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**Managing rare native vegetation holdings in South Australia-implications
of subdivision**

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Abstract

Native vegetation is a rare and valued land holding in many parts of Australia. This paper presents the preliminary findings of a project funded by the Native Vegetation Council of SA. The research sought to review the impact of land subdivision on the conservation and management of remnant native vegetation (RNV) in an Australian state typified by land clearing and degradation. The subdivision of remnant native vegetation is of concern to vegetation management and conservation agencies throughout Australia (Saunders, D.A., Hobbs, R.J., Margules, C.R., 1991). The purpose of the research is to provide information that might assist in the formation of planning and conservation policy in relation to the subdivision of RNV. It focuses on the extent of the land market for “nature blocks” and identifies the socio economic characteristics, attitudes, intentions and practices of owners of nature blocks in relation to conservation and management of remnant native vegetation.

Key words: land management, native vegetation, subdivision.

Managing rare native vegetation holdings in South Australia-the implications of Subdivision

Introduction

Native vegetation is a rare and valued land holding in many parts of Australia. This paper presents the preliminary findings of a funded research program that sought to review the impact of land subdivision on the conservation and management of remnant native vegetation (RNV) in an Australian state typified by land clearing and degradation. The conservation and enhancement of South Australia's remnant native vegetation is of considerable community and government concern. Rural land holders in South Australia have generally perceived their native vegetated areas as adding little or no value to the market value of their farms (Marano, 1990; 2000) and some have capitalized by subdividing their native vegetation areas into "nature blocks" primarily for a lifestyle market. Government, vegetation management and planning agencies believe this increased fragmentation may prove detrimental to South Australia's remnant native vegetation (Hobbs, R.J. and Saunders, D.A. eds. 1993). Fragmentation or break up of the vegetation is thought to threaten the ecological balance of the vegetation, encourage weed and pest infestation and make appropriate management more difficult. The subdivision of rural land holdings into "nature blocks" is a recent phenomenon and appears to be most prevalent in locations with reasonable proximity to the coast, with river frontage, or with access to cities or larger regional towns.

Values attributed to Remnant Native Vegetation

In Australia Remnant Native Vegetation (RNV) on private property has a range of private and social values. Private value is the worth of RNV on a property as perceived by the owner (purchaser). Social value is the worth of RNV as perceived by the community. Both can be expressed as an economic or non-economic benefit. "There is an underlying recognition of both public and private sector benefits from retention of remnant native vegetation on private land. By and large the broader public benefits far exceed the private benefits to individual landholders" (Slee 1998). This contention is supported by the Benefit Cost Analysis study of Lockwood *et.al.* (1999). In farming situations the private values are generally non economic and are outweighed by productive considerations, raising doubts as to the effectiveness of private management of RNV for the benefit of the general public (Marano 2000). On the other hand purchasers of rural property that is completely or almost completely covered with RNV are prepared to pay (RNV blocks sell for between A\$15000 to A\$100000 depending on location) for the private non economic benefits they enjoy. These benefits include aesthetic, conservation, spiritual attachment, and recreation values. So it could be expected that their management of privately owned RNV would be more aligned with the objectives of public RNV management authorities.

However, there is a public concern that the creation of RNV "lifestyle" or "nature" blocks by subdivision could lead to fragmentation of RNV. Practices such as construction of dams, clearing of RNV for telephone, power and access roads, construction of boundary fences and fire breaks, and agistment of domestic animals all have the potential to fragment the RNV. Many of these activities are not restricted by legislation such as the SA Native Vegetation Management Act and those that are, are difficult to police. If management for private value jeopardises the social value it could be argued that there is justification for the implementation of other measures such as education, incentives, or regulations to realign the private and social values to a more acceptable position. However, any additional interventions in South Australia that result in changes in the utilities possessed by RNV must be carefully assessed as they could impact on the market values of blocks with significant RNV cover.

Existing restriction on the management of RNV in South Australia

South Australia has had a long history of concern regarding native vegetation clearance for rural development. The first signs of clearance controls, other than through state acquisition to preserve desirable natural areas, emerged in 1972, with proposed Environment Preservation Regulations for Kangaroo Island, an island off the coast of SA, under the SA State Planning Act (Interdepartmental Committee on Vegetation Clearance 1976).

As a result of overwhelming local opposition, the proposal never succeeded but it led the way for the formation of the Interdepartmental Committee on Vegetation Clearance in 1974. The committee made several recommendations, one of which was for heritage agreements and financial assistance to prevent native vegetation being cleared. No government action eventuated and clearing continued. In 1980 the government introduced the Voluntary Heritage Agreement Scheme. The scheme had a slow take up rate and up to May 1983 only 2% (18,000 hectares) of the 1980 vegetated area had been committed to heritage agreements.

