NATIONAL PARKS ASSOCIATION OF NSW
protecting nature through community action

Local Land Services

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NPA submission on the draft NSW travelling stock reserves state draft framework

Introduction

The National Parks Association of NSW Inc (NPA) welcomes the opportunity to comment on the Draft NSW Travelling Stock Reserves State Planning Framework 2016-19 (Draft Framework).

NPA, formed in 1957, is a community based organisation with a network of branches and over 20,000 supporters in rural, remote and urban areas across the state. NPA promotes nature conservation and sound natural resource management. We have a particular interest in the protection of the State's biodiversity and it's supporting ecological processes, both within and outside of the formal conservation reserve system. We promote connectivity conservation, for example, through our involvement in the Great Eastern Ranges Initiative. Our interests extend to protection and management of the heritage values of natural and cultural landscapes.

In addition to our interest in environmental and heritage conservation and management, NPA conducts numerous outdoor recreational activities and is the largest bushwalking organisation in NSW.

The TSR network along eastern Australia, including Queensland, is a globally unique, corridor of publicly owned land. The Travelling Stock Reserves (TSR network) in NSW has high environmental, economic, cultural, and social values for NSW and Australia. In particular, the remnant vegetation on TSR Network is of great ecological importance.
NPA has advocated for over 50 years that the TSR network should remain in public ownership. Recently, NPA has focused on the unique potential of the TSR network for conservation and habitat corridors within the fragmented landscapes of western NSW. In 2011, NPA organised a conference, referred to in the Draft Framework, that brought together stakeholders with an interest in TSRs. Following the conference, NPA published "The NSW Travelling Stock Routes and Reserves network – Heritage, Habitat, Livelihood".

Executive Summary

Although NPA supports the stated aims of the Draft Framework to achieve an overarching management framework for the NSW TSR network, it considers that the draft Framework does not provide a clear or comprehensive foundation to guide LLS regions in the preparation of Regional TSR Management Plans. NPA also considers that the Draft Framework does not meet the aims of providing appropriate guidance for the development of capability analysis methodology or for valuation of TSRs.

NPA's position is that the TSR Network in both the Western Division and elsewhere in the State should be maintained in public ownership and managed by a single body to simplify their administration and ensure consistent management. Although LLS is a state-wide organisation, its focus is on regional decision-making and management. NPA believes that prioritising decision-making at the regional level is flawed. It jeopardises proper consideration of social and environmental issues at scales broader than LLS regions. The TSR Draft Framework reinforces this problem by providing no clear, effective or adequately detailed guidance to Local Land Service regions on how to deal with management issues consistently across the network.

The TSR Network has State, national and international importance for its environmental, cultural, economic and social values discussed in Part 2 of the submission which are under threat *inter alia* from the issuing of grazing permits, clearing and inappropriate activities such as the use of trail bikes. The Draft Framework fails to adequately describe the environmental, economic and social values of the TSR network. NPA considers that Identification of these values should have occurred prior to the preparation of the Draft Framework. As the Draft Framework indicates, there is considerable evidence and data available.

The Government has recently announced that a capability assessment of the TSRs is occurring after exhibition of the draft Framework. NPA considers that input from all stakeholders with an interest in TSRs should be sought during preparation of the capability assessment. NPA hopes that the draft Framework will not be finalised until the capability assessment has been completed and publicly exhibited.

The Framework also does not adequately set out the threats to environmental and social/cultural values. In particular, it fails to acknowledge the reason that a high proportion of the TSR network has significant biodiversity value is that over a long time period it has not been regularly grazed, or cleared for agriculture or forestry. Without identifying the threats to environmental and social/cultural values, the draft Framework cannot give meaningful guidance on how to reduce these threats.

The draft Framework fails to clearly state that the Crown Lands Act as well as the LLS Act applies to TSRs. There is no recognition that the Crown land management principles in the Crown Lands Act apply to TSRs.

In order to preserve the significant social and environmental values of the TSR network, which benefit the people of NSW, additional funding sources beyond those currently available must be found. NPA opposes a cost recovery/user pay model and notes that there was strong opposition to applying a business model to Crown lands in public submissions on the Crown Lands Review White Paper.

As the draft Framework indicates, legislation relevant to the management of TSRs is currently under review including the Crown Lands Act, Local Government Act and biodiversity legislation. In order for the document to remain up to date and relevant, and for

the public to make informed comment about the draft Framework, NPA considers that it should be re-exhibited once legislative reform has been completed.

PART 1
Specific Comments

Section 1.1
The Draft Framework does not clearly state that the Crown is the owner of all TSRs including those in the Western Division and that the Crown Lands Act applies to TSRs as well as the LLS Act.

Section 1.2
NPA considers that the management of TSRs should be based on ecologically sustainable development. The outcomes specified are vague and should be refined.

1. "Agricultural production" must be restricted to agricultural activities that will not undermine other identified significant values.

2. "Environmental" needs to be inserted before conservation. It is important that both ecosystem processes and biodiversity be maintained.

3. All forms of recreational activities have impacts. These impacts require careful and consistent management to ensure that these activities do not undermine other significant values. Some activities may not be appropriate as a consequence and should be excluded.

4. Cultural heritage needs to clarify that it takes into consideration both Aboriginal and non-Aboriginal cultural heritage.

Section 1.2 also refers 'other Crown land'. It is unclear what is being referred to and whether the Draft Framework applies to that other land.

Section 1.3 Guiding Principles
NPA has serious concerns about the Guiding Principles. As indicated above, TSRs are still Crown lands and as land manager LLS is required to comply with provisions of the Crown Lands Act as well as the LLS Act. Accordingly, LLS is required to apply the principles of Crown land management in s 11 of the Crown Lands Act. The guiding principles do not reflect the principles in s 11. In particular, they do not promote the conservation of land and natural resources in perpetuity. Comments in relation to specific principles:

1. "Recognition of historic use" should be changed to "Continuance of historic use". NPA supports the continued primary use of TSRs for providing cattle feed in times of drought, fire and flood and to cattle being driven for agistment or market.

2. Identification of Stakeholder Values – NPA considers that this approach is flawed. The difference between "use" and "value" is not recognised. The two words are used interchangeably. LLS should objectively assess the value of TSRs in the public interest using best available evidence and data. These values should have been

clearly identified in the Draft Framework. We are particularly concerned by the failure to refer to research by the Office of Environment and Heritage which have found that 80% TSRs have high environmental value and have emphasised their significance in connecting conservation reserves[1].

Values must be determined in the public interest and not solely for unidentified "stakeholders". We are concerned that this document may rely on the same definition of "stakeholder" as in the LLS Draft State Strategic plan 2015-2025 which is: "Organisations that collaborate and partner with Local Land Services directly to support customer service delivery." We raised concerns about the narrowness and inappropriateness of that definition in the NPA submission on the LLS Draft State Strategic Plan.

3. NPA supports ecologically sustainable use of TSRs. "Sustainable" use is not defined. Reference to delivery of services and stakeholder value raises the concern that economic considerations of unspecified "stakeholders" will be given primacy consideration at the expense of sound integration of environmental, social and economic values.

4. "Co-existence of stakeholder values" should be changed to "Appropriate multiple use of TSRs". NPA supports in principle multiple use of TSRs provided they are compatible with each other and do not destroy the environmental, cultural or social values of TSRs. An example of conflicting uses is long term grazing and environmental conservation. The former has the potential to degrade the natural environment, reduce the biodiversity of TSRs and impair the provision of ecosystem services.

5. "Economic viability, cost neutrality and user pays" Whilst NPA is pleased that there is recognition of the social, cultural and conservation values under this principle of TSRs, NPA strongly opposes full cost recovery from users and TSRs being administered under a business model. Submissions on the Crown Lands Review White Paper also raised strong objections to Crown land being administered as a trading enterprise. Instead, we support increased public funding to protect the environmental and social/cultural values of TSRs that is raised in section 5.1 of the Draft Framework.

   The Draft Framework does not recognise the economic value of ecosystems services that TSRs provide. These include water quality and carbon storage. In 2012, NPA commissioned a report "Estimating the Value of Ecosystem Services Provided by Travelling Stock Routes Final report: A Pilot Study of selected sites in NSW", a copy of which is included with this submission.

[1] Department of Environment and Climate Change (2006) State of the Environment Report

NPA considers that LLS needs to adopt new techniques and tools to properly value the economic, social/cultural and environmental benefits that TSRs provide.

6. "Statewide integration". NPA considers that this is an admirable goal but the Draft Framework fails to achieve it. It does not set out adequate mechanisms to ensure that there is consistent management of TSRs across the State nor does it identify issues of State or national significance and how they should be addressed at the regional level.

   We consider that there should be a single agency managing all TSRs in NSW including those in the Western Division. We have serious reservations about the suitability of the LLS model for administration and management TSRs because of the local focus of the organization that is strongly emphasized in LLS Draft State Strategic plan 2015-2025. NPA considers that there is a real risk that the broader scale values of TSRs discussed in Part 2 of this submission will be lost because primacy will be given to addressing the concerns of local "customer" and "stakeholders".

   We consider that there should be a single Draft Framework for all TSRs including those in the Western Division.

7. "Best Available Evidence/Data". We support decision-making based on sound objective evidence. However, the Draft Framework is fundamentally flawed because it is not based on such evidence and does not adequately identify environmental, social or economic values of TSRs. NPA considers that identification of the environmental, social and economic values of TSRs should have occurred prior to the preparation of the framework. As is indicated in the Draft Framework and Part 2 of this submission, there is considerable evidence and data available on the environmental, social and economic values and benefits of TSRs that could have been used to clearly identify those values and benefits in the Draft Framework.

Section 1.4 Travelling Stock Routes Conference

NPA is pleased that the Draft Framework refers to the consensus principles from the 2011 conference on TSRs organised by NPA. NPA remains committed to those principles. Regrettably, NPA does not consider that the consensus principles have been addressed in the Draft Framework

Section 2 Management Context

The Planning Framework is proposed to apply for five years. However, as the draft Framework indicates, legislation relevant to the management of TSRs is currently under review including the Local Government Act, Crown Lands Act and biodiversity legislation. In order for the document to remain up to date and relevant, and for the public to make

informed comment about the Draft Framework, NPA considers that it should be re-exhibited once legislative reform has been completed.

Section 3 Uses and values

We question the use of the terms "active" and "passive" uses. Environmental conservation can involve "active" management actions such as weed and feral pest control. More meaningful and consistent with how "active uses" are described in 3.1 would be describing uses as either "resource depleting" or "non-resource depleting".

Section 3.3

The approach taken in the draft Framework is that LLS regions will prepare land use classification matrices TSR by TSR. This approach provides no mechanism for identifying environmental or social/cultural features which extend beyond individual TSRs. NPA considers that the process needs to be reversed and broadscale features such as wildlife corridors and riparian corridors need to be identified first to enable them to be managed in order to maintain their integrity.

We are also concerned that there:

- is no primary use category for environmental or cultural conservation without recreational activities. Such categories would be appropriate for example where there is critical habitat of threatened species or site of special significance to Aboriginal people.
- are no requirements to maintain trees

Section 4 Consultation and Liaison

NPA is concerned that conservation groups were not consulted in preparation of the Draft Framework. It is also concerned that the localized focus of LLS regions will narrow the range of stakeholders that will be consulted in the preparation of regional TSR management plans. Many individuals and organisations, for example, apiarists, drovers, creative artists, environmentalists, fishermen and bird watchers, with an interest in the management of particular TSRs do not live in the same LLS region as the TSR/TSRs is/are located. There is need to recognize the public interest in TSR management and ensure that there is broad stakeholder engagement in the preparation of the Draft Framework and Regional TSR Management Plans and local operational schedules.

Section 5 Funding

See comments above.

Grazing Permits

The issuing of longer term grazing permits has the potential to alienate large parts of the TSR network and to severely undermine the environmental, social and cultural value of the network as a whole. There is a need for a moratorium on the issuing of longer term grazing permits until the ecological, social and cultural values of the network are properly assessed and public access assured.

