aspects of management of environmental water provisions should be transparent and clearly defined.

Principle 8 Environmental water provisions should be responsive to monitoring and improvements in understanding of environmental water requirements.

Other uses

Principle 9 All water uses should be managed in a manner which recognises ecological values.

Principle 10 Appropriate demand management and water pricing strategies should be used to assist in sustaining ecological values of water resources.

Further research

Principle 11 Strategic and applied research to improve understanding of environmental water requirements is essential.

Community involvement

Principle 12 All relevant environmental, social and economic stakeholders will be involved in water allocation planning and decision-making on environmental water provisions.

Source: As endorsed by ARMCANZ and ANZECC.

Box 12.5: **Framework for holding and trading environmental flow entitlements**

After environmental flow provisions have been determined, it is the role of governments to vest those rights in appropriate entities which are accountable to government. In most cases minimum passing flows through storages will be required for downstream environmental and riparian purposes, and these are generally not tradeable. However, other environmental water provisions may be managed to meet specific environmental objectives that may be highly variable resulting from seasonal or climatic factors, such that the actual water requirements associated with such provisions may vary over time and therefore provide opportunities for trading.

If private entities wish to purchase and exercise additional rights to storage allocation for non-consumptive environmental purposes, they should be able to do so providing that they pay the full cost of service provision.

In principle, trade of natural resource shares (with the exception of minimum passing flows) should be encouraged to seek the highest and best use of the resources available at any point in time, but jurisdictions must ensure that appropriate accountabilities are in place for those selling environmental flow requirements.

The environmental water provisions should not be permanently traded away from the environment as they represent the agreed level of the community's commitment to social values. However, in some climatic circumstances, there may be opportunities to trade a portion of these volumes to consumptive users for a specific period of time (ie temporary transfer of entitlement). In this fashion, the environmental sector may be able to raise funds to carry out other initiatives to enhance water-related environmental outcomes.

Source: Task Force (1995, pp. 10–11).

- *legal impediments* — flood mitigation, land tenure, weir removal and formalisation of environmental water provisions;
- *managerial impediments* — accounting for water, management planning, accountability, performance measures and monitoring of outcomes, and integrated catchment management approach;
- *regulatory impediments* — monitoring compliance;
- *infrastructure impediments* — weir and levee construction, storage releases and channel capacity;
- *information impediments* — insufficient knowledge, lack of models and community awareness;

- *biophysical impediments* — environmental hydrological variability and potential increases in water and soil salinity;
- *roles and responsibilities* — institutions organisational roles and responsibilities, community involvement and interest groups; and
- *resources* — managerial expertise and financial impediments.

Participants' views

The ACF (Sub. 296) expressed concern that few States were honouring their stated commitments (via COAG and ARMCANZ) to allocating water to the environment and to returning water to the environment in stressed river systems. In this regard, it cited a number of deficiencies in the process used to determine environmental flows in Victoria's Thomson Macalister system as an example of a serious breach of a number of requirements under the COAG Water Resources Policy.

The South Australian Government (Sub. 324) sighted the lack of scientific data, decision-making models and resources as the key impediments to the early adoption of the ARMCANZ principles for providing water to ecosystems.

For implementing the ARMCANZ principles, the National Farmers' Federation said that:

> For every regulated river system there should be clearly defined allocations to satisfy minimum environmental conditions (or minimum recharge requirements in the case of groundwater) to protect basic water quality and system health. This allocation must be based on sound scientific assessment. The Government should own this entitlement on behalf of the community and should take into account water property rights and bulk entitlements. (Sub. 294, p. 9)

The QGGA (Sub. 207) considered that the early implementation of the principles would depend largely on the extent to which a particular river system was over-committed. The Association believed there would be considerable debate about the pricing of environmental water and the source of payment. It suggested that the purchase of 'sleeper' (unused) entitlements and a partial buy-back of critically-located licences on over-stressed rivers would help.

Twynam Pastoral Company (Sub. 308) proposed that all 'sleeper' or 'dozer' licences that have no history of use over the last five years, or development for use, should be cancelled.

The TFGA (Sub. 303) was concerned about the lack of scientific knowledge of the minimum environmental flow requirements of all Tasmanian streams. Consequently, to overcome the effects of this lack of knowledge, the TFGA proposed that:

- 'draft' environmental flow regimes be developed, through facilitated local community and farmer consultation;
- compensation be paid where water or riparian rights are lost;
- agreements be struck with local communities on the process for either increasing or decreasing the flow regime, as knowledge develops; and
- the environmental flow management be transparent and accountable.

The NSW Government (Sub. 325) said that there were no impediments in New South Wales to the adoption of the ARMCANZ principles for providing water to ecosystems, other than time and resource constraints.

The Australian Seafood Industry Council (Sub. 260), whose constituents are significant beneficiaries of more natural flow regimes, argued that environmental flows should not only be sufficient to maintain a fish species but also able to support harvestable populations of fish.

Commission's assessment

The Commission considers that the fishing industry's current lack of property rights to water could be rectified by its acquisition of additional environmental allocation (either in its own right or through the environmental flow manager), once water markets are established and initial allocations known.

It is apparent that governments essentially face two key problems in implementing the ARMCANZ and ANZECC-endorsed environmental flow reforms. The first is ensuring a minimum flow to maintain the environmental health of waterways and wetlands where the flows have been over-allocated to consumptive uses. The second is managing a given environmental flow where the environmental and commercial needs may be quite different.

While it is not possible to provide detailed solutions that would fit all situations, some useful proposals can be made in regard to these two problems. They are discussed in the remainder of this section.

Over-allocation of water

Governments have discussed measures to address over-allocation based on:

- pro-rata reductions in existing allocations;
- pro-rata volumetric taxes on water market transfers; and
- systems aimed at withdrawing unused water entitlements.

In practice, governments have adopted a mix of these approaches, together with either a freeze on new allocations or a 'cap' on water extractions, such as in the Murray-Darling Basin.

In July 1995, the MDBC implemented an 'interim' cap on the amount of water that can be extracted from the Murray-Darling river system. This cap establishes an upper limit for diversion that reflects the level of irrigation development in 1993–94. It is intended to stop the degradation of the Basin's rivers and streams from getting worse and to 'buy some time' to address the complex issues associated with over-allocation.

The CRC for Freshwater Ecology (Sub. 139) suggested that water extraction in the Murray-Darling Basin needs to be reduced by around 20 per cent if the decline in the river basin's ecology is to be arrested.

Mr Paul McGowan (Sub. 206) claimed that the inclusion of non-irrigation storages under the cap would lead to degradation occurring, given that such storages are often built for ecological reasons, including preventing gully erosion, aesthetics/wildlife preservation, catching siltation and improving water quality.

The interim cap needs to be further developed, as a matter of some urgency, to better accommodate the needs of the environment. For instance, it needs to incorporate additional variables including those relating to the timing, variability and conditions of a given flow. Moreover, there is a need to assess alternative, more efficient ways of addressing the issue of over-allocation. In this regard, the Commission notes that the MDB Ministerial Council has agreed to a review of the cap commencing on 1 July 1998, following a further Independent Audit Group report on the broader outcomes of the cap.

In Victoria, the environment is to be catered for within a system of fully tradeable bulk water entitlements, due for implementation by 1999. The NSW Farmers' Association (NSWFA) (Sub. 317) thought that the provision would not necessarily be adequate.

The over-allocation problem is understood to be greatest in New South Wales, particularly in the northern irrigation areas. The Government has developed a set of indicative environmental flow management rules (to be implemented in 1998) which may reduce irrigators' allocations, on average, by up to 10 per cent. The NSWFA (Sub. 317) said that the management of these flows will be fine tuned by community-based river management committees over a five year period, leading to an announced period of longer resource security for both irrigators and nature conservation needs.

Issues in over-allocation

Over-allocation is a particularly difficult issue. Users have made (often significant) investment decisions on the basis of existing water allocations or long-standing access rights. These rights are becoming increasingly formalised and tradeable, thereby highlighting and increasing their value.

Some argue on equity grounds that there is a case for some 'clawback' of over-allocated water rights from those who have benefited from that over-allocation. However, there are likely to be some problems associated with this approach. Briefly, these are:

- pro-rata withdrawals would lead to resentment from those who see their traditional rights to access water being taken away without compensation;
- taxes on market transfers would hamper the development of water markets — the mechanism for encouraging more efficient allocation of the available supplies; and
- targeting unused entitlements could encourage their pre-emptive activation where there is otherwise no economic justification.

As discussed in Chapter 4, if governments decide to attenuate existing water rights, then it may be appropriate to pay compensation to those right holders. However, it could equally be argued that, with under-recovery of costs, right holders would only be giving back entitlements which haven't been paid for and therefore, it would not be unreasonable for governments to adopt this approach.

Under recovery of costs may have, in some instances, also contributed to the demand for an over-allocation of the available supplies. How governments will remedy this situation has, in itself, created uncertainty which may have affected investments in more efficient use of the available supplies.

Sydney Water (Sub. 335) suggested that, in providing for environmental flows, it may be preferable to give the flow manager a defined capacity share of the storage capacity, coupled with a continuous accounting system for sharing inflows. The flow manager, it claimed, would then be responsible for managing the ambient river quality within that shared capacity.

Another option is for governments to purchase the additional water for environmental uses. Such an approach would achieve two things. First, it would compensate those who forgo established water entitlements. Second, it would clarify the opportunity cost of allocating water between environmental and commercial uses so that society could make an informed choice between them.

In practice, this option may be difficult to implement. In addition, water markets are not yet well established, and there are still significant differences between the States in both the nature of entitlements and the extent of allowable trade. Some caution would be needed, and more robust markets established before extensive trading for environmental purposes by governments could be considered as a practical option.

At the same time, those landholders, irrigators, towns and other water users along a river, will be among the groups benefiting from action that improves the environmental health of the river.

Commission's assessment

The Commission envisages that, in determining such flows, jurisdictions should initially review all their regulated river systems and unregulated ones at greatest environmental risk, and then, as far as practical, other river systems where significant extraction rights exist.

In many areas, water is over-allocated or excessively used. Even so, minimum flows already exist to some extent, or they have been established by embargoes on new allocations and/or caps on existing water extractions. However, the specification of an annual minimum flow may be inadequate to ensure the environmental health of the river system in question. This has been evidenced through the occurrence of toxic algal blooms and the loss of aquatic biodiversity. Therefore, each State and Territory needs to work out what a viable minimum flow pattern is for each river system and whether it should be specified in terms of annual, monthly, daily or seasonal flows. If that 'viable minimum' works out to be more than the 'current minimum' flow, then a mechanism will be required to achieve that preferred minimum.

The Commission considers that governments should move towards an increasingly flexible system of managing environmental flows. As identified by ARMCANZ, initially this would involve establishing minimum passing flows required for downstream environmental and riparian purposes. Such minimum allocations should be clearly identified, vested in appropriate entities accountable to governments and generally not tradeable (see earlier Box 12.4).

This is only the beginning. A lot more needs to taken into account to ensure that water provision for the environment is undertaken in an efficient and effective manner. These matters are discussed in the following sub-sections.

Recommendation 12.1

States and Territories should establish a minimum environmental flow regime for each river system where extraction entitlements exist, commencing with regulated rivers and those unregulated ones at greatest environmental risk.

Managing environmental flows

ARMCANZ has identified the need for other environmental water provisions to be managed to meet specific environmental objectives that may be highly variable as a result of seasonal or climatic factors. Water requirements associated with such provisions may vary over time and therefore provide opportunities for trading.

The CRC for Freshwater Ecology (Sub. 139), the ACF (Sub. 105), the Inland Rivers Network (Sub. 191) and Macquarie Food and Fibre (Sub. 77), expressed concern about the current poor management of in-stream flows.

The CRC indicated that in-stream management needed to recognise the following characteristics of aquatic ecosystems:

- aquatic plants need light, nutrients and a certain temperature range and create organic matter;
- various animals eat the plants, and each other, forming a food web;
- microbial processes rot dead plants and animals and recycle nutrients and organic matter;
- organic matter can enter the aquatic ecosystem from the catchment;
- there is little stability as organisms compete with each other for supremacy often advantaged by minor changes in factors like light, temperature, nutrients and circulation;
- time scales of importance vary, for example algal cells may multiply every day or so, while red river gums might take a hundred years or more for a 'generation';
- the systems are adapted to pulses of flow (and nutrients) driven by variable rainfall;
- riverside vegetation (riparian) is important in providing leaf litter (important food sources for many organisms), shade, bank stability and filtering of materials that might otherwise wash into the water body;
- sediment and edge conditions are key parts of the habitat that are also altered by large flood events; and

– nutrients move on and off suspended particles in the water column. (Sub. 139, p. 2)

In regard to the environmental flow manager, Sydney Water (Sub. 335) suggested that responsibility for the management of such flows should be absorbed within the existing regulatory framework, rather than creating a new regulatory body.

The South Australian Farmers Federation (Sub. 222) felt that it would be most appropriate for the government to be the 'holder' of environmental flows, so as to maximise the prospect of them being safe-guarded. Others claimed that there is also a lack of trading skills and expertise in the non-government sector. Some argued that the environmental flow should be managed within an organisation which has broad river management objectives, while the NSWFA suggested that the 'appropriate organisation' should consist of a majority of catchment-based stakeholders.

In regard to the prime objective of the environmental flow manager, both the QGGA (Sub. 207) and the NSWFA (Sub. 317) suggested that 'optimising' or 'improving' the environmental health of developed or regulated river systems might be a more realistic objective for the manager to achieve, than trying to 'maximise' it. In order to satisfy the maximisation objective, the QGGA said that this would require the flow manager to obtain detailed information on the linear categorisation of the flow requirements for each individual 'reach' of a regulated river system.

Similarly, Mr Greg Hayes (Sub. 301) argued that the maximising objective would be at odds with the more generous view expressed in the ARMCANZ Principle 4 (see Box 12.4) which recognises the existing rights of other users.

Commission's assessment

The Commission considers that, in each State and Territory, the responsibility for managing the environmental flow for each river system should be allocated to a single organisation — the 'environmental flow manager'. The manager should have the specific objective of maximising the environmental benefits to the community of the water allocated to the river. At the same time, the amount of the environmental allocation available for the organisation to trade could be progressively increased as the environmental flow manager gains skills in trading entitlements, and as knowledge of the impacts of varying environmental flows increases.

In the longer term, it may be possible to specify the environmental goals and accountabilities, and provide maximum discretion on how its funds can be used to achieve its objectives. This would include trade in water entitlements, but it

could also include investing in research and development, and covenanting or buying riparian land that may be considered beneficial for flooding of wetland and floodplain purposes.

In determining an appropriate organisation to be the environmental flow manager for each river system in each State and Territory, some participants considered it important that potential conflicts of interest with consumptive uses be avoided and also saw specialisation in environmental flow issues as an important attribute. This is likely to involve the environmental flows being managed by organisations separate from those managing the river system or catchment.

Other participants felt that institutional separation was not an option, as they believed that the management of environmental and consumptive flows is inextricably linked — for instance, consumptive flows require an environmental flow for their carriage to users along the river system. They also considered that the transactions costs involved in having separate managers would more than offset any likely benefits from institutional separation.

The Commision considers that deciding on the appropriate institutional model might be best determined on a case-by-case basis. Such an assessment might also involve consideration of a number of other relevant factors, such as the availability of environmental, scientific and trading skills necessary in a particular region or catchment to form a separate environmental flow manager that would be capable of performing its duties competently within a reasonable timeframe.

Recommendation 12.2

In each State and Territory, responsibility for managing all aspects of the environmental flow in each river system should be vested in a single organisation.

Recommendation 12.3

The environmental flow managers in each State and Territory should be given the objective of managing the water entitlements allocated to them so as to maximise the environmental benefits of each river system to the community.

Recommendation 12.4

Each State and Territory should allow its environmental flow managers the ability to trade progressively more of their water entitlements so as to increase the environmental benefit of each river system to the community.

12.5 Trade issues

The ACF (Sub. 105) drew attention to the impact that subsidised water use can have in distorting trade in agricultural products. The question of input subsidies was covered in the recent Uruguay Round of multilateral trade negotiations under the General Agreement on Tariffs and Trade (GATT) (now the World Trade Organisation). The Agreement on Agriculture outlaws some subsidies but others such as through water and associated infrastructure remain outside the Agreement.

Australia is moving towards greater cost recovery in its water regime. Thus, the issue of competition with agricultural products from other countries which continue to subsidise water use for agriculture becomes more important for Australian agricultural producers. The ACF said:

> The widespread use of subsidies towards the construction of large dams and associated infrastructure, and associated water price subsidies, are primarily aimed at subsidising irrigated agriculture.
>
> Essentially such subsidies undercut Australian horticulture prices, while at the same time causing environmental degradation in the countries concerned.
>
> ACF contends that the need to develop a water resource and infrastructure pricing and management policy be placed on the GATT agenda by the Commonwealth. Such a protocol would cover:
>
> – water pricing;
>
> – water infrastructure;
>
> – water allocation (including allocation to the environment) and management;
>
> – water property rights; and
>
> – public consultation and education. (Sub. 105, p. 38)

The Commission agrees that the competitive position of Australian agriculture would be enhanced if continuing subsidies in other countries were reduced. Placing water pricing on the international trade negotiation agenda raises many

complex issues — for instance, many developing nations seek to encourage development through the provision of infrastructure such as irrigation.

However, it would be useful to begin the process of addressing the trade-distorting effects of irrigation and associated infrastructure subsidies. The gains would be more efficient use of domestic resources and better environmental outcomes. Australia can play a role in promoting the issue onto the trade negotiation agenda. Progress in international forums could increase the benefits of the domestic reforms. The multilateral trade agreement system operated under the World Trade Organisation would appear to be one of the forums in which to address this issue.

The ACF (Sub. 296) said that there are a number of other subsidies which affect land degradation that should be targeted along with water and associated infrastructure subsidies. However, the Commission considers that it may not be practical to pursue all subsidy issues concurrently in these forums.

Recommendation 12.5

The Commonwealth Government should actively promote discussion of assistance to water use, in the appropriate international forums, with the objective of reducing and ultimately eliminating distortions in international trade through the provision of subsidies to water and associated infrastructure.

13 GROUNDWATER

Groundwater is important to agriculture, particularly to the pastoral industry in the rangelands. However, its use has a number of adverse environmental impacts, especially where bores are free flowing and distribution is via open bore drains.

In most areas, surface water and groundwater management are inter-related, in both a hydrological sense and as substitutes for one another. The general principles for water reform endorsed in the 1994 Council of Australian Governments water agreement apply equally to groundwater. In 1996, the States and Territories agreed to endorse a set of groundwater-specific principles for each jurisdiction to use as a framework for their groundwater management reform — but on the condition that this agreement would not form part of the National Competition Council's criteria for the second tranche of competition policy payments. As yet, no specific milestones or timetables have been set — other than for groundwater charging — or actions specified for implementation. The Commission's recommendations seek to progress groundwater reforms in line with those already agreed for surface water.

13.1 State of groundwater use

Reliable data on groundwater resources in Australia are deficient. Australia uses about 15 per cent of the total water available from its shallow aquifer and artesian groundwater systems, with uses ranging from domestic to irrigation and stock watering (ABS 1996a). Usage in a drought year is believed to be typically about double the average usage. Nationally, there are in the order of 500 000 wells used for groundwater extraction of which about 100 000 are licensed (SKM 1995, p. v). The nature of the resource is summarised in Table 13.1.

Australia has the largest artesian groundwater basin in the world, the Great Artesian Basin (GAB). It underlies approximately one-fifth of Australia and extends beneath the arid and semi-arid parts of New South Wales, Queensland, South Australia and the Northern Territory. The GAB covers a total area of 1.7 million km^2 and it has an estimated total water storage of 8700 teralitres. This storage capacity is roughly 17 400 times that of Sydney Harbour.

Whilst most groundwater aquifers require the water to be pumped to the surface, water in artesian basins, such as the GAB, is brought to the surface under hydro-geological pressure. In the GAB, water is mostly reticulated by free flowing uncapped bores and open earth channels called bore drains. More than 4000 flowing bores have been sunk into the GAB, but by 1990, just over 1000 bores had stopped flowing (SEAC 1996).

The major use of water from the GAB is for livestock. In the majority of areas, the water contains dissolved minerals which, without treatment, makes it unsuitable for uses other than stock water. However, in some areas the water is of good enough quality to be used directly for domestic and other purposes. It is a vital source of water supply to many inland towns such as Alice Springs and mineral developments such as the Olympic Dam mining site in South Australia.

13.2 Consequences of use

In the past, groundwater, including both shallow-aquifer and artesian groundwater, has been treated as an open access resource. That is, landowners have been able to sink bores and draw water at will, with minimal or no restriction on the number of bores or volumes of water used, and generally without payment other than for the cost of the bore and its associated distribution systems. The consequence of treating groundwater as an open access resource is that no individual user has an incentive to reduce use. Rather, each user has an incentive to maximise individual use with little regard to the long-term sustainability of the system.

This situation is changing as governments increasingly restrict new access. However, action to limit new access is proving insufficient to reverse current trends towards aquifer depletion in a number of areas, or address externalities arising from their exploitation in others.

In terms of the main groundwater issues and problems, a report prepared in 1995 for the National Landcare Program/Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) commented that:

> Groundwater is big business and there is an urgent need for improvement in its management. At a national level, the amount of groundwater used represents about 15 per cent of that available. However, this figure disguises the fact that in many areas of Australia the groundwater resource is already overdeveloped. There are many locations across the nation where no or inadequate management is destroying the resource, be it through overdevelopment, seawater intrusion, pollution or many other processes. In most cases, unsustainable policies and practices are resulting in essentially irreversible degradation. (SKM 1995, p. v)

An indication of those aquifer systems where greater than natural recharge abstractions have been identified and a management scheme initiated, is given in Table 13.2.

Table 13.2: **Groundwater systems under stress**

Groundwater system	*Annual Use*	*Annual recharge*		*Present management*	*Future strategy*
		Natural	*Induced*		
	Gl	*Gl*	*Gl*		
Burdekin Delta, Qld	263	200	53	Extraction limits and recharge.	Planned recharge to provide extra 50 Gl
Namoi Valley, NSW	160	110	0	Extraction limits.	Conjunctive use, reduced entitlements
Bundaberg, Qld	100	na	0	Replace with surface water	Surface water scheme
Condamine Valley, Qld	87	13	0	Bore restriction, metering	Supplementary surface water scheme
Lockyer Valley, Qld	47	25	1	Recharge weirs, controls on use	Additional storage, restrict bores
Callide Valley, Qld	23	39	8	Metering, recharge weirs and diversion	Increase dam storage
Angus-Bremer, SA	25	na	0	Water quotas, metering.	
Padthaway, SA	24	na	0	Restrict irrigation area to prevent salinity increase.	
Pioneer Valley, Qld	21	35	3	Reduce supply.	
N. Adelaide Plains, SA	20	7	0	Water quotas to avoid salt intrusion.	
Millstream, WA	9	13	0	Limits on garden water	Conjunctive use, proposed dam.
Mt Newman, WA	10	3	7	Controlled release of surface storage, artificial recharge.	
Western Port, Victoria	10	na	0	Water quotas, metering	

Source: ABS (1992).

Any management scheme faces two main issues, namely how to:

- manage the aquifer as a whole to ensure its exploitation in a sustainable manner; and
- allocate the available supplies in a manner that maximises the net benefit to the community of the scarce resource.

Of particular interest for this inquiry is the GAB, because of its importance to the grazing industry in the rangelands. Management of this interconnected

aquifer basin is different from many other aquifers in that the immediate problems of over-exploitation and scarcity are not present.

The Great Artesian Basin

The GAB can be thought of as comprising two distinct but related resources. One is the very large reservoir of water that is slowly being depleted. Annual discharge is estimated to be about 530 000 ML per annum and recharge 410 000 ML per annum (Batterham 1996). The net discharge is very small relative to the total storage capacity of 8700 teralitres. At the current rate of usage over recharge, the resource would last for at least another 72 500 years.

The other is the water pressure that allows a free flow at the point of extraction. Managing the drawing of water is important to maintaining the integrity of this resource. The pressure of an individual bore is dependent on the drawing of water from nearby bores, as the lateral movement of the water in the aquifer is very slow.

Unlike many other aquifers that are under stress from competing uses — that is, where the resource is being depleted due to its over-exploitation — the risk of depletion of the GAB is very small at this stage. Regional pressure-flow problems are more significant. There are also the problems of land degradation and loss of biodiversity which are associated with use of the water. These problems are discussed separately below.

Reduction in water pressure

Drawing of water from the GAB has caused groundwater pressures to fall and artesian flows to decline (Batterham 1996). As indicated above, some previously free flowing bores now require pumping in some areas. These pressure effects are regional as a result of the slow lateral movement of water in the aquifer.

The regional link between pressure and flow may be illustrated by data from south west region of Queensland. In information supplied to the Commission by the Queensland Department of Natural Resources, it was estimated that the current flow is in the order of 260 ML per day but that for pressure to stabilise in the region, flow needs to be reduced to 100 ML per day.

Over 90 per cent of the water that flows into open earth channels is lost to evaporation and seepage. Consequently, capping bores and piping water can save most of this loss and, therefore, have significant effects on water pressure. Where such work has been undertaken, pressure increases of up to 30 per cent

have been realised. The Great Artesian Basin Rehabilitation Program is aimed at encouraging the capping and piping of bores (see Section 13.3).

The management of bores on one property has external effects on neighbouring properties. This means that there are clear benefits from regional cooperation in managing pressure-flow problems. The benefits from such cooperation are largely confined to the region. Thus, there is a role for governments in removing any impediments to and facilitating such cooperation.

Land degradation

One effect of reticulating water from the GAB in open earth drains is land degradation. This includes both soil erosion and the effect of increased grazing pressure from both introduced and native species as a result of the ready availability of water. The land degradation problems were detailed in Chapter 2, Section 2.10.

Land degradation effects are likely to be concentrated on the property in question — the larger the area of the property and the lower the density of the watering points in the region.

Converting to a system of capped bores and pipes reduces drain-based erosion and the reliance on farm dams and ring tanks. It also improves the ability of the landholder to control grazing pressures, as watering points can be relocated throughout the property and controlled. Through controlling water availability, the landowner can control the total grazing pressure from domestic livestock and feral animals. Successful management of total grazing pressure allows an improved ability to monitor and adjust stocking rates to account for fluctuations in weather and markets. Control of water also helps to control the impacts of grazing pressure on biodiversity.

Loss of biodiversity

Much of the land watered from the GAB is arid and semi-arid. The introduction of permanent open water supply in these areas significantly modified the ecosystems which had adapted to a general lack of water and only seasonal grazing presence from the larger herbivores.

Mr Ross Blick (Sub. 87) identified two major impacts of the provision of artesian water for pastoral development on the existing ecosystem. First, the reduction in water pressures across the GAB has dried up many mound springs, which otherwise formed inland pools and lakes. Mr Blick said that:

> Restricted plant species include: the sedges *Gahnia trifia, Machaerina juncea,* and the herb *Eriocaulon carsonii*. Restricted fish species include: the Desert Goby (*Chlamydogbius eremius*), the Desert Rainbowfish (*Malanotaenia splendida*

> *tatai*) and the recently discovered and described species, the Red-finned Blue-eye (*Scaturiginicthys vermeilitinnis*). Declining pressure in the Basin has caused many mound springs to cease flowing, a tragedy for many aquatic species, some of which may now be extinct. (Sub. 87, Attachment 4, p. 4)

These mound springs form an important part of the ecology and therefore, pressure is not only an important resource for farmers but also for the environment.

The second identified impact of artesian water is the reduction in rangeland further than 10 kilometres from an artificial water source. Mr Ross Blick (Sub. 87) reported CSIRO as having identified that about 25 per cent of native plant and animal species are disadvantaged by the presence of water. Mr Blick said that:

> In fact, 'water is death' to a dry landscape, at least to a significant proportion of wildlife that has evolved and/or become adapted to surviving in country with a highly variable rainfall. (Sub. 87, Attachment 4, p. 4)

The conservation of dry land biodiversity is dependent on removal of permanent water and the animals dependent on it.

13.3 Current policies and programs

The general principles for water reform, as endorsed in the 1994 Council of Australian Governments (COAG) water agreement, apply equally to groundwater. The agreement also explicitly sought further work on specific groundwater management reforms, for subsequent endorsement and implementation by the States and Territories. This commitment has been met.

In 1996, the States and Territories agreed to conditionally-endorse a set of groundwater-specific recommendations (developed by ARMCANZ and SCARM) for each jurisdiction to use as a framework for groundwater management reform. The condition was that progress in the implementation of these principles would not form part of the National Competition Council's criteria for assessment of the second tranche of national competition policy payments. The States and Territories apparently felt that, as these principles had only recently been determined and agreed to, their inclusion in the assessment would be 'too big a burden on them too late in the piece'.

Specifically, each jurisdiction agreed to use the following principles for groundwater management reform:

- sustainable use of groundwater in accordance with a nationally agreed approach;

- public identification of the sustainable yield, allocation and use of aquifers, with allocations limited to sustainable levels where appropriate;
- removing restrictions on groundwater use imposed by inefficiently designed or constructed wells;
- transferability of groundwater entitlements;
- improved integration of groundwater and surface water management;
- adequate funding for groundwater investigation in high priority areas;
- management and licensing of high yielding wells;
- full recovery of direct costs of groundwater management (by 2001), with consideration being given, where relevant, to the consequences of differential pricing between surface and groundwater;
- elimination of conflicts of interest in government institutional arrangements; and
- assessment of opportunities for development of groundwater education.

No specific timetables were set by the 1996 agreement — other than for groundwater charging — or actions specified for implementation. However, an agreement specifying timetables and milestones for these reforms is now expected by June 1998. The GAB Consultative Council (GABCC) (Sub. 320) said that the States and Territories are currently developing programs for implementation of the endorsed groundwater reforms, including community consultation, within their general water reform timetables. It also indicated that milestones for implementation of the groundwater component are being prepared and negotiated through the National Groundwater Committee/Sustainable Water Resources Sub-committee of SCARM. The Council suggested that the imposition of a timetable and milestones from outside of this process would be counterproductive in terms of maintaining commitment from the key parties.

COAG also directed ARMCANZ to put a framework in place to monitor implementation of these principles by individual jurisdictions. Details of the specific recommendations endorsed by COAG are given in Box 13.1.

Box 13.1: **COAG groundwater reforms**

COAG has endorsed the following detailed set of principles for groundwater reforms.

1. Groundwater management policies should employ the principles of ecologically sustainable development and should be directed at achieving sustainable use of the resource. ARMCANZ should develop an agreed nationally consistent definition and approach to sustainable groundwater yield.
2. All States should adopt the National Driller Licensing system for water production wells by 1997 and should seek to expand the system to all drilling.
3. Groundwater and surface water resource management should be better integrated, including approaches to pricing (especially adjacent to public surface water regulated schemes), water allocations and trading to ensure consistency.
4. In preparing groundwater management plans, policies and strategies, States should ensure that the utilisation of groundwater resources is not compromised by protection of existing users with inefficiently designed or constructed wells. This particularly applies to domestic and stock wells.
5. States should develop groundwater management plans based on a sound understanding of the resource. These plans should be the primary support for the development of groundwater allocation and property rights to support intra-aquifer trading both within the States, and across State borders.
6. In developing groundwater management plans, State agencies responsible for groundwater management ensure those plans include identification of the sustainable yield and the levels of allocation and use of aquifers. These plans should also include an identification of environmental water provisions in accordance with the principles set out in the joint ARMCANZ and ANZECC *National Principles for the Provision of Water for Ecosystems*. Where allocations exceed the sustainable yield, the agencies should develop strategies to reduce abstractions to sustainable levels within time frames that minimise permanent damage to the resource.
7. The provision by the driller, to the relevant State Authority, of well constructed data for all wells should be a mandatory requirement with provisions made exemption in areas, or circumstance, where the information is not required.
8. In all areas where there are high yielding wells, monitoring and data collection should be undertaken to a sufficiently high standard to ensure adequate information is available to manage the water resource sustainably. Where licensing is used as the primary mechanism for data collection, the provision of necessary management information will generally require licensing of all high yielding wells.

Box 13.1: (continued)

9. The full cost of groundwater management should be identified by the States. The cost of direct management activities should be recovered from users and, within the context of the overall water cycle, appropriate apportionment of indirect costs be given consideration. Outside urban water supplies, the remaining subsidies should be transparent where full cost-recovery is not achievable. The necessary charges should be implemented progressively by 2001 and particular attention should be given to timely resolution where, and as, trading in groundwater is likely to be demanded by the market. Public communication on these matters is important.

   With reference to Recommendation 3 above, States should give consideration to the consequences of differential pricing between surface water and groundwater. States should examine means for meeting the indirect costs of groundwater management, including investigations which are not appropriately apportioned to users; options may include a direct but transparent subsidy. Recovery of management costs from domestic and stock well owners is to be considered by the States as part of their overall cost recovery strategy.

10. The Federal Government should publicly identify its full costs of involvement in groundwater activities to assist the negotiation of priorities for Commonwealth funding of groundwater management activities.

11. State and Federal agencies should develop and implement organisational arrangements and processes which specifically eliminate conflict of interest situations in groundwater assessment and management.

12. SCARM should assess the opportunities for increasing public awareness of the value of groundwater, its vulnerability to over-use and damage through other activities and the need for groundwater management as key issues, and encourage the States to develop appropriate awareness programs.

Source: ARMCANZ and SCARM (1996).

In regard to groundwater charges, the 1995 *Report by the Expert Group on Asset Valuation Methods and Cost Recovery Definitions* (Expert Group 1995) recommended three principles for implementation by each jurisdiction. These principles are:

- that the full cost of providing groundwater services attributed to specific identifiable beneficiaries or impactors be recovered by way of charges on them (see Box 12.2, Chapter 12, for a definition of full cost recovery);

- where the costs of public benefits/impact management are unable to be attributed and charged to specific beneficiaries/impactors they be treated as community service obligations; and
- where costs are subsidised by a jurisdiction or local government authority, any such subsidy or community service obligations be made explicit and transparent.

As noted in the previous chapter (see Box 12.1), the Expert Group's report is specifically mentioned in the *Agreement to Implement the National Competition Policy and Related Reforms — 1995* as forming part of the criteria for the National Competition Council's assessment of payments to the States and Territories under the second tranche of competition payments. This means that the States and Territories' progress in implementing the Expert Group's principles for groundwater charging will be reviewed by the National Competition Council in 1999, along with progress in developing and implementing all the other principles that apply to groundwater from the 1994 COAG water agreement.

Regulation of access to groundwater

Currently, licences are required in all States prior to drilling. All new bores must be capped and water reticulated by piping. They must also meet prescribed construction standards and hydrological requirements. However, the licence conditions and establishment fees, which are administered through the relevant State government departments, vary between the States.

Licensing arrangements in Queensland are administered through the Department of Natural Resources (DNR). Prior to issuing a licence, DNR consults with applicants regarding water requirements, the purpose of proposed bores and compliance with the *Water Resources Act*. DNR also investigates the effects on local groundwater hydrology. If the proposed facility is for irrigation, aquaculture or industrial purposes, the community is given the opportunity to comment on the proposal. A licence is issued for two years. There is no cost to landowners for obtaining a licence and no usage fees apply.

In New South Wales, the Department of Land and Water Conservation (DLWC) is responsible for licensing artesian bores. Bores established for stock and domestic purposes attract a one-off licence fee of $48. The licence is issued in perpetuity and there is no charge for water use. Bores used for irrigation purposes attract an initial licence fee of $151, renewable every five years. There is an annual monitoring fee of $100 per bore per year, and an additional cost of $0.40/ML of total allocation, as determined by the DLWC, rather than actual usage (DLWC, information supplied to the Commission).

The New South Wales legislation makes specific provision for the establishment of bore trusts (see Box 13.2). There is also a number of bore trusts operating in Queensland.

Box 13.2: **Bore trusts in New South Wales**

The formation of local bore trusts is provided for in Sections 52, 53 and 54 of the *Water Act 1912* (NSW). The Trust collectively undertakes functions that are beyond the capacity of individual members of the Trust. The Trust maintains the bore and bore drains and levies members for the work.

All members in a given trust pay the same rate for each hectare 'benefited' by a bore drain, regardless of the reliability and quality of the supply. Bore drains are sited and maintenance work is undertaken with the consent of the members concerned. Easements are not held by the Trust. Replacement of the bore drains with polypipe is not mentioned in the Act, but administratively is assumed to be maintenance.

Source: Batterham (1996).

Bore trusts can, in many instances, be an efficient means of managing bore water, in that they allow for coordination and planning on an appropriate scale. However, the GABCC argued that while they have some attractions, bore trusts are not a universal solution to the need for improved groundwater management in the GAB. It said that:

> Bore trusts are usually confined to closely settled areas or where a bore, originally watering a large holding, now waters a small number of small holdings as a consequence of past resumption. They exist to manage and apportion the costs associated with common assets. Modern piping schemes involving common assets are not established as bore trusts in Queensland because trusts are considered to be a very inefficient form of administration for these situations ... due to the accountability and reporting costs associated with a statutory authority ... [and] ... trust costs are high in comparison with the capital and operating costs of the bore reticulation schemes. (Sub. 320, p. 4)

According to the GABCC, modern piping schemes allow appropriate cost sharing arrangements to be negotiated through private agreements between benefiting landholders without the added costs of more formal arrangements, as would be required by bore trusts in Queensland.

The regulation of new bores does not remedy the primary cause of environmental damage. Many existing bores were established in the late 1800s, are unlicensed and are free flowing into open earth drains. In addition, deteriorating bore cases cause damage to the remaining water in the upper levels

of the aquifer. Current policies and programs are aimed at remedying this situation.

Great Artesian Basin Rehabilitation Program

To arrest the declines in water pressure, the Commonwealth and States commenced the GAB Rehabilitation Program in 1989. This program is to encourage users in the GAB to rehabilitate uncontrolled flowing bores so that leakage can be reduced and flows controlled. Realising that the majority of water savings is made by piping water from bores to watering points instead of using open bore drains, the Commonwealth and State governments are now subsidising the replacement of bore drains through programs which vary in detail between the States (see Box 13.3).

Box 13.3: **Funding arrangements for rehabilitation programs**

In New South Wales, the Cap and Pipe the Bores Program provides a non-repayable grant to landholders for them to undertake the works. The present cost sharing arrangements for bore rehabilitation is 80 per cent State/Commonwealth and 20 per cent landholder, and for property water planning and piping is 20 per cent State/Commonwealth and 80 per cent landholder. Since 1990, the total cost of the program has been $5.6 million.

In Queensland, the Bore Drain Replacement Program, costed at more than $40 million to complete, is a joint Commonwealth and State initiative, funded by the Commonwealth, State and landholders. Negotiations with the Commonwealth and State governments have resulted in an initial subsidy of 40 per cent Commonwealth; 40 per cent State and 20 per cent landowner contribution for rehabilitating bores and piping water for both demonstration and economic analysis purposes. To date, the program has cost $12.5 million.

In South Australia, the bore rehabilitation program has concentrated on the uncontrolled flowing bores in the Frome Embayment region. The program only covers the capping of the bores, with the funding being shared equally between the Commonwealth and State government. There is no landowner contribution. Since 1990, the program has cost $4.7 million.

Sources: Information supplied to the Commission, DNR Queensland and SA Department of Environment and Natural Resources.

Progress on the GAB Rehabilitation Program has been slow. An estimated 1380 bores flowed uncontrollably in 1989 when the GAB Rehabilitation Program started, and since then some 250 have been repaired, replaced or plugged. At this rate it will take another 30 years to complete the Program. The

progress to date has, however, resulted in a reduction is water wastage of some 140 ML per day and significant increases in water pressure in some areas.

Estimates by the Queensland Department of Natural Resources of the amount of water saved, and cost per ML saved per annum, for various examples of work completed under the Bore Drain Replacement Program in south-west Queensland, is given in Table 13.3. It shows that the costs per ML saved per annum by the program have been between $532 and $730. This compares with an estimated cost of $275 per ML stored and available per annum (in 1990 dollars) for the dam and associated infrastructure to support the Burdekin River Irrigation Area.

To the landholder, the cost of saving water, represented by the cost per megalitre per annum, may be sufficiently large so as to discourage bore rehabilitation and piping. This may account for the slow implementation of the GAB Rehabilitation Program.

Table 13.3: **Bore Drain Replacement Program in south-west Queensland**

Data unit	*Case No.1*	*Case No.2*	*Case No.3*	*Case No.4*	*Case No.5*
Length of bore drain replaced *(km)*	35	27	34	86	18
Length of pipeline*(km)*	43.95	66.7	44	143	30
Properties served *(No.)*	2	4	1	5	2
Watering points *(No.)*	29	36	27	55	11
Domestic supply (*No.)*	2	0	1	3	0
Area served by drain *(Ha)*	14 000	10 600	12 300	34 000	7120
Area served by pipeline *(Ha)*	17 000	18 000	14 400	40 200	8360
Water saved *(ML/day)*	**0.637**	**1.197**	**0.470**	**1.628**	**0.851**
Cost *($)*	166 410	241 125	125 060	434 037	100 814
$/ML saved/annum	**715**	**552**	**729**	**730**	**532**

Source: Information supplied to the Commission by DNR (Queensland).

The Great Artesian Basin Consultative Council

The GABCC has been established to facilitate the coordinated management of the GAB. It consists of representatives of State Advisory Groups (groundwater users), industry (including pastoral and mining industries), local government,

traditional landholders, conservation groups and government. The primary functions of the GABCC are to:

- act as a partnership between government and the community;
- coordinate management of the GAB on a sustainable use basis; and
- advise State and Commonwealth governments on the strategic management of the water resources of the GAB for all users, and on natural resource management issues in relation to the GAB.

These functions have been accepted in principle by the participating governments. Funding is shared equally among Queensland, New South Wales and South Australia, with the Northern Territory participating but not contributing.

The GABCC is supported by the State Advisory Councils which have been set up in Queensland, New South Wales, South Australia and the Northern Territory. The GAB State Advisory Councils have a broad advisory function, providing a forum for stakeholder liaison between government and the community, as well as providing community representation on the GABCC. They do not have any direct decision-making function.

While the GAB extends across four jurisdictions, the movement of water within the Basin's aquifers is slow, estimated to flow at the rate of one kilometre every 100 to 600 years. This slow movement of water limits the prevalence of inter-jurisdictional issues, except for water pressure in border regions.

Existing institutions focus on the areas of advice and information sharing rather than on centralised management of the resource. The GABCC and the State Advisory Committees are in their infancy, and hence it is too soon to assess their achievements to date. Their goal of coordinating management of the GAB among the States is appropriate.

13.4 Proposals for change

As noted earlier, in some aquifers, groundwater is being depleted quicker than it is being replenished, giving rise to the need for broad reform to improve groundwater management and practices. In addition, in many areas, surface water scarcity is leading to an increasing demand for groundwater and thus, there is also a growing need for complementary groundwater reforms to avoid the possibility of negating the gains from surface water initiatives.

The groundwater reforms endorsed by COAG are sound, but, as yet, no timetable or milestones have been specified, other than for groundwater

charging (2001), and most jurisdictions have not yet announced specific actions for their implementation.

In principle, the Commission can see no reason why the COAG-agreed 1996 groundwater reforms, as developed by ARMCANZ and SCARM, should be exempted from the National Competition Council's criteria for assessment of the second tranche of national competition policy payments — particularly given that some 18 months will have past since the reforms were agreed to. And seemingly, nor was it necessary to seek their exemption. The National Competition Council advised the Commission that legally, for the second tranche assessment, it can only review progress regarding the groundwater principles etc that fall out of the two documents specifically referred to in the *Agreement to Implement the National Competition Policy and Related Reforms — 1995*; that is, the 1994 COAG water agreement and the 1995 Expert Group's report.

That said, there is certainly no argument for not including progress in implementing the 1996 COAG groundwater reforms as a criteria for assessing the third tranche of competition payments. Otherwise, there is the very real danger that the States and Territories might somehow manage to totally avoid the discipline created by the competition payments framework for the achievement of groundwater reforms within a specified time period.

Recommendation 13.1

The 1996 Council of Australian Governments' groundwater reforms, as detailed in the *Allocation and Use of Groundwater* (ARMCANZ and SCARM 1996), should form part of the National Competition Council's criteria for the third tranche of competition payments, as intended, under the *Agreement to Implement the National Competition Policy and Related Reforms — 1995*.

The Commission also considers that, as for surface water, the agreed groundwater reforms should be implemented by the States and Territories over milestones and timetables agreed and monitored by COAG. Participants generally considered that full implementation of all the reforms is achievable within five years from now — that is, by the end of 2002.

In regard to groundwater entitlements and their tradeability, the Commission notes the potential for developing markets demarcated in terms of tradeable drainage rights — the right to store surface water in groundwater aquifers —

and/or tradeable annual pumping/drawing rights — the right to extract water from groundwater aquifers — and encourages their further development and trialing.

Data and information deficiencies are hindering the development of appropriate responses to groundwater management problems. Increased research and extension, targeted principally at what constitutes ecologically sustainable groundwater use within each aquifer, will be required to overcome this problem. Such research might be part-funded via a levy on groundwater extractions or licences held in each aquifer.

Recommendation 13.2

COAG should agree to a set of measurable milestones and timetables for the implementation of all of the COAG principles for groundwater reform. Progress against those milestones and timetables should be monitored by COAG and reported publicly.

Licensing arrangements — existing bores

While all new bores are subject to licensing requirements, there are many established bores that are not. These established bores cause the greatest damage to the environment, through deteriorating bore cases and open earth bore drains. While licensing of all bores would facilitate the management of Australia's groundwater resources, the cost may be prohibitive relative to the likely benefits. Therefore, the Commission considers that it would only seem practical to pursue the licensing of established bores in those groundwater systems where there is competition for the resource which has led, or could lead, to its over-development. In principle, however, the best policy response to the environmental damage caused by unregulated bores would be to apply the polluter-pays principle and thus, for the owner to take steps to minimise that damage.

In regard to the licensing of bores in the GAB, the GABCC said that:

> ... while licensing is common (but not universal), these licences are generally an authority to construct and/or operate a bore and do not confer any volumetric entitlement to water and consequently, do not contribute to the active management of the groundwater resource. (Sub. 320, p. 3)

The extending of the licensing of bores should enable more complete and accurate information to be produced about the GAB. In turn, this should enable more informed debate about the future development of the resource. The

GABCC (Sub. 320) supported the view that all GAB bores should be brought under a regulatory regime. It suggested that the matter should be considered in the context of statutory arrangements and directions in each jurisdiction.

Recommendation 13.3

Each State and Territory should extend its licensing system to cover all bores in groundwater systems that are under stress from extraction. At the time of licensing, the condition of the bore should be assessed. The costs of extending licensing should be recovered from the landholder in question.

Rehabilitation of bores and bore drains — funding arrangements

Although funding arrangements differ between the States, under the current policy arrangements, Commonwealth and State governments are contributing up to 80 per cent of the costs for rehabilitating bores and replacing bore drains with a piped system.

Most of the land degradation costs of free flowing bores are on-site, and the costs in terms of falling water pressure extend only across a local region. Thus, the case for public funding is limited. However, because the impact of reduced water pressure is distributed across a local region, there is reduced incentive for the individual landowner to act. Encouraging cooperative action at the regional level is important. Local bore trusts in New South Wales are an example of this.

In this way, the benefits of capping the artesian bores gained by other landowners in the region through increased water pressure, can be captured and funding be provided by way of a levy on the landowners in the region.

Similarly, in Queensland, realisation of the private benefits to be gained by groups of landowners from the networking of modern groundwater piping systems, has led to private cost sharing agreements between benefiting land holders.

In the Draft Report for this inquiry, the Commission suggested that a formal review of the Great Artesian Basin Rehabilitation Scheme was warranted and proposed to recommend accordingly. However, both the DPIE (Sub. 329) and the GABCC (Sub. 320) indicated in their draft report submissions that an internal review of the scheme was about to commence, and that a study had already been commissioned from the Australian Bureau of Agricultural and

Resource Economics (ABARE) on the extent of public benefit from the capping and piping schemes.

The Commission considers that this review should also cover the following important issues:

- the reasons for the slow uptake of government assistance;
- the levels of government involvement in funding rehabilitation of bores;
- the differing levels of government funding between the States; and
- investigation of promoting regional cooperative arrangements, such as local bore trusts and private cost sharing agreements.

The Commission also considers that the review committee should release a draft report for public comment prior to its finalisation and submission to government.

Recommendation 13.4

A draft report of the committee reviewing the *Great Artesian Basin Rehabilitation Program* should be released for public comment, by the Commonwealth Department of Primary Industries and Energy, prior to its finalisation and submission to government.