On the 12th May 1983 the Government, by amendments to the Planning Act 1982, introduced restrictions on clearing remnant native vegetation. No compensation was awarded for decisions that disallowed owners to clear native vegetation. Rural landowners lobbied for compensation and on 21st of November 1985 the Native Vegetation Management Act became law and provided for financial assistance subject to conditions, which included that the landowner must enter a heritage agreement in respect of such land.

The main provisions of a heritage agreement prevent the land from being cleared, used for stock grazing, developed with any structures, and in addition make the owner responsible for its management. Heritage agreements are registered on the certificate of title and bind the owner and all subsequent owners (Marano 1991).

In 1991 the Native Vegetation Act replaced the Native Vegetation Management Act, 1985. The new act maintains the previous management restrictions and heritage agreement option but makes no provision for financial assistance for loss in market value. It does provide, however, some management assistance if the owner enters a heritage agreement.

Aim of the Research

This research sought to determine whether the subdivision of remnant native vegetation as of 1983 into so called nature or lifestyle blocks threatened its protection. Many of these blocks are not held under heritage agreements and were not formerly used for agricultural purposes. However there is concern on the part of government, planning authorities, and groups such as the Native Vegetation Council that such subdivision which breaks up land parcels, disperses ownership and increases land use would undermine land management practices. However it could be argued that ownership of smaller land parcels by greater numbers of interested parties might in fact improve management practices, allow for greater scrutiny and increase awareness in the community of native vegetation issues generally. As such the social value of the native vegetation may be better protected by increasing the number of households for whom the native vegetation has a private value. . There are also botanical and ecological arguments regarding fragmentation of vegetation but these are not addressed in this paper.

Methodology

The main research instrument was a survey of purchasers who had bought nature blocks with significant native vegetation cover, created after land subdivision. The aim of such a survey was to determine the attitudes and practices of these purchasers which could then be compared to those of the original land owners prior to subdivision. From this comparison some conclusions might be drawn as

to the implications of subdivision for the management and retention of RNV. Only the first stage of the research is reported in this paper i.e. the attitudes and practices of purchasers of nature blocks created after subdivision.

The objectives of the survey were to identify the:

- attitudes of purchasers to RNV on property,
- intended and actual use of RNV on the property,
- importance of production, consumption and locational factors in price determination.

Once the properties were identified, questionnaires were sent to the purchasers to determine their management practices and attitudes towards RNV.

Sample selection.

Property transfers for the study were initially extracted from the SA Sales History File using UpMarket¹, if they met the following criteria:

- Transfers had to be registered with the Lands Titles Office after 1st June, 1983
- Properties transferred had to have a vegetated lot land use code²,
- Properties had to be greater than 1 hectare.
- The property had been created by subdivision after 1st June, 1983.

This resulted in very few properties being selected and on investigation it was determined that the Valuer General's land use code for vegetated lots was poorly recorded. The search process was then widened to include properties coded as rural living allotments

Subsequently, using ArcView 3.0 geographic information system (GIS) software, all land parcels comprised in each land transfer were matched to the digitised cadastre data base (DCDB)³. Those sales that had no link to the DCDB were removed from the analysis. Then the digitised boundaries for remnant native vegetation in South Australia⁴ were imported into the GIS. This made it possible to extract sales that were covered by RNV. This resulted in a final population of 260 properties that had significant native vegetation cover, which was set at 80 percent coverage.

Survey method

Information on the attitudes of property buyers to RNV was obtained by mail questionnaire that included a pre paid self-addressed envelope. Mailing addresses for the purchasers were obtained from the sales records and checked with the telephone directory. Non-respondents were sent a reminder letter, four weeks after the initial mail out. The responses of 44 households are reported in this paper which represents 17 percent of all purchasers who have bought nature blocks in SA created after subdivision since 1983.

The questionnaire had 2 parts:

Part 1 contained questions relating to: the intended and actual use of RNV on the property, the purchaser's agreement or disagreement with statements in the questionnaire about RNV, and management aspects of RNV.

Part 2 contained questions about the characteristics of the purchasers.

¹ UpMarket is a sales database developed and maintained by the University of South Australia. It contains all land transfers in South Australia, which have been registered with the Lands Titles Office since 1981. Each transfer record includes sale price, sale date, vendors' name and address, purchasers' name and address, transfer document number, and Land Use Code.

² Rural land use codes classify land used in primary production. They do not distinguish rural holdings from hobby farms, or lifestyle blocks.