Although NPA acknowledges that including draft conditions for grazing permits in the Draft Framework adds transparency as to how they will be issued, it is concerned that it leads to a one size fits all approach.
We are concerned that the draft permit allows clearing of native vegetation with the consent of LLS. We consider that this is inappropriate on lands of high environmental conservation value.

PART 2 THE IMPORTANCE OF THE TSR NETWORK.
NPA wishes to highlight the following important aspects of the TSR network:

1. Maintenance of biodiversity and connectivity conservation

2. Provision of ecosystem services

3. Ecologically sustainable economic uses

4. Rich cultural heritage

5. Social Benefits

2.1 Maintenance of biodiversity and connectivity conservation

2.1. 1. Maintenance of biodiversity:

TSRs protect endangered ecological communities and threatened species in heavily cleared areas,
Temperate woodlands of the western slopes and Tablelands in eastern Australia have been heavily cleared for grazing and cropping. Remnants are extremely precious public land:

a) In Central West NSW, more than 99% of some vegetation types has been cleared[2];

b) The vegetation and habitats contained in TSRs are, in many cases, the best remnants of woodland ecosystems that are adapted to fertile soil conditions[3];

c) The woodlands found on TSRs are essential for the survival of a range of threatened plant and animal species. 70% of hollow-using fauna in Australia is found in woodlands[4];

d) The mature, hollow-bearing trees found along the TSRs provide vital habitat, nesting sites and protection for a range of birds, arboreal mammals and bats[5].

[2] Regional State of Environment Report for Councils of the Greater Central West Region of NSW 2009-2010 Supplementary Report, p. 33.
[3] Spooner P., Lunt I. (2004) The influence of land-use history on roadside conservation values in an Australian agricultural landscape. *Australian Journal of Botany* **52**, 445-458.
[4] Gibbons P., Lindenmayer D. (2002) *Tree hollows and wildlife conservation in Australia*. CSIRO Publishing: Victoria, Australia.
[5] Gibbons P., Lindenmayer D. (2002) *op. cit.*

e) Nationally listed endangered ecological communities, such as the critically endangered White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland, are found in the TSR network[6].

f) Some threatened species with extremely restricted habitats, such as the critically endangered Golden Sun Moth[7] and the endangered Grassland Earless Dragon[8] have populations within TSRs;

g) Other endangered species such as the Regent Honeyeater use the TSR network for food and nesting areas[9];

h) The woodlands contained in TSRs also provide habitat for a broad range of woodland birds in the sheep and wheat farming belt of NSW[10]. More than 60 species (25% of all native land bird species) have been identified as threatened or declining[11].

2.1.2 Connectivity conservation:

TSRs play an important role in connectivity conservation. Connectivity conservation is a developing approach to conservation that recognises the need for:

1. large-scale restoration and rehabilitation of heavily fragmented landscapes, so that protected areas do not remain isolated and suffer local extinctions of species;
2. conservation planning to factor in evolutionary and ecological processes on a large spatial scale; and
3. conservation management to extend beyond formally protected areas to the lands around them.[12,18]

The network of travelling stock routes in NSW provide a unique opportunity to apply the principles of connectivity conservation:

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[6] Oliver L., McLeish T (2007) *Box Gum Woodlands in Travelling Stock Reserves on the NSW South Western Slopes*. Draft report to Department of Environment and Climate Change (NSW).

[7] Department of Environment and Conservation NSW (2005) 'Golden Sun Moth- Priority Actions', *NSW Threatened Species,* Accessed 14.6.11. URL http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/pas_profile.aspx?id=10791

[8] . Department of Environment and Conservation NSW (2005) 'Grassland Earless Dragon- Priority Actions', *NSW Threatened Species,* Accessed 14.6.11. URL http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/pas_profile.aspx?id=10817

[9] Harris J. 'Northern NSW: Latest News', *Birds Australia* Accessed 14.6.11. URL http://www.birdsaustralia.com.au/the-organisation/northern-nsw.html

[10] Reid J. (1999) *Threatened and declining birds in the NSW sheep-wheat belt I: Diagnosis, characteristics and management.* Consultancy report to NSW National Parks and Wildlife Service. CSIRO Wildlife and Ecology: Canberra.

[11] Reid J. (1999) *op. cit.*

[12] . Mackey B., Watson J., Warboys G.L. of ANU Enterprises Pty Ltd (2010), *Connectivity conservation and the Great Eastern Ranges corridor,* an independent report to the Interstate Agency Working Group (Alps to Atherton Connectivity Conservation Working Group) convened under the Environmental Heritage and Protection Council/ Natural Resource Management Ministerial Council.

1. TSRs act as corridors and 'stepping stones', connecting fragmented vegetation across the landscape. In particular, they connect the remnants of a north-south corridor of woodland in eastern Australia. The links provided by TSRs allow animals and plants to disperse between remnant vegetation areas, promoting interbreeding between populations and allowing species to colonise new or abandoned habitats[13];

2. The TSR networks in NSW and Queensland also extend across climatic gradients in eastern Australia. Temperatures in eastern Australia generally increase from south to north, whilst moisture increases from west to east (Figure 1)[14]. These conditions have a major influence on habitat. As the TSR networks span these gradients, they allow species to move across the landscape in response to changes in rainfall and temperature. This enables the seasonal movement of species, particularly in response to extreme seasonal conditions such as drought[15];

Perhaps more crucially, the network may also help plant and animal species to survive climate change by allowing them to move to new areas, as habitats and food sources shift with changing weather patterns[16,22]

TSRs have also been incorporated as part of the Monaro Grassland Conservation Management Network, along with private land holdings, roadsides, cemeteries and other crown land[17,23]

[13] Reid J. (1999) *op. cit.*

[14] Sutherst B, Cleland E., Szabo J. and Rogers G. (2008) *A Protected Corridor for Travelling Stock and Biodiversity.* The case for conservation of the NSW TSRs and Qld SRN. Conference paper at 'Travelling Stock Networks: Biodiversity Highway of the Eastern Inland' Conference, Sydney

[15] Sutherst B. *et al.* (2008) *op. cit.*

[16] Sutherst B. *et al.* (2008) *op. cit.*

[17] Eddy D. (2007) The Monaro Grassland Conservation Management Network: Reconnecting the sward. *Ecological Management and Restoration.* **8**(3), 165-176.

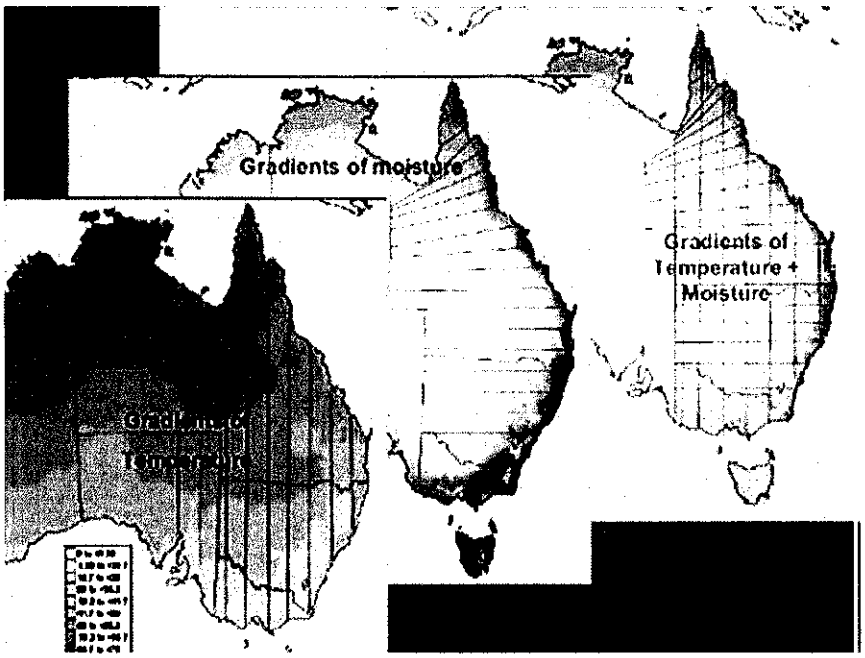

Figure 1: Gradients of temperature and moisture across eastern Australia[18]

2.2 Provision of Ecosystem Services

TSRs provide various ecosystems services including carbon storage, source of pollinators, improving air and water quality, nutrient storage and recycling and climate control.

2.3. Ecologically sustainable economic uses:

Agriculture

- TSRs can be an important source of feed for livestock during periods of drought[19];
- Grazing and droving of livestock on TSRs need not be incompatible with protection of the biodiversity values of the network. Although overgrazing and resulting damage to ecosystems is a serious problem, carefully managed intermittent grazing can promote survival of some native species in some ecosystems.[20];
- Intermittent managed grazing can also suppress some weeds, allowing native species to persist or re-establish in an area in some ecosystems[21].

[18] Sutherst B. *et al.* (2008) *op. cit.*

[19] Fatmata J., Cacho O., Marshall G. (2000) What price for the right to go a-droving? A derived demand approach. *Working paper series in agricultural and resource economics*, University of New England, Armidale.

[20] Davidson I., Scammell A., O'Shannassy P., Mullins M., Learmonth S. (2005) Travelling stock reserves: refuges for stock and biodiversity? *Ecological Management and Restoration.* **6**(1), 5-15.

[21] Davidson I. *et al.* (2005) *op. cit.*

- TSRs also provide a resource for apiarists, who can obtain licences to place bee hives on them.

Tourism.
The potential of TSRs for ecotourism is being increasingly recognised across NSW:

1. Barraba shire, in north-west NSW is well known as a breeding site for the Regent Honeyeater places are on the travelling stock routes that radiate around the district. In the 1990s local bird watchers published 'Bird Routes of the Barraba District' and the Regent Honeyeater became the emblem of the Shire[22];
2. There are now over 30 bird route brochures across NSW. Most are linked to travelling stock routes;
3. The "Long Paddock" is a touring route along the Cobb Highway, which follows part of the TSR network in Western NSW, stretching from the Victorian border to Wilcannia in the Central Darling Shire of NSW. A guide to the route and an audio tour CD have been produced, and 47 interpretive panels have been placed along the route, highlighting the history and stories of the TSRs and surrounding areas[23].

2.4. Rich cultural Heritage

Aboriginal culture and heritage.
Before European contact, Australia was criss-crossed by networks of Aboriginal travel lines. These trails connected food and water sources, and were used for travel, ceremonial and trade purposes. Traditional camping places were often located along these pathways[24].
Many TSRs may have developed by transfer of knowledge from Aboriginal guides and trackers, and workers in the pastoral industry, or by early Europeans observing the physical signs of traditional pathways and adopting them[25]. Traditional camping places were also sometimes gazetted as travelling stock reserves. The presence of scarred trees, middens and artefacts on many TSRs are evidence of the traditional spiritual and cultural connections of Aboriginal people with these areas. Many Aboriginal people have worked on the routes as drovers or in other roles, linking past and current uses of travel lines. As TSRs have remained publicly accessible they have often been sites for camping and provide resources used by many Aboriginal communities[26,35].

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[22] Watts R. 'Bird Routes of the Barraba district. *Conservation management network*. Accessed 23.3.11. URL http://users.tpg.com.au/tmcleish/animals/animals_birdroutes.html
[23] ' *The Long Paddock- Touring Guide*. URL http://www.thelongpaddock.com.au/
[24] Spooner P., Firman M., Yalmambirra (2010) Origin of Travelling Stock Routes. 1. Connections to Indigenous traditional pathways. *The Rangeland Journal* **32**, 329-339
[25] Spooner P., Firman M., Yalmambirra (2010) *op. cit.*
[26] Guilfoyle D. (2006) *Aboriginal cultural heritage regional studies: an illustrative approach* Department of Environment and Conservation NSW, Sydney

Historical development of TSRs.

The system of TSRs that developed in Australia is a unique institution of unusual scope and importance, both historically and currently. New South Wales, the oldest of the Australian colonies, pioneered the development and use of stock routes and the establishment of a formalized government administration for their management and maintenance.[36] TSRs today represent a continuation of early European pastoral activities in today's modern world. The drover is still an important part of the livestock industry in NSW and Queensland and connections with the rural landscape, lifestyle and working traditions are integral to the Australian identity. The historical importance of the TSR network was recently recognised by Minister Blair who stated in NSW Parliament that TSRs "play an important part in the history of New South Wales and will continue to do so in the future".[27]

Folk lore, songs and art.

