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A REVOLVING FUND FOR BIODIVERSITY CONSERVATION IN AUSTRALIA
Australian Case Study on Biodiversity Incentive Measures

by Marc Carter

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FOREWORD

This paper is one of a series of 22 case studies that describe practical experiences in OECD Member countries with the use of incentive measures for the conservation of biodiversity and the sustainable use of its components. These case studies were submitted by OECD Member countries to the OECD Working Group on Economic Aspects of Biodiversity as a contribution to the OECD study of the design and implementation of appropriate incentive measures for biodiversity conservation and sustainable use. In order to ensure maximum comparability between the case studies, all were developed under the common methodology described in “Incentive Measures to Promote the Conservation and the Sustainable Use of Biodiversity: Framework for Case Studies” [OECD/GD(97)125].

The practical experiences described in the 22 case studies were used as the basis for the policy advice developed in the *Handbook of Incentive Measures for Biodiversity: Design and Implementation* (OECD, 1999). This *Handbook* combines the lessons learned through the various experiences described in the case studies – covering a wide range of ecosystems, economic pressures on biodiversity, and utilising various incentive measures – with sound economic theory to develop a practical, step-by-step guide for policy-makers on the design and implementation of successful incentive measures for the conservation and sustainable use of biodiversity.

This paper was provided by the Australian Government and was written Marc Carter of the Environmental Economics Unit, Environment Australia. It is released as an unclassified document under the responsibility of the Secretary-General of the OECD with the aim of bringing information on this subject to the attention of a wider audience.

This study, and the other 21 case studies submitted by Member countries, are available on the world wide web at <http://www.oecd.org/env>.

TABLE OF CONTENTS

Executive summary	6
1. General description.....	7
1.1 Description of the ecosystem.....	7
1.2 Description of the main impacts.....	7
1.3 Identification of the incentive measure	8
1.4 Identification of economic sectors targeted by incentive measure.....	8
2. Identification of causes and sources of pressures.....	9
2.1 Identification of sectoral activities and resulting pressures through conversion of land use.....	9
2.2 Identification of underlying causes of biodiversity loss.....	10
2.3 Identification of adverse incentives.....	11
Direct and indirect subsidies.....	11
Tax incentives.....	11
Infrastructure provision	12
3. Impacts on ecosystems.....	13
Coastal grassy woodlands.....	13
Box ironbarks.....	13
Montane dry woodlands	14
Plains grasslands.....	14
Plains grassy woodlands	15
Herb-rich woodlands.....	15
Sub-alpine grassy woodlands.....	16
Montane grassy woodlands.....	16
Riverine grassy woodlands	16
Mallee	17
Mallee heaths	17
Mallee woodlands.....	17
3.1 Impacts on ecosystems in general.....	18
4. Impacts on economy and welfare	20
5. Implementation of incentive measure and context	21
5.1 Identification of incentive measure	21
5.2 Process of implementation and distributional effects	22
5.3 The role of information and uncertainty in the implementation process	23
5.4 Framework and context of implementation.....	23
6. Policy relevant conclusions	26
6.1 Lessons learned	26
6.2 Transferability of experience.....	27
References.....	28

A REVOLVING FUND FOR BIODIVERSITY CONSERVATION IN AUSTRALIA

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EXECUTIVE SUMMARY

This case study examines the role played by the Revolving Fund for Nature, administered by the Trust for Nature (Victoria), in the protection of lands of conservation significance, particularly those with remnant or heritage vegetation. The Revolving Fund purchases lands with conservation significance, places a covenant on them specifying the allowable and prohibited activities that can be undertaken on them, thus ensuring the future maintenance of the identified conservation values, and resells the lands to a sympathetic private owner whose use of the lands will be bound by the covenant. The regained capital is then used to finance the purchase of further lands, which again have a covenant placed on them before resale to sympathetic purchasers and the process is repeated again. The success of the Fund relies largely on its ability to recapture all or most of the original capital purchase cost for the lands, and to pass on responsibility for land management to owners who are committed to a conservation ethic. The fund is unique in that the Trust for Nature was formed through government legislation and is provided with some public funding but also attracts funds from non-government sources.

Ecosystems studied: arable lands, grasslands, forests

Incentive measures used: environmental fund, permits, covenants, removal of adverse tax incentives

Main lessons learned: A balance needs to be set between the amount of funds directed towards purchasing properties at any point in time and the amount kept in reserve funds; human habitation must be possible on the sites for purchase; it was found that the Fund has positive indirect effects in terms of promoting conservation ideals and facilitating land exchanges by government conservation agencies.

1. **Acknowledgments:** The author would like to thank Brian Whelan and Barry Traill of Trust for Nature (Victoria) for their valuable support in the preparation of the paper. This paper does not necessarily represent the views of Environment Australia or those of the Australian Government.

1. GENERAL DESCRIPTION

1.1 Description of the ecosystem

Australia's flora and fauna are described as 'megadiverse' to indicate its exceptional variety and uniqueness. In addition, its diversity is quite distinct with the vast majority of species not being found in any other part of the planet. The ecosystems targeted by the incentive measure discussed in this paper can be collectively described as remnant or heritage vegetation and range from native grasslands through to old growth forests. There are six specific ecosystem types included in the scope of the incentive measure and these are as follows:

- Northern Grasslands;
- Buloke Communities;
- Basalt Grasslands;
- Box Ironbark Forests;
- Mallee-Heavy Soils; and
- Grassy Woodlands.

These ecosystems range in geographic location from coastal plains to mountainous regions as well as ranging from being in close proximity to large urban areas to isolated sites.

1.2 Description of the main impacts

The predominant pressures on Australia's biodiversity are similar to those experienced by most other countries. These pressures include both direct and indirect effects from increased human population and activity, including lifestyle changes and expectations. The general requirements of the population for food, water, housing, energy, transportation, recreation and other aspects create these pressures on our biodiversity (DEST, 1996a). The pressures can be particularly observed in rural areas where agricultural activities have encroached on grasslands and woodlands to the point where, in some areas, only remnants of these vegetation types remain. The incentive measure discussed in this paper attempts to redress some of these pressures through minimising the long term impacts resulting from pressures of urban sprawl and conversion of areas to agricultural forms of land use.

1.3 Identification of the incentive measure

The Revolving Fund administered by the Trust For Nature (Victoria) involves the setting aside of funds for the purchase of land with conservation significance that can have a covenant placed on it to ensure future maintenance of those conservation values identified, and is also potentially attractive to private ownership following disposal. The fund is unique and differs from similar funds operated by the US Nature Conservancy and the UK Royal Society for the Protection of Birds in that the Trust for Nature was formed through government legislation and is provided with some public funding but also attracts funds from non-government sources.

1.4 Identification of economic sectors targeted by incentive measure

The Revolving Fund is a broad incentive measure that targets no individual economic sector but rather that segment of the community that seeks to maintain areas of high conservation through private ownership of land. In addition, the Trust seeks funding from a variety of sources to aid its programme of land purchase, including both public and private sector organisations and individuals.