³ The DCDB is a digitized data base, created and administered by the Land Information Group, Department of Administrative and Information Services, that contains the property boundaries of all parcels of land created in South Australia.

⁴ The digitized RNV maps were obtained from the Department of Housing and Urban Development. They were produced from color aerial photos at 1:40000 scale. The digitized RNV map for the Eyre Peninsula was produced from landsat imagery at 1:100000 scale. These digitized maps were the best available data.

Results of the Purchaser Survey

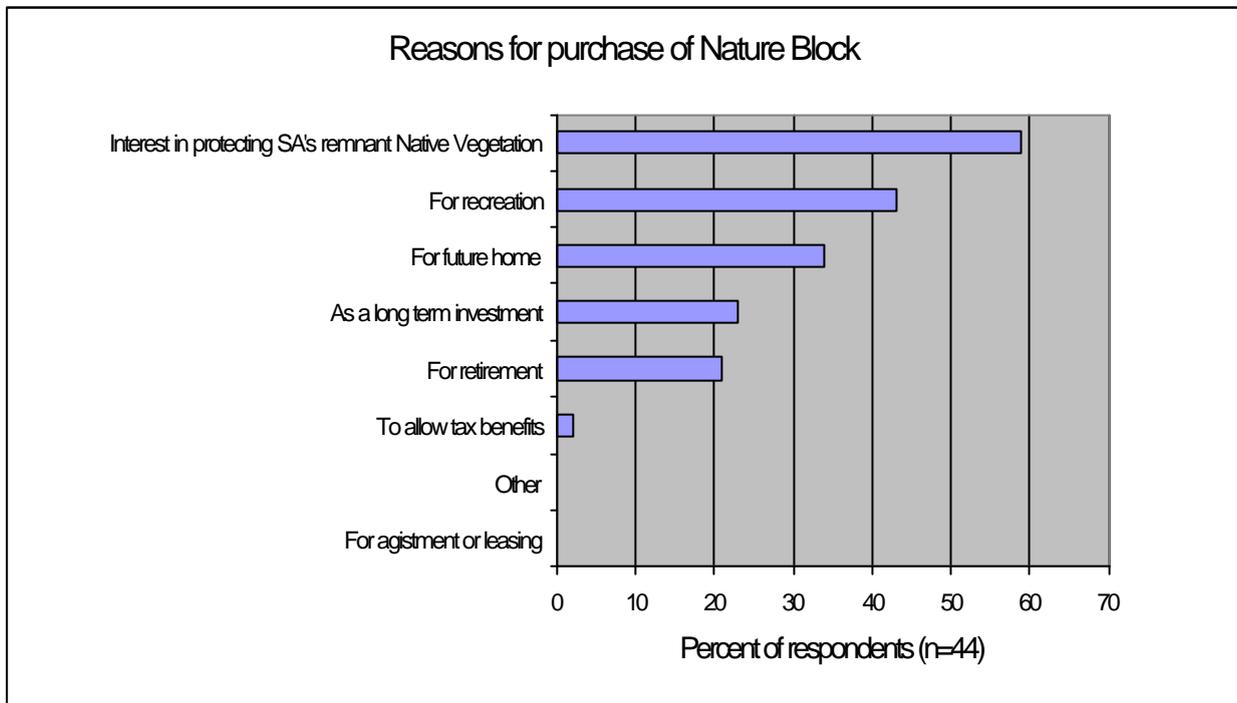
Household characteristics

Households represented by the survey were typically couples with (57 percent) or without children (18 percent). Almost 60 percent were employed in a professional, managerial or semi professional capacity with 29 percent on gross weekly incomes of over \$A1000. Employment areas represented by households included Primary Industry (21 percent), Education (14 percent) and Construction (9 percent). Some 47 percent of respondents held a Bachelor or Higher Degree.

Purchase of nature block

Some 60 percent of households gave as one of the main reasons for their purchase of a nature block an interest in protecting SA's remnant native vegetation. (Figure 1). Other reasons for purchase included for recreation (43 percent), as a site for a future home (34 percent) or as a long term investment (23 percent).

Figure 1 Reasons for purchase of nature block



Special qualities of nature block

Many felt that their block was special primarily because of the particular types of native flora or fauna that it contained (Figure 2). Some 30 percent of respondents suggested that their block held examples of rare or endangered species. Households were asked to divide up 100 points to indicate the relative importance of various property factors in their decision to purchase a nature block. Mean weightings for these factors (Figure 3) indicate that the quality and type of native vegetation on the block was considered most important relative to other property characteristics such as location, size, or access to power and water. On average households gave the quality and type of vegetation an allocation of 76 points, size of block 60, and distance to mains water 48.