14 WATER QUALITY

Agriculture can contribute to a loss of water quality, both directly — through, for instance, the return of agricultural wastewater and the impact of agrichemicals use — and indirectly — where clearing of vegetation and excess use of water can lead to the contamination of run-off by salt, nutrients etc. These impacts on water quality, in turn, affect the ecology and health of waterways, wetlands, estuaries and adjacent marine environments, such as the Great Barrier Reef. Such impacts can have varying direct and indirect effects on the viability of the fishing, seafood and tourism industries. They can also affect water users on farms downstream. For instance, high nutrient levels can lead to outbreaks of blue-green algae which can kill stock, while high salt levels can restrict plant growth and lead to salinisation of the land irrigated with the water in question.

Ecological sustainability is not achievable unless the issues associated with water quality are addressed. This chapter looks at market mechanisms for improving water quality management. In this regard, the Commission recommends that each State and Territory should develop strategies for improving water quality, based on the progressive trialing and application of tradeable discharge permits.

Water quality is strongly correlated with land and water use and the assimilative capacity of receiving waters. The national State of the Environment Report commented that:

> Land use affects soil properties and the amount of water infiltrating to groundwater, the rate of run-off and erosion, and hence the amounts of agricultural chemicals, sediment, and phosphorus and other nutrients reaching water bodies. (SEAC 1996, p. 7-5)

In a similar vein, the Cooperative Research Centre (CRC) for Freshwater Ecology said that:

> The land uses and the level of land management that are desirable in any catchment are a function of the state of the receiving waters and its capacity to receive pollutants without showing unacceptable symptoms. (Sub. 139, p. 2)

The ecology of freshwater aquatic and riverine environments has been changed greatly by river regulation and storages, snag removal, siltation, exotic fish and weeds, and chemical pollution. In addition, excessive extraction of water has

diminished the assimilative capacity of surface water systems. For instance, the Murray-Darling Basin Ministerial Council said that:

> The combination of extensive water extraction and river regulation has caused a profound change in the level and pattern of flow of the Basin's rivers, including flood frequency, duration and seasonality. Together the hydrological changes and other impacts have in turn had a significant adverse effect on river health and water quality. There is no doubt that the Basin's river systems are under stress as evidenced by:
>
> – a significant increase in the frequency and severity of blue-green algal blooms;
>
> – destruction and degradation of wetlands;
>
> – declining distribution and abundance of fish;
>
> – increasing salinities in streams; and
>
> – deteriorating water quality. (Murray-Darling Basin Commission, Sub. 129, Attachment 2, p. 2)

Over time, these impacts on water quality affect the ecology and health of waterways, wetlands, estuaries and adjacent marine environments, such as the lagoon area of the Great Barrier Reef. This can give rise to varying direct and indirect effects on the viability of the fishing, seafood and tourism industries. For instance, the Seafood Industry Council (Sub. 260) indicated that water pollution can impair the growth and reproduction of fish, affect their food chain and seagrass nurseries, and contaminate their tissue — which can then impact on the wider food chain.

Water pollution and habitat loss are clear net costs to the fishing, seafood and tourism industries.

That said, water quality is a difficult issue to manage. As a general rule, it is best handled at the catchment level for surface water, or the aquifer level for groundwater. The range of pollutants are diverse, including salt and nutrients, of which agricultural activity is a major contributor. The sources can also be diverse and not easily identifiable, including agricultural run-off.

There are several ways of addressing water quality problems. To date, control has centred on direct regulation, principally through the licensing of discharges. However, concerns over their cost and effectiveness have led to the search for alternatives and hence, this chapter concentrates on that issue and not on attempting to review the strengths and weaknesses of each regulatory measure.

There is scope for developing and extending the use of tradeable discharge permits to provide more efficient solutions to some water quality problems. In

particular, tradeable permit systems offer the potential for least cost compliance by all polluters.

While there is scope for developing and extending tradeable permit schemes to address pollution emanating from agricultural activities, there are many basic techniques which can be adopted for managing agricultural land to minimise pollution (see Box 14.1). These essentially 'best practice' measures might be expected to form the basis of any code of practice developed for future application.

Box 14.1: **Basic techniques for minimising pollution from agricultural land**

- Retain buffer strips (at least 10 metres each side) with natural vegetation along waterways.
- Prevent stock having access to stream or storage banks.
- Encourage landholders to adopt basic soil conservation management and ensure the maintenance of a vegetative cover on the land.
- Ensure fertiliser application does not take place directly to streams or storages.
- Control the use of agricultural chemicals and ensure they are not applied directly to streams and buffer areas, but rather applied in places and ways that ensure their retention onsite.
- Require animal wastes from dairies or other intensive congregation zones to be treated using wetland pollution control ponds or other appropriate technologies.
- Ensure landholders understand the impacts of the use of fire in agricultural areas on water quality and potential soil erosion.
- Maintain or provide wetlands in the catchment as pollution control zones to be part of the sediment, nutrient and pollutant trapping system.

Source: CRC for Freshwater Ecology (Sub. 139).

14.1 Existing tradeable permits

There is relatively little Australian experience with the use of tradeable permit systems to control the discharge of pollutants to waterways and water bodies.

In New South Wales, a trading system is currently in operation for certain point-source salt discharges to control salinity in the Hunter Valley. The Hunter River Salinity Trading Scheme was launched by the NSW Environment

Protection Authority (EPA) in January 1995 as a pilot scheme. It was an attempt to achieve a better environmental outcome at less cost and faster than would normally occur using regulatory instruments alone (see Box 14.2). The NSW EPA said that:

> The scheme marks an important step towards an outcomes based focus across a whole river catchment. Under the Hunter Scheme, the community has contributed to an explicitly articulated desired environmental outcome, with the regulator ensuring fair and efficient allocation of the available opportunities for discharge. The regulator provides minimal 'insulation' between the environment's finite nature and those who seek to use it. Thus maximum responsibility for environmental outcomes is transferred back to polluters, under conditions of high accountability. (1997, p. 3)

To date, the scheme has been successful in achieving its environmental objective — of preventing discharges that might otherwise cause the river water to exceed 900 EC (electrical conductivity) units — even though trades to date have been negligible. While trading does not have to occur for such schemes to be successful, the limited trading to date may reflect the relatively high salt level (900 EC) that is considered acceptable — where the individual reductions may not be particularly costly for any of the permit holders to achieve. As the overall salt level is reduced further, however, the attractiveness of trades may be expected to increase. The New South Wales Government (Sub. 325) said that the scheme's success may be due more to its 'real time' computerised monitoring system — which ensures that compliance can be visually monitored — than to the trading scheme itself.

Another tradeable permit scheme currently operating in Australia is a form of trading incorporated in the Murray-Darling Initiative for allocating salt discharge rights between New South Wales, Victoria and South Australia (see Box 14.2). The scheme forms part of the Murray-Darling Basin Commission's (MDBC) cooperative salinity abatement program, the Salinity and Drainage Strategy, which is targeted initially at irrigation-induced salinity impacts. It aims to reduce the level of salinity in the Murray-Darling river system by about 10 per cent (or 80 EC units) at Morgan in South Australia. At the same time, it seeks to allow vital drainage and land management schemes to be carried out within the Basin. The MDBC indicated that, to date, salinity at Morgan has been reduced by 50 EC units and thus, that the participating States were on track to achieving the target reduction.

The Australian Conservation Foundation (ACF) was, however, critical that these tradeable permits for salinity management have not been managed as market mechanisms to date:

> In the only major trade in salinity credits that the ACF is aware of, the NSW Government paid for the full cost of the purchase on behalf of the irrigators concerned ... (Sub. 296, p. 1)

A quasi-tradeable permit scheme, known as the South Creek Bubble Licence Scheme, is in place in New South Wales to reduce nutrient loads in the Hawkesbury-Nepean river system, especially during low-flow periods (see Box 14.2). According to Brunton (1997), the NSW EPA found a number of impediments with implementing a fully-fledged tradeable permit scheme to control phosphorus in the Hawkesbury-Nepean River system. These included the dominant role of Sydney Water Corporation (Sydney Water) as the major contributor of phosphorus discharges from its 23 sewage treatment plants (STPs), the contribution of diffuse sources, problems of monitoring and enforcement, and the lack of information of the abatement costs of the Sydney Water STPs. Consequently, the EPA preferred to develop and trial a bubble licence for three of Sydney Water's STPs for South Creek (a tributary of the Hawkesbury-Nepean). These plants are major sources of nutrients in the river system, although discharges occur also from other point and non-point sources in the catchment, including agriculture. The scheme incorporates progressively diminishing aggregate load limits for the bubble, such that load targets specified for the year 2004 will result in an 83 per cent reduction in predicted phosphorus loads and around a 50 per cent reduction in predicted nitrogen loads.

According to James, the main attribute of a bubble licence is that the regulator controls the aggregate load generated within the bubble, rather than controlling emissions or effluents from individual sources:

> The advantage of such a scheme over more traditional regulatory approaches is that the operator is given more flexibility in finding cost-effective solutions, while ensuring that the overall discharge targets set by the regulator are achieved. Environmental gains can be made at lower costs because relatively greater reductions can be undertaken by plants with lower abatement costs. (1997, p. 60)

James (1997) estimated that cost savings from the South Creek Bubble Licence Scheme, compared to uniform discharge concentration limits, are of the order of 10 to 20 per cent. The load-based licensing aspect of the scheme is also expected to provide considerable incentive for Sydney Water to investigate innovative alternatives to traditional technologies, which could result in additional savings in abatement costs.

Box 14.2: **Australian use of tradeable discharge permit systems**

Hunter River Salinity Trading Scheme

Sedimentary rocks of marine origin underlie the catchment of the Hunter River in New South Wales, resulting in significant areas of saline ground water and naturally high but variable salinity in the Hunter River and its tributaries. Coal mining often intersects saline ground water and some mines have had difficulty managing the volume of saline water intercepted by their operations under the current regulatory regime, particularly during low flow periods. Pacific Power also contributes to fluctuations of in-stream salinity, both by reducing the flow in the Hunter River and by occasional discharges of saline water from storage.

The Scheme involves trading in salinity credits between 11 coal mines and two large power stations along the Hunter River in New South Wales. Amongst them, they are licensed to discharge a total predetermined level of saline water into the river or its tributaries. Within that total level of discharge, each firm is allocated discharge 'credits' which they are free to trade with other credit holders.

In this Scheme, river flows are categorised as 'flood', 'high' or 'low'. In low-flows (about 85 per cent of the time), discharges from mines are to be phased out altogether. In floods, there are no limits. In high flows, controlled discharges are permitted, provided the river load does not exceed 900 EC units. These limits reflect the maximum load that is considered to be compatible with agreed in-stream salinity objectives, for the particular flow event. Dischargers are allocated a percentage share (credits) of the total discharge, based on their environmental performance record and their relative contributions to the local and national economies. If their share happens to be less than their requirements, they can either purchase or lease another dischargers' share, or construct larger dams which will enable them to wait until a flood or larger flow opportunity arises. By allowing dischargers to trade their credits, greater flexibility is afforded to mines in complying with their pollution control licence conditions, with resultant cost savings.

Murray-Darling Basin salinity credits trading scheme

The MDBC's salinity credits trading scheme operates between the irrigation districts of New South Wales, Victoria and South Australia. It essentially involves maintaining a ledger of salinity credits and debits for each of the participating States. Credits are tradeable between States, but are generally applied within each State to offset debits from drainage entering the river system.

Box 14.2: (continued)

Each State is responsible for future actions affecting river salinity, with each action's impact quantified against a set of baseline conditions. States undertaking activities which cause an increase in salinity of greater than 0.1 EC (Electrical Conductivity) units receive a debit, whereas salinity improvements lead to the granting of credits. States receive salinity credits for any salinity mitigation scheme to which they financially contribute and are entitled to increase river salinity (such as by flushing agreed amounts of saline water out of agricultural areas into the river to protect agricultural land) provided that the salinity impact of their actions is not greater than the State's balance of salinity credits.

The objective is a net salinity improvement of 80 EC units at Morgan in South Australia, or approximately 10 per cent of the total level of salinity in the river at that point. This will be achieved mainly through a series of groundwater interception schemes. New South Wales and Victoria each received 15 salinity credits for contributing towards the cost of the construction and subsequent maintenance of these schemes. New South Wales currently has a credit of 6.15 units and Victoria 5.92 units. South Australia and the Commonwealth have also earned credits but are not expected to use them to offset debits.

South Creek Bubble Licence Scheme

High nutrient loads, mainly phosphorus and nitrogen, have resulted in algal blooms and eutrophic conditions in the Hawkesbury-Nepean river system in New South Wales.

The NSW EPA launched this Scheme in July 1996. The environmental outcomes to be achieved by the bubble licence are reduced potential for excessive growth of algae and other water plants, and improved protection of aquatic ecosystems. The Scheme involves three Sydney Water Corporation sewage plants — treated as a group, (ie the 'bubble') — that discharge effluent to a specific section of the Hawkesbury-Nepean river system.

Under the Scheme, the EPA has set progressively diminishing aggregate load limits of phosphorus and nitrogen levels for the bubble as a whole and allows Sydney Water to determine the load allocation between the plants — that is, Sydney Water now has the option to achieve discharge reductions at any combination of the three plants. This implies that the plants are able to 'trade' nutrient discharges between themselves so as to meet the overall required reductions in emission levels at least cost.

The bubble pollution control licence is underpinned by a strong regulatory framework, to ensure effective functioning of the economic instrument and achievement of the environmental objectives.

Sources: NSW EPA (1995a, 1995b, 1997); James (1997).

14.2 Scope for extension of tradeable permits

According to Brunton (1997), there are a number of ecological concerns with tradeable permits — some of which apply equally to regulation — that need to be considered when assessing whether the implementation of a tradeable discharge permit scheme is likely to result in a net benefit to the community. They include:

- a gap often exists between what is ecologically safe and what is economically optimal — for example, the economic model is often said to give less weight to long-gestation pollutants, or toxic pollutants with cumulative effects, than do ecologists;
- tradeable permit schemes assume that regulatory authorities can accurately determine the aggregate level of pollution that can be discharged and thus, that the environment can indefinitely assimilate that level of pollution;
- tradeable permit schemes assume that localised effects of pollution will not occur, or if they do, they will be within acceptable limits — the Victorian EPA (1995) argued that 'tradeable permit systems are most appropriate for managing highly dispersive pollutants where the environmental impact occurs over a large area rather than having significant localised effects' (p. 24); and
- to ensure that the ecological impacts of any tradeable discharge permit scheme are minimised, detailed research is necessary into each water body where a scheme is proposed, and particularly into understanding the complexities of sedimentation, stream hydrology and biological uptake — often the costs of meeting these informational demands can be prohibitive.

In regard to the first of these concerns, tradeable permit schemes require a sound regulatory regime to operate within and help achieve objectives. However, whatever level of pollution is deemed to be acceptable on either ecological or economic grounds, or a combination of the two, it will be best handled by a permit scheme.

On the second point, determining what constitutes a 'safe' aggregate pollution load over time is a function of information, not whether to use a tradeable permit scheme or not. Rather, it would seem feasible to overcome such aggregate load assimilation problems by, for example, specifying in the design of a permit scheme that each trade would involve the resumption (loss) of a certain percentage of the discharge permits traded. In this way, the aggregate pollution load allowed would be reduced progressively, in line with the incentive provided by tradeable permit schemes for polluters to lower their abatement costs.

On the third point, localised pollution load problems can be overcome by, for

example, adopting a similar approach to that developed for the Hunter Valley Salinity Trading Scheme, where pollution discharges are only allowed into the river during high flows, and even then, within the ambient standards set. (see Tietenberg 1985 for further information). However, practical limitations due to high administrative, informational and/or transaction costs, can sometimes limit the amount of trading and hence, the overall efficiency of the permit scheme.

On the fourth point, the Commission agrees that there is a need for further baseline research. However, it considers that these information gaps would be best filled — and information costs minimised — by the necessary research being undertaken during the trialing of a proposed permit scheme.

In a recent review of the Hunter River and South Creek trading schemes, the NSW EPA said that:

> Many former critics now agree that introducing a pricing or quota system merely allows communities to give effect to their social choices faster, more cheaply and equitably, and with greater transparency.
>
> Therefore, while quota systems face particular implementation challenges, there is usually great potential for the difficulties to be compensated by efficiency gains in environment protection. (1997, p. 6)

The Commission agrees with the NSW EPA's assessment.

There is an urgent need for the wider use of tradeable permit schemes. Their use to date has been too tentative and limited, but care is needed in progressing their extended use. There is a need for:

- existing permit schemes to be extended to other point and non-point sources; and
- new permit schemes, suitable for subsequent extension.

According to the NSW EPA and the MDBC, there is potential for extending each of the current three Australian tradeable permit schemes to progressively encompass other point and non-point sources:

- the NSW EPA (1994) intends to extend the Hunter River Salinity Trading Scheme to other point sources such as Pacific Power's Ravensworth No. 2 fly ash disposal project and, for the effective management of Hunter salinity, to eventually embrace diffuse source discharges, such as irrigation;
- the MDBC (Sub. 129) suggested that there is scope for extending its Salinity and Drainage Strategy Salinity Credits Scheme to dryland areas; and

- the NSW EPA (1997) said there is potential to expand the South Creek Bubble Licence Scheme to other sewerage plants and point sources, as well as to diffuse sources.

The NSW Government (Sub. 325) said that, while it is currently considering expanding the Hunter and South Creek schemes to cover other non-point source emissions, it was important to recognise that these existing schemes are underpinned by a strong regulatory framework — so as to ensure effective functioning of the economic instrument and achievement of environmental objectives.

In South Australia, the SA Government (Sub. 324) and the South Australian Farmers Federation (Sub. 222) both endorsed the principle of tradeable permits. However, they noted that there were a number of constraints to their implementation in that State, not the least of which are the potential thinness of markets (except for salinity along the Murray River), insufficient knowledge of the State's environment and the pollution loads it can tolerate, and the impact of load-based permits, given that most of its water bodies are of an ephemeral nature. The South Australian Farmers Federation (Sub. 222) was also concerned about the applicability of tradeable permits to control diffuse pollution.

Ideally, any pollution control regime should include all point and non-point sources of a pollutant. The inclusion of point sources is generally straightforward, but non-point sources are more difficult. Diffuse sources, such as agricultural and irrigation run-off, are difficult to identify or control. These problems are compounded by the variability of the run-off — most of the pollutant load enters waterways and water bodies over very short time periods during storm events — and the generally prohibitive expense of continuous sampling.

Sydney Water (Sub. 335) and the Victorian Government (Sub. 341) both questioned the practicality of tradeable permit schemes for non-point source pollution. Sydney Water pointed to differences in the impacts that non-point and point sources have on waterways, which increase the complexity of establishing a tradeable permit scheme for diffuse discharges, as follows:

- firstly, the impact of point sources on rivers is often very specific to the location of the discharge into the river while, by their very nature, non-point source pollutants have diffuse impacts; and
- secondly, point sources are usually constant discharges whereas non-point source discharges usually occur for short time periods intermittently.

Sydney Water suggested that, in its opinion, this complexity could be addressed in one of two ways:

> Tradeable permits for non-point sources could be issued to organisations that have the capacity to influence land use practices, such as a local council. Tradeable permits would have to be sufficiently sophisticated to specify different discharge loads at different times and under different operating conditions. Consolidation of responsibility for diffuse impacts to a local council level reduces the potential for free riders while minimising transaction costs associated with permit trades. Alternatively, separate tradeable permit systems — one for point sources and one for non-point sources could be created. Under this regime, each permit system could focus on the specific characteristics of its impact and river system, to link pollution load inputs to a clear long-term environmental outcome. (Sub. 335, p. 4)

The Tasmanian Government (Sub. 319) felt that the problems arising from non-point sources of pollution may be more appropriately handled through integrated catchment management policies and codes of practice — such as those envisaged under the Commission's proposed duty of care statute — rather than tradeable permits. The SA Government also saw voluntary codes based on best practice as a viable default mechanism for acceptable loads and concentrations of diffuse pollutants.

The NSW Government (Sub. 325) argued that there are clearly situations where both economic instruments and voluntary codes of practice will fundamentally fail to protect the public interest. For example, the Government claimed that any regime for regulating animal wastes that included some component of choice may pose unacceptable health risks to downstream rural communities and consumers of agricultural products. These public health risks, it said, could arise from the contamination of water courses by waste transmitted pathogens, organic compounds, growth hormones and growth-promoting antibiotics, and other toxicants (including nutrient-induced toxic blue-green algae).

The Commission agrees that tradeable permit schemes are not a panacea for controlling and reducing all pollution problems emanating from diffuse sources. However, as evidenced above, there are also many instances where it would be worthwhile exploring further the applicability and practicality of their implementation, as part of a government's overall pollution abatement strategy.

Proxy and off-set measures for diffuse pollution

For the above reasons, the inclusion of diffuse sources in a trading permit system may not be straightforward. However, it may still be possible to include them using proxy measures of the pollution from a particular activity. For instance, proxies for nutrient run-off from agricultural land could be the volume of fertiliser used or the area of cleared land. However, the Victorian EPA has warned that:

> ... such proxy measures are likely to be quite inaccurate and may provide an active disincentive to property managers to adopt improved agricultural practices such as laser-grading and reduced irrigation regimes. Such a scheme might also fail to adequately address other nutrient sources such as bed and bank erosion in waterways. (1995, p. 22)

Further, the Commonwealth Department of Primary Industries and Energy (Sub. 329) pointed to a recent review of *Economic Measures and the Reduction of Nutrients from Agricultural Run-off in Waterways* (DPIE 1995). This review concluded that it is impossible to design and apply effective economic instruments without a thorough understanding of the natural relationships involved in the development and persistence of algal blooms and that continuing research is required to fill this information gap.

There may, however, be other ways of addressing agricultural impacts in a scheme of tradeable permits. Essentially, they involve recognising 'off-set' strategies for point source polluters. The Victorian EPA said that:

> Such strategies are generally based on granting discharge credits to point source dischargers if they:
>
> (i) engage in directly reducing discharges from diffuse sources;
>
> (ii) contribute to a fund that is used to finance control of discharges from diffuse sources; or
>
> (iii) enter into a contractual agreement with a third party to reduce discharges from diffuse sources. (1995, p. 23)

For instance, problems with tradeable permit schemes — in reducing diffuse discharges from unregulated properties — have led the Victorian EPA to establish an off-set scheme for point source discharges in the central Gippsland region which require a licence under the *Environment Protection Act 1970*. Freehill Hollingdale & Page said that:

> Under the scheme, the Victorian EPA may approve a lower quality of discharge than otherwise would be acceptable if the applicant agrees to implement and maintain off-set measures for diffuse or other sources approved by the Victorian EPA. The Victorian EPA may only approve an off-set arrangement where the discharge would not adversely affect any beneficial use of the water body outside a designated mixing zone and the off-set measure would offer either equivalent or greater protection of beneficial uses within a specified area. (Sub. 209, p. 27)

While this scheme also encounters some of the ecological uncertainties identified above in relation to nutrients, it does not rely on predicting an overall safe level of nutrients in a water body. Moreover, Freehill Hollingdale & Page (Sub. 209) suggested that such schemes need to be designed to avoid problems with implementation and enforcement. It said:

> Implementation problems could include: ensuring the diffuse source discharger complies with the scheme; having the point source discharger be responsible for works on another party's property and the issues of warranties and indemnities in favour of the diffuse source discharger in respect of such from the point source discharger in relation to the works (how can a point source discharger properly maintain works on the property of the diffuse source discharger except with an enforceable agreement); and, enforcement problems (what if the diffuse source discharger removes the controls on the diffuse sources contrary to the agreement with the point source discharger) should the third party discharger of diffuse sources act in a way contrary to breach the agreement to reduce emission. (Sub. 209, pp. 27-28)

The Commission considers that, where appropriate and despite the implementation challenges, it would be worthwhile governments continuing to pursue the development and trialing of both proxy and off-set measures to otherwise capture the gains from using tradeable permits to control pollution from diffuse agricultural run-off sources.

Managing diffuse groundwater pollution

In respect of groundwater pollution from diffuse (and multiple point) sources, Young and Evans (1997) identified the following three quasi-tradeable entitlement mechanisms as those which generally offered the greatest potential for reducing the environmental damage of groundwater pollution from these sources, namely:

- *conditional use-rights*, which attach conditions to surface and/or groundwater rights so that the polluting activities are either encouraged to move to less vulnerable areas, discouraged, prohibited or phased-out — they have application anywhere where there is licensed groundwater use, primarily, irrigation;
- *emission offsets*, where development approval is conditional upon pollution reduction elsewhere (and no development is allowed to cause a net increase in the pollution rate) — they have application wherever development controls are in place; and
- *treater-pays systems*, where water treatment plants and ecosystem managers pay for pollution reduction activities because this is more cost-effective than water treatment — they have application wherever a water authority has to treat water prior to distributing it for human use or has to treat sewage before disposing of it into a water body.

An assessment by Young and Evans (1997) of the ability of quasi-market mechanisms to significantly reduce various diffuse groundwater pollution problems is provided in Table 14.1.

Table 14.1: **Young and Evans' subjective assessment of the applicability of right-market mechanisms to reduce non-point source groundwater pollution in Australia**

Diffuse pollution problem	*Ability of quasi-tradeable entitlement mechanisms to significantly reduce diffuse pollution problem*
	(% of problem area amenable)
Nitrates	
Excess fertiliser applications	30
Animal excreta	20
Legume pasture	10
Pesticides	1
Groundwater salinisation	
Land clearing	40
Recycling	75
Lateral migration	75
Irrigation	50
Bacteria, nitrates from septic tanks	50
Sea water intrusion	90

Source: Young and Evans (1997, p. 7).

Implementation of tradeable permit systems

On the basis of its recent experiences, the NSW EPA (1997) indicated that success in developing and implementing tradeable permit schemes depends on a number of factors, including:

- winning over sceptics requires genuine, early consultation and flexibility;
- review periods should be incorporated into schemes;
- establishing schemes requires careful analysis of the proposed 'market';
- trading schemes do not have to fix everything, or involve every emission or discharge source;
- a tradeable permit scheme does not necessarily need trading to occur to be successful;
- trading schemes can prevent otherwise desirable new developments causing cumulative environmental goals to be exceeded; and
- tradeable permit schemes still require a strong regulatory framework, to provide assurance of compliance, adequate sanctions for non-compliance and to protect against the potential for temporal or spatial hotspots.

Similarly, Sydney Water (Sub. 335) said it had learnt a number of lessons from its participation in the successful South Creek scheme that might be worthwhile incorporating into other permit schemes. They include, in addition to the above principles, the need to:

- publicise environmental objectives;
- use transparent processes to determine bubble licence emission limits; and
- ensure that pollution loads, or discharge levels, are communicated to and supported by relevant stakeholders.

The Commission agrees with the EPA's and Sydney Water's comments.

The NSW Irrigators' Council (Sub. 263) said that the greatest impediment to the implementation of tradeable permit schemes in New South Wales was the current regulatory and administrative framework, which, it claimed, did not allow the benefits of salt credits etc to be owned by the affected groups or local communities. The devolution of salinity and drainage allocations below the State level, to enable catchment management organisations and other similar regional bodies to trade discharge permits, would seem to be a fundamental reform in facilitating the more widespread use of tradeable permit schemes in New South Wales.

14.3 Commission's view

It is clear to the Commission that each State and Territory government needs to develop strategies to create and extend tradeable permit schemes for both point and non-point source discharges into their rivers and coastal waters — this view was strongly supported by the New South Wales and Victorian Governments (Subs. 325 and 341, respectively) in their Draft Report submissions to this inquiry. The Commission considers that these strategies should incorporate the following features.

First, so as to maximise the net benefit to the community, governments should initially focus on those pollutants and environments where the potential for reducing environmental damage is greatest. This may, of course, involve committing resources to protecting high quality water systems from becoming degraded, as much as to remediating low quality ones.

Second, to facilitate their earlier implementation, each permit scheme should commence with the more significant point sources and subsequently be extended, progressively, to other point sources and to non-point sources, as circumstances allow.

Third, the success of tradeable permit schemes and their ultimate potential for extension depends largely on whether they are cost-effective in their delivery and produce efficient outcomes. Our knowledge of each river system and its interaction with pollutants is incomplete. We need to build up our experience in operating these schemes and in understanding their impacts. Therefore, to ensure that permit schemes designed to improve water quality are able to meet these essential criteria, they should first be trialed, then evaluated and modified, as necessary, prior to their extension to other sources. In addition, each stage in the process of introduction should be subject to a defined timetable of, say, up to three years for trialing and four years for extension, with review thereafter.

Fourth, all stages in the process of introducing and modifying a permit system should be the subject of public consultation with interested parties, so as to ensure full understanding and 'ownership' of the scheme.

Finally, to ensure that a sufficient amount of flexibility is retained in the extended permit schemes, the performance of each scheme should be monitored on an on-going basis and the design modified progressively as improved knowledge and changing circumstances warrant.

So as to ensure that a market for trading pollution discharges emerges quickly, it may also be most practical for permits to be allocated initially on the basis of current discharges. As the cost of pollution reduction is likely to differ between polluters, trading opportunities will emerge and the overall costs of pollution mitigation will be reduced as it is undertaken by the least costly source of pollution abatement.

Recommendation 14.1

Each State and Territory should develop a strategy to progressively introduce tradeable discharge permits. The strategies should incorporate the following features:

- they should first focus on those pollutants and environments where the potential for reducing environmental damage is greatest;
- each permit system should commence with the more significant point sources and subsequently be extended progressively to other point sources and, where feasible, to non-point sources;
- each permit system should be trialed, then evaluated and modified, as necessary, before being introduced more widely, with each stage being subject to a defined timetable for trialing (say 3 years), extension (say 4 years, depending on the complexity of the extension) and review thereafter;
- all stages in the process of introduction should be the subject of public consultation with interested parties; and
- each new permit system should have the ability to review and modify its structure and performance on an on-going basis, as dictated by either operational experience, new information or further research.

15 NATIVE FLORA AND FAUNA

This chapter considers options for better managing Australian native flora and fauna to improve the commercial prospects of agricultural enterprises, while simultaneously promoting incentives for conservation.

It covers current utilisation and barriers to further expansion in the utilisation of wildlife. It deals almost exclusively with fauna, as little comment was received on flora and for which current arrangements are generally viewed as satisfactory.

The commercial utilisation of Australian wildlife raises issues for many that extend well beyond ecologically sustainable land management. Utilisation offers an opportunity to improve the commercial prospects of agricultural enterprises in an ecologically sustainable manner, especially in the rangelands. For some, however, utilisation raises significant conservation, animal welfare and other ethical concerns.

The following discussion looks at the commercial utilisation activities currently in operation and the arguments for and against further commercial utilisation.

15.1 Current approach to utilisation of wildlife

The current approach to the commercial utilisation of Australian native wildlife includes both consumptive and non-consumptive uses. Commercial harvesting is currently undertaken of a number of species for products for both for the domestic and exports markets. A limited number of ecotourism ventures are also currently in operation.

Policy framework

As noted by the Department of the Environment, Sport and Territories (now Department of the Environment) (DEST 1997), the National Strategy for Ecologically Sustainable Development and the National Strategy for the Conservation of Australia's Biological Diversity provide the policy framework from which decisions on the commercial use of wildlife can be made. Consultation between Australian conservation agencies on the commercial use

of wildlife is currently facilitated through the Australian and New Zealand Environment and Conservation Council (ANZECC).

The State and Territory governments and the Commonwealth Government share responsibilities for regulating the conservation and utilisation of wildlife.

The conservation of native flora and fauna is the primary responsibility of State and Territory governments. Legislation has been enacted to both conserve native species and to ensure minimum standards are met for the processing of wild animal products for the domestic market.

The Commonwealth Government has responsibility for controlling the export of plant and animal wildlife and wildlife products through the *Wildlife Protection (Regulation of Exports and Imports) Act 1982*.[1] The aim of the Act is 'to ensure that trade in wildlife and wildlife products is not detrimental to a species survival or to the ecosystem in which it occurs and that wild harvesting is carried out in a sustainable manner' (Environment Australia 1997a, p. 1). In doing so, it implements the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES).

The Act controls the export of most Australian native animals and plants, controls the export of all wildlife considered internationally as endangered or threatened and prohibits the export of live native animals for commercial purposes (except fish). Under the Act, live native birds can be exported for use as household pets (provided certain conditions have been met).

Native wildlife which can be exported without a permit includes some marine and freshwater invertebrates, seed from Australian native plants, artificially propagated plants not intended for commercial use, and kangaroo and emu products not to be used for commercial purposes.

A permit to export must be obtained from Environment Australia prior to export. All proposals are assessed according to ecological sustainability and conservation of biodiversity principles (Environment Australia 1997b). Trade in produce from wildlife harvested from wild populations is permitted where either a management program[2] or controlled specimens[3] program has been prepared and approved.

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[1] Export of wildlife and their products may also be subject to controls under the *Quarantine Act 1908*. The *Export Control Act 1982* aims to ensure minimum standards are met for the processing of products from wild animals for export markets.

[2] Management programs are required where there is sufficient information on the biology of the species proposed to ensure that it will not be 'to the irreversible detriment of the species, or its habitat' (Environment Australia 1997c).

Approval may only be given to a management or controlled specimens program if legislation relating to the protection, conservation or management of the proposed species is in place within the State or Territory of application. Such programs are prepared and administered at State or Territory level and are implemented under State/Territory legislation.

For species covered by management programs under the Wildlife Protection Act, commercial harvest quotas are set by the Commonwealth Minister for the Environment. Introduced wildlife species which have become pests are not subject to harvest quotas.

Exports are also permitted of native plants harvested from an artificial propagation or harvesting operation approved by Environment Australia.

Operators who breed wildlife in captivity must be approved under the Wildlife Protection Act before they can enter overseas markets.

Commercial utilisation

Australia currently has significant, but limited, commercial wildlife activities. Under the Wildlife Protection Act, harvesting programs have been approved for: products from kangaroos (see below); brushtail possums (see Box 15.1) and muttonbirds from Tasmania; and wildflowers from Western Australia. Shell management programs exist in Western Australia, Queensland and South Australia (Environment Australia, Sub. 229, p. 14).

Approval has also been given to industries involved in breeding emus, insects (including butterflies), crocodiles, clams, fish, prawns, axolotls (a salamander) and crayfish. Australia already has an established export trade in products from captive bred crocodiles (skins), emus, artificially propagated native plants (and orchids), captive bred prawns and shells, captive bred butterflies and captive bred fish.

[3] This criterion allows commercial harvesting and trade where it would not be appropriate to require a management program (for example, for short-term salvage harvesting, small scale harvesting of common species and the developmental stage of management programs).

Box 15.1: **Management of brushtail possums in Tasmania**

In Tasmania, the conservation and management of the brushtail possum is regulated under the *Wildlife Regulations 1971* of the Tasmanian *National Parks and Wildlife Act 1970*. The brushtail possum is a protected species under the Regulations. It may only be taken for purposes of crop protection under a permit issued by the Tasmanian Parks and Wildlife Service. The products of possums taken for this purpose can be utilised commercially (meat and skins).

The brushtail possum skin industry has been regulated in Tasmania since 1918. Licences have been issued since 1964, and in 1974 a system of commercial permits was introduced. In 1985, the *Wildlife Regulations* were amended to permit trading in possum meat to make use of carcases taken for their skins. Since 1983, annual quotas have been set to regulate the number of possums allowed to enter the commercial trade. In 1995, the quota was expanded to include possums taken non-commercially. Since August 1996, two operators have been licensed by the Commonwealth to export possum meat.

A management program for the common brushtail possum *Trichosurus vulpecula* (Kerr) has been approved under the Wildlife Protection Act to enable export for commercial purposes. The management program will operate from 1 January 1997 to 31 December 1999. The aim of the program is: 'to provide for brushtail possums taken during crop protection programs to be used commercially subject to constraints to ensure the conservation of the species throughout its range'.

In the past, Tasmania has also had management programs approved for short-tailed shearwaters (muttonbirds) and two species of wallaby.

Sources: DEST (1997); Tasmanian Parks and Wildlife Service (1996).

The annual wholesale value of trade in wildlife (including native and introduced species) and their products has been estimated by the Australian Bureau of Statistics (ABS 1996a) at between $166 million and $190 million. Trade in kangaroo and wallaby products contributes between $50 million and $60 million. Exports of wild plants and flowers picked from the wild are estimated at around $9 million.

According to the Australian Horticultural Corporation (AHC 1997), in 1996–97 exports of cut flowers were around $30 million. Western Australia accounts for around half of all production of wildflowers in Australia.

Wild pigs and rabbits are considered the most commercially valuable introduced species (ABS 1996a). In its research report on *Pigs and Pigmeat* (IC 1995c), the Commission reported that more than half of exports of unprocessed pigmeat (8000 tonnes) in 1994–95 was accounted for by meat from wild pigs.

Commercial harvesting to control the European carp is also increasing. A number of businesses are using carp to make fertiliser, stockfeed and aquaculture meal for fish. Some carp are also being marketed for human consumption.

Due to the legislative restrictions on trade in live wildlife, the level of current trade is small. Exports of live native fauna (principally Australian birds), where not prohibited under the Wildlife Protection Act), were valued at $58 000 in 1994–95 (ABS 1996a). There is also an active illegal trade in live wildlife, particularly of Australian birds, but its 'value' is unknown.

Utilisation of the kangaroo

Harvesting kangaroos not only controls grazing pressure on pastoral properties, but can provide landholders with an additional source of income.

Commercial harvesting of kangaroos (under quotas) currently takes place in four States: New South Wales, Queensland, Western Australia and South Australia. Individual shooters must apply each year for licences for shooting kangaroos (tags).

Shooters in New South Wales, Queensland and Western Australia negotiate with landowners the right to enter properties to harvest animals. The total annual harvest ranges between 15 per cent and 20 per cent of the estimated population in that year.

In South Australia, tags are issued to landowners, who then negotiate with professional shooters to harvest the resource. This system allows greater on-the-ground control of the resource and is said to have contributed to a significant shift in the attitude of landowners in South Australia to kangaroos on their property — a shift away from treating kangaroos as a pest to be reduced, towards an asset that can be managed in an integrated manner with other farm assets (Environment Australia, pers. comm.).

A Code of Practice for the Humane Killing of Kangaroos has been produced to regulate the commercial harvesting of kangaroos. Shooters are made aware of the requirements of the code through education campaigns and licence conditions. Shooters are required to undergo a training program and are tested for competency and marksmanship. Existing arrangements provide for any evidence of cruelty to kangaroos to be reported to the appropriate authority in each State or Territory.

Kangaroo meat destined for human consumption is also subject to the *Australian Standard for Production of Game Meat for Human Consumption* which sets 'minimum requirements of hygiene in harvesting, transport,

processing, packaging and storage to assure a safe and wholesome product' CSIRO (1997). Live possum is included within the standard, but it does not apply to processing game animals into processed meat products.

Senate inquiry into commercial utilisation

The Senate Rural and Regional Affairs and Transport References Committee is currently undertaking an inquiry into the Commercial Utilisation of Australian Native Wildlife.

The terms of reference ask the Committee to inquire into: the potential impact which commercial utilisation might have on the Australian environment; the current and future economic viability of commercial activities; and the adequacy of existing Commonwealth regulations and controls to ensure biodiversity of any species commercially utilised.

The Committee was expected to report by 26 May 1997. However, due to the complex nature of the issue, an extensive program of public hearings were conducted in late 1997 and the reporting date was extended. The Committee is expected to report in March 1998. Over 400 submissions have been received by the Committee to date.

In its submission to the Senate inquiry, DEST supported the commercial utilisation of native wildlife:

> Australian native wildlife is a renewable natural resource. If managed in an ecologically sustainable manner, wildlife can provide a perpetual source of economic benefits for all Australians. (1997, p. iv)

DEST also noted the divergent views on commercial use of wildlife:

> There are individuals and groups who are philosophically opposed to the commercial use of wildlife, and the killing of animals in particular, as well as groups and individuals who believe that there are conservation benefits to be derived from such uses of wildlife. (1997, p.2)

15.2 Issues in utilisation of wildlife

As outlined below, some participants supported increased opportunities for commercial utilisation of wildlife. They also saw this as helping in the control of pests and facilitating conservation. Others opposed commercial utilisation, particularly if it involved the export of live animals. While questioning the commercial benefits, they also expressed concern about the animal welfare implications and the effectiveness of regulation. These issues are discussed below.

The Commission notes that in 1976 the Standing Committee on Environment and Conservation recommended the relaxation of the ban on exports of native birds, provided they were common or pest species or were bred in captivity. The recommendation, however, was not accepted by the then Government.

In this present inquiry, participants who supported increased opportunities for commercial utilisation of wildlife and the export of live native wildlife included: Agriculture Western Australia (Sub. 227); NSW Farmers' Association (Sub. 317); NT Government (pers. comm.); South Australia Farmers Federation (Sub. 222); South Australian Government (Adelaide Public Hearing and Sub. 324); Mr Peter Simpson (Sub. 212); and WA Farmers' Federation (Subs. 230 and 331).

The Department of Conservation and Land Management, Western Australia (Sub. 225); the Kangaroo Industry Association of Australia (Sub. 298); and the National Farmers' Federation (Sub. 294) did not take a position on the live export of wildlife, but supported the commercial utilisation of wildlife.

The National Farmers' Federation, in its submission to the Senate Inquiry, said:

> The National Farmers Federation supports the sustainable commercial utilisation of Australian Native Wildlife, particularly where there are economic advantages linked with the control of pest species. Harvesting wildlife can be an effective method of reducing total grazing pressure which is a major issue for many farmers.
>
> More widespread commercial use of native wildlife such as kangaroos, emus and crocodile under strict management programs would provide alternative incomes for many farmers, and provide long term environmental benefits. (Attachment to Sub. 294, p. 1)

A number of participants opposed most forms of commercialisation, particularly the export of live native animals. They included: Animal Liberation ACT (Sub. 216); Animal Liberation (Victoria) (Sub. 253); Animal Societies Federation (NSW) (Sub. 243); Ms R Ashby (Sub. 333); Dr Heather Aslin (Sub. 304); the Australian and New Zealand Federation of Animal Societies (ANZFAS) (Sub. 281); the Australian Conservation Foundation (Sub. 296); the Australian Wildlife Protection Council (Subs. 220, 248, 300 and 327); Australians Against Commercialisation of Wildlife (Sub. 290); Dr John Auty (Sub. 235); Blackwood Environment Society (Sub. 269); Mr Murray Conole (Sub. 267); Conservation Council of Western Australia (Sub. 315); the Goulburn Field Naturalists Society (Sub. 233); Ms Jocelyn Hulme (Sub. 307); Humane Society International (Sub. 246); Ms Jane Huzzey (Sub. 289); the Kangaroo Protection Co-operative (Sub. 261); the Native Bird Liberation Alliance (Sub. 231); the North Queensland Conservation Council (Sub. 270); RSPCA Australia (Sub. 309); Sunshine Coast Environment Council (Sub. 259);

the Tasmanian Conservation Trust (Sub. 322); TRAFFIC Oceania[4] (Sub. 218); the Victorian Government (Sub. 341); Mr Tim Walsh (Sub. 214); and the Wildlife Preservation Society of Queensland (Sub. 238). The Commission also received a petition against the export of live wildlife (Sub. 338).

Some participants stated that they were not opposed to the commercial utilisation of wildlife where certain safeguards could be met. For example, TRAFFIC Oceania (Sub. 218), a wildlife trade monitoring program which seeks to ensure that where there is trade in wildlife it is sustainable, said it was not opposed to commercial utilisation if it was sustainable. However, it considered shortfalls in the existing legislation did not ensure this outcome (see below). Similarly, the RSPCA Australia (Sub. 309), which said it was opposed to the commercialisation of wildlife, stated in its submission to the Senate Inquiry that an exception could be made if the use of the species was to its benefit, provided certain conditions could be met.

Opposition to commercialisation and the live export of wildlife was based on a number of grounds. These included:

- concerns that Australian plants and animals will become feral in other countries (or introduce diseases). Participants suggested it would be irresponsible for Australia to export its pest species;
- animal welfare concerns. Participants expressed concern about the cruelty involved in the capture of wild animals and argued that the humane treatment of live wildlife during transportation and in the country of destination could not be guaranteed. Some also questioned the suitability of some species as pets;
- ethical grounds. Participants argued that Australia's native wildlife should not be viewed as a resource or exploited under any circumstances. They argued that Australia's native wildlife 'belongs equally' to all Australians and should not be exploited to the potential benefit of a few;
- unsustainability/conservation benefits are doubtful or difficult to assess. Participants questioned the ability of wild populations to be sustained if commercial harvesting is added to the threats species face through habitat destruction and other natural population impacts;
- the loss to the tourist industry. Participants argued that by exporting our native wildlife, Australia is exporting one of its major tourist attractions;
- the loss of biodiversity. Participants suggested that the gene pool could be affected by exporting and/or farming native species;

[4] The TRAFFIC Network is a joint program of the World Wide Fund for Nature and the World Conservation Union.

- commercialisation is unlikely to reduce illegal trade. Participants argued that it might be difficult to distinguish between legal and illegal trade of wildlife and that regulating trade in some species would encourage illegal trade in rarer species;
- inadequacy of current and/or future controls; and
- lack of economic viability. Participants questioned the profitability from commercial wildlife ventures and whether it could be sustained.

These issues are discussed below.

Commercial opportunities

Commercial opportunities potentially exist in the areas of open range farming, particularly in the rangelands, and expanding the current trade in live exports. DEST said:

> Commercial use of wildlife offers an opportunity to achieve the objectives of the draft [Rangelands] Strategy by providing a cost-effective means of managing total grazing pressure on properties, and diversifying the source of income of land holders. (1997, p. 42)

And at the roundtable discussion held in Perth, Mr Kevin Goss of Agriculture WA said:

> ... in the case of the Gascoyne-Murchison rangelands strategy ... there are now technologies in their development and demonstration phase that allow routine harvesting ... or trapping of say sheep, feral goats and kangaroos, and then their return to other paddocks or disposal or sent to market as appropriate, and that's certainly a key part of future strategy in these areas. (Transcript, p. 138)

In a final draft of *A Regional Framework for Managing the Variability of Production in the Rangelands of Australia*, Stafford Smith (1993) (also a participant in this inquiry) stated that the options for diversification on-farm in the rangelands include:

- harvesting kangaroos, goats and pigs;
- cultivating emus, quarter-horses, fish and yabbies; and
- harvesting native plants (native seed, cut wildflowers, bush tucker, tree oils, sandalwood etc).

The Kangaroo Industry Association of Australia said:

> In recent times the scientific community dealing with rangelands sustainability has become increasingly vocal in its pleas for industries based on the animals which belong in the region. Chief amongst these is a greatly increased kangaroo industry, replacing to some extent the current industries based on hard hoofed animals with grazing patterns poorly adapted to the survival of the native pastures in the

> rangelands. This concept is widely recognised by the informed scientific community as offering huge potential environmental benefits. (Sub298, p. 2)

The Commission notes that the commercial use of native wildlife has been successfully introduced in other countries. For example, the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe has been attributed with a significant turn around in community attitudes and the conservation efforts of local people (see Box 15.2). While Australia does not have large (high value per unit) fauna like Zimbabwe, an open range farming concept could be applied to kangaroos (Environment Australia, pers. comm.).

The operations of the CAMPFIRE program were questioned by some participants. Humane Society International (Australian Office) (Sub. 246) said it did not support CAMPFIRE as an example of 'wildlife utilisation/incentive programs in action' (p. 3). A recent report of the United States Office of Society states:

> CAMPFIRE is environmentally unsound ... The methodology used to monitor wildlife populations is questionable, and there is a lack of quantitative assessment of the potential impacts on wildlife resulting from the project. (Attachment to Sub. 246, p. 2)

Mr Col Friel questioned the application of the CAMPFIRE program to Australia:

> There are very few communal lands here; in Zimbabwe the hunted animals are large game animals such as elephants, which are a pest species there. Some of the lessons learned from CAMPFIRE are of dubious validity ... When crocodile hunting *was unrestricted* in the Northern Territory they were almost wiped out — because they had a commercial value. (Sub.215, p. 5, emphasis in original)

As the ban on hunting and the more recent development of a farmed crocodile industry have shown, it was the relatively open access to hunt rather than any continuing existence of a commercial value for crocodile products that encouraged the previous over-exploitation.

Box 15.2: **Communal Areas Management Programme for Indigenous Resources**

The Communal Areas Management Programme for Indigenous Resources (CAMPFIRE), which addresses the depletion of wildlife on communal lands, was developed in 1982 in Zimbabwe following an amendment to the *Parks and Wildlife Act 1975*. Its development followed the success of according private farm owners rights to utilise wildlife on their property through a system of permits from 1960 to 1975.

CAMPFIRE allows rural communities to benefit from the ability to exploit natural resources by placing custodial rights and responsibilities with local authorities on their behalf. A local authority will only be accorded 'Appropriate Authority' status under the Act, however, if the authority can demonstrate that the natural resources within its jurisdiction can be utilised sustainably.

The benefits of valuing wildlife as a resource have been realised. From 1989 to 1995, income earned from CAMPFIRE districts has increased in real terms from $US350 000 to $US1.6 million.