2. IDENTIFICATION OF CAUSES AND SOURCES OF PRESSURES

2.1 Identification of sectoral activities and resulting pressures through conversion of land use

There has been consistent agreement that the conservation of biodiversity requires an understanding of both the fundamental pressures impacting on species and habitat loss as well as the underlying causes (OECD, 1996; Young, 1997). Land conversion in Australia remains one of the primary factors in the loss of habitat necessary for biodiversity conservation. Almost 70 per cent of the Australian land mass is controlled by private landholders with vegetation clearance on freehold land a major concern. Controls on the clearance of native vegetation vary between the States of Australia. In the State of Victoria, where the Revolving Fund operates, clearing of blocks of native vegetation larger than 0.4 hectares is subject to approval. No provision for compensation exists but heritage agreements can provide some financial assistance (DEST, 1996a).

The pattern of human settlement in Australia has also contributed to the pressure on ecosystems. Australia is one of the most highly urbanised countries in the world and coupled with an extensive land mass has resulted in large sprawling urban areas. Urban land use planning has often not integrated biodiversity values when assessing new areas for urban expansion. However, agricultural land use has been the primary factor in biodiversity loss since European settlement.

Harvesting of native species has also caused pressure on biodiversity. The rights provided to timber harvesting industries, for example, has resulted in further change to land with conservation values through even-aged regrowth. However, increased market related mechanisms for timber resources have somewhat reduced this pressure. Nonetheless, pressure remains in many areas for native vegetation to be cleared in order to establish plantation timber operations.

Mining developments present a pressure on certain areas of the continent where biodiversity can be important. However, all mining activities now require environmental impact statements as well as rehabilitation plans to be implemented following completion of the mining phase. In addition, performance bonds are in place in various States, including Victoria, to ensure rehabilitation occurs should a company be unable to meet original requirements.

Other fundamental causes of biodiversity loss in Australia have been identified as:

- population policy, and the carrying capacity of the continent;
- priority for economic development, which may result in further degradation of the environment;
- income inequality, and the short-term necessity for disadvantaged individuals to maintain living standards (Young, 1996).

Overall, all the pressures identified above impact either individually or collectively to some degree on the sites identified as being appropriate for allocating Revolving Fund expenditure. As the Fund is available across the entire State of Victoria there is the opportunity for identification and amelioration of these pressures through private conservation.

2.2 Identification of underlying causes of biodiversity loss

There are several underlying causes for the loss of biodiversity in Australia in general and in the ecosystems identified in this case in Victoria in particular. These include: market failure; property right failure; institutional failure and information failure.

The failure of markets to incorporate biodiversity values occurs for a number of reasons. Often it is difficult to initially attach a value to the externalities associated with biodiversity loss through land clearance or conversion. Subsequently, even should some valuation information be available, there are various impediments to internalising these externalities. Both local and global market failure occur in relation to biodiversity loss from land conversion. Local markets have generally placed a higher value on agricultural or forestry production due to the lack of specific markets for the habitat at issue. In addition, global markets while incorporating some Australian biodiversity values through, for example ecotourism, generally do not accrue to private landholders but to publicly owned and managed National Parks and reserves.

There is also a significant link between global pressures and local impacts arising from market failure. This has arisen through trade. Australian farmers have been increasingly placed under pressure to compete against other sources of produce and in the process have diminished assets to the point that funds that should be directed to farm conservation have been reallocated to ensuring economic survival.

As described above Australia is regarded as a 'megadiverse' nation which may partially explain the lack of full information on the nation's biodiversity. As in other countries, Australia has only described a small proportion of its species with lower plant forms little explored and details on invertebrates and micro-organisms being relatively unknown (DEST, 1996a). An added dimension to the general lack of knowledge of species and habitats is the lack of understanding of ecological processes and how they contribute to the processes of the wider community. The National Strategy for the Conservation of Australia's Biological Diversity (DEST, 1996b) has recognised this and has recommended that

'Full and effective implementation of many of the actions identified in this Strategy requires considerable improvement in our knowledge and understanding of Australia's biological diversity in terrestrial, marine and other aquatic environments. Accordingly there is a need for a significant increase in research into biological diversity at the genetic, species and ecosystem levels.'

A direct economic dimension also underpins the objective of improving our knowledge of biodiversity. In addition to undertaking research to understand biodiversity processes to assist recovery there is a commercial opportunity for certain species that provide industrial uses. These potential uses range from improving crops through genetic modification to aiding biological control of introduced species.

Institutional failure has often compounded information failure to exert pressure on biodiversity resources. Australia until recently provided the availability of tax deductions for land clearance. This

effectively provided a subsidy to private and leasehold landowners to clear vegetation for alternative production processes. However, this incentive has now been removed with the exception that farmers using their own equipment and employees to clear vegetation can continue to make tax deduction claims for this activity. The lack of integrated resource policy at both the Commonwealth and State levels of government has also contributed to institutional failure. The completion of the Ecologically Sustainable Development Strategy and the establishment of some innovative institutions, such as the Murray-Darling Basin Commission, has commenced a process of addressing these past problems.

The National Strategy for Ecologically Sustainable Development has developed a number of guiding principles to achieve the objective of protecting biological diversity and to maintain essential ecological processes and life-support systems. These principles include:

- decision making processes should effectively integrate both long and short term economic, environmental, social and equity considerations; and
- cost effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms (Commonwealth of Australia, 1992).

As a result of these processes there has been a significant increase in activity in the area of designing and applying incentive mechanisms for achieving environmental objectives. A recent survey of economic instruments (James, 1997) has found that there has been much greater support for the application of such mechanisms for achieving environmental objectives.

However, even greater uptake of these incentive mechanisms is required as current practices in many sectors of the economy related to, or based on, biodiversity resources remain unsustainable. This is the case with the ecosystems examined in this case study. Forestry, grazing and other agricultural activities have severely impacted on the grasslands and woodlands of Victoria.

2.3 Identification of adverse incentives

Direct and indirect subsidies

As discussed briefly above there have been various subsidies that have resulted in the loss of biodiversity in Australia in general and mechanisms associated with the particular ecosystems in this case study. Subsidies arise from taxation issues at the Commonwealth level, through charges and permits at the State level to land use planning and infrastructure issues at the Local Government level.

Broadly, subsidies have impacted through two categories: financial subsidies and environmental subsidies. Financial subsidies occur where there is non-recovery of public financial management costs, favourable taxation treatment, direct contributions and lower than usual rates of return. Environmental subsidies include the non-payment of environmental disruption costs by the entities involved (DEST 1996c).

Tax incentives

The primary incentive for the clearance of habitat was, until recently, the allowance of tax deductions available to agricultural producers under Section 75 (a) of the *Income Tax Assessment Act*. This allowance enabled the full cost of land clearance to be deducted from other income during the year in

which clearing occurred and enabled significant expansion of the agricultural sector. This has resulted in both creating the conditions for large-scale land degradation and simultaneously reduced biodiversity in these cleared areas.

The initial effect of this tax deduction was that primary producers were faced with lower costs of clearing and an incentive was created to reduce and replace vegetation cover with arable cropping or grazing pastures. Many longer term effects are only now becoming present in these areas such as salt scalding, erosion etc.

Infrastructure provision

The continued expansion of urban areas has compounded the loss of biodiversity in some of the case study areas. Australia's population growth continues to be above the OECD average. This in turn has led to pressure particularly on semi-rural areas on the urban fringe where continued infrastructure provision in the form of roads, sewage and drainage works, water supply facilities etc. has resulted in further clearance of native vegetation.

3. IMPACTS ON ECOSYSTEMS

Since European settlement there has been significant loss of many vegetation types in Victoria. In some cases up to 95 per cent of a broad vegetation type has been cleared for other purposes. The following provides a detailed description of the broad vegetation types that cover the six ecosystem types targeted by the Trust for conservation.