The extensive range of poetry, song, stories and art works inspired by the travelling stock routes, their history and the industries they support is an intrinsic element of the Australian self image and relationship with the bush. TSRs have been an inspiration for many poets and song-writers over the years including Banjo Paterson, Henry Lawson, Kev Carmody and John Williamson.

The "Long Paddock" touring guide mentioned above has incorporated 11 major public artworks making the touring route the largest art gallery in the world.[28] 2.5. Social benefits of TSRs.

The TSR network has a wide range of recognised social benefits and a range of recreational uses of TSRs is permitted, including walking, running, picnicking, swimming, horse riding, fishing and pedal cycling. Recreational and sporting groups may also obtain permits for other uses of TSRs.

Bird watchers, field naturalists and environmental educators are regular visitors to the TSR network. TSRs provide easily accessible 'outdoor classrooms' for nature study and experience of the complex web of life in the Australian bush. Their social importance is reflected by the involvement of many community groups in the management and maintenance of TSRs.

One such group was formed in 2001 to control invasion by Coolatai Grass on heritage-listed Klori TSR which was identified as a TSR of floristic significance[29].

[27] Hansard 21 October – Questions without Notice URL https://www.parliament.nsw.gov.au/Prod/parlment/hansart.nsf/V3Key/LC20151015038?open&refNavID=HA8_1
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[29] Austen J. (2002) *The conservation and identification of biodiversity on Travelling Stock Routes and Reserves of north west New South Wales.* North West Rural Lands Protection Board: Tamworth, NSW.

Conclusion

NPA considers that the draft Framework needs significant revision if it is to provide a sound overarching framework for managing TSRs. The Draft Framework should:

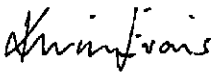
1. Extend the Planning Framework to apply to all TSRs in NSW.
2. Identify and discuss the social, cultural, environmental and economic values of TSRs based on objective data and evidence. The ecosystem services provided by TSRs must be recognised and included in economic valuations.
3. Ensure that appropriate recognition and protection is given to features of State and national significance including threatened species, endangered ecological communities and vegetation/wildlife corridors.
4. Identify of threats to social, cultural, environmental and economic values of TSRs and discussing how threats may be addressed based on objective data and evidence.
5. Set out specific matters that should be taken into consideration when assessing the future use and management of TSRs. These should include relevant Natural Resource Commission targets for natural resource management; State of the Environment and Catchment Action Plans; key biodiversity threats, threat abatement plans and priority action statements.
6. Set clear goals for economic, environmental and social outcomes.
7. Include monitoring and reporting requirements on how TSRs are being managed and whether economic, environmental and social outcomes are being met. There should be regular independent auditing of outcomes.
8. Reject a user pay model for the management of TSRs instead proposing additional funding from the State and Federal Government to support environmental conservation, provision of appropriate recreation opportunities and protection of cultural heritage.

Pending finalisation of the Draft Framework, NPA also considers that

- a moratorium on issuing long-term grazing leases to prevent environmental degradation of the TSR network should apply.
- LLS should engage key stakeholders, including community and conservation groups, in the revision of the draft Framework.

Given NPA's long involvement with issues related to TSRs, we hope to also be consulted in relation to Regional TSR Management Plans and local operational schedules.

Regards



Kevin Evans
Chief Executive Officer

NATIONAL PARKS ASSOCIATION OF NSW
protecting nature through community action

SUBMISSION by the

NATIONAL PARKS ASSOCIATION of NEW SOUTH WALES

ON

The CROWN LANDS LEGISLATION WHITE PAPER and the CROWN LANDS MANAGEMENT REVIEW

30 June 2014

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The National Parks Association of NSW

The National Parks Association of NSW Inc (NPA) welcomes the opportunity to comment on the Crown Lands Legislation White Paper.

NPA, formed in 1957, is a community based organisation with over 20,000 supporters from rural, remote and urban areas across the state. NPA promotes nature conservation and sound natural resource management. We have a particular interest in the protection of the State's biodiversity and its supporting ecological processes, both within and outside of the formal conservation reserve system. We promote connectivity conservation, for example, through our involvement in the Great Eastern Ranges Initiative. Our interests extend to protection and management of the heritage values of natural and cultural landscapes.

In addition to its interest in environmental and heritage conservation and management, NPA conducts numerous outdoor recreational activities and is one of the largest bushwalking organisations in NSW.

Crown lands are held on trust for the people of NSW. NPA's position is that:

1. Objects and management principles consistent with the principles of ecologically sustainable development must be incorporated in Crown Lands legislation.

2. Crown land should not be considered for conversion to freehold, transfer to other bodies, or new lease or licence arrangements unless its environmental, heritage and social values have been properly assessed. If it is assessed to be of high environmental conservation that land should remain Crown land and where appropriate be added to the NPWS' reserve system.

3. Management and administration of Crown land must be undertaken in a transparent and accountable manner.

4. There must be genuine and ongoing public participation in the management of Crown land, including its assessment and determination of its use, which accords with State NSW 2021 Plan - Goal 32: "Involve the community in decision making on government policy, services and projects".

5. Management of Crown land must accord with the State NSW 2021 Plan Goal 22: "Protect our natural environment, including to protect and conserve land, biodiversity and native vegetation".

NPA considers that the Crown Lands Management Review and Crown Lands Legislation White Paper fail to meet these requirements for reasons set out in its submission on the White Paper set out in the this Submission by the National Parks Association of NSW inc.

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NPA agrees that it is time that the administration of Crown Lands was made more efficient and that inconsistencies that have developed over many years should be removed. However, it is important that in doing this essential provisions that have served New South Wales well are not dropped in this process. Key points of concern are summarised below.

1.1 The White Paper and Crown Lands Review are Inadequate

NPA considers that both the White Paper and the Crown Lands Management Review are inadequate.

a. The Crown Lands Management Review failed to address one of its terms of reference to identify and recommend key public benefits (social, environmental and economic) derived from Crown land. This fundamental flaw is not acknowledged in the White Paper.
b. The White Paper lacks sufficient detail for the public to have an informed opinion on its implications. This is partly because proposals within the White Paper such as transferring lands to Councils rely on other legislation that is also under review.

The Government must release an exposure draft of any proposed Crown Lands legislation for public comment after the public has had the opportunity to comment on White Papers, including draft legislation, relating to all other relevant legislation under review.

1.2 Flawed Proposals for Decision-making, Management and Assessment

We consider that many proposals in the White Paper are flawed. These include:

a. The failure to require decision-making to be undertaken in accordance with the principles of ecologically sustainable development.
b. The removal of management principles currently in the *Crown Lands Act*.
c. The removal of assessment criteria currently in the *Crown Lands Act*.

1.3 Inappropriate Crown Lands Administration and Management

NPA strongly opposes Crown lands administration and management being undertaken by a Public Trading enterprise run on a business model. NPA considers that such a model will:

a. lead to the environmental, heritage and social values of Crown land being given insufficient consideration and managed poorly, resulting in diminution of those values; and
b. fail to acknowledge the diversity of purposes for which Crown land is reserved.

1.4 An Alternative Model for the Assessment, Management and Administration of Crown Lands

NPA proposes the establishment of a statutory Crown Lands Management Commission to administer and manage Crown lands with broad Government representation and an

advisory body representing stakeholders. NPA proposes a separate statutory, independent, expert Crown Lands Assessment Body *inter alia* to assess the environmental and heritage significance of Crown land and to advise on its future uses and management regimes.

1.5 Public Participation

We consider that there has been inadequate public participation in the process of developing the proposed new system for Crown lands management. There has been no Green Paper. The public has not been given the opportunity to comment on the Crown lands Management Review and draft legislation does not accompany the White Paper.

1.6 The Environmental Value and Significance of Crown Lands Must be Assessed

The outstanding environmental value of Crown lands and their importance in the conservation of biodiversity including threatened species, populations and ecological communities have been neglected in the Crown Lands Management Review and the White Paper. This is inconsistent with the Government's NSW 2021 Plan Goal 22: "Protect our natural environment, including to protect and conserve land, biodiversity and native vegetation"

Land must be assessed for its environmental and heritage significance before it is sold, has lease conditions weakened or is transferred to another body. The assessment must be accountable and transparent and include public participation.

Connectivity conservation must be a fundamental consideration in determining both the future ownership and management of all environmentally significant Crown lands including the network of Travelling Stock Routes and Reserves (TSRs) in the Central Division as well as Western Lands.

Land identified as having High conservation value (HCV), high cultural significance or providing connectivity must be managed to protect these values and should remain Crown Land.

As the body primarily responsible for administering and managing HCV Crown lands in the State, the National Parks and Wildlife Service (NPWS) should manage some but not all HCV crown lands. NPA considers that the proposed Crown Lands Management Commission would be primarily responsible for managing and administering the remainder as it would have the expertise and resources to properly manage these lands which local bodies such as council or local land services do not have. Further, management by numerous local bodies is likely to give rise to a piecemeal management of environmental and cultural values.

Converting land to freehold or weakening lease conditions in the fragile Western Division is likely to lead increased clearing and poorer land management resulting in not only a decline in environmental values, including a loss of biodiversity but also increased dryland salinity, erosion and aridification.

2. INTRODUCTION

The natural environment within the Crown Land estate of NSW is important for many reasons. It has an inherent value. It is culturally significant and provides resources, ecological services, carbon sequestration, living space and space for recreation. Our State is fixed in size yet it is expected to support an increasing population and increasing living standards.

Through its leadership, policy development and administration of legislation relating to Crown Lands, the NSW Government must continue to play a key role in managing the threats to the natural environment and ecological processes while reconciling the needs of a growing population and the demands for increased economic wealth[1].

The conservation values of Crown Lands have been highlighted in a number of reports prepared by NPA[2] [3] [4]. "The Significance of Crown Lands In Biodiversity Conservation" (2014), an analysis of the significance of Crown Lands in biodiversity conservation undertaken by the Nature Conservation Council of NSW and NPA, is set out in section 5 of this submission.

3. COMMENTS ON THE WHITE PAPER

3.1 Consolidation of legislation and simplification of administrative arrangements

In principle, NPA does not oppose the consolidation of Crown Lands legislation into a legislative package nor the simplification of some administrative arrangements such as the option of abolishing Reserve Trusts provided that the legislation achieves the following goals:

- Maintenance and where appropriate extension of current environmental and heritage protections;
- Decision-making based on objective criteria and evidence based on the principles of ecologically sustainable development;
- Reduction in Ministerial discretion to minimise corruption;
- Inclusion of a more transparent scheme for the assessment and management of the value of Crown Lands and the uses they should be put to; and
- Enhanced public participation in the assessment and management of Crown Lands

[1] NPA Submission to the Inquiry into the Management of Public Land in New South Wales (2012)
[2] Our Heritage Under the Hammer, The imminent fire sale of Crown leasehold lands in NSW, their outstanding conservation values, and how they can be saved (2005)
[3] The NSW travelling stock routes and reserves network: Heritage – Habitat – Livelihood (2011)
[4] The Unseen Conservation Estate: Tenure Security and Conservation Management of Crown Land in New South Wales (2005)

However, we have serious concerns about many proposals contained in the Crown Lands Legislation White Paper and the Crown Lands for the Future – Crown Lands Management Review Summary and Government Response because they do not meet these goals.

3.2 Proposed amendments to the Objects and the removal of the Principles in the *Crown Lands Act 1989*

Crown Lands are public assets and should be managed for the benefit of the whole community. Crown land currently is held for a diversity of purposes that include environmental protection, nature conservation, water conservation and recreation and is managed in accordance with a set of principles in s. 11 of the *Crown Lands Act 1989*. These are that:

a. environmental protection principles be observed in relation to the management and administration of Crown land,
b. the natural resources of Crown land (including water, soil, flora, fauna and scenic quality) be conserved wherever possible,
c. public use and enjoyment of appropriate Crown land be encouraged,
d. where appropriate, multiple use of Crown land be encouraged,
e. where appropriate, Crown land should be used and managed in such a way that both the land and its resources are sustained in perpetuity, and
f. Crown land be occupied, used, sold, leased, licensed or otherwise dealt with in the best interests of the State consistent with the above principles.