The majority of CAMPFIRE income is earned from leasing hunting rights for sporting activity to commercial safari operators. Other income is earned through non-consumptive tourism, sale of animal products (mainly from problem animal control), sale of live animals and collection of eggs. Under CAMPFIRE Guidelines issued in 1990, at least 50 per cent of income earned should be devolved to producer communities and 35 per cent should be invested in wildlife and program management.

The program has changed the perceptions of wildlife as a resource:

> Perceptions of wildlife as being a nuisance have changed dramatically. People are now so conscious about the value of even the smallest species of wildlife that they want each animal to be accounted for ... (CAPS 1997, p. 6)

According to one paper, a number of lessons have been learned from CAMPFIRE:

1. When people put a value on the resources they tend to protect, conserve and manage them.
2. When communities are empowered they make rational decisions about the utilisation of the resources.
3. Benefits can be derived from sustainable utilisation of the resources.
4. Utilisation of the resources result in the increased number of the resources.
5. Restoration of co-existence between wildlife and people by narrowing the extent of conflict. (*CAMPFIRE: Lessons from Zimbabwe*, p. 7)

Sources: WWF (1995); CAPS (1997); Martin (1992); *CAMPFIRE: Lessons from Zimbabwe.*

Some participants rejected the suggestion that kangaroos could be farmed (Animal Societies Federation (NSW), Sydney Public Hearing; Australian Wildlife Protection Council, Sub. 220; and Dr Heather Aslin, Sub. 304).

Animal Liberation (ACT) questioned the economic viability of farming some animals:

> Reports on the economic viability of farming of native animals seem to suggest most farms will not be able to obtain profits. ... In combination with the fact that kangaroos have a very slow growth rate and reproduction rate relative to sheep and cattle ... and the fact that most kangaroos only reproduce in good times means that farming kangaroos is unlikely to make profit. (Attachment to Sub253, pp. 7–8)

The Australian Wildlife Protection Council (Sub. 248) questioned the viability of harvesting wildlife, particularly kangaroos. It said:

> Arguments about cruelty and lack of regulation can and do impact on the marketability of wildlife products. ...
>
> There is little point opening up and expanding the kangaroo industry if markets do not exist for the products. (Sub. 248, p. 5)

However, Agriculture WA said:

> The ranching of indigenous animals can provide sufficient profitability for re-investment in the protection, management and rehabilitation of natural habitat and ecosystems. Enterprise and income diversification opportunities for pastoralists and farmers must be vigorously pursued if we are to achieve sustainable land management. This can extend to the harvest of native flora, allowing more farmers to protect or re-plant some native flora if it is shown that net income can be derived; beside the benefits of maintaining bio-diversity and habitat for native species. (Sub. 227, p. 2)

TRAFFIC Oceania (Sub. 218) suggested that the economic benefits of commercial exports of live wildlife were doubtful for the following reasons:

- the markets for species will drop as they become more readily available and demand will switch to rarer bird species (keeping the black market alive);
- many overseas markets will not allow imports of wildlife for conservation reasons or concerns that the species may become a pest;
- wild birds are unsuitable for the pet trade; and
- investors could suffer substantial losses from overcapitalisation in a new industry where the market could ‘bottom out’.

To take advantage of the market opportunities for highly valued Australian birds, the Northern Territory Government has recently proposed a trial for the export of the red-tailed black cockatoo.

In its initial submission to this inquiry, the Environment Centre of the Northern Territory said in *A critique of the proposed Wildlife Strategy and Management Program for the Red-tailed Black Cockatoo*:

> Market logic may be useful as a conservation tool if properly applied in some jurisdictions. The onus remains with those who propose trade in wildlife to justify and demonstrate the merits of the case. The mere existence of demand does not justify the supply. Nor does the increasing international pressure for trade, even when presented as a conservation strategy, substantiate the case in Australia. (Sub. 197, p. 4)

Representing the Environment Centre at the roundtable discussion in Darwin, Ms Jayne Weepers said:

> ... the current proposals that are up as future trials [such as the Red-tailed Black Cockatoo] ... have got no proven links between conservation outcomes and utilisation of the species.
>
> ... we do not think they are going to satisfy biodiversity, the ecological outcomes. (Transcript, p. 1051)

Mr Paul Mathewson, representing the Indigenous Land Corporation at the Darwin roundtable, said that, in addition to sustainability and conservation considerations, indigenous interests also needed to be accounted for.

Opportunities also exist to expand the current production of Australian native flora, particularly for export. The Commission notes that while global sales of Australian native cut flowers amount to over $400 million each year, only around 10 per cent is exported from Australia (Hamilton 1997).

Control of agricultural pests

The regulation designed to protect Australia's native flora and fauna can also result in some apparently perverse outcomes. For example, in some cases, a native species of considerable value overseas, such as the galah, is protected and cannot be exported live, yet is destroyed in large numbers in Australia because it is a pest to agriculture.

If a commercial/economic value can be attached to native flora and fauna, then landholders have an incentive to husband and harvest them rather than to consider their existence as a rival to existing commercial animals and land use. This suggests that opportunities for commercial uses should be explored and developed. As DEST said:

> In some cases the commercial use of native wildlife can be a more profitable form of land use than agriculture based on the more commonly farmed species, which are not native to Australia. (1997, p. 40)

In relation to the potential of commercial harvesting of kangaroos, Environment Australia said:

> Acceptance of kangaroos as a valuable resource to be managed, rather than as a pest to be eliminated, could lead to landowners managing their land to carry more kangaroos on their properties. (1996a, p. 1)

It noted the change in perceptions of the value of kangaroos:

> In recent years there have been changes in the way that kangaroos are viewed by the rural community. Increasingly kangaroos are being seen as a valuable natural resource for their meat and skins — rather than a possible rural problem. Harvesting kangaroos can change a problem into an important and valuable part of a farm's income and management. (1996b, p.1)

At the roundtable discussion in Darwin, Mr Bill Freeland, from the Parks and Wildlife Commission of the Northern Territory, said:

> If you look at the kangaroo industry in Queensland and New South Wales, the land owner is the only person who isn't involved. In other words, he is being taught by the way those industries are run, to view these kangaroos as pests, and he certainly does.
>
> ... So, what we're trying to do in the Northern Territory is with our crocodile industry ... we are endeavouring ... to ensure that it is, in fact, the landholder who has the option to sustain the use of the wildlife. ... Once the landholder has decided he wishes to be involved, he then has a range of options. (Transcript, pp. 1049–1050)

The Commission heard arguments from the Western Australian Farmers' Federation for the export of the pink and grey galah which is a native pest species not endemic to Western Australia. In support of the export of such birds, Kingwell (who also represented Agriculture WA in this inquiry) states:

> After considering these arguments concerning pest damage, it is clear that the harvest and export of pest species of native birds would reduce crop damage and bird control costs and would generate millions of export dollars. Official monitoring of these harvests and policing of exports, paid for through export licences would reduce the likelihood of local extinctions of pest species and increase deterrents for smuggling.
>
> One resolution adopted at the Kyoto meeting of CITES enables signatories to regulate trade to achieve sustainable wild populations of birds listed on Appendix II. Hence, harvesting pest species and even some other threatened species is consistent with CITES. In practice, however, several safeguards would need to accompany the export of these birds to deter smuggling and avoidance of payment of export fees. (1994, p. 267)

In the area of commercial use of wildlife, the problem does not appear to be one of restrictive legislation (with the exception of the ban on live exports for commercial purposes). State legislation does allow commercial use. The issue

appears to be one of the practical application of that legislation. In particular, because approvals for commercial harvesting of wildlife are largely in the hands of politicians and government departments, there appears to be a tendency to considerable caution in the face of vocal opposition from some groups in the community to the notion of commercial utilisation.

Conservation

In its submission to the Senate Inquiry into the commercial utilisation of wildlife, DEST (1997) said Australia's traditional approach to wildlife conservation through Crown ownership, legislative protection and provision of protected areas would not be enough to conserve Australia's biodiversity. It said:

> The challenge for wildlife agencies is to develop strategies which promote conservation outside the formal reserve system. The commercial use of wildlife has been identified as one strategy with the potential to achieve this outcome. (1997, p. 2)

and:

> The greatest environmental benefit of the commercial use of wildlife is the potential for it to act as an incentive for the maintenance and management of native vegetation on private lands, as well as a means of generating the financial resources required to manage the species involved and their habitats. (1997, p23)

As discussed below, commercial use by itself will not necessarily be sufficient to ensure conservation.

Animal welfare

Some participants were concerned with the cruelty involved in the capture of wild animals and argued that the humane transport of live wildlife could not be guaranteed. Some also questioned the suitability of some species as pets. They contended that Australia's native wildlife should not be viewed as a resource or exploited under any circumstances. They argued that Australia's native wildlife 'belongs equally' to all Australians and should not be exploited to the potential benefit of a few.

In the case of kangaroo harvesting, Environment Australia (1996c) considers that the ability to oversee and regulate harvesting results in more humane control than would otherwise apply. Environment Australia (1996d) says that the Code of Practice for the Humane Killing of Kangaroos sets a high standard for harvesting operations — though the effectiveness of this regulation was challenged in submissions on the Draft Report.

Questioning the level of enforcement of the code, ANZFAS said:

> Although a Code of Practice for the Humane Shooting of Kangaroos applies to the industry, it is deficient and unenforceable, and unlikely to be taken seriously by all of the thousands of shooters involved in the industry as they operate at night, in remote areas, and away from the public view. (Attachment to Sub.281, p. 6)

While Environment Australia (pers. comm.) agrees that it is difficult to enforce the code, shooters have an incentive to comply with the code as only animals shot in accordance with the code are processed. This requires that shooters have a high degree of skill and ensures firearms are maintained in good condition.

Effectiveness of regulation

The Commission notes participants general concerns about the current problems in enforcing the Wildlife Protection Act. For example, Animal Liberation (ACT) said that current controls were inadequate and ineffective:

> Current controls and resources for managing the wildlife trade are inadequate. The criteria under the Wildlife Protection Act 1992, which determine which programs should be approved, are far too weak. Current national law enforcement of wildlife use, monitoring and checking of export consignment etc is totally ineffective. (Sub. 216, p. 4)

TRAFFIC Oceania (Sub. 218) said that the existing legislation was not sufficient to ensure commercial utilisation is sustainable. It suggested the main shortcomings are: the lack of a requirement for an Environmental Impact Assessment; allowance for export as 'controlled specimens' not requiring a management plan; no monitoring of harvests; no monitoring of products; and exemptions from the Act. It suggested that, despite the 1992 review of the Act, little had been done to improve its enforcement.

TRAFFIC Oceania also said there were significant differences in the legislation relating to trade in each State. It noted:

> These differences create significant loopholes, facilitate wildlife crime and the black market within Australia, and effectively increases [*sic*] the burden on enforcement officials (McDowell 1997). (Sub. 218, p.2)

And:

> The lack of information on the level of domestic trade in native wildlife, combined with the lack of regulation and enforcement, lack of coordination between states and large illicit domestic trade in wildlife makes it difficult to judge the sustainability of the existing domestic commercial trade in native wildlife. (Sub. 218, p. 3)

In the Commission's view, the issue of adequate and appropriate safeguards and their enforcement must be addressed not only for any additions to the current trade in wildlife and wildlife products, but also as part of ongoing reviews of the current trade in wildlife and wildlife products. Its views are outlined below.

Transparency

In operating the export approval process for the utilisation of wildlife, the Parks and Wildlife Commission of the Northern Territory (Sub. 255) requested that the Commonwealth draw up with the States and Territories a mutually acceptable and transparent process for Commonwealth reviews of State and Territory wildlife utilisation programs. It argued:

> The Commonwealth should accept the results of the process that all such management programs go through before being accepted by the Northern Territory Government. This process ensures public and open consultation and results in robust and practical management programs. (Sub. 255, p. 1)

The Commission sees merit in the request as it clarifies and strengthens the respective roles of different regulatory agencies in our Federal system with its divided responsibilities in this area. This would avoid 'double jeopardy' and enable applicants to develop management programs that address not only State and Territory requirements, but also Commonwealth concerns.

Administration

The approach to administration of commercial activities may need to be changed. In many instances the design of a program can be as important as its existence in establishing incentives or disincentives for the major players.

For example, the design of existing kangaroo harvesting regimes appears to be unduly influenced by government administrative cost. It is generally easier and cheaper to administer harvesting through a small number of licensed processing facilities rather than regulating harvesting by a much larger number of individual landholders. However, under such an approach, landowners will continue to view harvesting as an occasional speculative activity centred around the control and removal of a pest rather than as a means of efficiently utilising a valuable resource.

This view of harvesting is reinforced by the current practice of issuing only annual licences, with little scope for long-term access rights under the current system, other than through tied arrangements with a licensed processor. While annual licensing may provide scope for more detailed control by government to guard against over-exploitation of existing populations, it introduces an

unnecessary high level of uncertainty for landholders seeking to develop commercial uses of wildlife based on sustainable populations.

The Kangaroo Industry Association of Australia requested the Commission to recommend that:

> in limited resource industries such as the kangaroo industry a system of processor licensing be implemented nationally that ensures an upper limit of processors consistent with competitive activity but which encourages capital investment in industry and attaches a commercial value to licences.
>
> the legal system be developed to deliver an impediment to those with philosophical opposition to wildlife utilisation from using misinformation to further their cause.
>
> governments should promote and champion the concept of wildlife utilisation as a means of developing agricultural systems more attuned to our environment and that funding should be developed for international campaigns to promote this concept. (Sub. 298, p. 1)

While its comments cover important aspects of the issues raised for ecologically sustainable land management, the Commission has not covered all aspects of the issues raised by the Kangaroo Industry Association due to the limited time and the very broad scope of this inquiry. If those aspects are not fully addressed by the Senate inquiry into the Commercial Utilisation of Australian Native Wildlife, there may be a case for further investigation into the development of the kangaroo industry.

In the Commission's view, an important feature of a successful program of commercial use of wildlife would be the granting of secure harvesting rights for landowners, and for these rights to be on a basis that enables long-term commercial decisions and investments to be made. This involves two issues. One, the right to harvest, and two, the amount to be harvested in a given period. As the quantity of the resource that could be harvested sustainably is unlikely to be known with a high degree of certainty and to vary with seasonal conditions, this could be achieved by issuing medium-/long-term licences with a variable harvest quota level based on tradeable shares of the permitted aggregate harvest.

TRAFFIC Oceania (Sub. 218) disagreed with granting secure harvesting rights on the basis that the ecological status of species is liable to change. This was also a concern of Animal Liberation (ACT) (Sub. 215) in relation to any form of commercial harvesting.

The Commission considers that, provided there is adequate monitoring of the population of the species to ensure its sustainability, secure harvesting rights should be granted and commercial harvesting continue. It also considers that with such security, the Commission's recommended duty of care to the environment (see Chapter 8) would provide in most circumstances for

landholders undertaking adequate monitoring of populations to ensure their sustainability.

The Commission notes TRAFFIC Oceania's (Sub. 218) objection to the application of the Commission's duty of care to wildlife harvesting. It said:

> The application of a Duty of Care principle as a primary means of regulating wildlife harvests may impose an unacceptable level of risk on the sustainability of the species being harvested, and its surrounding ecosystem. Wildlife harvesting would be best managed by a regulatory body with expertise in wildlife management, and the full range of regulatory options available to it, including on the spot fines and full prosecution. (Sub.218, p. 8)

The Commission considers that the degree of regulation and control advocated by TRAFFIC Oceania may be appropriate in some circumstances where the risks are unacceptably high — such as with some rare and endangered species — but that in the majority of circumstances where there is likely to be commercial interest, the Commission's duty of care provides for such risks in a cost-effective manner. The Commission also notes that the regulatory control advocated by TRAFFIC Oceania is expensive and of itself risks failure from a lack of funding and support for enforcement if applied extensively in situations were the risks are low.

15.3 Commission's assessment

The Commission acknowledges the seriousness with which many who oppose commercialisation of native wildlife view the issues they raised. It also notes that some views, like ethical views, are not amenable to compromise. However, a blanket ban of itself provides no safeguard. The real issue raised in many of the concerns is the effectiveness of the regulatory regime. It is to this issue that the Commission's recommendations are primarily addressed.

The question of potential problems caused in other countries by exported Australian wildlife is, in the Commission's view, rightly one for the sovereign nation concerned. Similarly, the question of commercial viability is rightly one for potential investors. The effect on tourism appears, at best, equivocal as no empirical evidence was presented to the Commission to substantiate the assertion of the effect being significantly negative.

In consideration of the seriously held concerns raised during the inquiry, the Commission recommends that the commercial exporting of live native fauna be facilitated by the Commonwealth, States and Territories in a manner which would build public confidence that further utilisation will occur only in the presence of adequate and appropriate safeguards.

A starting point may be for species where there is currently known to be an established illegal trade (such as for particular species of birds[5]) or for certain pest species (particularly birds) where trade does not conflict with Australia's obligations under CITES.

In this regard, the Commission notes the view of Humane Society International:

> If this inquiry is going to broadly support the commercial exploitation of wildlife ... it must differentiate between what species or category (flora or fauna) is appropriate and acceptable to the community. It must also ensure that strong, enforceable and fully transparent controls are in place to protect the species concerned and the individuals, and the role of the species in the complete ecosystem... (Sub. 238, p. 3)

The Commission considers that this involves the Commonwealth, States and Territories: agreeing to assess applications for the removal of export controls on a case-by-case basis conditional on there being an appropriate code of practice or management plan; developing and announcing measurable performance indicators and criteria to be used in assessing the effectiveness of such codes of practice or management plans; and where there is insufficient information to assess whether the criteria can be satisfied, approving the conduct of a trial.

The Commission proposes that, if trials are necessary, they be conducted by the relevant State/Territory agency in consultation with Environment Australia. The purpose of such trials would be to determine whether appropriate codes of practice and/or management programs can be developed and applied, and whether they can be enforced adequately.

Recommendation 15.1

The Commonwealth, States and Territories should facilitate the commercial utilisation and exporting of live native fauna in a manner which builds public confidence that further utilisation will occur only if adequate and appropriate safeguards exist.

To this end, the Commonwealth, States and Territories should:

- agree to assess applications for the removal of controls on the export of live native fauna on a case-by-case basis;
- make removal conditional upon there being in place a code of practice or management plan that satisfactorily addresses the conservation, animal welfare and cultural issues in utilisation;

[5] For example, white-tailed and red tailed black cockatoos in Western Australia (Kingwell 1994).

- develop and announce measurable performance indicators and criteria to be used in assessing codes of practice or management plans; and
- in cases where there is insufficient information to assess whether the criteria can be satisfied, approve the conduct of a trial for an agreed period to provide the necessary information, with safeguards appropriate for a trial.

In the Commission's view, such trials will also address other concerns raised by participants in terms of animal welfare and sustainability/conservation considerations.

The trials could also provide information relevant to establishing the economics of trade in wildlife. And if trade in a chosen species cannot be profitable enough under trial conditions, then regardless of satisfying all other conditions, it appropriately will not continue. As noted above, this is a commercial decision that rightfully should be left to potential investors.

Such trials could also encourage industry-funded research into particular species. Kingwell has suggested that industry could sponsor the research, conservation, administration and policing costs of government:

> Procedures of harvesting and exporting could be devised to ensure that bird populations and habitats were not endangered, that illegal harvesting and export were discouraged and that costs of regulation were fully recovered. One option would be for a government authority or contracted agency to research and monitor bird populations and decide on annual harvest numbers and locations. Avicultural exporters could tender for the right to receive some portion of the bird harvest with the tender revenue and subsequent export fees going to pay in part for the research, harvest, habitat protection, administration and policing costs of the government. (1994, p. 268)

A licensing system for native birds bred in captivity based on DNA fingerprinting could facilitate clear transferable property rights for these birds. The export permit fees would seek to cover the costs of administering and policing the industry, and part of the revenue from regulatory compliance would fund research and monitoring of wild populations.

The Commission also supports a number of specific recommendations made by DEST to the Senate inquiry on the commercial utilisation of wildlife which are of relevance to this inquiry (see Box 15.3).

It also notes the conclusions made by the Victorian Government to the Senate Inquiry into the commercialisation of native wildlife:

> Based on Victoria's experiences in the development of an industry based on the commercial utilisation of emus some principles are proposed for assessing emerging industries based on the commercial utilisation of native wildlife including:
>
> - a nationally uniform process for assessing the suitability of native wildlife species for commercial utilisation is desirable
> - principles and guidelines should be developed jointly by ARMCANZ and ANZECC and include consideration of the sustainability of wild populations, sources of animals and welfare issues when assessing proposals for utilisation
> - public consultation for each new wildlife species proposed for commercialisation should be undertaken (eg in Victoria the release of Regulatory Impact Statements for public comment are a requirement)
> - development of a sound industry plan which includes details of processing capital, market development, industry funding for R&D and structures for minimising environmental and animal welfare risks should be encouraged
> - provision of comprehensive commercial information to the market place to reduce the risk of non-viable, non-commercial starters, thereby minimising the need for market readjustment and risks to the environment is desirable. (Sub. 341, p. 17)

The Commission notes, the Victorian Government has approved an inquiry into the utilisation of Victorian native wildlife.

Box 15.3: **Commercial utilisation of wildlife: DEST**

Recommendation 8: Any large scale commercial use of native wildlife must include provision for independent and ongoing monitoring of the impact of the particular use regime on the species concerned.

Recommendation 9: Commercial use of wildlife can, and should, improve our knowledge of the species involved, not only through directed research which is funded by the commercial activity, but also by manipulating management regimes to test theories, as part of the commercial activity itself.

Recommendation 19: When considering how markets might be developed for wildlife use there will need to be some consideration of how economic instruments can be incorporated in the broader policy package to ensure sustainable use levels are achieved.

Recommendation 20: To ensure that farmers would be willing to invest in production from native species, and to be confident that there will be commercial returns, consideration should be given to:

- increased product and market research and development;
- establishment of an industry infrastructure;
- arrangements for long-term resource access, with clear responsibility and accountability for management of the resource;
- support for on-ground projects as trials or demonstrations;
- extensive promotion to farmers, including existing success stories, via farmer networks, facilitators, media etc; and
- consumer education and promotion, to create markets.

Recommendation 22: The community benefits of wildlife need to be considered when applying cost-recovery and user-pays principles to the administration of government controls over the commercial use of wildlife — a component of the costs of administration, which is commensurate with the public good value of wildlife, will need to be met from Government sources.

Recommendation 25: Any changes to policy or legislation should be supported by effective compliance and enforcement, with appropriate resources and training being provided for compliance and control function, with relevant stakeholders (including the community) sharing the costs.

Source: DEST (1997).

16 ENCOURAGING CONSERVATION AND REMEDIATION

The preservation of the richness of Australia's biodiversity is not well catered for under existing arrangements. This chapter reviews the variety of approaches that have been used to encourage conservation and remediation. These include: direct government provision through national parks and reserves; legislation to protect endangered species and habitat; the provision of incentives through the taxation system; the facilitation of private altruism; and the encouragement of conservation on private land through the use of conservation agreements. The Commission finds that, while all approaches have a role to play in preserving the richness of Australia's biodiversity, greater emphasis needs to be given to encouraging conservation on private land. In all these approaches, the Commission finds there is scope to improve outcomes.

Australia has a rich heritage of biodiversity because of its long isolation from other land masses. There is significant public demand to retain the richness of that heritage and on Australia's behalf, the Commonwealth Government has entered international agreements to do so (see Section 5.1, Chapter 5). The policies and actions of State and Territory governments are instrumental in meeting this public demand and in facilitating the required conservation and remediation of biodiversity. Much of this activity must occur on agricultural and pastoral land due to the extensive nature of such land. The nature of the public demand is such, however, that conservation and remediation of the richness of the biodiversity heritage are not able to be, or are poorly, delivered by the existing market system (see Chapter 4).

The Commonwealth Government ratified the International Convention on Biological Diversity in 1993. This commits Australia to:

- the conservation of biodiversity;
- the sustainable use of ecosystems, species and genetic resources; and
- the equitable sharing of any benefits from utilising genetic resources.

Among other things, Australia is required to provide legislative protection for endangered species; to regulate or manage biological resources which are important for biodiversity conservation (within or outside protected areas) and

activities likely to have significant adverse impacts on biodiversity; and to adopt 'economically and socially sound measures' which provide an incentive for biodiversity conservation (Young et al 1996, p. 17).

Domestically, the International Convention is reflected in the National Strategy for the Conservation of Australia's Biological Diversity. The National Strategy is a joint Commonwealth-State responsibility intended to strengthen conservation efforts across Australia.

Biodiversity is difficult to measure and value. The Australian and New Zealand Environment and Conservation Council's Working Group on National Parks and Protected Area Management has recently commissioned a study on State and Territory natural resource monitoring and performance standards (Environment Australia, Sub. 175).

A variety of instruments are necessary to promote the maintenance of biodiversity. This chapter briefly looks at each of these approaches, and considers impediments to their pursuit and what improvements could be made. Traditionally, biodiversity and other conservation objectives have been pursued through national parks and reserves (Section 16.1). Private altruism has also seen conservation undertaken on private land (Section 16.2). In addition, governments have legislated to protect habitat and endangered species (Section 16.3). More recently, governments have sought to encourage conservation through agreement with private landholders (Section 16.4), or through the provision of income tax concessions (Section 16.5).

16.1 National parks and state owned reserves

Historically, Australian governments have sought to achieve biodiversity and other environmental objectives through the establishment and expansion of national parks and other state-owned reserves. There have also been spin-off benefits for tourism, with almost half of all international tourists visiting a national or state park or reserve while in Australia (Office of National Tourism, Sub. 141).

This section discusses the under-representation, in the reserve system, of land suited to farming and grazing. It also highlights concerns raised during the inquiry about the management of reserves, including external effects on agricultural and pastoral land.

Representation in reserves

More than half of all major biogeographic regions in Australia are either not represented or are poorly represented in national parks and reserves (Young et al 1996). There is also a tendency for areas of poor biodiversity to be better protected than those of high biodiversity, as the poorer areas tend to have less economic value, and thus have remained as Crown land. In effect, state owned reserves often may not provide a representative sample of the ecosystems and species of a region, or of the nation. The State of the Environment Report found that:

> ... the patterns of protected-area coverage vary widely between biogeographic regions. There is no clear geographical pattern, but many biogeographic regions are below the 10 per cent level of representation recommended by the IUCN. ...
>
> Major ecosystems are heterogeneous in terms of physical and biological characteristics. High overall percentages in reserves can mask the fact that much internal variation is unprotected. In north-eastern New South Wales, for example, about seven per cent of the region is covered by national parks and nature reserves but some environments are protected poorly or not at all. High levels of bias in the distribution of reserves within ecosystems are common in Australia. Within many ecosystems, protected areas are concentrated in environments least prone to disturbance from intensive land uses while the most vulnerable environments are missed. (SEAC 1996, p. 4-28)

Land suitable for agricultural and pastoral use tends to be among the least represented in state owned reserves (see Figure 16.1):

> Alpine mountain and forest are two bioregions which tend to be well represented, as do some of the arid zones of marginal value to grazing. Specific areas such as south-west Tasmania and the Wet Tropics have been recognised as particularly important and also enjoy a far higher coverage. The most threatened habitats, and some of the most poorly protected, are those that are most suited to farming and grazing. (ABS 1996a, p. 216)

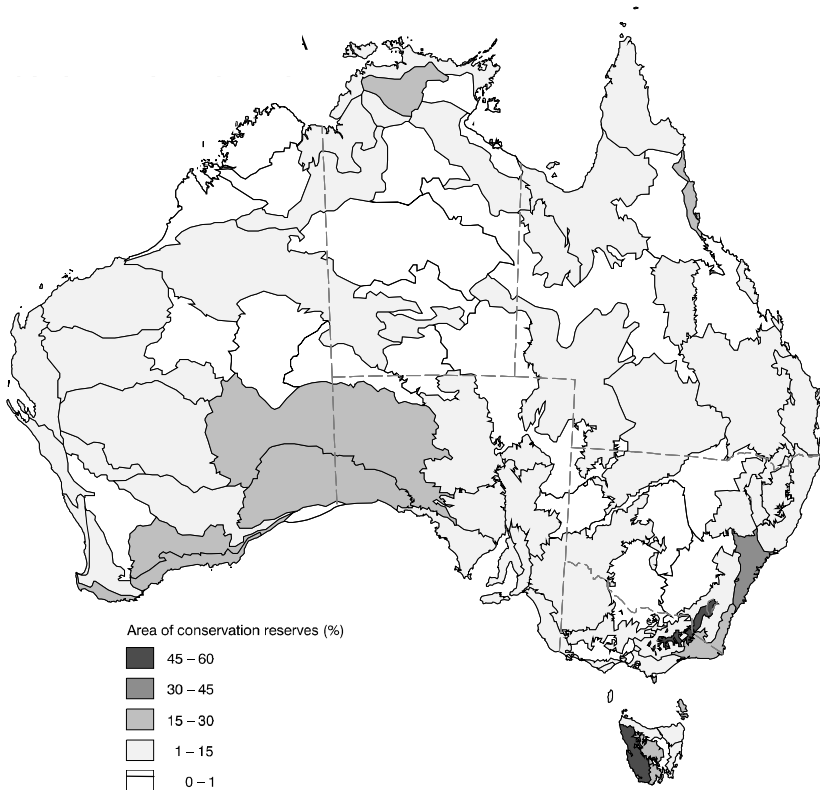
For example, only 0.2 per cent of the Riverina biogeographic region of New South Wales is in protected areas. In the Avon Wheatbelt region of Western Australia, protected areas cover just 0.5 per cent.

Under the National Biodiversity Conservation Strategy, the Commonwealth, States and Territories are seeking to establish a 'comprehensive, adequate and representative' system of protected areas by 2000. But whether the objectives of the National Strategy are achievable is highly questionable:

> At a purely financial level, the House of Representatives Standing Committee [on the Environment, Recreation and the Arts 1993] estimated that ... $150 million would be required over a period of six years for the acquisition of identified areas of private land [for inclusion in the reserve system]. The ... new Coalition Government [is committed] to providing additional funding of a mere

$16 million for the proposed National Reserve System. (Farrier 1996, pp. 11–12)

Figure 16.1: **Biogeographic regions of Australia covered by conservation reserves**



Source: Supplied by Australian Surveying and Land Information Group.

Ensuring the success of the National Strategy will require substantially greater funding or respecification of its objectives. The Commission has not explored this issue in detail. However, it observes that over-representation of some natural environments in state owned reserves, and under-representation of others, indicates a potential to obtain better value for money. Protecting more of the same, results in diminishing returns for each dollar of public expenditures invested in the reserve system.

In addition, there is the issue of whether conservation objectives are best achieved through state-owned reserves, off-reserve conservation (ie on privately-owned land) or some combination of the two. The House of Representatives Standing Committee on the Environment, Recreation and the

Arts (1993) concluded that the practical goal was for 80 per cent of the major ecosystems in each bioregion to be represented in reserves. Off-reserve management would be left to play a major role in relation to the remainder.

There are severe practical limits to the option of relying wholly on the system of state owned reserves. For example, the Minerals Council of Australia considered that:

> ... much of Australia's biodiversity is found outside currently protected areas and conservation of biodiversity will not be achieved solely through reliance on protected areas. (Sub. 176, p. 3)

One of the most serious questions raised concerns the environmental integrity of the existing piecemeal system of reserves:

> ... isolated reserves of less that 500 000 hectares require active interventionist management if they are to maintain their full complement of species in the longer term. Many of the existing nature reserves in Australia are less than 10 000 hectares. Boundaries of fragments are large in relation to the area incorporated, resulting in greater pressures from spillovers from outside, such as pesticides and flooding from neighbouring agricultural land. Fragmentation means loss of habitat connectivity with the result that areas will not be able to sustain populations of some species in the longer term in the absence of human intervention. Stochastic events, such as wildfire, can destroy a whole fragment. Management must take into account the singularities of each piece of land in light of the complexity of ecosystems and the fact that our current knowledge is very limited. (Farrier 1996, p. 13)

The Commission agrees with Farrier's (1996) view that 'Sustainable biodiversity conservation will not be achieved through the creation of protected islands alone. Complementary off-reserve management is crucial' (p. 7). Inevitably, areas of agricultural and pastoral land will need to be managed for conservation purposes. Sometimes this may involve joint production. At other times it may require management of the land solely for conservation purposes.

Management of Crown land

Several participants complained about the day-to-day management of state owned reserves, and Crown land more generally. For example, Top Woodlands Agricultural Bureau said:

> Parks and Wildlife, in particular, needs to take a more responsible role in the control of animal pests. ... The control of plant pests would be better achieved if they were dealt with at the appropriate times ... This applies especially to government land eg Shire roads, National Parks and forests. (Sub. 31, pp. 1–2)

There were particular concerns about the external effects of inadequate management of state owned reserves on private agricultural and pastoral land.

Concerns were expressed about whether management agencies were adequately resourced to address these issues. Mr K Kilpatrick, Chairman of the Southern Burrinjuck Landholders Association, stated:

> With the great increase in National Parks, there has not been a corresponding increase in personnel to be able to police and clean up their areas. ... Most people who live beside a National Park will tell you they are appalling neighbours and the build up of feral animals and weeds is a nightmare. (Sub. 114, pp. 1–2)

Macquarie River Food and Fibre commented:

> ... many in rural communities would assert that even those areas that are set aside for conservation purposes are frequently poorly managed partly because the community, in total, is not prepared to pay the costs of doing so adequately. (Sub. 77, p. 2)

These concerns included other Crown land such as state forests, railway and road easements, and the poor weed management and pest control associated with the management of this land (see also Chapter 2). This often resulted in the land becoming a seed bank for weeds and worked against effective weed control on all land. As Heathdon Agricultural Services said at the Sydney Public Hearing in November 1997:

> The railways are lousy with weeds, why should I control mine? (Transcript, p. 1902)

Governments have been progressively developing management plans for on- and off-reserve conservation. Under the Commission's proposed regulatory regime (see Chapter 8), government agencies responsible for any Crown land would be subject to the same environmental duty of care as other landholders. It will then be up to individual agencies to make whatever reasonable and practical improvements are necessary to alleviate the effects on their neighbours of their management of the Crown land in their care.

In most jurisdictions, communication between National Parks and Wildlife Services (NPWSs) and farmers are poor. This is marked by a mutual lack of understanding of, or sympathy for, the other's position. Poor communications are probably impeding the effectiveness of program delivery on the ground. This is compounded by the dual role of most NPWSs as park manager and off-reserve regulator.

To help improve this situation, NPWSs should make greater use of input from local landholders and non-profit conservation organisations such as nature trusts, by contracting them to undertake park management where this is more cost-effective. There is a number of non-profit conservation organisations currently managing conservation on private land capable of managing conservation on public land. These organisations are discussed in more detail in

the following section. Governments should also contract out the management of other Crown land on a similar basis. In this way, governments and their conservation agencies could utilise the local knowledge of land managers already in the area and non-profit groups for day-to-day management. Specialist support could be provided by the central agency on an 'as needed' basis, or through a system of regular visits and audits.

Recommendation 16.1

Each State and Territory should make greater use of local landholders and non-profit conservation organisations by sub-contracting to them, as appropriate, part or all of the day-to-day management of Crown land including national parks and reserves, particularly in more remote areas.

16.2 Environmental altruism

Some of the community's environmental goals are met by the voluntary actions of individuals and groups. This occurs through private altruism and, sometimes, the desire of landholders to avoid regulation.

There are a number of private non-profit conservation organisations undertaking conservation on private land. They include the Australian Bush Heritage Fund (see Box 16.1), the National Trust of Australia and the National Parks Foundation of South Australia.

Others are the Trust for Nature in Victoria (see Box 16.2), the Brown Mountain Trust and the Nature Australia Association Society.

Altruism can also result from commercial incentives, such as to enhance a company's standing in the community. The Mala Fund, established by the Central Australian Tourism Industry Association and the Pacific Asia Travel Association, was an example stemming from commercial incentive in the ecotourism industry. The fund was set up in 1991, but is now defunct. It raised $33 000 for research into the mala, or rufous harewallaby, an endangered marsupial found in the central Australian deserts (James 1997).

Box 16.1: **The Australian Bush Heritage Fund**

The Australian Bush Heritage Fund purchases and receives donations and bequests of private land of significant environmental value for permanent protection. The Fund seeks to conserve vegetation types that are not well represented in reserves or the habitat of threatened species.

The Fund is a registered company administered by a board of directors. Income is derived mainly from donations. In 1996–97, donation accounted for around 95 per cent of the Fund's income.

A panel of experts appointed by the Fund's board identifies land to be purchased for conservation and assesses the conservation values of land donated or bequested to the Fund. In cases where land donated or bequested to the Fund does not meet the conservation criteria of the Fund, part or all of the land may be sold and the proceeds used to preserve the remainder of the land or conserve land with higher conservation values.

The Fund commenced operations in 1990 with the purchase of two privately owned forest blocks in Tasmania to protect the area from clearing. Presently, over 1240 hectares of land is owned and protected by the Fund. These reserves include an island in Bass Strait, wet tropical forest in North Queensland and woodland in the south west of Western Australia.

Management committees, comprising local volunteers or immediate neighbours and representatives of the relevant government departments, are used to manage the reserves. Flora and fauna studies and most of the on-ground maintenance is undertaken by volunteers.

Source: Australian Bush Heritage Fund (1997).

Most jurisdictions offer assistance through the tax system to encourage private altruism for conservation of the environment. For example, land tax concessions apply in some States for land with high conservation values. New South Wales allows an exemption from land tax for land that is primarily used for the maintenance of endangered native species. (For more details of these approaches, see Young et al 1996, Appendix 1.)

While other States generally pursue conservation agreements with private landholders through NPWSs (see Section 16.4), Victoria has established its own not-for-profit Trust for Nature for this purpose (see Box 16.2).

Box 16.2: **Trust for Nature**

The Trust for Nature, previously the Victorian Conservation Trust, is a non-profit organisation established under its own act, the *Victorian Conservation Trust Act 1972*. The Trust is managed by a government appointed board of trustees representing different community interests and a director who reports directly to the Minister. In 1995–96, the Trust received just under half its revenue in the form of government grants, with the remainder consisting of investments, donations and membership fees.

The Trust uses covenants on private land entered into on a voluntary basis by the landholder to conserve areas of ecological significance, wildlife or plants, sites of cultural significance or natural beauty. The covenants are placed in perpetuity under the Act.

The Trust is also involved in promoting conservation through buying land of conservation value and selling this land to buyers sympathetic to conservation. The Trust also provides a range of services to the public such as habitat management advice, flora and fauna surveys and conservation education and training.

Under its act the Trust accepts gifts and donations, acts as a trustee of money and property, acquires and disposes of property, and transfers land to the Crown for purposes specified by the Trust.

Relative to NPWSs, the Trust has the distinct advantage of attracting donations from the public. It has conducted over 20 appeals, raising more than $3.5 million (Trust for Nature, Sub. 170, p. 1). Trusts with similar purposes exist in most other States independent of direct government support.

Sources: Trust for Nature (1997); (Sub. 170).

At the local government level, some councils offer rate concessions for land used for conservation. For example, in Queensland:

> Incentives for nature conservation activities on rateable land are available under the *Local Government Act 1993*. Landowners can obtain rate relief as an exemption under a regulation; under a differential rating scheme; or as a remission of rates. (James 1997, p. 103)

Government support for voluntary conservation efforts can complement alternatives such as national parks. They can also be a more cost-effective way, from the viewpoint of taxpayers, of delivering environmental benefits.

The Commission considers that, in principle, direct grants or tax and rate rebates would be preferable to tax and rate concessions or exemptions. The level of revenue forgone would then be more readily identifiable. Rebates and grants,

unlike exemptions or concessions, are easily quantifiable and are included as outlays in budgetary documents. This would improve both transparency and accountability.

Voluntary-based approaches to conservation have several desirable features. In particular, they are subject to the discipline of raising funds voluntarily, which requires the benefits of the use of the funds to be accounted for to donors. In addition, as funds are likely to be limited, there is a significant incentive to prioritise their use and seek synergies with other compatible land uses, such as ecotourism.

There are currently some disincentives to voluntary conservation efforts. They are likely to be undermined by government measures (such as agricultural assistance) which encourage other land uses. Of more direct relevance is the disincentive provided by the treatment of environmental altruism by Commonwealth, State and local government taxation.

For example, Ms Rosalind Stafford (Sub. 232) provided the following table (Table 16.1) to illustrate a number of disincentives to voluntary conservation on land not used for primary production in her submission to the inquiry.

From the table provided, Ms Stafford (Sub. 232) raised an anomaly in the assessment of land tax on rural land covered by a voluntary conservation agreement (VCA) in New South Wales. On a rural property used for primary production, the land under the VCA is not included in the assessment for land tax. Where a rural property is not used for primary production, the land under the VCA is included in the assessment for land tax. This is likely to act as a deterrent to those rural land holders not involved in primary production to engage in environmental altruism by entering into a VCA. It should be noted, however, that land used for the maintenance of endangered species in New South Wales is exempt from land tax.

The Trust for Nature considers that inadequate recognition of the value of permanently conserved private land to the national estate is reflected in the lack of tax deductibility and lack of concessions or rebates on rates and land taxes for landowners who donate land for conservation (Whelan 1996). It pointed to income tax deductibility as the ‘driving force’ behind the operation of land trusts in the United States (see Box 16.3).

Table 16.1: **Tax status of selected expenses associated with voluntary conservation agreements**

Expense	*Payable to*	*Main business primary production*	*No primary production*
Rates	Local government	deductible	not deductible
Land tax	State government	exempt	not exempt[a]
Leasehold rent	State government	deductible	not deductible
Enclosure permit	State government	deductible	not deductible
Rural Land Protection Board levy	Local Board	deductible	not deductible
Bushfire brigade levy	Local bushfire brigade	deductible	not deductible
Insurance	Insurance firm	deductible	not deductible
Weed and feral animal control	Rural suppliers, local government, private contractors	deductible	not deductible[b]
Fencing	Private contractor	deductible[c]	not deductible[d]
Gun licence	State government	deductible	not deductible
Vehicle running costs	Various	deductible	not deductible
Telephone	Carrier	deductible	not deductible

a An exemption may be available for land containing endangered species.
b A tax deduction may be available for expenditure on fencing immediately prior to sale of property.
c Depreciable as capital item, or deductible under Section 75D.
d May be recouped through increased sale value of property.
Source: Ms Rosalind Stafford (Sub. 232).

In Australia, land donated to a trust for conservation (whether donated outright or via a covenant) is generally not an eligible deduction for income tax purposes. Donations of money to charitable organisations such as the Trust for Nature are tax deductible. But donations of property are only tax deductible if the property has been owned for less than 12 months before the donation (Young et al 1996). There is little basis for such a time distinction from either an equity or efficiency viewpoint.

The treatment of expenditure on private nature conservation also differs from that accorded to approved work on buildings and structures of cultural significance that are recorded on a prescribed heritage list. For such approved heritage work, the Commonwealth currently allows a 20 per cent tax rebate

(Young et al 1996, Appendix 1). It is difficult to justify why nature conservation should be treated differently.

Recommendation 16.2

The Commonwealth, States, Territories and local governments should encourage environmental altruism as much as other forms of altruism and, as far as practicable, treat monetary and in-kind donations equally in this respect. In particular, expenditure on private nature conservation should be eligible for the same income tax treatment as applies to heritage buildings and structures; and the treatment of the donations of land to registered charities for conservation purposes should not be dependent on the date of purchase.

Donating land to be placed under a conservation covenant or agreement is also an act of environmental altruism. In principle then, a tax rebate should also be extended to land voluntarily placed under a conservation covenant or agreement. Consequently, governments should also examine providing taxation incentives for environmental altruism involving land donated for conservation agreements or covenants.

A number of safeguards would be necessary in providing incentives for this type of land donation to avoid abuse through tax minimisation schemes. For example, incentives should only be available where:

- an agreement has been entered into with a recognised body; and
- the method of determining the value of any deduction has been clearly determined.

In the United States, for example, income tax deductions for land donated for conservation agreements are calculated on the difference between the value of the land without the conservation agreement and the value of the land after the agreement is in place (see Appendix F).

Box 16.3: **Land trusts and conservation easements in the US**

In the United States use of land trusts is widespread. Land trusts are non-profit organisations which work with landowners who want to protect open land for conservation, recreation and other public benefits.

There are over 1000 non-profit national, regional and local land trusts across the United States operating under the national umbrella organisation, the Land Trust Alliance. The size and scope of these trusts vary. For example, the American Farmland Trust takes a nationwide focus to preserve farmland from urban expansion and is involved in lobbying the federal government from its headquarters in Washington DC. Other trusts have a more restricted mission. For example, the Medomak Valley Land Trust in Maine focuses on preserving the Medomak catchment area.

Land trusts protect over 4 million acres of land in the United States. These trusts protect open space of all kinds, including wetlands, wildlife habitat, ranches, shorelines, forests, scenic views, farms, watersheds, historic estates, and recreational areas. The land may be any size and type that has conservation, historic, scenic or other value as open space.

Land trusts also lobby public decision makers about the benefits of protecting open space, and conduct environmental education programs. Land trusts assist landowners to find ways to protect their land in the face of development pressure. They may acquire land through donation and purchase, and work with landowners to develop conservation easements (permanent restrictions on the title that prevent specified land uses).

In donating land for a conservation easement, landowners place voluntary restrictions on their land. In return the landholder is provided with a range of taxation benefits, while the trust is provided with a legally enforceable right over the easement conditions. The taxation benefits of voluntarily providing an easement are promoted by the trusts.

Under the US Internal Revenue Service code, conservation easement contributions can be treated as charitable gifts. The value of the easement can be deducted at an amount of up to 30 per cent of the donor's gross income in the year the gift was made. If it exceeds 30 per cent of the donor's income, the excess can be carried forward and deducted (subject to the 30 per cent limit) in each of the following five tax years. Similarly, most US state income tax laws provide a deduction for conservation easements.

Trusts also own and manage land which is donated to them. Similarly, properties can be donated to a trust as a 'remainder interest' whereby the owner continues to live on the land until a specified time (usually until their death), after which the trust gains full title over the property. In certain circumstances, a trust may agree to provide a lifetime annuity to provide income to landholders who agree to donate the land upon their death.

Sources: Land Trust Alliance (1997); American Farmland Trust (1997).

Governments should consider the use of conservation trusts such as the Victorian Trust for Nature to oversee conservation on private land. In addition to facilitating public donations, public funding could be provided to the trusts on a contestable basis to oversee these areas. Under such an arrangement, trusts would compete for the government funds allocated to conservation on private land. Some trusts are likely to emerge which could specialise in protecting certain environments (eg wetlands) while others could be more widely focussed.

There are a number of advantages in using conservation trusts as opposed to NPWSs for overseeing conservation on private land. This would act to limit the extent of any conflict of interest between the regulatory and management roles of a NPWS. It would also allow a NPWS to focus on managing national parks and reserves. In addition, trusts may provide greater efficiency in overseeing this conservation and avoid some landholder distrust of government conservation agencies. An important advantage of such an arrangement is that it allows private funds to be harnessed with public funds for conservation.

Recommendation 16.3

The States and Territories should consider contracting conservation trusts to oversee conservation on Crown and private land. This should be arranged on a contestable basis.

16.3 Use of regulatory measures

With more than 60 per cent of Australia's land area used for agricultural and pastoral activities, it is inevitable that the habitat for a large part of Australia's flora and fauna will also be found in this zone. To supplement biodiversity conservation in protected areas, governments have used regulatory approaches. These generally fall into two categories. Firstly, all States have legislation available which protects endangered species of flora and fauna (see Box 16.4). Secondly, most States also have legislation protecting native vegetation on private land, often with joint objectives of protecting habitat and limiting other effects (such as dryland salinity) (see Chapter 5).

Restrictions on clearance might seem an attractive means of protecting native habitats. Indeed, there may be circumstances where direct regulation is the only practical option. For example, immediate action may be needed as a temporary measure pending the collection and analysis of more information and the development of other approaches (as has occurred in New South Wales).

Box 16.4: **Legislative protection of habitats on private land**

Most jurisdictions have legislation in place to intervene on private land to protect the habitat of endangered species. Several examples follow.

In New South Wales, the Minister for Environment under the *Threatened Species Conservation Act 1985* can declare an area, on either public or private land, a critical habitat for endangered species, populations or ecological communities. After an area is declared a critical habitat, any damage to that habitat is an offence under the *National Parks and Wildlife Act 1974*.

In Victoria, under the *Catchment and Land Protection Act 1994*, a Regional Catchment and Land Protection Board can recommend that land in its regions be declared a special area to protect the land from degradation and to protect biodiversity.

In Queensland, the *Nature Conservation Act 1992* provides for the Minister for the Environment to compulsorily declare a nature refuge on private land. Also, the Minister can issue an interim conservation order over a wildlife habitat or area.

In Tasmania, the *Threatened Species Protection Act 1995* provides for temporary intervention on private land. The Minister for Environment and Land Management can issue an Interim Protection Order (IPO) to protect a critical habitat of a threatened species. The IPO specifies the activities or use of land within the habitat and can direct land owners to undertake any work specified in the order. The IPO is valid for 60 days on Crown land and 30 days on private land. An IPO is seen to be a last resort to allow time for further negotiation in situations where the Government and the landowner have failed to reach a voluntary management agreement to protect the habitat.