Coastal grassy woodlands

Coastal Grassy Woodland is a broad vegetation type which occurs on damp loams that are derived from the sands of dunes and sand sheets that are leached of calcium and iron, which have developed moderate levels of organic matter over time. The rainfall range is <600-700mm per annum. These are usually restricted to near-coastal locations, although outliers can occur further inland where they are generally minor elements of other broad vegetation types. The vegetation has a woodland formation generally of Coast Manna Gum *Eucalyptus pryoriana*, Coast Banksia *Banksia integrifolia*, Drooping Sheoke *Allocasuarina verticillata* and Black Sheoke *A. littoralis*, with few understorey shrubs of Black Wattle *Acacia mearnsii* and a variety of grasses (Wallaby Grasses *Danthonia* spp., Tussock Grasses *Poa* spp.), Bracken *Pteridium esculentum*, sedges (Spiney Mat-rush *Lomandra longifolia* var. *longifolia*, Club-rush *Isolepis nodosa*) and herbs (Pennyworts *Hydrocotyl* spp., Stone-crops *Crassula* spp., Starworts *Stellaria* spp. and various orchids) in the ground layer.

The most usual ecological vegetation class represented is Coastal Grassy Woodland, with smaller inliers within the broad vegetation type of Coast Banksia Woodland on soils of lower organic content with higher calcium and iron levels, Coastal Lagoon Wetlands, Saltmarshes, Heathy Woodlands and occasionally Plains Grassy Woodland where sand sheets overlay fertile plains.

Box ironbarks

The Box Ironbark broad vegetation types occur on the gentle slopes and hills with sedimentary geology north of the Great Divide, under a rainfall regime of 400-600mm. The clayey soils are usually low in organic matter, hydrophobic, and of moderate to low fertility. The broad vegetation type is dominated by trees (Red-Ironbark *Eucalyptus tricarpa*, Mugga *E. sideroxylon*, Grey Box *E. microcarpa* of moderate height and a shrubby understorey of Wattles *Acacia* spp. Guinea-flowers *Hibbertia* spp., Composites *Cassinia* spp and *Ozothamnus* spp., Parrot Peas *Dillwynia* spp. and Bitter-peas *Davesia* spp. with few grass (Wallaby Grasses *Danthonia*\ *Chionocloa* spp.) and herbs.

Box Ironbark Forest is the dominant ecological vegetation class of this broad vegetation type with smaller areas of Metamorphic Slopes Shrubby Woodland on poorer soils, Heathy Dry Forest under higher rainfall regimes, Grassy Dry Forest on slightly better soils of steeper country and Low Rises Grassy

Woodland on low relief sedimentary hills at the foot of the broad vegetation type where it meets the Northern Plains.

Montane dry woodlands

Montane Dry Woodland broad vegetation types develop at elevations of 1 000-1 200m in areas with rainfall of 1 000-1 400mm per annum and where fogs are common. Snow falls are regular events every winter, although the snow cover generally only last for several weeks at a time. Soils are generally skeletal and moderate to low in fertility clays to sandy clay loams. Aspect plays a significant part in the distribution of the broad vegetation type at the higher end of the rainfall gradient where it becomes restricted to northern or western slopes. The overstorey is dominated by gum-barked species such as Mountain Gum *Eucalyptus dalrympleana*, Candlebark *E. rubida*, with smaller amounts of Snow Gum *E. pauciflora* and stunted Alpine Ash *E. delegatensis* that in undisturbed cases produces a woodland (frequent burning can produce a forest structure). The understorey is dominated by sclerophyllous shrubs (Prickly Bush-pea *Pultanea juniperina*, Gorse Bitter-pea *Daviesia ulicifolia*, Rough Coprosma *Coprosma hirtella*, and coarse grasses (Tussock\snow grasses such as *Poa hothamensis*, Red-anther Wallaby-grass *Chionocloa pallida*, Common Wheat Grass *Elymus scabrus*). Heathy species (Grevilleas *Grevillea* spp., Mountain Beard Heath *Leucopogon gelidus*, and Hooker's Beard Heath *Leucopogon hookeri*) may also be present but herbs are generally low in numbers and cover.

The most usual ecological vegetation class in this broad vegetation type is Montane Dry Woodland, with smaller areas of Montane Damp Forest on more sheltered aspects. Cold air drainage may produce Wet Heaths along the drainage lines and small outcrops of fertile geologies (particularly basalt and granodiorite) can give rise to Montane Grassy Woodlands. At higher elevations this broad vegetation type merges with Sub-alpine Woodland broad vegetation types whilst at lower elevations it abuts Dry Foothill Forest broad vegetation types.

Plains grasslands

Plains Grasslands broad vegetation types occupy fertile plains under low rainfall regimes of 300-700mm per annum. The parent geologies of the plains varies with the Western Volcanic Plains being basalts, the Sale Plains being outwash clays and the Northern Plains being riverine silts and clays. These broad vegetation types are characterised by a very low density or complete absence of trees and shrubs, although the tree-form of Silver Banksia *Banksia marginata* may be present as may Drooping Sheoke *Allocasuarina verticillata*. The ground layer is dominated by perennial grasses (Kangaroo Grass *Themeda triandra*, Wallaby Grasses *Danthonia* spp., Spear grasses such as Rough Spear Grass *Stipa scabra* herbs (particularly composites) *Brachyscome* spp., Blue Devil *Eryngium ovinum*, Common Everlasting *Chrysocephalum apiculatum* and perennial geophytes such as bulbines *Bulbine* spp. Annuals may be common in areas that are regularly grazed or burnt.

This broad vegetation type is characterised by extensive tracts of land with this vegetation. The dominant ecological vegetation class represented in this broad vegetation type varies according to biogeographic zone and parent geology: on the Western Volcanic Plains heavy clay basalt soils the ecological vegetation class is Western Plains Grassland, on the Sale Plains outwash clays the dominant ecological vegetation class is Gippsland Plains Grassland and on the Northern Plains with its riverine silts and clays, the dominant ecological vegetation class is Northern Plains Grassland. Within this broad vegetation type there are smaller areas of Wetlands and Grassy Woodlands.

Plains grassy woodlands

Plains Grassy Woodland broad vegetation types occupy fertile plains under low rainfall regimes of 400-700mm per annum. The original geologies of the plains varies with the Western Volcanic Plains being basalts, the Sale Plains being outwash clays and the Northern Plains being riverine silts and clays. These broad vegetation types are characterised by a very low density cover of trees such as River Red Gum *Eucalyptus camaldulensis*, Yellow Box *Eucalyptus melliodora*, White Box *Eucalyptus albens*, and shrubs like Lightwood *Acacia implexa*, Golden Wattle *Acacia pycnantha*, Cranberry Heath *Astroloma humifusum* and a ground layer dominated by perennial grasses, particularly Wallaby Grasses *Danthonia* spp., Spear Grasses *Stipa* spp., Cane Wire Grass *Aristida ramosa*, herbs such as Scaly Buttons *Leptorhynchos squamatus* Kidney weed *Dichondra repens* Solenogynes *Solenogyne* spp., Plantains *Plantago varia* and *P. debilis*, Cotton Fireweed *Senecio quadridentatus*, Austral Bear's Ear *Cymbonotus preissianus* and perennial geophytes especially orchids and lilies.

