PRODUCTIVITY COMMISSION INQUIRY

IMPACTS OF NATIVE VEGETATION AND BIODIVERSITY REGULATIONS

SUBMISSION BY THE SOUTH AUSTRALIAN GOVERNMENT

MARCH 2004

IMPACTS OF NATIVE VEGETATION AND BIODIVERSITY REGULATIONS
SUBMISSION BY THE SOUTH AUSTRALIAN GOVERNMENT
EXECUTIVE SUMMARY

The South Australian Government welcomes the inquiry by the Productivity Commission into the impacts of native vegetation and biodiversity regulations. As the jurisdiction, which led in the introduction of such measures, it has extensive experience in their implementation and has gained lessons of national significance.

The submission describes several key measures in which South Australia has led the nation. These are the controls over native vegetation clearance, pastoral management, kangaroo management, the dryland salinity and flood control project in the Upper South East, the valuation of public and private good, particularly in relation to native vegetation, and the proposals to regulate bioprospecting. Appendixes further detail the native vegetation measures and one of the studies of public good.

The submission responds in turn to each of the Inquiry's terms of reference.

The impacts of the native vegetation regulations on landholders & the rural community: Some landholders are disgruntled by the loss of productive land due to controls on the clearance of native vegetation. There is some concern regarding the loss of control and the ability to use the native vegetation as part of the production system, rather than as an area for biodiversity conservation. A study in 1997 found that in some areas (Murray Mallee, Eyre Peninsula), property values were reduced when a property contained native vegetation that was protected by a Heritage Agreement, although no such effect was observed in the South East region of the State. However, surveys completed in South Australia and elsewhere indicate that most landholders are positive about the benefits that native vegetation provides in regard to conservation, farm stability, and aesthetics. Over the last four years the Heritage Agreement Fencing Program, in conjunction with the Natural Heritage Trust, has injected around $1 million per year into the rural community. For example, fencing material has been bought through local stock agents and employment has been provided for regional fencing contractors.

Efficiency & effectiveness of regulatory regimes: Economic studies demonstrate that native vegetation provides benefits to the landholder, the local community and the wider community, though it appears that most of the responsibility for land management currently rests with landowners.

Overlaps & inconsistencies with Commonwealth regimes: There do not appear to be problems in this regard with the Commonwealth's *Environment Protection & Biodiversity Conservation Act, 1999*. However, because of the native vegetation controls that exist in South Australia, landholders cannot claim the foregone use in their tax. Also, the current taxation system does not allow the value of existing alternative agricultural use to be taken into account when areas of native vegetation are sold for conservation purposes.

Perverse environmental outcomes: Some panic clearing occurred in 1983 due to the expectation that controls would be introduced. At a Local Government level, there are cases of rate differentiation where land used for primary production purposes is rated at lower levels than land. This could result in some marginal land remaining in production when it would be better suited to conservation uses.

Assessment of economic and social impacts: The Native Vegetation Council is required to consider the impact of its decisions on the viability of applicant's property.

Community consultation: Legislation controlling the clearance of native vegetation needs to be drafted in consultation with stakeholders, however panic clearing is a real issue for other States without legislation. The South Australian experience is that a moratorium on clearance is vital. Policies developed by the Native Vegetation Council are required to include appropriate levels of community consultation. The pastoral legislation and kangaroo harvesting program also have provisions for community consultation in the development of management programs.

Although South Australia has implemented innovative and courageous approaches to the management of native vegetation and other biodiversity areas, often well ahead of other jurisdictions, native vegetation and biodiversity continue to be lost due to disease, salinity, and the fragmented nature of the remaining native vegetation. This makes its genetic and ecological integrity difficult to sustain.
The development of an appreciation among landholders of their duty of care (both as individuals and as part of a catchment) for sustaining the environment is essential. However, the broader community also needs to recognise the benefits that they receive from conservation undertaken on private land and the need to support landholders to deliver them. This aspect needs careful consideration in the review and/or development of support programs such as the Natural Heritage Trust. To address this it may be appropriate to develop a cost sharing formula that reflects the different benefits received by landholders, the local community, and the wider community. This type of arrangement was used in South Australia, under the *Native Vegetation Act 1985*, where legally binding agreements(such as a Heritage Agreement) were developed between the Government of the day and landholders, under which the latter agreed to the ongoing conservation and management of the area in return for management assistance. South Australia has progressed and under new legislation broadacre clearance is no longer considered in discussing native vegetation issues.

Significant financial support is needed to achieve a reasonable outcome. In this context, South Australia notes that its vegetation retention measures also safeguard species under the Commonwealth's *Endangered Species Protection Act*, 1992 notwithstanding that there has been minimal Commonwealth contribution. South Australia further notes that $75 million is to be provided to the Queensland Government to assist in measures to protect remnant vegetation and that the Commonwealth is providing further funding for the ongoing management of these areas. While South Australia welcomes this move, it is concerned about the inequity of the support provided to different States by the Commonwealth in this regard.

The Commonwealth and State/Territory Governments should undertake research at the national level to measure the external benefits of native vegetation and biodiversity resources that accrue to the wider community. Economic studies of the public and private good derived from native vegetation and from other ecological systems can provide an indication of the distribution of costs and benefits and provide the basis for a cost sharing formula.

RECOMMENDATIONS

The South Australian Government recommends the following:

1) A culture of 'duty of care' for environmental sustainability is fostered among landholders and includes those who benefit from land use, (including the catchment and the wider community) to provide the basis for the conservation and management of native vegetation and biodiversity resources. The 'duty of care' should take into account the state of the land when the current landholder took control.

2) The Commonwealth Government should support the development of consistent national approach to the application of the 'duty of care' principle.

3) The Commonwealth's *Income Tax Assessment Act 1999* be amended to ensure that all landholders are treated equitably with regard to the conservation of native vegetation on their property, regardless of whether or not measures exist in individual jurisdictions to control clearance.

4) The Commonwealth Government support the States and Territories to establish and employ legally binding agreements that are tied to the land, as the means of facilitating the provision of assistance to landowners to conserve and manage native vegetation and biodiversity resources on private land.

5) The costs of retaining native vegetation be shared amongst the beneficiaries in proportion to the level of benefit that they receive (eg. landholder, local community and/or wider community) and that these proportions be determined through the application of an agreed cost sharing formula.

6) The Commonwealth Government assist landholders, through the States and Territories, to manage native vegetation and biodiversity resources that contribute to the fulfillment of the Commonwealth's conservation obligations.

7) In recognition of the fact that States and Territories are restricted in the range of incentives that they can provide to landholders or investors, the Commonwealth Government should investigate how it may use tax reduction incentives for landholders or investors, and other market based instruments, to encourage greater use of legally binding agreements as a conservation mechanism. Inherent in this will be a need to recognise that there will be inconsistencies and possible interstate trade issues. For example, tax benefits for conservation in States where there are little or no clearance controls may be more attractive to investors than in States where there are controls and no alternative uses for the land exist.

8) The Commonwealth Government, together with the States and Territories, undertake a comprehensive program in regions throughout Australia to quantify the non-market costs and benefits of the ecosystem services provided by native vegetation and biodiversity resources to landholders, the local community, and the wider community.

9) The Commonwealth Government encourages partnerships between community groups and Governments and the application of cost-benefit and beneficiary analyses to natural resource management projects.

10) The Commonwealth Government, in partnership with landholders, the community and Local, State and Territory Governments, negotiate cost-sharing frameworks

that cover the wider community benefits and costs associated with the conservation and management of native vegetation and biodiversity resources on private land.

CONTENTS

INTRODUCTION

The South Australian Government welcomes the inquiry by the Productivity Commission into the impacts of native vegetation and biodiversity regulations. As the jurisdiction, which led in the introduction of such measures, it has extensive experience in their implementation and has gained lessons of national significance.

In this submission, the following is covered:

- Description of key South Australian native vegetation and biodiversity conservation measures covering:
  - Vegetation clearance measures
  - Pastoral management
  - Kangaroo management
  - Upper South East dryland salinity and flood management project
  - Valuation of public and private good
  - Bioprospecting (proposals)

- Response to Inquiry's Terms of Reference
  - Impacts on Rural Landholders and the Rural Community
  - Efficiency & Effectiveness of Regulatory Regimes
  - Overlap & Inconsistency between Commonwealth & States
  - Perverse Environmental Outcomes
  - Assessment of Economic & Social Impacts
  - Transparency & Community Consultation

- The way forward

- Recommendations

Detailed appendixes describe South Australia's native vegetation measures and the analysis undertaken in the Salt to Success project in the Upper South East.

SOUTH AUSTRALIAN NATIVE VEGETATION & BIODIVERSITY REGULATIONS

Described in this section are outstanding South Australian examples of the management of native vegetation and biodiversity resources including:

- Vegetation clearance measures
- Pastoral management
- Kangaroo management
- Wildlife out of balance
- Upper South East dryland salinity and flood management project
- Valuation of public and private good
- Bioprospecting (proposals)

VEGETATION CLEARANCE MEASURES

The South Australian Government introduced Regulations to control the clearance of native vegetation on 12 May 1983. These Regulations were subsequently replaced by the:

- Native Vegetation Management Act 1985
- Native Vegetation Act 1991
- Native Vegetation (Miscellaneous) Amendment Act 2002

Appendix 2 describes the situation prior to the introduction of the regulations and then traces through the subsequent development of the measures.

Prior to the commencement of the controls, approximately 75% of the agricultural region had been cleared, leaving 3.86 million hectares. In 1980 the Government introduced the voluntary Heritage Agreement (HA) Scheme that provided financial incentives for farmers to retain and manage significant areas of native vegetation on their land. The Agreements bind successors in title to the land for the term of the Agreement, with most Agreements written in perpetuity. The incentives covered the cost of local government rates and the provision of stockproof fencing. In the first two years after its introduction, the scheme established 170 Agreements covering 15,000 ha.

However, as expected the voluntary scheme failed to stem clearance. By 1982, only 0.75% of remaining native vegetation was covered by Heritage Agreements. Few farmers were prepared to alter their clearance plans.

On 12 May 1983, the Government introduced a regulation under the Planning Act 1983 controlling clearance. The Third Schedule of the Regulations was amended by insertion of the statement: “the clearance of any tree, shrub or plant of a species

indigenous to South Australia", in defined areas or parts of the State would constitute an act or activity that would comprise development[1].

Clearance was thus defined as a change in land use[2] that required planning approval from the South Australian Planning Commission[3].

In the two years following the introduction of the regulations, between June 1983 and April 1985, 635 applications were processed covering around 450,000 ha of vegetation. However, this number was about half of the applications due to a significant backlog[4]. Following negotiation with officers, landholders sought clearance approval for 250,000 ha. An area of 150,000 ha was approved for clearance (60% of the 0.25 m ha or 33% of 0.45 m ha). 97,000 ha were refused clearance.

The coverage of the regulations went well beyond biodiversity conservation and also covered land and water care. The Regulations met with strong opposition from farmers and farmer organisations.

In late 1983 a farmer on Kangaroo Island applied for clearance approval. It was indicated to him that the application was likely to be refused and it was suggested that it be amended. The farmer advised that some clearing had commenced and that he intended to disregard any restrictions. The Planning Commission sought an injunction and in January 1984 the Supreme Court issued an interim restraining order. In May the Full Bench upheld the appeal.

The farmer appealed to the High Court and on 30 November 1984 the High Court held the controls to be valid but found that clearance represented an extension of existing use of land for agricultural purposes.

As a contingency in the event of a loss in the High Court, the Government had introduced legislation into Parliament which, when proclaimed immediately after the High Court judgement, allowed the controls to continue. In passing this, Parliament established a Legislative Council Select Committee to investigate the administrative, legal and compensation issues.

Native Vegetation Management Act 1985

1. Clearance was defined as "any manner of destruction of tree, shrub or plant and shall include cutting, felling, chaining, rolling, ringbarking, poisoning or burning of trees, shrubs or plants." The definition did not include grazing but a significant increase in grazing could constitute clearance.
2. Planning Act, Sec 56(1)(a) "…no provisions of the Development Plan shall prevent the continue use … for the purposes for which that land was lawfully being used at the time the provision took effect."
3. The Commission delegated responsibility to specified officers of the Vegetation Retention Unit of the Department of Environment and Planning.
4. As an indication of backlog, over the 22 months to February 1985, 1275 applications for clearance were received of which 721 were assessed. The large number of applications compares with the 192 applications received under the Soil Conservation Act over the 1981 – 83 period prior to the regulations.

The Act was proclaimed on 21 November 1985. The costs of adjusting to the controls would be shared by:

- The landholder – who would retain up to 12.5% of a given property without financial assistance
- Local government which would release the landholder from rates over areas subject to Heritage Agreements
- State Government which would provide financial assistance in some cases

The SA Government also accepted responsibility to fence the land and would consider specific requests for management costs such as pest plant and animal control

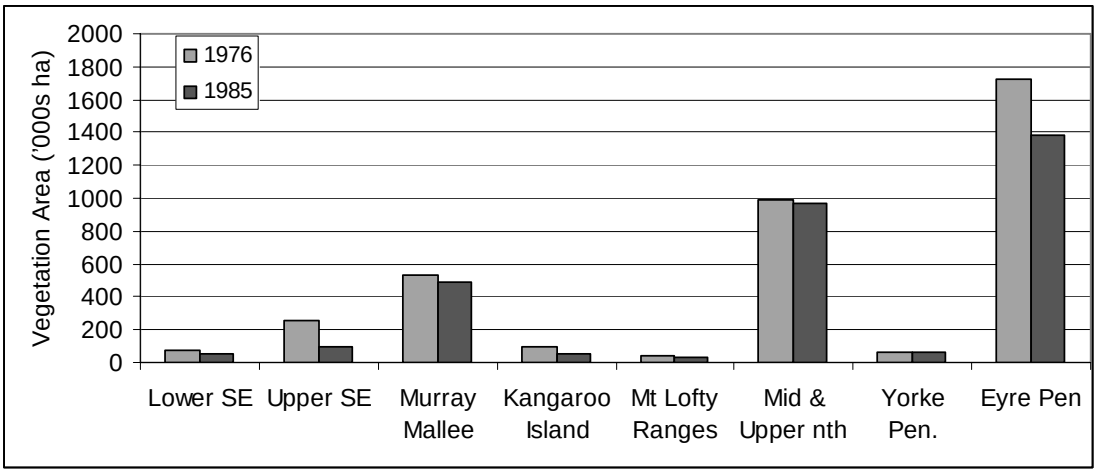
Financial assistance was not provided where the land was acquired after May 1983, did not comprise agricultural land, comprised a Miscellaneous Lease or licence, or was less than 12.5% of the holding. The level of financial assistance was based on the difference in value of uncleared land with and without consent to clear.

The Act established a five person Native Vegetation Authority as the decision making body for all applications. Membership covered rural and biological expertise and the Chair was the Chairman of the Planning Commission, thereby providing a link with the former controls. The Act also established a larger Native Vegetation Advisory Committee to advise the Minister on policy matters relating to the retention and management of native vegetation and in particular on regulations under the Act.

The Authority advised the Minister on proposed Heritage Agreements and financial assistance.

A significant shift in clearance approvals followed under the new Authority. While previously around 80% of the area applied for had been approved, the figure approved under the new Authority was less than 4%. The UF&S were concerned that instead of meeting farmer expectations of clearing half the area they applied for, they were being banned from any clearance. In addition, the measures were not achieving conservation objectives as few farmers were entering Heritage Agreements because of the 12.5% reserved fromfinancial assistance.
The Government waived the 12.5% requirement where the refusal to clear was based on biodiversity grounds, although it still applied where land management hazards existed. Some properties made non-viable by the controls were acquired by the Government and incorporated into the Parks system or resold with a Heritage Agreement applying to the vegetation.

Six conciliators with agricultural experience were appointed by the Minister in May 1987 to provide an intermediary between farmers and the Department and to assist farmers with their applications.



Source: First Annual Report, Native Vegetation Authority, 1985/86

Figure 1 Changes in area of Native Vegetation (outside Parks) 1976 - 1985

By 1985, the area of native vegetation had shrunk significantly since the review by the Vegetation Clearance Committee in the mid 1970s (Figure 1). Overall, there had been a loss of 640,600 ha or 17% between 1976 and 1985, the largest reductions occurring in the Upper South East (61% reduction), Lower South East (29.5%), Kangaroo Island (48%) and Eyre Peninsula (20%).

During 1988 the Act was amended to provide for an independent chairman of the Authority.

Table 1 Decisions under Native Vegetation Management Act 1985

	Application ha	Refused ha	Granted ha	Conditional consent ha	% refused
1985/86	30906	29293	675	938	94.78
1986/87	88361	82523	2354	3484	93.39
1987/88	78917	68148	6638	4187	86.35
1988/89	66514	62010	4504		93.23
1989/90	99454	91967	7487		92.47
1990/91	141411	138452	1195	1764	97.91
1991/92	112472	108743	1619	2008	96.68
1992/93	71023	70285	402	306	98.96
1993/94	12596	11996	520	80	95.24
Total	**701,654**	**663,417**	**25,394**	**12,767**	**94.34%**

Source: Native Vegetation Authority Annual Reports, 1985/86 – 1993/94

Table 2 Area and Cost of Heritage Agreements

Year	Total No. HA	Total area HA	Financial assistance ($m)	Total costs ($m)
1985/86	72	7031	0.564	1.094
1986/87	107	10800	1.443	2.145
1987/88	117	13476	2.256	3.259
1988/89	177	121193	4.549	5.634
1989/90	298	237930	9.449	11.197
1990/91	431	337642	9.739	13.454
1991/92	552	470260	10.157	14.53
1992/93	695	520540	10.715	14.209
1993/94	764	550000	7.367	7.542
Total			56.239	73.064

Source: Native Vegetation Authority Annual Reports, 1985/86 – 1993/94

The areas subject to the Native Vegetation Management Act 1985 are summarised in Tables 1 and 2 (see Appendix 2 for further details). The total cost was $73 million, of which financial assistance payments totaled $56 m. A total area of 550,000 ha of native vegetation was retained under 764 Heritage Agreements.

The 550,000 ha represents 20% of the remnant vegetation in the agricultural region and about 3.7% of the agricultural region itself. Through this ongoing scheme, South Australia has the largest area of private land under long term conservation of any State or Territory in Australia.

Although the Act was replaced in 1991 by the Native Vegetation Act, applications received under the former Act continued to be assessed and the Native Vegetation Authority's final annual report covered the 1993/94 year.

Native Vegetation Act 1991

The Native Vegetation Management Act 1985 was repealed on 18 April 1991 by the Native Vegetation Act 1991 proclaimed. The Act provided that no new applications for a Heritage Agreement with financial assistance could be lodged after 12

February 1991. This was justified on the grounds that landholders had been provided with sufficient time to seek payment for any loss in the market value of their properties due to clearance refusals. There was also evidence that some landholders were applying for approval to clear marginal areas with the aim of being refused and obtaining financial assistance for loss of production on land that they possibly would never have cleared.

The new Act provided incentives and assistance to landowners to protect and to manage native vegetation for wildlife. It also controlled the clearance of native vegetation including scattered trees. The Native Vegetation Council comprising seven people with expertise in farming and/or vegetation management replaced the Native Vegetation Authority.

Between 1994/95 and 2001/02, 1146 applications covering nearly 50,000 ha were assessed. Of this 16,874 ha (35.4% of total area) was approved for clearance and a further 21,394 ha (43.8%) of scattered trees were allowed to be cleared. While the area of scattered trees is provided, this cannot be compared with the area of intact vegetation applied for clearance approval. The Council also has data on the number of individual trees where they are scattered.

4772 ha was placed under Heritage Agreements that provided management assistance but nofinancial assistance. To offset the areas approved for clearance, 5533 ha was required to be regenerated and a further 3186 ha replanted with trees and shrubs[5]. The four major purposes of clearance were vineyard development, irrigation development, farm management and commercial tree plantations; these accounted for 63% of all applications (see Appendix 2).

Increased regional staff through state and Natural Heritage Trust funding has increased the community knowledge about the Heritage Agreement scheme and now there are 20 – 30 applications for voluntary heritage agreements per year. There are now over 1250 agreements covering more than 560,000 hectares.

Native Vegetation (Miscellaneous) Amendment Act 2002

The purpose of this amendment Act was to formally bring about an end to broadacre clearance in the State. The Act reads:

> "…the Council cannot give its consent to the clearance of native vegetation … if the vegetation comprises or forms part of a stratum of native vegetation that is substantially intact." (S27)

The amendment provides that any clearance approval would be conditional on a net environmental gain. It also enables the applicant to seek to pay money into the Native Vegetation Fund to compensate for the fact that there will not be a significant environmental benefit on the property where the clearance is proposed to take place. The Native Vegetation Council may attach a condition requiring the applicant to make a payment into the Fund of an amount that the Council considers to be sufficient to

[5]. It is difficult to compare areas of scattered trees to be cleared with the area of vegetation to be revegetated or regenerated.

achieve an environmental benefit by establishing and maintaining native vegetation on other land in the region.