However, uniform controls pay insufficient attention to the nature and quality of the habitat being protected. This might be justified if all areas contained unique habitat. However, such controls provide no incentive to improve degraded habitat, and if the habitat being protected is already over-represented, costs are imposed on landholders and the community for little benefit. There is also a danger that the threat of restrictions may lead to more rapid species extinction as farmers clear land in anticipation of their introduction (Edwards et al 1996). Experience in Queensland provides an illustration:

> Draft Tree-Clearing Guidelines for leasehold and other Crown land in Queensland were announced in March 1995. ... The guidelines have led to some degree of panic clearing as land managers attempt to clear as much land as possible before the guidelines are formalised. (Young et al 1996, p. 24)

Box 16.5: **Vegetation clearing restrictions in South Australia**

Initial controls on the clearance of native vegetation were introduced in 1983 through regulations under the *Planning Act 1982*. Approval was required from the State Planning Commission.

Specific legislation aimed at controlling land clearance, the *Native Vegetation Management Act 1985*, set up the Native Vegetation Authority to make decisions on clearance applications. If approval was not granted, landholders were encouraged to enter into a Heritage Agreement with the government. This entitled landholders to the cost of fencing the relevant area and to 'financial assistance' according to a set formula, essentially compensation. The financial assistance excluded income forgone, but included recompense for the difference between the value of the uncleared productive land and that of the non-productive land, as assessed by the Valuer General.

Problems with landholders applying for consent to clear, in the expectation that approval would be denied and compensation paid, led to new legislation, the *Native Vegetation Act 1991* which does not provide for automatic compensation. This established the Native Vegetation Council with responsibility for making decisions on the conservation and clearance of native vegetation. Its seven members come from the SA Farmers Federation, the Local Government Association, the State Soil Conservation Council, the SA Conservation Council, the Commonwealth Government, and two appointed by the Minister — a presiding member and a person with extensive knowledge of preservation and management of native vegetation.

Landholders are required to obtain approval from the Native Vegetation Council before clearing can occur. Generally, conditions may be attached to any consent to clear. No broadacre clearance applications have been approved under the Act. Where consent is granted to clear isolated plants or scattered trees, conditions are attached requiring revegetation. These usually require the environmental benefits of the revegetation to outweigh that lost by about 10 to 1. Regulations attached to the Act permit native vegetation up to 5 metres either side of fence lines for a fire break, or a vehicle track of up to 5 metres in width, to be cleared without consent (provided the land is not under Heritage Agreement).

Source: Working Group on Nature Conservation on Private Land (1996).

Unless such approaches are accompanied by compensation (as occurred in South Australia), the full cost of meeting the community's biodiversity and other conservation objectives is imposed on landholders. The retention of uncleared land can represent a significant opportunity cost to landholders in terms of income forgone from agricultural and pastoral uses. At the same time, such areas of land still need to be managed in an active way, at the very least to control weeds and feral animals.

The New South Wales Government expressed concern at the cost of paying compensation to landholders to protect native vegetation and said:

> To compensate all landholders for the loss of potential income resulting from vegetation preservation would be very expensive ... (Sub. 325, p. 15)

Compensation has not been widely used as an element of regulation of land clearing. The situation in South Australia is in many ways an exception (see Box 16.5). There are arguments that say that compensation should have been offered — not the least of which is the discipline it would have placed on the wider community's demand for remnant vegetation protection. However, restrictions now exist in all States and, there would be little to be gained with re-opening the question of compensation for past decisions of government in this area.

In addition to imposing the bulk of the cost of conservation onto landholders, clearing restrictions, in effect, penalise the wrong party. Landholders who have been 'responsible' from a conservation viewpoint, and have kept significant areas of habitat, bear the brunt of the restrictions. Those landowners who have already extensively cleared their land are much less affected.

The more inflexible the restrictions, the greater the likely costs imposed on agricultural and pastoral activities. Allowing at least some flexibility (for example, permitting clearance of regrowth and taking account of habitat 'offsets') can reduce the costs. But there are some practical limits. Permitting trade in the rights to clear, for example, would be complex. A quota specified on the basis of area of habitat alone would be inadequate to take account of the contribution of the vegetation in different areas to soil conservation, water quality or biodiversity (NSW Department of Land and Water Conservation, Sub. 90).

The problems with current approaches to the regulation of habitat on private land highlight the need for alternatives. The Commission's proposed environmental duty of care and associated codes of conduct would address the problem in a positive and productive way (see Chapter 8). For example, under the proposed duty of care, farmers would be expected to report significant flora, fauna and habitat on their land to the relevant agency. They would also be required to prevent any loss of biodiversity where it was reasonable and practical to do so. The practical extent of what needs to be done would be set out in the code of practice for the particular locality.

There may be some circumstances where the environmental duty of care proposed by the Commission could make a positive contribution to biodiversity

conservation. This would be the case where a code of practice specified retaining a minimum proportion of local native species or habitat.

As the costs of biodiversity conservation rise, at some point it becomes both inefficient and inequitable — unreasonable and impractical — to expect individual land managers to fund biodiversity conservation as part of their duty of care. As discussed in the next section, the community should be expected to incur these additional costs.

16.4 Conservation on private land

The public good nature of biodiversity and environmental amenity indicates that relying on altruism, even with encouragement from governments, is likely to be insufficient to meet community demands in a number of cases. And relying solely on publicly owned reserves is likely to prove both inadequate and expensive. Large tracts of remaining bushland in rural areas, for example, occur on private land leased from the Crown.

Australian governments have recognised that complementary off-reserve conservation management will therefore be essential if community biodiversity conservation goals are to be met. For example, the NSW Department of Land and Water Conservation (Sub. 90) concluded that 'Private land has a critical role to play in the maintenance of biodiversity values' (p. 7).

The National Biodiversity Strategy specifically recognises the need for biodiversity conservation on private land. It identifies several areas for priority attention: migratory species; threatened indigenous species; remnant vegetation; wetlands; and corridors between protected areas. It also highlights the need for adequate, efficient and cost effective incentives to conserve biological diversity (Environment Australia, Sub. 175).

As many inquiry participants acknowledged, ensuring that on-farm habitat is adequately managed for conservation purposes will require the community to contribute to the costs. Macquarie River Food and Fibre, for example, argued that:

> As species diversity is of benefit to the whole community, not just a landholder on whose property such species occur (and indeed for the landholder there may be extremely little "value" in the species or in any case no more than that for any other member of the community) then attention should be given to constructing equitable ways for species protection. ... the whole community could be reasonably asked to contribute to an individual landholder to do so with a system of performance agreements. ... You are then much more likely to have landholders feeling very positive towards species preservation, rather than

> feeling they were being loaded with a responsibility just because of where they happened to live. (Sub. 77, p. 3)

Similarly, the Canegrowers stated:

> If private land is to be used for conservation purposes, assistance with management and rate relief is critical. Canegrowers cannot be expected to fund land rates, maintenance costs and lost opportunity for income generation from an area which is to be preserved for the benefit of the broader Australian community. (Sub. 199, p. 6)

The wider community would, however, only be expected to contribute to the cost of using land for conservation purposes above the level that would occur as part of the duty of care:

> ... we certainly do not need public funding equal to the estimated size of the public benefits. Throughout the economy public benefits frequently free ride private investment. Good policy takes advantage of this by only interfering, particularly in regard to funding, to the extent sufficient to secure the desired change in the behaviour of market participants. (Hussey 1996, p. 11)

The Tasmanian Government (Sub. 319) believed that any payment to landholders for conservation purposes was inconsistent with the duty of care. However, as noted above, individual land managers as part of their duty of care are required to meet the costs involved in complying with the duty. The community would only be expected to fund biodiversity conservation past the point where it falls outside the duty of care.

Furthermore, the Tasmanian Government (Sub. 319) believed that any payment would adversely affect environmental altruism. It said:

> ... and mitigates against appealing to the altruistic instincts of landowners who in many cases would, and have, volunteered to conserve the particular resources without compensation. (Sub. 319, p. 7)

The Commission acknowledges that stewardship payments for conservation purposes on private land may adversely affect the extent of altruistic conservation by some landholders. However, it should not reduce the place of altruism in supplementing other efforts and catering for particular situations. Stewardship payments must necessarily be limited and should be used in situations where the conservation benefits are not otherwise obtainable or involve greater cost.

Publicly-funded welfare programs co-exist along side those of the charitable organisations that are funded by private altruism. While the former have probably reduced the demand for the services of the charitable organisations to some degree, it is also true that the two complement each other to a significant

degree (IC 1995d). The Commission expects that much the same type of relationship would develop in the area of environmental altruism.

Current approaches

Most State governments use agreements with private landholders for conservation purposes. But the extent and success of this type of approach has varied greatly (see Table 16.2). In total there are nearly 2400 conservation agreements covering over 600 000 hectares of land. The details of the arrangements used in each jurisdiction are summarised in Appendix F.

The bulk of the conservation agreements, by number and by area covered are in South Australia and Western Australia. These jurisdictions provide financial assistance for fencing to protect the land under agreement, which otherwise would be a significant cost to the landholder.

South Australia

The large number of the agreements in South Australia are a result of the 'compensation' paid to landholders, under previous native vegetation legislation. Where approval to clear was not granted, landholders were encouraged to enter into a Heritage Agreement. By entering into a Heritage Agreement, landholders became eligible for compensation (see Box 16.5). As Binning and Young said:

> ... landholders were compensated for entering Heritage Agreements that resulted from land clearing legislation. The payments were costly, over $70 million, but were effective in putting 650 agreements in place in a short space in time. (1997, p. 45)

Problems with landholders applying for consent to clear, in the expectation that approval would be denied and compensation paid, led to new legislation. The *Native Vegetation Act 1991* does not provide automatic compensation. A new body, the Native Vegetation Council has the responsibility for approving clearing permits. Assistance to cover the cost of fencing and some management is still provided to landholders entering Heritage Agreements, but there is no longer compensation as a right upon a refusal to clear.

In total, over $75 million has been provided over the last 10 years for the management and fencing of areas covered by Heritage Agreements. Of this, between $6 to $7 million has been provided for fencing. Also, land covered by a Heritage Agreement may be exempted from rates and taxes.

Western Australia

In Western Australia, the large number of agreements and areas of land covered by agreements are a result of the financial assistance available for fencing. Assistance for fencing was originally set at $600 per kilometre of fencing — equivalent to nearly half the cost of materials. Assistance for fencing is now at $900 a kilometre and is under consideration to be raised to $1200 a kilometre. This would cover the cost of materials in many situations.

The Western Australian scheme has demonstrated that incentives have helped to expand the number of landholders entering into conservation agreements. In addition to the financial assistance provided for fencing, the fixed 30 year period of the agreements rather than a perpetual agreement may have also contributed to the uptake of the scheme (Binning and Young 1997).

Victoria

In Victoria, nature conservations programs on private land are administered by both the Trust for Nature and the Department of Natural Resources and the Environment. A Land for Wildlife program also operates in Victoria administered by the Department of Natural Resources and the Environment and a similar scheme is about to be introduced in Tasmania. These programs are non-binding voluntary schemes that allow landholders to register their properties where areas on the property are actively managed for nature conservation. The program encourages and assists landholders to manage their land for conservation by registering their property and providing management advice. A landholder can remove their property from the register at any time (Binning and Young 1997).

The Trust for Nature uses covenants on private land entered into on a voluntary basis by the landholder to conserve areas of ecological significance, wildlife or plants, or natural beauty. The covenants are permanently registered on the land title. Properties are inspected every three years to ensure that conservation values are being maintained with the costs of registering the covenant being met by the Trust.

The Trust has registered over 200 covenants protecting more than 8000 hectares (Trust for Nature, Sub. 170). The cost to the Trust of acquiring a 35 hectare covenant, including the inspection process and legal processing of the title, is approximately $3000 (Trust for Nature 1997).

The Trust also promotes conservation by buying land of conservation value. It has purchased over 100 properties totalling in excess of 7000 hectares. About half have been transferred to the Crown for incorporation into national or state

parks. In addition, 10 per cent have been sold to 'conservation minded owners', with the balance retained by the Trust (Trust for Nature, Sub. 170, p. 1).

In other jurisdictions the slow uptake of agreements is a result of the lack of incentives and resources available.

Queensland

In Queensland, the *Local Government Act 1993* makes provision for local government authorities to differentiate rates or provide rate exemptions for private land used for nature conservation purposes (Working Group on Nature Conservation on Private Land 1996). However, in Queensland:

> ... local governments face special problems in implementing conservation policies as there are no provisions for covenants in land titles. Economic incentives are thus an important mechanism for achieving environmental protection. (James 1997, p. 103)

However, the use of conservation agreements in Queensland has been limited by the lack of incentives. The Queensland Government said:

> ... few conservation agreements exist on freehold land to supplement parks at this stage due mainly to the lack of incentives to enter into such agreements. (Sub. 164, p. 16)

New South Wales

In New South Wales, past lack of funds and staff resources have meant that considerably fewer agreements have been concluded. In 1994, the NSW Government announced a commitment to conservation agreements of $400 000 per annum for five years. By 1997, 11 agreements had been entered into and a further 160 were being actively pursued (Binning and Young 1997).

The Local Government Association of New South Wales has made representation to the State government to have land subject to conservation agreements exempted from rates (Local Government and Shires Association of NSW, Sub. 276).

Promoting the use of conservation agreements

The Commission considers that conservation agreements with landholders offer an effective instrument for biodiversity conservation on private land. Such an approach can harness individual empathy to achieve conservation objectives.

Conservation agreements do have limitations. As Environment Australia commented:

> ... landholders need to be very committed and even when they are, problems can occur if land use changes around them. ... 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. (Sub. 175, p. 25)

If the pursuit of conservation objectives involves setting aside other productive activities then there are potentially two costs involved. One is the opportunity cost of production on the land forgone. The other is the ongoing costs of managing the land to retain its conservation values. In principle, the use of conservation agreements should recognise both these costs when they are important to the achievement of conservation objectives.

Any stewardship payment or compensation settlement provided should be from general revenue to provide both transparency and accountability for the costs incurred in managing the biodiversity for the wider community benefit.

In providing for ongoing payments for active management of conservation, consideration needs to be given to administrative arrangements to ensure value for money and accountability. In this regard, contracting out the management of biodiversity conservation to non-government conservation organisations, such as charitable trusts, should be examined .

The Commission considers that the range of terms and conditions offered by most State and Territory governments in their conservation agreements are too restrictive. In most cases, the only option is an agreement in perpetuity. This is unlikely to be attractive to many landowners. Indeed, a number privately expressed concerns to the Commission about being locked in to such an agreement were there to be a change of government to one that is antagonistic to the rights of the landowner. While the risk of this being realised may be felt to be slight, such perceptions undermine the attractiveness of conservation agreements. Sympathetic and enlightened administration of these agreements will help to build the trust between government and landowners that can counter such perceptions. In the Commission's view, a concrete reform would be for governments to offer landholders agreements with a range of terms of conditions attached to them. Landowners should be allowed to select the combination that best suits their circumstances and not to be expected to take only the terms and conditions governments believe they should accept.

Different jurisdictions have different conservation priorities. The Commonwealth sets national priorities, State governments focus within their jurisdiction while local government may focus on a particular piece of

vegetation or water course. Where priorities overlap, cost sharing between jurisdictions is appropriate.

In principle, the Commission considers that, in making payments for conservation agreements, the Commonwealth should be responsible for funding the States to secure conservation agreements where these were required to meet Australia's national priorities. State governments should be responsible for conservation agreements to meet the environmental objectives of their respective State. And local governments, catchment and other regional groups should be responsible for pursuing local and regional environmental objectives within their area of jurisdiction.

Existing legislative provisions which enable areas of private land to be declared as a critical habitat for endangered species should remain (see Box 16.2). But they should be used only as a last resort if voluntary agreements are refused, and should be accompanied by compensation where appropriate.

Recommendation 16.4

The Commonwealth, States and Territories should use conservation agreements for the management and conservation of biodiversity and natural heritage on private land holdings. Conservation agreements should:

(a) be offered to landholders on a voluntary basis;

(b) be available for a range of time periods, terms and conditions to allow landholders to choose the combination which suits them best;

(c) pay the landholder for the financial costs of conservation management; and

(d) pay the landholder for forgone economic opportunities where this is necessary to secure the landholder's agreement.

Recommendation 16.5

Local government authorities, and appropriately constituted local and regional land and natural resource management bodies, should be permitted to achieve their conservation priorities by entering conservation agreements with private landholders.

The Commission considers that effective forward planning would be best achieved if a single agency within each jurisdiction was responsible for the

development of policy in both on- and off-reserve conservation in a more systematic manner than occurs currently through NPWSs in most States.

To promote the efficient use of funds, there should be publicly announced national, state and regional conservation strategies which clearly establish priorities. Community participation (at the farm, catchment and regional level), including Aboriginal and agricultural landholders, in identifying and prioritising threatened ecosystems, species and habitats, will be necessary to achieve ownership of the strategies.

Expenditure on conservation agreements with private landholders should only be for projects that are consistent with the announced priorities of the relevant government, and should take into account the conservation benefits provided by non-government organisations. Projects which do not meet these priorities should be left to not-for-profit, local government, catchment management or other regional natural resource management bodies.

The Commission also sees merit in each jurisdiction having access to an independent body to provide objective advice on nominated environmental issues and associated community values. The provision of such advice would assist governments in determining priorities for their expenditure on natural heritage and biodiversity conservation. Currently, there are several bodies which perform these types of functions, but only in specific areas. For example, in New South Wales, the Healthy Rivers Commission provides independent advice on water quality and environmental flow objectives for particular catchments, the Victorian Catchment Management Authorities execute catchment management plans and the Resource and Conservation Assessment Commission coordinates regional assessments as part of the National Forest Policy process. Where possible an existing agency should be used for this role.

Recommendation 16.6

Each State and Territory should nominate a single agency to be responsible for the development of policy for both on- and off-reserve conservation of biodiversity and natural heritage.

Recommendation 16.7

The Commonwealth, States and Territories should develop and publicise strategic and operating plans setting out their priorities for funding on- and

off-reserve conservation. These plans should be prepared in consultation with the interested parties, including Aboriginal and agricultural landholders.

Recommendation 16.8

The Commonwealth, States and Territories should agree and publicise their strategic priorities for funding conservation of biodiversity and natural heritage. Commonwealth, State and Territory expenditure on conservation agreements with private landholders should only be for projects which are consistent with the announced priorities of the relevant government.

Recommendation 16.9

The Commonwealth, States and Territories should each ensure it has access to an independent body to provide objective advice on nominated environmental issues and associated community values. In doing so, the body should use open and transparent processes and allow opportunity for public input. Jurisdictions should consider sharing the same body.

16.5 Income tax concessions

The following discussion of the use of income tax concessions to encourage conservation draws on the more detailed account of current income tax provisions provided in Appendix E.

Recurrent expenses

Section 51(1) of the *Income Tax Assessment Act 1936* allows deductions from assessable income for items of expenditure incurred in:

- gaining or producing assessable income; or
- carrying on a business for the purpose of gaining or producing such income.

Where the expenditure of a taxpayer incurred in earning income from one activity exceeds the income earned from that activity, the excess may be deducted from income earned from another, unrelated activity (known as ‘negative gearing’).

It was brought to the Commission’s notice, that although there may be significant costs associated with managing land under a conservation agreement (eg weed and feral animal control, fencing), no tax deduction is allowed. This is

because where the land is managed solely for conservation, it does not earn income from which such costs may be deducted. And, as it is not managed for the purpose of gaining income, those costs cannot be deducted from other income. Rosalind Stafford, who has been involved in a number of Voluntary Conservation Agreements in New South Wales, said:

> There are a whole lot of things that are involved in just owning land ... Two of our properties are perpetual leases so there is a rent there. Enclosure permits for roads, crown reserve roads. And the last thing you want running through a conservation area is a crown reserve road, but you can't do much about it. You still have to pay for it. You're not grazing it or anything. Rural Land Protection Board Levy, and there is a case there for contributing to that because although you don't have the stock costs associated with their management that they do they also manage feral animals and weeds. And bush fire brigade, insurance, weed and feral animal control, fencing, et cetera, et cetera.
>
> All of these are tax deductible to the primary producer, but when you've devoted your property essentially to conservation they're not because there's no income from the property. (Transcript, p. 1646)

The Commission considers it is appropriate that costs related to land which is managed for the private enjoyment of the owner only, should not be eligible for a tax deduction. However, as discussed earlier in this report, there are wider community benefits associated with land managed under conservation agreements. One of the Commission's recommendations is that in recognition of the wider community benefit, in some situations, stewardship payments be made to landholders for the costs of conservation management over the period of the agreement (see Recommendation 16.4). Such payments should be recognised as assessable income derived from the land. Similarly then for taxation purposes, any costs associated with earning that income will then be able to be claimable against that income.

Conservation expenditure

Primary producers, in addition to the normal deductions for recurrent expenditure, are eligible under Sections 75B and 75D, for the deduction of certain items of conservation expenditure.

Section 75B of the Income Tax Assessment Act allows primary producers to write off, over three years, capital expenditure on plant or structural improvements for the purpose of conserving or conveying water. Items include dams, tanks and tank stands, bores, wells, irrigation channels, pipes and pumps.

Section 75D allows the writing off, in the year incurred, of capital expenditure primarily and principally to control land degradation. Eligible expenditures

include the eradication of weeds and pests, fencing for certain specified purposes, and tree and shrub establishment.

According to the Australian Taxation Office, expenses claimed for the 1994–95 income year under Section 75D were $62 million. It estimated the value of the concession to farmers at $14 million.

As part of the Natural Heritage Trust measures, the Commonwealth Government has announced that from 1 July 1997 farmers will be able to choose between claiming a tax concession and a tax rebate or credit at the rate of 34 cents in the dollar. For this purpose, $80 million has been committed, via the National Landcare Program, from the Trust. In announcing this change, the Minister for Primary Industries and Energy said:

> The rebates or credits are aimed to directly help farmers with low incomes to establish and maintain on-farm Landcare works. (Anderson 1997b, p. 1)

Effectiveness of concessions

Tax concessions constitute, at least for those landowners with taxable incomes, a community subsidy for addressing land degradation measures. Such a subsidy could be justified where there are external benefits associated with improved land management practices. However, as noted by Peterson, tax concessions:

> ... do not discriminate between land degradation measures which have large off-site effects and those which have primarily on-site effects. (1995, p. 26)

The Australian Bureau of Agricultural and Resource Economics (ABARE 1996) also found that the tax concessions do not target the degradation problems that cause the largest off-farm costs.

Those farmers who are not earning taxable income will receive no benefits from a tax concession, and its inducement power will be less accordingly. Ms Liz Abel said:

> Use of tax deductions as an encouragement for adopting sustainable land management is not relevant for a large proportion of the farming community who in many years have little or not taxable income. (Sub. 60, p. 4)

Another feature of tax concessions is that they provide higher benefits to those farmers on higher marginal tax rates who are best able to fund the projects themselves. The SA Government considered that the problem with providing farmer support through the taxation system is that they are biased towards farm businesses able to take advantage of them, while:

> ... those with smaller taxable incomes may more frequently be the preferred target group for the incentive program. (Sub. 84, p. 35)

The Queensland Grain Growers Association (Subs. 61, 207) said that because few producers pay regular tax, alternative financial incentives have the potential to produce better outcomes. Alternative incentives suggested included concessional loans, grants for various purposes, rate rebates, compensation for land set aside and investment allowances.

Apart from their ability to increase landcare expenditure, there is the question of how effective the concessions are in reversing land degradation. Some consider that they may well result in more, rather than less degradation.

Chisholm (1994) points out that some farmers may have more intensively exploited their land because the private costs of rehabilitation are reduced by the tax concession. Consequently, rather than reducing land degradation:

> ... subsidies for land rehabilitation ... provide an incentive towards increasing the future supply of land in need of rehabilitation. (Chisholm 1994, p. 19)

NSW Agriculture said:

> Subsidising remedial measures ... may ... provide an incentive for farmers to run down their resource base in the knowledge that concessions will subsequently be available to correct the problem. (Sub. 186, p. 22)

The Victorian Government said Sections 75B and 75D have a number of deficiencies as economic instruments to address land degradation and that:

> ... tax incentives have in some cases inadvertently encouraged land degradation by lowering the marginal private costs of primary producers and encouraging them to degrade their land. (Sub. 172, p. 11)

From 1 July 1997 landowners were given a choice between a deduction and a rebate or a credit. This change may overcome some of the incentive problems associated with tax concessions. The National Farmers' Federation (Sub. 294), however, said that they still do not provide an incentive to those with taxable incomes below the tax free threshold or who make a loss. It said:

> In order to remedy this distortion, it is desirable that the proposed tax rebates or credits be made refundable. (Sub. 294, p. 12)

16.6 Conclusion

In conclusion, the Commission considers it needs to be recognised that there is a significant public demand to preserve Australia's biodiversity. To meet this demand, there is a need to complement the government provision of national parks and reserves through increasing conservation on private land. The Commission considers that conservation agreements with private landholders could be used to a greater extent by governments to achieve their conservation

priorities in a cost-effective manner. To encourage their use and promote other acts of environmental altruism, such as the donation of land, governments should provide suitable incentives to private landholders.

Environmental altruism is no different to any other forms of altruism, and as with other altruistic acts it should be encouraged and, to the extent practicable, be treated equally. In some instances, altruism and the use of general incentives may be insufficient to preserve areas of high conservation value on private land. In these instances, it may be necessary to compensate the landholder for other productive uses forgone and pay a stewardship payment to manage the land and associated natural resources on behalf of the wider community.

17 NATURAL HERITAGE TRUST

The Natural Heritage Trust attracted strong community support, but its predecessor programs were subject to a number of criticisms by the participants to the inquiry. These related to the distribution of funding between programs, the setting of priorities within programs, the commitment to long term funding of projects and the need for improved accountability.

To address these concerns there is a need to adjust some of the frameworks inherited by the Natural Heritage Trust. This is being undertaken in implementing the Natural Heritage Trust. However, in doing so it needs to be remembered the goal should be to promote the greatest net public benefit from the substantial investment of public funds through the Trust.

This chapter discusses the effectiveness of the program and proposes changes to the broad framework of the Natural Heritage Trust (NHT) to improve its overall effectiveness. These proposed changes focus on the articulation of well-defined and measurable outcomes that are essential for the effective performance and accountability of the Trust. In addition, improving decisions on project funding, the terms of funding and better integration of community and government priorities are discussed.

17.1 The Natural Heritage Trust

The NHT was formed in 1997 to improve Australia's environmental infrastructure. Expenditure of $1.25 billion is to be allocated through the Trust over the five years to 2001–02. The funds are to be managed in accordance with the following principles:

- funds are meant to stimulate significant improvement in and greater integration of biodiversity, land, water and vegetation management on public and private land;
- funds are to address the causes of problems rather than their symptoms;
- interaction between local communities and government agencies will be transparent, integrated and readily understood;
- funds will encourage management systems with long-term environmental, economic and social benefits;

- because they have prime responsibility for managing their land, individual landholders will be encouraged to make the necessary investments to achieve high standards of performance in natural resource and environmental management; and
- the States and Territories have primary constitutional responsibility for natural resource and environmental management, in keeping with the goals of the National Strategy for Ecologically Sustainable Development.

The funding is provided by way of five groups of programs — vegetation, rivers, biodiversity, land resources and coasts — delivered at four levels — community projects, regional strategies, the State and Territory component, and Commonwealth activities.

- The *community projects* are to assist community groups to develop proposals in response to problems at the local and regional level, and provides for increased resources for on-ground works.
- The *regional strategies* component provides assistance for regional strategies to integrate biodiversity conservation and sustainable agricultural management. They are developed through partnership arrangements with State and Territory agencies, industries, local government, community groups and individual landholders and managers.
- Under the *State/Territory component*, the Commonwealth, States and Territories cooperate to deliver programs that are best undertaken on a State-wide basis or across States and Territories. It also covers the activities of State agencies to support community group initiatives.
- *Commonwealth activities* include projects which have national strategic benefits, such as national education activities, and national research and development programs.

Further details of various components of the NHT and its aims and approval processes are outlined in Appendix D.

17.2 Effectiveness of NHT Programs

The Trust has subsumed a number of existing resource management programs, including the National Landcare Program (NLP) and Coastcare, as well as providing additional funding for them. In the process, these programs have been consolidated, reformulated and refocussed.

The previous Decade of Landcare Plan called for triennial reviews of the National Landcare Program to be conducted in 1994, 1997 and 2000. The first review was conducted by the Sustainable Resource Management Committee of

the Agriculture and Resource Management Council of Australia and New Zealand (see Box 17.1).

Box 17.1: **Decade of Landcare Plan reviews**

The Sustainable Resource Management Committee of the Agriculture and Resource Management Council of Australia and New Zealand Review found that progress had been made on all the goals in the Decade of Landcare Plan, but any future plan should define the desired outcomes more clearly, with credible performance indicators and specific targets. In response, the plan was amended to provide a greater focus on changes in the condition of the natural resource base and biological diversity.

In April 1996, an interim report was released by the Senate Rural and Regional Affairs and Transport References Committee reviewing Landcare policies and programs in Australia. The Committee concluded that:

> The landcare group of programs has enjoyed a high level of initial success since the establishment of the National Landcare Program in 1992. (Senate Rural and Regional Affairs and Transport References Committee 1996)[1]

The Committee also noted substantial frustration among Landcare groups and others about the program. It observed that increased funding for on-ground works was not universally supported, and that there was some evidence suggesting this would be counter-productive.

The most recent review, by the Australian National Audit Office (ANAO 1997), was released in June 1997 (see Box 17.2). The review looked at the NLP and related natural resource management and environmental programs. The ANAO concluded that there was no indication in any detail of the outcomes that have been achieved from any of the programs examined after eight years of operation. It made detailed recommendations covering all aspects of the deficiencies outlined in Box 17.2.

[1] The latest estimate of the number of Landcare groups is 3250.

Box 17.2: **ANAO Review of the National Landcare Program**

In June 1997, the ANAO released a performance audit of the NLP. It also covered programs including Save the Bush, One Billion Trees, National Corridors of Green, River Murray Corridor of Green and Grassland Ecology. These involved expenditure of $407.6 million over the four years from 1993–94, split between the Department of Primary Industries and Energy and Environment Australia. According to the ANAO:

> The purpose ... was to examine and benchmark the administrative processes established for the relevant Commonwealth natural resource management and environment programs. By providing a comprehensive analysis of the lessons learned from the purchaser/provider arrangements in DPIE and Environment Australia, it is hoped to assist in the development and implementation of the NHT for more cost effective outcomes. Issues such as the scope for improvement in program efficiency, economy and coordination were also examined. (1997, p. xi)

Performance was assessed against a set of criteria. These included: design of program objectives; respective roles of the Commonwealth and States; appropriateness of performance information; and adequacy of monitoring, review and reporting.

The ANAO explicitly recognised the evolutionary nature of the programs under review. It also acknowledged the difficulties in measuring program outcomes, given the long lead times in redressing environmental damage. Nevertheless, it commented that:

> ... after some five years since the then Prime Minister's Statement on the Environment and nearly eight years into the Decade of Landcare, the Commonwealth is still unable to indicate in any detail the outcomes that have been achieved from any of the programs examined. (1997, p. xii)

A range of specific deficiencies were identified by the ANAO. These included:

- a lack of operational objectives needed to determine program performance;
- a lack of clarity between the roles and responsibilities of the Commonwealth and the States, which has increased the scope for overlap between their activities;
- a failure to effectively apply the performance indicators, targets and milestones originally developed;
- administration was overly input-oriented and lacked a sufficient outcome focus;
- the absence of a comprehensive assessment of needs meant that programs could not consistently target Commonwealth investment to highest priorities;
- monitoring and review had been variable and fell short of better practice; and
- financial accountability was inadequate, with most grants not being acquitted.

Recommendations for improvements to programs encompassed within the NHT funding arrangements focused on addressing these shortcomings.

Source: ANAO (1997).

In response to the ANAO report, the Department of Primary Industries and Energy (DPIE) (Sub. 329) said that actions were already in place or were to be incorporated in the arrangements for the NHT. As the DPIE said:

> The ANAO report also focuses principally on the past operations of the NLP and related programs, and while DPIE does not take issue with the formal recommendations, DPIE would comment that these reflect actions that are either underway or to be incorporated in the arrangements for the NHT. (Sub.329, p. 6)

However, a wide cross-section of participants, including conservation organisations, industry groups, State governments and research agencies, were critical of many aspects of the NHT and were not sanguine that the deficiencies in the NLP were being remedied with the introduction of the NHT.

Participant's views

For this inquiry, the Commission explicitly sought comments from participants on the distribution of funding between the various programs in the NHT and on changes required to Landcare programs. In presenting these views, the Commission recognises the strong support for the NHT and programs such as Landcare among stakeholder groups.

The Tasmanian Government (Sub. 319) made a comprehensive critique of the NHT, questioning its current structure, effectiveness and appraisal mechanisms. It said that:

> ... there is a need for review of the structure of the NHT, the separation of programs under the Trust, and the funding arrangements within and between programs. (Sub. 319, p. 8)

In its submission to this inquiry, the National Farmers' Federation (NFF) (Sub. 294) presented a comprehensive and State specific listing of concerns it had with the first round of NHT funding. In summary, the NFF said that:

- There is concern at State agencies taking over the agenda (cost shifting).
- There are problems in some areas in the RAP SAP [Regional Assessment Panels and State Assessment Panel] process.
- Guidance is required in regional strategic priority setting.
- Realistic and costed action plans are required, including cost (or investment) sharing (drawing on experience of the MDBC cost sharing framework). (Sub. 294, Attachment 2, p. 8)

Mr Patrick Morrisey (Sub. 50) made a submission on Landcare based on four case studies he had carried out. He warned that :

> In frontier Australia, public funds can actually legitimise unsustainable practices rather than assist changing them.
>
> The outcome is that the NLP is fostering a relief aid and cargo cult mentality, rather than a community development culture in some areas. (Sub50, p. 3)

He went on to conclude that:

> ... whilst Landcare has proven to be a very effective model for changing land use practices in many instances, it does not work everywhere as a national strategy. (Sub. 50, p. 4)

The Indigenous Land Corporation commented at the roundtables held in Sydney and Melbourne on the low representation of indigenous people in Landcare groups and projects.

A number of specific issues were raised by participants including the distribution of funding, the setting of priorities within programs, the commitment to long term funding and the need for improved accountability. These are discussed in turn next.

Objectives and milestones

The stated aims of the Trust are to:

- provide a framework for strategic capital investment in the natural environment;
- achieve complementary environment protection, natural resource management and sustainable agriculture outcomes consistent with national strategies; and
- provide for cooperation between communities and all levels of government.

The first and third of these focuses on inputs and processes — investment and cooperation — rather than the outcomes that the investment and cooperation are meant to achieve. Although the second of the aims speaks of outcomes, the definition of them in the relevant national strategies is simply so broad that they are not particularly helpful in determining the specific outcomes that are desired by government let alone the milestones that should be achieved along the way.

As AACM International observed at the public hearing on the Draft Report in Adelaide:

> At the moment most of the programs focus on investing money to help people purchase some inputs for ESLM, whether that's catchment planning or on-ground works or whatever; it is focused on inputs rather than outcomes. We believe that governments could invest their money in sustainable land management using some

> form of a market for environmental services; in other words, actually paying for the outcomes and making that a clear economic message rather than having complex programs to focus on inputs. (Transcript, p.1512)

The WA Farmers' Federation agreed:

> There needs to be a clear statement from the Commonwealth about what is expected by way of outcomes from NHT funding. (Sub.230, p. 5)

In principle, the Commission supports the use of outcomes-based program funding in the NHT. However, a shift to specifying and funding on the basis of outputs and outcomes would not be easy, but it would better focus program performance.

One of the impediments in better defining the specific outcomes and milestones required of the Trust, is the lack of historical information on the state of the environment at the relevant scale. The NFF commented that:

> Sound baseline data is required, it is critical in determining national priorities, and highlighting key issues at the regional level. We are concerned at the slow pace of progress in the establishment of the Land and Water Audit, and the lack of involvement of farm organisations to date. (Sub.249, Attachment 2, p. 9)

The Commission recognises the need for better information on the state of the environment and to achieve this has recommended measures to improve the collection of environmental data in Chapter 10.

Program performance

Not only does the Trust lack detailed objectives, but credible measures of what has been achieved by its various programs are yet to be developed. Such performance indicators are also required for evaluation of projects at the community, catchment, regional, state or national level.

The Commission was told by AACM International at the Adelaide Public Hearing that while there has been considerable effort in developing indicators for technical issues (for example, measuring changes in a particular stream) and small scale evaluations, there was a lack of performance indicators for use at the catchment, regional or state level.

As part of the partnership agreements between the States and the Commonwealth, performance indicators have been developed for the NHT as a whole. A working group on NHT Performance Reporting has been established to develop an evaluation framework. It has developed the following Key Result Areas which have been endorsed by the Commonwealth and agreed by the States and Territories:

- integrated, cooperative and strategic approaches to investment;

- biodiversity conservation and environmental protection;
- sustainable productive capacity of the environment and our natural resources; and
- empowerment of the community to take responsibility for ecologically sustainable development (Environment Australia, Sub. 229).

These Key Result Areas show that the administration of the Trust continues to focus on a mixture of outcomes on the one hand and input and process on the other. This runs the risk of diverting effort from the definition of the outcomes that are clearly the more important of the two.

The development of an evaluation framework needs to recognise the need for performance indicators not only for the NHT as a whole, but also of the pressing need for indicators that are relevant to the outcomes at the State, regional, catchment, and local levels as well.

Accountability

The lack of specific outcomes and milestones required of the Trust impacts on the overall accountability of the Trust. In addition, the Queensland Grain Growers Association said that the focus on short term accountability was a problem for community groups involved in Landcare projects:

> The effectiveness of large State Landcare projects does warrant attention, but the over-insistence on short term accountability by community groups has reached the point where it is demotivating some groups — particularly those who recognise the long term nature of their reclamation work. (Sub.207, p. 7)

Linking funding to specific outcomes would provide a long-term focus and greater motivation for these groups to complete projects of a long-term nature.

Not withstanding the basis of funding, as part of improving the overall accountability of the NHT programs, the development of credible performance indicators for use at the community or catchment level as discussed in the previous section would further assist in improving the accountability of voluntary groups in their use of public funds.

In addition, the routine accountability for the spending of public funds should be as simple and transparent as possible.

Improvement in the overall accountability of the program would clarify to the wider community what is expected from the NHT funds.

Program priorities

As discussed previously, NHT funding is provided by way of five groups of programs — vegetation; rivers; biodiversity; land resources and coasts.

The distribution of NHT funding was a significant concern to participants. There was a pronounced difference of view among participants over the distribution of funding between sustainable agriculture and biodiversity conservation.

For its part, the Queensland Grain Growers Association said:

> It is unlikely that consensus will be gained among the disparate groups seeking support for a particular program within the NHT. However, it should be noted that the general trend toward expanding the area under trees (by several programs within the NHT), appears to have *shifted the focus of the total rural environmental strategy from good farming to vegetation*. While there are several good reasons for tree planting and vegetation retention, *the original objective of encouraging sound crop and animal production methods, has lost its primacy*. (Sub. 207, p. 7, emphasis in original)

On the issue of Landcare funding it said:

> The Commission needs to recognise that financially hard-pressed producers will remain sceptical of Commonwealth-funded programs which appear to concentrate on trees and biodiversity, when Landcare's original aims were to promote better farming methods. (Sub. 207, p. 7)

The NSW Irrigators' Council (Sub. 263) implied that some NHT funding would be better spent on water efficiency programs. It said:

> It is important that new funding be made available, not just for feel-good publicity-oriented heritage programs, but for substantive water efficiency programs also. In this regard, the Council would see merit in extending the ideas expressed in the report of the Prime Minister's Science and Engineering Council entitled "Managing Australia's Inland Waters" of 13 December 1996 concerning the generation of water savings. With funding support (say on a 1:1 matching basis) landholders could be encouraged to switch to water-efficient techniques capable of saving as much as half the water currently used. This could be accompanied by an understanding that savings would be allocated 50/50 to the farmers themselves and the environment but that would be a policy matter to be decided. (Sub263, p. 19)

In contrast, the South Australian Government said that:

> There is concern that programs such as the NLP and the NHT focus on improving the productivity of agriculture rather than promoting biodiversity conservation. (Sub. 324, Appendix 1, p. 3)

The Australian Conservation Foundation (ACF) agreed:

> The emphasis is on *sustaining production*, as distinct from *ecologically sustainable land use and management*. A broad strategic framework to address ecological sustainability is comprehensively absent. (Sub. 105, p. 26, emphasis in original)

The ACF was also concerned that insufficient NHT funds were being directed to biodiversity conservation:

> Whenever ACF reviews where the money goes under both past and present environmental programs, it is disturbing to see so little go towards the conservation of biodiversity. For example, of NHT funding made available under the Murray Darling 2001 program in Victoria this financial year, only 5% is directed to biodiversity conservation. Much of the rest is primarily a form of industry assistance. (Sub. 296, p. 28)

The Tasmanian Government said:

> There are too many separate programs and the funds available are locked into the separate programs under the Trust through the budgetary process. The proportions of funds in each 'bucket' are inflexible and the split of funding between programs has not been determined on the basis of the needs in each State. To effectively address our resource management needs, NHT funds need to be flexible between the various programs under the Trust. (Sub. 319, p. 9)

The Tasmanian Landcare Association was concerned that NHT funds were substituting for, rather than complementing, State funding:

> ... the Commonwealth should also ensure that Landcare/Natural Heritage Trust funds are not being used by State Governments as a replacement for State funding responsibilities to address land degradation and conservation issues. (Sub. 80, p. 4)

The WA Farmers' Federation passed comment on the priorities in NHT funding:

> From the community perspective, it is considered that all worthy community projects that achieve the Commonwealth desired outcomes, should have priority. Agency projects that strongly support an implementation outcome should follow. Many other agency projects of a 'core business' nature should be questioned - if they are not worthy of funding by the agency, they shouldn't draw on NHT (a limited fund). (Sub. 230, p. 5)

The Geelong Environment Council (GEC) (Sub. 310) suggested that conservation groups had been disadvantaged in the distribution of NHT funds. It said:

> Funding programmes in the NHT should be allocated more evenly to conservation groups as well as to Landcare and farming groups. It is the view of the GEC that conservation groups have been disadvantaged in the process to date. The IC must recognise that members of conservation groups have a high personal commitment

> to the protection and enhancement of Australia's environment, and unlike land utilisers have no vested interest. (Sub.310, p. 3)

A number of participants said there was a lack of NHT funding provided for on-ground work. For example, the Queensland Grain Growers Association said:

> The push for more funding for on-ground works has been heard from all States for at least three years now, but the Commonwealth persists in finding reasons (and selected quotations) for not giving direct assistance to landholders wishing to get on with the job. (Sub. 207, p. 7)

In response to these criticisms the DPIE, at the Canberra roundtable, said:

> ... the reason the Commonwealth has not funded works historically comes back to three basic reasons, that often if you leave it to the community, until they think through the issues, people think in terms of addressing the symptoms of the problems rather than the cause.
>
> The second issue is that if the government keeps on investing in these things, and this is something we are going to have to address in the Heritage Trust arrangements, people will start to say, "It's not our responsibility, it's the government's."
>
> The third issue which is going to have to be addressed is quite simply, how can we manage the issue of working out which properties are going to get assistance and works on the ground, and which are not. There are - so an overall strategic approach, focussing on more and more investment and activity at the regional level is the way we see those particular issues being best addressed. (Transcript, p. 610)

There has also been criticism of NHT funds being used to confer private benefits to individuals with little or no demonstrable public benefit. For example, the ACF said:

> The Natural Heritage Trust and other 'environmental' programs are littered with examples of pure industry assistance programs disguised as environmental works. For example, Victoria's current 3-year rolling proposal to the Murray Darling 2001 program includes an item headed "Sunrise 21" (an organisation committed to the expansion of irrigation in the Sunraysia region) which states "Increase regional wealth by creating an attractive investment environment for all sectors of the community based on highly productive irrigated agriculture". On further reading it is apparent that this proposal would involve expenditure of NHT funds to pay for land-use planning, and for drainage and salinity works, to facilitate irrigation investment. In other words, the NHT would pay for all or part of the planning, regulatory and environmental impact work which, in other industries, the investor would be required to pay as a matter of course.
>
> Similar criticisms can be levelled at other areas. Pasture improvement subsidies (ostensibly for salinity management), subsidies towards the cost of farm management plans; and subsidies for the control of wind erosion, all present funding to the benefit of private individuals with little or no demonstrable public benefit. (Sub. 296, p. 3)

However, Environment Australia said that funding would be distributed in line with the national strategies of the NHT:

> The distribution of funding between Natural Heritage Trust programmes is designed to achieve complementary environment protection, natural resource management and sustainable agriculture outcomes consistent with national strategies. Community projects within programmes will be funded taking into account the amount of public benefit received relative to the private benefit derived from the activity. (Sub. 229, p. 16)

The Commission considers the overriding objective for the NHT should be to achieve the greatest net public benefit from the expenditure by the Trust. The real issue, however, is how this objective is translated into practical action given the complexity of issues and of their solutions, and the severe lack of good information on both, particularly at the local and regional levels.

The application of a risk management framework to the setting of expenditure priorities and the selection of projects would assist where there is incomplete information on which to base decisions. With this approach, the emphasis is on enhancing the chances of making the right decisions and minimising those of making the wrong ones. This is done by explicitly considering the range of factors that influence the achievement of the objectives set for the Trust.

For example, projects that have clearly identified and widespread 'public good' benefits — such as biodiversity conservation — are likely to have a higher payoff to the community than those that involve remediating environmental damage — such as loss of soil fertility and soil structure — simply to increase farm productivity, particularly where it is confined to the one property. Similarly, the preservation of biodiversity in a bioregion that is unrepresented in the national estate is likely to have a higher payoff than spending the same money on conservation and remediation in a region which is already well represented.

In many cases the projects involve a mix of public and private benefits and the two are not able to be separated. This can occur, for example, with riparian and water quality projects. In such circumstances, the public benefits are more likely to be realised if there are contributions to project costs from those landholders who will gain from the project.

In other cases, the benefits may be largely regionally or industry specific in nature. In these cases, the wider public benefits are more likely to be realised if there are contributions to costs from the relevant State and local governments, or industry. An example of the former is councils funding local nature reserves and of the latter is industry contributions to research and development.

For these reasons, consideration needs to be given to cost-sharing arrangements where there are joint public and private benefits in a project proposal. An example of this approach is the cost-sharing arrangements being introduced by the Murray-Darling Basin Commission. The approach is not without its practical difficulties — for example, maintaining consistency and exercising any discretion in a fair and rational manner. However, the danger is that, if it is not adopted, not only are the net public gains unlikely to be realised, but community support for the NHT is also likely to be eroded, especially if substantial public funds end up being provided for purely private gain. This raises the issue of how the Trust is administered. This is taken up later in a subsequent section.

Term of assistance

A number of participants raised concerns over the short-term commitment to the funding of projects under the NHT.

The Natural Resources Council of South Australia questioned the effectiveness of the NHT given the need for longer time frames in delivering sustainability outcomes:

> Although NHT provides a welcome catalyst for further integration of natural resource planning and program delivery in South Australia, ecologically sustainable natural resource management requires long term commitment by State and Local Governments and the community: the majority of the programs initiated or progressed through the NHT initiative will need to have jurisdictional policy and resource support over longer time frames to achieve effective and sustainable outcomes. (Sub. 250, p. 2)

The Hawkesbury-Nepean Catchment Management Trust offered the view that:

> The NHT like other environmental and natural resource funding schemes operate for short to medium periods. This is a substantial constraint to doing meaningful environmental/natural resource restoration activities given the reality that many of the problems being addressed will require action over many years. Governments need to provide funds on a long term basis. (Sub.323, p. 10)

The funding commitment provided to projects has to reflect the time frame required to effectively address the problem. Where short-term funding is provided to a project that requires long-term action there is the risk that scarce funds will be expended without any improvement in the problem. Similarly, any commitment to long-term funding of projects without achievable outcomes also runs the risk of wasting NHT funds.

Administration of NHT

At the Commonwealth level, the operation of the Trust programs is the responsibility of the Natural Heritage Trust Ministerial Board comprising the Minister of the Environment and the Minister for Primary Industries and Energy. Advice is provided to the Board by a range of groups including the National Landcare Advisory Committee, the Biological Diversity Advisory Council, the Endangered Species Advisory Committee and the Council for Sustainable Vegetation Management.

The day-to-day administration of the programs is divided between three agencies. The land and water programs are administered by the DPIE. Environment Australia administers the nature conservation elements and the Murray-Darling Basin Natural Resources Management Strategy is administered by the Murray-Darling Basin Commission.