This broad vegetation type is characterised by extensive tracts of land with this vegetation. The dominant ecological vegetation class represented in this broad vegetation type varies according to biogeographic zone and parent geology: on the Western Volcanic Plains heavy clay basalt soils the ecological vegetation class is Western Plains Grassy Woodland, on the Sale Plains outwash clays the dominant ecological vegetation class is Gippsland Plains Grassy Woodland and on the Northern Plains with its riverine silts and clays, the dominant ecological vegetation class is Northern Plains Grassy Woodland. Within this broad vegetation type there are smaller areas of Wetlands and Grasslands. There are however smaller outliers of fertile geology that support this vegetation broad vegetation type such as the granodiorites around Mansfield and the limestones of the Buchan and Murrindal area.

Herb-rich woodlands

Herb-rich Woodland broad vegetation types occur on lateritic fertile clays and silty clay loams or the volcanic stony rises of the Western District under an annual rainfall regime of 500-600mm. The vegetation usually occurs on gentle slopes or plains that represent past depositional or volcanic environments that today remain fairly damp. The broad vegetation type is characterised by an open medium woodland structure predominantly of Yellow Box *Eucalyptus melliodora* with Long-leaf Box *Eucalyptus goniocalyx* and an understorey almost devoid of shrubs and grasses. Tree-form Silver Banksia *Banksia marginata* and Black Wattle *Acacia mearnsii* are exceptions to this general rule. The dominant ground cover is perennial geophytes such Yellow Bulbine Lily *Bulbine bulbosa*, Nodding Chocolate Lily *Arthropodium fimbriatum*, Small Vanilla Lily *Arthropodium minus*, Yellow Star *Hypoxis hygrometrica*, Early Nancy Wurbea spp., Trigger plants *Stylidium* spp., as orchids and lilies and a diverse array of herbs such as Solenogynes *Solenogyne* spp., Austral Bear's Ear *Cymbonotus preissianus* (both perennial and annual), with smaller numbers of grasses such as Wallaby Grass *Danthonia* spp., and minute sedges of the genus *Centrolepis*.

The most usual ecological vegetation class is Herb-rich Woodland although there is often small Wetlands, areas of Box Ironbark Forest, Grassy Dry Forest or Western Plains Grassy Woodlands or Grasslands within the broad vegetation type or on its periphery. On current alluvial terraces the broad vegetation type merges with Riverine Plains Grassy Woodland and on more fertile better drained sites Grassy Woodlands.

Sub-alpine grassy woodlands

Sub-alpine Grassy Woodland broad vegetation types are confined to altitudes of 1 200-1 400m where fertile geologies such as basalts or granodiorites occur. The precipitation regime is in excess of 1 400mm per annum, a great deal of which falls as snow over autumn, winter and spring and fog cover is often present. Snows may come at any time of year and frosts can occur during summer. Structurally the vegetation of this broad vegetation type is an open low woodland of Snow Gum *Eucalyptus pauciflora* with a generally grassy ground layer of Snow grasses *Poa* spp. and Wallaby Grasses *Danthonia* spp., where shrubs are not an obvious component, but herbs are nearly always diverse and obvious, including Australian Caraway *Oreomyrrhis eriopoda*, Royal Bluebell *Wahlenbergia gloriosa*, Showy Violet *Viola betonicaefolia* and Grass Trigger Plant *Stylidium graminifolium*.

The dominant ecological vegetation class in this vegetation broad vegetation type is Sub-alpine Grassy Woodland, with smaller areas of Sub-alpine Woodland and Sub-alpine Meadows. Sub-alpine heaths are uncommon.

Montane grassy woodlands

Montane Grassy Woodland broad vegetation types are confined to altitudes of 1 000-1 200m where fertile geologies such as basalts or granodiorites occur. The precipitation regime is in excess of 1400mm per annum, a great deal of which falls as snow over autumn, winter and spring with fogs a common event. Snows may come at any time of year and frosts can occur during summer. Structurally the vegetation of this broad vegetation type is an open low woodland of Candlebark *Eucalyptus rubida* and Snow Gum *Eucalyptus pauciflora* with a generally grassy ground layer of Kangaroo Grass *Themeda triandra*, Common Tussock Grass *Poa labillardieri* and Wallaby Grass *Danthonia* spp., where shrubs are not an obvious component of the shrub-layer (with the exception of the tree-form of Silver Banksia *Banksia marginata* and Pale Fruit Ballart *Exocarpus strictus* and occasional heaths in the genus *Epacris*), but herbs like Common Everlasting *Chrysocephalum semipapposum*, Sheep's Burr *Acaena echinata*, Variable Plantain *Plantago varia* are nearly always present, diverse and obvious. Composites are usually present.

The dominant ecological vegetation class in this vegetation broad vegetation type is Montane Grassy Woodland, with smaller areas of Montane Dry Woodland. This vegetation merges into Sub-alpine Treeless broad vegetation types at elevations of >1 200m, whereas at elevations of <1 000m the broad vegetation type merges into Moist Foothill Forest broad vegetation types.

Riverine grassy woodlands

Riverine Grassy Woodland broad vegetation type grow on the flood plains of major rivers and streams in Victoria where the rainfall is 300-700mm per annum. The soils are fertile silts and water is rarely a limiting factor. Floods are a regular feature usually happening at least once a year. The structure is a woodland of River Red Gum *Eucalyptus camaldulensis*, occasionally Black Box *Eucalyptus largiflorens* and on higher ground Grey Box *Eucalyptus microcarpa* and Yellow Box *Eucalyptus melliodora*, although timber harvesting can cause the structure to alter to a forest. The understorey has very few shrubs (often only the occasional wattle like Silver Wattle *Acacia dealbata*) and the ground layer is dominated by grasses such as Common Tussock Grass *Poa labillardieri*, Spiney Mud Grass *Pseudoraphis spinescens* and Warrego Summer Grass *Paspalidium jubiflorum* and various sedges (usually *Carex* spp.) and rushes *Juncus* spp. Herbs are not always obvious but there are generally Water Peppers *Persicaria* spp. and Willow Herbs *Epilobium* spp. present.

The dominant ecological vegetation class is Riverine Grassy Woodland, with smaller areas of Riverine Grasslands and Billabong Wetlands. On more elevated sites on the flood plain Grassy Woodlands develop. This broad vegetation type merges into Grassy Woodlands broad vegetation type on older alluvial terraces.

Mallee

The Mallee broad vegetation types develop on poor sandy soils under rainfall regimes of <350mm. Organic matter is low and soil structure is poor and droughty. This broad vegetation type can occur on dunes and swales as well as on old lacustrine deposits provided these are sandy. The structure is variable although the overstorey is usually dominated by Mallee-form trees such as Yellow Mallee *Eucalyptus incrassata*, Slender-leaf Mallee *E. leptophylla*, Dumosa Mallee *E. dumosa* and Grey Mallee *E. socialis* that are low in height, occasionally heaths and also woodlands. The understorey is dominated by heathy shrubs like Desert Banksia *Banksia ornata*, Green Tea-tree *Leptospermum coriaceum*, Baeckias *Baeckia* spp., Scrub Cypress Pine *Callitris verrucosa* and Myrtles *Calytrix* spp. with few if any grasses except for Common *Triodia scariosas* and annual herbs (particularly composites). In Chenopod Mallees the understorey is dominated by Blue-bushes *Maireana* spp.