Figure 2 Special qualities of nature block

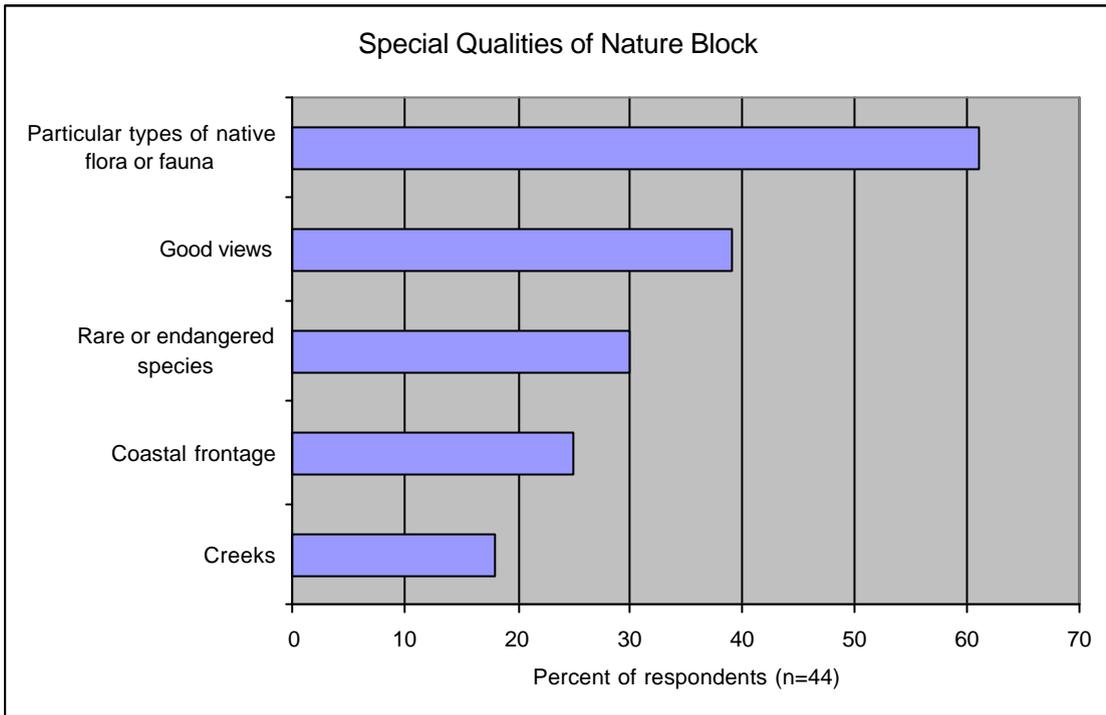
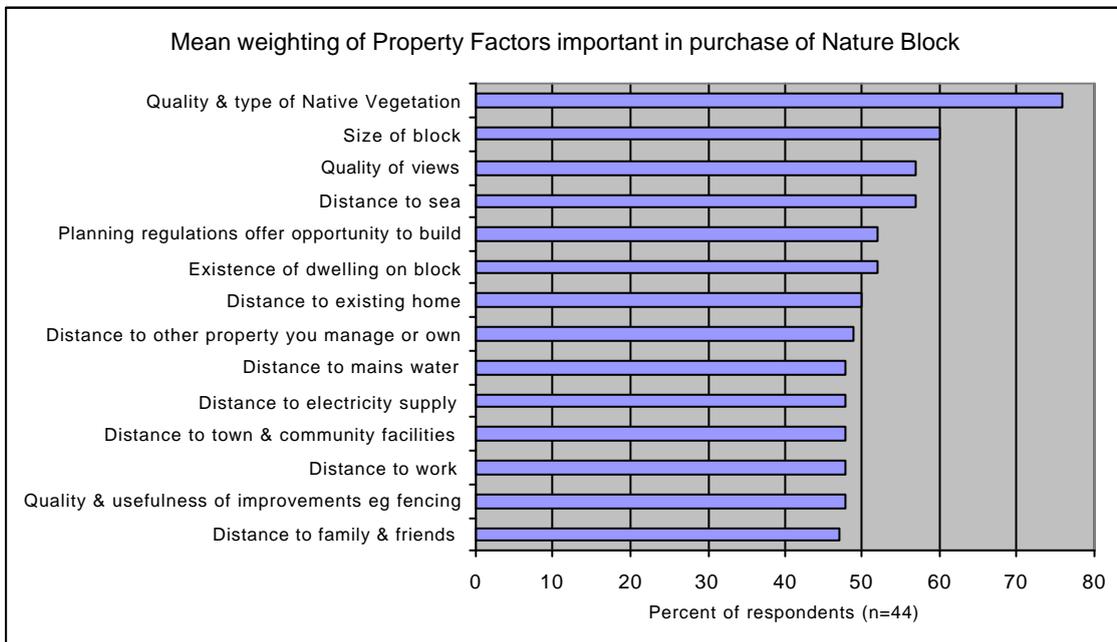