There is also an increased emphasis on revegetation and the changes provide for landholders to voluntarily apply for the Act to apply to revegetated areas. If the Native Vegetation Council approves clearance, these areas will be noted against the title to the land to ensure that future owners are aware of the provision.

In addition the amendments ensures that people proposing to clear land finance the collection of data on which the Native Vegetation Council needs to determine an application. This is a user pays provision. There is now provision to allow the public an opportunity to comment on clearance applications. There are increased penalties for unauthorised clearance up to a maximum of $100,000 and improvements in the enforcement capability. In addition, the changes provide for a judicial appeals process through the Environment, Development and Resources Court, to replace the existing process for landholders seeking conciliation in relation to Native Vegetation Council decisions.

Costs

The terms of reference look at the costs for landholders. Following is some general comments on the costs and timeframes for permit applications.

Application fees are set at $400 (as of July 2002). The changes to the regulations are not proposed to alter this fee.

The amendments will allow for the introduction of an additional fee, payable by the applicant, for the preparation of a report required by the NVC to enable a decision on an application. The report will be prepared by a Native Vegetation officer or consultant accredited by the NVC to undertake that role.

The cost of the report preparation will be determined by the NVC. The first hour of the site visit will be included in the $400 application fee to minimise the cost for small applications.

The NVC has the capacity to remit payment of, or refund, the whole or part, of the fee (application and report preparation).

The Act also requires the applicant to prepare a Management Plan to be submitted with any application and provide

> *"... information that establishes that the planting and maintenance of native vegetation on the land after clearance or on adjacent land in accordance with the native vegetation management plan will, after allowing for the loss of the vegetation to be cleared, result in a significant environmental benefit"*

It is anticipated that this information should be included as part of any report prepared and funded by the applicant. The government in setting fees is mindful of the cost to the community in assessing a change of land use

(whether in a rural or peri-urban setting) for a landowner or developer. Where there was a very low fee (under the 1991 Act) the community has been subsidizing the process. In some cases the developer has reaped a 4-fold increase in land value site (e.g. broadacre farming to intensive viticulture or housing estate) without paying a realistic price for the assessment of the biodiversity and the community has lost a biodiversity asset in the process.

Cost to developers arising from conditions to implement or contribute to environmental management programs or the native vegetation fund.

Under the 2002 changes to the Act, there is the ability to make a payment into the Native Vegetation fund to achieve an "*significant environmental benefit"* rather than replanting on the site. The level of funding required is currently being determined.

A key new initiative is that under the regulations any payment must be used as far as practicable

> "...*to establish or regenerate native vegetation on land that is in the same region of the state as the land that is to be cleared ... and has been selected by the Council for that purpose after having regard to the Regional Biodiversity Plans ... within that region*"

and must be used

> "...*to preserve and maintain that vegetation once established or reinstated*."

There is clearly intent for there to be an ongoing maintenance cost in any payment and possibly also a contribution to acquisition.

Timelines

The Act / Regulations *do not* prescribe timelines for the completion of reports, however the ability to make use of paid consultants to assist in the collection of data and preparation of reports is seen as a mechanism to speed up the processing of applications.

Looking back from 1995 over the South Australian experience, the principal architect of the measures[6] wrote that the following pertinent lessons were to be learnt:

(i) A co-operative approach to vegetation retention is, on its own, unlikely to succeed (pre 1983 Heritage Agreement Scheme)
(ii) The community, at large, must understand the need for controls

---

6. See Colin Harris, 1996. Native Vegetation Controls – the South Australian Experience, in: Dendy, T. & J. Murray, *From Conflict to Conservation, Native Vegetation Management in Australia, A focus on the South Australian program and other Australian initiatives. Seminar Proceedings November 1985.* Department of Environment & Natural Resources.

(iii) Legislation needs to be drafted in consultation with the rural community, but panic clearance is a real issue and a moratorium is needed on clearance while consultation is in progress
(iv) Even with consultation, powerful opposition can be expected and a strong government commitment is essential
(v) Any controls must be capable of withstanding legal challenge
(vi) Vegetation retained needs to be managed to ensure conservation objectives are achieved
(vii) Landholders need encouragement and assistance in this and substantial financial support is essential

The experience in South Australia indicates that significant levels of assistance need to be offered in order to encourage participation in biodiversity conservation programs. In view of the value of extended use of Heritage Agreements as a conservation mechanism, the South Australia Government is of the view that there is a case for the provision of Commonwealth assistance in encouraging broad based participation in such programs.

Biodiversity Benefits of Vegetation Management Program

With 560,000 ha representing 20% of the remnant vegetation in the agricultural region and about 3.7% of the agricultural region itself the Heritage Agreement has, and continues to play a significant role in the conservation of the State's biodiversity.

Figure 2 and Table 3 summarises the contribution of Heritage Agreements to conservation in South Australia. Heritage Agreement areas contain 45% of rare flora, and 32% of endangered and vulnerable flora. They also contain 9.5% of endangered fauna, 6% of rare fauna, and 11% of vulnerable fauna.

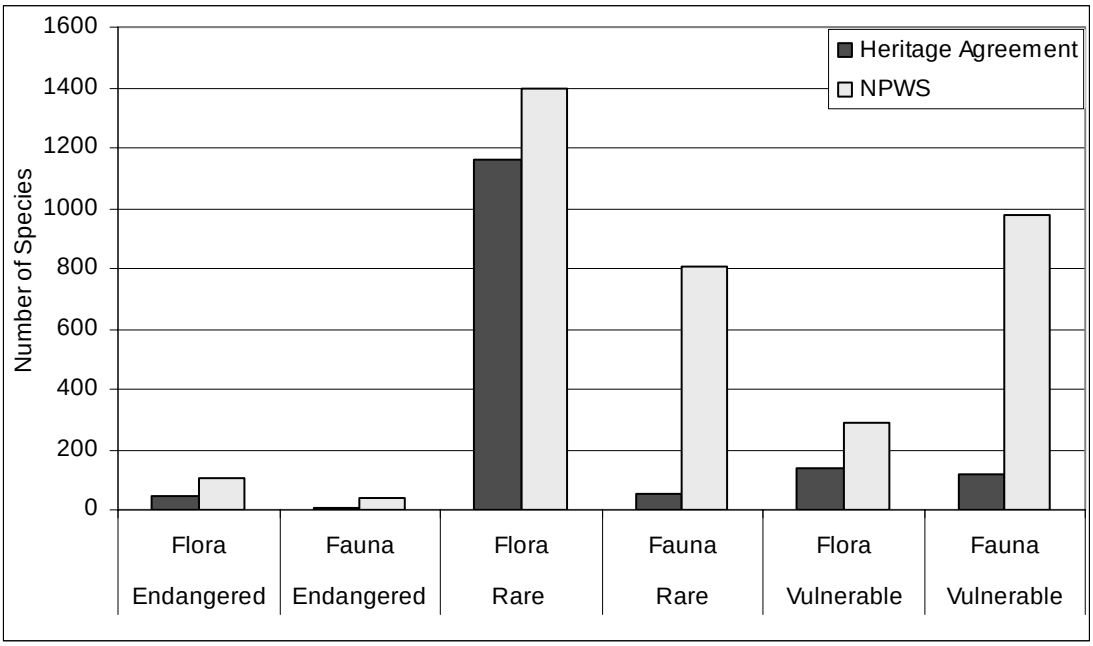


Figure 2 Contribution of Heritage Agreements to Conservation Status under South Australia's National Parks & Wildlife Act

Table 3 Contribution of Heritage Agreements to Conservation Status under South Australia's National Parks & Wildlife Act
(Number of Species)

	Endangered		Rare		Vulnerable	
	Flora	Fauna	Flora	Fauna	Flora	Fauna
Heritage Agreement	49	4	1162	53	136	120
NPWS	103	38	1397	805	286	974

Source: Department of Water, Land & Biodiversity Conservation

Table 4 Contribution of Heritage Agreements to Conservation Status under Commonwealth's Endangered Species Act
(Number of Species)

	Endangered	Endangered	Vulnerable	Vulnerable
	Flora	Fauna	Flora	Fauna
Heritage Agreement	26	3	69	27
NPWS	33	40	106	190

Source: Department of Water, Land & Biodiversity Conservation

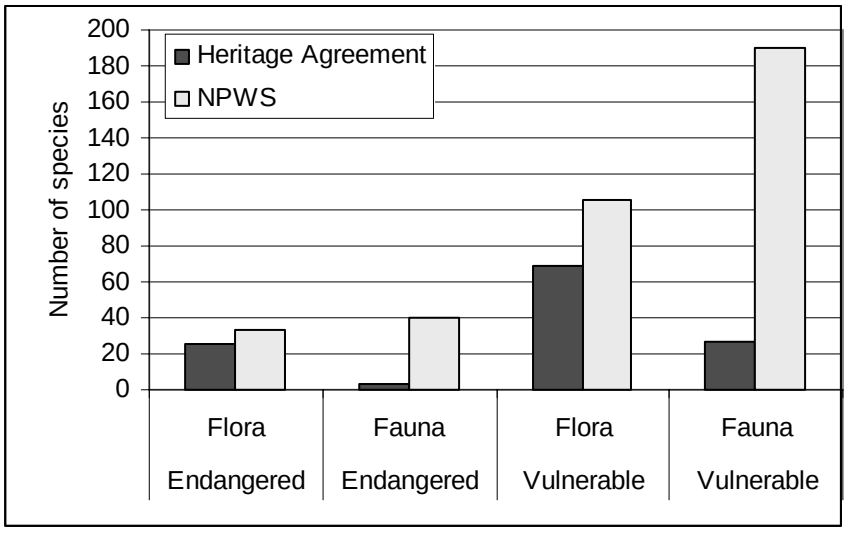


Figure 3 Contribution of Heritage Agreements to Conservation Status under Commonwealth's Endangered Species Act

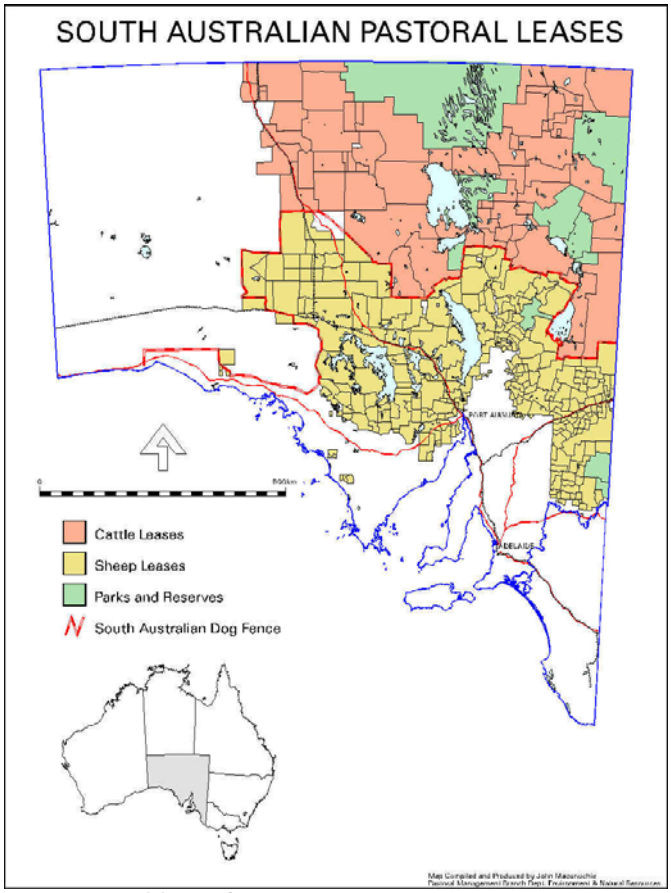
Under the Commonwealth's Endangered Species Act, the contribution of Heritage Agreements to conservation is also significant (Table 4, Figure 3). 44% of endangered flora and 39% of vulnerable flora (measured on a national basis) are protected within Heritage Agreement areas.

If the Heritage Agreement areas did not exist, the conservation status of South Australia's flora and fauna would be significantly the poorer, particularly its flora.

PASTORAL MANAGEMENT

South Australia's pastoral areas cover 409,000 km^2 or 41.5% of the State. There are 328 individual leases that range in size from 20 km^2 to over 14,000 km^2. They are amalgamated into 222 properties. A 2,225 km long wire netting fence (the Dog Fence) excludes dingoes from the southern properties, most of which are stocked with sheep. The properties north of the Dog Fence run cattle.

Cattle leases cover approximately 232,000 km^2 and support approximately 135,000 cattle. Sheep leases cover 176,000 km^2 and support 1.14 million sheep and 36,800 cattle[7] (Figure 4).



Source: Gould, *et al,* 2001

Figure 4 South Australia's Pastoral Lands

The Pastoral Land Management and Conservation Act 1989 (PLMCA] requires the land to be used and managed according to ecologically sustainable principles and that this be assessed and monitored. Section 4 of the Act requires the Pastoral Board:

> *to ensure that all pastoral land in the State is well managed and utilised prudently so that its renewable resources are maintained and its yield sustained*

The Act explicitly required that all pastoral land be assessed, for a baseline monitoring system to be installed and for areas of concern to be identified. It also provided for continuing tenure to be conditional upon the land being maintained or improved. The objectives under the PLMCA specify sustainable pastoral production without degrading the land (which includes indigenous flora and fauna). A pastoral lease cannot be granted or extended without an assessment of the condition of the

7. Sources of Pastoral Lands section: Paul Gould, Brendan Lay, Rodger Tynan and Ian Watson, 2001. *Rangeland monitoring, resource inventory, condition assessment and lease inspection activities in South Australia conducted by Primary Industries and Resources South Australia*. Report prepared for the Rangeland Theme of the National Land and Water Resources Audit

land. South Australia's *Pastoral Land Management and Conservation Act 1989* is regarded as the national benchmark and forms the basis of similar legislation is Western Australia and the Northern Territory.

Because of this legislation, South Australia has the most comprehensive and integrated program of resource inventory, resource condition assessment, range monitoring and lease inspection of any of the Australian states and the Northern Territory.

Between 1990 and 2000, resource inventory mapping was completed for the 409,000 km^2 of land under pastoral tenure in South Australia. Teams of two field staff worked on specific leases, generally spending two weeks on each lease assessing the land condition, compiling data on infrastructure and setting up a baseline monitoring system. A major role of the program (40% of time) was the building of a Geographic Information System (GIS) coverage of all pastoral leases. This included the location of watering points, fencelines and tracks (Tynan 2000).

On the southern leases, which largely consist of relatively homogenous chenopod shrublands, small paddocks and reliable winter rainfall, the Land Condition Index (LCI) was used. On the northern leases, where rainfall is more erratic, paddocks are much larger and the vegetation is more ephemeral, the non-equilibrium dynamics are not suited to the LCI technique and subjective paddock based assessments were used. The Grazing Gradient remote sensing technique was also trialled in the northern areas but is not operational on a broad scale.

Areas of land degradation were documented at the sub-paddock scale, following the assessment of about 4,500 paddocks (or unfenced grazing areas in cattle country). About 5,500 photopoint monitoring sites were established and about 15,000 Land Condition Index points were sampled.

The Pastoral Board, originally established in 1893, is responsible for managing the sustainable use of rangelands. It is committed to the three equally important aspects of sustainability – ecological, social and economic, and sees itself as the custodian or trustee for the future interests of all stakeholders in the rangelands of South Australia.

There is no firm schedule for reassessment of leases or systematic reassessment of photopoint monitoring sites. However, all leases will be reassessed and photopoints revisited within 14 years of the initial work.

The theoretical basis for the PLMC Act is the conservation of indigenous resources, rather than on those resources for pastoral purposes *per se*.

The example of the Gawler Ranges, north of Eyre Peninsula (Table 5) illustrates the results of the rangelands assessment. Over half the area has minimal disturbance and only 16% is highly disturbed.

Table 5 Percentage of condition rating observations for pasture type communities within Gawler Ranges pastoral leases

	Land Condition Index (LCI) Rating (%)			
Vegetation type community	**Class 1 Highly disturbed**	**Class 2**	**Class 3 Minimally disturbed**	**Total**
Chenopod shrublands				
1(a) Treeless plains	0.30	0.64	5.56	6.51
1(c) Samphire / saltlake	0.61	1.14	6.48	8.22
1(d) Calcareous plains	1.88	9.11	16.17	27.16
1(e) Arcoona Tableland	0.30	0.30	4.68	5.29
1(g) Blackbush watercourses	2.08	6.78	9.52	18.38
1(h) Gawler Range alluvial valleys	5.23	5.20	1.41	11.85
Total	***10.41***	***23.17***	***43.83***	***77.41***
Low woodlands				
2(a) Mulga grasslands-sandy	0.36	1.30	0.55	2.2.1
2(d) Mallee / blackoak	3.99	5.34	6.17	15.5
2(e) Native pine on dunes	0.33	1.14	0.28	1.74
2(f) Mallee / spinifex on dunes	0.00	0.39	1.16	1.555
Total	***4.68***	***8.17***	***8.17***	***21.02***
Hummock grasslands				
4(a) Gawler Range rhyolite hills	0.61	0.58	0.36	1.55
Total	***0.61***	***0.58***	***0.36***	***1.55***
TOTAL	**15.70**	**31.92**	**52.36**	**100.00**

Source: Tynan, R.W., 1995*. Lease assessment overview report. Gawler Ranges Soil Conservation District*. Pastoral Management Branch, DENR.

Land managers in pastoral areas are actively encouraged to manage for wildlife conservation. For example, a Wildlife Management Manual has been prepared to help land managers in the Kingoonya and Gawler Ranges Soil Conservation Districts to learn more about individual wildlife species (distribution, ecology, threats) and management practices to maintain or enhance wildlife diversity.

The introduction of plants non-indigenous to South Australia into lands held under pastoral leasehold, for improving pasture values, requires the approval of the Pastoral Board. In general, the Board is not in favour of introducing non-indigenous species, unless they are widely established already in the immediate vicinity.

Under the PLMCA (1989) it is possible to establish Heritage Agreements to assist in the conservation of biological diversity, especially those elements that are susceptible to grazing. The process is a voluntary one, although there are some minor incentives to encourage applications and some agreements now exist.

A significant issue currently confronting rangelands management is that of increasing the distribution of watering points in parts of the pastoral lands. The carrying capacity of rangelands (both domestic animals and wildlife) is closely linked to watering points; the more dispersed the lower the capacity. Increasing water points also spreads grazing pressure. If the stocking rate is maintained at current levels this may decrease the overall pressure across the paddock by grazing, as long as non domesticated stock are also managed. However with increased grazing pressure over a longer timeframe, species that are very sensitive to grazing suffer

and decline in abundance. With each watering point worth an additional $50,000 in production, pastoralists believe they are at a competitive disadvantage if they are restricted from extending them.

Rangelands management operates closely with biodiversity conservation and at times both pastoral and biodiversity staff have been in the same section of the same department (e.g. Department of Environment and Heritage).

KANGAROO MANAGEMENT

The kangaroo management program in South Australia aims to allow for a sustainable harvest of common kangaroos, and to minimise the unwanted impacts of kangaroos on land management objectives, in combination with the management of total grazing pressure[8]. The management plan covers many aspects of the management of Red Kangaroos, Western Grey Kangaroos and Euros, including commercial harvest, non-commercial destruction and kangaroo management on National Parks and reserves. Conservation, animal welfare and communication objectives are also considered within the plan.

The management of common kangaroos in South Australia takes place at a regional level, to promote and encourage increased regional decision making and management. Since 1996, Kangaroo Management Regions have been based on the administrative boundaries of district Soil Conservation Boards.

The program promotes the management of kangaroos as part of the management of total grazing pressure. Excessive herbivore grazing pressure can lead to negative impacts on both biodiversity and land condition. Experience from areas such as Flinders Ranges National Park shows that even complete removal of domestic stock will not necessarily result in improvements to land condition and that all components of grazing pressure may require active management, including that of kangaroos.

Commercial harvest of Red Kangaroos, Western Grey Kangaroos and Euros in South Australia takes place under the *National Parks and Wildlife Act 1972* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.* Harvesting of a protected species requires a management plan approved under both pieces of legislation. The Commonwealth Minister for the Environment and Heritage is responsible for setting annual commercial harvest quotas for each State.