Applications for community projects are assessed by Regional Assessment Panels (RAPs) comprising experts in natural resource management and nature conservation, with a majority of community members. They are assessed against funding guidelines and regional or catchment strategies. State Assessment Panels review the recommendations of the RAPs against State or Territory and national priorities and forward their recommendations to the Natural Heritage Trust Ministerial Board.

The NFF considered that there were problems with these arrangements:

> There is ... concern at the number of advisory bodies involved in the administration of the NHT and related programs, and the potential for duplication. The NFF recognises that sound technical and community input on specific issues is vital. However, we are now looking at a Council for Sustainable Vegetation Management, a Biological Diversity Advisory Committee, a proposed advisory body for the Land and Water Audit. All in addition to the National Landcare Advisory Committee (NLAC), now renamed the Australian Landcare Council.
>
> NLAC has played the role of peak advisory body, with broad representation, providing a forum for different groups to raise issues and to have direct input at the Ministerial level. The fact that it has not met for over a year is of concern, and to a degree the development of the NHT has been occurring in a policy vacuum. (Sub. 294, Attachment 2, p. 9)

The Tasmanian Government said:

> Currently the NHT covers sixteen program areas many of which existed prior to the establishment of the Trust. The pre-existence of these programs, and the fact that the NHT is delivered through the two Commonwealth agencies, has resulted in a number of different assessment processes. This is compounded by the decision to call for project applications at different times of the year and the pre-allocation

> of funds for each of the different program areas. As a result the NHT is confusing and not well integrated. (Sub. 319, pp. 8–9)

Considerable emphasis has been placed on community groups identifying projects for funding. This approach was strongly endorsed by many participants. For example, Mr Terry Baldwin (Sub. 247) considered that while ESLM was the responsibility of everyone, for solutions '... the push must come from the bottom up' (p. 1).

The strengths of this approach are the local ownership of problems, the incentive and empowerment it provides local stakeholders, the application of local knowledge and working cooperatively on solutions to local problems. It also allows local solutions to be tailor-made to local problems.

The weaknesses of such a 'bottom-up' approach is that the commonality of local interests may not reflect wider priorities of national significance and the risk of funding being captured for private gain at the expense of net public benefit.

Also, as explained by Mr E Fitzpatrick:

> At present funding is not on an integrated basis. Proposals are dealt with on a project by project basis. Projects are first considered by Regional Assessment Panels. Projects which are approved at that level are then considered by State Assessment Panels where final approval takes place and the projects are funded. (Sub. 35, p. 8)

He considered:

> The whole process is time consuming and frustrating to the fund users. Each year the process is repeated for each project. Apart from the problems of unnecessary detail the assessment panels cannot have the full picture of how individual projects fit into the whole landscape and its problems. (Sub. 35, p. 9)

The filtering of projects at the regional and then State level does, however, provide a degree of consistency to decisions on funding while allowing for the particular features of individual regions. The State filtering is itself governed by funding negotiated federally for specific programs under the NHT. This means there is a strong 'top-down' component in the NHT, both through funding of program areas and within programs.

The tensions between the two approaches and difficulties created were summarised by the Tasmanian Government as follows:

> The reasons behind a regional approach are sound, but to be effective will require larger, more integrated projects. Many Landcare groups are small and their members are already under pressure from the demands of making a living from primary production. There is a real danger that the objectives expected to be achieved from the NHT via the community Landcare groups will not be realised

> because of group 'burnout': loss of enthusiasm through delays in funding, the overestimation of the capabilities of voluntary groups, and the unfriendly bureaucratic and administrative arrangements currently in place. Unless the delivery of the NHT is also integrated, these tensions are likely to hinder its success. In addition the premise that landcare groups are willing and able to handle bigger and more complex projects needs to be questioned. (Sub319, p. 9)

A degree of difficulty and tension between the two approaches is inevitable. However, the Commission considers that the successful integration of both 'top-down' priorities and coordination and 'bottom-up' initiatives is essential to the success of the NHT. This requires, in addition to establishing and articulating national priorities, facilitating local and regional community input in a user friendly manner while at the same time ensuring appropriate accountability for the use of public funds.

17.3 Conclusions

The Commission considers that it is too early at this stage to judge whether there is a need for fundamental changes to the NHT. However, there is an urgent need to adjust some of the framework the NHT has inherited from the Landcare programs. This is recognised by those agencies administering the NHT. As Environment Australia said:

> In addition, the Commonwealth, in partnership with the States/Territories, has invested significant effort in developing from the National Landcare Program, a significantly improved process for the Natural Heritage Trust. While there are undoubtedly further changes needed to meet the needs of particular communities, such as urban groups and indigenous communities, wholesale changes are not warranted at such an early stage – after only one grant round. (Sub.229, p. 15)

There is a need to address the results of the ANAO review and implement the appropriate changes in a timely fashion. As discussed previously, Environment Australia and DPIE are already moving to develop and implement the required changes.

The Commission recognises that improvements to the administration have already been put in place. A Working Group on NHT Performance Reporting has been established and performance indicators are being developed. The first results from this process have been incorporated in the partnership agreements between the States and the Commonwealth (Environment Australia, Sub. 229).

Nevertheless, the NHT represents a very substantial investment of public funds and this alone calls for a framework that will ensure the highest net benefit to the community and enhance public confidence in the Trust. To this end, there is a number of issues that warrant early consideration.

The lack of detailed objectives and milestones for the NHT remains the most pressing issue. The articulation of well-defined and measurable outcomes and milestones is essential to the sound performance and the accountability of the Trust. There is an equal need for credible outcome indicators which can be used at the community, catchment, regional, State and national levels.

As detailed above, decisions on project funding should be based on a risk management strategy so as to maximise the public benefit.

There is a need to better integrate the setting of government priorities for program funding with local initiative in the selection of individual projects for assistance. Success in this regard would lessen the tension between the two and the difficulty associated with accessing funds.

Finally, assistance should better match the term of the project that is necessary for success in terms of achieving the outcomes required of it. Providing funding on a short to medium term basis to projects that require long-term action risks wasting funds with little or no improvement in the problem the project aimed to address.

Recommendation 17.1

The Commonwealth, States and Territories should agree to amend the Natural Heritage Trust in the following direction:

(a) as a matter of urgency, to specify the specific landscape outcomes that expenditure from the Trust is meant to achieve;

(b) as appropriate, to specify these outcomes in sufficient detail so that they are capable of being interpreted accurately at the local and regional level;

(c) from time to time, specify the milestones that are meant to be achieved in the progress towards these outcomes;

(d) to be prepared to commit funding to projects for the minimum period that is necessary for successful completion, subject to their realising any milestones specified for them; and

(e) to adopt a risk management strategy to the approval of projects for funding.

18 DIVERSIFICATION IN THE RANGELANDS

Conditions placed on land held under leasehold in the rangelands generally prevent lessees from undertaking alternative economic activities when pastoralism becomes unviable and/or puts unacceptable pressures on natural resources. But, properly handled, permitting economic restructuring in the rangelands can provide incentives for the conservation of those resources.

Rangelands is a term applied internationally to land used for grazing livestock on native pastures, and where rainfall is too low for intensive agriculture. Nearly three-quarters of Australia's land area is rangelands, that is, much of New South Wales, Queensland, South Australia, Western Australia and virtually all of the Northern Territory.

Pastoralists control the largest part of the rangelands (58 per cent) predominantly under some form of pastoral lease (see Box 18.1), a significant proportion is under Aboriginal ownership (nearly 20 per cent), as well as some still being subject to claim (ANZECC and ARMCANZ 1996). Around 15 per cent is classed as vacant crown land. While less than 7 per cent of the rangelands is formally set aside for conservation, at the Adelaide Public Hearing Mr Greg Campbell of S. Kidman and Co. pointed out that Aboriginal land and Crown land also contribute to conservation.

The potential for diversifying the commercial use of those parts of the rangelands currently used for pastoral purposes is influenced not only by economic opportunities, but also by environmental regulation and the nature of the rights to the land and resources concerned. During this inquiry, participants expressed concerns that economic opportunities were unnecessarily constrained and environmental objectives were not being achieved because of restrictive conditions on land use in the rangelands.

18.1 Degradation in the rangelands

The rangelands contain a range of ecosystems, many of which are habitats for rare and endangered species. Because of the low level of nutrients in the soil, and low and highly variable rainfall, the land is marginal for agricultural purposes and the environment is easily disturbed.

Box 18.1: **Pastoral leases**

Leasehold tenures had their origins in the efforts of colonial authorities to control the unauthorised settlement of land (Holmes and Knight 1994). Leasehold tenure was meant to give governments greater flexibility in regulating the use of land, than does freehold tenure.

Pastoral leasehold tenure covers a range of conditions, both in terms of the rights to the land and the natural resources associated with it, their duration and the right of renewal. While the grazing of livestock has remained the predominant commercial activity permitted, there have been many changes over the years. Most jurisdictions now provide for continuing occupancy and require that the land be used in a sustainable way.

Some of the States are examining the possibility of permitting leaseholders to diversify into other commercial activities. However, the Mabo, and more recently the *Wik* decisions of the High Court, may have implications for the ability of leaseholders to diversify. The explanation lies at least partly in the nature of pastoral leases.

After the *Mabo* decision, the Commonwealth Government received legal advice that native title was extinguished by both the valid grant of freehold and leasehold titles. However, this advice assumed that pastoral leases were not relevantly different from traditional common law leases, which confer on the leaseholder 'exclusive possession'. Exclusive possession means that, subject to reservations in the lease and any rights of third parties, such as an easement or a right of way, the leaseholder can turn everyone else off the land.

In the *Wik* decision, a majority of judges said that the pastoral leases which were the subject of the case, were not leases in the common law sense but were special interests created by statute. The judges said that the 'leases' were subject to so many reservations of rights of entry in favour of the Crown's agents and other authorised persons that they could not be said to confer a right to exclusive possession. The majority concluded that the pastoralists' rights were not exclusive of the rights of native title holders, but were capable of being enjoyed concurrently. Since the rights could coexist, the grant of the pastoral leases did not extinguish native title. And with the substantial variation in the terms of pastoral leases and their authorising statutes in operation at various time in different parts of the country, it is difficult to predict which of these may be found to confer exclusive possession.

The judgement stated that where exclusive possession is not found and therefore native title is not extinguished, only the existing rights given in the lease, prevail over those of the native titleholders — not all rights. Uncertainty arises because any additional rights necessary to enable leaseholders to diversify may be found to be inconsistent with the rights of native title holders.

Sources: Holmes and Knight (1994); O'Connor (1997).

The Australian and New Zealand Environment and Conservation Council and the Agriculture and Resource Management Council of Australia and New Zealand Joint Working Group (ANZECC and ARMCANZ 1996) reported widespread degradation in the rangelands (see Table 18.1). Not all participants agreed with this assessment. For instance, at the Adelaide Public Hearing Mr Peter Day of the South Australian Farmers Federation said pastoralists have seen a gradual improvement in the condition of their lands over the past 40 to 50 years.

Table 18.1: **Condition of rangelands predominantly used for running cattle in northern Australia**

State	*Good condition*		*Degraded but recoverable*		*Degraded and economically unrecoverable*	
	millions of hectares	*per cent*	*millions of hectares*	*per cent*	*millions of hectares*	*per cent*
Queensland	67.8	42	66.9	41	26.8	17
Western Australia	41.6	75	11.6	21	2.2	4
Northern Territory	35.8	89	3.8	9	1.0	2
Australia	145.2	56	82.3	32	30.0	12

Source: Derived from Tothill and Gillies (1992) by ANZECC and ARMCANZ (1996).

A number of participants commented on specific aspects of rangelands degradation. The Cooperative Research Centre for Soil & Land Management said:

> Almost all parts of the rangelands show signs of over-grazing and many plant communities are so impoverished that whole habitats have been lost. Many areas (up to a third the total area) show the acute symptoms of rangeland degradation of bare ground, salt scalds, or spreads of invasive single species of plants. (Sub. 99, p. 34)

NSW Agriculture said:

> Pastoral development [in the semi-arid and arid rangelands] over the last 150 years has been associated with major changes to soil and vegetation. Heavy grazing by domestic, native and feral herbivores has resulted in the extensive removal or reduction of perennial pasture species and the increase of less palatable species or woody weeds, often in association with various forms of soil erosion. (Sub. 186, p. 11)

At the public hearing in Brisbane, Mr Ian Mott of the Australian Forest Growers pointed out that some of what have been termed weed invasions are in effect brigalow or cypress regrowth.

CSIRO (1990b) said that so far no rangeland bird species has been confirmed as extinct, but nearly half of the rangelands' original native mammals are no longer found there. For instance:

> The desert bandicoot is extinct, the bilby has retreated to small pockets, the burrowing bettong survives precariously on islands off the coast. Foxes, rabbits and overgrazing have contributed to the losses. Most importantly, though, many animals have lost the special 'refuge habitats' in which they once survived droughts. (CSIRO 1990b, p. 8)

Mr Ross Blick (Sub. 87) said the loss of biodiversity in the rangelands is due to the exploitation of groundwater and the drying up of mound springs following reduced groundwater pressure in the Great Artesian Basin on the one hand, and the provision of permanent water in formerly dry areas on the other hand (see Section 10.1).

The Central Land Council said:

> Even in the remote areas which have not been used for agricultural or pastoral production there have been major changes. Many of the species which were central to Aboriginal life on these lands have gone to be replaced by feral animals. Introduced plants have spread widely across the lands threatening natural ecosystems. (Sub. 165, p. 2)

The Commission sees achieving ecologically sustainable management in the rangelands as an important component of ESLM.

18.2 Alternative land use options

With 32 per cent of the northern rangelands degraded but recoverable, changes in management appear imperative. Such changes could involve the cessation of grazing in certain areas and permitting other commercial land uses. Pastoralists who are able to diversify into other activities may be able to maintain or even increase income while at the same time reducing the pressure on the fragile environment which prevails in the rangelands.

One of the nine key goals identified in the Draft National Strategy for Rangeland Management (see Box 18.2) was to encourage enterprise diversification. Its broad strategies aimed at achieving that goal were to:

Box 18.2: **Guidelines and Principles for Rangeland Management**

A Draft National Strategy for Rangeland Management was prepared by the Australian and New Zealand Environment and Conservation Council (ANZECC) and the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) Joint Working Group. The Draft Strategy was released in July 1996. At their meeting in Darwin on 8 August 1997, the ARMCANZ Ministers agreed to release the current draft document, with some minor word changes, as *National Guidelines and Principles for Rangeland Management*, to help in the development of State/Territory/regional rangeland management strategies. ARMCANZ is currently seeking ANZECC agreement to this action. The Draft identified nine key goals:

Policy, Legislation and Administration: Complementary and integrated policies, legislation and administrative practices which ensure ecologically sustainable management and economic viability.

Commercial Use: Support rangeland communities to improve business management, encourage enterprise diversification and ensure the financial capacity to manage the rangeland resource in an ecologically sustainable way.

Management: Resilient rangeland communities using and managing healthy rangeland systems by adopting best practice, establishing commercially and ecologically sustainable rangeland enterprises and rehabilitating and protecting degraded resources, water resources and biodiversity for the future.

Conservation of the Natural Environment: Protection and improvement of biological diversity, essential ecological processes and other assets of the natural rangeland environment.

Recognition of the Knowledge, Rights and Interest of Indigenous Peoples: Accommodation of the knowledge, rights, interest and responsibilities of Australia's indigenous peoples within all aspects of rangeland management.

Conservation of the Cultural and Social Heritage: Resource use planning and management that recognises the diverse social, cultural and heritage values of the rangelands.

Research and monitoring: Provision of information essential for the ecologically sustainable management of the rangelands and the maintenance of a continuing monitoring program.

Coordinated Planning: Participative, coordinated planning processes implementing the National Strategy for Rangeland Management.

Programs and Services: Provision of complementary, integrated and effective government and non-government services.

Sources: ANZECC and ARMCANZ (1996); John Grahame (pers. comm.).

- Develop and implement measures to provide comprehensive information and support on resource capability and best practice for existing and emerging rangeland uses;
- Identify and support new, diverse and multiple uses which are compatible with the principles of ecologically sustainable development; and
- Assist the restructuring of the pastoral industry where long-term viability cannot be achieved (ANZECC and ARMCANZ 1996).

Diversification of commercial activity in the rangelands was supported by a number of participants. The Central Land Council (Sub. 165) said that Aboriginal groups which have been purchasing pastoral properties through the Aboriginal Land Fund Commission and more recently the Aboriginal and Torres Strait Islander Commission do not see the long-term future of those properties solely in terms of pastoralism. It believed that:

> ... activities such as tourism, emu farming, feral animal harvesting, bush food production, horticulture, seed collection for revegetation, conservation management and other ventures will be viable alternative or complementary land uses. (Sub. 165, Attachment, p. 8)

At the Adelaide Public Hearing, the South Australian Farmers Federation strongly supported diversification, as did Environment Australia in its submission. Qualifying its support, however, the latter said it was:

> ... essential to ensure that any diversification is concomitant with the goals of ecologically sustainable land management. (Sub. 229, p. 12)

Ms Jayne Weepers, of the Environment Centre in Darwin, said she would like to see:

> ... land capability assessments across the rangelands, so that the kind of decisions that are being made about diversifying or not diversifying, are made on an ecological basis. (Transcript, p. 1258)

Turning from livestock grazing into other economic activities is not easy. It requires a great deal of research, including market research, by pastoralists. Those proposing to diversify need advice, new skills and very likely finance. It may also require changes in the social culture and values of families and individuals who have become accustomed to a lifestyle they expected to continue into the future. Box 18.3 documents the experience of one outback family when diversifying, first into feral goats, and later into horticulture.

Box 18.3: **Diversification — a case study**

The following is an extract from a speech delivered by Margot Steadman, a pastoralist, at a Pastoralists & Graziers Association conference at Murchison on 24 August 1994.

The first diverse enterprise we commenced, ie goats, began some 8 or 9 years ago. And I'm very proud to say it has been highly successful and one of the main reasons we are still in this country we all seem to enjoy so much. It has also allowed us to diversify into the horticultural field. Although *some aspects* are now common to both, it was vastly different in the early years. In horticulture, we have full time partners with a good deal of technical knowledge and numerous people already experienced in the industry, albeit in different areas. In the pastoral goat export trade, there was no-one with experience in preparation, feedlotting or product marketing. Consequently, it was a great learning experience, often thwarted by various sectors. We found our own markets and in constant consultation with the consumer and exporter, have attempted to streamline the market requirements. This was started in the drought years, where sheep, vegetation and money were almost nonexistent. The product was there and so was the basic infrastructure, so we took that and developed it. This was important as we needed an enterprise which didn't require a great deal of capital insertion.

Those who have watched, now realise that the potential in goat meat exports is huge and that goats *can be* controlled behind electric fencing. It is not such a learning curve, as handling stock is our livelihood and as mentioned, the basic infrastructure was in place. There is the product, there are the avenues to sell the product and the market demand. After all, goat meat is the most widely consumed meat in the world, and we provide a lean, chemical and disease free game meat product.

Research and monitoring the market avenues of both goats and horticultural produce has proven both interesting and essential. The majority of us simply put our product on a truck and get on with our daily lives. One may make the occasional phone call to the broker and/or a visit to the sale arena. In today's world this is simply not good enough. This is our livelihood that we have in the past so casually put in the hands of someone else. For the goat enterprise, we began by visiting and discussing with the overseas consumer what their requirements were. Now we liaise regularly with the importer, exporter and shipping or aircraft agent.

Since horticulture was new to us and we had experienced market competitors, we had to work even harder. In addition to producing a marketable product, we had to research carton design, logo and colour, and this all had to meet the approval of the agents, wholesaler, buyers and retailers.

Source: Steadman (1996).

The option of destocking is discussed next. One opportunity for diversification, the commercial use of native species, was discussed in Chapter 15. Another industry, often noted for its potential as an additional source of income for pastoralists, is tourism. Yet another is the development of a timber products industry. These are discussed later in this chapter.

Discontinuing grazing

Some participants suggested that grazing should be discontinued — in part or in total — and the rangelands left to regenerate. Both Mr Tim Walsh (Sub. 214) and Mr Col Friel (Sub. 215) favoured such a course of action. Dr John Auty (Sub. 235) supported the cessation of grazing, but said this would not be an option if that meant that feral animals were left to exploit the pastoral resources no longer grazed. He suggested pastoralists could be compensated for their loss of income and those wishing to remain resident could be paid to act as managers of the environment.

There are a number of potential environmental benefits — for current and future generations — from destocking parts of the rangelands and managing the vacated area, or a large part of it, for conservation. These would include an improved natural environment and environmental amenity. Scientists have also suggested that the rangelands have the potential to become an important carbon sink, not only because more trees would grow, but also because when the soil is in good condition there is scope for storing significant amounts of carbon in the soil (Ash, Howden and McIvor 1995, see Chapter 11).

The magnitude of these benefits, however, is very difficult to estimate. It is also unclear whether these benefits would be greater than the costs to the community of destocking. With regard to these costs, they would include the initial costs of compensating pastoralists for the loss of their land and livestock, and for improvements (homestead, farm buildings etc), if they are not to remain as managers. Bores would have to be capped and dams filled in (other than those required for management purposes). The continued management of the areas destocked is likely to require the existing management input to be roughly maintained, at least in the short term (see Box 18.4 for average and total market values of land, fixed improvements and livestock in the pastoral zone, as well as selected management costs). Indeed, it is even possible that management costs could increase in the short to medium term to cope with an expected increase in feral animal numbers and weed infestations in the wake of the reduction in grazing pressure from domestic animals.

Box 18.4: **Pastoral zone estimates, 1995–96**

Area		*Average per farm*	*Total*
Total area operated	ha	80 558	325 858 000
Market value of land	$	912 510	3 691 103 000
Market value of land and fixed improvements	$	1 236 778	5 002 768 000
Market value of livestock	$	577 953	2 337 820 000

Selected pastoralists' costs			
Fencing to exclude feral animals	$/a	181	732 000
Repairs and maintenance to building structures (including fencing)	$/a	13 308	53 831 000
Weed control (direct expenses and chemicals)	$/a	1 810	7 321 000
Fuel, oil and grease	$/a	17 738	71 750 000
Feral animal control	$/a	290	1 173 000
Total hired labour	$/a	47 605	192 562 000
Estimated number of water supply structures			
Dams	No	8	33 000
Wells	No		1000
Bores	No	6	23 000

Source: Information provided by ABARE.

CSIRO said:

> ... closing down huge areas of the industry is not an economic option. Feral animals, vegetation change and fire must still be managed over this vast area at an impossible cost to the public purse. (1990b, p. 2)

For these reasons, the Commission considers that a wholesale destocking of the rangelands is not likely to be of net benefit to the community. That is not to say that there would not be scope for areas with important natural heritage features to be managed for conservation. To some extent this is already occurring. For instance, the South Australian Government (Sub. 324) said that private conservation groups had acquired three leases in recent years, purely for conservation purposes. And in Western Australia, the proposed reforms to pastoral land tenure will involve some lessees being required to surrender land for conservation purposes (DOLA 1994).

Because environmental conditions in the rangelands vary greatly, as do grazing productivity and the potential for alternative enterprise, a case-by-case approach to conservation in the rangelands seems to be preferable. The Commission's proposed conservation instruments will enable socially appropriate outcomes to be achieved. These instruments — duty of care regulation; voluntary conservation agreements either with a public or a private organisation; or, as a last resort, compulsory acquisition for a reserve — are discussed in Chapter 16.

Tourism

The rangelands may provide opportunities not only for nature-based tourism, but also for what the Office of National Tourism (Sub. 141) terms 'agricultural tourism'. It notes two categories of agricultural tourism which could be relevant in the rangelands:

- farmstays, which involve tourists living and sharing meals with the farm family and possibly accompanying the farmer while he goes about his work. Special trips may be arranged to sites of cultural and/or Aboriginal significance, or activities organised, such as horse riding etc; and
- agribusiness tours, which involve technical visits to specialised farms, perhaps more in the nature of a business trip than a tourism visit.

Some pastoralists have already ventured into tourism. For instance, the South Australian Government said:

> ... many stations have a small tourist venture running as a sideline to their grazing enterprises. (Sub. 324, Appendix 1, p. 3)

Tourism can serve as a supplementary source of income, or even pay for the running of the farm. The Western Australian Tourism Commission (WATC) noted the continued growth of farmstay and stationstay as accommodation providers in the tourism industry and said that:

> The need in many parts of the farming community for the diversification of revenue sources has added to this growth in recent years. (Sub. 22, p. 1)

ANZECC and ARMCANZ (1996) reported that, in 1992–93, 4.6 million people visited Australia's rangelands, staying an average of four or five nights.[1] Expenditure for that year was estimated at $1.7 billion, around 8.5 per cent of total tourism expenditure in Australia. Employment provided by rangelands tourism was estimated at 40 000 people in 1991–92, compared with 7000 employed in pastoralism (ANZECC and ARMCANZ 1996).

ANZECC and ARMCANZ (1996) consider that it is probable that tourism will only be a viable alternative to pastoralism in areas where there are scenic, ecological or cultural features, or hunting and fishing opportunities. It also said that to date many outback tourism ventures have been owned and managed from distant metropolitan centres, with limited benefits for rangeland residents.

One of the advantages of tourism is that it can provide an incentive for the better management of the land. As noted by the Office of National Tourism:

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[1] It is not clear whether this includes visitors to, for instance, Uluru-Kata Tjuta National Park. Fee paying adults visiting Uluru-Kata Tjuta National Park in 1995–96 numbered 312 500, an increase from 250 000 in 1991–92 (Office of National Tourism, Sub. 141).

> ... for tourism to prosper, the land needs to be managed in an ecologically sustainable manner. (Sub. 141, p. 1)

Tourism may stimulate private tourism agencies to undertake research into the better management of the resources on which the prosperity of the industry depends. For instance, in 1991, the Central Australian Tourism Industry Association and the Pacific Asia Travel Association established the Mala Fund, to undertake research into the mala (or rufous harewallaby), an endangered marsupial found in the central Australian deserts (James 1997) (see also Chapter 16).

On the other hand, tourism can put pressure on the natural environment. The WATC, in its *Nature Based Tourism Strategy for Western Australia*, said:

> The irony is that the very features that attract tourism and recreational use are inevitably changed by that use. (1996, pp. 7–8, Attachment to WATC, Sub. 22)

A number of participants commented on what they considered to be impediments to tourism development in the rangelands. The Western Australian Farmers' Federation said:

> Clarification about land title issues ... are the main impediments to increased tourism development. (Sub. 230, p. 5)

The Cooperative Research Centre for Soil & Land Management said attention is currently focussed solely on native title issues, which is unhelpful, because:

> ... other activities that are currently taking place on rural adjustment in the rangelands to provide alternative land use and income generation to pastoralists are totally overlooked. (Sub. 274, p. 5)

Dr John Auty (Sub. 235) said that much present day outback tourism is the almost accidental by-product of infrastructure developed for other, often specious, reasons. He added:

> Tourism to the attractive corner country of New South Wales, South Australia, Queensland and the Northern Territory could be revolutionised by constructing a highway with necessary bridges, bringing the area under command from New South Wales and Victoria. (Sub. 235, p. 3)

The Queensland Grain Growers Association (Sub. 207) said tourism is a form of diversification with considerable environmentally-friendly potential. It said:

> The critical issue is the size of the market, ie how many tourists would see rangelands as an attractive destination. ... The only serious impediment to rangeland tourism is a cultural one, caused by a reluctance of many landholders to enter the tourism business. (Sub. 207, p. 6)

The Commission believes there is likely to be scope to expand the current level of tourism activity in many areas of the rangelands, particularly where there are

scenic features. However, in view of the remoteness of many leases, this option would be viable for only a relatively small number of pastoralists. The impediments related to native title and pastoral lease conditions, noted by participants, are similar to those applying to any commercial development in the rangelands and are discussed in the next section.

Timber products

Leasehold conditions do not generally permit the cutting of timber for sale. For instance, in the Northern Territory under the *Pastoral Land Act*, no trees or parts of trees may be taken except for use on, or in connection with, the land. As a consequence there is no incentive for pastoralists to plant trees. Furthermore, since trees cannot provide income, they can be seen as a liability, as stated by Mr Ian Cormack:

> ... unless a tree is good fodder, or is providing shelter for stock, it is a liability, as it is preventing grass from growing. (Sub. 179, p. 1)

There are a number of species of trees which grow naturally in the rangelands which could provide an income. They include sandalwood, boree and gidgee. With regard to sandalwood, Mr Cormack said:

> ... I believe that with nurturing, at current values ... we could, on our 10 000 acre property, have $1 million in 40 years, and cut this amount every 30 years. (Sub. 179, p. 1)

Given the right conditions, land managers would have an incentive to plant these trees for harvesting, providing not only an income, but also addressing land degradation problems. Forestry issues are discussed in more detail in Chapter 11.

18.3 Impediments to diversification

One of the main impediments to diversification in the rangelands appears to be the way the rangelands tenure system operates. As already noted, the predominant form of land tenure in the rangelands is leasehold (see Box 18.1). Generally, under the terms of a grazing lease, economic activity other than livestock grazing and associated activity is precluded. This means pastoralists have limited opportunity to restructure or to diversify and exploit other resources when economic conditions demand it, or when land degradation problems affect the income they are earning from grazing livestock.

Currently, some State governments are considering changes in the leasehold system, which may incorporate greater freedom and flexibility for leaseholders

with regard to the activities they can undertake on the land. In New South Wales, a regional strategy for diversification has been developed for the Western Division of the State, where land is held under perpetual lease. This strategy is known as WEST 2000, and considers sustainability issues, in both a socio-economic and an environmental sense.

A similar strategy is in place in Western Australia, where there is a Bill before Parliament to reform pastoral land tenure. The Bill provides for the land to be used for pastoral purposes only, but a permit may be issued, at a fee, for alternative uses, including the sowing of non-indigenous pastures, tourist activities of a specified kind, and other non-pastoral uses.

In South Australia, a change of land use to other than grazing by sheep and cattle must be approved by the South Australian Pastoral Board. The South Australian Government (Sub. 324) said applications for a change of use which have been viewed favourably tend to be those with a high degree of conservation integrity.

It is clear that in most States changes to leasehold conditions are necessary if pastoralists are to be given the necessary degree of security of property rights to be able to diversify into alternative commercial activity. What is not clear is the *extent* to which changes are needed, and indeed possible, because of the uncertainty about Native Title and its effect on other property rights. As the Queensland Government said:

> Diversification into alternative activities on pastoral and grazing leases could involve native title considerations which would affect such activities. (Sub. 342, p. 16)

One other impediment to diversification noted by the New South Wales Government (Sub. 325) is the lack of reliable water supplies required by many agricultural alternatives to grazing unimproved pastures in most pastoral regions.

Leasehold versus freehold

Freehold provides a wider range of property rights than leasehold, and has, as Holmes (1996) puts it, no ‘statement of duties’ directly attached to it (although regulation has the effect of adding such duties indirectly). Freehold is also viewed by pastoralists as providing greater security of tenure, and therefore said to provide greater incentives for sustainable land management. The Commission understands that before the *Wik* decision some jurisdictions were considering allowing leases to be converted to freehold. Among other things,

such a conversion would reduce the States' ongoing costs of land administration.

Box 18.5: **Property rights and duties by land tenure instruments (Queensland)**

Rights relating to land use and related resources	*Freehold*	*Pastoral lease*
Right to graze livestock	Yes	Yes
Right to cultivate land	Yes	No
Right to introduce plant species	Yes	No
Right to clear vegetation	Yes	No
Right to take timber	Yes	No
Ownership of water	No	No
Ownership of minerals	No	No
Ownership of wildlife	No	No
Right to exclusive occupation	Yes	No
General right to use at discretion of titleholder	Yes	No
Responsibilities and duties		
To develop and maintain improvements	No	Yes
To be in residence	No	No
To maintain stock numbers above a prescribed minimum	No	Yes*
Duty of care for the land	No	Yes
To control stocking levels (if required)	No	Yes
To engage in property planning (if required)	No	Yes

* Selectively applicable
Source: Holmes (1996).

In contrast, leasehold tenures, apart from restricting the economic activity permitted, do have duties attached (see Box 18.5 for an example). These duties can be relatively easily varied, as leasehold tenure conditions are reviewed. For instance, in recent years a requirement for ecologically sustainable management has come to be incorporated in most of the legislation governing pastoral leases. It is much more difficult to place new limits on the property rights of those with freehold tenure, involving, as that does, the withdrawal of an existing right, and possible compensation payments. Holmes said:

> Where governments have attempted to restrain long-accepted land practices [on freehold land] ... they have had to overcome political, administrative and legal difficulties, pay substantial compensation and also accept pre-emptive action by landholders. (1996, p. 250)

Furthermore, the instrument most readily available to governments to impose such restrictions, eg regulatory controls, has generally been applied to the whole jurisdiction, while lease conditions can be varied regionally or even for individual leases, as stated by Holmes and Knight:

> Flexibility and specificity can ... be achieved at the level of individual properties through the use of lease covenants (or conditions) to specify additional duties, and permits (or licences) to grant additional rights. This specificity is particularly useful in the rangelands where there can be significant variation between neighbouring properties or even adjacent paddocks. (1994, p. 117)

They go on to say that establishing controls at the level of individual paddocks is not necessarily 'bureaucratic overkill' as:

> ... many rangeland properties are so large that a lease covenant may apply to a similar area to that controlled by a shire by-law in the more closely settled regions. (1994, p. 117)

The environmental risks inherent in farming a given piece of land are a function of its biophysical character, and this is not affected by the nature of the legal title to the land in question. It is for this reason that the South Australia Government observed:

> There is a strong view ... that land cannot be successfully managed according to tenure and all land should be managed under the same land management principles. (Sub. 84, p. 28)

Accordingly, the requirement to manage land in an ecologically sustainable way should apply equally to all those who manage or use land, no matter under what type of tenure the land is held. For that reason the Commission's proposed duty of care regime will apply universally to all land managers and users, independently of the land tenure. Where conditions differ, management practices can be adapted to specific circumstances, making it unnecessary, and indeed inappropriate, to use tenure conditions to regulate for ESLM.

One advantage of the leasehold system may be that, unlike freehold, it does not necessarily confer exclusive possession, and therefore can, theoretically, accommodate the allocation of different development rights to different people. As the Australian Conservation Foundation (ACF) argued, development rights do not necessarily have to be automatically allocated to existing leaseholders but ought to be contestable. It said:

> ... pastoral legislation in Queensland and NSW does not assign leaseholders the right to take, or to grow, timber for commercial purposes. That right remains with state forestry agencies ... Should those rights become available, why should it be assumed that the leaseholder is best equipped to take up those rights ... (Sub. 296, p. 21)

The Commission supports the concept of separate development rights which can be allocated in parallel with grazing rights to other than existing leaseholders. However, the joint use of land for different commercial ventures by different individuals or groups, may create conflicts, particularly where these involve the joint use of private infrastructure. In the case of farm stay tourism, the nature of the enterprise is likely to make it impossible to separate the tourism rights from the grazing rights. In practice therefore, it is more likely that it is the pastoralist *in situ* who would take up the right.

One important issue to be considered when permitting additional economic activity is the matter of the amount of rent charged for grazing leases. Currently rent payments are (or should be) based on the value of the land for grazing purposes only. Where other economic activities are permitted, whether by the original pastoral lessee, or some other individual or group, the rent charged should reflect the increased income-earning capacity of the land.

In any case, the *Wik* decision may have reduced the capacity of governments to convert leasehold to freehold. Certainly, under the *Native Title Amendment Bill 1997*, presently under inquiry by the Parliamentary Joint Committee on Native Title and the Aboriginal and Torres Strait Islander Land Fund, the only way for pastoral lease land to be changed to a 'higher tenure' is by agreement with native title holders or by compulsory acquisition of native title in a non-discriminatory way (Commonwealth of Australia 1997c).

The *Wik* decision also created uncertainty about the feasibility and/or legality of alternative commercial activities. The *Native Title Amendment Bill 1997* seeks to remove such uncertainties. The National Farmers' Federation (NFF) said limits on activities allowed under pastoral leases are one of the key impediments to increased tourism, but that:

> Current Government proposals contained in the *Native Title Amendment Bill 1997* go some way towards overcoming this impediment. (Sub. 294, p. 11)

Farmstay tourism is provided for in the Bill. The NFF noted, however, that there are still impediments to those landholders who wished to remove stock and manage their properties for tourism and nature conservation, in that:

> ... it is still required that more than 50 per cent of the area is used for primary production. (Sub. 294, p. 11)

The Indigenous Land Corporation (Sub. 292) opposed the notion that the *Wik* decision is an impediment to change. It argued that:

> ... the *Wik* decision, rather than being an impediment to change, is actually a catalyst for it. In negotiating with native title holders, pastoralists and other rangeland users have a unique opportunity to harness the skills of native title

> holders and their knowledge of the variety of resources on their land. (Sub. 292, p. 2)

The ACF expressed concerns about the *Native Title Amendment Bill 1997*, specifically *because* it will permit other activities. Under the Bill, primary production (as defined in the *Income Tax Assessment Act 1936*) will be permitted on pastoral leases. The ACF said:

> These new land uses – such as intensive irrigated agriculture, aquaculture, tourism, and native forest logging – will create additional environmental damage in environments already degraded by grazing. (Sub. 296, p. 22)

18.4 Conclusion

The Commission believes that alternative economic activity in the rangelands has the potential to be beneficial, both in terms of the economic circumstances of leaseholders and the ecologically sustainable management of the rangelands. Existing leasehold tenure conditions, however, often preclude such beneficial changes in land use.

As already noted, some of the State governments have begun reappraising their leasehold legislation. This task is made more complex, and has to a large extent been interrupted, by the uncertainties arising from the recent *Wik* decision and the subsequent attempt to provide a clarification of the legal rights of the parties involved. It is important, however, for stakeholders — governments, owners and managers of pastoral leases, and Aboriginal interests — to work through all the issues necessary to ensuring that the rights and needs of all groups are acknowledged and taken into consideration.

In the meantime, implementation of the Commission's proposed approach to the regulation of natural resource management and environmental protection will largely remove the rationale and need for many of the existing conditions written into pastoral leases. In these circumstances there is a need to reappraise the objectives of the system of pastoral leases and the manner of their implementation. Accordingly, the Commission sees merit in a thorough review of the leasehold system in all States and Territories.

Recommendation 18.1

Upon resolution of native title issues and following implementation of the Commission's proposed regulatory regime, each State and Territory should review its policy and practice on the leasing of Crown land for agricultural

purposes with a view to removing any impediments to the efficient diversification of economic activity.

19 STRENGTHENING INSTITUTIONS

Most environmental impacts associated with the use of agricultural and pastoral land and associated natural resources are most effectively and efficiently managed at the local or regional level by those knowledgeable of the situation and circumstances of their area. Most States and Territories have recognised this by establishing catchment management and other regional bodies to identify and coordinate action by stakeholders in the area.

Under its proposed arrangements, the Commission considers the capacity of local or regional bodies to contribute to ESLM in their areas should be increased — particularly by developing codes of practice which could be adopted by landholders to meet the proposed statutory duty of care for the environment, entering conservation agreements with local landholders, and by monitoring the state of the local environment. There is, however, no single institutional model which is best suited to all circumstances. The most appropriate structure for local or regional bodies and the functions they should perform will depend on, among other things, the nature of the problems to be dealt with, the biophysical characteristics of the region, the number of landholders affected and the distribution of impacts from land management decisions.

As noted previously, the management of the environmental impacts associated with land management needs to reflect the large temporal and spatial variation in both the factors that contribute to the problem and the solutions. Many impacts spill over from one property to another, but are largely confined to a particular locality or region. For example, water and water-related impacts like soil erosion are typically concentrated in the catchment or basin in question. Even where the impacts are wider than this, their effective management still has to reflect local circumstances and conditions.

Approaching the issues in land and associated natural resource management on a local or regional basis provides a sound start to the internalisation of individual property spillover effects. In most cases, this means a management focus on river catchments or groundwater aquifers because of the dominance of hydrological processes in natural resource impacts. For some, however, such as weeds and pests, a different management focus may be more appropriate to better coordinate individual landowner and community control efforts. In both

cases, some form of organisation is necessary either to coordinate the actions of the various players or to carry out the work in question.

As outlined in Chapters 8 and 9, the Commission is advocating a regulatory model built around a statutory duty of care with voluntary codes of practice to provide the practical guidance to landholders and other users on how to meet the duty. For the reasons outlined above, these codes would be best developed for local or regional application by those with an interest in, and who are familiar with, the area in question. Such an approach encourages stakeholders to obtain the information that is relevant to improving local decision making. It also empowers those who possess the local knowledge and who stand to gain most from better outcomes. In many cases, there will be significant saving and other benefits from local stakeholders pooling their knowledge and expertise to develop such codes of practice. This would be facilitated by the creation of appropriately designed, locally-based organisations.

For similar reasons, there is often a strong local or regional dimension to the benefits of conserving biological diversity. The Commission recognises that it is unlikely the Commonwealth or the States would fund conservation which benefits only a local community. In these circumstances, it would be appropriate for the local community to contribute to the cost of such conservation. This would require an appropriate local or regional institution to define what is to be conserved, organise its funding and manage the work in question.

The following sections look at the nature of existing regional organisations involved in land management, including local government. The scope for strengthening local and regional institutions is then discussed.

19.1 Existing arrangements

Community involvement in the resolution of land management problems is already a feature of land management in Australia. Widespread support for community involvement was evident during the course of the inquiry (for example, from the Soil and Land Conservation Council of Western Australia, Sub. 153; and the Victorian Government, Sub. 172).

There is a variety of local or regional organisations that are widespread throughout Australia, which involve local participation, and with roles in advising on or undertaking land management functions.

Many States and Territories have organisations responsible for promoting soil conservation. Local organisations based on water catchments exist in virtually all States and Territories, although their coverage is not comprehensive in most

cases. A catchment-based approach is central to the Council of Australian Governments (COAG) water reforms — and the Murray-Darling Basin Initiative is built around the management of individual catchments within the basin. A number of States have set up, or are setting up, formal catchment management institutions. Many landcare groups have been set up under the landcare program and some are established on a catchment basis. Local government also plays an important role.

Within these groups, there is a variety of structures involved, ranging from voluntary bodies (such as many involved in landcare, see Appendix D), and advisory bodies set up under State legislation (such as catchment management committees), to statutory organisations with responsibility to undertake land management activities (such as catchment trusts, and soil conservation boards).

The fundamental objective of advisory bodies is to involve local people, with local knowledge and experience in regional land management. As well as raising awareness of the relevant problems within an area, they also provide advice, coordinate the activities of landholders and act as a type of clearing house for information from both within and outside the region. Stakeholder representation is usually broad and the focus is typically on land management issues.

In some cases, arrangements based on advice and persuasion, are not capable of achieving the desired outcome. As the number of players increases, it becomes less likely that voluntary cooperation will be capable of achieving all the changes required. There is further scope for 'free riding', and peer group pressure is less likely to prevent its exploitation. This likelihood is further increased where there is a sharp delineation between those who would benefit and those who would bear the cost of the changes in question. Finally, the informal arrangements will be unable to work where the area concerned does not include those who bear the major costs or benefits. In these cases, more formal institutional arrangements requiring statutory powers to compel landholders to act, and responsibilities to ensure accountable governance, may be warranted.

Existing examples of these types of arrangements are the Murray-Darling Basin Commission (MDBC), the Catchment Management Authorities (CMAs) in Victoria and the Catchment Management Trusts (CMTs) in New South Wales (see Section 5.2 for a brief description of the current institutional arrangements operating in each State).

Victoria has gone furthest in establishing statewide catchment management organisations, providing complete coverage of the State, and with formal

structures, powers and funding established by statute. The Victorian Government said:

> ... Victoria has recently undertaken a major review of its catchment management system and is now revising legislation to strengthen the role of Catchment Management Authorities. Some of the additional roles proposed by the Commission [in its Draft Report] (such as monitoring and reporting of the state of the local environment) are already being undertaken. (Sub341, p. 20)

Local government

The local government system in Australia performs a number of general functions including waste disposal, infrastructure maintenance, urban transport provision, community and welfare services. They raise revenue directly from ratepayers who benefit from the services provided and they are accountable to both those ratepayers and to their respective State governments. Local councils play an important role in land and associated natural resource management through the delegated powers they exercise over land use planning. Some 750 local councils across Australia are responsible, within the context of State legislation, which can vary between States, for producing land use plans indicating activities permitted or restricted in particular locations and under what conditions. In addition, many councils are organised into regional groupings which cooperate in the preparation and implementation of regional environmental strategies.

The Local Government and Shires Association of NSW said:

> Local councils have, over the past century, moved from becoming public utilities to become the primary strategic manager of the land and environment within their boundaries and, indeed, across their boundaries in a regional, often bioregional sense. They have a fundamental role to play in land management not only through their development assessment functions, but also because councils themselves manage significant areas of land and water and can also impact on the environment through their own activities. (Sub. 276, p. 1)

In a recent paper, Williams and Walcott draw on a study by the Australian Local Government Association to point out that:

> Various studies stress that local government is the sphere of government best placed to assist with initiatives dealing with the systemic environmental impacts of agriculture. However, it appears that the involvement of local governments in natural resource management is patchy, and there are some major obstacles to be overcome before there is widespread effective local government involvement. A major obstacle has been identified as the need for a clear definition of roles and responsibilities in order to avoid duplication. This is particularly the case regarding the relationship between the different spheres of government, Landcare groups and catchment management initiatives. (1997)

The need to ensure that local government can effectively contribute to land management objectives has been recognised. Victoria has recently rationalised its 210 pre-existing councils into the current 78. As well as the aim of raising efficiency and reducing the cost burden on ratepayers, this rationalisation also sought to make boundaries more compatible with Victoria's biogeographic characteristics, principally catchments. Despite this change to local government, Victoria has nonetheless established a comprehensive set of statewide catchment management organisations.

Local government participants in the inquiry argued for expanding the role of local governments in land management. The Local Government and Shires Association of NSW said:

> Local Government has shown a willingness to undertake environmental management initiatives, and there is significant potential for Local Governments to take on a greater role in environmental management in the future. However, limiting factors such as resources and expertise need to be examined for this potential to be fully realised. (Sub. 276, pp. 2–3)

The Shire of Yarra Ranges said:

> Local government has arguably the greatest potential to implement ESLM due to close contact with residents. However, in a climate of downward pressure on income, the potential for local government to fund innovative approaches is reduced. In order to implement ESLM objectives local government will require process guidelines and resourcing. (Sub. 101, p. 2)

Similar views were expressed by the Shire of Serpentine-Jarrahdale (Sub. 109).

Others participants expressed concern about creating a fourth tier of government through expanding the role of catchment, or similar regional groups, when an established local government system is already in place. The New South Wales Government said:

> NSW has recently reviewed the role of Catchment Management Committees (CMCs), including the possibilities specified in the [Industry Commission's] draft report. The model poses a risk of effectively creating a fourth tier of government which may have the potential to come in to conflict with or duplicate the work of local or state governments. NSW would be sceptical of the level of community support for the creation of such institutions, particularly where they have levying powers. (Sub. 325, p. 17)

and that:

> This is a particular risk where the role of local government in the activities proposed for regional catchment groups is not fully recognised. The [Draft] report has given insufficient consideration of the alternative approach of enhancing the capacity of local government. (Sub.325, p. 17)

While catchment management committees exist in New South Wales, there are significant areas of the State where they do not exist — being self-initiated rather than established by the State government — and are purely advisory.

The Local Government and Shires Associations of NSW questioned whether catchment management groups should undertake additional responsibilities, saying:

> The Associations are concerned about the [Draft Report] recommendation that catchment management bodies undertake additional responsibilities. It is important to first determine the nature of those responsibilities and whether they could be more appropriately and effectively undertaken by other bodies such as local councils, which already have the necessary infrastructure in place. (Sub. 276, p. 4)

The question of the appropriate organisational structure is a difficult one. While local governments do already exist, and have well-established mechanisms for accountability to both residents and the State government, almost all States and Territories have felt the need to establish separate regional organisations to handle particular aspects of land management. Two key aspects seem to be important. The first is that the current local government boundaries are often not well defined in terms of biogeographic areas or water catchments. The second relates to the nature of community involvement. An important feature of local and regional groupings is that a range of stakeholders in the region are represented, often formally. This is particularly important where a major element of the role of the organisation is education, advice and persuasion, including the harnessing of peer group pressure. Councils already have a number of well-defined responsibilities and it needs to be considered whether the added responsibilities could be sympathetically added to them or would detract from them.

19.2 Strengthening the institutions

Given differences in the nature of problems to be dealt with, the biophysical characteristics of the regions, the number of landholders affected and the distribution of impacts from land management decisions, the Commission believes there is no single institutional model which will be appropriate in all situations.

In some cases, expanding the role and responsibilities of informal or advisory catchment and conservation groups will be the most effective means of giving effect to the Commission proposals. In other cases, more formal arrangements underpinned by stronger legislative backing for catchment management institutions may be more appropriate. Alternatively, expanding the current role

of local councils may, in some circumstances, provide a more suitable means of implementing the new resource management regime.