This broad vegetation type has one or a combination of: East\West Dune Mallees, Loamy Sand Mallees, Chenopod Mallees, Shallow Sand Mallees, Broombush Mallees, Red Swale Mallees, Big Mallees, Mallee Heaths, Yellow Gum Woodlands, Belah Woodlands, Sandstone-rise Broombush, Scrub Pine Woodlands.

Mallee heaths

The Mallee Heath broad vegetation types develop on deep siliceous sands associated with relatively recent dune formation, for example parabolic dune fields. These vegetation types occur under rainfall regimes of <350mm. Organic matter is low and soil structure is poor and droughty. The structure is variable although the overstorey where present is usually dominated by Mallee-form trees such as Yellow Mallee *Eucalyptus incrassata*, Slender-leaf Mallee *E. leptophylla*, Dumosa Mallee *E. dumosa* and Desert Stringybark *Eucalyptus arenacea* that are low in height. The understorey is dominated by heathy shrubs like Desert Banksia *Banksia ornata*, Green Tea-tree *Leptospermum coriaceum*, Scrub Sheoake *Allocasuarina paludosa*, Baeckias *Baeckia* spp., Scrub Cypress Pine *Callitris verrucosa* and Myrtles *Calytrix* spp. with few if any grasses except for Common *Triodia scariosa*.

This broad vegetation type has one or a combination of: Dune-crest Tea-tree Heaths, Sandplain Heaths, Tea-tree Scrubs, Mallee Heaths, Shallow Sand Mallee-Heaths, Loamy Sand Mallees and Scrub-pine Woodlands.

Mallee woodlands

The Mallee Woodland broad vegetation types develop on moderately fertile heavy soils under rainfall regimes of <350mm. This broad vegetation type occurs primarily on old lacustrine deposits. The structure is variable although the overstorey is usually dominated by a low woodland of Slender Cypress Pine *Callitris preissii*, Buloke *Allocasuarina* spp. and Oil Mallee *Eucalyptus oleosa* or occasionally grasslands. The understorey is dominated by grasses Spear Grasses *Stipa* spp. and annuals, with few if any shrubs.

The broad vegetation type has one or a combination of Pine Buloke Woodlands, Savannah Woodlands, Savannah Mallees, Grasslands or Sandplain Grasslands.

3.1 Impacts on ecosystems in general

The now State of Victoria was settled through European colonisation beginning in the 1830s and in the proceeding years considerable impact on the above described woodlands and grasslands has occurred. It has been estimated that in 1869 Victoria's woodlands and grasslands covered some 20 million hectares extending over 88 per cent of the State (Powell 1967). However, the past 130 years has seen some 65 per cent of this cover (approximately 12 million hectares) cleared. To aid its prioritisation of expenditure for property purchase the Trust has developed several categories that indicate the extent of clearing for each of the above detailed broad vegetation types. These are shown in Table 1. This clearly indicates that for the rarer ecosystems there is a critical requirement to target private landholders to covenant land for biodiversity conservation. Clearing for agricultural purposes, in the whole State, continued at a rate of between 6-10 000 hectares per year in the 1980s (Woodgate and Black, 1988) but has now decreased to approximately 1 000 hectares per year (Traill, pers.comm).

Table 1. Remaining native vegetation on private land

Broad Vegetation Type	% remaining uncleared	Hectares remaining uncleared	% of remaining area on private land
Plains grassland	< 5	8 000	63
Plains grassy woodlands		122 200	52
Herb rich woodlands		67 700	49
Coastal grassy woodlands	5 - 25	33 500	27
Box ironbarks		256 700	30
Riverine grassy woodlands		193 700	21
Mallee	< 50	1 028 200	8
Mallee woodlands		60 700	14
Montane dry woodlands	> 50	287 200	3
Sub-alpine grassy woodlands		24 100	3
Montane grassy woodlands		38 700	22
Mallee heaths		502 600	5

Source: derived from Traill and Henderson (1997).

The immediate effect of vegetation clearance on biodiversity can be significant. For vertebrate animals, comparative estimates of woodland bird densities indicate that between 1000 to 2000 birds permanently lose their habitat for every 100 hectares of woodland cleared. It has also been estimated that the clearing of Mallee for wheat kills more than 85 per cent of the resident reptiles or more than 200 individuals, on average, per hectare (DEST, 1995). Table 2 indicates the specific species that are rare and endangered split between the woodland and grassland ecosystems targeted by the Trust for conservation.

Table 2. Key species

Broad ecosystem type	Rare and endangered species
Woodlands	Stonebush curlew Regent honeyeater Squirrel glider Grey-crowned babbler
Grasslands	Brolga Striped legless lizard Earless dragon Plains wanderer Golden moths orchid

The degradation of habitat by the removal of the understorey of woodland ecosystems, through grazing for example, can also simplify these ecosystems and result in a loss of genetic and species variability. For example, in some of the grassy woodlands described above, a study has found that small grazed patches (less than 10 hectares) supported fewer native forest birds and an increased number of farmland birds that aggressively excluded other species. Few birds were found to eat insects in the woodland canopy of these areas and dieback from insect damage was evident in such patches (Loyn, 1987).

4. IMPACTS ON ECONOMY AND WELFARE

There has been no comprehensive assessment of the economic losses associated with the loss of vegetation cover in Victoria. However, the marginal value of woodlands and grasslands has been addressed by several studies in recent years. Predominantly these studies have estimated conservation values of natural areas for inclusion in the public reserve system. However, for the purpose of this paper it could be claimed that these values would be commensurate for private land being managed for conservation to a standard at least equal to, or in advance of, conservation management for areas in public reserve system.

Carter (1992) found that the use values for forests in the region covering the high country between Victoria and New South Wales and registered on the National Estate were in the order of \$8.90 per visitor resulting in a total \$950 000 per year for an area of 130 000 hectares. Non-use values were estimated at \$43.50 per household per year for the same area. This study was aimed at determining the conservation values of the forests through the presentation of scenarios where respondents were required to choose between the area being made available for logging or preserved for conservation objectives. As the areas studied are predominantly Crown land there was not the question of whether the forests should be purchased only whether the current land management arrangements should be modified.

If this figure is extrapolated to cover the loss of the approximately 12 million hectares cleared since European settlement the total cost could amount to a net present value of more than A\$1 billion.

A study by Jakobsson and Dragun (1996) focussed on the biodiversity values associated with a single species, the Leadbeater possum, found in the montane forests of Victoria. A non-use value of \$29 per household per year was estimated through the use of a CVM survey. While the study provides a useful indicator of the value of this particular species it does not cover the range of species existing in the ecosystem being examined.

There has, to date, been a dearth of economic studies related to biodiversity loss in Australia and in particular specific analysis of individual or collections of species in forest and grassland areas targeted by the Revolving Fund. However, there are some recently commenced studies that are examining the relationships between the loss of vegetation and the economic impacts on biodiversity. A study using the choice modelling methodology (Rolfe et al, 1997) is attempting to estimate the costs and benefits of the tradeoffs between increased agricultural productivity and environmental damage, including specifically ecosystem degradation. In addition, another study (Lockwood, 1997) is examining the economics of remnant vegetation conservation on private property in Victoria. Following completion of these studies within the next two years policy makers will have a much clearer picture of the broader economic costs and benefits associated with the biodiversity values being maintained and improved by the Revolving Fund programme.