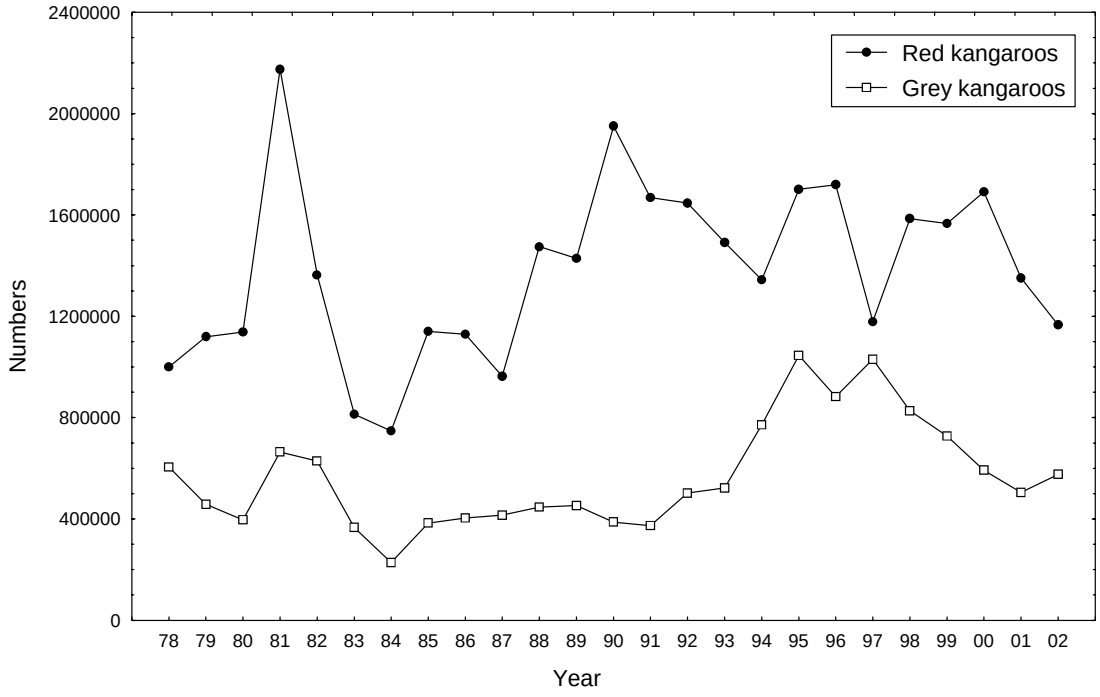
The kangaroo management plan underwent a compulsory five-yearly review in 2002. A task group with broad industry and conservation representation undertook the review. The revised draft plan has been prepared by this task group, and has been made available for a public consultation period of three months.

The draft revised management plan outlines two strategies for commercial harvest: *constant proportional harvest* and *threshold harvest*. *Constant proportional harvest*

8. Based on: Lisa Farroway, 2002. *2003 A Kangaroo Harvesting Quota Proposal for South Australia, A quota requested under the Macropod Conservation and Management Plan for South Australia: Conservation and Management of Common Kangaroos*, National Parks & Wildlife South Australia.

will allocate annual quotas at a standard percentage of kangaroo populations. These quotas will be allocated at up to 20% of the estimated population of each harvested species. This harvest strategy is the same as that employed by other States that allow for commercial harvesting of kangaroos. Quota may be distributed throughout the year in a manner that allows for landholders to actively manage kangaroo populations at times when high kangaroo densities may impact on land management objectives.

Threshold harvest will allow for higher harvest quotas to be allocated above an identified threshold density and no harvest quotas to be allocated below. This strategy requires the development of specified threshold densities or ranges for kangaroo density, which must be approved annually by the Commonwealth Minister for the Environment and Heritage as part of the quota proposal. This harvest strategy has similarities to the previous harvest strategy employed by NPWSA, using variable harvest quotas set around identified target densities.



Source: Department for Environment and Heritage
Note: Population estimates derived by aerial survey conducted by the University of Qld and NPWSA.

Figure 5 Population trends of Red and Western Grey Kangaroos in the South Australian Pastoral zone from 1978 – 2002.

Annual quotas for each kangaroo species are derived from aerial surveys conducted the preceding year. Aerial surveys of kangaroo populations have been conducted over the entire South Australian pastoral zone since 1978, making this dataset one of the longest of its type in the world. Kangaroos are counted in 200 m strips either side of a fixed-wing aircraft, while maintaining a height of 250 ft, and a ground speed of 100 knots. Raw counts are converted to density estimates for each harvest region (Soil Conservation Board) by the application of correction factors specific to each species. Ground surveys (using line transect survey methodology) are conducted in

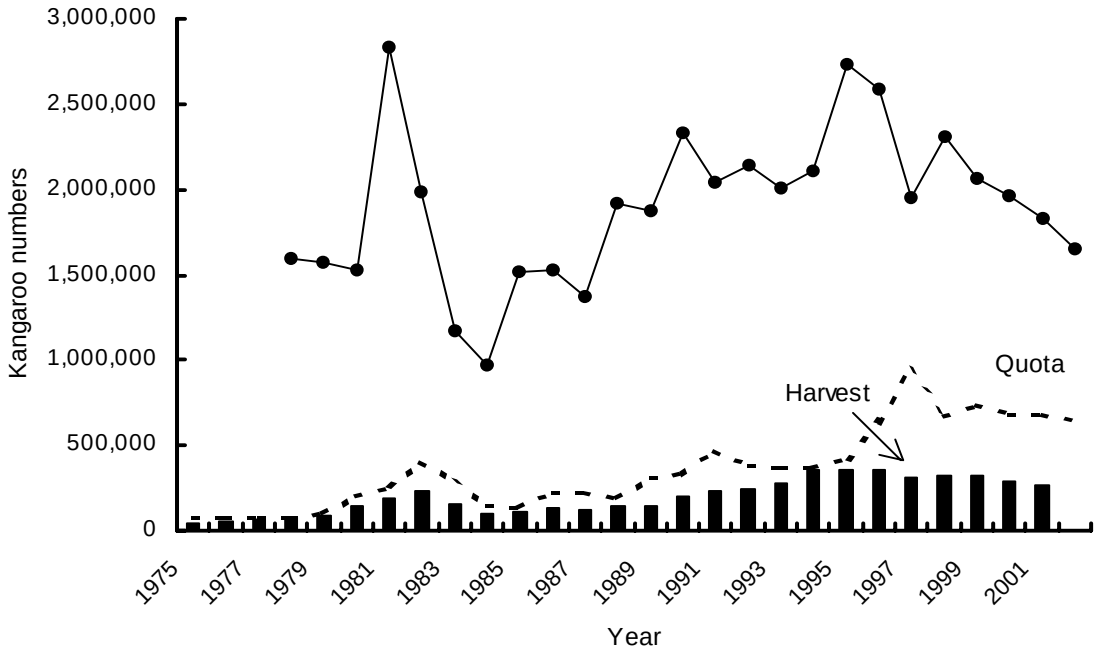
specific regions to provide small-scale estimates where aerial survey is not possible, or to provide estimates of Euro populations which are difficult to count from the air.

In 2001, the commercial kangaroo harvest in South Australia was 264,268. This figure represents 39% of the approved quota of 677 920, and a 9% reduction on harvest recorded for the previous year. Less than half of the total commercial quota for South Australia has been harvested for the last five calendar years. Breakdowns of quota and harvest figures for each species in 2001 are shown in Table 6. Figure 6 compares harvest trends against kangaroo quotas and populations.

Table 6 2001 Kangaroo Harvest

Species	Quota	Harvest	% of Quota
Red Kangaroo	403,260	193,400	48%
Western Grey Kangaroo	187,660	55,589	30%
Euro	87,000	15,279	18%
Total	677,920	264,268	39%

Source: Department for Environment and Heritage



Source: Department for Environment and Heritage
Note: Covers combined figures for Red Kangaroo, Western Grey Kangaroo and Euro

Figure 6 Trends in South Australian Kangaroo Population, Quotas and Harvests 1975 - 2002

A commercial quota allocation, based on a constant proportional harvest strategy, is proposed for each harvest region in 2003. Quotas are set for harvest regions, whose boundaries are currently set on the administrative boundaries of district Soil Conservation Boards.

Regional quota percentages have been limited to a maximum of 20% of estimated population size for Red Kangaroos and 15% for Western Grey Kangaroos and Euros. More conservative quota percentages have been requested for regions which

have been surveyed at a lower intensity, or which have historically low harvest rates. Estimated kangaroo population sizes and/or regional kangaroo densities have been estimated using results obtained from broad-scale aerial survey and line transect walking surveys.

Harvest regions have been combined into larger management zones to provide added flexibility to quota management and allocation procedures. Quotas are designed to be transferable between harvest regions within the one management zone where necessary, but are not transferable between zones.

Value of the Industry

The kangaroo industry within Australia is worth about 200 Million and SA contributes about 10% (20 Million). In terms of current land holder involvement, there are 350 Landholder with commercial permits. 100 Field Processors (Kangaroo Shooters) service these properties. All carcasses go to 7 meat processors and then on to 2 tanneries. These figures will probably remain static for the foreseeable future. (DEH per comm)

WILDLIFE OUT OF BALANCE

There have been concerns raised about “wildlife out of balance” and the effects that birds feeding may have on crops and horticulture. However, this is a complex area and in some cases where there is a “lifestyle product” such as wine, consumers have reacted negatively to the removal of birds by destructive means. Some vineyards and orchards are now netting their product. Although this is an extra cost, it does give increased flexibility to optimise the harvest and volume of the crop.

In terms of the cost of Abundant birds on horticultural production, effects are so variable (0-15% grape damage for instance) it is difficult to make generalised statements on the costs. (NPWSA Officers per comm.)

UPPER SOUTH EAST DRYLAND SALINITY AND FLOOD MANAGEMENT PROJECT

This project is an example of the complex integrated planning for natural resource management that is now practiced in South Australia. The Upper South East has increasingly been degraded by salinisation due to high groundwater levels and flooding. The region, an area of around 680,000 ha, extends from the Coorong eastwards to Keith and Naracoorte.

Over the past decade, salinisation has extended to 250,000 ha (excluding wetlands) or 40% of the area with a further 175,000 ha at risk of degradation. Farm incomes are projected to drop by 40%. Over three quarters of the South Australian land affected by dryland salinity is in the Upper South East.

Around 97,000 ha of native vegetation are protected in the reserve system or by Heritage Agreements (20,000 ha). The vegetation encompasses a wide range of native communities and species, including a number of rare and endangered species

and communities. The natural environment includes a substantial series of wetlands, including the Ramsar listed Coorong. These wetlands are considered to have a high conservation value. The area contains extensive wetlands and is bordered by the Coorong, which is recognised as a wetland of international importance.

During the early 1990s, major investigations were undertaken leading to the Upper South East (SE) Dryland Salinity and Flood Management Plan. An EIS was prepared to evaluate the impacts.

In 1995, the State Government approved the staged implementation of an integrated catchment management plan. The plan included coordinated drainage incorporating surface water and wetland management, revegetation and a range of on-farm measures such as saltland agronomy and development of perennial pastures. A funding package was negotiated in which the State and Commonwealth Governments contributed 37.5% each and the local community contributed 25% of the $24 million cost. Commonwealth funding was approved in 1996 through the Natural Heritage Trust.

The community contribution was spread over 6 years at around $1 million per year, charged at a variable rate per hectare depending on the property location. Most of these funds were paid by the due date.

During the period of 1995 – 1999, 132 km of drains were constructed at a total cost of $8 m. The entire 450 km of drains will cost $27 m. Most of the drains follow the lie of the land and trend in a northerly direction. There are several cuts through the low hills, which parallel the coast. The drains mainly empty into the Coorong at Salt Creek.

The biologically significant wetlands of the region have been a key consideration in the design of the drainage system. For example, highly saline water has been diverted from entering these wetlands. Crossings have been included in some drains to permit the free movement of fauna across the drain. In some wetlands, a regulator has been installed to prevent premature drying of the vegetation. Monitoring of wetlands is an intrinsic part of the project.

Concurrent with the drainage project, the Upper South East Regional Revegetation Strategy was launched in 1998. Under the Salt to Success program, also launched in 1998, incentives were provided to landholders to cover permanent vegetation and wetlands (Table 7).

Table 7 Incentive Payments for Perennial Plant, Remnant Vegetation & Wetlands

Permanent Vegetation	Maximum Incentive Payments
Fodder species – tagasaste, saltbush	$50/ha
Agroforestry – pines, natives	50% cost
Native vegetation – windbreaks, blocks, corridors, creeklines	$350 – $450/ha
Remnant vegetation protection – revegetation to extend	$450/ha
Wetland management - revegetation, weed/pest control, earthworks	$450/ha or cost of materials

Note: in addition, fencing at $450/km was also provided

In the first five rounds of Community Incentive Grants, more than 450 applicants gained grants of $874,000 of works covering 2,719 ha of revegetation, 2,343 ha of native vegetation protected, and 460 km of fencing. The cost of revegetation averaged $913/ha and protection of remnant vegetation $101/ha. Demand for the incentive funding was stronger than expected.

Community incentives were also provided for works to protect wetlands. In the first year (1999), over $300,000 was provided to protect 2000 ha of wetlands, involving 82 km of fencing and 54 ha of revegetation. In addition, there were several other significant wetland projects involving revegetation, fencing and improved hydrology to manage water levels.
Recently the Upper South East project has been given new impetus by the Upper South East Dryland Salinity and Flood Management Act December 2002. The Act enables the Minister to enter land for the purpose of the project and defines and acquires at no cost the alignments of all remaining drains. Prior to this the lack of legislation had made it difficult for the Government to deliver the program as landholders were permitted to construct and control drains and refuse access to their land. This had detrimental implications for upstream properties as well as for native vegetation and wetland habitats.

The Upper South East project is a significant program of works involving the construction of 255km of drains, over 12,000ha of vegetation and wetlands protected and 4,000ha revegetated with pasture established on 67% of salt affected land.

Under the new legislation all the land required to complete the drainage network has been acquired. A package of projects has been compiled to complete the network and achieve regional environmental goals and protect the Coorong. The package, to cost over $49 million has been endorsed by regional, landholder and environmental groups and has been approved by the State and Federal governments for funding through the National Action Plan for Salinity and Water Quality (NAP). The funding will be split under NAP arrangements as follows:

State	**Commonwealth**	**Landholder**
$19.15 m	$19.15 m	$11 m
39%	39%	22%

A new levy contribution from landholders with more than 10 ha of private land will raise $11 million. The legislation provides an option for a landholder to reduce, and possibly achieve full exemption from their new levy commitment through choosing to enter into a management agreement that protects remnant native vegetation (including wetlands) on their property.

Principles guiding the development of the levy were developed by the Upper South East Program Landholder Consultative Committee:

- There should be practical options allowing all properties in the levy paying regions to participate;

- To be a viable alternative, the rate of levy offset for providing biodiversity enhancement should reflect realistic costs and market values;

- There should be effective communication of the levy trade-off options and of the assessment procedures;

- Trusted, pragmatic facilitators will be needed to help individual landholders arrive at a 'best' combination of native vegetation protection, revegetation and wetland creation options to optimise overall outcomes at both individual property and regional levels.

The levy will operate as follows:

1. The Minister will levy all eligible landholders a total of $11 million and will offer long payment periods and flexible payment options
2. Landholders can either pay this levy and choose to take no part in the management agreement process,
3. Landholders can seek to have their cash levy obligation lowered or removed completely by inviting the Minister to consider parcels of land on their properties that contain remnant biodiversity value for inclusion in the management agreement process.
4. The Levy/Biodiversity Trading officers will inspect the land offered, assess its biodiversity values against a valuation framework and develop an application for Levy/Biodiversity Trading.
5. The Minister will offer a formal management agreement over that land to the landholder. The agreement will be tailored according to individual circumstances.
6. The landholder will consider/accept/reject the Minister's offer of a management agreement
7. The Minister will adjust the amount of levy payment due as appropriate
8. All management agreements will be noted on the property title and will be binding on future owners

It is the Government's intention to conserve as much as possible of remnant biodiversity under threat from continuing degradation. The offset scheme provides the incentive for landholders to manage the biodiversity and is being developed with local community input to the program.

VALUATION OF PUBLIC AND PRIVATE GOOD

The South Australian Government recognises that the distinction between private and public good components of government imposed conservation measures and the valuation of these components, is not a straightforward matter. The protection of native vegetation for example provides benefits to the private landholder but greater benefits to the wider community. Valuing these private and public goods is essential in order that the cost may be equitably assigned between private individuals and the public at large.

This is particularly important in South Australia through measures to promote integrated natural resource management in which regional communities are encouraged to take responsibility for resource management decisions. This process involves engaging communities in the research necessary to understand biophysical processes 'driving' issues that require attention and local action or catchment planning, to develop remediation and management strategies.

The valuation of public and private costs and benefits is a necessary element of this process to enable and facilitate decision making by stakeholders regarding resource management planning. This process has enabled the implementation of over a dozen catchment projects in South Australia, with negotiated cost-sharing based on the beneficiary pays principle.

These financial arrangements are based on cost-benefit analyses and beneficiary analyses, which take account of a wide range of issues as follows:

1. Temporal factors including inter-generational equity and time scale of implementation. Many current resource management problems arise from past land use decisions, while action taken to address problems will usually benefit future generations.

2. Spatial, i.e. downstream impacts of upstream land use. It is common in the case of many resource management issues (eg dryland salinity and declining water quality), for the cause of problems to be remotely located from areas of impact.

3. Socio-economic factors (eg willingness to pay, capacity to pay, equity). A landholder's first priority and motivation is short term financial gain. Additionally, landholders often do not have the funds to spend on land management practices that are not guaranteed to increase their immediate financial returns.

4. Regulatory issues including duty of care.

5. Valuation of non-market benefits. Because of the expense of contingent value analysis to assign values to these factors, a commonly used method in South Australia is the application of 'threshold values." This approach provides an estimate of the community's minimum willingness to pay to achieve environmental improvements.

The process for negotiating cost sharing arrangements involves the following steps:

1. Completion of a regional scoping study, which identifies the major resource and degradation, issues and appropriate works and other approaches for managing the issues.

2. Undertake cost-benefit analysis (CBA) to evaluate the economic worth of the identified activities. The CBA applied is consistent with Commonwealth and State Treasury guidelines.

3. Undertake beneficiary analysis (BA) in order to assign the benefits of a project to relevant stakeholders based on the level of benefit they are expected to receive. Three levels of stakeholder are identified: private/on farm, local community (ie public in local area) and wider community (State and Commonwealth Governments).

4. Utilisation of the results of CBA and BA to develop a cost-sharing framework with landholders regarding the project being contemplated.

5. Following negotiation of a cost-sharing framework with landholders, expressions of interest are sought from landholders and incentives provided to encourage them to undertake resource management activities. Finally, contracts of works are awarded.

This approach has been used successfully by a variety of community groups as part of catchment planning processes and as they prepare to implement on-ground works.

Consultants[9] were engaged to undertake the economic analyses for nine pilot projects. The analyses involved the following parts.

1. Information gathered on the catchment and locality including the relationship between the landscape and the proposed works; the pilot project and the proposed works and their costs and timing.

2. Review the information gathered and determine the approach of economic analysis. This included a full specification of the on-ground works program and the base case scenario. Cost-sharing principles appropriate to the project were determined. This was generally based on the Beneficiary-Pays principle.

3. The third stage is the largest component and involves the economic analysis and cost sharing arrangements. A table is developed covering all relevant costs and benefits generated in the 'with' and 'without' project scenarios. This covered a 20 year period and included both market and non-market items. The CBA quantified the cost and benefit items based on the information collected and then generated the Benefit Cost Ratio (BCR), Net Present Value (NPV) and Internal Rate of Return (IRR). The analysis covered a 20 year time horizon by using discounted values and included sensitivity analysis for key variables.

4. The cost sharing process involved attributing the quantified benefit items to the relevant identified beneficiary – on farm, local community and wider community. The proportion of benefits allocated to these stakeholders represents the true cost share split. Important unquantified, social, historical or political issues that should be incorporated in actual cost sharing negotiations between the stakeholders were then outlined.

The results of analyses undertaken for several land management projects are summarised in Table 8. The results indicate that the amount and ratio of public and private benefit varies within any given catchment depending on the management option selected. They also indicate that the same management option applied across different catchments may have quite different levels of public and private benefits depending on the type of resource management problems and off-site impacts associated with these problems. The analyses provided the starting point for negotiations with landholders over the incentives necessary to secure participation in on-ground works. It has been noted by economists that more work needs to be done

[9]. AACM International and EconSearch P/L.

to build flexibility into the analysis. The final on ground works are invariably different, due to a range of issues, to those which were used in the original economic evaluation.

Table 8 Beneficiary Outcomes for Different Landscape Management Programs

Native Vegetation Establishment

Project	Present Value of Benefits	On Farm %	Local %	Wider %
Greening the Willunga Hills Face	$2,370,195	6	20	74
Upper River Torrens	$61,750	0	7	93
Salt to Success (Upper South East)	$1,880,617	50	29	21
Yorke Peninsula	$590,058	72	18	10

Protection of Remnant Vegetation

Project	Present Value of Benefits	On Farm %	Local %	Wider %
Salt to Success	$298,420	5	16	79
Yorke Peninsula	$167,617	33	0	67

Establishment of Windbreaks

Project	Present Value of Benefits	On Farm %	Local %	Wider %
Yorke Peninsula	$1,712,903	66	32	2

Appendix 3 summarises the analysis involved in the Salt to Success program.