The need for flexibility in approach was evident in several participants' comments on the Draft Report. Some participants even favoured a combination of institutional structures. The NSW Farmers' Association, for example, supported the integration of catchment bodies with local council organisations in saying:

> A regional approach to management of natural resources is supported and should be integrated with the effective regional provision of utilities and services currently provided by local government. Regional Organisations of Councils (ROC) based on catchment or bio-region boundaries, should take a greater role in the development of natural resource management strategies in cooperation with CMCs. A combining of CMCs and ROCs may provide for effective integrated management of natural resources at regional scale. (Sub.317, p. 9)

Irrespective of the approach adopted, to effectively implement the Commission's proposals there is a need to strengthen the various regional institutions.

As outlined in other chapters, the Commission's proposals elsewhere in the report infer local and regional institutions concerned with natural resource management should take on the following additional roles:

- assist in developing and monitoring of codes of practice to meet the proposed environmental duty of care (Chapters 8 and 9);
- monitor and report on the state of the local environment (Chapter 10); and.
- enter into agreements with local landholders to conserve local biological diversity (Chapter 16).

The Commission's view is that, in many cases, the existing institutional arrangements are not sufficiently developed to give effect to the new resource management regime being recommended was supported in a number of submissions to the Draft Report. Environment Australia (Sub. 229), for example, commented on this in its discussion of the changes needed to enable local or regional organisations to effectively undertake additional responsibilities. They said these changes could include:

> - capacity building for local and regional bodies in the form of training and institutional strengthening measures, such as the upgrading of environmental officers in local and regional organisations and more effective communication strategies with stakeholders. (Sub.229, p. 17)

They also said:

> Given the other additional role recommended by the Commonwealth of monitoring and reporting on the state of the environment is closely tied to implementing codes of practice, a key question is the extent to which a regional catchment body would have the authority and resources to fulfil its expanded functions. Codes of practice may be more effective on an industry basis than a geographic basis. (Sub. 229, p. 17)

Mr Greg Hayes (Sub. 301) echoed the views of other participants in calling for increased funding and resources for catchment management organisations. He said:

> The magnitude of the challenge embodied in an integrated catchment management approach is generally under-estimated. Without local participation, catchment strategies will surely achieve very little. Considerable time and money will be needed to prepare communities so that they are able to participate meaningfully and equitably in this process. Amongst the needs will be access to technical and economic advice that is unbiased and independent. Planning needs to based on realistic views of the future which could involve significant land use change compared to those of the past.
>
> - Implementation of catchment strategies will be no less a challenge. It should be supervised by suitably qualified professionals rather than by volunteers who may be less qualified and not able to devote the necessary time and effort. This certainly will be costly but either the whole process is tendered out or the catchment management organisations are provided with sufficient resources to be able to supervise the process themselves. (Sub.301, p. 4)

In strengthening the existing organisations, the following issues need to be addressed:

- the size and boundaries of the institutions and their relationship with one another;
- their roles and responsibilities;
- their funding; and
- governance arrangements.

Size, boundaries and inter-regional relationships

As indicated in Section 5.2, Victoria has introduced 10 regions based on catchments that cover the State. By way of contrast, New South Wales has a much larger number of catchment management areas — 43 at present — and significant areas of the State are not covered. In both States, the catchment management arrangements allow for a hierarchy of organisations — basin, catchment and sub-catchment. Other States are broadly following the New South Wales example, except for Tasmania which does not have local or regional institutions specialising in natural resource management.

The Commission's proposed environmental duty of care would apply throughout each State and Territory. Thus, state and Territory-wide coverage of regional institutions will be important. While catchments will often be the most useful way of delineating groupings — especially where water and water-borne or related problems are prominent — there will be some areas, such as the rangelands, where a different basis of regional cooperation will be appropriate.

Environment Australia commented:

> In relation to changes needed to enable catchment organisations to effectively undertake additional responsibilities, these could include:
>
> - further examination of the basis on which catchment organisations are drawn up, that is instead of being based on water catchments some could be based on native vegetation boundaries. (Sub.229, p. 17)

As mentioned above, South Australia, for example, has developed regional groupings based on Soil Conservation Boards.

The appropriate coverage, number and size of regional organisations is difficult to determine at the outset. A number of factors will be important, including the commonality of interests in the region, the cost of establishing regional institutions and the nature of the problems (for example, the need or scope for wider coordination via basin-wide groupings).

It is not possible to specify a structure which would have universal application throughout Australia. However, a degree of central coordination is necessary to ensure that regional organisations are well structured, while scope for independent action and self-initiated cooperation between adjacent regions on common problems will be essential. The tension between central State level control and reporting and local accountability and 'ownership' will always exist.

With respect to local governments, there are presently 750 such organisations in Australia. The Commission believes that any expansion of local government responsibilities to give effect to its proposals would be facilitated by a realignment of local government boundaries on the basis of the biogeographic characteristics of particular regions. It recognises that this would involve considerable rationalisation of existing local government boundaries in some regions and that in realigning boundaries, a range of other factors, such as maintaining social cohesion, would also be important.

The Shire of Yarra Ranges said:

> Municipal boundaries can be an impediment to implementing ESLM objectives. This is primarily because municipal boundaries do not conform to catchments and therefore downstream effects may not be accounted for. Land tenure and responsibility within a catchment is further divided amongst drainage authorities

> (waterway managers) state government (national parks and crown land) and finally local government. (Sub. 101, p. 8)

The Commission notes that recently Victoria rationalised its 210 pre-existing councils into the current 78 with the aim of raising efficiency and reducing the cost burden on ratepayers. A better alignment of councils with Victoria's biogeographic characteristics also resulted.

As indicated earlier, the Commission believes that the nature of the land management issues to be addressed, and of the subsequent objectives to be achieved, should be a primary determinant of the type of regional organisation which can best coordinate individual efforts toward remediation. And this requires active participation from local stakeholders in identifying the problems and agreeing on regions for action.

Roles and responsibilities

Current responsibilities of catchment groups vary between States but are generally limited, focusing on information exchange and advice to government. The notable exception is Victoria, where the responsibilities of catchment management authorities are broader and cover:

- development and ongoing review of Regional Catchment Strategies (RCSs);
- identification of priority activities and work programs to implement RCSs;
- provision of advice to the State government on both Commonwealth and State resourcing priorities at a regional level through budget processes;
- negotiation with the Department of Natural Resources and Environment (DNRE) on an annual approved work program for DNRE regions relevant to the implementation of RCSs;
- provision of services related to integrated waterway and floodplain management (including field extension, provision of advice, coordination works, referral and enforcement consistent with approved functions); and
- monitoring and reporting on the condition and management of land and water resources.

In addition, CMAs are required to submit an annual report to the State government on outcomes achieved against targets.

As mentioned above, local governments influence land management decisions primarily through land use planning. In addition, many councils are organised into regional groupings which cooperate in the preparation and implementation of regional environmental strategies.

To give effect to the Commission's proposals, local and regional bodies such as catchment groups or local governments would need to fulfil additional roles and responsibilities. In particular, they should be able to be involved in developing codes of practice to reflect particular local conditions which could be adopted by landowners and others in the region to meet their statutory duty of care.

While development of codes of practice would be voluntary, and any organisation could develop a code, there would be an advantage in local or regional organisations undertaking development because of their interest in and understanding of local circumstances.

A version of this type of arrangement already exists in South Australia where Soil Conservation Boards, made up of landowners from the district, develop district plans, including recommended land management guidelines for the district. Under this arrangement, landowners deemed to be degrading their land or using land management practices which increase the risk of degradation may be required to change their land management practices.

If local and regional bodies are to develop effective codes of practice, a sound knowledge of the local environment will be essential. This will require the collection and analysis of appropriate information on the state of the local environment. To undertake this responsibility effectively, local organisations will need to have access to financial resources including, if needed, the capacity to acquire the necessary expertise.

Local and regional bodies could also be responsible for the development and monitoring of conservation management agreements with landowners. They could act as either an implementing and monitoring agency on behalf of the Commonwealth or State government, or on a self-initiated basis reflecting the needs and priorities of the local area. This would also require them to have access to finance to fund local agreements.

To avoid duplication with local government roles, the responsibilities of local and regional bodies would need to be clearly specified. Their effective operation would also be dependent on them having the powers and funding to meet their responsibilities. Funding is discussed below.

Funding

If local and regional bodies are to undertake the activities envisaged by the Commission, appropriate funding arrangements for them would need to be established. This is particularly true for catchment management organisations which are essentially advisory in a number of States, and rely heavily on the

voluntary involvement of local stakeholders. The Royal Australian Planning Institute commented:

> ... catchment management committees are widespread at local level and in some areas also regional level but reviews of catchment management in NSW have found that, because of their community status, CMCs seriously lack administrative assistance and expertise to carry out systematic strategic planning and target their programs accordingly. Where funding is solely directed at project proposals form local residents, regional, state and national priorities (such as dryland salinity) can be overlooked.
>
> The importance of resourcing and educating local or regional organisations also need to be given more serious attention and tangible recommendations by IC. (Sub. 251, p. 6)

The Australian Conservation Foundation (Sub. 105, p. 35) also expressed concerns about the lack of resources and expertise of catchment management organisations.

In addition, where the activities are primarily of benefit to the region, mechanisms could be established to levy landholders and others in that region to fund such activities.

In New South Wales, CMTs have the power to introduce levies to fund a clearly defined set of activities, such as flood mitigation. Catchment Authorities in Victoria also have some levying powers. Where the activities are clearly of benefit to the wider community, funding from the State or Commonwealth would be warranted.

Local councils already exercise the power to raise revenue to provide ratepayers with a range of general services. In addition, special environmental levies have been used by local councils (by virtue of legislative provision) in some States to fund remediation of specific land management problems.

Funding issues, including the ability to levy landholders, were of considerable importance to many participants. The Hawkesbury-Nepean Catchment Management Trust (Sub. 323), for example, commented on its ability to carry out the roles ascribed by the Commission given current resource availability. It said:

> - The trust is already assisting in the development of codes of practice (e.g. Vegetable growing, see attached). The Trust does not monitor or audit these codes of practice due to resource constraints. (Sub.323, p. 9)

In relation to the question of levies, the Hawkesbury-Nepean Catchment Management Trust outlined the restrictions on their ability to raise revenue in this way and mentioned that local government already had the capacity to set environmental levies.

> In regards to funding, the Trust has the opportunity to levy landholders in the catchment, however the State Government has decided that the Trust should not exercise this power. The reasons for this are two fold:
>
> - the beneficiaries from the river go beyond the catchment (for example to Sydney). So more than just the catchment community should pay for its protection.
> - the Trust does not do works on the ground.
>
> Local Government already has the opportunity to fund environmental activities via a special rate under the Local Government Act. Within the Trust's area Gosford, Hornsby and Warringah levy special rates for environmental works. (Sub. 323, p. 10)

Environment Australia (Sub. 229) questioned whether landholders in many parts of rural Australia would have the capacity or willingness to pay a levy. It said:

> The Commission clearly states that to undertake these additional responsibilities, local organisations would need to have the necessary financial resources and expertise. A key recommendation of the [Draft] report is that individual landholders should be levied, but it is doubtful whether, in many regions of rural Australia, they have the will or capacity to pay. If this is the case, careful consideration needs to be given not only to whether such a levy would be acceptable but what other means might be available. (Sub.229, p. 17)

The willingness of those in a region to pay any levy will, to a large degree, depend on the extent to which they see the local or regional organisation as working for the benefit of the region. Community participation in the organisations is essential, and clear reporting and accountability to the local community will also be necessary. In addition, where environmental benefits are significant for those outside the region, a willingness of Commonwealth and State governments to contribute will increase the likelihood of local acceptance of fund raising activities.

A number of local councils complained about the effect of rate capping in New South Wales. The Leeton Shire Council said:

> Rate pegging as imposed by the New South Wales State Government on local government has effectively prevented the renewal of existing infrastructure, and reduced the maintenance carried out by councils. At the same time, government subsidies and grants have declined or been abolished, reducing the money available for infrastructure improvements. (Sub. 19, p. 2)

Similarly, the Local Government and Shires Association of NSW said:

> In NSW this approach to raising funds for environmental management is hampered by rate pegging. It is the view of the Association that the government should adopt

> an open mind on rate pegging and allow it to be fully considered in the context of review of Local Government finances. (Sub. 276, p. 2)

The power to levy landowners and decide on the use of such funds is potentially a significant expansion of the role of local and regional bodies. As discussed below, accountability and good governance assume increased importance in such situations.

Governance

As the powers and responsibilities of local and regional bodies are expanded — particularly the power to tax and spend for the benefit of the area — clear accountability is essential. This would involve:

- transparency in procedures and practices;
- financial and performance auditing of activities; and
- clearly established lines of accountability to State governments and to local stakeholders.

Young et al (1996) point to a number of ways in which performance goals and accountability can be achieved in the specific context of devolving responsibility for land management decisions to the local level. They argue that one mechanism would be to establish goals and performance indicators against which levels of success can be measured. Establishing these criteria is also seen as assisting the local groups themselves by providing guidelines for their objectives.

Reporting and audit requirements against set goals and performance criteria would help ensure transparency (an important element of accountability) in the application of program funds while, at the same time, ensuring that the key land management issues relevant to specific local areas remain a priority for the responsible body.

Equally important will be the transparency of regional and local decision-making processes and of their implementation. This is needed to allow community scrutiny of how the organisations have performed. The ultimate sanction in the case of any abuse of power would be for the State or Territory government to relieve the decision-making body of its functions and replace it with an administrator. This would be similar to the powers used occasionally by State governments in removing and replacing some local councils.

On this issue, the Hawkesbury-Nepean Catchment Management Trust questioned the need for modification of governance provisions under expanded responsibilities. It said:

> In regards to governance, whether or not the powers and responsibilities of local and regional bodies are expanded, there already exists appropriate levels of transparency, auditing and accountability. (Sub.323, p. 10)

Mr Greg Hayes (Sub. 301) thought otherwise, and briefly outlined a governance framework for catchment bodies. He said:

> The catchment management organisations should be the purchasers of services with real control over the process and real accountability to ensure cost-effectiveness. State governments should set benchmarks for the cost of services and monitor the performance of the catchment management organisations. State departments should be considered as possible service providers but not automatically be assumed to be the providers. (Sub.301, p. 4)

The question of stakeholder involvement was the subject of some comment by participants. Typically catchment management organisations have significant landholder representation. For example, in New South Wales the majority of members must be landholders, and relevant local and state government agencies must be represented. The Australian Conservation Foundation expressed concerns which included:

> ... bias in membership towards landholders and water users, sometimes prescribed in legislation, and leading to (a potential for) conflicts of interest ... (Sub. 105, p. 35)

This can present a problem when a region contains significant areas of conservation importance for the State or nationally, where important stakeholders do not reside in the region. Thus, any strengthening of responsibilities of catchment management or other local or regional organisations, must take place in a context of clearly articulated and funded national and state programs of conservation.

Of the alternative institutional arrangements raised above, local governments have the most well-developed governance arrangements already in place. They are accountable to both the ratepayers who elect the councillors and to the State government which provides the legislative basis for their existence. They are also subject to transparency in procedures, financial auditing and receive constant scrutiny from the local community.

19.3 Conclusion

The Commission considers that appropriately empowered and resourced organisations at the local and regional level have a critical role to play in improving natural resource management. Such organisations will be very useful, if not critical, to the implementation of a number of the Commission's recommendations elsewhere in this report. Firstly, such organisations would

have an advantage in the development of codes of practice to assist landholders and others in meeting the proposed duty of care. Secondly, they would be a suitable vehicle to manage agreements with local landholders for the conservation of biodiversity of local and regional significance.

Given differences in the nature of problems to be dealt with, the biophysical characteristics of the regions, the number of landholders affected and the spatial and temporal distribution of impacts from land management decisions, the Commission believes there is no single institutional model which would be appropriate in all situations.

In some cases, expanding the role and responsibilities of informally constituted catchment and conservation groups will be the most effective means of giving effect to the Commission proposals. In other cases, more formal arrangements underpinned by legislation, such as that applying for some catchment management institutions, may be more appropriate. Alternatively, expanding the current role of local councils may provide a more suitable means of implementing the new resource management regime in some circumstances.

Strengthening the local and regional institutions along the lines discussed above raises a number of important and sensitive issues. Roles and responsibilities would need to be developed to enable them to play an expanded role, as will funding arrangements.

20 URBAN ENCROACHMENT

There are concerns about urban encroachment and rural residential development on agricultural land. Converting agricultural land to urban and rural residential uses does not necessarily imply a loss to society, provided that the higher price paid for land for non-agricultural purposes reflects its value to society in the alternative use. However, inefficient or inappropriate action by government, such as the tax treatment of hobby farms, provision of infrastructure and zoning regulations could result in a non-optimal outcome for society as a whole.

This chapter specifically addresses the term of reference that asks the Commission to report on the impact on rural lands of urban encroachment, including the subdivision of land for hobby farms.

20.1 Participants' concerns

A number of participants in the inquiry, including the Victorian Government (Sub. 172), the Queensland Government (Sub. 164), the Tasmanian Government (Sub. 88) and the ACT Government (Sub. 107), expressed concern about the loss of agricultural land through both urban development and the conversion of commercial farms to hobby farms and rural residential development. Their concerns covered land on the fringe of small country towns, as well as the larger urban centres.

In addition, a number of participants, such as Australians for an Ecologically Sustainable Population (NSW Branch) (Sub. 278) and Australians for an Ecologically Sustainable Population (National Office) (Sub. 291) and the Australian Conservation Foundation (Sub. 296), considered that ESLM fundamentally revolves around population issues. They argued that, as the population increases, domestic demand for food and imports also increases — placing pressure on the land at the expense of the environment. Furthermore, the expansion of cities to accommodate an increasing population reduces the amount of rural land and places further productive pressure on the land at the expense of the environment.

However, as discussed in Chapter 3, agricultural production in Australia is orientated to supplying world markets. As a price taker in such markets, Australia has little influence on world prices and, hence, any growth in

domestic population will have a minimal effect on domestic food production at the expense of the environment. The size of the Australian population may influence the available exportable surpluses, but world income and population, as reflected in world demand is likely to be far more influential. While the expansion of cities is likely to reflect population growth, it is also likely to reflect changes in income and tastes. An increase in income will usually stimulate demand for lifestyles that involve a more expansive use of land. Shifts in tastes towards low density and rural or semi-rural living will have the same effect.

Urban development

The spread of urban development over what was previously agricultural land and bush land has been ongoing since European settlement. For example, between 1971 and 1981, the land area of Australian cities increased by 1207 square metres for each additional resident. This area, which is very high by international standards, indicates the low population density of Australian cities. (SEAC 1996)

As the Queensland Landcare Council said:

> The major concern in Queensland is that many population centres grew from smaller settlements on fertile land, often along rivers for water supply and access to coastal shipping. Much of the 3% of Queensland classified as good quality agricultural land (on the basis of soil fertility, rainfall and access to markets) occurs around towns and cities. (Sub. 75, p. 16)

Some agricultural activities have been displaced to what has been described as 'inferior' land, or to more remote locations. Some see this as adding to existing environmental problems. For example, Mr John Newlands said:

> Most of Canberra's milk comes in from 200 km or more away at some cost in terms of transport, pollution from burning fuels, road maintenance costs and so on. ... in South Australia commercial fruit and vegetable growing has been driven into areas that require massive irrigation, such as the Murray Valley and the Virginia Two-Wells aquifer. (Sub. 12, p. 5)

While the loss of agricultural land is of concern to many, some rural landowners benefit from higher prices arising from competing demands for this land. Indeed, the issue often creates a conflict between those wishing to ensure a plentiful supply of rural land for agriculture and farmers that stand to gain from the subdivision of their land for urban development. As the South Australian Government said:

> On the one hand as a group, primary producers espouse the need to protect primary production resources. On the other hand, as individuals they wish to

> optimise their market place and equity opportunities by gaining titles for subdivision during downturns in primary production or when choosing to leave their properties. (Sub. 84, p. 40)

Conflict with existing agricultural activities

The subdivision of rural land for urban use or for rural residential development is likely to cause conflict between farmers and non-farm residents. The presence of non-farming residents can produce adverse effects on agricultural activities, such as dog attacks on stock, poor control of pests and weeds and vandalism. On the other hand, agricultural activities can produce off-farm effects such as noise, pesticide spray drift, dust and odour. While these off-farm effects are usually accepted by other farmers, they often create conflict with surrounding non-farm residents. As a result, non-rural residents may seek to remove or reduce any off-farm effects through the use of regulatory provisions. As Young said:

> ... those suffering the effects of external impacts by farming seek recourse in the nuisance provisions of the NSW Local Government Act or take action in the Land and Environment Court to force compliance with various pollution control statutes. (1996, p. 23)

Environmental regulation itself can create problems for rural land managers by, for example, increasing restrictions on agricultural activities that 'disrupt' adjacent urban use (for example crop spraying or the use of machinery at night). The South Australian Farmers Federation said that urban expansion has resulted in:

> ... increased regulation on agriculture, restrictions on the industry's ability to adapt and change ... (Sub. 89, Appendix 2, p. 1)

Such restrictions on rural land use have resulted in 'right to farm' legislation in areas of the United States and Europe to ensure that rural activities bordering on a new urban subdivision can continue.

Under such legislation, the conflict between urban and rural interests over land use is settled by allowing the first type of land use undertaken on that land to take precedence over other types of land use that might follow. This type of legislation does not provide a solution to the conflict between urban and rural land use. As Edge Land Planning said:

> This is a good concept in theory, but in practice is difficult to implement effectively as it does not provide a solution to both sides of the problem. The farmer is able to continue operating, but the surrounding rural residential users have not solved their amenity problem. (Sub. 173, p.2)

Another option is the use of buffer zones placed between urban development and rural land use areas to lessen any of the adverse effects. For example, as a condition of any subdivision bordering on a rural area, developers could be required to maintain an adequate zone of bushland between the rural and urban land.

A number of participants endorsed the use of buffer zones. Environment Australia (Sub. 229) said that buffer zones, if appropriately managed for weeds and pests, could provide a valuable resource for both urban and rural land users. The WA Farmers Federation (Sub. 230) said that the introduction of buffer zones may be necessary to reduce the conflict between rural and urban land use.

The Royal Australian Planning Institute (RAPI) (Sub. 251) believed that planning instruments such as buffer zones and separation areas could be used more intelligently. On the use of buffer or separation zones, RAPI (Sub. 251) drawing on a paper prepared by Capelin (1996), said that:

- the size of these zones or the distances between rural and urban land use should be determined by the propensity to cause harm;
- planning schemes should ensure lot sizes are of sufficient size to include buffer zones on private land;
- vegetated buffer zones should be used where chemical spraying occurs;
- lower quality rural land should be used where possible for the buffer; and
- by screening agricultural activities and reducing visual reminders, buffer zones become very effective in alleviating a problem where it is based on perception rather than reality.

However, buffer zones are not a costless means of reducing conflict between rural and urban land use. Developers or landowners may carry the cost through the loss of selling additional lots on the land designated as the buffer zone. Alternatively, primary producers have to forgo production on the land to be used as a buffer zone. For buffer zones to be used effectively, planners will not only have to determine which party will provide the area for the zone, but also resist development pressures to reduce or remove such areas.

Hobby farms

The subdivision of agricultural land into smaller parcels for hobby farms is claimed to lead to a number of poor land management practices. For example, Mr John Newlands (Sub. 12) claimed that overstocking, over-fertilising, sidestream and water diversion caused by blocking gullies are common problems on hobby farms. He said that this resulted in damage to catchment areas.

While not denying the poor land management practices associated with some hobby farms, the South Australian Farmers Federation (Sub. 89) said this type of land use had also been associated with increases in capital investment and can often sustain higher levels of production. Environment Australia (Sub. 229) said that, because of their off-farm income, hobby farmers often could afford to retain native vegetation and biodiversity and are more likely to enter into conservation agreements.

Some participants pointed to negative environmental impacts resulting from the under-use or neglect of hobby farms, particularly where hobby farmers live off-farm and are engaged in off-farm occupations. For instance, some hobby farms were seen to be little more than a breeding ground for weeds and feral animals, and detract from the aesthetic value of their locality.

20.2 Key issues

The essential issue is to what extent does the loss of agricultural land to urban, rural residential and hobby farm use represent a loss from the point of view of society as a whole?

The process of converting agricultural land to urban, rural residential and hobby farm use does not necessarily imply a loss to society, provided that the higher price paid for land for such uses reflects its true value to society in the alternative use. A number of factors could result in a non-optimal outcome for society as a whole. For example, the favourable tax treatment of hobby farms, subsidised provision of infrastructure and associated services and, inappropriate zoning regulations can lead to excessive urban fringe development.

Taxation

Because of the tax deductions available to primary producers, in the past hobby farming has provided both a lifestyle and a means of reducing taxation. These incentives are likely to have encouraged over-investment in the subdivision of agricultural land. As Young said:

> It also appears that aspects of the taxation system are distorting market signals and increasing the demand for part-time farming above that which would exist in the absence of those taxation measures. This is likely to have increased the rate of subdivision of agricultural land. (1996, p.12)

In recent years, the Australian Taxation Office (ATO) has sought to tighten the eligibility for taxation as a primary producer with a view to excluding small,

non-commercial businesses. The ATO criteria list a number of indicators including:

> Is the activity better described as a hobby, a form of recreation or a sporting activity? ... Subject to all the circumstances of a case, where an overall profit motive appears absent and the activity does not look like it will ever produce a profit, it is unlikely that the activity will amount to a business. (1997,pp. 1–2)

While the problem may be difficult to eliminate completely, these guidelines should help to reduce the likelihood of small hobby farmers inappropriately gaining primary producer status and help to ensure a more neutral environment for investment in hobby farms.

Infrastructure and associated services

Under-charging for the provision of services and infrastructure to hobby farms and other forms of peri-urban development may also encourage over-investment.

At present, developer contributions for the provision of infrastructure are levied by both State and local government authorities. However, the coverage and method of calculating these charges varies.

A number of studies have found that the services provided to fringe settlements are subsidised.

At a New South Wales Government Department of Planning seminar, which examined the cost of providing services to dispersed residential settlements on the north coast of New South Wales, it was suggested that there was considerable cross-subsidisation of services to all rural residents, both farming and non-farm residents (Young 1996; Northern Rivers Regional Strategy, Sub. 166).

Young (1996) found that, while local government in New South Wales is able to levy developers to cover the capital costs of providing services to rural residential development, these levies have generally not covered the cost of maintaining such services.

There is also a significant under-recovery of costs in the rural road network. Young, quoting Craythorn (1994), estimated that in the Wellington Shire of New South Wales there was almost $100 000 of road infrastructure for each rural resident:

> If these costs were calculated as an annuity, including maintenance, depreciation and an interest charge of 10% on capital, he calculated that this would equal $17 500 per dwelling each year. Actual rates were less than one fifth of this. (1996, p. 27)

Requiring developers to pay for infrastructure costs helps to avoid a situation where existing landholders subsidise new developments. Full cost recovery of infrastructure may also act as a control on development. As the Leeton Shire Council said:

> The full recovery of the cost of providing infrastructure to rural residential would serve as a market control on development and reduce some interface conflicts. (Sub. 266, p. 2)

Even if developers are levied for infrastructure costs, the residents of rural residential developments over time may gain sufficient lobbying power and demand residential type services, such as kerbed and channelled roads, garbage collection and town water and sewerage. As the Dubbo City Council said:

> The rates collected from these residents do not cater for improvements like these, [ie upgrading existing infrastructure] so if provided, these services are financed from general funds. In effect other ratepayers subsidise the servicing of these small rural lots. ... The strategy should aim to prevent or minimise such a cost unless it is a conscious decision of Council to subside such development. (1994, p. 64)

The costing and provision of infrastructure and associated services was examined in detail by the Commission in its report into the *Taxation and Financial Policy Impacts on Urban Settlement* (IC 1993b). The Commission found that infrastructure charges were not sufficiently reflective of locational differences and that there was an over-reliance on uniform charges. Furthermore, the Commission found that cost recovery was desirable to ensure efficient resource management and decision making in the provision of infrastructure.

However, in regard to subsidisation of services to the urban fringe, the Commission found that, for most categories of infrastructure, the detailed information needed for definitive analysis was not available. In one case where detailed information was available — the provision of water and sewerage services in Sydney and Melbourne — the existence of subsidies to fringe locations was not confirmed.

In most other cases, the Commission found that it was difficult to determine whether net subsidisation of the urban fringe was occurring, let alone the magnitudes involved.

Despite the difficulties, the Commission considers that ensuring, to the maximum extent practicable, urban expansion incurs the real cost to society of such development is appropriate. Full cost recovery will help provide a common basis with other urban development options, such as infill and high

rise, to provide people with the maximum choice of lifestyles while facilitating efficient patterns of settlement and resource use.

Zoning and related issues

All governments have instituted a range of zoning and other policies to protect certain land uses and control urban expansion. Some, as discussed in Chapter 9, have integrated planning instruments with natural resource management regulation. They have had limited success.

The most comprehensive study of the effectiveness of these policies was undertaken by Young (1996). The study, which focussed on New South Wales, found that the New South Wales Government policy to protect agricultural land, released in 1984, relied heavily on the establishment of minimum subdivision sizes, such as the 40 hectare minimum lot size for subdivided agricultural land. This policy allowed unimpeded subdivision below this size, provided no dwelling was part of the subdivision. Despite this, faced with pressure for development in certain regions of New South Wales, particularly the north coast region, subdivisions were allowed to proceed with dwelling entitlements attached.

Under Section 117 Directions of the *Environment and Planning Act 1979*, the New South Wales Government created agricultural protection zones to protect high grade agricultural land. This was intended to result in only land outside these agricultural protection zones being subdivided below the minimum 40 hectare lots, unless the local government authority could justify an exemption as part of its Local Environment Plan (LEP). In practice, local governments frequently appear to have approved exemptions through the use of LEPs. Furthermore, LEPs encapsulating exemptions have often been approved by the state government. As Young said:

> In many cases, however, LEPs put forward in contravention of the S117 directions were approved, despite the Direction still being current (including the 40 ha standard). (1996, p. 43)

The Queensland Government also has a policy in place, State Planning Policy 1/92, to conserve good quality agricultural land. Under this policy, local governments are expected to identify and protect good quality agricultural land from development and implement measures to avoid or reduce conflicts between agricultural land uses and adjacent developments. Local government authorities are provided with a broad set of principles to apply when carrying out their planning schemes and assessing applications for development. For example, under the policy:

> Local governments will be expected to include provisions regarding the conservation of good quality agricultural land when preparing, amending or reviewing planning schemes, particularly when framing strategic plans, development control plans or local planning policies. Applications for rezoning, consent uses and subdivision should be considered in the context of such provisions. (Queensland Government 1992, p.4)

However, this policy does not *exclude* development on good quality agricultural land. Agricultural land considered to be of good quality can still be developed provided an overriding need for the development in terms of benefit to the community can be demonstrated (Queensland Government, Sub. 164).

Similarly, the Victorian Government has planning provisions in place to protect high quality agricultural land. Under these provisions, local government authorities are required to consider the productive quality and the significance at the local, regional and State level of high quality agricultural land when determining alternative land use proposals. Also, these provisions require local government authorities to consider, in consultation with the community and other key stakeholders, where development should be directed (Victorian Government, Sub. 172).

The Tasmanian Government (Sub. 88) is also in the process of implementing a State Policy on the protection of agricultural land.

Local government has also acted to control the subdivision of rural land and the expansion of urban land mainly through the use of zoning. For example, some local government authorities use zoning regulations to specify minimum lot size or prohibit subdivision in certain areas. For instance, Leeton Shire Council:

> ... prohibit small lot subdivisions from farms, while encouraging rural residential within a small area around the main town of Leeton. (Sub.19, p. 2)

Many land holders view such regulation as an infringement of their rights to profit from their asset. As the Queensland Grain Growers Association said:

> In the coastal belt of Queensland where high population pressure and this demand for new residential land drives peri-urban farm land prices up to 4-5 times the agricultural land price, serious community conflict arises from anti-subdivision regulations. Understandably, landholders nearing retirement age regard such legislation as discriminatory, preventing them from receiving what they regard as the equivalent of their city counterparts' superannuation lump sum. (Sub. 61, p. 19)

Young (1996) found zoning has been unsuccessful in protecting rural land, predominantly because zoning changes can significantly alter land values. Consequently, landholders and developers have an incentive to pressure government to alter zoning arrangements so as to maximise their financial gains. As the Queensland Grain Growers Association said:

> The planning process also requires commitment to long term stability through adhering to sound zoning principles despite pressure from parochial development interests. (Sub. 207, p. 9)

Given that zoning will continue to be used to control land use, the Commission considers there may be scope for governments to use infrastructure provision in conjunction with zoning to assist in the efficient transition of rural land to urban and peri-urban use. This would involve the zoning of different categories of land use (for example, rural, rural residential) focussing less on size restrictions and more on ensuring the cost-effective provision of infrastructure such as roads, water and sewerage. For example, in certain zones in less settled areas, developers would only be required to provide sealed road access. In more closely settled areas, zoning would require developers to provide more comprehensive infrastructure, perhaps sealed road access, water and sewerage. A requirement that the developer provide and meet the costs of infrastructure for a whole development would help avoid the possibility of costs being cross-subsidised by existing householders. In all zones, ongoing costs should, wherever possible, be met by residents on a user-pays basis to ensure full cost recovery.

Transferable development rights

As means of protecting rural land from urban expansion, the use of a transferable development rights schemes was suggested by the South Australian Government (Sub. 84). Under such a scheme, the development rights are separated from the property rights and become transferable to another location. Landholders lose the right to develop their property, but are able to sell the rights to developers to undertake development in another location.

The right to develop a dwelling on a title is, as the South Australian Government (Sub. 84) said, an assumed right. A right to construct a dwelling does not exist in law until the proposed construction has been approved under the appropriate planning legislation.

To address the demand for expansion and peri-urban development in the Adelaide Hills, the South Australian Government (Sub. 324) trialed a scheme of transferable development rights. As the South Australian Government said:

> The now abandoned Mt Lofty Ranges Scheme proposed to enable the transfer of 'development rights' from areas where the existing zoning control did not allow for development (of housing and land division) to more appropriate areas identified for urban expansion and infrastructure provision. (Sub. 324, p. 5)

In the South Australian scheme, planning authorities failed to resolve which areas were to be developed and which were to be protected. In this context, the South Australian Government said:

> The scheme failed for several reasons, but largely due to insufficient resolution of 'donor' and 'target' criteria. The resulting uncertainty hindered confidence in the market. (Sub. 324, p. 5)

To achieve its objective, such a system entails denying development rights for dwellings on rural land that the planning authorities want to protect. In practice, this involves planning authorities resisting pressure to approve development rights in protected or target areas. As mentioned previously, the New South Wales experience of removing dwelling entitlements from land subdivision failed to stop development. There, under pressure for development, numerous subdivisions were allowed to proceed with the dwelling rights attached.

The advantage of such schemes is that they can provide a means of compensating landholders for forgoing development rights on their land in the public interest, although developers rather than the wider community purchase the development rights and meet the cost of compensation. However, for any transferable development rights scheme to work, 'sending' and 'receiving' areas for the development rights must be established and government and planning authorities have to resist pressure to have development approved in the 'sending' or protected areas. Furthermore, development in the 'receiving' areas, other than by purchasing the transferable rights, must also be restricted so as not to degrade the value of the rights.

Summary

The spread of urban development on what was previously agricultural land reflects the increasing demand for land for urban use. Primary producers, as a group, want to ensure a plentiful supply of rural land for agriculture, but as individuals the gains from subdividing their land for urban development are often considerable.

Provided the higher price paid for land for non-agricultural use reflects it true value to society, the conversion of rural land to urban, rural residential and hobby farm, does not necessarily intimate a loss to society. As discussed above, inefficient or inappropriate actions by government in the tax treatment of hobby farms or in the provision of infrastructure and the use of zoning regulations could result in a less than optimal outcome for society as a whole.

As the subdivision of rural land for urban development in the presence of existing rural land use is likely to create conflict between non-farm and farm residents, buffer zones and separation areas may provide a means of reducing such conflicts.

A TERMS OF REFERENCE

INDUSTRY COMMISSION ACT 1989

I, JOHN FAHEY, Acting Treasurer, under Part 2 of the Industry Commission Act 1989:

1. refer ecologically sustainable land management in Australia to the Industry Commission for inquiry and report within twelve months of receipt of this reference;

2. specify that the Commission report on the ecologically sustainable management of land used for agricultural or pastoral purposes. Land, for the purposes of this inquiry, includes both land and associated vegetation and ground and surface water including rivers, riversides and wetlands, etc, whether publicly or privately owned and whether currently or potentially available for economic use;

3. specify that in making its recommendations the Commission aim to improve the overall performance of the Australian economy, while meeting the core objectives of the National Strategy for Ecologically Sustainable Development;

4. without limiting the scope of this reference request that the Commission report on:

   (a) the nature and appropriateness of the roles and contributions of Commonwealth, State, Territory and Local Governments and their agencies, and landowners, land managers and community groups to ecologically sustainable land management;

   (b) the impact of regulatory, taxation and institutional arrangements on ecologically sustainable land management practices;

   (c) the impact upon rural lands of urban encroachment, including the subdivision of land for hobby farms;

   (d) the effectiveness of existing mechanisms, policies and programs relating to ecologically sustainable land management, including land and water resource policies;

(e) measures, including economic instruments, which could be taken to remove impediments to or otherwise promote the adoption of ecologically sustainable land management practices;

(f) the identification of adjustment issues, including groups benefiting from or disadvantaged by any measures flowing from 4(e) above;

(g) the development of a set of guidelines that public sector managers, landowners, land managers and community groups can use to promote ecologically sustainable land management;

(h) the regional impacts of its recommendations;

5. specify that the Commission report, where appropriate, on implementation strategies and evaluation and monitoring criteria for its recommendations;

6. specify that the Commission take account of, and draw together, the work of recent relevant studies undertaken elsewhere; and

7. specify that the Commission have regard to the established economic, social and environmental objectives of governments.

JOHN FAHEY

17 JAN 1997

B PUBLIC CONSULTATION

During the course of the inquiry the Commission held informal discussions with a wide range of participants (see Section B.1) and held roundtable meetings (see Section B.2). Roundtable meetings were held in April, May and June 1997. The initial public hearing was held in Melbourne in June 1997.

The Commission released the Draft Report for this inquiry in September 1997. Comments on the draft were invited and a series of public hearings were held during October and November 1997 (see Section B.3).

A total of 343 submissions have been received for this inquiry (see Section B.3).

B.1 Visits with individuals and organisations

The Commission held extensive visits with individuals and organisations in each State and completed two sets of rural visits, one in Northern Queensland and the other in south-west Queensland. Discussions were held with the following:

New South Wales

Cabinet Office, The

Department of Land and Water Conservation

Department of Local Government

Department of Mineral Resources

Department of Urban Affairs and Planning

Environment Protection Authority

Gunnedah Environment Group

Murrumbidgee Irrigation

Healthy Rivers Commission

National Parks and Wildlife Service

National Parks Association of NSW Inc.

New South Wales Agriculture

New South Wales Farmers' Association

New South Wales Fisheries

Ricegrower's Co-operative Ltd

New South Wales State Forests

Stein, The Hon Justice Paul

Treasury Department

Victoria

Australian Conservation Foundation

Australian Paper

Department of Natural Resources and Environment

Department of Premier and Cabinet

Greening Australia

Municipal Association of Victoria

Trust for Nature

Victorian Catchment and Land Protection Council

Victorian Farmers' Federation

Queensland

Australian Environment International Pty Ltd

Australian Institute of Marine Science

Brigalow-Jimbour Flood Plain Project Management

Brown, Mr G

Bryant, Mr C

Bureau of Sugar Experiment Stations

Cattlemen's Union of Australia

Condamine Catchment Management Association

CSIRO, Division of Soils

Darling Downs Regional Assessment Panel

Darling Downs Vision 2000

Department of Economic Development and Trade

Department of Environment

Department of Lands

Department of Local Government and Planning

Department of Main Roads

Department of Mines and Energy

Department of Natural Resources

Department of Natural Resources, South West Strategy Group

Department of Primary Industries

Department of the Premier and Cabinet

Department of Tourism, Small Business and Industry

Douglas, Mr N

Lavery, Dr H

Malanda and Upper Johnstone Catchment and Landcare Association

Mary River Catchment Management Group

Middleton, Mayor Ivan

Mooloolah River Catchment Management Group

Moreton Sugar Mill

National Australia Bank

North Australia Pastoral Company

O'Brien, Mr P

Olm, Mr N

Pietsch, Mr R

PMP Managing the Future Project

Queensland Dairy Farmers' Organisation

Queensland Farmers' Federation

Queensland Fruit and Vegetable Growers' Association

Queensland Grain Growers' Association

Roberts, Professor B

South West Queensland Resource Centre

South West Regional Adjustment Program

South West Regional Development Association

Stallman, Mr K

Stanbroke Pastoral Company Pty Ltd

Tinnenburra Landcare Group

Treasury Department

United Graziers' Association

Wambo Shire

Warrego Paroo Catchment Management Association

Waterwatch

Western Australia

Agriculture Western Australia

Department of Conservation and Land Management

Department of Environment Protection

Department of Minerals and Energy

Department of Resources Development

Local Government Association of South Australia

Ministry of the Premier and Cabinet

Water and Rivers Commission

Western Australian Federated Farmers

Western Australian Municipal Association

South Australia

Department of Premier and Cabinet

Department of Primary Industries

Department of Treasury

Economic Development Authority

South Australian Farmers Federation

South Australian Local Government Association

Water and Rivers Commission

Western Australian Farmers Federation Inc., The

Western Australian Municipal Association

Tasmania

Burgess, Mr S

Cameron, Mr D

Chilvers, Mr B

Crosby, Mr L

Department of Education, Community and Cultural Development

Department of Premier and Cabinet

Department of Primary Industries and Fisheries

Department of Treasury and Finance

Department of Environment and Land Management

Forest Industries Association of Tasmania

Hydro-electric Corporation

Office of Energy, Planning and Conservation

Parks and Wildlife Service

Tasmania Development and Resources

Tasmanian Farmers and Graziers Association

Australian Capital Territory

Australian Bureau of Agricultural and Resource Economics

Australian Bureau of Statistics

Bureau of Resource Sciences

Chief Minister's Department

CSIRO

CSIRO, Division of Soils

CSIRO, Division of Wildlife and Ecology

CSIRO, Environment and Natural Resources

Department of the Environment, Sport and Tourism

Department of Primary Industries and Energy

Department of Urban Services

Great Artesian Basin Consultative Council

Greening Australia

Howden, Mr M

Kimberley Land Council

Land and Water Resources Research and Development Corporation

Minerals Council of Australia

Murray-Darling Basin Commission

National Association of Forest Industries

National Farmers' Federation

National Resource Information Centre

NSW Irrigators' Council

Res Eng Australia Ltd

Soil and Water Conservation Association of Australia (NSW Branch)

Wilderness Society, The

Northern Territory

Central Land Council

Department of Lands, Planning and Environment

Department of the Chief Minister

Department of Treasury

Litchfield Shire

Northern Land Council

Wildlife Management Unit , Parks and Wildlife

B.2 Roundtables

During the period 30 April 1997 to 27 June 1997 the Commission held several roundtable discussions in each State. They were attended by a wide range of people representing rural, environmental, and academic interests. Participants are listed below.

Hobart, 30 April 1997

Department of Agricultural Science, University of Tasmania

Farmwood Association

Forest Industries Association of Tasmania

Geard, Mr S

Irrigation Association of Australia

National Environmental Law Association

Tasmanian Conservation Trust

Tasmanian Farmers and Graziers Association

Tasmanian Landcare Association

Adelaide, 1 May 1997

Centre for Environment and Recreation Management, University of South Australia

Conservation Council of South Australia

Coorang and Districts Soil Conservation Board

CSIRO, Division of Soils

Indigenous Land Corporation

Murray Plains District Soil Conservation Board

Natural Resources Council of South Australia

Soil Conservation Council of South Australia

South Australian Farmers Federation

Perth, 19 May 1997

Agriculture WA

Conservation Council of Western Australia

Department of Conservation and Land Management

Department of Premier and Cabinet

Fitzpatrick, Mr E

Gardener, Mr B

Hamersley Iron

Indigenous Land Corporation

Land Management Society of Western Australia

Mcleod, Mr P

Pastoralists and Graziers Association

Serpentine-Jarrahdale LCDC

Serpentine-Jarrahdale Shire

Soil and Land Conservation Council of Western Australia

Swan-Avon Integrated Catchment Management Coordinating Group

Waters and Rivers Commission

Western Australian Farmers' Federation

Whittington Interceptor Sustainable Agriculture Land Treatment Society

Bunbury, 20 May 1997

Agriculture WA

Augusta Regional Planning Group

Augusta-Margaret River Shire

Blackwood Catchment Co-ordinating Group

Farmers' Federation of Western Australia

Galloway, Mr D

Lower Blackwood LCDC

Martin, Mr K

South West Irrigators Co-operative Board

Cairns, 26 May 1997

Atherton Dairy Farmers

Balkann Cape York Development Corporation

Barron River Catchment Management Committee

Cairns and Far North Environment Centre

Cattlemens' Union of Australia

Cooperative Research Centre for Tropical Rainforest Ecology and Management

Etheridge Landcare Group Inc.

Far North Queensland Regional Organisation of Councils

Indigenous Land Corporation

Johnstone River Catchment Management Association

Malanda-Upper Johnstone Catchment Landcare Group

Queensland Cane Growers' Association

Russell-Mulgrave Landcare Group

Brisbane, 28 May 1997

Australian Forest Growers

Barung Landcare and Lake Baroon Catchment Care Groups

Biological Farmers of Australia

Bureau of Sugar Experimental Stations

Cattlemen's Union of Australia

Currumbin Sand and Gravel

Fertiliser Industry Federation of Australia

Indigenous Lands Corporation

National Parks Association

Natural and Rural Systems Management, Gatton College, University of Queensland

Organic Food Chain

Queensland Conservation Council

Queensland Farmers' Federation

Queensland Grain Growers Association

Queensland Landcare Council

Queensland Murray-Darling Basin Coordinating Committee

Science Policy Research Centre, Griffith University

Southern Queensland Regional Studies Centre, University of Southern Queensland

Sugar Research and Development Corporation

United Graziers Association of Queensland

Sydney, 2 June 1997

Australian Conservation Foundation Inland Rivers Network

Australian Research Council

Blick, Mr R

Department of Land and Water Conservation

Department of Urban Affairs and Planning

Hawkesbury-Nepean Catchment Management Trust

Indigenous Land Corporation

Landcare Australia Ltd

Local Government Association

National Parks Association

Nature Conservation Council NSW

New South Wales Irrigators' Council

NSW Aboriginal Land Council

NSW Agriculture

NSW Dairy Farmers' Association

NSW National Farmers' Association

Premier's Department

Westpac Agribusiness Centre

WWF Australia

ACT, 3 June 1997

Australian Geological Survey Organisation

Australians for an Ecologically Sustainable Population

Bennett, Mr J

Brown, Professor A D

Centre for International Economics

Centre for Resource and Environmental Studies, Australian National University

Clancy, Mr K

Community Advisory Committee for the Murray-Darling Basin Commission

CRC for Freshwater Ecology

CSIRO

Department of Primary Industries and Energy

Indigenous Land Corporation

Murray-Darling Basin Commission

National Association of Forest Industries

Riverina Regional Development Board

Royal Australian Planning Institute

Rural Land Protection Board

Soil and Water Conservation Association of Australia

Southern Burrinjuck Landholders' Association

Mildura, 4 June 1997

Australian Conservation Foundation, Sunraysia Mallee Branch

Australian Dried Fruits Association

Bookmark Biosphere Trust

Mallee Catchment and Land Protection Board

MIA Council of Horticultural Associations

Murray Irrigation Limited

National Parks and Wildlife Service

Pine Creek Area Rangecare Group

Ricegrower's Association of Australia

River Murray Water Resources Committee

Sunraysia Rural Water Authority Water Users Committee

Sunraysia Salinity Management Plan

SunRISE 21

Melbourne, 5 June 1997

Australian Conservation Foundation

Australian Dairy Industry Council

Australian Institute of Agricultural Research

Australian Paper

Department of Agriculture and Resource Management, University of Melbourne

Goulburn Broken Catchment Board

Goulburn Valley Landcare Network

Greening Australia Victoria

Indigenous Land Corporation

Municipal Association of Victoria

Organic Retailers and Growers Association of Victoria

River Basin Management Society (Inc.)