It is proposed to replace the current objects of the Crown Lands Act with a series of new objects and remove the principles that guide the objects entirely. Although one of the proposed new objects is to integrate social, economic and environmental considerations in decision-making, there is no indication how this will occur.

We oppose the removal of the principles for the management of Crown Land in the current Crown Lands Act. Environmental conservation and protection and the protection and proper use of natural resources must underpin any new legislation for Crown Lands. The proper integration of environmental, social and economic use must accord with the principles of ecologically sustainable development.

3.3 Crown Lands as a Public Trading Enterprise

The proposed establishment of Crown Lands as a Public Trading enterprise on a business model strongly implies that economic considerations will have primacy in decision-making at the expense of sound environmental management and proper consideration of social issues. This is reflected in the replacement of the requirement that lands in the Western Division must be managed in accordance with ecologically sustainable development with one that requires only consideration of land use capability. NPA opposes these proposals and regards them as seriously retrograde steps in the management of Crown Land.

3.4 An Alternative Model for Administration and Management of Crown Lands

NPA recommends consideration of a new model with the administration and management of Crown Lands primarily carried out by a new statutory body, a Crown Lands Management Commission and that the Western Lands Commission should be a division within it.

The Commission would include Representative from relevant Government Departments and would have an Advisory Body comprising representatives of stakeholder groups including environmental groups and organisations involved in the conservation of Aboriginal and European Heritage.

The Commission would include a Business Unit that would be responsible for the collection of commercial rents and licence fees, sale of Crown lands and negotiation of commercial leases but would not be responsible for administration, assessment nor management of Crown Land nor for drawing up the terms non-commercial leases including leases in the Western Division.

The Crown Lands legislation would provide that the Commission can only enter into the sale, new lease or transfer of land if the significance of its environmental, heritage and social significance had been undertaken and it was found to be in the public interest to sell, lease or transfer the land.

NPA considers that such a Commission would provide a more open and transparent assessment of Crown land than under the current Crown Lands legislation or is proposed in the White Paper. It would:

- allow for a whole of Government approach to Crown Lands management;
- provide holistic management of Crown Lands which have multiple values such as Travelling Stock Routes and Reserves;
- reduce Ministerial discretion thereby reducing the potential for corruption;
- better consider stakeholder input; and
- increase public confidence in the management and administration of Crown Lands.

For Crown Lands to be administered and managed properly there must be adequate funding. Increased funding could be used *inter alia* for better fire management and weed and feral animal control.

3.5 An independent expert Assessment Body is needed to complement the proposed Commission.

NPA commends the establishment of a separate independent expert Crown Lands Assessment Body along the lines of the Victorian Environment Assessment Council to:

1. address the term of reference - to identify and recommend key public benefits (social, environmental and economic) derived from Crown land -that has not been done in the Crown Lands Management Review;

2. assess in accordance with statutory criteria the environmental, heritage; social and values of Crown land including seeking public and stakeholder submissions on such values and potential use(s) of the land;
3. identify land of State or local significance;
4. determine the future use(s) of Crown land;
5. determine appropriate management regimes for Crown land according to its recommended use(s) and seek stakeholder and public comments on such regimes; and
6. provide advice on particular aspects of Crown land management.

This Crown Lands Assessment Body would include members with expertise in a number of disciplines including ecology and biodiversity conservation and the conservation of Aboriginal and European heritage.

The proposed Crown Lands Assessment Body would be a statutory body with its powers and responsibilities set out in legislation and would not be subject to Ministerial control relating to the preparation and contents of any advice or recommendation but in other respects would be subject to the control and direction of the relevant Minister.

NPA considers that the creation of an Independent expert Crown Lands Assessment Body would provide a more open and transparent assessment of Crown land than under the current Crown Lands legislation or is proposed in the White Paper. It would also:

- provide objective evidence-based advice;
- provide transparent and accountable recommendations about the assessment, management and uses of Crown Land
- lessen the risk of corruption; and
- increase public confidence in the assessment and management of Crown land.

3.6 Assessment of Crown Lands

Of great concern is the abolition of land assessment requirements in the proposed legislation. Justifications given for this omission include that a parcel by parcel approach is time consuming and inefficient. However, currently assessment can be waived in certain circumstances. We consider that it is essential that new legislation includes a transparent scheme for assessment or re-assessment of the appropriate purposes of Crown land before decisions are taken about sale, transfer or other dealing with Crown Land.

NPA asserts that the assessment of the environmental significance of Crown land should be undertaken as discussed above in section 3.5.

The assessment process must provide for public consultation not just consultation with a few selected stakeholders or Government Departments. What is currently proposed is not transparent, is based on unknown criteria and could foster corruption. It undoubtedly will result in *ad hoc* inappropriate dealing with Crown land.

There are many areas of Crown land that have already been assessed under previous whole of government processes such as Regional Forest Agreements and the Western Regional Assessment (Brigalow-Nandewar bioregions). The recommendations of these assessments relating to lands of high environmental value should be implemented.

3.7 Identification of Crown land of State or Local significance

NPA considers that the assessment and identification of parcels of land, which are of high environmental conservation value, that is of "State" rather than "local" significance should be undertaken as discussed in sections 3.5 and 3.6 above.

The proposal to define criteria to distinguish land of local significance must be transparent and properly take into consideration matters relating to the environmental, Aboriginal and European Heritage and social significance of land. The public not just selected stakeholders should have the opportunity to comment before such criteria are finalised and they should be clearly set out within the legislation.

Any criteria developed must be applied on a parcel by parcel basis otherwise the environmental, heritage or social significance of individual parcels of land will not be adequately considered. A parcel of land may have more than one designated use. Further, small parcels of land can have State or even national significance. For example, they may contain threatened species, populations or ecological communities.

3.8 Transfer of Crown Land to Local Bodies

It is proposed that land of "local significance" be transferred to local bodies, including local councils. Crown lands transferred to Councils will become subject to Local Government legislation. However, since the Local Government Act and other relevant legislation are also under review, the legislative scheme under which transferred land may be managed is uncertain. It is imperative that lands which are assessed to have environmental, heritage or social significance have similar restrictions on sale and requirements for plans of management that currently apply to community land under the *Local Government Act 1993.*

It is NPA's position that the Government should not proceed with Crown lands legislative reform until other relevant legislative reforms are completed so that the public can properly ascertain what the implications of any transfer of land to other bodies will be.

Transfer of land to local bodies is likely to result in loss of opportunities to manage Crown Lands in a holistic manner and could result in piecemeal inconsistent management between parcels. This is of concern because significance of conservation connectivity cannot be overestimated.

An example where opportunities for connectivity conservation could be lost through transfer of lands to local councils is the bushland catchment and surrounds of Narrabeen Lagoon. This land contains a mosaic of land designations, all notionally intended for environmental protection or open space. It includes Crown Reserves and vacant Crown land. Transferring this land to councils would mean that three separate bodies rather than

one could administer the land. A co-ordinated approach to fire management across jurisdictions has been developed and the opportunities for conservation management by a single body are obvious. NPA notes that much of this Crown land is subject to Aboriginal land claims.

Parcels of remnant urban bushland are becoming increasingly rare as the population of cities and towns grow. They are very important for passive recreation such as bushwalking, birdwatching and photography. Transferring parcels of land to local authorities is also likely to break up management of some significant walking tracks within metropolitan Sydney and elsewhere.

There are no proposals within the White Paper to increase funding to local bodies to manage land transferred to them. Transfer of Crown land to local bodies not accompanied by financial assistance will likely result in poor management and pressure to sell or develop land. A financial burden could also be placed on some local bodies if they were required to pay local government rates on transferred land.

3.9 Lack of Public Participation

We consider that there has been inadequate public participation in the process of developing the proposed new system for Crown lands management. There has been no Green Paper. The public has not been given the opportunity to comment on the Crown lands Management Review and draft legislation does not accompany the White Paper. This is inconsistent with the Government's NSW 2021 Plan - Goal 32: Involve the community in decision making on government policy, services and projects.

We consider that an Exposure Draft Bill for a new scheme for Crown lands must be released for public comment prior to the introduction of any Bill to Parliament. This should not occur until Government review of all other relevant legislation including the Local Government Act, the Aboriginal Land Rights Act and the Threatened Species Conservation Act has been finalised and the public has had the opportunity to comment on exposure drafts for all relevant legislation. Failure to do this will deny the public the opportunity to have meaningful input into proposals to amend Crown lands legislation.

4. ISSUES RELATING TO SPECIFIC TYPES OF CROWN LAND

4.1 Introduction

NPA has identified issues and concerns relating to specific Crown lands that are relevant to the Crown Lands Management Review. They are:

- Travelling Stock Routes and Reserves
- Western Division Lands
- Crown lands which have already been identified as being of high conservation status by intergovernmental or whole of Government assessments
- Crown lands subject to Aboriginal land claims

- Crown Road reserves
- Unallocated Crown lands and Crown lands no longer required for their allocated purpose
- Subtidal lands.
- State Parks
- Crown Leases

Issues and concerns related to each type of Crown land are discussed below.

4.2 Travelling Stock Routes and Reserves – Central Division and Eastern Divisions

The TSR network in New South Wales is an extensive network of Crown land that was established for the droving of sheep and cattle during early European colonisation, often along traditional Aboriginal pathways through the landscape. The TSR network includes stock routes as well as fenced areas for camping and watering stock overnight. Although the main purpose of the TSR network was originally for droving stock, the network is now recognised for its environmental, economic, cultural and social importance. Tourism activities such as birdwatching and heritage trails are undertaken on TSRs.

TSRs are still important in times of fire, drought and flood. Given that models of climate change predict these events to occur more frequently, the value of TSRs for short term grazing should not be underestimated. An economic analysis of the value of TSRs has highlighted the economic benefits resulting from ecological services[5].

The TSR network in the Central and Eastern Divisions comprise land under the *Crown Lands Act 1989*. The TSR network in these divisions comprises approximately 6,466 separate reserves totalling 740,000 hectares.

TSRs preserve a range of threatened ecological communities and species. Additionally, many TSRs, which generally have not been cleared, protect remnants of woodland vegetation in the otherwise highly-cleared wheat and sheep farming belt of New South Wales. Often, these remnants are the best examples of ecosystems and communities that are not well represented in National Parks and other NPWS' estate. Across the state, approximately 80% of TSRs contain vegetation communities of high or very high conservation status[6]. (See further discussion of the significant conservation values of TSRs in Section 5 below).

The TSR network provides a unique opportunity for large-scale, connectivity-based conservation, which may mitigate the effects of climate change on native species. Effective management and restoration of the TSR network would make a significant contribution towards state, federal and international biodiversity conservation targets[7] [8] [9] [10].

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[5] Estimating the Value of Ecosystem Services Provided by Travelling Stock Routes (2012)
[6] The NSW travelling stock routes and reserves network: Heritage – Habitat – Livelihood (2011)
[7] Australia's Strategy for the National Reserve System 2009-2030 (2009)
[8] NSW National Parks Establishment Plan 2008
[9] Building Nature's Safety Net (2011)
[10] The NSW travelling stock routes and reserves network: Heritage – Habitat – Livelihood, (2011).

The relatively light grazing regimes of many leasehold blocks, and the intermittent grazing of those TSRs still used for their traditional purposes, have both been conducive to a higher level of protection for native species and communities than on adjacent freehold land.

NPA advocates the retention of TSRs under a single land management agency, the proposed Public Lands Management Commission, with a management regime that provides for sustainable conservation of natural and cultural values, including conservation of natural habitat. TSRs should also be available for long distance travel on foot.

NPA considers that Local Land Services are not the right bodies to review the future use and management of TSRs because they are localised in their operations and they individually do not have a broad overview of the TSR system. They also do not have appropriate expertise in assessing the environmental significance of ecosystems or recommending appropriate management regimes for HCV land.