Noting the rigorous analysis of resource management projects which is undertaken in South Australia in order to ensure equitable cost-sharing arrangements, the South Australian Government considers that such an approach also provides a sound method of ensuring the equitable allocation of Commonwealth assistance for resource management purposes.

This approach is heavily reliant on the availability of information and data regarding ecological processes and the state of the environment. It is therefore important that the Commonwealth Government provides all possible support to research and monitoring of these elements as this data is crucial in identifying the beneficiaries of conservation measures and valuing these benefits.

The Commonwealth Government, in partnership with landholders, the community and local, state and territory governments negotiate cost-sharing frameworks covering the wider community benefits and costs of conserving and managing native vegetation and biodiversity resources on private land

Recommendations

The Commonwealth Government encourages partnerships between community groups and Governments and the application of cost-benefit and beneficiary analyses to natural resource management projects.

The Commonwealth Government, in partnership with landholders, the community and Local, State and Territory Governments, negotiate cost-sharing frameworks that cover the wider community benefits and costs associated with the conservation and management of native vegetation and biodiversity resources on private land.

BIOPROSPECTING (Proposal)

New legislative and administrative arrangements are needed to capture more effectively the potential benefits arising from bioprospecting in South Australia. In South Australia there are two Acts that can provide for bioprospecting – the *National Parks and Wildlife Act 1972* (NPW Act) and *Fisheries Act 1982*. Collecting material on public land or in the marine environment requires permission to be obtained in accordance with these Acts. However, with the exception of species listed under these Acts, collecting can be carried out on private land with only the approval of the landowner.

These Acts enable access to biological resources but they provide different mechanisms, and are not sufficiently broad to extend to all organisms from which material might be collected. In particular, the definition of species, the geographical area that these Acts cover and the circumstances within which an approval for access can be given are of limited use for this purpose. Additionally they do not address issues such as ownership of biological material, benefit sharing and reporting requirements.

Under the current legislative provisions it is possible for material to be collected from private land, developed and commercialised without any recognition of indigenous cultural knowledge or need for benefit sharing with indigenous communities or the South Australian community at large.

Six options to facilitate access to biological resources were discussed in the South Australian discussion paper that was released in 2000:

- Option 1 Do nothing
- Option 2 Amend NPW Act to extend control to a wider range of species
- Option 3 As for option 2 but establish an advisory committee to foster and facilitate access

- Option 4 Amend NPW Act to extend control to a wider range of species, establish an advisory committee and require Minister to be notified of intention to prospect on private land
- Option 5 As for option 4 but Ministerial approval required for a permit to bioprospect on both private and public land
- Option 6 State assumes ownership of all indigenous biological resources

Only one public submission supported the no change option. The remainder supported options 4-6. Most responses supported option 5

Unlike Options 2-4, Option 5 creates broad consistency in legislative and administrative arrangements across Commonwealth, State and private lands in South Australia.

However option 5 does not seek to acquire genetic resources in the way that the Crown has acquired mineral and aquatic resources. Option 6 seeks to operate by way of ownership of the resource; however this creates difficulties where organisms move between different land tenures. An approval system based on an equitable arrangement between the person who grants access to the land from which the resources is to be taken and the bioprospector is considered the simplest and most certain approach.

The adoption of the nationally consistent approach for access to biological resources at the 11 October 2002 meeting of the Natural Resource Management Ministerial Council has paved the way for the development of South Australian legislation.

The proposed approach for South Australia is to develop a stand alone *Access to Biological Resources Act* that is in general conformity with the national and international approach of encouraging bioprospecting while ensuring that all parties involved are dealt with fairly. This particularly includes any indigenous communities that have a traditional interest in the species that might be the subject of investigation. It is also envisaged that the proposed legislation will ensure that any benefits flow more widely to the South Australian community.

RESPONSE TO INQUIRY'S TERMS OF REFERENCE

The Inquiry's terms of reference are wide ranging and cover:

- Impacts on rural landholders and the rural community
- Efficiency and effectiveness of regulatory regimes
- Overlaps and inconsistencies between Commonwealth and State regimes
- Perverse environmental outcomes
- Economic and social impacts
- Transparency and community consultation

Responses are provided on several of these matters.

IMPACTS ON RURAL LANDHOLDERS AND THE RURAL COMMUNITY

The Inquiry's Terms of Reference include the impact of the native vegetation and biodiversity regulations on, farming practices, productivity, sustainability, property values, landholder investment patterns, attitude of finance providers, and on other economic activities (eg infrastructure, mineral exploration) and the flow on effects to regional communities. It sought information on the positive and negative impacts, the level of understanding of the relevant legislative and regulatory regimes among stakeholders, the likely duration of such impacts and the factors influencing their duration, and the extent to which existing government measures are mitigating any negative impacts.

There are several aspects of these Terms of Reference about which little is known. Information is available on the attitudes of landholders to the cost and benefits of native vegetation, some information on their perceptions regarding its impact on productive capacity, and some interesting information on the impact on property values.

The lack of detailed information and understanding of many of these aspects does not imply that the South Australian Government does not consider them important, rather that its attention has been focused on ensuring the effective and efficient implementation of the native vegetation retention program and other biodiversity regulations.

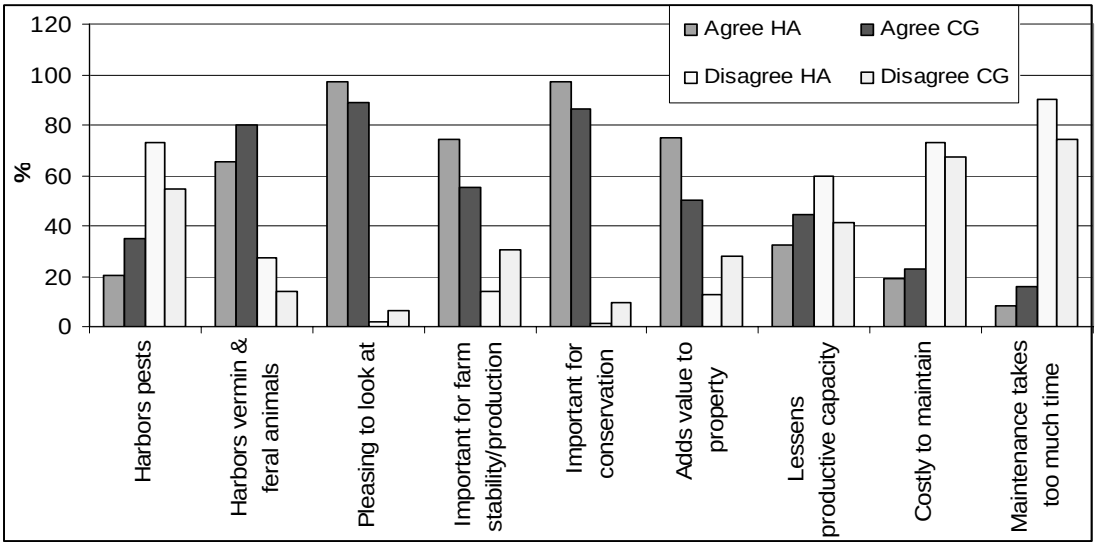
With nearly 20 years of experience of the measures to control clearance of native vegetation in South Australia there is a high level of acceptance of the need for the measures and that with salinity now becoming more evident, recognition that introducing the controls was the right action at the time.

This is not to say that there have not been any problems with the measures – to a large extent the experience has been in refining the measures in response to experience and need. The difficulties are largely in their application on individual properties rather than at a generic system wide level.

Attitudes to Native Vegetation Costs and Benefits

A survey of landholders who had applied for the voluntary Heritage Agreement scheme (i.e. pre 1983 regulations) asked about their attitudes regarding native vegetation[10]. A control sample of other landholders was also surveyed. 422 responses were obtained (50% of sample).

[10].Craig, R.A., N.M. Smith & B.T. Sheahan, 1983. *Landholders and Native Vegetation Attitudes to Retention and Clearing.* Dept. of Extension & Education, Roseworthy Agricultural College. Note that the survey also included applicants under the then recently introduced Vegetation Clearance regulations.



Source: Craig & Smith, 1983

Figure 7 Comparison of Heritage Agreement inquirers (HA) & Control Group (CG)

Figure 7 compares the attitudes of the two groups. There was relatively close agreement on most areas except that far fewer of the control group thought that native vegetation was important for farm stability and production, or added value to the property. Both groups considered that native vegetation harbors pests, vermin & feral animals, the control group more so than those inquiring about Heritage Agreements.

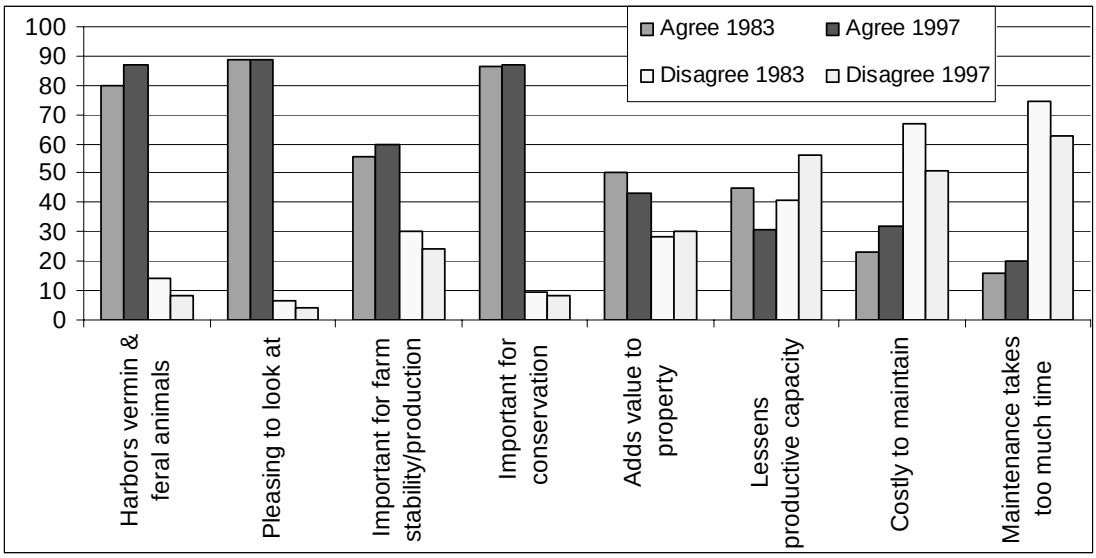
In 1999, a valuer, Wayne Marano used the same set of questions of purchasers of rural land between 1983 and 1997[11]. Comparing the responses with those of the control group used by Craig and Smith 14 years previously yielded surprisingly similar results (Figure 8).

Marano commented:

> "The responses from the two studies are very similar indicating that attitudes in relation to these statements have changed very little over the fourteen year time period (i.e. to 1997). Noticeably a greater percentage of farmers now disagree with statements on "maintenance taking too much time", and "native vegetation is costly to maintain". Also a greater percentage of farmers disagree than in the 1983 survey with the statement that "native vegetation lessens the productive capacity of my property". This could indicate that the education and extension work in this area has had some effect in changing

[11]. Marano, W., 1999. *Factors influencing the market value of remnant native vegetation on rural properties in South Australia, 1983 – 1997*. University of South Australia. Note that the same set of questions have also been used in at least two other surveys of landholder attitudes to native vegetation: Jennings, J.T, G. Clarke & B.T Sheahan, 1989, Study on Kangaroo Island Landholders' Attitudes towards Native Vegetation Retention and Clearance. Roseworthy Agricultural College. Jevremov, D., 1991 *A pilot survey of Rural Landholders in the South East and West of South Australia … to Determine Attitudes Concerning Native Vegetation*, University of South Australia.

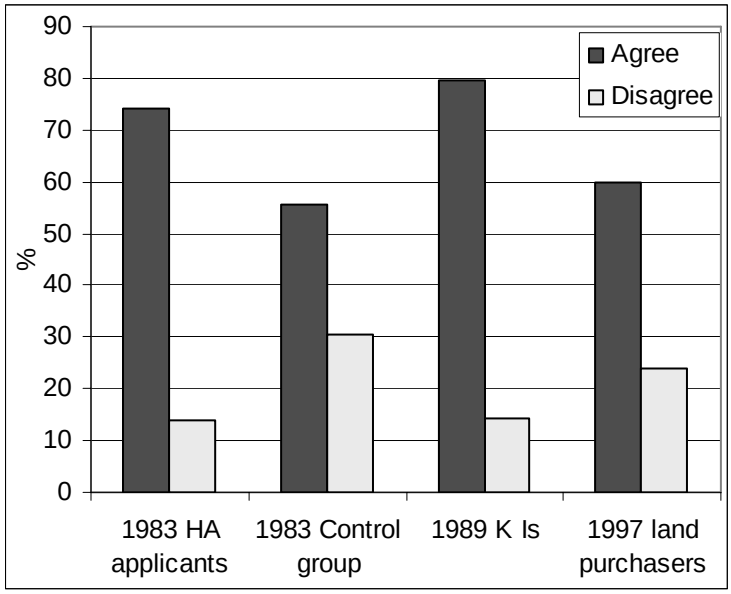
attitudes however, it has not changed the attitudes on increases in property values as a result of having native vegetation."



Source: Marano, W., 1999

Figure 8 Comparison of Farmer Attitudes to Native Vegetation, 1983 and 1997

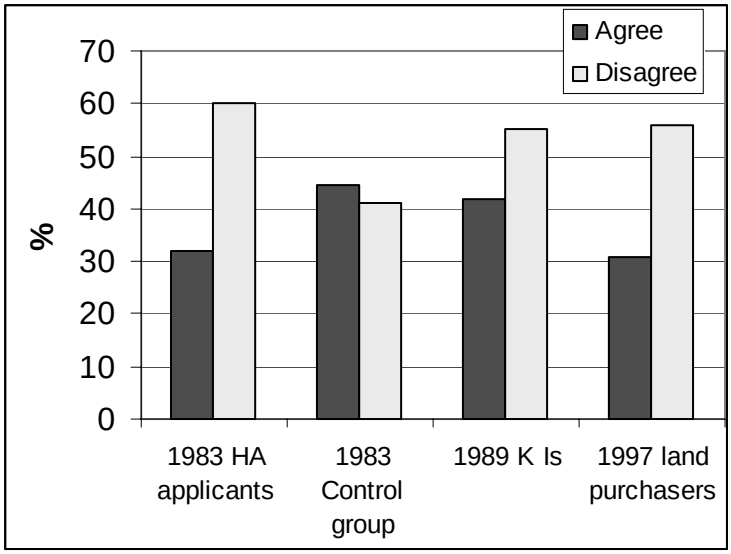
It is worth noting, in the context of the Inquiry's terms of reference regarding the impact of native vegetation controls on farming practices, productivity and sustainability, that the 1983 survey, the 1997 survey and a 1989 survey of Kangaroo Island landholders indicated that by far a majority of landholders view native vegetation as important for farm stability and production (Figure 9).



Source: Craig & Smith, 1983, Jennings *et al*, 1989, Marano 1999

Figure 9 Importance of Native Vegetation for Farm Stability and Production

Similarly most farmers believe that native vegetation does not lessen the productive capability of their farms (Figure 10).



Source: Craig & Smith, 1983, Jennings *et al*, 1989, Marano 1999

Figure 10 Native Vegetation Lessens Productive Capability

Marano's survey covered the landholder's use (Table 9) and management (Table 10) of remnant native vegetation.

Table 9 Use of Native Vegetation by Landholders

Stock shelter and shade	66% - 75% (depending on region)
Either regular or emergency grazing	27% – 48%
Regular grazing	16% - 35%
Flora & fauna sanctuary	15% - 33%
No intended use	10% - 31%
Firewood for household	11% - 28%
Recreation	14% - 27%

Note: Regions covered were Eyre Peninsula, South East, Murray Mallee & Kangaroo Island

Making productive use of the native vegetation is clearly the priority of landholders.

Table 10 Management of Native Vegetation by Landholders

Vermin control	53% - 85% (depending on region)
Weeding	42% - 48%
Fence construction	35% - 44%
Fence maintenance	29% - 45%
Grazing to reduce fire risk	26% - 42%`
Firebreak maintenance	19% - 45%
Firebreak new	12% - 16%
Tree planting	14% - 18%
Vegetation regeneration	16% - 18%
Inventories	4% - 6%

Note: Regions covered were Eyre Peninsula, South East, Murray Mallee

Priority was given to preventing pests from the native vegetation affecting farm productivity and reducing risk from fire. Enhancing the vegetation in the areas took lower priority. Marano found the more than 40% of respondents spent less than one day a year managing their native vegetation. However around 20% spent a week or more in management.

Only 13% of landholders had considered applying for a Heritage Agreement to cover their native vegetation. The reasons given for not entering a Heritage Agreement are summarised in Table 11.

Table 11 Landholders' Reasons for not entering Heritage Agreement

Too small	57% - 64%
Lose control	32% - 57%
Not thought about it	14% - 28%
Reduce value	11% - 27%
Too costly	10% - 14%
Too disturbed	8% - 15%

Concerns about losing control and economic implications are among the main reasons cited.

These surveys give both hope and concern; hope regarding the positive attitudes of the importance of native vegetation for conservation, farm stability and production, and concern that native vegetation continues to be regarded as an integral part of the farm for use in grazing, stock shelter and shade, and other productive uses.

It is the South Australian experience that landholders with sufficient resources will conserve native vegetation but landholders in marginal situations find it more difficult. Because it is non-profitable in the short term, vegetation retention adds another source of pressure on these landholders. In some situations this may hasten farm restructuring and other changes. Because much of the remaining native vegetation exists in the more marginal areas, as the better areas have long been cleared, the vegetation retention program tends to have greater impact on those with more marginal land. However, this needs to be balanced by determining if these lands could have been economically cleared or has the vegetation retention scheme actually been of assistance in restructuring of the rural sector in marginal areas and allowed some landholders who took advantage of the program to leave the industry with respect.

Establishing a culture that understands and appreciates the benefits of native vegetation is fundamental to these programs. The benefits of native vegetation accrue over the long term and to the wider community. The benefits are not so evident at the property level in the short term. A culture that emphasises the sustainability of the land resource, and the significant contribution of native vegetation to this, is needed.

Impact on Property Values

Wayne Marano (1999) surveyed sales of rural land between 1983 and 1997 to assess the impact of native vegetation on land values. He postulated that the price is a function of the property's production characteristics, locational attributes, and native vegetation. Following discussion with agents and valuers he found that purchasers make comparisons between properties based on rates per hectare or price per unit of production. He also excluded the value of structural improvements on the property and adjusted prices to a common base year (1996). He compared values of native vegetation with and without a Heritage Agreement. Table 12 summarises his findings.

Table 12 Influence of Native Vegetation on Land Values

Region	Non heritage native vegetation	Heritage native vegetation
South East	For the average property each additional hectare of native vegetation increases the price by $295	No significant influence on price
Murray Mallee	No significant influence on price	For the average property each additional hectare of native vegetation reduces the price by $36
Eyre Peninsula	No significant influence on price	For the average property each additional hectare of native vegetation reduces the price by $125

The results indicate that native vegetation not held within a Heritage Agreement increases property values in the South East but has no influence in either the Murray Mallee or Eyre Peninsula. Native vegetation held within a Heritage Agreement does not affect property values in the South East but does reduce property values in the Murray Mallee and Eyre Peninsula.

Commenting on the results, Marano believes that it can be partly explained by the different land uses of the region. In the South East the dominant land use is grazing whereas it is cropping or cropping/grazing in the other two regions. Nearly twice as many farmers in the South East as the other regions did not want to lose their management control by taking on a Heritage Agreement (63% SE compared with 32% MM and 35% EP). Thus in the South East the utility of non-heritage native vegetation could be one of the influences affecting its implicit market value.

While placing a Heritage Agreement over the native vegetation is perceived to reduce farmer control over its management, other benefits such as salinity and erosion control, recreation and conservation are not diminished. Therefore the drop in market value of native vegetation under a Heritage Agreement suggests that these are off farm benefits rather than on farm benefits.

Regarding native vegetation protected by Heritage Agreements, in the South East many more farmers use native vegetation for recreation or as a sanctuary than in the other two regions. This use and its erosion and salinity benefits balance the responsibilities of management. Therefore the result does not impact price. However in the Murray Mallee and Eyre Peninsula, the perceived benefits of native vegetation protected by Heritage Agreements do not outweigh the perceived management responsibilities and potential costs, therefore resulting in a reduction in price[12]. Additionally the benefits are regarded as off farm whereas the costs are on farm and hence reduce the property value.

According to Marano, during the 1983 – 97 period, there were over 200 sales of properties that were almost completely vegetated. The number of sales has been progressively increasing indicating a general increased demand for this type of property. The prices paid have also been increasing.