5. IMPLEMENTATION OF INCENTIVE MEASURE AND CONTEXT

5.1 Identification of incentive measure

The measure described in this section can be classified as a market incentive supported by a fund that acts as clearing house mechanism to reallocate land of high biodiversity value. Through the purchase and sale of property in a market setting the conditions are set for a more efficient approach to on-going nature conservation management on these properties.

In Australia it is increasingly recognised that land owners (particularly those in rural and semi-rural regions) need to be encouraged to take a greater role in the conservation of the land, including its associated ecological processes and biodiversity functions. However, limited resources available to those institutions responsible for public areas of conservation has resulted in alternative approaches being examined and implemented.

In the Victorian context there are four compelling reasons for including private land in a comprehensive nature conservation strategy:

- Private land can make a major contribution to conserving biodiversity and wildlife habitats, particularly those species and habitats poorly represented on public land;
- A landscape approach to conserving flora and fauna must involve private land and is essential for long-term management of natural systems;
- Nature conservation is dependent on the willing cooperation and full support of the community. Private landholders have a special significance as major stakeholders. Nature conservation on private land can provide a means for the community to support and participate in conservation; and
- A conservation oriented, ‘ecologically healthy’ approach to property management has benefits for landholders and for the sustainability and long-term variability of agricultural systems and other rural-based enterprises. (Forge, 1994a)

In addition, a broad objective is to sell land to purchasers who are sympathetic to maintaining, through on-going management, the nature conservation values of the properties available from the Revolving Fund.

The choice of the Revolving Fund as the appropriate measure for maintaining the case study ecosystems is based on a number of historical factors. Initially the Trust for Nature (Victoria) was established to provide an institutional mechanism for purchasing land that could have a conservation covenant placed on the associated title and then be maintained by the Trust or transferred to the Crown for incorporation with existing National Parks or other areas with reserve status. The Trust has also had a

successful history of assisting landowners to place conservation covenants on their land titles. However, with the increasing loss of critical habitat and the lack of funds for outright purchase of significant blocks it was necessary to move to a mechanism that changed the ownership of the land from predominantly individuals and families in the farming sector to those willing to maintain the nature conservation and biodiversity values of these areas.

There has not been a specific cost-benefit analysis undertaken of the Revolving Fund in the setting up phase. As the Fund is sourced both through government grants and private contributions it is difficult to assess where the costs and benefits would be attributed.

5.2 Process of implementation and distributional effects

The establishment of the Revolving Fund was based partially on the parameters developed for the fund created by the US Nature Conservancy. This experience indicated that the revolving fund mechanism is frequently appropriate in cases where areas of high conservation are to be acquired on a priority basis. This may include private land within the boundaries of existing nature reserves or adjacent to reserves and containing values not well represented in the reserve. These areas can often present serious management problems through the spread of feral animals and weeds to the nature reserve. However, immediate acquisition for the inclusion in a reserve may not be feasible due to lack of public funds. The Revolving Fund has been developed to address this problem in a flexible manner and to operate independently of government.

The implementation of the Revolving Fund has minimal, if any, negative distributional effects. The primary aim of the process is to move areas of high conservation and biodiversity values away from land managers whose practices may be deleterious to the maintenance of these values to owners who positively maintain such values. In this way, due to the voluntary nature of the transactions, there are only winners to found. It is possible that where a property is sold for less than its original purchase price then it could be concluded that the taxpayer (through the government grant to the Fund) has suffered a loss. However, this could alternatively be viewed as a purchasing of the public good aspect of the transaction and wider benefits to the community would accrue from such a financial transaction loss.

One of the important factors in conducting the work of the Trust has been encouraging the involvement and participation of the local communities where land has been purchased and covenanted. In the broader work of the Trust there are opportunities where local communities have identified land for purchase and have been involved in public appeals for contributions to enable acquisition. In addition, the Trust has status independent of government and has the ability to capture the support of the community and negotiate successful outcomes. This success is partly due to the perception that governments are not seen as long term partners in private land relationships due to their continuing change in role and emphasis on these issues. The Trust has found through experience that landholders prefer to operate with an independent authority and in turn this provides the Trust with the flexibility to acquire and place conditions on land management for the properties made available to the Fund (Whelan, 1997).

The enforcement and compliance of the new landholders is achieved in a number of ways. The covenant placed on all properties purchased by the Fund is legally enforceable under the *Victorian Conservation Trust Act (1972)*. The covenant defines the relevant conservation area and the management conditions that apply. The covenant will generally reference the fencing of the area, prohibiting of subdivision, the exclusion of grazing animals as well as feral animals, and the control of exotic weeds and any other conservation issues such as the removal of timber. All covenanted properties have a management programme which is developed with the landholder and includes a monitoring component

whereby the property is visited on average every three years by staff of the Trust to evaluate the effectiveness of the programme (Whelan, 1997).

5.3 The role of information and uncertainty in the implementation process

The Victorian Trust for Nature has viewed the issue of information on biodiversity values to be a very important factor in the management of its programmes. It has developed a strong network through a centralised system. This has allowed the Covenant Program Manager to develop a personal relationship with almost all property owners entering the covenanting scheme. In addition the Director of the Trust is personally involved in all fundraising activities associated with the programmes. At the grassroots level there has been significant success through the development of community networks to achieve local objectives. This has occurred through the establishment of property management committees, fundraising committees and friends groups.

However, despite its success to date the Trust recognises that there will remain uncertainty in relation to achievement of its objectives if further development of the network model is not carried out. It is likely that a more decentralised model will evolve to ensure that relationships that have developed are maintained and that more land owners and managers will become aware of the benefits of the covenanting process and the opportunity for participation in the Revolving Fund. Part of this strategy involves the development of habitat management courses for local communities and has the potential to enable conservation minded individuals to be brought together on a common basis (Safstrom, 1995).

5.4 Framework and context of implementation

The rationale for the implementation of the Revolving Fund arose from the need to capture nature conservation values on private land. Forge (1994b) describes the revolving fund as a concept that involves the purchase of land, application of a statutory covenant to protect conservation values, and resale to a sympathetic purchaser. With access to sufficient capital, and at relatively modest overall expense, the revolving fund enables the establishment of a substantial private conservation reserve system which is managed by private landowners. In Australia the concept is still in its infancy, but it has great potential if the Trust for Nature (Victoria)'s experiences can serve as an accurate guide.

The effectiveness of the revolving fund concept lies in its ability to:

- a) recapture the whole or most of the capital purchase cost; and
- b) pass on responsibility for land management to owners who are committed to a conservation ethic.

Historically, conservation agencies have generally assumed that conservation of valuable habitats will require acquisition and reservation. This will always be appropriate for certain areas but for others it may not be necessary and for some, not even desirable. The Trust's experience suggests that habitat management practices on covenanted land compare favourably with public land where labour costs are increasingly formidable.

Experience demonstrates that the revolving fund mechanism is frequently appropriate in areas of high priority for nature conservation. For example, private land within or on the margins of nature reserves may contain ecosystems not well represented in the reserve. They can also pose serious management

problems through the spread of pest plants and animals. Consequently, many such areas are a high priority for acquisition but this is often not possible through lack of funds.

Lands on the fringes of reserves are readily marketable and the Trust has covenanted many of these areas - for example, Little Desert, Grampians and the Lower Glenelg National Parks. These properties typically attract sympathetic owners who make good managers and will often control trail bike riders, wood gathers, vermin etc., providing significant benefits for the adjacent reserve.