4.3 Western Lands Division

Whilst the decision to retain the Western Division under leasehold tenure had been made under the *Crown Lands Act 1884*, it was the 1901 *Report of the Royal Commission to Inquire into the Condition of the Crown Tenants, Western Division of New South Wales* that laid the basis for the current system of land administration by the Western Lands Commission. The Royal Commission provided a damning account of what in today's terms would be described as an ecological collapse, arising from the absence of any appropriate controls over the use of the fragile rangelands.

Since that time, over a century of accumulated experience and scientific knowledge has only further confirmed the need to maintain these lands in Crown ownership under a regime of low modification. Predicted models of climate change suggest lands in the Western Division will be subject to longer periods of drought in the future. Such environmentally sensitive land can be rapidly degraded through freehold conversion of leases, licensing TSRs for long term grazing or timber removal, or weakening management requirements. Aridification, dryland salinity and erosion are all associated with land clearing in the Western Division.

It should be noted that in the western United States, where 60 million people reside and agricultural productivity is considerable, the Federal Bureau of Land Management retains public ownership of grazing lands across a vast area[11]. This grazing licensing system underpins the management of the US rangelands, including adjustment of practices according to sustainability needs.

[11] Bureau of Land Management (2004), cited in The Unseen Conservation Estate (2005)

When adhered to, the conditions of grazing leases offer more comprehensive protection to environmental values than laws applying to freehold tenure[12]. Any perceived benefits of reducing red tape by having a single legislative regime applying to the land are outweighed by the positive conservation benefits of having more than one form of protection for land of HCV. Potential negative impacts permissible under one legislative regime may be prevented by other environmental protection requirements including lease conditions.

NPA considers that leasehold conditions have provided better protection of native vegetation of the environmentally sensitive lands in the Western Division than the *Native Vegetation Act 2003*. Therefore, NPA is deeply concerned by the proposal that this legislation should replace lease conditions in the Western Division especially as provisions in the *Native Vegetation Regulation 2013* have reduced protection of native vegetation.

A recently announced review of other environmental legislation including the Threatened Species Conservation Act could also lead to reduced protection of threatened species, communities and populations of flora and fauna again making lease provisions requiring environmental conservation more essential.

Rather than considering converting leasehold Crown land to freehold, consideration should be given to revising land management priorities and associated cost sharing. Consideration should be given to reducing the rent of properties where active conservation measures are pursued. Part of this revision of land management priorities should also where appropriate transfer HCV land to the NPWS' reserve system.

Converting HCV leases for a one-off, insubstantial return may be a short tem measure. The Government may later end up later repurchasing the same land for conservation purposes. This has occurred on a number of occasions in the past including in the Pilliga where former leasehold land was subsequently bought back to add to Pilliga Nature Reserve at a higher price[13].

Lands in the Western Division are very poorly represented in the NPWS' reserve system. Less that 4% of the whole of the Western Division is currently protected within secure reserves under the NPW Act. Various reports have stressed the need to significantly increase the area protected under secure protected areas in this region to conserve biodiversity and cultural heritage and build resilience to the impacts of climate change[14] [15] [16]. New and larger parks in this region can also have a real positive effect on regional economies through sustainable tourism and employment.

NPA asserts that increased funding should be made available for the purchase of HCV Western Division leases to enable to progressively build up the reserve system there. To promote conservation in the Western Division, conservation should be included as one of the purposes for which a lease can be held.

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[12] The Unseen Conservation Estate (2005)
[13] The Unseen Conservation Estate NPA (2005)
[14] The NSW National Parks Establishment Plan (2008)
[15] Australia's Strategy for the National Reserve System 2099-2030 (2009)
[16] Building Nature's Safety Net (2011)

As well as leasehold land for grazing or cropping in the Western Division there are TSRs held by private landholders as leaseholders under the *Crown Lands Act (1989)*. The requirement to provide access to travelling stock is a condition of the relevant leases. Such lease provisions should be retained.

4.4 Crown Land Assessed under Intergovernmental or whole of Government Assessments

As mentioned above, most Crown lands within coastal bioregions and within the Brigalow and Nandewar bioregions have been comprehensively assessed under previous intergovernmental or whole of Government processes. Land identified as being appropriate to manage under the NPWS Act should be transferred to the NPWS' reserve system. These include lands identified in:

- Upper and Lower North East RFAs
- Southern RFAs
- Brigalow – Nandewar Regional Assessment

Some of these would constitute new, stand-alone small reserves, but the vast majority of them are small areas of Crown land adjoining or embedded within existing NPWS' reserves and are clearly sensible and logical additions to those reserves enabling better and more effective and efficient management of those reserves as a whole.

4.5 Land subject to Aboriginal Land Claims

The White Paper is silent as to what will happen to Aboriginal land claims over Crown lands and who will administer these lands pending resolution of land claims. A review of the Aboriginal Land Rights (ALR) Act, which is also underway, may clarify this issue. Although it was announced that a draft Bill amending the ALR Act would be released for public comment in early 2014, this has not occurred. For the public to properly understand the implications of the Crown Lands Review for Crown lands subject to Aboriginal land claims, it is essential that the Bill amending the ALR Act be released for public comment, prior to further public consultation on the Crown Lands Review occurring.

Given that Aboriginal land claims extend over the majority of unreserved Crown land in central and eastern NSW, there is the potential for very large areas of land to eventually be transferred to Aboriginal bodies. NPA is concerned about the short and long term future of these large and significant areas of Crown land, many of which have extremely high natural and heritage values. If the previous slow rate of progress by the Government in assessing land claims continues these claims may not be resolved for decades. If this is the case, then this is of serious concern to NPA as the White Paper does not indicate how these lands will be managed and who will be responsible for their management pending resolution of land claims.

4.6 Crown Road Reserves

The existence of many road reserves, including even 'paper' roads running towards, alongside and through NPWS' reserves (existing and proposed), raises several urgent issues.

On the one hand, some of these can provide access for activities that are inappropriate for the long term sustainable management of those reserves (in which case NPA supports their progressive revocation and inclusion within the adjoining parks).

On the other hand, road reserves may be vital to ensuring legal right of access is provided to the park for both park managers and the public. In this case NPA is concerned that hundreds of such road reserves are currently being closed and sold to adjoining landowners before NPWS can properly assess the impacts of the closures on their management needs for those parks or on the maintenance of legal access to those parks for management, visitation and recreational activities.

NPA understands that the process undertaken by the Government, whereby over $30 million was allocated to the Lands Department to expedite these closures, with no funds given to other agencies, has meant that the NPWS and other agencies, have thousands of closure applications that they cannot assess properly (or at all in many cases) in the limited time imposed by the Lands Department. This approach runs counter to the White Paper's asserted consultative whole of government approach and for the access to public land to be maintained or enhanced. Clearly, more resources, more realistic timeframes for assessment and greater inter-Department liaison are required in respect of these closure applications.

4.7 Unallocated Crown Lands and Other Crown Lands no longer required for their allocated use.

NPA considers that there is much other Crown land of HCV that is currently unallocated or allocated to various other long-term uses. The current Crown Lands Review raises the opportunity to identify lands which are no longer required for their current purpose or are unallocated and add them to the formal reserve system or change their management to give recognition to their environmental significance. These parcels of land can form important links in connectivity-based conservation, examples include disused rail corridors.

A parcel of land no longer required for its designated use should revert to being unallocated Crown land with its future use re-assessed for its environmental, heritage and social significance. Where it is assessed to be of high environmental value, appropriate management should be put in place.

4.8 Subtidal lands

For many coastal national parks and other conservations reserves, the boundary of the reserve only extends to mean high water mark. This means that shoreline habitats are under two different management regimes – one above mean high water mark, the other below it. Even more confusing for park users and land managers is where some lands

within a reserve extend to low water mark but others do not. These management regimes are not optimal for maximizing conservation and protection of coastal habitats. NPA considers that all land adjacent to formal conservation reserves should extend to at least mean low water mark.

We understand that OEH has undertaken a comprehensive assessment of all areas of intertidal areas adjoining all its coastal parks reserves and identified those that would more appropriately be managed as part of the adjoining coastal NPWS' reserve.

4.9 State Parks

NPA considers that any new Crown lands legislation should make specific provision for the dedication, management and administration of State Parks to recognize their social and environmental significance and to give accountability and transparency in their management and administration. Such provisions should include requirements for plans of management and restrictions on revocation of their state park status.

4.10 Crown Leases

The NPA has had long-standing interest in the management of perpetual leases, including Crown Leases in the central and eastern Divisions. Similar to leases in the Western division, the leasehold conditions and controls over their management meant that many of them maintained their natural qualities, often when the surrounding freehold lands were being progressively clear-felled. Consequently, NPA has long advocated that those perpetual leases with high natural and cultural heritage conservation value should not be converted to freehold, but maintained in public ownership.

The Government in 1990 placed a moratorium on the conversion of perpetual leases pending an assessment of their environmental conservation values. This assessment process identified that around 10,000 leases had HCV. The Government then placed on a moratorium on conversion of these lease to freehold.

In 2006, the Government lifted the moratorium. After public concern, including from NPA, a second round of assessments found that around 6,500 Moratorium leases maintained their HCV status with a further assessment showing that around 2000 of these met criteria for inclusion within the reserve system under the NPW Act.

Nevertheless, the Government, subsequently, resolved that all leases, which had been subject to the moratorium, be allowed to be converted to freehold if a conservation covenant was placed over those identified as having HCV. Funds were also provided for the purchase of these leases for inclusion in the NPWS' Reserve system. This funding was sufficient to acquire only 16 of the 400 Moratorium Leases identified for purchase.

Former lessees of these leases have the choice of a covenant being imposed on the land converted under the *Crown Lands Act 1989* or *National Parks and Wildlife* (NPW) *Act 1974*. NPA understands that the majority of covenants have been placed on these lands under the *Crown Lands Act 1989* that provides weaker protection of HCV values than the NPW Act.

Accordingly, NPA believes that:

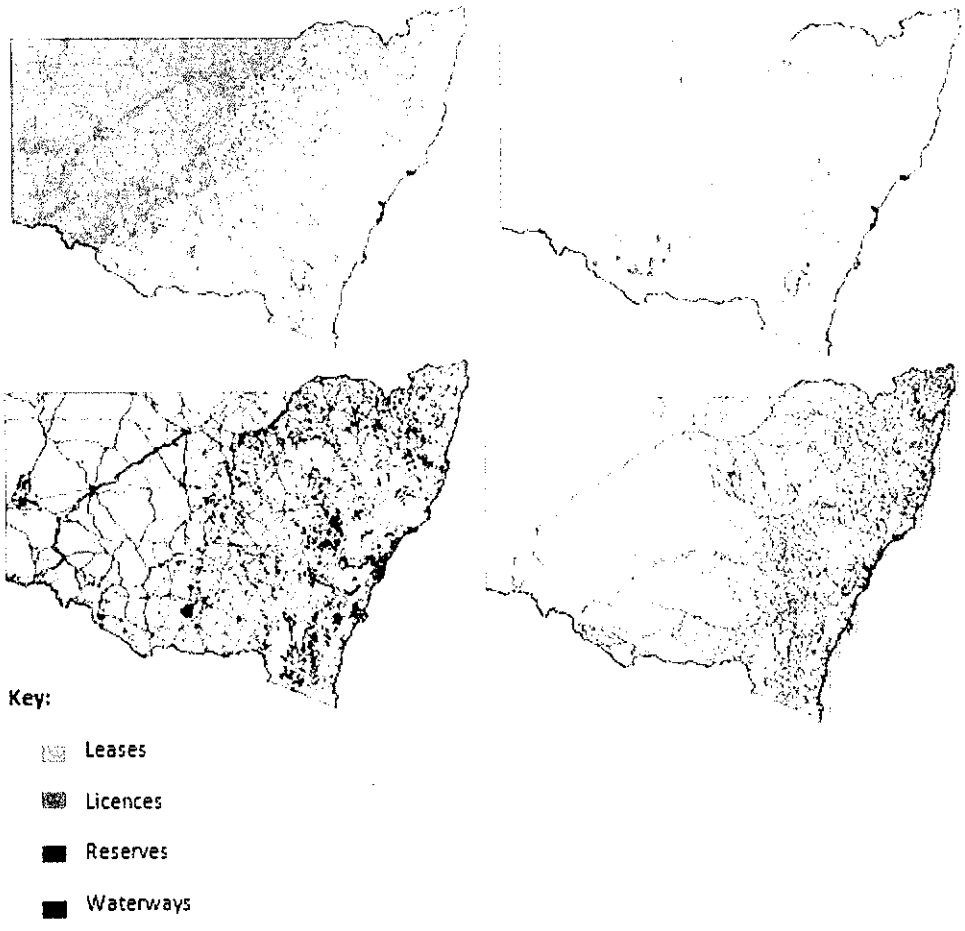
- The moratorium on the conversion of any remaining HCV Crown Leases should be reinstated.
- A further allocation of funding be made for acquisition of HCV leases for inclusion in reserves administered by NPWS
- Covenants placed on leased Crown lands with HCV, which are converted, to freehold should have covenants applied which reflect requirements under the NPW Act.