Arising from his study, Marano proposed several recommendations including:

- If Heritage Agreements restrict grazing potential this is likely to lead to loss in market value of rural holding. Therefore, it is likely that widespread acceptance of this kind of instrument by rural holding landowners will only occur if offered with financial incentives. (This assumes traditional rural land uses).
- Heritage Agreements should be tailored to the individual property rather than having a standard one which is applied to all properties (Note: South Australia is considering the role in management plans associated with Heritage Agreements to give this flexibility)
- The use of revolving funds as a mechanism for securing Heritage Agreements on rural holdings would only work with significant “topping up” of funds. It is not expected that in the long term, this option would cost less than direct payments of financial assistance for signing Heritage Agreements. (Note: This is not the view of the South Australian Government)
- Rate relief as a financial incentive for entering Heritage Agreements has no financial benefit for rural holdings as native vegetation has no market value. However it does recognise the contribution to conservation by the landholder.

[12]. The report erroneously stated that the benefits outweighed the costs but this has been corrected following contact with W. Marano.

- In the study region it will be difficult to get new landholders to take up Heritage Agreements as this will result in a loss in market value. (Note: Nevertheless around 20 – 30 landholders per year come to the NVC about Heritage Agreements).
- The economic benefits on native vegetation as windbreaks, and in controlling soil erosion and soil salinity need to be made relevant at the farm scale and communicated to landholders.
- Market values for native vegetation in Heritage Agreements across regions are not equally affected by restrictions on clearing and introduction of Heritage Agreements. These can have some unexpected equity outcomes and the economic impacts can be substantial.

EFFICIENCY AND EFFECTIVENESS OF NATIVE VEGETATION AND BIODIVERSITY REGIMES

The terms of reference include examining the efficiency and effectiveness of these regimes in reducing the costs of resource degradation and the appropriateness of the current distribution of costs for preventing environmental degradation across industry, all levels of government, and the community.

The earlier section on the valuation of public and private good relates particularly to this term of reference as it identifies the distribution of the benefits to the landholder, the local community and the wider community. Appendix 3 provides the details of one of the studies that has been undertaken to qualify these benefits.

The distribution of benefits for the protection of remnant vegetation ranged as follows (see Table 8): on farm 5% -33%, local community 0% - 16%, wider community 67% - 79%. The distribution of these costs will doubtless vary in differing regions of Australia and further economic studies need to be undertaken to establish the range.

While it is feasible to identify the distribution of the benefits the corollary is that cost sharing frameworks need to be established which reflect this distribution. It is essential to identify all benefits and costs related to a particular action/project in order to be able to allocate them to the individual or group to whom they accrue. This allows cost-sharing arrangements to be substantiated on the basis of net benefits received.

OVERLAPS AND INCONSISTENCIES BETWEEN COMMONWEALTH AND STATE REGIMES

The principal area where overlap could potentially occur is between the Commonwealth's Environment Protection and Biodiversity Conservation Act and State legislation. The EPBC Act aims at the high level, the large developments and undertakings but is written to potentially cover all developments. However the risk of overlap is more theoretical than real. The provisions of the EPBC Act relating to having regard to ESD principles may be broader than State statutes but again the

risk is not regarded as significant. While the EPBC Act gives more standing (*locus standi*) to third parties than is the case with State legislation, again this has not presented difficulties.

An area of concern is the tax disadvantage to South Australian landholders who purchase land with native vegetation and manage it for conservation. In States without controls on clearance the use forgone on the land can be factored into the loss but because broad acre clearance is no longer permitted in South Australia, this tax advantage is not available. This is not the tax concession available for the management of land for conservation for which South Australian landholders would continue to be eligible. Rather it is the use forgone which can be included in the loss.

In addition, where a landholder sells the land with native vegetation to an NGO for a decreased price for conservation purposes the price set for the worth of the vegetation cannot reflect in South Australia its potential for agriculture which is the case in jurisdictions without the controls.

Recommendation

The Commonwealth's Income Tax Assessment Act 1999, be amended to ensure that all landholders are treated equitably with regard to the conservation of native vegetation on their property, regardless of whether or not measures exist in individual jurisdictions to control clearance

PERVERSE ENVIRONMENTAL OUTCOMES

The terms of reference for the Inquiry include the identification of any perverse environmental outcomes arising from native vegetation and biodiversity regulations.

The principal example is the extensive panic clearing that occurred in the pre 1983 period in fear of impending controls. Anecdotal evidence from farming and Departmental sources indicate that a substantial amount of clearing occurred due to this concern but there is no data on the exact amount. It has also been established that significant areas of native vegetation were cleared in Victoria ahead of the 1983 regulation in anticipation of the possibility of similar measures being instituted there.

Following the introduction of the controls, there has been little evidence to suggest that the controls themselves or the financial assistance, which accompanied them, have resulted in perverse outcomes. With over $50 million being made available to the rural sector over the 1985 – 93 period, it might be expected to have resulted in some restructuring such as acquisition of additional land or intensification of agriculture (eg irrigation). There is little evidence of this occurring though no doubt it did.

There has been a case where a landholder that looked after his native vegetation was unable to clear where as another landholder had degraded his native vegetation over a long time was able to clear as the area was deemed to have little biodiversity

value. The latter was able to change to intensive land use and increased the value of the land substantially. The former received little reward for his efforts.

At a local government level there are cases of rate differentiation where primary production land is rated less than other land uses. This can mean that some marginal land that would be better suited for conservation may remain in production and eventually the cost pressures on the landholder may degrade any biodiversity asset that is left

ASSESSMENT OF ECONOMIC AND SOCIAL IMPACTS

The terms of reference for the Inquiry include the adequacy of assessments of economic and social impacts of decisions made.

Native Vegetation Legislation

In South Australia, the basis of the decision has been explicitly defined in the 1983 regulation and in the subsequent 1985 and 1991 Acts. The principles of native vegetation control are set out below from the 1983 controls, and the subsequent Acts have varied these only marginally.

Principles of Native Vegetation Control

Native vegetation should not be cleared if it:

(a) Provides important habitat for wildlife;
(b) Has a high plant species diversity or has rare or endangered species and plant associations;
(c) Has high amenity value;
(d) Contributes to the landscape quality of an area;
(e) Has high value as a remnant of vegetation associations characteristic of a district or region prior to extensive clearance for agriculture;
(f) Is associated with sites of scientific, archaeological, historic or cultural significance; or
(g) Is growing in, or is characteristically associated with, a wetland environme

Native vegetation should not be cleared if such clearance is likely to:

(a) Create or contribute to soil erosion;
(b) Decrease soil stability and initiate soil slip;
(c) Create, or contribute to, a local or regional soil salinity problem
(d) Lead to the deterioration in the quality of surface waters; or
(e) Create or exacerbate the incidence or intensity of local or regional floodin

The 1985 Act specified:

Sec 21 (1) In deciding whether to consent to an application to clear native vegetation, the (Native Vegetation) Authority –

(a) shall have regard to the provisions of the Development Plan so far as they are relevant to that decision; and

(b) shall not make a decision that is seriously at variance with those provisions.

Thus the Native Vegetation Authority could not take economic or social impacts into account in its decision.

However the 1991 Act included a provision (Sec 29) that enabled the Native Vegetation Council to have regard to the applicant's management of the property as a business. Section 29 (1) was similar to Sec 21 above from the 1985 Act. Clauses (2) to (4) however varied this:

> (2) When determining an application to clear native vegetation in order to facilitate the management of other native vegetation, the Council must, in exercising its limited discretion under subsection (1), have regard to the applicant's desire to facilitate the management of that other vegetation.
>
> (3) When determining an application to clear native vegetation that is growing or is situated on land that forms part of a property that is used for the business of primary production, the Council must, in exercising its limited discretion under subsection (1), have regard to the applicant's desire to operate the business as efficiently as possible.
>
> (4) The Council may give its consent to clearance of native vegetation that is in contravention of subsection (1)(b) if –
>
> (a) the vegetation comprises one or more isolated plants; and
> (b) the applicant is engaged in the business of primary production; and
> (c) in the opinion of the Council, the retention of that plant, or those plants, would put the applicant to unreasonable expense in carrying on that business or would result in an unreasonable reduction of potential income from that business.
>
> As shown below , section (11) of the Act requires that any decision made by the Council to approve clearance is required to result in an environmental benefit.
>
> (11) The Council may give its consent to clearance of native vegetation pursuant to subsection (4) if, and only if –
>
> (a) it attaches to the consent a condition requiring the applicant to establish native vegetation on land specified by the Council; and
> (b) the Council is satisfied that the environmental benefits that will be provided by that vegetation significantly outweigh the environmental benefits provided by the vegetation to be cleared.

Thus the Council now considers the circumstances under which the applicant operates their property and the extent to which their decision may affect its viability.

Over the period 1994/95 and 2001/02, 16,874 ha were approved for clearance and a further 21,394 ha of scattered trees were allowed to be cleared. To offset the areas approved for clearance, 5533 ha was required to be regenerated and a further 3186 ha replanted with trees and shrubs (see Appendix 2).

Pastoral Land Management and Conservation Act 1989

The Act establishes the basis for the leasing of the Pastoral lands in South Australia. It provides as an over-arching requirement (sec 5):

> The Minister and the Board, in administering this Act and in exercising any other power or discharging any other function in relation to pastoral leases
>
> *(a)* must act consistently with and seek to further the objects of this Act; and
>
> *(b)* must have regard to plans or guidelines established by Government agencies, soil conservation authorities and planning authorities that are applicable to pastoral land.

Under the Act, the Minister may grant a pastoral lease over Crown land but is required, under Sec 19, to make the process for taking a lease an open competitive process (except in specified circumstances, eg addition to existing lease).

National Parks & Wildlife Act 1972

Kangaroo management is administered under the National Parks & Wildlife Act that requires the preparation of management plans for the harvesting of the species. While the emphasis of such plans is on their biology and sustainability of harvesting, the Act (Sec 60 (I)(2)(d) provides that the draft plan must:

> "assess whether there is a need to reduce the number of animals of the species to protect the environment, crops, stock or other property"

Draft plans are made available for public comment for a minimum of 3 months before being adopted by the Minister.

TRANSPARENCY AND COMMUNITY CONSULTATION

Because of the very real threat of panic clearance, the original 1983 regulations to control vegetation clearance were developed without consultation. Once they were instituted, consultation commenced with the farming organisation on the content of the Development Plan provisions. There was also extensive and confidential consultation with the farming organisation in developing the 1985 Act.

Legislation needs to be drafted in consultation with the rural community, but panic clearance is a real issue and a moratorium is needed on clearance while consultation is in progress.

The process leading to the Pastoral Land Management and Conservation Act in 1989 involved extensive community and stakeholder consultation.

THE WAY FORWARD

South Australia has taken innovative and courageous initiatives, often well ahead of other jurisdictions, to regulate the use and clearance of its native vegetation and biodiversity resources. It has been engaged in this process for nearly 20 years and has made considerable strides in better ensuring the sustainability of South Australia.

Yet despite the gains that have been made, clearance and loss of native vegetation continues. South Australia's measures were instituted at a time when much of the extant vegetation was fragmented into relatively small areas. Continued loss has resulted from the combined stress of grazing pressure from stock and feral animals (eg rabbits), diseases such as *Mundulla Yellows* and *phytophthora* (which are themselves symptoms of stressed vegetation), and dryland salinity together with the genetic consequences of fragmented, small areas of vegetation.

Protection of native vegetation is more likely to succeed where the remaining vegetation exists in large contiguous tracts that are more likely to survive genetically and ecologically. Where this situation exists, as in some interstate jurisdictions, every effort should be made, on biodiversity conservation grounds, to retain the integrity of these areas and avoid their fragmentation.

South Australia aims to revegetate and regenerate areas to enlarge and link existing areas of vegetation. However much of the vegetation that remains is in locations that are of low rainfall or poor soil condition and this adds to the risk of their loss.

It has proven extraordinarily difficult to achieve a solution, which is socially equitable, economically viable and ecologically sustainable. South Australia continues to work towards these goals but while much has been achieved, challenges remain.

The Wentworth Group of Concerned Scientists has suggested[13] that the sustainability of Australia will depend significantly on finding a way of protecting what native vegetation remains and gaining the community benefits to water quality, salinity prevention, soil conservation and biodiversity conservation which will result.

The benefits of retaining native vegetation are widely recognised and it is highly unlikely that any government would turn back the clock and permit widespread clearing. Yet the terms of reference for the Inquiry are narrowly construed to focus on the costs, not the benefits of vegetation retention.

This is not to say that the difficulties of retaining native vegetation in an equitable, efficient and effective manner have been resolved. Far from it. But we are moving towards solutions for this intractable problem that has involved an appreciation by the farming community of the off-farm impacts of clearance.

Moving forward in finding a solution will involve farmers recognising their duty of care for sustaining the environment, of finding a way of valuing the ecosystem

[13]. www.wwf.org.au/downloads/blueprint_for_a_living_continent.pdf

services that are provided by native vegetation, and of developing the means to enable landowners to manage the native vegetation on their properties so that the community gains the benefits of sustainability.

The House of Representatives Standing Committee on Environment and Heritage has defined the term “public good conservation” as conservation activities undertaken by private land users which bring environmental benefits to the community at large. This of course describes exactly the situation in respect of native vegetation retention on private land for public good.

The Wentworth Group of Concerned Scientists identified three elements to achieve private land conservation for public good:

1. We need to provide financial support to landholders who supply environmental services to the rest of the community because this will often involve reduced income for farmers – at least in the short to medium term;

2. We need to change our institutions to remove the hidden “environmental subsidies” to agriculture, where farmers impose costs on other people or future generations. These subsidies generally benefit consumers – not farmers – through lower prices, and often hurt farmers who are trying to be sustainable by making them compete with others who are not paying the full costs of their actions;

3. We need to ensure our tax systems support sustainability and send the right signals to farmers and the wider community.

The Wentworth Group also expected farmers to accept a duty of care to protect the environment. This duty of care should ensure the continued sustainability of the environment. Supporting farmers provide an off-farm ecosystem service through the native vegetation on their properties involves an acceptance by the farming community of their duty of care. In its 1998 Report, *A Full Repairing Lease: Inquiry into Ecologically Sustainable Land Management*, the Productivity Commission’s predecessor, the Industry Commission, recommended the introduction of a statutory duty of care to the environment.

A duty of care is to ensure that one does not injure a person or the property of another. The common law on which this is based does not recognise that a duty of care may be owed to the environment *per se*. To overcome this, governments have included statutory duties of care in environmental legislation. South Australia’s Environment Protection Act 1993 (S25) includes such a duty of care but it relates only to avoiding pollution of the environment, not on such activities as vegetation clearance or drainage of wetlands.

In his report to the Productivity Commission, *A Duty of Care for the Protection of Biodiversity on Land*, Dr Gerry Bates argues that statutory duties of care may be difficult to enforce and offer little additional protection for biodiversity where legislation exists. Nevertheless, Dr Bates contends, that such a duty can provide a “means to articulate required environmental standards and positive measures for environmental

management can be stipulated. The test for compliance with the duty of care should be best practice."

A statutory duty of care for biodiversity would be beneficial but need to be supported by complementary measures including voluntary action, education and financial assistance.

South Australia recognises that wider community benefits arise from retaining native vegetation on private property. Successive South Australian Governments have recognised that while it is reasonable for landholders to undertake their duty of care responsibilities at their own expense, where they are expected to exceed a reasonable duty of care, the issue of financial assistance arises.

Recommendations

A culture of 'duty of care' for environmental sustainability is fostered among landholders and includes those who benefit from land use, (including the catchment and the wider community) to provide the basis for the conservation and management of native vegetation and biodiversity resources. The 'duty of care' should take into account the state of the land when the current landholder took control

The Commonwealth Government should support the development of consistent national approach to the application of the 'duty of care' principle

The costs of retaining native vegetation be shared amongst the beneficiaries in proportion to the level of benefit that they receive (eg. landholder, local community and/or wider community) and that these proportions be determined through the application of an agreed cost sharing formula

The Commonwealth Government assist landholders, through the States and Territories, to manage native vegetation and biodiversity resources that contribute to the fulfillment of the Commonwealth's conservation obligations.

In its 1999 report, *A Full Repairing Lease: Inquiry into Ecologically Sustainable Land Management*, the Commission identified the use of heritage agreements between landowners and Governments as an important principle of ecologically sustainable land management. Legally binding agreements can provide the means of paying farmers for the ecosystem services their native vegetation provides and supporting them in managing these areas. A *quid pro quo* is thus involved: the community pays for the environmental services provided by the farm and in return the landholder agrees to the conservation and management of its native vegetation and biodiversity resources.

While the South Australian Government welcomes the Productivity Commission's support for the use of heritage agreements, the South Australian experience indicates that significant levels of assistance need to be offered in order to encourage participation in such programs. In view of the value of extended use of heritage agreements as a conservation mechanism, the South Australian Government is of

the view that there is a case for the provision of Commonwealth assistance in encouraging broad based participation in such programs.

Justification for such support also derives from the contribution that the South Australian Heritage Agreement scheme has provided towards meeting the Commonwealth's Endangered Species Act: 40% of endangered flora and 39% of vulnerable fauna defined under the Act are protected. Yet, as has been pointed out this has been achieved with minimal Commonwealth contribution.

Recommendations

The Commonwealth Government support the States and Territories to establish and employ legally binding agreements that are tied to the land, as the means of facilitating the provision of assistance to landowners to conserve and manage native vegetation and biodiversity resources on private land

In recognition of the fact that States and Territories are restricted in the range of incentives that they can provide to landholders or investors, the Commonwealth Government should investigate how it may use tax reduction incentives for landholders or investors, and other market based instruments, to encourage greater use of legally binding agreements as a conservation mechanism. Inherent in this will be a need to recognise that there will be inconsistencies and possible interstate trade issues. For example, tax benefits for conservation in States where there are little or no clearance controls may be more attractive to investors than in States where there are controls and no alternative uses for the land exist. (This recommendation was included in State Government submission to Public Good Conservation Inquiry by House of Representatives Standing Committee on Environment and Heritage).

Valuing the ecosystem benefits that derive from the retention of native vegetation on private land is no easy matter. These benefits and services do not flow through the conventional market place and are subject to the normal laws of supply and demand in setting prices. Rather they are goods and services, which can only be measured through determining the community's willingness to pay for them. Tools including contingent valuation, choice modeling, travel cost and hedonic pricing are available to assist in determining the appropriate value of these services.

In the South East of South Australia a series of studies have been underway for some years to determine the private and social values of wetlands. Like native vegetation, wetlands provide benefits both to landholders, the local community and to the wider community. Wetlands are used for grazing, hunting and eco-tourism. The community gains the benefits of biodiversity conservation, landscape enhancement, recreation and tourism, as well as their role in trapping and recycling nutrients, reducing water pollution, and controlling floods and fires[14].

[14]. See the following reports by Stuart Whitten and Jeff Bennett funded by LWRDC and Environment Australia: Report #2, *Farmer perceptions of Wetlands and Wetland Management in the Upper South East of South Australi*a; Report #3, *Potential Upper South East Regional Wetland Management Strategies*; Report #7, *A Travel Cost Study of Duck Hunting in the Upper South East of South Australia*; Report #8 *Non-market Values of Wetlands: A Choice Modelling Study of*

Using choice modeling a study has determined the value of market and non-market costs and benefits for a range of retention options of the South East wetlands (Table 13). This provides an indication of the scale of costs and benefits involved. From the perspective of the landowner, the costs are high but the benefits are low. However from the community perspective, the benefits substantially outweigh these costs.

Table 13 Market and Non-market Costs and Benefits of Wetlands

Cost/benefit	Wetland retention	Pro-wetlands	Wetlands & remnants
Costs to wetland owners	-$4,170,000	-$13,500,000	-$40,527,000
Benefits to wetland owners	$17,000	$43,000	$46,000
Other benefits – some to wetland owners	$750,000	$1,836,000	$2,367,000
Net monetary benefits	-$3,403,000	-$11,621,000	-$38,661,000
Non-monetary benefits – conservative estimates	$8,645,000	$9,312,000	$22,947,000
Total net benefits – conservative	$5,242,000	-$2,309,000	-$15,168,000
Non-monetary benefits – less conservative estimates	$17,432,000	$17,664,000	$50,562,000
Total net benefits – less conservative estimates	$14,029,000	$6,043,000	$12,448,000

Source: Report No. 11 (see footnote 15)
Note: Wetland retention: improved management of existing wetlands not improved under the 'Wetlands Waterlink' program to return them to a healthy condition
Pro-wetlands: improved wetland management of existing areas plus restoration of additional areas of wetlands
Wetlands & remnants: improved wetland management of existing wetland areas and remnant vegetation plus restoration of additional areas of wetlands and remnant vegetation (especially as linkages between existing areas)

These studies, together with the economic studies of the public and private good from native vegetation referred to earlier (see Appendix 3), indicate the complexity and difficulties involved in obtaining substantive and valid data on non-market costs and benefits of ecosystem services. Similar studies should be undertaken for vegetation retention covering differing regions in Australia and differing retention and management options. These could range from complete conservation through to mixed conservation and partial use of resources – eg light grazing, honey, firewood extraction.