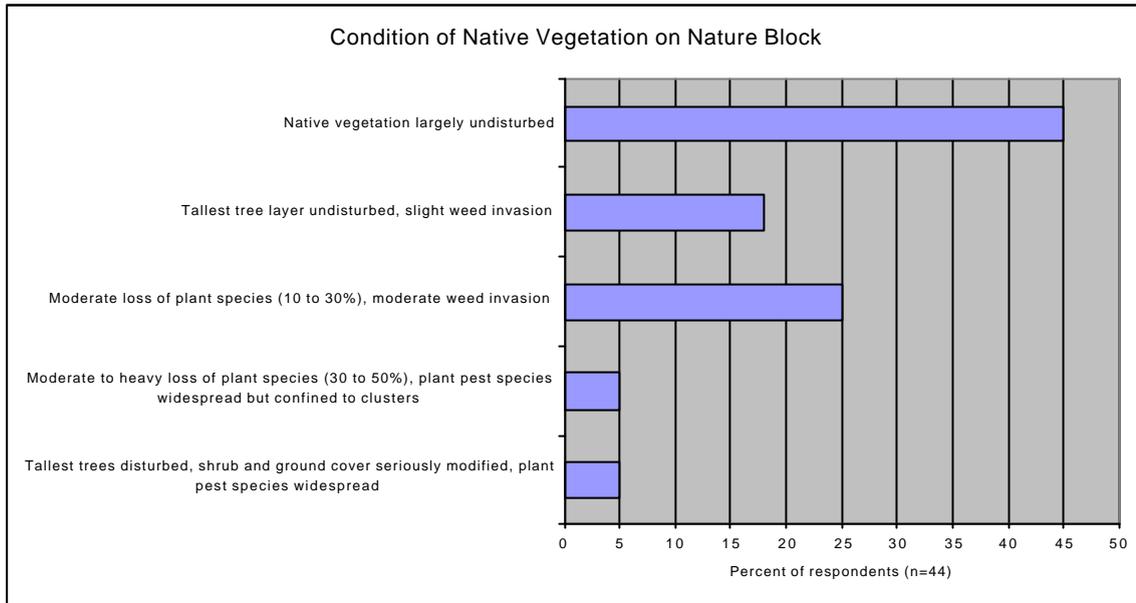
Figure 3 Mean weighting of factors important in purchase of block



Condition of nature blocks

Some 45 percent of households visited their blocks at least once a month while over fifteen percent visited their blocks no more than twice a year. A number of the blocks contained native vegetation that owners described as largely undisturbed (Figure 4) and virtually weed or pest free. However 35 percent of blocks were described as having suffered plant disturbance, moderate to heavy loss of plant species and considerable weed invasion.

Figure 4 Condition of native vegetation on nature block



Management of nature blocks

Almost 50 percent of owners had received no advice from any source on managing the native vegetation on their property. Some 16 percent had conferred with local Land Care Groups while just over 20 percent had sought advice either from other block owners or with the SA Native Vegetation Management Branch. Various native vegetation management activities were suggested to households as actions they may have intended to carry out on their properties. Households were also asked about management activities they had actually carried out since purchase (Table 1).

Table 1 Management of nature blocks

<i>Management activity (n=44)</i>	<i>Intended activity (% of respondents)</i>	<i>Actual activity (% of respondents)</i>
Firebreak maintenance	18	21
Firebreak clearing	9	9
Vermin & feral animal control	27	34
Fence construction	18	16
Fence maintenance	23	23
Flora & fauna inventories	30	25
Replant trees & shrubs	25	32
Vegetation regeneration	25	27
Removal of weeds	46	55
Other	7	2
No intended management	23	
No actual management		27

On average most owners had carried out their intended management activities. A slightly greater percentage of owners had removed weeds (nine percent), replanted trees (seven percent) and attempted vermin control (seven percent) than had originally intended to do so. A few less (five percent) had not carried out the flora and fauna inventory they had planned to undertake. Some 23 percent of purchasers never intended to carry out any native vegetation management and 27 percent had not undertaken any management activity since buying their block.