Increasingly, Government agencies are approaching the Trust to covenant properties with conservation values which are not really appropriate for retention in public ownership. For example, in the Victorian Mallee, the Land Conservation Council has recommended that various parcels of crown land that are too remote for effective management as public land, but have moderate conservation values, should be sold subject to covenant. Similarly, Melbourne Parks and Waterways has retained options to purchase land zoned Proposed Public Open Space but now recognises that a protective covenant will be quite adequate to sustain the land as a streamside buffer, enabling the land to be retained in private hands.

It is vital to keep transaction costs at a minimum. The Trust maintains a schedule of interested purchasers and is often able to market land through conservation journals at no cost which reduces advertising expenses.

As a semi-government body, the Trust is exempt from rates and taxes (save where the land is occupied) and is fully exempt from stamp duty. Conveyancing costs are often minimised through sympathetic solicitors and programme management costs are currently absorbed as part of the normal conservation programme. As the programme grows, it will be necessary to include such transaction costs.

One issue that is necessary to resolve is whether it is critical for a revolving fund to endeavour to break-even or whether, in the interests of conservation, some modest losses can be sustained. If transaction and management costs are fully included, it would normally be anticipated that over time, the size of the fund will gradually diminish. On the other hand, in periods of economic buoyancy, prices may rise if there is sufficient capital to hold property for longer periods. The Trust has been keen to turn property over quickly due to lack of capital. However, experience demonstrates this can be offset by the fact that landowners will sometimes sell to a charitable Trust for less than to Government with its vast financial resources.

Legislation enabling the registration of statutory covenants on property titles is necessary for the success of a revolving fund programme. The Trust has an active covenanting programme which currently processes around 50 covenants per year at an average cost of \$2 500-3 000 per covenant.

An effective land stewardship programme is critical for maintaining sound management of covenanted land.

The Trust calculates that an endowment of approximately \$3 000 is required for every covenant in order to provide sufficient funds for the stewardship programme which involves regular contact, advice and support. A stewardship programme is essential for long term habitat maintenance.

For such a scheme, it is vital to 'keep it simple'. The Trust, unlike Government Departments, is in a position to act swiftly to seize acquisition and sale opportunities. It is not bound by red tape requiring ministerial or other government approvals for land transactions. If it wishes, the Trust can buy above valuation. This will often be important because some valuations are conservative and if the conservation values are high, purchase may be strongly recommended. It may be argued that valuations will inevitably

be too high half the time and too low for the other half. A scheme will not achieve its conservation objectives if it is to be constrained by the need to break-even in all cases. Experience suggests that the public relies upon the Trust's expertise and credibility when searching for land for sale. Response to paid advertisements has been surprisingly good. Experience also suggests that many real estate agents are not sympathetic to conservation values, do not understand them, or promote them and are not trusted by the public. The Trust therefore is well equipped to compete in the market place.

While an internal review of the Revolving Fund has not been conducted to date in general it is the case that most properties are attracting buyers at prices equal to, or often above, the original purchase price expended by the Trust.

Overall, the Fund has been successful in purchasing, covenanting and re-selling (or currently for sale) more than 500 hectares of land since its inception in 1992 with a government grant of \$250 000. Ignoring the value of bequests to the Fund results in figures of \$618 000 required to purchase land which has resulted in a sales value of \$632 000. The addition of over \$200 000 from the sale of bequested land has considerably augmented the Fund for future purchases.

In a comparative context, it has been estimated by the Trust that for their general covenanting programme in which 70 properties covering over 2 000 hectares with a market value of more than \$7 million, on-going management benefits exceed a further \$7 million in form of landholders' provision of management rather than public nature conservation programmes being required to manage the biodiversity on these sites. These figures are derived from the negation of requirements for salaries, uniforms, superannuation, vehicles etc. required by public agency staff. The Trust has achieved this result with grants totalling only \$1 million during the period of 1992 through to 1997.

6. POLICY RELEVANT CONCLUSIONS

6.1 Lessons learned

While the Revolving Fund has had only a limited number of transactions during its period of operation and no formal assessment review has taken place there are a number of lessons to be drawn from the experience acquired.

There is a necessity to determine the correct balance between the amount of funds directed towards purchasing properties at any point in time and the need to have reserve funds should an important piece of land become available for purchase. In this context, it should be noted that the Fund is primarily an adjunct to the other covenanting processes carried out by the Trust and is for use when sites of high conservation value are likely to be sold to potential owners who may not be aware or sympathetic to the biodiversity values associated with the site.

There is a strong need to ensure that human habitation is possible and continuing on the sites assessed for purchase. The Fund is very much focussed on a niche market for those seeking a property with special conservation values. These individuals will generally need to have an on-going interest in the maintenance of the values of the property to ensure the covenant conditions are met. In addition, as the name implies the fund is a mechanism for recycling funds to continue the covenanting process, therefore, properties must be viable propositions for sale within a reasonable time frame otherwise funds remain unavailable for further important purchases. There is also need to ensure individuals are both conservation-minded but also financial when approaching the Trust regarding land purchase. A considerable amount of time can be potentially wasted if individuals are passionate about the desire to ensure on-going conservation of a certain piece of land but do not have the wherewithal to finance the project.

The Trust has found that, in some circumstances, a buyer has required short-term assistance with financing prior to completion of the sale. In these cases the Trust, through the Fund, has charged only interest payments on the basis of the sale price with settlement being up to 2 years. This allows the purchaser further time to raise capital from other sources. To date there have been few problems with this approach. Only in one case has a contract failed to be fulfilled at final settlement.

The Fund has been operating for a sufficient period now that the Trust believes that there is enough activity for a “one-stop shop” for nature conservation land to be established on a commercial basis with similar institutional arrangements to a general real estate agent. This would result in the Fund being less reliant on government funding. However, there remain some unanswered questions in relation to proceeding on this route, for example, at what stage would licensing as a real estate agent be required. Currently, insufficient properties are turned over each year for this to be undertaken. A move to this type of arrangement will require the employment of staff with general real estate experience whereas to date all transactions are handled by staff whose primary experience and qualifications are in nature conservation.

A positive knock-on effect of the Fund has been the fact that knowledge of the its activities has resulted in various owners of properties with nature conservation values advertising their sites for sale in the Trust's literature which is distributed to a wide conservation audience.

A final lesson is that the Fund has the added benefit that land exchanges by government conservation agencies can be facilitated. For example, the Trust has, through the Fund, been able acquire important sites when these other agencies have had insufficient funds or it has been politically infeasible. There have also been cases where Crown land has been placed with the Trust to find a local owner to assist on-going management that could otherwise be difficult due to remoteness from existing public reserves.

6.2 Transferability of experience

There are a number of issues that need to be considered when assessing the potential for the experience of the Revolving Fund to be transferred to other jurisdictions in Australia, or perhaps internationally.

The most important factor is that for a Revolving Fund to be established and to remain viable, at least in the short-term, then the support of the government of the day is critical.

As indicated in the previous section the Fund targets a niche market and therefore may not be suitable in many circumstances. There are a number of conditions that need to be assessed prior to the establishment of a similar fund.

The agency or institution that is responsible for the establishment of a fund will need to be able to form a strong network of people and associated information to ensure both the conveyance of knowledge on potential properties for purchase and for identifying potential purchasers.