Recommendation

The Commonwealth Government, together with the States and Territories, undertake a comprehensive program in regions throughout Australia to quantify the non-market costs and benefits of the ecosystem services provided by native vegetation and biodiversity resources to landholders, the local community, and the wider community.

The National Research and Development Program on Rehabilitation, Management and Conservation of Remnant Vegetation by Land & Water Australia sponsors

---

Wetlands in the Upper South East of South Australia and the Murrumbidgee River Floodplain in New South Wales; Report #9, *A Bio-economic Analysis of Potential Upper South East Regional Wetland Management Strategies*, Report # 11, *Policies for Wetland Management Change on Private Land: Case Studies of Wetlands in the Upper South East of South Australia and the Murrumbidgee River Floodplain in New South Wales.*

research on the economic value of native vegetation including its wider community values[15].

The Upper South East project has shown the benefit of close partnerships between the Commonwealth, State and local communities. The local communities have the knowledge, the States have the technical expertise and support infrastructure and the Commonwealth has the financial and fiscal clout. Bilateral arrangements in which the Commonwealth direct the States provide little opportunity for the State to influence the outcome and virtually no input from the local community.

The Commonwealth needs to work with the States and Territories in framing a national agenda. South Australia is very willing to work with the Commonwealth regarding the agenda for the protection of native vegetation and biodiversity as our record demonstrates.

South Australia has invested heavily in native vegetation protection, well before this became fashionable. The point is that there is still loss of vegetation through insidious means of salinity, island ecology problems and continuing use of areas that is not compatible with conserving biodiversity. Support is required through a range of means to make the native vegetation (or habitat) that is left of value to landholders and users of the asset. Preventing the clearance of vegetation through mechanical means can be dealt with fairly and the lessons learnt in South Australia should be used throughout Australia. Ongoing management and keeping the asset as rich sources of biodiversity for the future requires ongoing assistance from all Australians.

[15]. See Lockwood, M., S. Walpole, C. Miles, 2000. *Economics of Remnant Native Vegetation Conservation on Private Property*, Research Report 2/00 – PR000333. See also Chudleigh, P, R. Johnston & S. Morton, 1999. *Exploring the Future Requirements for Managing Australia's Remnant Vegetation,* Occasional Paper 02/99. Land & Water Resources R&D Corp.

RECOMMENDATIONS

The South Australian Government recommends the following:

1) A culture of 'duty of care' for environmental sustainability is fostered among landholders and includes those who benefit from land use, (including the catchment and the wider community) to provide the basis for the conservation and management of native vegetation and biodiversity resources. The 'duty of care' should take into account the state of the land when the current landholder took control.

2) The Commonwealth Government should support the development of consistent national approach to the application of the 'duty of care' principle.

3) The Commonwealth's *Income Tax Assessment Act 1999* be amended to ensure that all landholders are treated equitably with regard to the conservation of native vegetation on their property, regardless of whether or not measures exist in individual jurisdictions to control clearance.

4) The Commonwealth Government support the States and Territories to establish and employ legally binding agreements that are tied to the land, as the means of facilitating the provision of assistance to landowners to conserve and manage native vegetation and biodiversity resources on private land.

5) The costs of retaining native vegetation be shared amongst the beneficiaries in proportion to the level of benefit that they receive (eg. landholder, local community and/or wider community) and that these proportions be determined through the application of an agreed cost sharing formula.

6) The Commonwealth Government assist landholders, through the States and Territories, to manage native vegetation and biodiversity resources that contribute to the fulfillment of the Commonwealth's conservation obligations.

7) In recognition of the fact that States and Territories are restricted in the range of incentives that they can provide to landholders or investors, the Commonwealth Government should investigate how it may use tax reduction incentives for landholders or investors, and other market based instruments, to encourage greater use of legally binding agreements as a conservation mechanism. Inherent in this will be a need to recognise that there will be inconsistencies and possible interstate trade issues. For example, tax benefits for conservation in States where there are little or no clearance controls may be more

attractive to investors than in States where there are controls and no alternative uses for the land exist.

8) The Commonwealth Government, together with the States and Territories, undertake a comprehensive program in regions throughout Australia to quantify the non-market costs and benefits of the ecosystem services provided by native vegetation and biodiversity resources to landholders, the local community, and the wider community.

9) The Commonwealth Government encourages partnerships between community groups and Governments and the application of cost-benefit and beneficiary analyses to natural resource management projects.

10) The Commonwealth Government, in partnership with landholders, the community and Local, State and Territory Governments, negotiate cost-sharing frameworks that cover the wider community benefits and costs associated with the conservation and management of native vegetation and biodiversity resources on private land.

Appendix 1
Inquiry's Terms of Reference

Inquiry into the impacts of native vegetation and biodiversity regulations

The Productivity Commission is to report on:

(a) The impacts on farming practices, productivity, sustainability, property values and returns, landholders' investment patterns and the attitude of finance providers, and on other economic activities such as infrastructure development and mineral exploration, and flow on effects to regional communities, arising from the regulation of native vegetation clearance and/or biodiversity conservation, including:

  (i) Both positive and negative impacts
  (ii) The level of understanding of the relevant legislative and regulatory regimes among stakeholders;
  (iii) The likely duration of such impacts and the factors influencing their duration; and
  (iv) The extent to which existing government measures are mitigating any negative impacts

(b) The efficiency and effectiveness of the above regimes in reducing the costs of resource degradation and the appropriateness of the current distribution of costs for preventing environmental degradation across industry, all levels of government, and the community;
(c) Whether there is any overlap or inconsistency between Commonwealth and State/Territory regimes, including their administration;
(d) The evidence for possible perverse environmental outcomes, including those that may result from perceptions of a financial impact, arising from the implementation of the above regimes;
(e) The adequacy of assessments of economic and social impacts of decisions made under the above regulatory regimes;
(f) The degree of transparency and extent of community consultation when developing and implementing the above regimes; and
(g) Recommendations (of a regulatory or non-regulatory nature) that governments could consider to minimise the adverse impacts of the above regimes, while achieving the desired environmental outcomes, including measures to clarify the responsibilities and rights of resource users.

Appendix 2
Development of the South Australian Vegetation Clearance Controls

The South Australian Government introduced Regulations to control the clearance of native vegetation on 12 May 1983. These Regulations were subsequently replaced by the:

- Native Vegetation Management Act 1985
- Native Vegetation Act 1991
- Native Vegetation (Miscellaneous) Amendment Act 2002

This section describes the situation prior to the introduction of the regulations and then traces through the subsequent development of the measures.

THE PRE- 1983 SITUATION

The development of South Australia from its settlement in 1836 well into the post World War II period has necessitated the clearance of native vegetation and the development of land for agriculture.

Successive governments have legislated, released land, built infrastructure (eg railways and roads), drained land (eg South East) and provided assistance to facilitate clearance and land development, mainly in the southern wetter agricultural region of the State[16]. An example was the Scrub Lands Act 1877 which greatly liberalized the conditions of tenure and provided incentives to open up more districts. In the interwar period, further land was released, cleared and developed by returned servicemen. Droughts and attendant soil erosion, rabbit plagues, lack of capital for fertilizers and other constraints resulted in degradation of the more marginal lands such in the Murray Mallee and Eyre Peninsula[17].

In the post Second World War period, further Soldier Settler schemes saw the clearance and development of much of Kangaroo Island. Correction of trace element deficient soils in the mallee heath lands of the upper South East led to the clearance of this area. Similar trace element deficiencies were rectified on Kangaroo Island, the southern Mt Lofty Ranges and parts of Eyre and Yorke Peninsula, enabling clearance to proceed. Larger agricultural machinery, particularly tractors capable of

[16]. Only 20% of South Australia receives more than 250 mm rainfall, compared with 33% for Australia as a whole

[17]. See for example, Dept of Agriculture reports: *The badly drifting farm report of the Murray Mallee District Soil Conservation Board 1948 – 1952*; *Soil erosion and farming methods survey of the Wanbi land unit in the Murray Mallee of South Australia* (1973); *Wind erosion on Eyre Peninsula, 1975 – 1979.*

clearing large tracts of land[18], together with strong wool prices throughout the 1950s accelerated the pace of clearance.

Generous taxation concessions under the Commonwealth's Income Tax Assessment Act 1936 allowed full deduction of clearance costs for expenditure on "the destruction and removal of timber, scrub, or undergrowth indigenous to the land" (Section 75[1]). Through the 1950s broadacre clearance occurred in the upper South East, Murray Mallee, Eyre Peninsula and the west coast (i.e. western Eyre Peninsula).

Over 55% of the agricultural land was held under Perpetual Leases and until 1983, these required lessees to clear all but 2% of the property within 10 years of allotment.

By the late 1960s, depressed wheat markets and quotas reduced the economic pressure for clearance and the taxation incentives were facing increasing criticism on environmental grounds. Following a review by the Bureau of Agricultural Economics, the income tax concessions were curtailed in 1973 by spreading the deduction over 10 years. This reduced the speculative component of clearance. However, the more buoyant market conditions for commodities led to renewed clearance pressure.

It is widely recognised that the agricultural zone of SA has been 'over-cleared' by any objective scientific standards. A consequence of agricultural developments on biodiversity is evident in the suite of native animals that have significantly increased in the simpler and more open landscapes developed across the State over the last 150 years, including such species as Australian Magpies, Crested Pigeons, Galahs and Corellas.

The negative impacts of clearance resulted in Australia having the worst record of mammal extinctions in the world over the last 500 years with South Australia having the worst in the nation. This extinction process is still proceeding, and certainly not just for mammals.

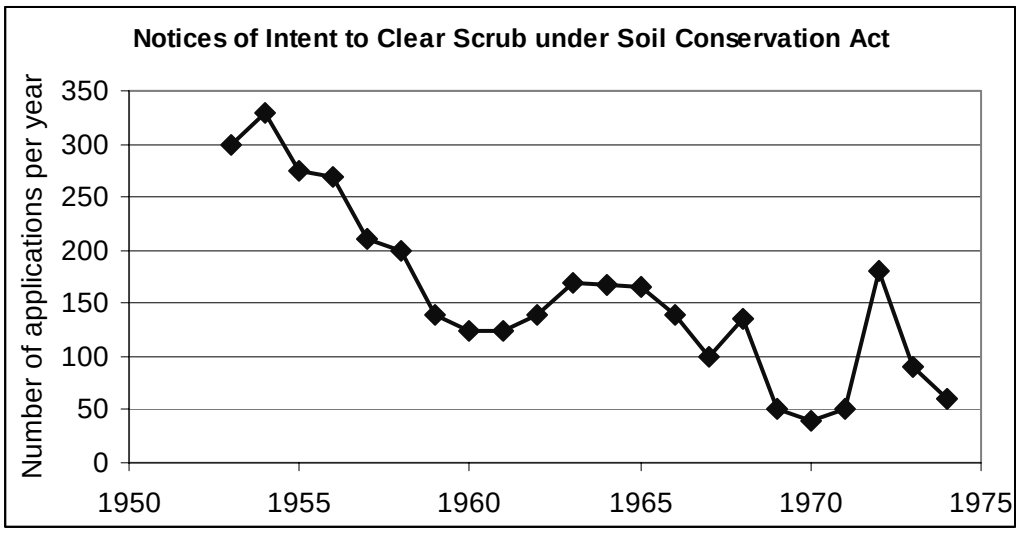
Agricultural clearance and development has generated its own set of "problems" with native animals favoured by this process reaching such abundance that they are considered "pests" and managed accordingly. The three large kangaroo species are typical examples.

Apart from ongoing biodiversity decline across South Australia the other major direct result of agricultural development has been the well-documented salinity problems. The agricultural regions of South Australia are second only to the south west of Western Australia in suffering from this problem for which no broadly applicable solutions currently exist.

[18].Whereas horse or bullock-drawn rollers could clear up to 16 ha of low scrub per day, two bulldozers pulling a chain between them could clear this area in an hour.

The 1975 – 77 Commonwealth/State collaborative study on soil erosion[19] found that 337,000 km^2 of agricultural land required corrective works in South Australia. This was 59% of the total agricultural area. A further 58,000 km^2 required remedial management practices.

Under the Soil Conservation Act 1939, 3 months notice of intent to clear was required by the Department of Agriculture (Figure 1). The main requirement of the Department was to reserve sand dunes from clearance. The meagre penalties were insufficient to deter clearance where the returns vastly exceeded the penalty[20].



Source: Inter-Departmental Committee on Vegetation Clearance, 1976. *Vegetation Clearance in South Australia*. Note upsurge in 1972 following the proposals to control clearance.

Figure 1 Notices of Intent to Clear Scrub

Until the mid 1960s, national parks were few and far between but this changed with the passage of the National Parks Act 1966 and a vigorous program of reserving previously undedicated Crown Lands as national parks. Between 1960 and 1979 the area of reserves grew from less than 200,000 ha to around 3,500,000 ha.

On at least one occasion before introduction of the May 1983 regulations, an attempt was made to control vegetation clearance. In September 1972, the State Planning Authority proposed planning controls over cutting of trees exceeding 1.2 m in height on Kangaroo Island. Local farmers vigorously opposed the measures and they were subsequently dropped in November 1973.

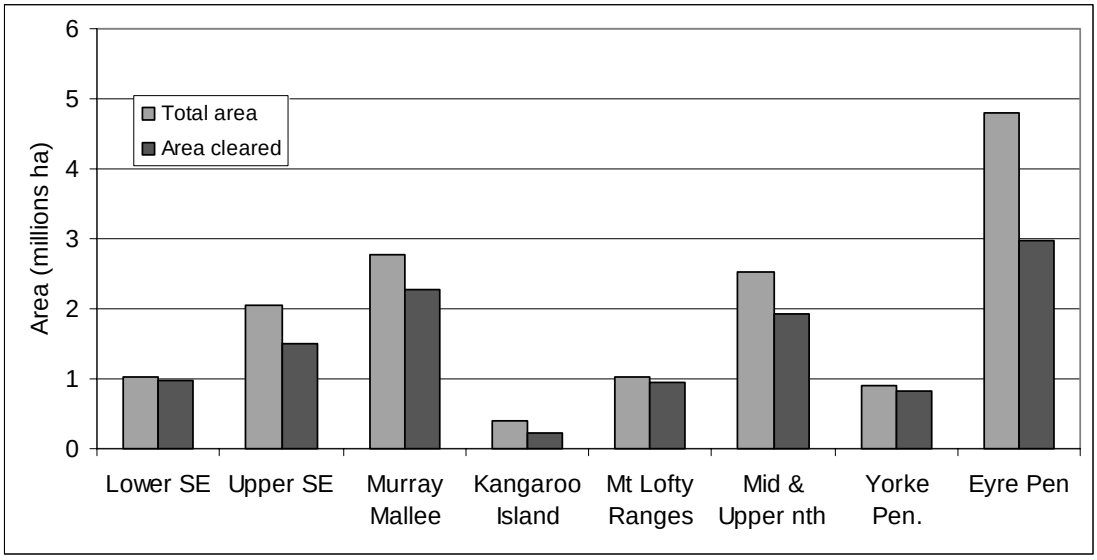
In July 1974, the South Australian Government approved the formation of the Inter-departmental Committee on Vegetation Clearance to inquire into the extent of vegetation clearance, the factors which influence clearance, principles of sound land management, controls necessary, and means of encouraging retention of

[19]. Commonwealth and State Government Collaborative Soil Conservation Study 1975 – 77. 1978*. A Basis for Soil Conservation Policy in Australia*. AGPS, Canberra. For summary see: Woods, L. E. 1983. *Land Degradation in Aus*tralia. AGPS, Canberra.

[20].The penalty was originally $200; in 1978 it was increased to $1000.

vegetation[21]. It completed its work in December 1975 but its report was not released until 1977.

Of a total area of the agricultural region of 15.52 m ha, the Committee found that 11.66 m ha had been cleared (75.1%) leaving 3.86 ha uncleared. Figure 2 illustrates the areas cleared by region. The most extensive uncleared area was in Eyre Peninsula with 1.8 m ha uncleared.



Source: Inter-Departmental Committee on Vegetation Clearance, 1976. *Vegetation Clearance in South Australia*

Figure 2 Extent of Vegetation Clearance by Regions, 1975

In most regions, the remaining areas of uncleared land were less suitable for agriculture. Clearance had occurred on the better watered more fertile lands leaving the poorer, rocky, hilly land. The Murray Mallee was marginal for cereals having low and erratic rainfall and the remaining land was deep sand country with high erosion hazard and low productivity.

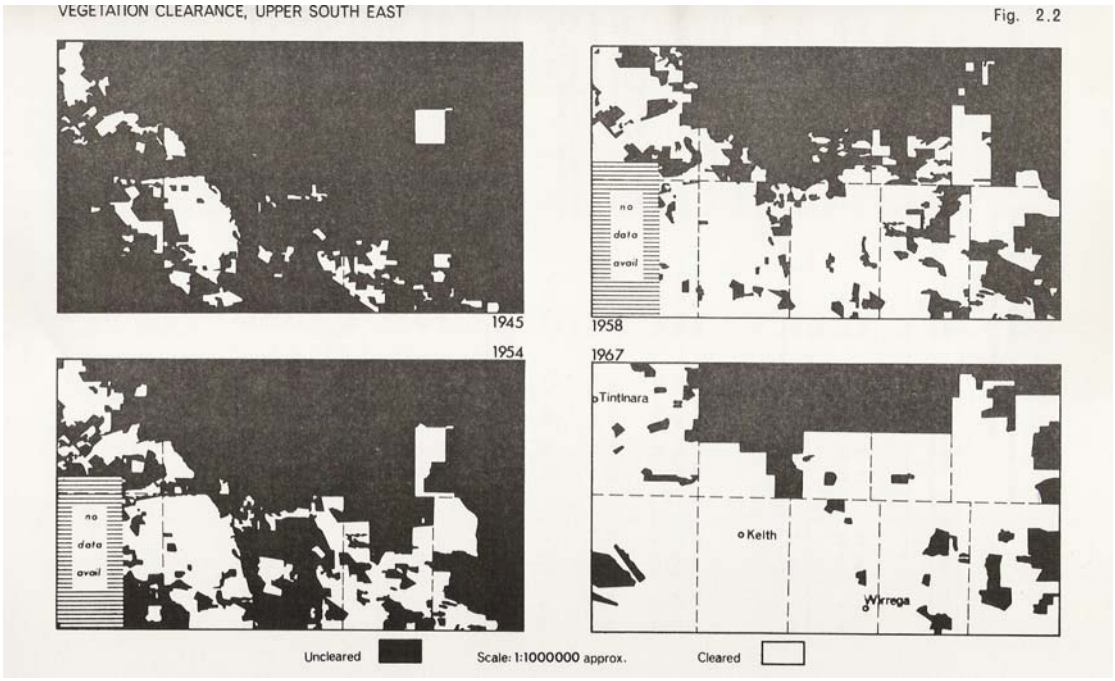
Remaining vegetated areas in the Mt Lofty Ranges were on steep slopes and of low agricultural worth. In the mid and upper north, the remaining vegetation was confined to crests and upper slopes of the low north-south ridgelines. On Eyre Peninsula, vegetation remained on the extensive sheet calcrete areas on the west coast and on deep infertile sands in other areas. Low rainfall constrained clearance in the far west. Despite the poor agricultural prospects of the uncleared areas, the Vegetation Clearance Committee concluded that there would continue to be pressure for clearance.

From time to time, media comment on the need for vegetation controls or rumours in rural areas about impending controls led to panic clearing by farmers in various parts of South Australia. The 1972/73 proposals for controls on Kangaroo Island clearance, the establishment of the Vegetation Clearance Committee and publicity

[21]. It is interesting to note that the regulations to control native vegetation clearance were introduced in May 1983, nearly a decade later.

regarding its findings of the extent of clearance, and intermittent media coverage of the environmental consequences of clearance all served to fuel this concern.

The fear was widespread that farmers who, in good faith, had purchased “scrub blocks” and held them for future development (often for their sons to enable them to stay on the land), would be prevented from clearing and developing the land. Moreover they would not be compensated for the land. It is widely believed, for example by officers of the Department of Agriculture, that such fear pushed farmers into clearance. Gaining a good cheque from sale of wool or cereals would lead to another spate of clearing from cashed up farmers.



Source: Inter-Departmental Committee on Vegetation Clearance, 1976. *Vegetation Clearance in South Australia*

Figure 3 Vegetation Clearance, Upper SouthEast

Interestingly the Committee on Vegetation Clearance argued against vegetation controls on the basis that “its introduction could well be divisive and counter-productive, serving only to further polarize the existing rift between rural and urban communities.” Mindful of the controversy over Kangaroo Island clearance controls the Committee turned to an approach based on co-operation rather than coercion. The Committee proposed that applications for clearance be scrutinized by the Department for the Environment. It proposed three options:

1. Land of little environmental significance: subject to the land being used within its capability or that of adjacent land, the Department would have no interest in the proposal. It would draw attention to any incentives available to retain the vegetation.