5 THE SIGNIFICANCE OF CROWN LANDS IN BIODIVERSITY CONSERVATION

1. CONSERVATION VALUES OF CROWN LAND

The Crown Lands estate covers millions of hectares, including significant areas of high conservation value. **Diagram 1** shows the extent of the Crown Lands Estate in NSW.

Diagram 1: Extent of Crown Lands in NSW



Data source: NSW Crown Lands Division and NSW Office of Environment and Heritage. Analysis performed using ArcGIS.

Crown land, especially in central and western NSW, represents a significant proportion of the remaining vegetation within some catchments. Crown lands in urban areas can contain

important remnant vegetation and can be critical to the survival of native flora and resident, itinerant and migratory animals.

In response to the Government's current review, the National Parks Association of NSW and Nature Conservation Council of NSW conducted an assessment of the conservation values of NSW Crown land. The following Crown land types were analysed:

1. Crown reserves – all Crown reserves including TSRs
2. Crown leases – all forms of leases, distinguishing Western Division leases from other leases
3. Crown waterways – all waterways across NSW

Road reserves and enclosure permits were not analysed. Further details about the assessment methodology and results are found in **Attachment 1**.

For each land parcel of each Crown land type the following values were assessed:

1. Statutory/Conservation status:
    a. Number of threatened fauna
    b. Number of threatened flora
    c. SEPP14 Coastal wetland presence
    d. SEPP26 Littoral rainforest presence

2. Landscape Conservation Values:
    a. Landscape % Cleared based on Mitchell landscapes
    b. Connectivity Presence based on statewide extant native vegetation

3. Condition:
    a. Associated Vegetation Patch Size
    b. Disturbance Level – low disturbance located more than 1km from infrastructure

For each Crown land type, tabulated data indicating conservation values for each CMA were produced. See **Attachment 2**. For each value assessed (except connectivity), a set of detailed maps was produced refer to **Attachment 3**. The assessment was limited to readily available statewide spatial datasets and the values of the Crown lands analysed. Further information about the limitation of the analyses is in **Attachment 1**.

The assessment reveals that the Crown lands assessed have the following highly significant conservation values.

- **All Crown land types** offer a range of important conservation values. These values include providing remnant vegetation and habitat for threatened species in highly cleared landscapes, habitat connectivity and irreplaceable coastal values.

- **Crown leases** and **Crown reserves** overwhelmingly offer high habitat connectivity, especially the Crown leases of the Western Division.

- **Crown leases in the Central and Eastern divisions** and **Crown waterways** contain extremely important vegetation remnants in heavily cleared landscapes, with many Crown leases forming part of remnants larger than 1,000ha.

- Significant records of threatened species have been found across **all Crown land types**, with **Crown reserves** showing the highest abundance of threatened species recorded.

- Most **Crown lands of Central Division** contain endangered ecological communities.

- **Crown leases in Western Division** within Western CMA contain extremely high numbers of threatened species records while for **most Crown land types,** Northern Rivers, Hunter-Central Rivers and Southern Rivers CMAs tend to have the highest occurrence of threatened species records.

- **Crown reserves** and, to a lesser extent, **Crown waterways** are important sites for coastal wetlands and littoral rainforests recognised in SEPP designations. Over 2,000 of these Crown parcels contain these values.

Further summaries of values for each Crown land type are found in **Attachment 1** under the 'Summary of conservation assessment' results heading. Table 1 below summarises the results of the assessment by Crown land type.

Table 1. Conservation values by Crown land type

Conservation Value	[illegible]	[illegible]	[illegible]	[illegible]
Number of land parcels	**20,102**	**17,453**	**21,223**	**122,711**
Proportion cleared - landscape rarity				
0-30% cleared	13%	78%	14%	55%
30-50% cleared	18%	12%	14%	9%
50-70% cleared	24%	9%	25%	14%
>70% cleared	45%	1%	46%	23%
Proportion part of small-large patch size				
Small (<250 ha)	22%	4%	23%	11%
Medium (250-1,000 ha)	10%	6%	7%	4%
Large (>1,000 ha)	38%	82%	22%	9%
Proportion with habitat connectivity	**79%**	**96%**	**29%**	**69%**
Proportion with low disturbance	**61%**	**58%**	**33%**	**16%**
Contains threatened flora	**93**	**203**	**154**	**974**
1-2 species	73	152	112	712
3-6 species	17	45	30	196
7-10 species	2	2	9	35
>10 species	1	4	3	31
Contains threatened fauna	**643**	**1,526**	**647**	**3,386**
1-2 species	394	902	349	2,272
3-6 species	162	389	137	686
7-10 species	43	117	50	164
>10 species	44	118	111	264
Contains SEPP 14 - coastal wetlands	**48**	**n/a**	**610**	**1,415**
Contains SEPP26 - littoral rainforest	**5**	**n/a**	**14**	**107**

The conservation values of Crown lands should be of high priority, particularly taking into account the fact that NSW is facing unprecedented environmental challenges including the loss and fragmentation of native vegetation and wildlife habitat.

The 2012 *State of the Environment* Report confirms that:
"The overall diversity and richness of native species in New South Wales remain under threat of further decline".

Our extensive public land estate contains significant remnants of relatively undisturbed natural landscapes in rural, coastal and urban areas that when properly managed contribute enormously to the conservation of native vegetation, wildlife habitat and connectivity, biodiversity and coastal environments, wetlands, rivers and estuaries in NSW.

Often these public lands support threatened species and the last vestiges of endangered ecological communities lost from surrounding private lands due to development pressures. A number of high conservation value Crown lands are identified in Local Environment Plans

for transfer to the National Parks Estate, and would be lost to the public should such Crown lands be sold.

The Crown land estate provides many valuable ecosystem services which have been identified in Catchment Action Plans. The retention and appropriate management of these services will provide a long-term public benefit in the form of landscape resilience and river health.

ATTACHMENT 1: Assessment of conservation values of NSW Crown lands

Introduction

Between June 2013 and June 2014 National Parks Association of NSW and Nature Conservation Council of NSW conducted an assessment of the conservation values of NSW Crown land. The following Crown land types were analysed.

1. Crown reserves – all Crown reserves including TSRs
2. Crown leases – all forms of leases, distinguishing Western Division leases from other leases
3. Crown waterways – all waterways across NSW

Road reserves and enclosure permits were not analysed.

The assessment was carried out by pro-bono GIS consultants with further analysis conducted by pro-bono technical consultant Andrew Cox.

Conservation values assessed

The assessment was carried out by using available spatial data of conservation values and intersecting this with each Crown land type. The following values were identified for each land parcel of each Crown land type:

1. Statutory/Conservation status:

a. **Number of threatened fauna** – Total number of different threatened fauna recorded on the parcel from the Atlas of NSW Wildlife. Threatened status was based on the Threatened Species Conservation Act.
b. **Number of threatened flora** – Total number of different threatened flora recorded on the parcel from the Atlas of NSW Wildlife. Threatened status was based on the Threatened Species Conservation Act.
c. **SEPP14 Presence** – value of SEPP14 denotes presence
d. **SEPP26 Presence** - value of SEPP26 denotes presence

2. Landscape Conservation Values:

a. **Landscape % Cleared** – rarity of the landscape unit on which the reserve parcel sits based on Mitchell landscapes. The following ranges were recorded:
    i. 0-30% largely uncleared
    ii. 30-50%
    iii. 50-70%

iv. > 70% over-cleared landscapes & therefore high rarity

b. **Connectivity Presence** – presence of connected habitat associated with the reserve parcel based on statewide extant native vegetation

3. Condition:

a. **Associated Vegetation Patch Size** – size of overall vegetation patch that the reserve parcel is associated with (extending beyond the boundaries of the reserve parcel). This reflects the ability of the size of the patch to support fauna generally from small (low or local) to large (regional significance)
   i. Small: 1 – 250 ha
   ii. 250 – 1000 ha
   iii. Large: > 1000 ha

b. **Disturbance** Level – low disturbance = reserve parcels associated with areas located > 1,000m from infrastructure

Maps of conservation values

For each value assessed, a set of maps was produced. The maps also show the CMA regions. For each Crown land type there are two sets of maps. One set covers the coastal CMAs while the other covers the inland CMAs. CMAs were used since the Local Land Services boundaries were not available when the assessment was undertaken in mid 2013. No map showing connectivity was produced.

The following maps were produced for each Crown land type:

- Threatened flora
- Threatened fauna
- Coastal wetland and littoral rainforest presence (coastal CMAs only)
- Low disturbance
- Patch size
- Landscape clearance

The maps are displayed in **Attachment 3**.

Summary of conservation assessment results

The assessment reveals that the Crown lands assessed have significant conservation values.

<u>Standout values across all Crown land types</u>

- **All Crown lease types** offer a range of important conservation values. These values range from providing remnant vegetation and habitat for threatened species in highly cleared landscapes, habitat connectivity and irreplaceable coastal values.
- **Crown leases** and **Crown reserves** overwhelmingly offer high habitat connectivity, especially the Crown leases of the Western Division.

- **Crown leases in the Central and Eastern divisions** and **Crown waterways** contain extremely important vegetation remnants in heavily cleared landscapes, with many Crown leases forming part of remnants larger than 1,000ha.
- Significant records of threatened species have been found across **all Crown land types**, with **Crown reserves** showing the highest abundance of threatened species recorded.
- Most **Crown lands of Central Division** contain endangered ecological communities.
- **Crown leases in Western Division** within Western CMA contain extremely high numbers of threatened species records while for **most Crown land types,** Northern Rivers, Hunter-Central Rivers and Southern Rivers CMAs tend to have the highest occurrence of threatened species records.
- **Crown reserves** and, to a lesser extent, **Crown waterways** are important sites for coastal wetlands and littoral rainforests recognised in SEPP designations. Over 2,000 of these Crown parcels contain these values.

Central and Eastern Division Crown leases

- **Crown leases within Eastern Division** mostly protect landscapes that are generally uncleared (less than 50% cleared)
- **Crown leases** within Northern Rivers, Hawkesbury-Nepean and Southern Rivers CMAs mostly form part of large patches of vegetation (>1,000 ha).
- All **Crown leases in Central and Eastern divisions** are well connected, with an average of 79% of leases having high habitat connectivity. Crown leases in Sydney Metro, Lachlan and Murrumbidgee CMAs are the least connected (between 57% and 66% of leases connected).
- More than half of **Crown leases in the Central Division** are important for protecting heavily cleared landscapes. Lachlan, Central West, Namoi and Murray CMAs have between 58 and 72% of Crown leases within these heavily cleared landscapes.
- Almost all **Crown leases of Central Division** are likely to contain endangered ecological communities (see related point regarding limitations of this assessment)

Western Division Crown leases

- **Western Division** leases are extremely well connected and are part of large remnants in largely intact uncleared landscapes. Over 95% of Western lease parcels are well connected, over 80% are part of remnants greater than 1,000 ha and close to 80% are found in intact landscapes with less than 30% cleared.
- Within the **Western Division**, the **Crown leases** within the Murray, Murrumbidgee and Central West CMAs are particularly important since they are found in more cleared landscapes, and in the case of the Murray and Murrumbidgee CMAs, are likely to protect smaller remnants that are less well connected.
- **Western Division leases** generally have lower disturbance, most being found more than 1km from infrastructure.
- **Western Division leases** have high records of threatened fauna, with the Western CMA part of Western Division containing extremely high numbers of land parcels with threatened fauna records (858 parcels, 54 of these with more than 10 different threatened fauna species).