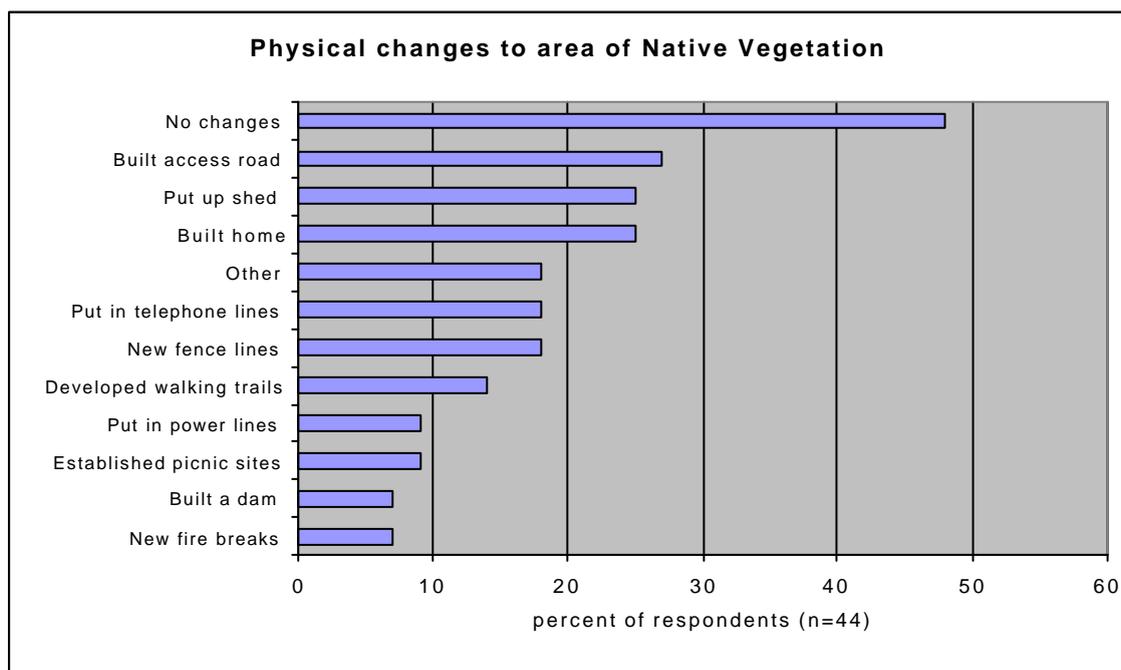
Under normal circumstances adequate management of remnant native vegetation for conservation purposes would imply revegetation or rehabilitation of degraded or disturbed areas of native vegetation as well as the exclusion of domestic farm animals. It also involves the eradication of weeds, exotic trees and vermin from the native vegetation and the establishment of an inventory of the flora and fauna. In this context owners were asked about their annual expenditure on the management of their native vegetation. A quarter of block owners did not spend anything. Some 25 percent spent less than \$200 per year with another 27 percent spending between \$200 and \$500. Some 9 percent of owners spent at least \$2000 per year and another 10 percent spent between \$500 to \$2000. However when asked to estimate the annual expenditure they believed was necessary in order to ensure adequate management, 25 percent believed that at least \$2000 was needed, ten percent estimated between \$1000 and \$2000 and another 25 percent between \$200 to \$500. Some seven percent of owners had no idea what such management might be expected to cost.

Government funded financial assistance is available to landowners for the management of native vegetation. However fifty six percent of those surveyed were unaware of such assistance. Thirty percent knew of such assistance but had never applied, five percent had applied and been rejected and finally seven percent had applied for and been successful in obtaining financial support.

Changes to nature blocks

Almost 50 percent of owners had made no changes to the area of native vegetation on their block (Figure 4). Of the rest who had made changes, some 27 percent had built an access road, 25 percent had put up a shed and 25 percent had built a home. Other changes to the area of native vegetation included the development of walking trails, the introduction of telephone and power lines and the building of new fence lines.