2. Land of environmental significance but not sufficient to warrant acquisition: subject to the land being used within its capability or that of adjacent land, the

Department would indicate approval but would acquaint the owner of its environmental significance and draw his attention to any incentives available.

3. Land of outstanding environmental significance, required for the State's park system: the Department, with Ministerial approval would indicate interest in purchasing the land and open negotiations.

While stating that it believed that this approach is necessary and desirable as a short term or interim measure, the Committee said "It is in every anachronistic to have, in 1976, wide-spread vegetation clearance proceeding without scrutiny by a Department for the Environment." The Committee proposed that these measures be trialed over 3 years but was vague as to what should happen after that time, referring obliquely to "a different approach to vegetation clearance".

The Committee examined a range of incentives to retain remaining areas of vegetation [22] and recommended the development of reasonable and fair incentives.

After three years of work on development of the legal mechanisms required and costing of the recommendations, in 1980 the incoming Liberal Government committed itself to the introduction of a voluntary Heritage Agreement Scheme as recommended by the report.

The Heritage Agreement Scheme provided financial incentives for farmers to retain and manage significant areas of native vegetation on their land. The Agreements would bind successors in title to the land for its term, with most Agreements written in perpetuity. The incentives covered the cost of local government rates and the provision of stockproof fencing. Over its first two years after its introduction, the scheme established 170 Agreements covering 15,000 ha. The scheme was widely publicised and was well received.

However, as expected the voluntary scheme failed to stem clearance. By 1982, only 0.75% of remaining native vegetation was covered by Agreements. Few farmers were prepared to alter their clearance plans. Clearance rates remained high, for example in the South East, around 51% of the vegetation remaining in 1974 had been cleared by 1981. The Labor Party's pre-election policy for the 1982 election stated that "further clearance should be discouraged".

THE 1983 REGULATIONS

Five months after the 1982 election, on 12 May 1983, the new Labor Government introduced without consultation a regulation under the Planning Act 1983 controlling clearance. The Third Schedule of the Regulations was amended by insertion of the statement: "the clearance of any tree, shrub or plant of a species indigenous to

[22]. Incentives examined include relief from rates and taxes - varying the Income Tax Assessment Act so that only approved clearance proposals would gain the deduction, changing the basis of land tax from undeveloped to developed value, local government rates, succession and gift duties, water rates. It noted that many of these were based on the development potential of the land, which acted as a spur to clearance.

South Australia" in defined areas or parts of the State would constitute an act or activity that would comprise development[23].

Clearance was thus defined as a change in land use[24] that required planning approval from the South Australian Planning Commission[25]. No public notice of clearance applications was required and consequently no third party appeals were possible on clearance decisions.

In the following two years after introduction of the regulations, between June 1983 and April 1985, 635 applications were processed covering around 450,000 ha of vegetation. However, this number was about half of the applications due to a significant backlog[26]. Clearance approval for 250,000 ha was sought. An area of 150,000 ha was approved for clearance (60% of the 0.25 m ha or 33% of 0.45 m ha). 97,000 ha were refused clearance. On the average property subject to an application to clear, there were 650 ha of vegetation present and the application sought to clear 390 ha. Of this, 240 ha were approved and 150 ha refused, leaving a total of 405 ha uncleared. The majority of applications were from the Eyre Peninsula (24%), Mid North (21%) and Murray Mallee (21%).

The coverage of the regulations went well beyond biodiversity conservation. The principles are shown below.

Principles of Native Vegetation Control

Native vegetation should not be cleared if it:

(a) Provides important habitat for wildlife;
(b) Has a high plant species diversity or has rare or endangered species and pla associations;
(c) Has high amenity value;
(d) Contributes to the landscape quality of an area;
(e) Has high value as a remnant of vegetation associations characteristic of a dis or region prior to extensive clearance for agriculture;
(f) Is associated with sites of scientific, archaeological, historic or cultural significance; or
(g) Is growing in, or is characteristically associated with, a wetland environment.

Native vegetation should not be cleared if such clearance is likely to:

[23]. Clearance was defined as "any manner of destruction of tree, shrub or plant and shall include cutting, felling, chaining, rolling, ringbarking, poisoning or burning of trees, shrubs or plants." The definition did not include grazing but a significant increase in grazing could constitute clearance.
[24]. Planning Act, Sec 56(1)(a) "…no provisions of the Development Plan shall prevent the continue use … for the purposes for which that land was lawfully being used at the time the provision took effect."
[25].The Commission delegated responsibility to specified officers of the Vegetation Retention Unit of the Department of Environment and Planning.
[26]. As an indication of backlog, over the 22 months to February 1985, 1275 applications for clearance were received of which 721 were assessed. The large number of applications compares with the 192 applications received under the Soil Conservation Act over the 1981 – 83 period prior to the regulations.

(a) Create or contribute to soil erosion;
(b) Decrease soil stability and initiate soil slip;
(c) Create, or contribute to, a local or regional soil salinity problem
(d) Lead to the deterioration in the quality of surface waters; or
(e) Create or exacerbate the incidence or intensity of local or regional flooding

Source: Vegetation Clearance Supplementary Development Plan, Authorised 14 June 1984

The grounds for controlling vegetation clearance thus covered land and water care as well as biodiversity conservation.

The May 1983 regulations met with strong opposition from farmers and farmer organisations, particularly the United Farmers and Stockowners of South Australia (UF&S). At first the organisation did not believe it would have much effect other than for a few west coast and mallee farmers. However they took up the issue as applications were refused and as the backlog of applications awaiting a response grew.

The organisation met with farmers, arranged meetings in country areas and represented their concerns to the Minister and Department. According to Dennis Slee of the US&S, some 700 – 800 farmers visited the organisation's South Terrace office during the 1980s, some of whom had never visited Adelaide previously. The prospect of them taking the issue up directly with the Department in Grenfell Street was for many intimidating.

At the time of the introduction of the regulations, farmers regarded conservation as referring to soil conservation; few had any appreciation of biodiversity conservation. It took many years of awareness raising through the establishment of Ibis awards, Bush Care schemes, Save the Bush, One Billion Trees, etc for the knowledge and understanding of biodiversity conservation to become widespread.

In late 1983 a farmer on Kangaroo Island[27], operating under a perpetual Crown lease applied for clearance approval. It was indicated to him that this was likely to be refused and it was suggested that it be amended. The farmer advised that some clearing had commenced and that he intended to disregard any restrictions. The Planning Commission sought an injunction before the District Court but the Judge refused on the basis that clearing did not constitute a change in the existing use of the land which was farming. The Commission appealed the decision to the Full Supreme Court. In January 1984 the Court issued an interim restraining order and in May the Full Bench in a 2:1 decision upheld the appeal.

The farmer lodged an appeal to the High Court. This was heard in June and on 30 November 1984 the High Court handed down its decision. Although it held the controls to be valid, it found that clearance represented an extension of existing use of land for agricultural purposes. Thus the existing use provisions of Sec 56(1)(a) of the Planning Act protected the landholder. Consequently, the controls were

[27].C. & R. Dorrestijn

significantly weakened, as large areas of remaining vegetation would be similarly exempted.

As a contingency in the event of a loss in the High Court, the Government had introduced legislation into Parliament which, when proclaimed immediately after the High Court judgement, suspended the operation of Sec 56(1)(a) and allowed the controls to continue. In passing this, Parliament established a Legislative Council Select Committee to investigate the administrative, legal and compensation issues.

As it was clear that some form of compromise would be required, the Department and HF&S entered into sensitive and confidential negotiations. Three points were settled from the outset of these negotiations:

- Controls on the clearance of native vegetation were necessary
- Areas restricted from clearance needed to be managed
- Disaffected farmers would be most reluctant to manage these areas

It was also agreed that the assessment criteria and exemptions were sound and should be retained. However it was considered desirable to replace the Planning Commission with a body more expert in farm and conservation management.. The most significant point of agreement was that some form of financial assistance was needed and that it should be conditional to landholders entering a Heritage Agreement to manage the land for conservation purposes. On the basis of these agreements, the Native Vegetation Management Bill was introduced to Parliament where it received bi-partisan support.

THE NATIVE VEGETATION MANAGEMENT ACT 1985

The Act was proclaimed on 21 November 1985, a year after the High Court decision, which precipitated action following its swift passage in Parliament. The cost of the implementing the controls would be shared by:

- The landholder – who would retain up to 12.5% of a given property without financial assistance
- Local government which would release the landholder from rates over areas subject to Heritage Agreements
- State Government which would provide financial assistance equivalent to any reduction in the market value of the land resulting from a clearance decision

The Government also accepted responsibility to fence the land and would consider specific requests for management costs such as pest plant and animal control

Financial assistance was not payable where the land was acquired after May 1983, did not comprise agricultural land, comprised a Miscellaneous Lease or licence, or was less than 12.5% of the holding. Financial assistance was based on the difference in value of uncleared land with and without consent to clear.

The Act established a five person Native Vegetation Authority as the decision making body for all applications. Membership covered rural and biological expertise and comprised:

- A person nominated by the UF&S
- A person nominated by the Nature Conservation Society of South Australia
- A person with experience in conservation of native vegetation
- A person with knowledge of agricultural land management

The Chair was the Chairman of the Planning Commission, thereby providing a link with the former controls. The Act also established a larger Native Vegetation Advisory Committee to advise the Minister on policy matters relating to the retention and management of native vegetation and in particular on regulations under the Act.

The Authority advised the Minister on proposed Heritage Agreements and financial assistance.

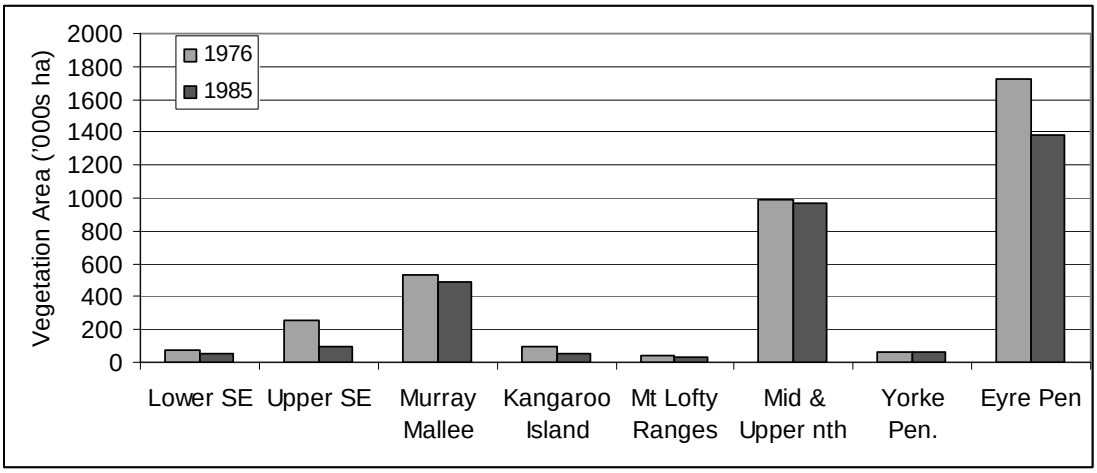
The principles on which applications would be based followed the previous criteria:

- The importance of the vegetation as habitat for wildlife
- The presence of rare and endangered
- The value of the area as a wildlife ‘corridor’ or ‘stepping stone’ linking larger vegetated areas
- The value as a remnant of former vegetation types
- Its amenity value to the district
- Whether clearance would create or contribute to soil erosion or soil salinisation or lead to deterioration in the quality of surface waters
- The value of the vegetation as livestock shade and shelter
- The effect of retention on fire management and fire control

A significant shift in clearance approvals followed under the new Authority. While previously around 80% of the area applied for had been approved, the figure under the Authority was less than 4%. The UF&S was concerned that instead of meeting farmer expectations of clearing half the area they applied for, they were being banned from any clearance. Also the measures were not achieving conservation objectives as few farmers were entering Heritage Agreements because of the 12.5% reserved from financial assistance.

In response, the Government waived the 12.5% requirement where the refusal to clear was based on biodiversity grounds although it still applied where land management hazards existed (e.g. erosion, salinisation). Some properties made non-viable by the controls were acquired by the Government and incorporated into the Parks system or resold with a Heritage Agreement applying to the vegetation.

In addition six conciliators were appointed by the Minister in May 1987 to provide an intermediary between farmers and the Department and to assist farmers with their applications. Each of the conciliators had a long association with agriculture and land management and understood the needs of the farming community.



Source: First Annual Report, Native Vegetation Authority, 1985/86

Figure 4 Changes in area of Native Vegetation (outside Parks) 1976 - 1985

By 1985, the area of native vegetation had shrunk significantly since the review by the Vegetation Clearance Committee in the mid 1970s (Figure 4). Overall, there had been a loss of 640,600 ha or 17% between 1976 and 1985, the largest reductions occurring in the Upper South East (61% reduction), Lower South East (29.5%), Kangaroo Island (48%) and Eyre Peninsula (20%).

Table 1 Decisions under Native Vegetation Management Act 1985

	Application ha	Refused ha	Granted ha	Conditional consent ha	% refused
1985/86	30906	29293	675	938	94.78
1986/87	88361	82523	2354	3484	93.39
1987/88	78917	68148	6638	4187	86.35
1988/89	66514	62010	4504		93.23
1989/90	99454	91967	7487		92.47
1990/91	141411	138452	1195	1764	97.91
1991/92	112472	108743	1619	2008	96.68
1992/93	71023	70285	402	306	98.96
1993/94	12596	11996	520	80	95.24
Total	**701,654**	**663,417**	**25,394**	**12,767**	**94.34%**

Source: Native Vegetation Authority Annual Reports

Note: The 1985/86 report gave no figure for the area applied for. The figure is sum of other columns
From 1989/90 on figures included the area of scattered trees
In 1988/89 and 1989/90, although some applications were granted conditionally, the area was not indicated

During 1988 the Act was amended to remove the nexus between the Chairman of the South Australian Planning Commission and the Presiding Officer of the Native Vegetation Authority. An independent chairman was appointed to the Authority.
In the late 1980s the Authority became concerned about the number of applications involving the removal of mature eucalypts where land use was being changed from grazing to intensive agriculture, in particular vineyards. Concern also grew about applications from the Murray Mallee region where soil salinisation and saline groundwater were being recognised as significant problems.

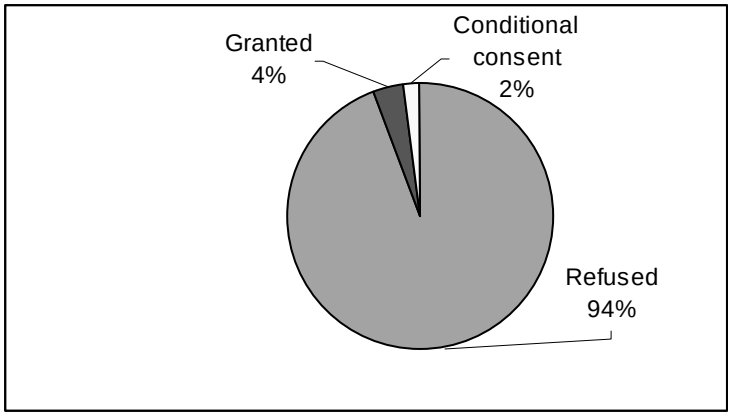


Figure 5 Summary of Decisions under Native Vegetation Management Act 1985

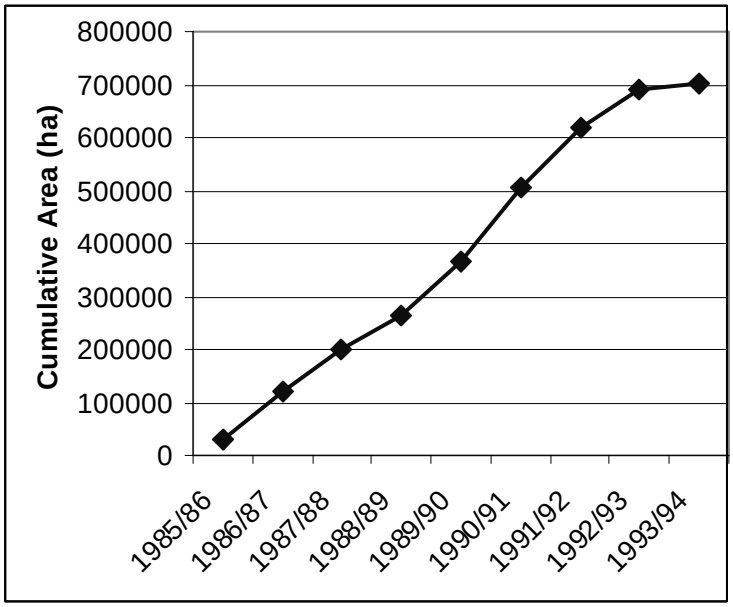


Figure 6 Cumulative Area Subject to Applications to Clear

Table 2 Area and Cost of Heritage Agreements

Year	Total No. HA	Total area HA	Financial assistance ($m)	Total costs ($m)
1985/86	72	7031	0.564	1.094
1986/87	107	10800	1.443	2.145
1987/88	117	13476	2.256	3.259
1988/89	177	121193	4.549	5.634
1989/90	298	237930	9.449	11.197
1990/91	431	337642	9.739	13.454
1991/92	552	470260	10.157	14.53
1992/93	695	520540	10.715	14.209
1993/94	764	550000	7.367	7.542
Total			56.239	73.064

Source: Native Vegetation Authority Annual Reports

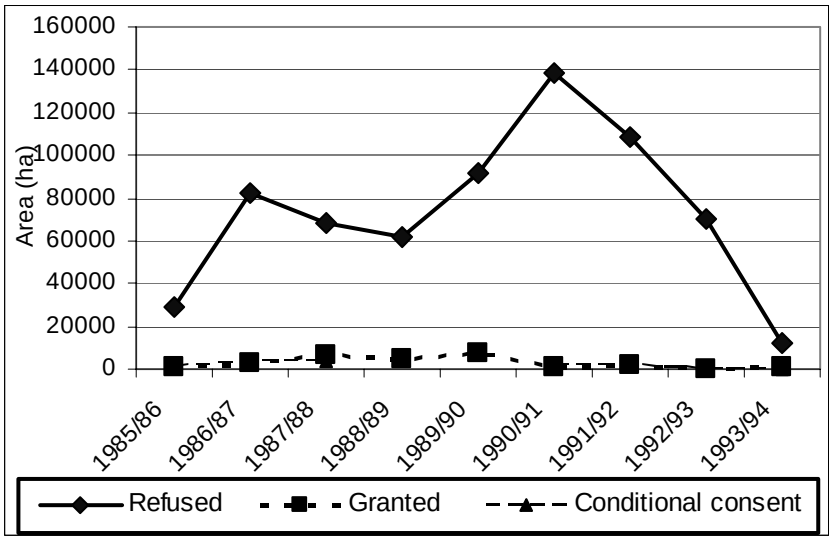


Figure 7 Annual Areas subject to 1985 Act

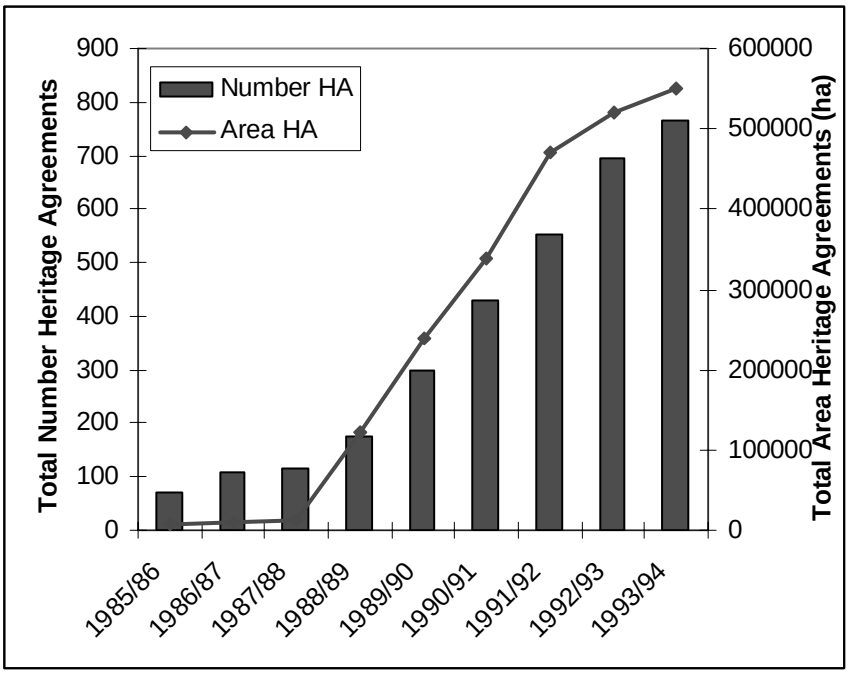


Figure 8 Number & Cumulative Area of Heritage Agreements (ha)

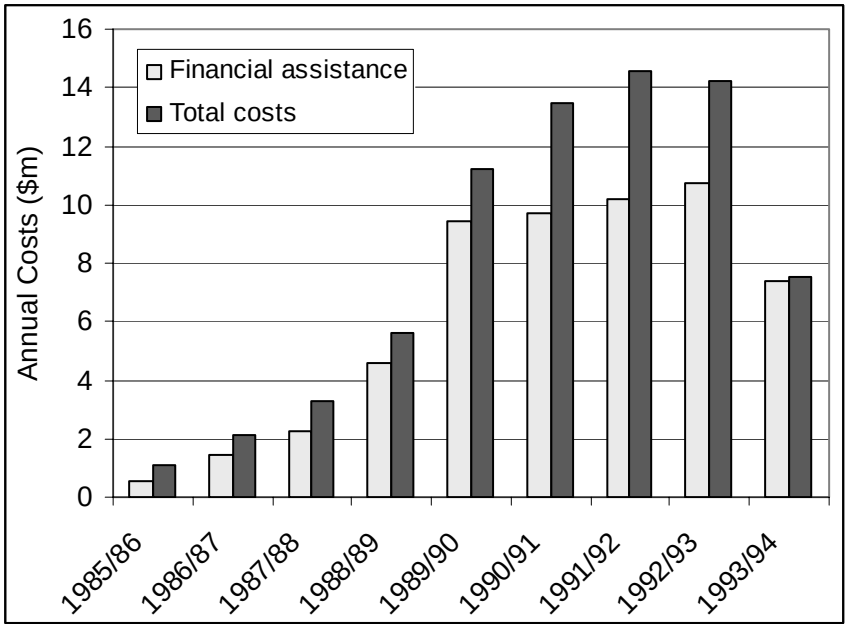


Figure 9 Annual Costs of Financial Assistance & Total Costs

The areas subject to the Native Vegetation Management Act 1985 are summarised by Tables 1 and 2 and Figures 5, 6, 7, 8 and 9. The total cost was $73 million, of which financial assistance payments totaled $56 m. A total area of 550,000 ha of native vegetation was retained under 764 Heritage Agreements. Thus each hectare of native vegetation protection under a Heritage Agreement cost $102.25 of financial assistance or a total cost of $132.8 m.