Crown waterways

- **Crown waterways** are extremely important in protecting vegetation in heavily cleared landscapes in central NSW. In Central West, Lachlan and Murrumbidgee CMAs, between 65% and 79% of Crown waterways are found within heavily cleared landscapes.
- Most **Crown waterways** are part of small vegetation patches (less than 250ha), however in western NSW they overwhelmingly form part of large patches of vegetation.
- **Crown waterways** are highly connected, with an average of 71% of land parcels being connected, ranging from 45% in Murrumbidgee CMA to over 96% for Lower Murray-Darling and Western CMAs.
- Most **Crown waterways** are disturbed, being located close to infrastructure, however an average of one third of all waterways are undisturbed, with Western and Lower Murray-Darling CMA's being the least disturbed with over half of waterway parcels being distant from infrastructure.
- **Crown waterways** are important sites for coastal wetlands and littoral rainforests recognised in SEPP designations. Over 624 of these Crown parcels contain these habitats.

Crown reserves

- **Crown reserves** are highly connected, with an average of 69% of land parcels being connected, ranging from half in Sydney Metro and Murrumbidgee to over 90% for Western and Murray CMAs.
- **Crown reserves** are especially important as remnants in cleared landscapes, with between 36% and 41% of Crown leases in Central West, Lachlan and Namoi CMAs safeguarding these remnants.
- **Crown reserves** are usually protecting lands forming parts of small patches, with less than 9% of Crown reserves forming parts of patches larger than 1,000 ha.
- **Crown reserves** are extremely important sites for coastal wetlands and littoral rainforests recognised in SEPP designations. Over 1,500 of these Crown parcels contain these values.
- **Crown reserves** have extremely high abundance of threatened species recorded in more than 3,300 Crown reserve parcels. These Crown reserves have about half of the 20,300 records in all Crown land types.

Detailed information about the occurrence of each conservation values for each Crown land type and each CMA is provided as tabulated data in **Attachment 2**. This information is summarised in Tables 1 and 2 below. A set of maps for each Crown land type in **Attachment 3** provides information about the location of each of these values (see 'Maps of conservation values' section above).

Table 2. Conservation values by CMA region

	Threatened species recorded	Crown land parcels with	Crown

	on Crown lands		statutory conservation significant SEPPs		land parcels >1km from infrastructure
CMA's	**Number of threatened fauna species**	**Number of threatened flora species**	**SEPP14 coastal wetland**	**SEPP26 littoral rainforests**	**Parcels with low disturbance**
Border Rivers-Gwydir	864	135	0	0	1,573
Central West	1,099	62	0	0	2,403
Hawkesbury-Nepean	519	891	0	0	888
Hunter-Central Rivers	2,573	408	553	43	2,061
Lachlan	602	48	0	0	1,925
Lower Murray-Darling	431	56	0	0	1,046
Murray	176	93	0	0	648
Murrumbidgee	1,343	54	0	0	1,820
Namoi	605	81	0	0	904
Northern Rivers	3,247	327	595	60	2,486
Southern Rivers	1,315	283	267	4	1,455
Sydney Metro	598	216	0	0	302
Western	693	52	0	0	2,691
Grand	**14,114**	**2,707**	**1,415**	**107**	**20,288**

Limitations of the assessment:

1. The assessment was reliant on readily available statewide GIS datasets. The lack of reliable statewide datasets indicating vegetation type and condition and information on biodiversity values limits the ability to comprehensively determine the conservation values of Crown lands.
2. For example there is no dataset indicating endangered ecological communities. Almost all Crown land parcels in the Central Division with trees or native grasses are likely to fall under a defined endangered ecological community.
3. Flora and fauna records were based on records of actual sightings/trappings/collection. Due to difficulties with public access to many lands and the limited survey effort, most Crown land has not be surveyed. This information is a major underestimate of the occurrence of threatened species. It would be far more useful to use flora and fauna modelled habitat to indicate presence or absence of threatened species.
4. The assessment did not compare the values of the Crown land types with the values of other lands in the same locality.
5. A definitive Crown land dataset cannot be obtained due to poor digital record-keeping by Crown Lands Division
6. The result of the assessment of connectivity presence was not mapped.

ATTACHMENT 2 Tabulated analysis by Crown land reserve type

ATTACHMENT 2A. Crown leases – Central and Eastern Division

1. Proportion cleared

CMAs	0-30% cleared	30-50% cleared	50-70% cleared	>70% cleared	Total
Border Rivers-Gwydir	0%	23%	30%	46%	100%
Central West	4%	7%	25%	65%	100%
Hawkesbury-Nepean	32%	14%	40%	14%	100%
Hunter-Central Rivers	30%	21%	22%	26%	100%
Lachlan	4%	6%	18%	72%	100%
Murray	0%	5%	37%	58%	100%
Murrumbidgee	11%	6%	36%	48%	100%
Namoi	6%	22%	15%	58%	100%
Northern Rivers	39%	29%	12%	20%	100%
Southern Rivers	38%	16%	27%	18%	100%
Sydney Metro	35%	20%	20%	25%	100%
Western	29%	71%	0%	0%	100%
Total	13%	18%	24%	45%	100%

2. Proportion part of patch size

CMAs	Small	Medium	Large
Border Rivers-Gwydir	26%	13%	36%
Central West	29%	16%	30%
Hawkesbury-Nepean	12%	7%	62%
Hunter-Central Rivers	15%	6%	39%
Lachlan	28%	10%	19%
Murray	44%	4%	18%
Murrumbidgee	17%	5%	32%
Namoi	19%	15%	40%
Northern Rivers	13%	3%	61%
Southern Rivers	15%	12%	51%
Sydney Metro	29%	5%	2%
Western	8%	7%	67%
Total	22%	10%	38%

small: part of patch 1-250 ha medium: part of patch 251- 1,000 ha large: part of patch >1,000 ha

3. Proportion with habitat connectivity

CMAs	Habitat Connectivity
Border Rivers-Gwydir	83%
Central West	85%
Hawkesbury-Nepean	91%
Hunter-Central Rivers	81%
Lachlan	66%
Murray	78%
Murrumbidgee	62%
Namoi	83%
Northern Rivers	88%
Southern Rivers	90%
Sydney Metro	57%
Western	88%

Total	79%

4. Proportion with low disturbance

CMAs	Low Disturbance
Border Rivers-Gwydir	65%
Central West	71%
Hawkesbury-Nepean	46%
Hunter-Central Rivers	48%
Lachlan	62%
Murray	51%
Murrumbidgee	56%
Namoi	68%
Northern Rivers	64%
Southern Rivers	46%
Sydney Metro	7%
Western	55%
Total	**61%**

5. Number of threatened flora

CMAs	1-2	3-6	7-10	>10	Total
Border Rivers-Gwydir	12	5		1	18
Central West	5	1			6
Hawkesbury-Nepean	5	2			7
Hunter-Central Rivers	5				5
Lachlan	5				5
Murray	8				8
Murrumbidgee	6	2			8
Namoi	3	3	1		7
Northern Rivers	12	1			13
Southern Rivers	5	2	1		8
Sydney Metro	3				3
Western	4	1			5
Total	73	17	2	1	93

6. Number of threatened fauna

CMAs	1-2	3-6	7-10	>10	Total
Border Rivers-Gwydir	27	19	7	5	58
Central West	75	34	10	6	125
Hawkesbury-Nepean	13	2			15
Hunter-Central Rivers	34	6	3	3	46
Lachlan	24	9	5	3	41
Murray	6	2		2	10
Murrumbidgee	39	12	3	10	64
Namoi	39	13	2	4	58
Northern Rivers	60	24	6	6	96
Southern Rivers	26	9	1		36
Sydney Metro	5	2			7

Western	46	30	6	5	87
Total	394	162	43	44	643

7. Contains SEPP14 - coastal wetland

CMAs	Total
Hunter-Central Rivers	16
Northern Rivers	24
Southern Rivers	8
Total	48

8. Contains SEPP26 - littoral rainforest

CMAs	Total
Hunter-Central Rivers	3
Northern Rivers	2
Total	5

9. Total Central and Eastern Division Crown lease parcels

CMAs	Total
Border Rivers-Gwydir	2,736
Central West	4,243
Hawkesbury-Nepean	384
Hunter-Central Rivers	1,292
Lachlan	1,896
Murray	832
Murrumbidgee	2,809
Namoi	1,590
Northern Rivers	1,898
Southern Rivers	904
Sydney Metro	184
Western	1,334
Total	20,102

ATTACHMENT 2B. Crown lands – Western Division

1. Proportion cleared

CMAs	0-30% cleared	30-50% cleared	50-70% cleared	>70% cleared	Total
Central West	31%	27%	38%	3%	100%
Lachlan	38%	47%	10%	5%	100%
Lower Murray-Darling	85%	4%	11%	0%	100%
Murray	51%	0%	47%	2%	100%
Murrumbidgee	40%	5%	44%	10%	100%
Western	87%	8%	5%	0%	100%
Total	**78%**	**12%**	**9%**	**1%**	**100%**

2. Proportion part of patch size

CMAs	Small	Medium	Large
Central West	2%	15%	81%

Lachlan	8%	6%	78%
Lower Murray-Darling	4%	9%	77%
Murray	15%	2%	9%
Murrumbidgee	7%	1%	32%
Western	3%	3%	89%
Total	**4%**	**6%**	**82%**

small: part of patch 1-250 ha medium: part of patch 251- 1,000 ha large: part of patch >1,000 ha

3. Proportion with habitat connectivity

CMAs	**Habitat Connectivity**
Central West	99%
Lachlan	96%
Lower Murray-Darling	95%
Murray	46%
Murrumbidgee	63%
Western	98%
Total	**96%**

4. Proportion with low disturbance

CMAs	**Low Disturbance**
Central West	75%
Lachlan	61%
Lower Murray-Darling	45%
Murray	31%
Murrumbidgee	31%
Western	68%
Total	**58%**

5. Number of threatened flora

CMAs	**1-2**	**3-6**	**7-10**	**>10**	**Total**
Central West	1				1
Lachlan	13	6		1	20
Lower Murray-Darling	72	20	2	2	96
Murrumbidgee	1				1
Western	65	19		1	85
Total	**152**	**45**	**2**	**4**	**203**

6. Number of threatened fauna

CMAs	**1-2**	**3-6**	**7-10**	**>10**	**Total**
Central West	9	4	3	1	17
Lachlan	82	47	12	13	154
Lower Murray-Darling	268	126	43	49	486
Murray	1		2	1	4
Murrumbidgee	6	1			7
Western	536	211	57	54	858
Total	**902**	**389**	**117**	**118**	**1,526**

7. Total Western Division Crown lease parcels

CMAs	Total
Central West	182
Lachlan	2347
Lower Murray-Darling	6108
Murray	130
Murrumbidgee	211
Western	8475
Total	**17,453**

ATTACHMENT 2C. Crown waterways

1. Proportion cleared

CMAs	0-30% cleared	30-50% cleared	50-70% cleared	>70% cleared	Total
Border Rivers-Gwydir	0%	26%	43%	30%	100%
Central West	1%	3%	25%	71%	100%
Hawkesbury-Nepean	26%	14%	20%	40%	100%
Hunter-Central Rivers	17%	16%	27%	40%	100%
Lachlan	5%	4%	13%	79%	100%
Lower Murray-Darling	61%	8%	31%	0%	100%
Murray	4%	7%	50%	39%	100%
Murrumbidgee	8%	11%	17%	65%	100%
Namoi	6%	8%	30%	55%	100%
Northern Rivers	16%	20%	24%	40%	100%
Southern Rivers	33%	19%	26%	22%	100%
Sydney Metro	50%	4%	10%	36%	100%
Western	72%	25%	3%	0%	100%
Total	**14%**	**14%**	**25%**	**46%**	**100%**