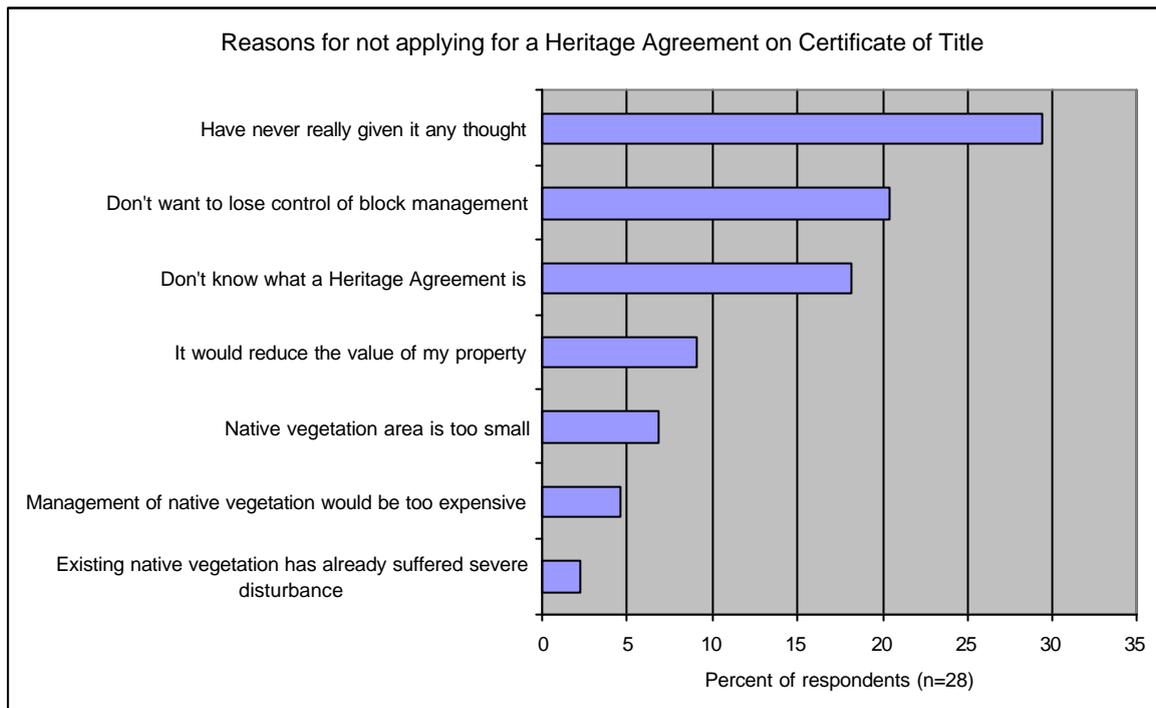
Figure 4 Physical changes to nature blocks



Heritage agreements

For the purposes of conservation areas of native vegetation, either in part or the whole, can be registered as a heritage agreement on the certificate of land title. Almost 60 percent of block owners had not considered applying to have their native vegetation registered. Of those who had not applied, some 30 percent had never given such an application any thought while 20 percent of owners believed that such an agreement would threaten control over management of their block (Figure 5). Eighteen percent did not know what such an agreement was, while nine percent thought entering into such an arrangement would reduce the value of their property.

Figure 5 Heritage agreements



Native vegetation & community plans as management options

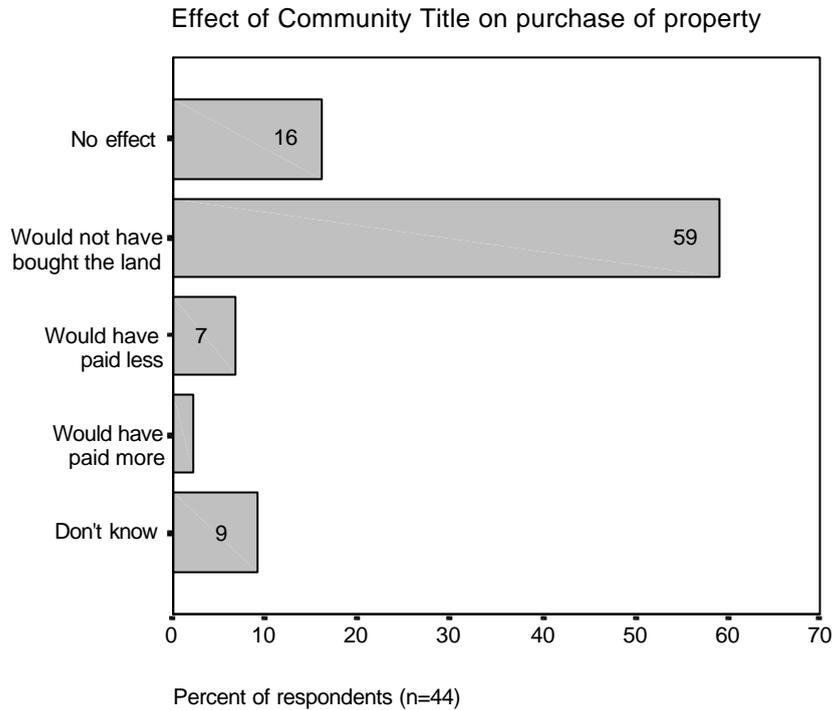
Property owners were asked about alternative property ownership rights to freehold title, which could incorporate concepts of a Native Vegetation Management Plan or Community Plan. Such plans are of interest to policy makers in the management of remnant native vegetation. Native Vegetation Management Plans could require a land owner to carry out some or all of the following tasks; revegetation or rehabilitation of degraded or disturbed areas of remnant vegetation, exclusion of stock, eradication of weeds and vermin and the establishment of an inventory of flora and fauna. Given a series of hypothetical conditions relating to such plans, owners were asked how their purchase of a nature block might have been affected (Table 2).