The 560,000 ha represents 20% of the remnant vegetation in the agricultural region and about 3.7% of the agricultural region itself. Through this scheme, South Australia has the largest area of private land under long term conservation of any State or Territory in Australia.

Although the Act was replaced in 1991 by the Native Vegetation Act, applications received under the former Act continued to be assessed and the Native Vegetation Authority's final annual report covered the 1993/94 year.

THE NATIVE VEGETATION ACT 1991

The Native Vegetation Management Act 1985 was repealed on 18 April 1991 and the Native Vegetation Act 1991 proclaimed. The Act provided that no new applications for a Heritage Agreement with financial assistance could be lodged after 12 February 1991. Applicants must make a claim for payment of financial assistance within two years of the Authority's decision on their application. Any payment for reductions in the market value of land is now a discretionary payment as recommended by the Native Vegetation Council to the Minister for Environment and Heritage.

The restriction in financial assistance was justified on the grounds that landholders in the agricultural zone had been provided with sufficient time to seek payment for any loss in the market value of their properties due to clearance refusals. The validity of the decision to reduce the level for assistance offered was also supported by the fact

that some landholders had started to apply for clearance on areas that they would not normally have cleared in order to receive payments offered upon entering into a Heritage Agreement.

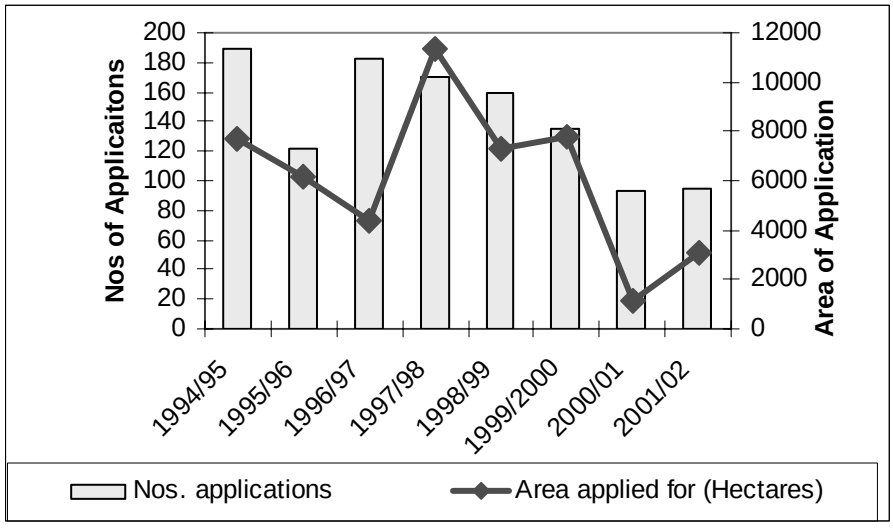
The new Act provided incentives and assistance to landowners to protect and to manage native vegetation for wildlife. It also controlled the clearance of native vegetation including scattered trees. The Native Vegetation Council comprising seven people with expertise in farming and/or vegetation management replaced the Native Vegetation Authority.

The Native Vegetation Council may approve clearance of native vegetation if the clearance is not significantly at variance with the Principles of Clearance. However, in such circumstances, the Council has used its discretion under the Act to secure a 'net biodiversity gain' by requiring, as a condition of consent, that the landholder must set-aside an area for biodiversity conservation purposes. This may result from placing an area of intact native vegetation under a heritage agreement, de-stocking an area of degraded vegetation and encouraging its regeneration, or revegetating a cleared area.

Between 1994/95 and 2001/02, 1146 applications covering nearly 50,000 ha were assessed (Figure 10). Of this 16,874 ha (35.4% of total area) was approved for clearance and 21,394 ha (43.8%) of scattered trees were allowed to be cleared.

A total of 4772 ha was placed under Heritage Agreements which provided management assistance but no compensation. To offset the areas approved for clearance, 5533 ha was required to be regenerated and a further 3186 ha replanted with trees and shrubs. Figure 11 summarises the treatment of applications.

The Native Vegetation Council (NVC) may approve clearance of native vegetation provided it does not conflict with the conservation values as outlined in the clearance principles. The NVC does not permit broad-scale clearance of native vegetation. For example large healthy trees and small patches of intact bushland are rarely approved for clearance.



Source: Native Vegetation Council Annual Reports

Figure 10 Applications & Areas under Native Vegetation Act 1991

Areas approved for clearance are generally not considered to be in conflict with the conservation values as outlined in the clearance principles; i.e. the area is considered to be highly degraded or the scattered trees are considered to have a low conservation value. Comment is sought from local Soil Boards and District Councils.

If consent is given to clear, a condition is that a set aside area is to be established. This area works on the formula of starting from Area cleared to Area for set aside of a ratio of 1:10. As the area given consent to clear contains less native plant species the ratio will also become smaller i.e. 1:5; e.g. if a degraded area (low species diversity) of 1 hectare is given consent to clear the set aside area would be approximately 5 hectares.

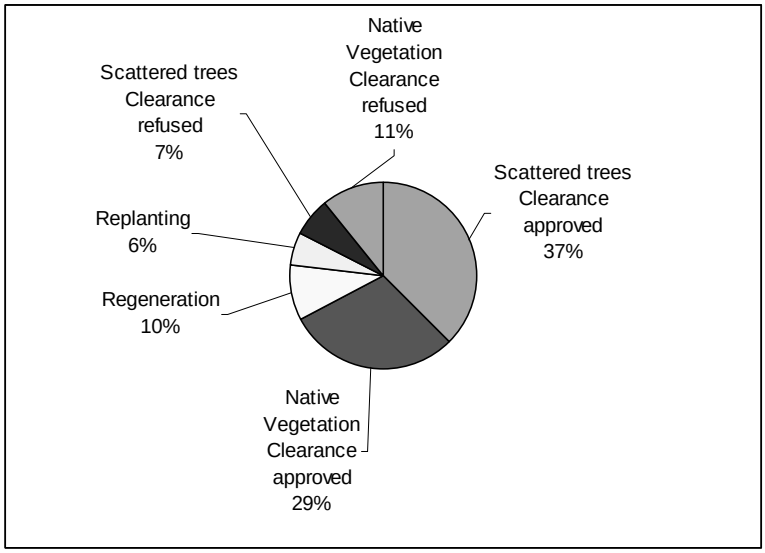
For scattered trees a number of attributes are collected for each tree, this is then entered into a spreadsheet. Using the spreadsheet (Wildlife Habitat Table) a score for each tree is calculated and also a minimum set aside area based upon the score of that tree.

$$\text{Total score} = \sum \text{weighted values (height, health, hollows, density, proximity)}^3/55.5$$

The minimum area required as set aside in hectares is then determined by dividing the total tree score by 150. For example a *Eucalyptus camaldulensis var. camaldulensis* (River Red Gum) with a height of 14m, no hollows, 5% dieback and growing in a low density scored a total of 26.7 points with 0.178 hectares being the calculated minimal set aside if the tree was approved for clearance by the NVC.

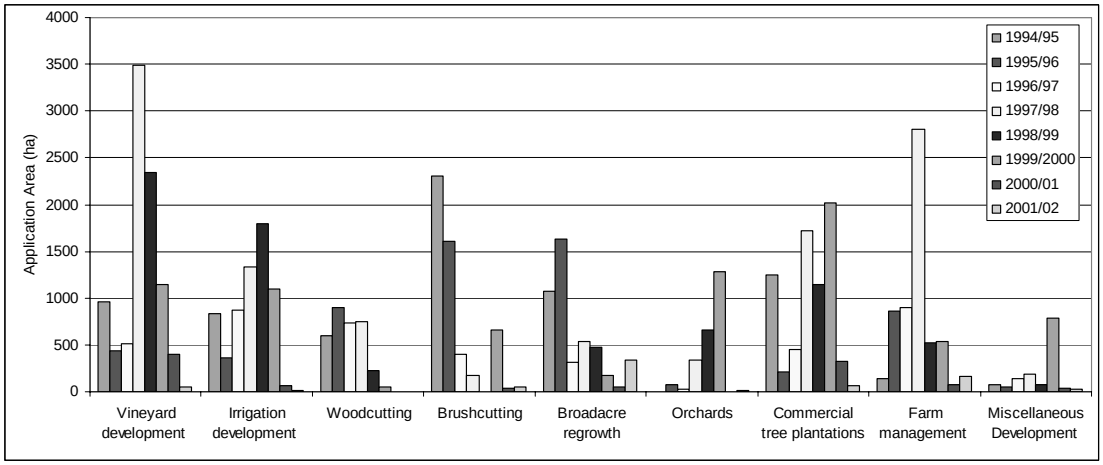
The plant species used for revegetation areas must satisfy the following criteria:

- All seed or plants used for replanting the revegetation land must be from seed collected from naturally occurring areas of native vegetation on the property or from areas of similar soil type, slope and aspect as close as practicable to the revegetation land.
- The use of any seed collected from sites more than 10 km from the revegetation land requires the written consent of the Native Vegetation Council.



Note: the areas approved covered regenerated & degraded vegetation

Figure 11 Treatment of Applications under Native Vegetation Act 1991



Note: Omits minor uses: emu farming 121.5 ha, controlled burning 2403 ha, fire protection 502 ha, & roadside vegetation 136 ha.

Figure 12 Purpose of Clearance Applications by Area (ha), 1994/95 – 2001/02

The total areas of application for each purpose is summarised by Figure 12. The four major purposes, vineyard development, irrigation development, farm management and commercial tree plantations, accounted for 63% of all applications (Figure 13).

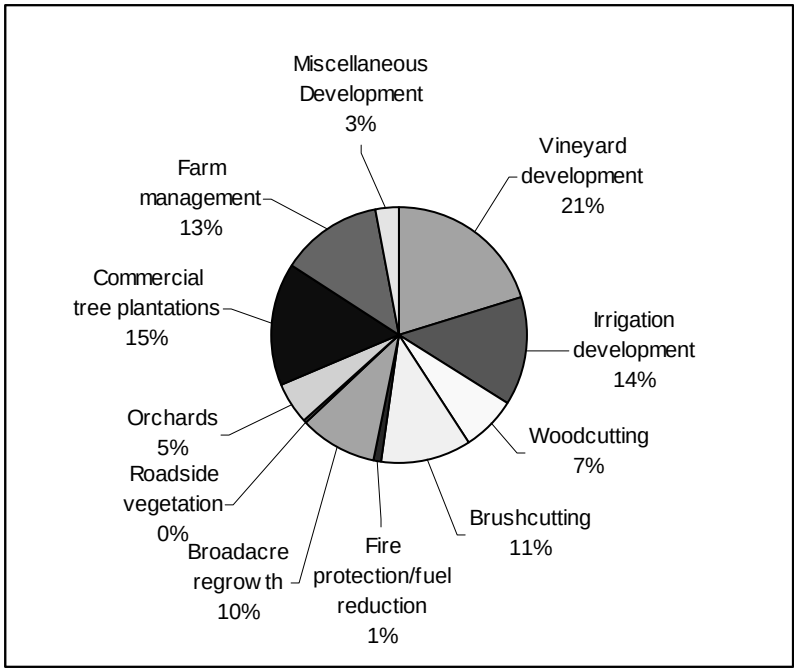


Figure 13 Purposes of Clearance Applications 1994/95 – 2001/02

THE NATIVE VEGETATION (MISCELLANEOUS) AMENDMENT ACT 2002

This Act formally ended broadacre clearance in the State. The Act reads:

> "…the Council cannot give its consent to the clearance of native vegetation … if the vegetation comprises or forms part of a stratum of native vegetation that is substantially intact." (S27)

The Act provides that any clearance approval would be conditional on a net environmental gain. The Act enables the applicant to seek to pay money into the Native Vegetation Fund to compensate for the fact that there will not be a significant environmental benefit on the property where the clearance is proposed to take place. The Native Vegetation Council may attach a condition requiring the applicant to make a payment into the Fund of an amount that the Council considers to be sufficient to achieve an environmental benefit by establishing and maintaining native vegetation on other land in the region. The money paid into the Fund for this purpose must be used by the Council to establish or regenerate native vegetation within the region of the cleared land, having regard to the Regional Biodiversity Plan or Plans approved by the Minister.

The Act significantly encourages revegetation. Significant support exists in the community for the reestablishment of native vegetation in over-cleared areas but a difficulty has been that such vegetation has sometimes been cleared by subsequent owners. To safeguard against this, the Act provides that landholders may voluntarily apply for the Act to apply to revegetated areas, which if approved by the Native Vegetation Council, will be noted against the title to the land to ensure that future owners are aware of the provision. In addition, money paid into the Native Vegetation Fund resulting from a penalty or exemplary damages in relation to offences against this Act

must, as far as practicable, be used to establish native vegetation on land in the vicinity of the cleared land.

The Act ensures that people proposing to clear land finance the collection of data on which the Native Vegetation Council needs to determine an application. This is a user pays provision. There is now provision to allow the public an opportunity to comment on clearance applications. The Act increases the penalty for unauthorised clearance to $100,000 and improves the enforcement capability. In addition, the Act provides for a judicial appeals process through the Environment, Development and Resources Court, to replace the existing process for landholders seeking conciliation in relation to Native Vegetation Council decisions.

Appendix 3
Economic Analysis of the Salt to Success Project

The economic analysis was undertaken by AACM International as a consultancy for Primary Industries and Resources South Australia. This appendix summarises the study, which were originally described in a 15-page report plus spreadsheets.

Description of study region and proposed works

The Salt to Success project incorporates the components summarised in Table 1.

Table 1 Components of Salt to Success Project

Component	Description	Benefits
Fodder shrubs	Plant tagasaste and saltbush	Increases feed availability; high water use plants which reduces recharge to aquifer and controls salinity
Agroforestry	Block plantings of pines and eucalypts	Harvest over 35 yr rotation; windbreaks – increased lambing, stock growth, reduced off shears mortality, higher carrying capacity
Revegetation	Rows of revegetation	Windbreaks – see above
Remnant vegetation	Protect vegetation	Habitat & biodiversity conservation
Clay spreading	Added to non wetting sands	Increases capacity of soil to retain water and nutrients
Perennial pasture	Establish on low lying land	Increase grazing capacities

Benefits and Costs

Table 2 Items Included Under Benefits & Costs

Item	Landholder	Local community	Wider community
BENEFITS			
Existing production	Yes	Yes	
Fodder shrubs planting	Yes		
Agroforestry - products from thinnings and windbreak	Yes	Yes	
Heritage value of native vegetation			Yes
Clay spreading – improved carrying capacity	Yes		
Perennial pasture	Yes		
Reduced dryland salinity – increase plant water use, lower recharge		Yes	
Soil conservation – for future generations			Yes
Reduced waterlogging –from increased plant water use and soil moisture retention rates		Yes	
Reduced infrastructure maintenance – from reduced waterlogging & dryland salinity		Yes	
Unquantified benefits – protection of native vegetation, wetlands, biodiversity from reduced dryland salinity			Yes
COSTS			
Establishment – materials & labour			
Annual maintenance – labour			
Overheads			

Estimates of the quantified benefits from each of these were made; eg windbreaks would reduce mortality of lambs from 12.5% to 6.25%; tagasaste would improve carrying capacity by 250% pa; trees planted for agroforestry thinned at years 12, 18 and 27 (sold as posts & sawlogs) and final logging at year 35.

The value of native revegetation was based on the price paid for properties with significant environmental attributes being 150% of opportunity cost of the land (i.e. the gross margin of grazing on perennial pasture). This averaged $54/ha so the heritage value of the land equates to $81/ha. The value would start at $0 and rise to maximum value at 10 years maturity. The value of remnant vegetation was calculated similarly however the annual value remains constant equal to the value of existing production in the year prior to protection. Without the salinity works, the value would decline due to the degrading effects of dryland salinity.

Table 3 Quantified Benefits and Costs ($'000s)

	PV benefits			PV Costs			
Items	**On farm**	**Off-site**	**Total**		**NPV**	**BCR**	**IRR**
Fodder shrubs	859	51	910	523	386	1.74	25.5%
Agroforestry	1057	103	1160	909	251	1.28	30.7%
Revegetation	948	932	1881	1209	672	1.56	13.4%
Remnant vegetation	14	284	298	204	94	1.46	13.4%
Clay spreading	12580	1431	14011	6312	7700	2.22	66.0%
Perennial pasture	2653	364	3017	1974	1043	1.53	14.2%
	18111	3166	21277	11131	10146	1.91	32.3%

The overall project and all six components deliver positive NPV's and BCR's greater than 1, implying that they will deliver net benefits to society as a whole. IRR's compare well with current real interest rates from conventional market investments.

Cost sharing framework

The split of benefits between the three stakeholders – landholders, local community and wider community are shown in Table 4 for several of the components.

Table 4 Cost Sharing Benefits ($'000s)

(a) Native Revegetation

Items	**PV Benefits**	**Stakeholder**		
		On farm	**Local**	**Wider**
On farm works	948	948		
Specific off-site benefits	541		237	304
Share of generic off-site benefits	392	0	314	78
Total benefits	1881	948	551	382
Share of Benefits		50.4%	29.3%	20.3%

(b) Remnant Vegetation

Items	**PV Benefits**	**Stakeholder**		
		On farm	**Local**	**Wider**
On farm works	14	14		
Specific off-site benefits	301			201
Share of generic off-site benefits	83	0	47	36
Total benefits	298	14	47	237
Share of Benefits		4.8%	15.8%	79.4%

(c) Perennial Pasture

Items	PV Benefits	Stakeholder		
		On farm	Local	Wider
On farm works	2653	2653		
Share of generic off-site benefits	364	0	321	43
Total benefits	3017	2653	321	43
Share of Benefits		87.9%	10.7%	1.4%

(d) Total Project Cost Sharing

Items	PV Benefits	Stakeholder		
		On farm	Local	Wider
On farm works	18111	18111		
Specific off-site benefits	767		767	
Share of generic off-site benefits	2399	0	1911	488
Total benefits	21277	18111	2677	488
Share of Benefits		85.1%	12.6%	2.3%

The benefits of native revegetation and particularly remnant vegetation accrue substantially to the wider community rather than the landholder, whereas for treatments such as perennial pastures (as well as for fodder shrubs, agroforestry and clay spreading) the benefits accrue largely to the landholder. For the project as a whole the cost-sharing split of 85% landholder, 13% local community and 2% wider community applies.

A sensitivity analysis was applied to the figures, varying the discount rate from 8% to 5% and varying the gross margins indicate that the economic analysis and cost sharing results are reasonably insensitive to these changes.