It is unlikely that a similar fund could be established unless a body such as the Trust already exists. This will ensure that the required skills and existing experience with the nature conservation in the respective jurisdiction is immediately available for input to purchase and sale decisions. In some cases this will also require enabling legislation to be established by the government.

A major attraction of establishing such funds at arms length from government is the Trust's experience that individuals have greater confidence in the final outcomes of the process.

REFERENCES

- CARTER, M. (1992), *The Use of Contingent Valuation in the Valuation of National Estate Forests in South-east Australia*, in Lockwood, M. and DeLacy, T. (eds) *Valuing Natural Areas; Applications and Problems of the Contingent Valuation Method*, Charles Sturt University Press, NSW, Australia.
- COMMONWEALTH OF AUSTRALIA (1992), *National Strategy for Ecologically Sustainable Development*, AGPS, Canberra, Australia.
- DEPARTMENT OF THE ENVIRONMENT, SPORT AND TERRITORIES (1995), *Native Vegetation Clearance, Habitat Loss and Biodiversity Decline*, Biodiversity Series, Paper No.6, DEST, Canberra, Australia.
- DEPARTMENT OF THE ENVIRONMENT, SPORT AND TERRITORIES (1996a), *State of the Environment Australia*, CSIRO Publishing, Melbourne, Australia.
- DEPARTMENT OF THE ENVIRONMENT, SPORT AND TERRITORIES (1996b), *The National Strategy for the Conservation of Australia's Biological Diversity*, DEST, Canberra, Australia.
- DEPARTMENT OF THE ENVIRONMENT, SPORT AND TERRITORIES (1996c), *Subsidies to the Use of Natural Resources*, Environmental Economics Research Paper No.2, DEST, Canberra, Australia.
- FORGE, W. (1994a), *Incentive for Nature Conservation on Private Land - An Introduction*, Paper for Trust for Nature (Victoria), Melbourne, Australia.
- FORGE, W. (1994b), *Nature Conservation and the Revolving Fund*, Trust for Nature (Victoria), Melbourne, Australia.
- JAKOBSSON, K. and DRAGUN, A. (1996), *Contingent Valuation and Endangered Species: Methodological Issues and Applications*, Edward Elgar, Cheltenham, UK.
- JAMES, D. (1997), *Environmental Incentives: Australian Experience with Economic Instruments for Environmental Management*, Environment Australia, Canberra, Australia.
- LOCKWOOD, M. (1997), *Economics of Remnant Vegetation Conservation on Private Property: Who Benefits? Who Pays?*, Project proposal, Charles Sturt University, Albury, Australia.
- LOYN, R.H. (1987), *Effects of Patch Areas and Habitat on Bird Abundances, Species Numbers and Tree Health in Fragmented Victorian Forest*, in Saunders, D.A., Arnold, G.W., Burbidge, A.A.,

Hopkins, A.J.M. (eds) *Nature Conservation: The Role of Remnants of Native Vegetation*, CSIRO and CALM, Surrey Beatty and Sons, NSW, Australia.

OECD (1996), *Saving Biological Diversity: Economic Incentives*, OECD, Paris, France.

POWELL, J.M. (1967), Victoria's Woodland Cover in 1869: A Bureaucratic Adventure in Cartography, *New Zealand Geographic*, Vol 23.

ROLFE, J., BLAMEY, R.K. and BENNETT, J.W. (1997), *Remnant Vegetation and Broadscale Tree Clearing in the Desert Uplands Region of Queensland*, Research Report No.3 Choice Modelling Research Reports, University of New South Wales, Australia.

SAFSTROM, R. (1995), In Trust: Working with People to Achieve Conservation on Private Land in Victoria, in Saunders,D.A., Craig,J.L. and Mattiske,E.M. (eds) *Nature Conservation 4: The Role of Networks*, Surrey Beatty & Sons.

TRAILL, B. and HENDERSON, M. (1997), *Draft criteria for assessing priorities for acquisition and retainment by the Trust for Nature*, Victorian Trust for Nature, Melbourne, Australia.

WHELAN, B. (1997), *The advantage of a Trust in Conservation for private land owners*, in Hale,P. and Lamb,D. (eds) *Conservation Outside Nature Reserves*, The University of Queensland, Brisbane, Australia.

WOODGATE, P.W. AND BLACK, P.J. (1988), *Forest Cover Changes in Victoria 1869 - 1987*, Department of Conservation, Forest and Lands, Melbourne, Australia.

YOUNG, M. et al (1996), *Reimbursing the Future: An evaluation of motivational, voluntary, price-based, property -right and regulatory incentives for the conservation of biodiversity*, Biodiversity Series, Paper No.9, Department of Environment, Sport and Territories, Canberra.

YOUNG, M. (1996), Mining or Minding: opportunities for Australia to Improve Conservation of remnant vegetation and to alleviate land degradation, in Environment Australia, Environmental Economics Round Table: Proceedings, Environment Australia, Canberra, Australia.

OECD Case Studies on the Design and Implementation of Incentive Measures for the Conservation and Sustainable Use of Biodiversity

All case studies are available on the OECD Internet Site at <http://www.oecd.org/env>

Country	Case study title
Australia	A Revolving Fund for Biodiversity Conservation in Australia
Austria	Austrian Case Study on Economic Incentive Measures in the Creation of the National Park Neusiedler See - Seewinkel: Summary
Austria	The Austrian Programme on Environmentally Sound and Sustainable Agriculture: Experiences and Consequences of Sustainable Use of Biodiversity in Austrian Agriculture
Canada	Revealing the Economic Value of Biodiversity: A New Incentive Measure to Conserve and Protect It
Canada	Using the Income Tax Act of Canada to Promote Biodiversity and Sensitive Lands Conservation
Denmark	Economic Incentives for the Transformation of Privately Cultivated Forest Areas into Strict (Untouched) Forest Reserves
Finland	The Act of the Financing of Sustainable Forestry and the Development of Forest Certification
France	A Cost-Benefit Analysis of Biodiversity Conservation Programmes in the Garonne Valley
Germany	UNESCO Biosphere Reserves Schorfheide-Chorin and Rhön
Greece	Incentives for the Conservation of the Nesting Grounds of the Sea Turtle <i>Caretta caretta</i> in Laganas Bay, Zakynthos, Greece
Japan	The Case of Oze Area: Case Study on the Japanese Experience Concerning Economic Aspects of Conserving Biodiversity
Korea	Case Study on Korean Experiences Relating to the Conservation of Biodiversity in Mount Chiri, with Special Attention to the Poaching of Bears
Mexico	Incitations Economiques pour la Protection des Espèces de la Vie Sauvage au Mexique: Le cas de l'Espèce <i>Ovis canadensis</i>
Netherlands	Green Investment Funds: Organic Farming
Netherlands	Green Investment Funds: PIM Project
New Zealand	Conservation of the Pae O Te Rangī Area
Norway	Valuation of Benefits Connected to Conservation or Improvement of Environmental Quality in Local Watercourses in Norway
Poland	Case Study on the Polish Experiences Relating to the Implementation of Economic Incentive Measures to Promote the Conservation and Sustainable Use of Biodiversity in the Biebrza Valley, with Special Attention to the Biebrza National Park
Turkey	The Development of Appropriate Methods for Community Forestry in Turkey
UK	Heathland Management in the UK
US	US Experiences with Incentive Measures to Promote the Conservation of Wetlands
US	Individual Transferable Quotas as an Incentive Measure for the Conservation and the Sustainable Use of Marine Biodiversity