If building on the land were allowed only at designated places some 28 percent would not have bought the block. However for some 38 percent such a condition would have had no effect. Other conditions associated with such plans such as prohibitions on the building of fences, the clearing of native vegetation as a firebreak, or the clearing of vegetation for power lines or walking trails would have made no difference to the majority of purchasers. For over 64 percent of purchasers restrictions on the clearing of native vegetation without consent would have had no impact on their decision to purchase the property. However if such a plan prohibited building on the land 65 percent of purchasers would have paid less while 22 percent would not have bought the land. If clearing of native vegetation for building were prohibited under such a plan 46 percent would not have bought the land.

Table 2 Impact of native vegetation plan on purchase of nature block

	<i>No effect (%)</i>	<i>Would not have bought the land (%)</i>	<i>Would have paid less (%)</i>	<i>N=</i>
Building on the land prohibited	3	23	65	40
Building on the land allowed only at designated places	39	28	26	39
Clearing of native veg for building prohibited	46	46	3	39
Building of fences prohibited	65	15	8	40
Building of fences allowed subject to consent	74	8	5	38
Clearing of native vegetation for fire break prohibited	63	24	5	38
Clearing of native vegetation for provision of power or telecommunications prohibited	56	33	5	39
Clearing of native vegetation for access prohibited	31	51	8	39
Clearing of native vegetation for walking trails prohibited	58	28	8	40
Clearing of native vegetation prohibited without consent	64	18	10	39
Land subject to native vegetation management plan	31	26	18	39

A Community Plan when applied to a nature block is an alternative form of subdivision and property ownership. It incorporates a Native Vegetation Management Plan, which is adhered to by all owners participating in the Community Plan. The Community Plan is comprised of community land and individual community titles. The community titles provide exclusive rights to individuals (as if freehold) over designated areas for development and also give community title owners shared ownership of the community land. The implementation of the Native Vegetation Management Plan is the group responsibility of all community title owners involved in the Community Plan. Nature block owners were asked how their purchase would have been effected if at the time of purchase their property were held under a community title (Figure 6). Under such circumstances almost 60 percent of owners would not have bought their property. For 16 percent it would have made no difference, while seven percent would have paid less.

Figure 6 Impact of community title on purchase of nature block

Conclusion

It would appear that despite purchasing blocks based on an interest in protecting SA's remnant native vegetation most purchasers have received no advice on how to effectively manage their vegetation or sought any financial assistance. Most purchasers are well educated, in the middle to top income brackets and consider their nature blocks special because of the nature of the vegetation it contains including rare flora and fauna species. The majority of blocks reviewed in the survey were in an undisturbed to original state yet the majority of owners had not sought to protect such vegetation through Heritage Agreements.

Most owners did not spend what they believed was necessary to protect or enhance the native vegetation on their block nor had many applied for financial assistance to do so. Almost a quarter of owners did not engage in any management activity what so ever though some 55 percent were involved in weed eradication and a third of owners were involved in vermin control and replanting of trees and shrubs.

Although the majority of purchasers had made no changes to the native vegetation on their block most were anxious to keep their options open in terms of future building and development of their block. Almost 60 percent had not considered applying to have a Heritage Agreement placed on their property and the protection offered by a Native Vegetation Plan generally did not hold much appeal. If clearing of native vegetation for building were prohibited under a Native Vegetation Plan, 46 percent would not have bought their block. If clearing were prohibited for the purposes of improving access, 51 percent would not have purchased. The concept of a Community Title on their property in order to encourage more holistic management practices had even less appeal with almost 60 percent suggesting they would not have bought the land under such a Plan despite the accommodation of exclusive rights to individuals over designated areas for development.

From this survey it would appear that private values with respect to native vegetation may not result in effective management practices and that increased subdivision could place social values in some jeopardy. Planning and native vegetation management authorities would seem to have some way to go in educating land holders about the advantages of alternative titling arrangement and community action in terms of protecting both the private and social values attached to endangered vegetation. Alternatively the market values of nature blocks may well be threatened given the response by owners to purchase under such arrangements. Further analysis and reporting of results is required and research into the attitudes of original owners before subdivision is also anticipated.

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