School of Business, Latrobe University

South Gippsland Landcare Network

Trust for Nature

Victorian Farmers' Federation

Victorian National Parks Association

Water Service Association of Australia

Alice Springs, 23 June 1997

Arid Lands Environment Centre

Central Land Council

Centralian Land Management Association

Centre for Arid Zone Research

Indigenous Land Corporation

Darwin, Thursday, 24 June 1997

Environment Centre of the Northern Territory

Environmental Defender's Office

Friel, Mr C

Greening Australia Northern Territory

Indigenous Land Corporation

Litchfield Shire

Lower Mary River Landcare Group

Northern Territory Cattlemen's Association

Northern Territory Government

Northern Territory University

Tamworth, 27 June 1997

Central West Catchment Management Committee

Central West Planning Group

Centre for Water Policy Research

Department of Geography and Planning, University of New England

Department of Land and Water Conservation, University of New England

Forest Protection Society

Gunnedah Chemical Liaison Committee

Gunnedah Environment Group

Liverpool Plains Land Management Committee

Namoi Valley Water Users

North West Catchment Management Committee

Upper Namoi Cotton Growers

B.3 Submissions and public hearings

The following submissions were received during the course of this report, those marked with an asterisk (*) presented their submission at the public hearings. A list of participants at the public hearings follows.

Participant	*Submission number*
AACM International	148 *
Abel, Ms L	60
ACT Government	107
Agriculture Western Australia	227
Alexandra, Mr J	108
Animal Liberation ACT	216
Animal Liberation Victoria	253 *
Animal Societies Federation (NSW)	243
Anti-Rabbit Research Foundation of Australia, The	86
Arbuthnot, Mr A	305 *
Arid Lands Coalition	185
Armstrong-McDonald, Ms R and Fichera, Mr F	65
Ashby, Ms R	333
Aslin, Dr H	304
Augusta Regional Planning Group	41
Australia and New Zealand Land Information Council	283
Australian and New Zealand Federation of Animal Societies Inc.	281
Australian Bureau of Statistics	302 *
Australian Centre for Regional and Local Government Studies	43
Australian Conservation Foundation	105, 268, 296 *
Australian Egg Industry Association Inc.	258 *
Australian Farm Journal	23
Australian Forest Growers	116, 125

Australian Heritage Commission 282
Australian Institute of Agricultural Science and Technology 135
Australian National Audit Office 205
Australian Paper 57
Australian Research Council 115
Australian Seafood Industry Council 260 *
Australian Vegetable and Potato Growers Federation 96
Australian Wildlife Protection Council 220, 248, 300, 327, 334 *
Australians Against Commercialisation of Wildlife 290
Australians for an Ecologically Sustainable Population Inc. (National Office) 242, 291 *
Australians for an Ecologically Sustainable Population Inc. (NSW Branch) 278 *
Australians for an Ecologically Sustainable Population Inc. (Queensland Branch) 49
Australians for an Ecologically Sustainable Population Inc. (Victorian Branch) 297 *
Auty, Dr J 235, 311 *
Baldwin, Mr T 1, 182, 193, 203, 217, 247, 343 *
Bell, Mr I 100
Bennett, Mr J W 8
Bennett, Professor J and Whitten, Mr S 240 *
Blackwood Catchment Coordinating Group 124
Blackwood Environment Society Inc. 269
Blick, Mr R 87, 196
Brennan, M J and Patterson, R A 16
Brown, Professor A D 275 *
Brown, Mr G 62
Bureau of Meteorology 110
Bureau of Resource Sciences 329

Burnett, Mrs V D 271
Canegrowers 199
Cathles, Ms H 149, 306 *
Cattlemen's Union of Australia Inc., The 150
Central Land Council 165
Centralian Land Management Association 69
Centre for Environmental Applied Hydrology 44
Chidarsi, Dr K 249
Clancy, K W 81
Clarke, Mr D 38
Colong Foundation for Wilderness Ltd, The 58
Community Advisory Committee of the Murray-Darling Basin Ministerial Council 64
Conacher, Professor A and Mrs J 219
Conole, Mr M W 267
Conservation Council of the South-East Region and Canberra Inc. 257 *
Conservation Council of Western Australia 177, 315
Cooperative Research Centre for Freshwater Ecology 139
Cooperative Research Centre for Soil & Land Management 99, 274
Cooperative Research Centre for Tropical Pest Management 143
Cooperative Research Centre for Weed Management Systems 224 *
Coordinating Committee of Namoi Valley Water Users Association Inc. 178
Cormack, Mr I 179
Cotton Research and Development Corporation 66
Cotton, Mr R 9
CRC Reef Research Centre 76
CSIRO 128
Cunderdin Land Conservation District Committee and Tammin Land Conservation District Committee 142

Currumbin Sand and Gravel Pty Ltd	97, 237
Department of Administrative Services	160
Department of Conservation and Land Management Western Australia	225
Department of Defence	208
Department of Geography and Planning, University of New England	28
Department of Primary Industries and Energy	202, 329
Douglas, Mr J	3, 198
Edge Land Planning	173
Egan, Ms S; Smith ,Ms C and Cowley, Ms R	10
Environment Australia	175, 200, 229 *
Environment Centre Northern Territory	197
Faulconbridge Residents Association	221
Fertilizer Industry Federation of Australia Inc.	93
Fisher, Mr W	117
Fitzpatrick, E N	35
Formby, Dr J	33
Franklin, N A F	157
Freehill, Hollingdale & Page	209
Friel, Mr C M	17, 215
Friends of the Earth Australia	201
Gardner, Mr M, Hand, Mr G, Marshall, Mr B and Ward, Mr B	18
Geelong Environment Council Inc.	310
Geography Teachers' Association of New South Wales Inc.	68
Gloucester Shire Council	244
Gold Coast and Hinterland Environment Council	102
Gordon, Mr G	245 *
Goulburn Broken Catchment and Land Protection Board	126

Goulburn Field Naturalists Society 233 *
Grace, Mr G 272
Gravestein, Mr V R 137
Great Artesian Basin Consultative Council 320
Green, Mrs E M 45
Greening Australia 174
Greening Australia Northern Territory 161, 288
Griffith City Council 321
Gunnedah Environment Group 70
Gunnedah Shire Council and Swain, Mrs R 167
Hammond, Mr R 254
Hardy, Mrs B 48
Hart, K G 52
Hawkesbury-Nepean Catchment Management Trust 130, 323
Hayes, Mr G 301 *
Hayes, Mr G and Watson, Mr A 121 *
Heathdon Agricultural Services 5, 262 *
Henderson, Mr J 134
Herlihy, Ms A 286
Holland, Mr I 314
Holmes, Dr R 241 *
Horsnell, Mr L 36, 239 *
Houston, Mr P 162
Howell, Dr C 30
Hulme, Ms J 307
Humane Society International Incorporated Australian Office 246
Hunter Environment Lobby 4
Huntley, D V 55
Huzzey, Ms J of Albury Wodonga Environment Centre Inc. 289

Hyde, Mr J	14, 138, 234
Indigenous Land Corporation	67, 292
Infoscan Pty Ltd	72
Inland Rivers Network	191, 332
Institute of Foresters of Australia Inc.	183, 226
Inverell Shire Council	293
Kangaroo Industry Association of Australia	298 *
Kangaroo Protection Co-operative Ltd	261 *
Kennealy, Ms S	27
Kilpatrick, Mr K	114
Land and Environment Planning	13
Land and Water Resources Research and Development Corporation	204
Land Conservation Centre, Faculty of Environment Sciences, Griffith University	74
Land Management Society	98, 328
Landcare Australia Ltd	122
Landcare Australia Ltd and Westpac Banking Corp.	119
Leeton Shire Council	19, 266
Lines, Mr W J	228 *
Liverpool Plains Land Management Committee	192
Local Government and Shires Association of NSW	276
Locki, Dr S	26
Lockyer Resource Management Group Inc.	312
Lockyer Watershed Management Association Vegetation Project Group	316
Lord, Mr D	46
Lower Blackwood Catchment LCDC	54
Macquarie River Food and Fibre	77
McCormack, Ms L	78

McGowan, Mr P	9 *
McLean, Colonel G B	42, 210
McManus, Mr K	2
McNamara, Mr G	181
Meat Research Corporation	156, 264
Melville Conservation Group	287
Merryville Estates Pty Ltd	339
Messer, Mr R and Patterson Mr D	103
Minerals Council of Australia Ltd	176
Morrisey, Mr P	50
Moss Vale Rural Lands Protection Board	53
Municipal Association of Victoria	151
Murray-Darling Basin Commission	129
Murrumbidgee Irrigation	152
National Association of Forest Industries Ltd	73, 336 *
National Committee for the Environment	295
National Farmers' Federation	190, 294 *
National Native Title Tribunal	340
Native Bird Liberation Alliance	231
Natural Resources Council of South Australia	94, 250
Newlands, Mr J A	12
North Queensland Conservation Council Inc.	270
North West Sydney Regional Development Organisation Inc.	82
North-West Catchment Management Committee	39
Northern Rivers Regional Strategy	166
Northern Territory Government	188
NSW Aboriginal Land Council	159
NSW Agriculture	186
NSW Dairy Farmers' Association Ltd	184

NSW Department of Land and Water Conservation	90
NSW Farmers' Association	317
NSW Government	325 *
NSW Irrigators' Council	140, 263 *
O'Keefe, Mr C	168
Office of National Tourism	141
Organic Retailers and Growers Association of Australia	21
Osborne, Dr G	189
Page, Mr G	144
Palmer, Mr J	71
Parks and Wildlife Commission of the Northern Territory	255
Pastoralists and Graziers Association of Western Australia	47
Pathways to Sustainability	106
Peel Rural Land Use Taskforce	112
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Pickard, Dr J	145
Prater, Ms S	51
Price, Ms J	195
Pulp and Paper Manufacturers Federation of Australia	279
Queensland Farmers' Federation	146
Queensland Government	164, 342
Queensland Grain Growers Association	61, 207
Queensland Landcare Council	75
Queensland Murray Darling Basin Coordinating Committee	136
Queensland Pork Producers Organisation	40
Rich, Mr F	85
River Basin Management Society Inc.	118
Ross, Dr H and Young, Professor E	187
Royal Australian Planning Institute	131, 251, 326 *

RSPCA Australia Inc. 309
Rural Development Centre, University of New England 63
Sanders, Mr R 285
Sattler, Mr P S 83
Schapper, Mr H 256
Schroeder, Mr C 11, 133
Sealy, Mr J and Ms D 180
Searle, Dr G 6
Searle, Mr J 127
Shaw, Mr D 265 *
Shire of Serpentine-Jarrahdale 109
Shire of Yarra Ranges 101
Simpson, Mr P 212
Sims, Mr P C 280
Soil and Land Conservation Council Western Australia 153, 284
Soil Conservation Council of South Australia 79
Sorgiovanni, Mr J 104
South Australian Farmers Federation 89, 222 *
South Australian Government 84, 324
Stafford, Ms R 232, 313, 318 *
State of the Environment Advisory Council 194
Stevenson, Dr G 15
Stewart, Mr G 37
Strider 213 *
Sugar Research and Development Corporation 132
Sunshine Coast Environment Council Inc. 155, 259
Sunshine Coast Rural Landholders Association Inc. 20
Sutherland Shire Environment Centre Inc. 273
Swan-Avon Integrated Catchment Management Coordinating Group 29

Sydney Water	335
Synapse Agricultural and Resource Consulting	211 *
Tasmanian Conservation Trust	322
Tasmanian Farmers and Graziers Association	95, 303 *
Tasmanian Government	88, 319
Tasmanian Landcare Association Inc.	80
Thomas, Mr S	252
Toowoomba and Regional Environment Council	171
Top Woodlands Agricultural Bureau	31
Total Catchment Management	330
TRAFFIC Oceania Pty Ltd	218
Trevethan, Mr P	299
Trust for Nature (Victoria)	170
Twynam Pastoral Company Pty Ltd	56, 308
United Graziers' Association of Queensland	223
Upper Bolinda Creek Land Management Group	92
Victorian Government	172, 341
Victorian National Parks Association Ltd	59
Walker, Mr J	123 *
Walsh, Mr T	214 *
Watson, Dr C	169, 236 *
Webb, Mr P W	32
Western Australian Farmers' Federation	113, 163, 230, 331 *
Western Australian Government	111
Western Australian No-Tillage Farmers Association Inc.	337 *
Western Australian Tourism Commission	22
Western Catchment Management Committee	34
Whittington Interceptor Sustainable Agriculture Land Treatment Society	24, 147

Whittington, Mr H S 25, 277
Wilderness Society Inc., The 158
Wildlife Preservation Society of Queensland Capricorn Branch Inc. 238
Williams, Dr B 7
Wollondilly Shire Council 154
Wright, Mr G 91

Hearing participants

Melbourne, 10 June 1997

NSW Irrigators' Association

Land and Water Resources Research and Development Corporation

Australian Conservation Foundation

Hayes, Mr G and Watson, Mr A

Walker, Mr J

National Association of Forest Industries

Hobart, 31 October 1997

Australian Bush Heritage Fund

Tasmanian Conservation Trust

Tasmanian Farmers and Graziers Association

Peart, Mr K

Darwin, 4 November 1997

Baldwin, Mr T

Darwin Area Housing Association

Environment Centre Northern Territory

Friel, Mr C

Greening Australia Northern Territory

Strider

Brisbane, 6 November 1997

Australian Forest Growers

Queensland Grain Growers Association

Synapse Consulting

Perth, 10 November 1997

Agriculture Western Australia

National Trust of Australia, Western Australia Branch

Pastoralists and Graziers Association

Western Australia No-Tillage Farmers Association

Western Australian Farmers' Federation

Adelaide, 11 November 1997

AACM International

Hardy, Ms B

McKay, Ms J

Natural Resources Council of South Australia

S. Kidman and Co.

South Australian Farmers Federation

South Australian Government

Canberra, 12 November 1997

Australian Association of Natural Resource Management

Australians for an Ecologically Sustainable Population Inc. (National Office)

Bennett, Associate Professor J

Brown, Professor A D

Cooperative Research Centre for Weed Management

Environment Australia

Goulburn Field Naturalists Society

Institute of Foresters Australia Inc.

Lines, Mr W

Stafford, Ms Rosalind

Watson, Dr C

Sydney, 13 & 14 November 1997

Animal Societies Federation (NSW)

Australian Conservation Foundation

Australian Egg Industry Association

Australian Geography Teachers Association and Geography Teachers Association

Australian Seafood Industry Council

Australians for an Ecologically Sustainable Population Inc. (NSW Branch)

Heathdon Agricultural Services

Kangaroo Protection Co-operative Ltd

Local Government and Shires Associations of New South Wales

Native Bird Liberation Alliance

Albury, 17 November 1997

Australian Wildlife Protection Council

Davidson, Mr I

Hayes, Mr G

L'Estrange, Mr K

Trevethan, Mr P

Melbourne, 18 & 19 November 1997

Animal Liberation

Australian Conservation Foundation

Australian Wildlife Protection Council

Australians for and Ecologically Sustainable Population Inc. (Victorian Branch)

Auty, Mr J

Christoff, Mr P

Gordon, Mr G

Holmes, Mr R

Kangaroo Industry Association of Australia

Landcare Australia Ltd

McGowan, Mr P

Victorian Farmers Federation

Canberra, 20 November 1997

Australian Bureau of Statistics

Cathles, Ms H

Conservation Council of the South East Region and Canberra

Department of Primary Industries and Energy

Horsnell, Mr L

National Farmers' Federation

Royal Australian Planning Institute

Shaw, Mr D

C COAG WATER REFORMS — RURAL ISSUES

This appendix provides a summary of the progress to the end of 1996 of each State and Territory and the Murray-Darling Basin Commission (MDBC) in implementing the Council of Australian Governments' (COAG) rural water reforms.

This information is based on the reports compiled by the Task Force on COAG Water Reform (Working Group 1995; Task Force 1996, 1997). The reports provide information on the broad reforms either undertaken or in progress in each jurisdiction. While the intent to proceed is evident with many rural water reforms in prospect, the reports do not provide the details necessary to demonstrate that the implementation lines up with COAG's reform agenda and its timetable for implementation. The Task Force will not report on reforms in 1997 until February 1998.

The information, which is cumulative over the three years, is presented on a broad category of reform basis under the following five headings:

- cost recovery and pricing;
- institutional reform;
- allocation and trading in sustainable water entitlements;
- environment and water quality; and
- community consultation and education.

C.1 Cost recovery and pricing

New South Wales

- Water charges for water reticulation within irrigation areas are being determined by water users within government parameters.
- Interim measures in place include the introduction of resource management charges.
- Water delivery charges include full cost recovery of a share of yearly operating costs.
- Bulk water prices are being determined independently by the Independent Pricing and Regulatory Tribunal (IPART).
- Investment assessment policies are in place.

- Subsidies are not yet transparent for bulk water.
- Working groups are examining capital structure, infrastructure refurbishment and irrigators' capacity to pay for water charges.

Victoria

- Five new regional rural water organisations are aiming to achieve full-cost recovery by 2001.
- Irrigation districts and areas are meeting full business costs, but not full economic costs.
- In 1995, four irrigation districts were on target to achieve financial self-sufficiency on a renewals basis by 2001.
- Irrigation services are pricing on a zero rate of return to equity basis.
- Districts are no longer subsidised.
- Water authorities are preparing Annual Reports on a Deprival Cost basis.
- New pricing and tariff arrangements have been negotiated by all regional urban authorities.
- CSO policy implementation and the adoption of asset management guidelines are planned.
- A major study into pricing and tariffs of bulk supplies is being undertaken.
- In 1996, all rural irrigation authorities are continuing to move towards full cost recovery based on renewals pricing.

Queensland

- In 1996, the Government released its policy document on *Rural Water: Pricing and Management* which aims to ensure water revenue from State-owned schemes covers operating costs and identifies strategies to reduce costs, increase revenue and consider increases in charges above the consumer price index.

Western Australia

- There is on-going rationalisation of water prices. For country non-residential customers, charges are still based on valuations, but there is a program to implement meter-based charging.
- In 1994, a Task Force recommended that the South West Irrigation Service be placed on a more commercial footing.
- Consumption charges have some regard for the differential costs of service provision.

- A new framework for the Water Corporation recognises losses on service provision as a CSO.
- New schemes are to be subject to the commercial environment facing existing providers.
- Water service providers have moved to full cost recovery, but only the WA Water Corporation is on a tax equivalent regime.
- Cross subsidies are being eliminated through explicit payments in recognition of CSOs.
- A process for auditing the costs associated with CSOs is being developed.

South Australia

- The *Water Resources (Imposition of Levies) Amendment Act 1995* provides for effective water resource pricing.
- The Business Plan for the River Murray Government Highland Irrigation Districts was approved in June 1995 to allow for cost recovery.
- Water supply and sewerage services have been declared for pricing oversight under the *Government Business Enterprises (Competition) Act 1996*.
- A CSO policy has been endorsed.
- A water resources charge has been introduced for SA Water customers and River Murray users.
- The Government is committed to the establishment of a commercially focussed bulk water supply business within the MDBC.

Tasmania

- Each regional water or local government authority is responsible for pricing within its jurisdiction. Few policies are based on user-pays.
- Rural water users in the government-run irrigation schemes are meeting the full costs of operation, maintenance and administration.
- Business plans have been prepared for three State-owned and operated irrigation schemes (which identify price increases to apply).
- The water price for non-regulated rivers is set by regulation and does not reflect management costs.
- An Interdepartmental Water Policy Committee has been established to implement reforms.
- Water royalties on water use have been introduced.

Northern Territory

- No government-owned or managed irrigation supply schemes exist.
- Charges are not levied on individual users of ground- or surface water.
- There is no recovery of management costs.
- Consumption-based pricing was adopted prior to COAG.
- The Power and Water Authority is moving towards full cost recovery.
- Uniform tariffs and charges continue to be applied, the cost of which is funded as a CSO.
- The Northern Territory is working with Western Australia on a pricing policy for the Ord River Scheme.

Australian Capital Territory

- Control and licensing of abstractions of water are being developed.
- The position of ACT Energy and Water Charges Commissioner has been established to provide independent advice on pricing and to undertake an inquiry into ACT prices for energy, water and sewerage services.
- A two-part tariff for water supply is in place.
- Charging for bulk water supplies is not appropriate.

Murray-Darling Basin Commission

- A Water Business Committee has been appointed to develop and guide the development and management of a Water Business Unit. The Unit will contract with water owners to provide an adequate delivery service and will move towards a positive real rate of return.
- Arrangements are proposed to enable the Water Business Unit to operate and manage full cost recovery operations.

C.2 Institutional reform

New South Wales

- The Irrigation Corporations Act will allow management of irrigation distribution schemes by irrigation interests.
- Authority for permits to extract groundwater from the coastal area, set aside for the protection of groundwater, has been transferred to the DLWC.
- The DLWC is reviewing internal role separation.

- The Healthy Rivers Commission has been established to provide independent advice on water quality and environmental flow objectives.
- Measures for improving DLWC's business efficiency are included in the 1997 IPART report.
- A program of efficiency gains for bulk rural water delivery has yet to be developed.
- A number of irrigation areas have been privatised and a number remain to be corporatised by February 1997.
- DLWC's service delivery has been heavily regionalised.
- Water user groups have been established for input to local water management decisions

Victoria

- In 1994, the Rural Water Corporation was divided into five regional boards.
- The *Catchment and Land Protection Act 1994* became fully operational in 1995. It sets up a framework for integrated management and protection of catchments and encourages community participation.
- A Catchment and Land Protection Council and ten regional Catchment and Land Protection Boards have been formed to advise the Minister on land and water management issues. (Regional catchment strategies were released in 1997.)
- The Catchment and Land Management Division of the Department of Conservation and Natural Resources has been restructured into Catchment Management and Land and Water Resources.
- Sunraysia and Loddon Torrumbarry have implemented business plans.
- All authorities are required to submit a five-year business plan.
- The *Water Industry (Amendment) Act 1995* enables streamlining of water industry licences.
- The Water Bureau replaced the Office of Water Reform. Its function is to consolidate legislative changes and to continue the government's reform program. Its objectives are to improve efficiency, water quality and effluent disposal, develop water entitlements and water markets and improve asset management.
- The *Water (Further Amendment) Act* provides for the devolution of price setting to customer groups.
- Rural water authorities have assumed management of headworks.

- In 1995, the rural water authorities were reduced in number from five to four.
- The feasibility of water and catchment contracts is being investigated.
- The Rural Water Corporation has been restructured. This has enabled policy and regulatory functions to be transferred to a departmental-based operation and service delivery to be undertaken by dedicated commercial service entities. The Minister has responsibility for the resource allocation system and regulation.
- Plans exist for a State environmental water management plan.
- The charter of the Office of the Regulator General has been extended to include price regulation and oversight.
- Compliance audits are conducted under the *Trade Practices Act*.
- Authorities report on performance indicators as part of the business planning and annual report cycle.
- Best practice is encouraged through industry-based competition. Yarra Valley Water has achieved ISO 14 000. South East Water has been accredited with ISO 9001.
- Eighteen regional water businesses (formerly 83 entities) have accelerated the commercialisation of services.
- Commercial boards have been appointed in the rural irrigation sector.
- Customer service groups have price and decision-making responsibilities in irrigation areas.
- A state Groundwater Council has been set up to provide community input and advise on sustainable groundwater management.
- A draft State Environment Protection Policy - Groundwaters of Victoria has been released.

Queensland

- Water resource management was separated from water service provision on 1 July 1995.
- Separation of regulators from service providers commenced in 1993 with departmental separation of commercial and regulatory function.
- Implementation of a commercial department business group to provide operations services for rural State-owned assets commenced on 1 July 1995.
- Institutional arrangement for bulk water supply delivery are being reviewed.

- Land and water management has been brought together under the Department of Natural Resources. Regional Infrastructure Development undertakes activities related to water resource development, while the Resource Management Group is the water resource regulator. Within Regional Infrastructure Development, the separation of the developer and operator role has been approved to become a fully commercial entity called State Water Projects.
- The Department of Environment is responsible for setting environmental objectives and targets for water quality.
- A working group has been established to establish a system of performance indicators for reporting by local governments.
- Commercialisation of water supply services is expected to be in place by mid-1997.
- Planning for local irrigation management is proceeding.

Western Australia

- An Implementation Committee has been appointed to oversee and recommend on reforms.
- Prospects for a change in management or ownership of irrigation networks is being explored.
- The Water and Rivers Commission is reviewing the entitlement structures for the Ord, South West and Preston schemes with the aim of developing a market framework.
- Institutional separation of resource management, service provision and regulation was implemented on 1 January 1996 through the formation of the Water and Rivers Commission, the Water Corporation and the Office of Water Regulation.
- Water service providers are regulated by the Office of Water Regulation through licensing.
- The *Water Corporation Act 1995* provides the Water Corporation with a commercial focus.
- Performance monitoring and best practice is the responsibility of the Office of Water Regulation.
- Three of the State's irrigation schemes are being devolved to local management.

South Australia

- Ministerial portfolios for environment and resource management and infrastructure have been separated. The Engineering and Water Supply Department (now SA Water Corporation) is no longer the sole water agency.
- A Regional Development Task Force has been established to identify total water demand, facilitate trade in water rights, assist development projects and provide information and support to irrigation developers.
- The Catchment Water Management Act (now repealed and replaced by the *Water Resources Act 1997*) enables the community to manage water resources and raise funds for works.[1]
- Catchment Water Management Boards are being established to enable community management.
- Water resource management has been separated from service provision since January 1994.
- The Government Highland Business Plan (agreed to in June 1995) forms the basis for negotiations by any irrigation district to become self-managing.
- SA Water has been corporatised. The *Public Corporations Act 1993* provides a framework for its commercial focus.
- Water resources management functions have been transferred to the Department of Environment and Natural Resources (now the Department of Environment, Heritage and Aboriginal Affairs) to separate these functions from water service provision.
- The Competition Commissioner is the economic regulator for SA Water.
- The Government is reviewing all legislation which restricts competition.
- All government highland irrigation districts will be transferred to self-management in 1997.

Tasmania

- Development of a State policy on Integrated Catchment Management under the Resource Management Planning Scheme has been recommended.
- The role of Advisory Committees for three Government irrigation schemes has been better defined and strengthened.

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[1] The Catchment Water Management Act has now been repealed and replaced by the *Water Resources Act 1997*.

- Studies have been commissioned for two of the schemes on ways to improve operational efficiency. Devolution to local management has been recommended.
- A report on the Roles and Functions of State and local governments in the water industry recommended irrigation schemes be managed by a local corporate entity.
- The Rivers and Water Supply Commission has been established as a government business enterprise.
- Change from government management to user management of three River Improvement Schemes.
- Responsibility for government-owned irrigation has been transferred to the Rivers and Water Supply Commission (RWSC).

Northern Territory

- The Department of Lands, Planning and Environment was created on 1 July to merge the land resource and environment functions of the Conservation Commission and the land planning and development functions of the Department of Lands and Housing and Local Government.
- Environmental legislation is being prepared.
- The Water Resources Division of the Power and Water Authority has been transferred to the Department of Lands Planning and Environment.
- The functions of the Division are now co-located with other government resource management and environmental responsibilities.
- The Power and Water Authority is required to operate commercially.

Australian Capital Territory

- The Land (Planning and Environment) Act 1991 enables integrated consideration of land and water issues based on total catchment management principles and guidelines for water quality, environmental flows and floodplain protection to be set down.
- There are currently no arrangements for licensing of surface and groundwater abstraction.
- The ACT Electricity and Water Supply authority has been corporatised to become ACTEW Corporation.
- Water supply and sewerage services have been corporatised. Regulatory and water resource management functions have been transferred to the responsible government agency.

- A groundwater management plan is being prepared and will be necessary to implement water allocation and licensing arrangements.

Murray-Darling Basin Commission

- The MDBC has proposed it be restructured to separate operation and regulatory functions (this involves a separation of the Water Business Unit).

C.3 Allocation and trading in sustainable water entitlements

New South Wales

- Trading in water entitlements on a yearly and permanent basis already exists.
- Inter-valley transfers have taken place over the last two years on a trial basis.
- Transfers are limited within the artificial boundaries of each regulated river system.
- Mechanisms allow temporary and permanent transfers ‘carry over’ and ‘overdraw’.
- The NSW environmental flows policy is being applied to regulated rural rivers and other rivers in NSW. The components of the policy are: minimum release rules for storages; an allowance within the regulated supply of water to meet ‘environmental contingencies’; and unregulated flow management.
- The 1995 Water Reform package gives priority to environmental flow objectives for all rivers.
- Water quality and environmental flow objectives are being reviewed in detail for critical rivers by a Commissioner for Healthy Rivers.
- An embargo has been placed on the issue of licences in most unregulated rivers in response to growing water use.
- A moratorium on the permanent transfer of inactive portions of entitlements has been introduced.
- Water property rights green paper is to be developed in 1997.

- Allocations will be dependant on River Flow and Water Quality Objectives process outcomes during 1997–98.[2]
- Legislation already provides for both temporary and permanent trading within valleys, inter-valley and interstate.
- An inter-valley trial is complete and a review is underway.
- The State is involved in an interstate trial with MDBC.
- Opportunities are being explored to enhance trading of groundwater and trading between surface and groundwater.
- Development of a State Groundwater Policy has commenced.

Victoria

- The *Water Act 1989* provides for permanent transfer of irrigators' water entitlements.
- In July 1994 legislation was enacted to allow water rights in irrigation districts to be traded to private diversion licences.
- The *Water Act 1989* provides for the separation of water property rights from land title.
- A two-year program commenced in 1994 to formalise all bulk water allocations.
- Provision has been made for allocations to the environment.
- Bulk water entitlements for the Goulburn system have been formalised under the Water Act.
- Systems have been developed to allow the hydrology of the Goulburn system to be assessed.
- A program is underway to convert current rights to water to bulk entitlements.
- The first sales of environmental water and interstate water took place in 1995.
- The *Water (Amendment) Act 1995* provides for irrigator-to-irrigator trade on a temporary basis; permanent transfers from irrigators to urban

[2] On Tuesday 19 August 1997, the NSW Government announced a $117 million water reforms package which, in part, sets a maximum of an average 10 per cent cut in water allocations to NSW irrigators over the five year life of the plan. Specific implementation of this measure has been deferred for six months while special community-based committees are formed to negotiate the levels of allocation for environmental flows, on a river-by-river basis, within the ceiling imposed. The plan will also identify rivers in urgent need of help and force unused water allocation licences onto the market where they could be traded.

authorities; automatic adjustment of bulk water entitlements; application of conversion factors when trade occurs; and sale of new water rights.

- The Water Act provides the legislative basis for a property rights system of water entitlements and permanent and temporary trade in those entitlements. Temporary trade between irrigators across State boundaries is also provided for.
- A two phase process is being implemented to clarify water rights (a bulk entitlement conversion process and a process whereby rights of the environment and private diverters on unregulated waterways are better specified).

Queensland

- A model is being developed for a management plan based approach to water allocation and entitlements (Water Allocation Management Plans or WAMPs). Provisions for environmental and other instream water requirements will be incorporated within the plans.
- Temporary transferability is available in all Queensland schemes.
- Strategies for the allocation and management of water resources on a catchment basis have been developed.
- The WAMP process will enable allocations from natural water resources to be made to private and public developers. Pilot implementations are in progress.
- Natural resources management legislation is being developed.
- The development of WAMPs (which involve community and stakeholder consultation) is proceeding in priority catchments.
- Impact Assessment Studies and Environmental Management Plans are being undertaken for all major water infrastructure proposals.
- A commitment to tradeable property rights in water is included in the *Rural Water* policy document.

Western Australia

- A tiered management plan approach provides the framework for the statutory licensing of water allocations.
- Moves are underway to rationalise South West, Ord River and Carnarvon public irrigation areas.
- Consideration is being given to trading within the irrigation sector.
- The Water Authority is working on proposals for a system of tradeable water entitlements.

- A framework for water resource allocation and licensing based on sustainable consumptive draw is well established. Water allocation licensing policy is established for individual resource management areas.
- Tradeable water rights for consumptive draws are being developed with devolution of public irrigation systems to private irrigation cooperatives. Implementation is dependent on institutional and law reform.
- Specification of licenses/entitlements and their transferability have been developed for the South-west and Ord Irrigation Districts.
- In 1996, the Water and Rivers Commission completed allocation licensing of water services providers.
- Work is being undertaken to develop an allocation and trading framework (legislative changes will be required).
- The Minister has approved an environmental allocation plan for Perth's major groundwater resource.

South Australia

- Formal allocation of volume and issuing of licences to individual irrigators within Government Irrigation Areas commenced in 1994.
- Water trading has existed on the River Murray since 1983 and on the Northern Adelaide Plains since 1984.
- Water allocations have been granted and issued to the River Murray Government Irrigation Districts.
- Trade in permanent allocations continue on the River Murray and in some groundwater areas.
- Temporary trade of River Murray water allocations across the border has been agreed to in principle.
- Once enacted, the *Water Resources Bill 1996* will establish a system of transferable property rights for water allocations.[3]
- A statement on the future of water resource planning and management, *South Australia - Our Water Our Future* was released in 1995.
- Trading in water allocations will be extended to all resources in South Australia by end-1998.

Tasmania

- Research is underway on developing a methodology for determining environmental allocations.

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[3] The legislation has now been enacted, entitled the *Water Resources Act 1997*.

- Temporary water transfers have been introduced as a precursor to trading in water rights.
- A new program will provide data on environmental flow requirements for the State's major rivers and streams.
- A new program has been developed for environmental flow management in the South Esk.
- Temporary transfers of irrigation rights for unregulated rivers and streams have been provided for.

Northern Territory

- Non-riparian diversions of surface water are subject to licensing.
- Groundwater extraction is regulated in declared 'Water Control Districts' and for some individual bores.
- Allocation policies to limit extraction are developed when needed.
- Work is underway to develop principles and a framework for water allocation from surface and groundwater systems. It will address bulk allocation, environmental flows, water entitlements to individuals, pricing and trading.
- The principles and processes embodied in the National Water Quality Management Strategy (NWQMS) have been adopted.
- Policy recommendations from the *ARMCANZ & ANZECC Framework for Improved Groundwater Management* will be reviewed to develop a forward program of action.

Australian Capital Territory

- Controls on water abstractions are being developed.
- Draft environmental flow guidelines have been developed under planning legislation as a basis for water allocation.
- Work is concentrating on determining environmental flows in ACT rivers.
- Proposed water resources legislation will provide a system of water allocation and licensing across ACT.

Murray-Darling Basin Commission

- Progress continues on a cap on diversions in the Basin.
- An Independent Audit Group has been appointed to examine outstanding issues regarding the cap.

- A pilot project in the Mallee region has been approved to fast-track trade in water entitlements between States.

C.4 Environment and water quality

New South Wales

- Catchment management committees have been set up to facilitate integrated natural resource management and community/government partnership. The aim is to have strategic catchment plans for each catchment within five years.
- NSW Water Quality Objectives are being developed consistent with the NWQMS.

Victoria

- Catchment and Land Protection Boards have been established across the State.
- A State Groundwater Council has been established to consider cost recovery and cross subsidy issues.

Queensland

- An Environmental Protection Policy for Water and a Waste Management Strategy have been prepared.
- Guidelines on requirements for effluent re-use and disposal have been issued to local governments.
- A Queensland Nutrient Removal Infrastructure Program has been developed.
- A South East Queensland 2001 Water and Wastewater Study has been completed.
- The preparation of legislation to integrate and update natural resource management legislation to include water resource management and ICM has been approved.
- Queensland is moving to adopt the guidelines of the NWQMS where relevant.
- The Government is assisting local governments to develop alternative strategies to sewage discharge to waterways.
- Guidelines on the design of constructed wetlands are being updated.

- A State Waste Water Re-use Strategy has been proposed with irrigation being the main focus of the re-use proposals.
- An environmental protection policy for water is being prepared to provide water quality objectives, require a program for the protection of groundwaters, and require local authorities to consider other options for waste disposal.
- Proposed natural resource management legislation may provide for statutory management plans for groundwater, facilitate protection of groundwater in unregulated areas by controlling drilling, and improve flexibility of regulation.

Western Australia

- The principles of sustainable development, intergenerational equity, the precautionary principle, beneficial use, and integrated economic, social and environmental goals are being adopted in water planning and management.
- Progress continues on the development of environmental protection policies for key water resources.
- The NWQMS approach is adopted for preparation of catchment management plans.
- A Water Quality Monitoring Committee has been established.
- Community groups are being established in rural areas to protect the environmental values of rivers and creeks.
- A Salinity Action Plan has been announced to be implemented through a whole-of-government approach.
- The South Coast Regional Initiative, released in 1996, is a model regional strategy for integrated natural resource management.
- The ‘beneficial use’ concept of the NWQMS has been adopted in allocation and water resource protection.
- Integrated land and water strategies for water quality protection are being developed.
- The Middle Canning Catchment Water Resources Management Study was completed in September 1995 to provide land planners in State and local governments with technically based information on water resources and environmental constraints and opportunities in the Canning River catchment.

South Australia

- The Water Resources Bill (now Water Resources Act) will provide catchment management boards with management responsibilities and fund-raising abilities.
- The Environment Protection Authority is preparing an environment protection policy on water quality under the *Environment Protection Act 1993*.

Tasmania

- A Land and Water Management Council has been established.
- Guidelines and a Framework for Catchment Management has been developed.
- A State policy for Water Quality Management has been developed to implement NWQMS guidelines.

Northern Territory

- A Water Quality Management Strategy based on the NWQMS has been adopted.
- Integrated catchment management is gaining recognition as an overall approach.
- The Water Act is being used to establish Water Advisory Committees where stakeholders can take part in decision-making and policy.

Australian Capital Territory

- Proposed water resources legislation will address resource management issues.
- Compliance with the NWQMS has been examined.

Murray-Darling Basin Commission

Not reported on in the Task Force reports.

C.5 Public consultation and education

New South Wales

- Total Catchment Management has encourage community input into resource management activities.
- The DLWC encourages public input into its processes.

- Public education programs and educational materials continue to be developed on water use and reform.
- Councils are now required to implement a community consultation program before assistance for capital works can be approved.
- Education on the effects of phosphorus is taking place.
- Consultation is achieved through IPART, River Management Boards, the Water Advisory Committee, Catchment Management Committees, the Healthy Rivers Commission and County Councils.
- Education measures include Waterwise, Streamwatch.

Victoria

- Consultation on reforms is progressing through industry and the Victorian Farmer's Federation.
- A Customer Consultative Committee has been created to advise the Office of the Regulator-General on customer issues arising.
- Rural water authorities have established Water Services Committees.
- Public consultation occurs where necessary. The Office of the Regulator General also undertakes public consultation as part of its process.
- Educational materials are prepared in consultation with the education system.

Queensland

- Consultation is progressing through WaterWise and Integrated Catchment Management Programs.
- The development and preparation of natural resource management legislation has been undertaken in consultation with stakeholders.
- A steering group of water users and government representatives is planning a program to implement the water pricing and local management proposals outlined in the *Rural Water* policy paper.
- WAMPS have involved extensive community consultation.
- All major water infrastructure planning proposals of government have community consultation processes.
- Community consultation is required for Impact Assessment Studies and Environmental Management Plans.
- WaterWise is a dedicated public education campaign currently in operation.

Western Australia

- Public consultation is undertaken when new initiatives are proposed (irrigation, allocations, trading).
- A 'Waterwise' curriculum is being introduced.
- 'Ribbons of Blue' is an educational water monitoring program that has been introduced.
- Integrated catchment plans continue to be developed.
- Sub-catchment plans are being developed.
- Integrated catchment management resource networks and centres are being established to provide support, information and a link between State Government, local government and community initiatives.
- Any changes or initiatives involving multiple interests involve public consultation (for example, irrigation cooperatives, the strategy for Geographe Bay, by-laws for water quality protection, strategies for Gnagara and Jandakot Mounds).
- Work has commenced to review and update educational materials.
- Special events and publications have been developed and implemented to raise public awareness of water reform measures.

South Australia

- The Mount Lofty Ranges Community Consultation Program is an example of community involvement.
- The establishment of a Water Resources Committee under the *Water Resources Act 1990* ensures community involvement.
- *Watercare* has been launched as a curriculum reference for primary schools.
- Community consultation has been undertaken in the establishment and operation of the River Murray Catchment Water Management Board, in assessing management options for groundwater resources in some regions, in preparing a draft Bill for the Water Resources Act, and in preparing the State Water Plan.
- The Water Resources Bill (now Water Resources Act) will provide for increased community consultation through catchment management boards.

Tasmania

- Consultative groups were being established as part of the review of water legislation.

- A policy to promote greater consultation on water allocations has been introduced. Stakeholders are participating in the setting and monitoring of minimal flow requirements.
- Greater stakeholder input has been encouraged into the Rivers and Water Supply Commission.
- Stakeholder groups have been established to develop new catchment management plans.

Northern Territory

- Primary and secondary school curricula has been prepared in consultation with the Education Department.
- The water resource management document *NT WATER* involved a six-month consultation program.
- Consultative committees have been formed within the Power and Water Authority to assist the development of water resources policy.
- Water Advisory Committees have been formed under the Water Act to enable stakeholder involvement in resource allocation and management.
- Waterwatch has a public education element.

Australian Capital Territory

- Waterwatch is a community-based water quality program.
- A commitment has been made to community consultation on the implementation of new policies and initiatives.
- Community comment has been invited on environmental flow guidelines and consultation is planned before water allocation and water abstraction licensing are introduced.
- Public consultation is required before major initiatives are implemented.
- Public education arrangements have been reviewed.

Murray-Darling Basin Commission

Not reported on in the Task Force reports.

D NATURAL HERITAGE TRUST

D.1 Introduction

Establishment of the Natural Heritage Trust of Australia (NHT) was given affect during 1997 following the partial sale of Telstra. The NHT provides for an expenditure package of close to $1.25 billion to be allocated over five years to 2001–02 and aims, broadly, to improve Australia's environmental infrastructure. The Trust subsumes a number of existing resource management programs as well as providing additional funding for initiatives such as the National Landcare Program and Coastcare. As such, the NHT aims to provide an integrated approach to solving environmental problems and has been structured around five interdependent areas — vegetation; rivers; biodiversity; land resources and coasts. Stated objectives of the NHT are to:

- provide a framework for strategic capital investment to stimulate additional investment in the natural environment;
- achieve complementary environment protection, natural resource management and sustainable agriculture outcomes consistent with national strategies; and
- provide a framework for cooperative partnerships between communities and all levels of government.

At the Commonwealth level, programs covered by the Trust are to be administered through the Natural Heritage Trust Ministerial Board comprising the Minister for the Environment and the Minister for Primary Industries and Energy. Advice is provided to the Board by a range of groups including the National Landcare Advisory Committee, the Biological Diversity Advisory Council, the Endangered Species Advisory Committee and the Council for Sustainable Vegetation Management.

NHT funds are to be managed in accordance with the following principles:

- trust investment will be used to stimulate significant improvement and greater integration of biodiversity, land, water and vegetation management on public and private land;
- trust funds will be used to address the causes of problems rather than their symptoms;

- interaction between local communities and government agencies will be transparent, integrated and readily understood;
- the Trust will encourage management systems that bring long-term environmental, economic and social benefits;
- because they have prime responsibility for managing their land, individual landholders will be encouraged to make the necessary investments to achieve high standards of performance in natural resource and environmental management; and
- the States and Territories have primary constitutional responsibility for natural resource and environmental management, in keeping with the goals of the National Strategy for Ecologically Sustainable Development.

Program delivery

The Trust delivers assistance at four levels:

1. Community Projects;
2. Regional Strategies;
3. State/Territory Component;
4. Commonwealth Activities.

Community projects

The NHT encourages community groups to develop proposals in response to problems confronting them at the local and regional level and provides for increased resources for on-ground works. Community groups will be able to lodge applications for assistance in the areas of Landcare, Bushcare, Rivercare, Wetlands and the Murray-Darling 2001 programs (described below). Community group funding is designed to meet the needs of newer or smaller groups who wish to undertake small-scale projects, as well as established groups who can develop and successfully undertake larger-scale projects involving cooperation with other community groups and organisations.

Applications for project funding under the Trust will be assessed by Regional Assessment Panels (RAPs) comprising a balance of natural resource management and nature conservation expertise, with a majority of community members. Applications will be assessed against funding guidelines and regional or catchment strategies. State Assessment Panels will review the recommendations of the RAPs against State or Territory and national priorities and forward their recommendations to the Natural Heritage Trust Ministerial Board.

Regional strategies

The Regional Strategies component of the NHT provides assistance to implement regional strategies which integrate biodiversity conservation and sustainable agricultural management. These major regional scale projects are to be developed through partnership arrangements with State and Territory agencies, industries, local government, community groups and individual landholders and managers.

State/Territory component

Through the State/Territory component, the Commonwealth, States and Territories cooperate to deliver NHT programs that are best undertaken on a State-wide basis or across States and Territories. Through National Partnership Funding, the Commonwealth, States and Territories cooperate to deliver programs such as the Endangered Species Program, and the National Reserve System on a State and Territory-wide basis across the nation. They also cover activities funded through State agencies to support community group initiatives.

Commonwealth funds are not intended to substitute for the responsibilities of other levels of government, or other bodies with statutory obligations. Similarly, Commonwealth funds are not intended to replace resource owners' and managers' responsibilities for sustainable management of their own property or to fund activities which are of a purely private nature.

Commonwealth activities

NHT activities that will be directly funded by the Commonwealth include projects which have national strategic benefits, such as national education activities, and national research and development programs.

Performance monitoring

Concerns raised by review agencies such as the Australian National Audit Office (ANAO 1997) over the adequacy of performance monitoring of environment programs have resulted in moves to develop an outputs/outcomes based evaluation framework to be used to mark NHT program performance.

A performance reporting working group has been established with representatives from Environment Australia, the Department of Primary Industries and Energy, and the Department of Finance to develop an evaluation framework for the NHT as a whole. A program logic has been developed with a hierarchy of outputs and outcomes and four key result areas have been developed. These were endorsed by the Commonwealth and agreed by the

States for use in categorising outcomes and performance indicators in the Partnership Agreements. These agreements present the objectives of the NHT as a whole and of its component programs. These key result areas are:

> **Integration and institutions** - Integrated, cooperative and strategic approaches to investment in ecologically sustainable management of land, water, and marine resources and environments.
>
> **Environment** - Biodiversity conservation and improved long-term protection and management of environmental resources, including native vegetation, representative ecosystems and World Heritage Areas.
>
> **Sustainable production** - Maintenance of and improvement to the sustainable productive capacity of Australia's environmental and natural resource base.
>
> **People** - A community empowered to invest in and take responsibility for ecologically sustainable management.

Individual NHT programs have developed specific outcomes and performance indicators which have been included in the Partnership Agreements and which will be reviewed and refined over time. The Land and Water Resources Audit (described below) will provide the relevant data to measure performance against these indicators. In addition, the working group is involving all NHT program managers and the States in the development of a core set of performance indicators for reporting on the performance of the NHT as a whole.

D.2 NHT programs

Expenditure under the NHT is directed toward five major areas: vegetation; rivers; biodiversity; land resources and coasts and marine. Within these broad funding groups a series of specific programs will be supported. These are listed in Table D.1 along with the funding allocated to each. A brief description of each program is provided below.

Table D.1: **Natural Heritage Trust funding, 1996–97 to 2001–02**

Program/Initiative	*Amount allocated ($ million)*					
	1996–97	*1997–98*	*1998–99*	*1999–00*	*2000–01*	*2001–02*
Vegetation						
National Vegetation Initiative	4.0	29.1	70.5	78.0	78.0	69.0
Farm Forestry	–	1.6	4.8	6.4	5.8	3.4
Rivers						
Murray-Darling 2001	4.7	29.5	37.5	38.5	43.5	9.3
National Rivercare Initiative	0.4	12.4	24.4	25.4	25.4	9.0
National Wetlands Program	1.3	1.8	2.5	2.9	1.5	1.0
Tasmanian Regional Remediation Program	1.8	3.5	3.5	–	–	–
Biodiversity						
National System of Reserves	2.0	11.0	21.0	23.0	20.0	3.0
Endangered Species Program	2.0	4.3	4.2	5.5	–	–
Land Resources						
National Landcare Program (including tax measures)	10.2	35.0	63.0	57.0	54.0	44.8
National Land & Water Audit	1.6	7.5	7.0	7.0	7.0	7.0
National Weeds Strategy	2.5	5.0	5.0	5.0	5.0	1.7
National Feral Animal Control Strategy	4.4	3.7	2.7	2.6	2.1	0.5
Property Management Planning	0.4	3.0	3.0	3.0	3.0	2.6
Coasts and Oceans						
Coasts and Clean Seas	–	22.5	27.5	31.0	24.0	1.0
Human Settlements						
Waste Management Awareness Program	0.5	2.0	2.0	0.5	–	–
Atmosphere						
Air Pollution in Major Cities	1.5	3.5	3.5	4.0	3.5	–
Australian Heritage						
World Heritage Area Management & Upkeep	4.7	11.7	8.3	7.9	7.1	–
Total	**41.9**	**186.9**	**290.4**	**297.7**	**279.9**	**152.3**

Source: Commonwealth of Australia (1997a).

Vegetation

The protection and enhancement of native vegetation cover across Australia is one of the most significant funding initiatives under the NHT with some $350 million devoted to two specific initiatives: the National Vegetation Initiative (NVI) — also known as Bushcare — and the Farm Forestry Program.

The core objective of the NVI is to reverse the long-term decline in the quality and extent of Australia's native vegetation in order to conserve biodiversity and contribute to the ecologically sustainable management of natural resources. This is to be achieved through funding for extensive revegetation activities and protection of remnant native vegetation at risk from unsustainable clearing. The goal is to ensure that the rate of vegetation establishment will exceed the rate of vegetation clearance by 2002. Guidance for the NVI will be provided by a Council for Sustainable Vegetation Management.

The NVI subsumes a number of vegetation programs in existence prior to the introduction of the NHT. These are the One Billion Trees, Urban Forests, River Murray Corridors of Green, National Corridors of Green, Grasslands Ecology and the Wet Tropics Tree Planting Scheme. The other pre-NHT vegetation program — Save the Bush — has been discontinued. Close to $330 million (26.3 per cent of total NHT funding) has been allocated to the NVI up to 2001–02. An allocation of $29.1 million has been made for 1997–98. (See Table D.1.)

In addition to the NVI, the other vegetation initiative funded under the NHT is the Farm Forestry Program. This program aims to promote wood production on cleared agricultural land. More specifically, it seeks to encourage into farming systems commercial tree growing for wood and non-wood production, increasing agricultural productivity and sustainable natural resource management.

This is thought to provide not only direct economic benefits through higher returns but also provide substantial environmental benefits, including absorbing greenhouse gases and restoring biodiversity, as well as landcare, regional development and employment benefits. The Farm Forestry Program will work with the NVI to extend commercial farm forestry into lower rainfall areas. Funding of $22 million (1.8 per cent of Trust funding) has been allocated to the program over five years with $1.6 million allocated for 1997–98.

Rivers

With respect to water resources, the NHT will provide $260 million for projects aimed at improving water quality and the ecological health of river systems.

This initiative aims to combat the environmental stress caused by unsustainable levels of water extraction, destruction of aquatic and riverbank habitat, weed growth through nutrient enrichment and rising levels of salinity, silt and pollutants. This has led to reduced water quality and flows, loss of native fish populations, fisheries habitat destruction, deterioration of wetlands and a general decline in the health of river systems. NHT funding in this area will focus on three initiatives.

These are the:

- National Rivercare Program;
- Murray-Darling 2001; and the
- National Wetlands Program.

The $97 million (7.8 per cent of NHT funding) National Rivercare Program aims to assist the sustainable management, rehabilitation and conservation of rivers outside the Murray-Darling Basin. The objectives and outcomes of the National Rivercare Program are to be achieved through a coordinated and integrated package of measures which focus on:

- community activities for on-ground restorative measures which concentrate on the causes of environmental and resource degradation;
- larger scale projects or works by government or water management agencies which address key factors or barriers to improved water quality management as identified in a catchment or broader regional plan;
- community education and monitoring including through Waterwatch Australia activities; and
- a national biological river health assessment, refinement of river health indicators and a decision support system for determining environmental flows.

Rivercare projects are expected to comply with the Council of Australian Governments' water reform framework and National Water Quality Management Strategy requirements. Rivercare will build on programs which have contributed towards addressing river issues, including the National River Health Program, Waterwatch Australia and elements of the Fisheries Action Program. Links with other Trust programs and existing State initiatives will also be developed to achieve the integrated management of river systems.

The National River Health Program will assess and monitor the health of Australia's rivers through the use of biological indicators and undertake research into the environmental flow requirements of rivers and streams. Water quality monitoring will be facilitated by the Waterwatch program which encourages volunteer involvement in this activity. The program, with tens of

thousands of participants, aims to raise awareness of the importance of the long-term health of natural waterways and river systems. The Fisheries Action Program seeks local participation and commitment to the sustainable management of fisheries and fish habitats.

The Murray-Darling 2001 program recognises the loss of an estimated 15 billion trees in the past 200 years, resulting in dryland salinity affecting half a million hectares of the Murray-Darling Basin. Large scale water diversion for irrigation means the Basin now experiences drought level flows for three out of every four years, compared to one in 20 under natural circumstances. Extensive blooms of blue-green algae have also caused significant water quality problems.

The NHT will allocate $163 million (13.1 per cent of Trust funding) for the Murray-Darling 2001 project, significantly accelerating on-ground action within the basin to achieve a number of objectives. These include:

- improving the health of key river systems;
- encouraging ecologically and economically sustainable land use;
- restoring riverbank land systems, wetlands and flood plains; and
- improving water quality.

Murray-Darling 2001 will be delivered through the Murray-Darling Basin Commission's Basin Sustainability Program. The program will promote and coordinate effective planning and management for the equitable, efficient and sustainable use of water, land and other environmental resources of the Murray-Darling Basin.

The National Wetlands Program promotes the conservation and wise use of wetlands across Australia. Funding of $11 million (0.8 per cent of NHT funds) has been allocated to 2001–02. Under the Trust, the National Wetlands Program will support local projects to rehabilitate degraded wetlands and contribute to the overall health of our waterways. The program will support activities aimed at:

- improving the management of nationally significant wetlands;
- demonstrating the wise-use principle for managing wetlands, particularly to develop and implement innovative or best practice management arrangements; and
- monitoring the health of wetlands.

Biodiversity

Biodiversity conservation is to be targeted by the NHT through the development of a comprehensive National Reserve System of parks and reserves across the

major ecosystem types in Australia. Additional funding is also to be allocated to the Endangered Species Program to restore endangered and vulnerable species to a secure status. In addition, increased funding will also be provided under the World Heritage Area Management Program to implement improved and consistent management arrangements for the eleven Australian World Heritage Properties.

In more detail, the Trust will focus on six specific areas in biodiversity conservation. These are the:

- National Reserve System;
- Endangered Species Program;
- National Vegetation Initiative (see Vegetation Section);
- World Heritage Management Program;
- National Feral Animal Control Strategy (see Land resources section); and
- National Weeds Strategy (see Land section and Chapter 5).

The $80 million (6.4 per cent of NHT funding) National Reserve System aims to assist with the establishment and maintenance of a comprehensive, adequate and representative network of protected areas across Australia. It is complemented by other measures to conserve biodiversity in places outside protected areas, such as farms, roadsides, streams and urban and coastal areas.

Cooperation between all levels of government will be sought in the development of a national system of parks and reserves across the range of ecosystems, including wetlands, saltmarshes and grasslands, and is expected to increase the areas under protection for wilderness and wild scenic characteristics. An important component of the Trust's initiatives is to encourage local action to conserve threatened species and ecological communities.

The Endangered Species Program aims to ensure that all species can survive and flourish in their natural habitat. Funding of $16 million (1.3 per cent of Trust funding) has been allocated to 1999–2000). Specific objectives of the Endangered Species Program are to:

- implement recovery plans for endangered species;
- implement threat abatement plans to reduce the causes of species becoming endangered; and
- encourage local and regional groups to be involved in the conservation of endangered species.

The World Heritage Management Program aims to improve the management of Australia's World Heritage properties, in cooperation with State, Territory and

local governments. The 11 World Heritage properties in Australia are: the Great Barrier Reef; Kakadu National Park; Fraser Island; Shark Bay; Tasmanian Wilderness; Wet Tropics of Queensland; Uluru-Kata Tjuta National Park; Willandra Lakes Region; Australian Fossil Mammal Sites at Riversleigh and Naracoorte; Central Eastern Rainforest Reserves (Australia); and the Lord Howe Island Group. Close to $40 million (3.2 per cent of total NHT funding) has been earmarked for the program to 2000–01.

Land resources

Land management initiatives represent a substantial funding component under the NHT. Funding support of $356 million (28.5 per cent of total NHT funds) to 2001–02 will be provided for five specific initiatives. These are the:

- National Landcare Program;
- National Land and Water Resources Audit;
- National Feral Animal Control Strategy;
- National Weeds Strategy; and
- Advanced Property Management Planning.

The National Landcare Program (NLP) supports activities which contribute to the sustainable management of land, water, vegetation and biological diversity, in line with regional, State and national strategies. Trust funding of around $264 million (21.1 per cent of NHT funds) until 2001–02 will refocus the NLP, broadening its scope by tackling specific issues on the ground and taking a more integrated approach to its activities. The funding will support the implementation of conservation strategies based on a catchment and regional approach. Substantially increased support will be provided for the development of community initiated and managed projects addressing critical issues on public and private land for the public benefit.

Emphasis will be placed on helping local groups to achieve sustainable management. State agencies, local government, community groups and industry are encouraged to work together towards achieving strategic goals. The objectives of the NLP are to:

- promote partnerships between local groups, industry and government in the management of natural resources;
- establish institutional arrangements to develop and implement policies, programs and practices that will encourage the sustainable use of natural resources;
- enhance the long-term productivity of natural resources; and
- develop approaches to help resolve conflicts over access to natural resources in Australia.

Presently there are more than 3200 local Landcare groups, spread across the country and about one in every three farmers is a member of a Landcare group. An enhanced NLP will also support an expansion of property management planning to give farmers improved natural resource and business management skills. Other initiatives will address flood plain management and provide the option of extended income tax concessions to encourage investment in on-farm landcare works.

A National Land and Water Resources Audit will be established to provide a baseline for carrying out assessments of the effectiveness of policies and programs to overcome land and water degradation and improve natural resources management. It is to be overseen by a panel of experts and provide the first comprehensive appraisal of the extent of land and water degradation in Australia and the environmental, social and economic costs of this degradation to the nation. Funding of $37 million (3.0 per cent of NHT funds) has been allocated, with $7.5 million to be spent in 1997–98.

Information on about 20 key types of land and water problems will be collected and subjected to economic analysis. The audit will also incorporate an assessment of the extent, supply capabilities and demand for Australia's water resources, including environmental needs, as a step towards achieving a balance in water supply and use. The Audit aims to assist policy refinement and priority setting across NHT initiatives by assisting to establish benchmarks against which to measure the effectiveness of investments made by the Commonwealth and other stakeholders.

A National Feral Animal Control Strategy will be implemented to reduce damage to the natural environment and agricultural production from feral animals. The strategy will address the management of feral animals and will link closely with threat abatement plans for endangered species under the

Endangered Species Protection Act, 1992. Some $16 million (1.3 per cent of NHT funds) has been allocated to 2001–02 with $3.7 million of this to be spent in 1997–98.

The National Weeds Strategy aims to control weeds of national significance which most threaten the natural environment and agriculture. The strategy will encourage the recovery of threatened species, farm productivity and natural landscapes. Funding of $24 million (1.9 per cent of NHT funds) has been provided over the next five years with $5 million allocated for 1997–98.

Assistance will also be provided to farmers to attend Advanced Property Management Planning training courses and to engage professional consultants in the field of advanced integrated farm management planning, taking account of financial, natural resource and regional planning. Funding for 1997–98 is $3 million with a total of $15 million (1.2 per cent of total NHT funds) to 2001–02.

Coasts and marine

Under the NHT, Coasts and Clean Seas projects will tackle pollution problems and threats to water quality and marine life, and thus protecting the coastline. Some $106 million (8.5 per cent of total NHT funds) will be provided to the Coasts and Clean Seas Initiative to tackle pollution problems and protect the environment in Australia's coastal and marine areas. Stated activities include:

- tackling coastal pollution and significant threats to coastal water quality and marine biodiversity by focussing on ocean outfalls, stormwater pollution and oil spills;
- developing, through the Coastal and Marine Planning Program, local and regional plans to improve coordination and prevent ad hoc decisions, and to reduce ocean pollution;
- protecting Australian coasts and oceans from exotic marine pests which are brought to Australia by ships;
- rehabilitating coastal environments by supporting community coastal zone projects;
- funding community and other projects to protect and restore fish habitats through the Fisheries Action Program; and
- undertaking coastal monitoring to identify problem areas and test the success of government and community action.

Under the Coasts and Clean Seas Initiative, a comprehensive oceans policy will be developed to ensure the protection of marine species like fish, whales,

seabirds and turtles, while promoting job-creating ocean industries in a way that does not threaten the marine environment.

E INCOME TAX ISSUES

The *Income Tax Assessment Act 1936* contains provisions for the concessional treatment of a number of conservation-related expenditures. If it were not for these provisions, some of the expenditure items listed would not be eligible for a deduction, either because they are items of capital expenditure, or because they are not expenditure incurred in gaining assessable income. Others would be deductible, but would not receive concessional treatment.

The Act also contains a number of provisions, not aimed directly at conservation or environmental expenditure, but which are said to indirectly promote land degradation, or inhibit activities which could address land degradation.

This appendix first discusses certain special provisions available to primary producers, and then looks at the concessional taxation treatment of conservation expenditure. It ends by discussing the taxation provisions for drought assistance and the treatment of farm forestry.

E.1 Recurrent expenses of primary producers

Section 51(1) of the Income Tax Assessment Act allows deductions for items of expenditure incurred in:

- gaining or producing assessable income; or
- carrying on a business for the purpose of gaining or producing such income.

Deductions are items of expenditure which are deducted from gross income in order to calculate taxable income. Under separate provisions, deductions are also available for 'eligible' environment protection activities (preventing, combating or rectifying pollution of the environment, treating, cleaning up, removing or storing waste) and 'eligible' environmental impact studies.

Recurrent expenditure by landowners on soil conservation is expenditure incurred for the purpose of producing income and therefore fully deductible in the year it is incurred. Levy payments by primary producers to R&D corporations are also deductible.

Deductions are concessionary when the deduction allowed is greater than that which normally would be permitted under these provisions. In this context,

some of the special deductions available for expenditure addressing land degradation are concessionary.

E.2 Capital investment and depreciation by primary producers

No *deduction* is allowed under Section 51(1) for items of a capital nature, although such items may qualify for depreciation deductions under Section 54 (if they qualify as 'plant or articles' used for the purpose of producing assessable income).

Rates of depreciation permitted for taxation purposes generally depend on the economic life of an asset. For instance, tractors can be written off at a rate of 20 per cent per year. Depreciation deductions are concessionary when accelerated depreciation permits an asset to be written off before the end of its economic life.

Various specific items not qualifying as plant and articles are depreciable under other sections of the Act. However, a number of assets are not depreciable or able to be written off under the Act. Agricultural land is one such asset.

According to Peterson (1995), taxation policy distinguishes between two types of assets: wasting and non-wasting assets. Wasting assets depreciate in value as they are used up, but non-wasting assets retain their value indefinitely, or only change their value as a result of market forces external to the asset itself. Assets falling in the latter category cannot be deducted from taxable income. Land has traditionally been considered to be one such asset.

Peterson argues that there is a number of wasting assets used by primary producers in preventing or addressing land degradation for which no deductions would be allowed, but for the special provisions. These include expenditures on improvements to land for the purposes of water storage, and expenditures on structural improvements for the prevention and treatment of land degradation, such as filling of erosion gullies and planting of trees. Peterson argues that these provisions should not be seen as concessional, but as capital expenditure on depreciating items. However, as most of this capital expenditure can be written off in the year it is incurred, the depreciation allowed is clearly concessional.

E.3 Income averaging for primary producers

Income averaging for taxation purposes is available to individuals (not companies) who carry on (either alone or in partnership) a business of primary

production in Australia. The purpose of averaging is to ensure that individuals who earn fluctuating incomes do not pay more tax than those with comparable, but steady, incomes.

Income subject to averaging is the assessable income from primary production plus up to $5000 of non-primary production income (depending on the amount of non-primary production income and excluding capital gains). Averaging applies over five years, and a minimum period of two years is required. If the income in the first year was more than in the second year, the first year cannot be taken as the first averaging year. Other conditions apply — for instance, a year during which a primary producer does not carry on a primary production business cannot be taken as the first averaging year. Instead, under the existing provisions a producer is excluded from the system and must start again.

In the short term, income averaging can have some adverse effects. For instance, it can result in farmers paying more tax in bad years than they would if averaging were not in place. It also reduces the benefits of tax concessions by reducing the marginal tax rate. Davenport (1995) notes that the conditions associated with the inclusion of non-farm income discourage diversification into non-farm activities.

E.4 Income equalisation deposits for primary producers

The income equalisation deposit (IED) scheme provides a means for individual primary producers (not companies) to reduce fluctuations in income by putting away money in good years for use in bad years.

Deposits are tax deductible in the year of deposit and assessable in the year of withdrawal. The minimum that can be deposited is $1000 and the maximum that can be held by any one depositor is $300 000. The minimum period of deposit is 12 months, unless the farmer is experiencing serious financial difficulties.

Interest is payable on a proportion of the deposit only (61 per cent — termed the ‘investment component’) unless the deposit qualifies as a ‘Farm Management Bond’ (FMB). Farm Management Bonds are a special category of deposit within the IED scheme, attracting interest on the total amount. The conditions for a deposit to be treated as an FMB are more restricted than those listed above for normal IEDs. The total amount cannot exceed $150 000 (and forms part of the overall $300 000 limit) and the depositor’s taxable non-primary production income must be less than $50 000. Interest on both categories of deposits is payable at the short-term Commonwealth bond rate and is assessable in the year in which it accrues.

IEDs can be converted into FMBs (and vice versa) if the appropriate conditions exist (or cease to exist). Davenport (1995) considers the existence of both IEDs and FMBs causes confusion and uncertainty among producers, possibly accounting for low levels of utilisation.

The South Australian Government (Sub. 84) said the fact that FMBs are only accessible during periods of demonstrated financial hardship, may be responsible for their limited current use. It supported the recommendation of the National Drought Policy Task Force that FMBs be dropped and the IED scheme be enhanced to encourage greater uptake and self reliance for farmers.

In September 1997, the Commonwealth Government announced that the existing IED and FMB scheme would be overhauled, with the new measure to be known as the Farm Management Deposit (FMD) Scheme (Anderson 1997b). The new scheme will differ from the old one mainly in two of its features:

- the investment component will be set at 100 per cent on the first $150 000 of holdings in the scheme, and 80 per cent on the balance thereafter; and
- financial institutions will pay an interest rate determined in the market.

Legislation to implement the FMD scheme is to be introduced in the autumn 1998 session of Parliament.

E.5 Concessions for conservation expenditure

The relevant sections of the Income Tax Assessment Act are Sections 75B and 75D. Section 75B was introduced in 1980 and appears to have been drought related. It initially allowed primary producers (only) to write off fully, capital expenditure on plant or structural improvements for the purpose of conserving or conveying water. In 1985, the provision was changed to deductibility over three years. Items included are dams, tanks and tankstands, bores, wells, irrigation channels, pipes, pumps etc. Since 1 July 1997, landowners have had the choice of a concessionary deduction or a rebate or credit of 34 cents in the dollar.

Section 75D, which was also introduced in 1980, initially allowed for the writing off, in the year incurred, of capital expenditures which address soil erosion and excessive salinity. Amendments in 1985 broadened its scope by substituting the term ‘land degradation’ for ‘soil erosion and excessive salinity’. However, the amendments also restricted eligible expenditure to that ‘primarily and principally’ for the control of land degradation. Eligible expenditures include that on the eradication of animal or vegetation pests, the destruction of weeds, fencing for certain specified purposes and tree and shrub establishment. Bulldozers, for instance, are not included, but they are depreciable under the

normal provisions for writing off business expenditure. The choice between a concessionary deduction and a rebate or credit will also apply to expenditure eligible as Section 75D expenditure.

Expenditure claimed

According to the Australian Taxation Office (ATO), expenses claimed for the 1994–95 income tax year under Section 75D were $62 million. It estimated the value of the concession to farmers at $14 million. However, some of the expenditure claimed under the special provisions is claimable as normal business expenditure and, vice versa, some of the expenditure claimed as normal business expenditure is likely to be claimable as special conservation expenditure. It is difficult, therefore, to gauge the true amount of expenditure induced, or of the subsidy provided, by the special provisions.

Effectiveness of concessions

On the grounds that there are external benefits associated with improved land management practices, a case could be said to exist for a subsidy for addressing land degradation measures. There are, however, problems with providing such a subsidy through the income tax system. One problem is that those farmers who do not presently earn taxable incomes, and are not likely to do so in the foreseeable future, will receive no benefits from an income tax concession, and the inducement effect will be minimal. Ms Liz Abel said:

> Use of tax deductions as an encouragement for adopting sustainable land management is not relevant for a large proportion of the farming community who in many years have little or no taxable income. (Sub. 60, p. 4)

Another feature of tax concessions is that they provide higher benefits to those farmers on higher marginal tax rates. The South Australian Government said the problem with farmer support measures through the taxation system is that they are biased towards farm businesses able to take advantage of them, while:

> ... those with smaller taxable incomes may more frequently be the preferred target group for the incentive program ... (Sub. 84, p. 35)

Apart from their effectiveness in inducing land care expenditure, there is the question of how effective the provisions are in reversing land degradation. Some authors consider that the tax concessions may well result in more, rather than less degradation. For instance, Chisholm (1994) said there may be a proportion of farmers who may have changed their management practices towards more intensive exploitation of the soil because the private costs of

rehabilitation are reduced by the tax concession. Consequently, rather than reducing land degradation:

> ... subsidies for land rehabilitation ... provide an incentive towards increasing the future supply of land in need of rehabilitation. (Chisholm 1994, p. 19)

NSW Agriculture said:

> Subsidising remedial measures ... may ... provide an incentive for farmers to run down their resource base in the knowledge that concessions will subsequently be available to correct the problem. (Sub. 186, p. 22)

The Victorian Government said Sections 75B and 75D have a number of deficiencies as economic instruments to address land degradation and that:

> ... tax incentives have in some cases inadvertently encouraged land degradation by lowering the marginal private costs of primary producers and encouraging them to degrade their land. (Sub. 172, p. 11)

Peterson noted that tax concessions:

> ... do not distinguish between land care expenditures with high external benefits and land care expenditures with low external benefits. (1995, p. 215)

The Australian Bureau of Agricultural and Resource Economics (Mues et al 1996) also found that the tax concessions do not target the degradation problems that cause the largest off-farm costs.

As part of the Natural Heritage Trust measures, the Commonwealth Government has announced that from 1 July 1997 farmers will be able to choose between claiming the Section 75B and 75D deductions, and claiming a tax rebate or credit at the rate of 34 cents in the dollar. For this purpose, $80 million has been committed, via the National Landcare Program, from the Trust. In his press release, the Minister said:

> The rebates or credits are aimed to directly help farmers with low incomes to establish and maintain on-farm Landcare works. (Anderson 1997b, p. 1)

This initiative is likely to overcome some of the incentive problems associated with tax concessions. More specifically, it will allow primary producers with low or negative taxable incomes to opt for a credit which can be carried forward to reduce future tax payable.

E.6 Concessions for drought

The taxation system provides two kinds of drought assistance for farmers. One mechanism is through an investment allowance and the other through the treatment of the profits from forced sales of livestock.

Investment allowance

A drought investment allowance deduction of 10 per cent of the capital expenditure (at least $3000) on drought mitigation measures is available. The maximum deduction allowed is $5000 (ie 10 per cent of a capital expenditure of $50 000). This means that, in addition to any deductions under, for instance Section 75B, or any normal depreciation allowed, an additional 10 per cent of the expenditure can be written off in the year the investment is made. The allowance is capped at $5000 to ensure that wealthy farmers would not become the main beneficiaries (Wood 1995).

Drought mitigation investment can consist of one of four kinds:

- a fodder storage facility;
- a water storage facility (predominantly for livestock);
- a water transport facility (eg a bore, well, pump, windmill, pipe, water tower or header tank); and
- minimum tillage equipment.

Eligibility criteria apply. For instance, the expenditure must be incurred after 23 March 1995 and before 1 July 2000.

An investment allowance provides a subsidy to taxpayers by permitting depreciation on the eligible investment at a rate greater than the economic rate of depreciation. The higher the allowance, the larger the subsidy and the greater the incentive effect is likely to be. As with concessionary deductions, those on higher marginal tax rates will gain the largest benefits.

The South Australian Government (Sub. 84) said the 10 per cent allowance is not seen to be high enough to provide an inducement for farmers to adopt improved drought-proofing measures. It said that a higher allowance, for instance 50 per cent, might have more incentive power to encourage farmers to undertake such investment.

Forced disposal of livestock

For taxation purposes, the taxpayer has the option of valuing livestock at the end of the financial year at market value or at a nominal cost. The Act prescribes minimum values for a range of livestock for taxation purposes. The revenue from the sale of livestock is assessable income for income tax purposes.

This means that, when a property is forcibly destocked as a result of drought, fire, flood, or in compliance with the law, the sale value of the livestock is likely to exceed their ‘cost price’ or book value, and generate assessable

income. Subsequently, when the property is restocked the cost of the purchase of livestock becomes an allowable deduction.

The net extent of the deduction is determined by the purchase price of the livestock less their assessed end of financial year book value or 'cost price'. When the destocking and restocking occurs in different financial years, this can result in sharply fluctuating net assessable incomes for the producer as the difference between sale and cost price or book value, and purchase and cost price or book value are usually substantial.

To reduce any additional income tax liability which could result from such fluctuations in income, two alternative concessions are available:

- the primary producer may spread the assessment of the profit from the sale over five successive tax years, commencing with the year in which the disposal occurred; or
- income tax on the entire profit can be deferred until the year in which replacement stock is purchased, when the profit is reduced by the cost of replacement stock; the allowable deferral period varies from five to 10 years depending on the reason for disposal.

These provisions were put in place to reduce any adverse tax effects from the forced disposal of livestock.

Some participants have argued that special provisions for drought assistance could encourage higher than optimal stocking levels, resulting in overgrazing. The Toowoomba and Regional Environment Council said:

> Drought assistance can and does lead to intense grazing pressure. Incentives to destock would be more appropriate. (Sub. 171, p. 4)

Mr Col Friel said that natural events such as droughts and floods should be regarded as part of living on the land:

> They should no more attract government assistance than bumper crops and wool clips and high stock prices should attract excessive taxation. They are all part of the cycle. If the inability of a property to survive these events is due to degradation of the land by past practice it should be taken out of production. (Sub. 17, p. 9)

E.7 Farm forestry

Farm plantation forestry is one of the activities encouraged by natural resource departments around Australia, not only as a means of addressing land degradation problems but also to provide another source of income to

landowners. Some participants, however, have said the taxation system discriminates against farm forestry.

Taxation Ruling TR 95/6 deals with the extent to which receipts derived from the sale of timber constitute assessable income. It also considers the deductions allowable in respect of that income.

Assessable income

Assessable income may include proceeds from the sale of timber, from royalties received from granting the rights to sell the timber to other persons, from insurance recoveries (for instance after destruction of a plantation by fire), or from reafforestation incentive grants or payments.

Taxpayers engaged in 'forest operations', that is those who plant or tend trees in a plantation intended for felling, and who fell those trees, are primary producers for income tax purposes if those activities constitute the carrying on of a business. Income averaging for taxation purposes is available to individuals (not companies) who carry on (either alone or in partnership) a business of primary production in Australia. Consequently, farmers engaged in forest operations have the option of income averaging for farm forestry receipts. This also applies to any insurance recoveries.

As noted earlier, the purpose of averaging is to ensure that individuals who earn fluctuating incomes do not pay more tax than those with comparable, but steady, incomes. Because the income received from harvesting may be received at the end of possibly 25 years, but can be averaged only over five years, this means the income may attract a higher tax bill than the same income earned from other agricultural activities from which the returns are more evenly spread out. On the other hand, farmers engaged in forest operations have an advantage over forest companies in that forest companies are not permitted to average income for taxation purposes.

Allowable deductions

On first commencing a business of forest operations, the initial expenditure of clearing or preparing land for planting is treated as capital. That means it is not generally deductible — except for any eligible expenditure under Section 75D for combating land degradation where the taxpayer is carrying on a business on the land. The reason these costs are treated as capital is that they may come too early to be regarded as being incurred in carrying on a business of forest operations. Subsequent clearing or preparing of the same land for new

plantings will be deductible as the taxpayer is already conducting a business of forest operations.

Costs not considered to be capital, such as weed control, expenditure incurred on seedlings and planting costs, watering, fertilising etc, are deductible. Where there is no income — either from forestry or other sources — there will initially be losses. Those losses can, however, be carried forward (indefinitely) until such time as the timber is harvested and revenue received, although inflation will reduce the real value of those losses.

Uncertainties associated with the taxation of forestry operations

According to a number of participants (for example, the National Association of Forest Industries, Sub. 73; and Mr Jason Alexandra, Sub. 108), many of the uncertainties and anomalies perceived to be associated with the taxation of private forestry in the past, have been resolved, either through the Commonwealth Budget process, or by the issue of a number of tax rulings and determinations.

Some uncertainties and anomalies persist. The major uncertainty noted by participants is the treatment of agreements to sell timber in the future. There is concern that the profits earned from plantation forestry will be taxed twice.

Such circumstances may arise when a private plantation owner enters into a contract with another party, for instance a timber harvesting company, granting that party the rights to remove timber as and when required. At the time of the granting of those rights, the original asset of land with trees 'attached' to it is split into two assets. These are the land, and a new asset — the right to remove the trees — known as a '*profit a prendre*'. A *profit a prendre* is a right to enter upon the land of another and take away soil or its produce, or, in the words of Taxation Ruling 95/6, it is an interest in the land, but separate from the land.

Under the capital gains tax provisions, the grant of a *profit a prendre* constitutes the disposal of an asset and gives rise to capital gains tax, even if no consideration has been received by the grantor at the time of the granting of the *profit a prendre*. At the time the timber is actually removed and paid for, the proceeds of the sale of the timber constitute income to the grantor of the *profit a prendre*, and is liable to income tax.

The Commission understands that the problem came about as a result of the way the capital gains tax provisions were drafted. The ATO is aware of the anomaly and has indicated that it would deal with it sympathetically when it arises. The problem was brought to the attention of the ATO in a submission by the Australian Forest Group in 1994 and the ATO has recommended a

legislative amendment to eliminate the problem (CIE 1997b). One of the difficulties associated with such action is thought by the forestry industry to be the complexity of the capital gains tax legislation, and the possible implications for other activities affected by the relevant provisions of the Income Tax Assessment Act.

Nevertheless, the Commission understands that private plantation owners may be reluctant to enter into agreements for the future sale of timber still growing, and the incentive to establish private plantations may be reduced. Timber harvesting companies wishing to enter into contracts for the felling and removing of timber may also be disadvantaged as their ability to gain security of supply will be reduced.

F CONSERVATION COVENANTS, EASEMENTS AND AGREEMENTS

F.1 Introduction

Covenants and easements have not been used extensively in Australia for conservation purposes. Covenants generally place restrictions on the landholder's use of the land and easements usually confer rights to do something on another person's land or restrict the way in which the landholder can use the land. In Australia, easements are more often associated with electricity, water and sewerage supply. They confer certain rights to the provider of these services to carry out particular activities on private land.

The precise definition and the use of these terms varies between jurisdictions in Australia. Nevertheless, where the covenant or easement is attached to the title of the land, future owners of the land are bound to the conditions made by the landholder originating the agreement.

F.2 How conservation covenants or easements work

Under a conservation easement or covenant, the land remains privately owned and the holder of the covenant or easement is granted certain rights over the land for a fixed term or in perpetuity. The rights attached to a covenant or easement are acquired either by purchasing the rights, or through the landholder donating the rights.

The details of a conservation covenant or easement may set out either restrictive or prescriptive obligations. For example, as part of the detail of the easement or covenant, subdivision of the land may be prohibited while the landholder may be required to manage the land having regard to particular values of the land such as vegetation or wildlife (see Box F.1).

Box F.1: **Details and conditions of a standard South Australian Heritage Agreement**

The standard South Australian Heritage Agreement details the parties to the agreement, the real property description of the land subject to the agreement and the conditions placed on the landholder in respect of the use of the land and the details of any assistance to be provided. Under the standard memorandum of agreement the Minister responsible for the Native Vegetation Act and the relevant landowner are the parties to the agreement.

The agreement stipulates that the landholder shall not, without the consent of the Minister, undertake or permit on the land covered by the agreement:

- the clearance of native vegetation;
- plant vegetation either native or exotic;
- construct buildings or dwellings;
- graze stock; and
- any other activity that in the opinion of the Minister, is likely to injure or endanger native vegetation or native fauna on the land covered by the agreement.

Provided the land is not used for primary production or comprises a dwelling, the owner is exempt from rates and land taxes during the period of the agreement

The full cost of fencing is funded from the Native Vegetation Fund. Landowners can erect fencing in advance of receiving payment and have the cost reimbursed. Landowners are advised to have written agreement that the type and location of fencing is suitable for the conservation of the area before proceeding with construction. As part of the agreement, the Department retains the right to access the land to construct and inspect fencing and carry out inspections on the land as necessary.

The penalties for breaching a Heritage Agreement are set out in the agreement details. As the Heritage Agreement releases the landholder from rates and land taxes on the land covered by the agreement, the Minister is able to hold the landholder liable for all the rates and land taxes forgone where the landholder breaches the agreement and fails to remedy the breach to the satisfaction of the Minister.

Source: Department of Environment and Natural Resources (South Australia) (1995).

F.3 Conservation easements in the United States

In the United States, there is widespread use of conservation easements whereby landholders place voluntary restrictions on their land to protect natural resources such as top soil, water quality, wildlife habitat or to protect the land

for a certain type of land use such as farming. Landholders donate land of conservation value in the form of an easement to land trusts.

There are over 1000 non-profit national, regional and local land trusts across the United States operating under the national umbrella organisation, the Land Trust Alliance. The size and scope of these trusts varies. For example, the American Farmland Trust takes a nation-wide focus to preserve farmland from urban expansion and is involved in lobbying the US Government from its Washington headquarters, while small groups such as the Medomak Valley Land Trust in Maine, focus on preserving the Medomak catchment area.

By placing restrictions voluntarily on their land, the landholder is provided with a range of taxation benefits, while the trust is provided with a legally enforceable right over the easement conditions. The taxation benefits of voluntarily providing an easement are promoted by the trusts.

Under the US Internal Revenue Service code, conservation easement contributions can be treated as charitable gifts. The value of the easement can be deducted at an amount of up to 30 per cent of the donor's gross income in the year the gift was donated. If the value of the easement exceeds 30 per cent of the donor's income, the excess can be carried forward and deducted (subject to the 30 per cent limit) in each of the following five tax years (American Farmland Trust 1997). Similarly, most US state income tax laws provide a deduction for conservation easements.

The value of the easement is the difference between the value of the land without conservation restrictions and the value of the land after restrictions have been imposed. For example, if a landholder agrees to a conservation easement over land with a market value of $200 000 prior to the easement which is then valued at $140 000 after the restrictions of the easement are in place, the value of the easement is $60 000.

Similarly, the value of any easements on the land is used to reduce the total value of the farm on which estate taxes or inheritance taxes are levied. Some rural properties are not subject to federal estate tax because the assets of the owner do not exceed the value required for the tax. Consequently, there is an incentive for landholders later in life, whose assets would otherwise exceed this value, to donate land as a conservation easement to help ensure the family does not have to sell the farm to pay the taxes.

Land trusts also own and manage land which is donated to the trust for conservation purposes. Similarly, properties can be donated to a trust as a remainder interest whereby the owner continues to live on the land until a specified time (usually until their death) after which the trust gains full title and control over the property. In certain circumstances, a trust may agree to provide

a life time annuity to provide income to landholders who agree to donate land to the trust on their death.

F.4 Open space covenants in New Zealand

In New Zealand, the Queen Elizabeth II National Trust was established under its own Act in 1977 to provide and protect open space. The Trust uses what are called open space covenants to place terms and conditions on the title of private land. Most of the covenants drawn up between the Trust and private landowners are in perpetuity.

The covenants are, in most cases, initiated by the landholder to protect a landscape feature or a specific area of vegetation on their property, such as wetlands, forest, grassland or archaeological features, from future development. The covenant defines the area to be covered and the activities that can and cannot be undertaken within the area under covenant. These covenants do not prevent farm production and development unless the land is to be set aside in its natural state.

Management of the land under covenant remains with the landholder, but the Trust may offer management advice, assistance for fencing and specialist services. A regional representative of the Trust conducts annual visits to the site to monitor and discuss the management of the land with the landholder.

The Trust itself is managed by a board of directors with a Chairperson appointed by the Minister for Conservation. Two directors are appointed by members of the Trust, with rural landholders, the Maori community and conservation groups each having one representative on the board.

The Trust is financed in part by a government grant, donations and membership fees. The Trust accepts donations of property and has purchased land for conservation purposes. As at the end of 1996, the Trust had registered over 1000 covenants covering 40 000 hectares of land with a further 350 covenants covering 60 000 hectares awaiting registration (Queen Elizabeth the Second National Trust 1997).

F.5 Voluntary agreements in the United Kingdom

In the United Kingdom, voluntary agreements are used to conserve environmentally sensitive areas including the rural landscape which is considered a significant aspect of the national heritage. A number of voluntary schemes such as the Environmentally Sensitive Areas Scheme, the Country

Stewardship Program and the agreements for areas of Special Scientific Interest are used to promote conservation on private land (Tasmanian Government 1997).

The Environmentally Sensitive Areas Scheme, controlled by the Ministry for Agriculture, Fisheries and Food, is based on 10 year agreements between the landholder and the Ministry. Under the agreement, landholders agree to undertake or refrain from certain practices on the land under agreement. Landholders are compensated on a per hectare basis. Compensation payments under this scheme focus on reducing the environmental impacts resulting from certain agricultural practices, rather than on nature conservation. For example, payments in one area were set at 70 pounds sterling per hectare for implementing controls on fertiliser and biocide use. In 1993, 13 per cent of agricultural land in the United Kingdom was to covered under this scheme. Similar schemes are used throughout the European Union (Tasmanian Government 1997).

The Country Stewardship Program operated by the Countryside Commission provides for 10 year voluntary agreements to conserve wildlife habitats. Payments are made to cover management and capital costs.

Under the *Wildlife and Countryside Act*, areas of Special Scientific Interest are identified by Nature Conservation Councils established under the Act (previously the Nature Conservancy Council). A Council may notify an owner or occupier that the land is of special interest because of its flora, fauna or scientific value. The notification specifies which activities are likely to damage the feature of interest. The landholder cannot carry out these activities unless approval is granted by the Council.

As the notifications and orders relating to Special Scientific Interest are effective for a limited time, the ongoing protection of the area is dependent on the Council and the landholder entering into an agreement. Compensation is payable for the loss of the use of the land. While compulsory purchase of the land is possible under the legislation, this rarely occurs.

Under these agreements, the focus has shifted from compensating the landholder to rewarding the landholder for active management in meeting certain outcomes. The agreements are for a 21 year period in most cases. In 1990, there were 1759 agreements in place costing 6.85 million pounds sterling per year (Young et al 1996).

F.6 The use of conservation covenants and easements in Australia

In Australia, conservation easements or covenants have generally taken the form of a voluntary management agreement between the landowner and the Minister for the Environment or Conservation in the respective State or Territory government. These management agreements, as with covenants or easements, represent similar contractual arrangements. Management agreements can be negotiated on either a fixed-term or perpetual basis. Most of these agreements are on a perpetual basis. A summary of the agreements used in each jurisdiction is provided in Table 16.1 (Chapter 16).

New South Wales

Conservation agreements are voluntary agreements between the landholder and the Minister responsible for administering the *National Parks and Wildlife Act 1974*. The agreements are in effect easements or covenants as they restrict land use, and or require the landholder to carry out certain activities. The terms and conditions of these agreements are negotiated between the landholder and the National Parks and Wildlife Service and vary according to the conservation requirements of the land and the needs of the landholder. The agreement is attached to the title of the land and binds all future owners of the land.

To date, there have been very few agreements entered into due to the lack of funds available and staff resources. As at April 1997, only 34 agreements had been entered into (Binning and Young 1997).

In New South Wales, another voluntary scheme between landholders and the National Parks and Wildlife Service is the designation of wildlife refuges. These agreements are not binding and their duration is at the landholder's discretion. Revocation of the agreement is mutual at any time. Financial assistance for the management of these refuges may be provided. However, according to the Working Group on Nature Conservation on Private Land (1996), funds are scarce.

Victoria

Victoria differs from the other States and Territories through the widespread use of a trust, the Trust for Nature, to enter into conservation agreements with landholders. The Trust for Nature, previously the Victorian Conservation Trust, is a non-profit organisation established under its own act, the *Victorian Conservation Trust Act 1972*. The Trust is managed by a government appointed board of trustees representing different community interests and a director who

reports directly to the Minister. In 1995–96, the Trust received just under half its revenue in the form of government grants, with the remainder consisting of investments, donations and membership fees.

The Trust uses covenants on private land entered into on a voluntary basis by the landholder to conserve areas of ecological significance, wildlife or plants, sites of cultural significance or natural beauty. The covenants are placed in perpetuity under the Act. However, a covenant can be removed by legislation at the request of the Trust where agreement has been reached between the Trust and the landholder. While it is the exception for covenants to be removed, such a mechanism allows the Trust to remove a covenant from land where the need for conservation no longer exists and transfer resources into areas with higher conservation values.

The cost to the Trust of acquiring a 35 hectare covenant including the inspection process and legal processing of the title is approximately $3000 (Trust for Nature 1997). A total of 309 covenants covering 10 000 hectares had been approved by 1996 (Young et al 1996).

The details of the covenants are negotiated between the landowner and the Trust. The Trust for Nature (1996) believes the advantage of the covenants are that they are flexible and can be designed to suit the particular property or lifestyle of the owner as long as the Trust is confident the conservation values of the land are not compromised in the process. Typically, the covenant prohibits subdivision, grazing, removal of vegetation and places obligations on the landowner to control feral animals and weeds. All these management programs for the covenant are designed in consultation with the landowner and include a monitoring program that provides for an inspection of the land under covenant by a Trust Program Manger to assist the owner in evaluating the effectiveness of the management program.

The Trust is also involved in promoting conservation through buying land of conservation value and selling this land to buyers sympathetic to conservation. The Trust also provides a range of services to the public such as habitat management advice, flora and fauna surveys and conservation education and training.

Under its Act, the Trust accepts gifts and donations, acts as a trustee of money and property, acquires and disposes of property, and transfers land to the Crown for purposes specified by the Trust. While a government department could undertake these functions, it is less likely that the public would donate money or property to a government department.

In addition to the operations of the Trust, the Victorian Government through the Department of Natural Resources and Environment can enter into Land

Management Cooperative Agreements with landholders. These agreements may restrict certain activities as well as specify works to be carried out on the land. These agreements are permanent. Landholders may also apply to have a wildlife sanctuary in the form of a Wildlife Management Cooperative Area declared on their land. Only a small number of Land Management Cooperative Agreements and Wildlife Management Cooperative Areas have been established (Working Group on Nature Conservation on Private Land 1996).

The Land for Wildlife Scheme is a non-binding voluntary scheme that allows landholders to register their properties where areas within the property are actively managed for conservation. The program provides management advice and extension support to the registered landholders. While landholders can remove their property from the register at any time, the scheme has been successful with over 3 500 properties registered (Binning and Young 1997).

Queensland

In Queensland, conservation agreements can be made between the Minister for the Environment and the landholder and can be either permanent and attached to the land title or of a fixed duration. These agreements vary depending on the management needs of the particular area and may be comprehensive or only directed at protecting a certain specie.

Nature Refuges may be declared over land subject to a conservation agreement where the Minister is satisfied that the area has significant natural features. The conditions of the Nature Refuge are attached to the title. There are currently 11 Nature Refuges in place with a further 33 under negotiation (Binning and Young 1997).

Western Australia

Under the *Conservation and Land Management Act 1984*, the Executive Director of the Department of Conservation and Land Management can enter into agreements with landholders and pastoral lessees to manage private or leasehold land as a nature reserve or conservation reserve. To date, no agreements have been entered into (Binning and Young 1997).

The Remnant Vegetation Protection Scheme provides assistance to landholders to manage and fence off remnant vegetation under 30 year agreements. Nearly 1100 agreements have been entered into covering in excess of 38 000 hectares of vegetation at a cost of approximately $2.25 million (Binning and Young 1997).

The agreements stipulate restrictions on the use of the land under agreement. In addition to these restrictions, the Remnant Vegetation Agreements specify that the owner shall manage the land to maintain the conservation value of the native vegetation.

The agreement sets out the details of the fence to be erected and the amount of payment for the fencing. In most agreements, the landholder is required to give notice to the government of any change in ownership.

The National Trust (WA) have put forward a proposal to the Western Australian Government which would allow the Trust to enter into conservation agreements with private landholders and develop a revolving fund to purchase land of high conservation value and resell the land with a covenant attached. At present the Trust is seeking financial support from the WA Government to establish the program. A feasibility study undertaken for the Trust estimated $243 000 per year would be required to administer 50 covenants (Environs Consulting 1993).

South Australia

The South Australian Government provides for landowners to voluntarily enter into Heritage Agreements with the State government to protect land covered by native vegetation. These agreements provide for permanent protection of the land and specify which activities can be carried out on the land covered by the agreement.

Financial assistance is provided through the Native Vegetation Fund for the fencing of areas covered by Heritage Agreements (see Box F.1). Landholders signing a Heritage Agreement may be exempted from rates and taxes on that land. In South Australia, there were over 900 Heritage Agreements on private land in 1996 covering an area of 600 000 hectares (Working Group on Nature Conservation on Private Land 1996).

Tasmania

Tasmania also uses voluntary agreements between landholders and the Minister administering the *National Parks and Wildlife Act 1970* to secure land for conservation purposes. The conditions of the agreements are placed on the title, making the agreement permanent.

A Land for Wildlife scheme is currently being developed in Tasmania by the Parks and Wildlife Service to encourage landholders to voluntarily conserve vegetation and wildlife habitats (Binning and Young 1997).

Northern Territory

Two conservation agreements have been entered into in the Northern Territory between landholders and the Department of Lands, Planning and Environment. These two agreements cover 11 000 hectares and were designed to protect waterbird habitats (Working Group on Nature Conservation on Private Land 1996).

Australian Capital Territory

Due to the tenure system in the ACT, where all the land is under leasehold title, easements and covenants are not used. However, rural lessees purchasing or renewing leases are required to undertake a property survey of the land and enter into a property management agreement with the ACT Government. The agreement then provides a mechanism for implementing management practices to protect native flora and fauna.

F.7 Encouraging the use of conservation covenants or easements

Conservation covenants or easements have not been used as extensively in Australia as in other countries, in particular the United States. In the United States, there are taxation benefits from donating land to a trust for a conservation easement. In comparison, there are limited incentives for landholders, apart from altruism, in Australia to enter into a voluntary management agreement with government (see Table 16.1, Chapter 16).

While financial incentives are a means of encouraging landholders to enter into agreements, they also provide a signal to the landholder that the rest of the community is willing to share the costs in recognition of the conservation service being provided by the landholder. As Binning and Young said:

> Landholders might receive small payment as due recognition for the conservation service they are providing the public. Indeed, many landholders feel strongly that the community should acknowledge their efforts. (1997, p44)

Governments in certain jurisdictions in Australia do provide some financial assistance. For example, the South Australian Government provides financial assistance to landholders who enter into an agreement for fencing and the land may be exempted from rates and taxes. The Western Australian Government provides assistance for fencing under the Remnant Vegetation Protection scheme. The Queensland *Local Government Act 1993* makes provision for local government authorities to differentiate rates or provide rate exemptions for

private land used for nature conservation purposes (Working Group on Nature Conservation on Private Land 1996). However, the use of conservation agreements in Queensland has been limited by the lack of incentives. The Queensland Government said:

> ... few conservation agreements exist on freehold land to supplement parks at this stage due mainly to the lack of incentives to enter into such agreements. (Sub. 164, p. 16)

In Tasmania, landholders may be compensated for any financial hardship resulting from entering into an agreement. As discussed in Chapter 16, the relatively high uptake of agreements in South Australia is not only due to the incentives of the financial assistance provided for the management and fencing of areas covered by Heritage Agreements, but also by linking agreements to an application to clear land.

In Australia, land donated to a State government or trust, as in Victoria, is not eligible under taxation legislation as a tax deduction. Donations of money to the Trust for Nature are tax deductible, but under Section 78 of the *Income Tax Assessment Act 1936* donations of property are only tax deductible if the property has been owned for less than 12 months prior to the donation.

The Commission understands that the rationale for the 12 month ruling on the donation of land is to ensure that the deduction is not unduly increased by any appreciation in land prices and to use the price paid for the land as a recent valuation. This ruling highlights the anomaly in the current taxation legislation concerning the tax deductibility of monetary donations and donations of land for conservation purposes, because if the land is sold and the donation is given as money, any appreciation in land values will be reflected in the amount of the deduction. To circumvent this anomaly, there have been instances of landholders selling a property to a conservation trust and then donating the money back to the trust to claim the tax deduction. However, such measures only increase the transaction costs of conserving land and may be open to challenge on grounds of tax avoidance.

Any loss incurred on the value of land from donating the land as a conservation covenant or easement, under the provisions of the *Income Tax Assessment Act 1936*, is not tax deductible. However, Young et al (1996) believe that the possibility of a tax deduction being available for land donated as a conservation covenant is yet to be tested under current taxation legislation.

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