2. Proportion part of patch size

CMAs	Small	Medium	Large
Border Rivers-Gwydir	27%	10%	22%
Central West	34%	6%	10%
Hawkesbury-Nepean	27%	9%	31%
Hunter-Central Rivers	21%	5%	20%
Lachlan	33%	4%	8%
Lower Murray-Darling	3%	8%	81%
Murray	32%	9%	19%
Murrumbidgee	14%	4%	15%
Namoi	25%	10%	23%
Northern Rivers	16%	5%	27%
Southern Rivers	21%	9%	35%
Sydney Metro	26%	9%	7%
Western	5%	4%	88%
Total	**23%**	**7%**	**22%**

small: part of patch 1-250 ha medium: part of patch 251- 1,000 ha large: part of patch >1,000 ha

3. Proportion with habitat connectivity

CMAs	Connectivity
Border Rivers-Gwydir	75%
Central West	71%
Hawkesbury-Nepean	85%
Hunter-Central Rivers	68%
Lachlan	61%
Lower Murray-Darling	96%
Murray	76%
Murrumbidgee	45%

Namoi	74%
Northern Rivers	71%
Southern Rivers	84%
Sydney Metro	61%
Western	98%
Total	**71%**

4. Proportion with low disturbance

CMAs	Low Disturbance
Border Rivers-Gwydir	42%
Central West	37%
Hawkesbury-Nepean	27%
Hunter-Central Rivers	27%
Lachlan	39%
Lower Murray-Darling	56%
Murray	41%
Murrumbidgee	34%
Namoi	32%
Northern Rivers	31%
Southern Rivers	28%
Sydney Metro	12%
Western	65%
Total	**33%**

5. Number of threatened flora

CMAs	1-2	3-6	7-10	>10	Total
Border Rivers-Gwydir	2				2
Hawkesbury-Nepean	16	3			19
Hunter-Central Rivers	15	2	2	1	20
Lower Murray-Darling	2	1			3
Murray	2				2
Murrumbidgee	2				2
Northern Rivers	40	18	5	2	65
Southern Rivers	22	3			25
Sydney Metro	11	2	2		15
Western		1			1
Total	**112**	**30**	**9**	**3**	**154**

6. Number of threatened fauna

CMAs	1-2	3-6	7-10	>10	Total
Border Rivers-Gwydir	14	8	2	1	25
Central West	23	7	1	2	33
Hawkesbury-Nepean	16	7	2	5	30
Hunter-Central Rivers	58	16	10	21	105
Lachlan	8	4	1	2	15
Lower Murray-Darling	6	2	1	4	13
Murray	9	1	2	1	13

ATTACHMENT 2D. Crown reserves

1. Proportion cleared

CMAs	0-30% cleared	30-50% cleared	50-70% cleared	>70% cleared	Total
Border Rivers-Gwydir	30%	17%	24%	29%	100%
Central West	33%	2%	24%	41%	100%
Hawkesbury-Nepean	58%	9%	21%	12%	100%
Hunter-Central Rivers	44%	19%	18%	19%	100%
Lachlan	58%	1%	5%	36%	100%
Lower Murray-Darling	100%	0%	0%	0%	100%
Murray	76%	4%	6%	14%	100%
Murrumbidgee	53%	4%	15%	27%	100%
Namoi	41%	6%	16%	37%	100%
Northern Rivers	45%	20%	13%	23%	100%
Southern Rivers	60%	14%	19%	7%	100%
Sydney Metro	56%	9%	11%	23%	100%
Western	96%	4%	0%	0%	100%
Total	**55%**	**9%**	**14%**	**23%**	**100%**

2. Proportion of patch size

CMAs	Small	Medium	Large
Border Rivers-Gwydir	19%	5%	9%
Central West	16%	4%	7%
Hawkesbury-Nepean	12%	6%	25%
Hunter-Central Rivers	11%	6%	12%
Lachlan	12%	2%	2%
Lower Murray-Darling	0%	0%	0%
Murray	6%	1%	2%
Murrumbidgee	7%	3%	5%
Namoi	12%	5%	10%
Northern Rivers	12%	3%	14%
Southern Rivers	14%	6%	17%
Sydney Metro	10%	4%	2%
Western	1%	1%	10%
Total	**11%**	**4%**	**9%**

small: part of patch 1-250 ha medium: part of patch 251- 1,000 ha large: part of patch >1,000 ha

3. Proportion with habitat connectivity

CMAs	Habitat Connectivity
Border Rivers-Gwydir	70%
Central West	64%
Hawkesbury-Nepean	88%
Hunter-Central Rivers	73%
Lachlan	60%
Lower Murray-Darling	93%
Murray	66%
Murrumbidgee	49%
Namoi	64%

Northern Rivers	69%
Southern Rivers	81%
Sydney Metro	47%
Western	94%
Total	**69%**

4. Proportion with low disturbance

CMAs	Low Disturbance
Border Rivers-Gwydir	15%
Central West	18%
Hawkesbury-Nepean	14%
Hunter-Central Rivers	20%
Lachlan	14%
Lower Murray-Darling	18%
Murray	11%
Murrumbidgee	14%
Namoi	14%
Northern Rivers	19%
Southern Rivers	18%
Sydney Metro	6%
Western	26%
Total	**16%**

5. Threatened flora

CMAs	1-2	3-6	7-10	>10	Total
Border Rivers-Gwydir	56	12		1	69
Central West	21	7		1	29
Hawkesbury-Nepean	162	61	7	12	242
Hunter-Central Rivers	108	40	8	2	158
Lachlan	29	3			32
Lower Murray-Darling	16	6	1		23
Murray	23	3	3	1	30
Murrumbidgee	36	3			39
Namoi	16	3	2	2	23
Northern Rivers	116	24	6	3	149
Southern Rivers	72	14	5	5	96
Sydney Metro	38	16	2	4	60
Western	19	4	1		24
Total	**712**	**196**	**35**	**31**	**974**

6. Threatened fauna

CMAs	1-2	3-6	7-10	>10	Total
Border Rivers-Gwydir	154	42	8	17	221
Central West	157	41	11	15	224
Hawkesbury-Nepean	157	36	12	6	211
Hunter-Central Rivers	296	91	21	59	467
Lachlan	134	44	8	7	193

Lower Murray-Darling	76	34	7	8	125
Murray	60	15	5	1	81
Murrumbidgee	182	50	8	30	270
Namoi	78	32	6	14	130
Northern Rivers	392	149	41	70	652
Southern Rivers	258	80	25	19	382
Sydney Metro	100	32	2	10	144
Western	228	40	10	8	286
Total	2,272	686	164	264	3,386

7. Contains SEPP14 - coastal wetland

CMAs	**Total**
Hunter-Central Rivers	553
Northern Rivers	595
Southern Rivers	267
Total	1,415

8. Contains SEPP26 - littoral rainforest

CMAs	**Total**
Hunter-Central Rivers	43
Northern Rivers	60
Southern Rivers	4
Total	107

9. Total reserve parcels

CMAs	**Total**
Border Rivers-Gwydir	10,568
Central West	13,657
Hawkesbury-Nepean	6,355
Hunter-Central Rivers	10,500
Lachlan	13,499
Lower Murray-Darling	5,693
Murray	5,893
Murrumbidgee	13,331
Namoi	6,696
Northern Rivers	12,960
Southern Rivers	8,163
Sydney Metro	4,854
Western	10,542
Total	122,711

ATTACHMENT 3 - Maps of Conservation Values

The following maps can be downloaded from the link below (and are available in hardcopy on request):

ATTACHMENT 3A – Percentage cleared / rarity

ATTACHMENT 3B – Low Disturbance

ATTACHMENT 3C – Part of patch size

ATTACHMENT 3D – Threatened flora records

ATTACHMENT 3E – Threatened fauna records

ATTACHMENT 3F – SEPP coastal wetland and littoral rainforest

Available for download at:

https://drive.google.com/folderview?id=0BxLsiuTM_UrnS0dTeDJPSFZGbVE&usp=sharing

Maps prepared by the Nature Conservation Council of NSW and National Parks Association of NSW in 2014. Data source: NSW Crown Lands Division and NSW Office of Environment and Heritage. Analysis performed using ArcGIS. If you wish to use these maps, please credit "The Significance of Crown Lands In Biodiversity Conservation_Nature Conservation Council of NSW and National Parks Association of NSW, 2014."

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ESTIMATING THE VALUE OF ECOSYSTEM SERVICES PROVIDED BY TRAVELLING STOCK ROUTES

A Pilot Study of selected sites in NSW

Final report

Prepared for the National Parks Association of NSW
2012

Curtis NRA® Australia

Land & Ecological Economists, Environmental Scientists

economists | at | large |
ADDING VALUE TO SOCIETY

This report is prepared for the contracting party only and no fiducial obligation or duty of care of any sort whatsoever exists by Ecolarge or *Curtis NRA* to any other party who may be affected by the contents contained herein. The report contains confidential data as to the economic value of selected travelling stock routes in NSW for the use of the client.

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The photo on the cover page is of a TSR in the Lachlan catchment located near Parkes, NSW.

Contents

Executive Summary

The Travelling Stock Routes and Reserves (TSRs) comprise a vast network in New South Wales and Queensland of public land (some 3 million hectares), bordering roads and creeks and other private and public land, formerly used for intermittent grazing and to drive stock to market. Today they are largely an anachronism. Extra fodder is often purchased and graziers mostly use road transport to take animals to market. Nevertheless, they are often used by local graziers to rest stock and access is allowed to the public, who often camp alongside creeks and roads. They are acknowledged as a valuable conservation resource, often being the only intact native vegetation in a mosaic of cultivated and modified land.

The TSRs in NSW cover an area of approximately 700,000ha and are administered by the Livestock Health and Pest Authority (LHPA). The Rural Land Protection Board (RLPB) administered the TSRs until 2009.

The remnant vegetation within the TSR network is a significant national biodiversity asset but faces possible conversion due to grazing, logging, mining exploration and privatisation. The NSW Government has restructured the TSR management system with an emphasis on economic benefits of TSRs.

This report looks specifically at the economic value of the ecosystem services provided by TSRs, as a proxy for their economic benefit to society. Table 1 in Section 5 of this report provides a tabular summary of the different types of ecosystem services. Two TSR sites in NSW were selected for this pilot study. The study is intended to assess the feasibility of putting a value on the ecosystem services provided by two TSRs with a view to conducting a larger study into the value of the entire TSR network in NSW.

The Travelling Stock Routes (TSRs) used in this pilot study are Borah Creek (261ha) and Saveall Creek(64ha), two larger TSR sites near Tamworth, north-east New South Wales. These sites were selected from a conservation assessment of reserves and TSRs in the Tamworth region.

The methodology to estimate ecosystem service values used in this study was developed by Dr Ian Curtis during his Doctor of Philosophy degree at James Cook University between the years 2000 to 2003. The methodology uses an opportunity cost approach to valuing ecosystem services. Dr Curtis's methodology is based on Land Economics theory and practice, utilising the current median

unimproved land value in a bioregion to set a base value for land that is not traded, such as a National Park, or a TSR. A very simple summary of the methodology is provided in the diagram below:

The TSRs selected for this pilot study were both located near to each other in the New England Bioregion. The median unimproved value per hectare of the alienated (rateable) land in the bioregion was used as a surrogate for the median unimproved capital value per hectare of the un-alienated (public or unrateable land). Adoption of the median unimproved capital value results in a conservative estimate, allowing that other uses of land can co-exist with the provision of ecosystems services.

The mean of this data set is $1,924.43 per ha, and the median is $1,870.30 per ha. However, the 'per' hectare value to be used in this study is only the median ($1,870 per ha).

Capitalisation rates for this 'land use characteristic' would normally be 7 – 8 %, while for this 'level of protection' they would be, say 9%. The higher capitalisation rate of 9% was thus used.

Applying the capitalisation rate to the median capital value, results in an annual value $168.30 per hectare of ecological values, or the production function of the land in its natural state.

Because Borah Creek is a large parcel and majority hillside remnant, adjoining other like vegetation, rather than roadside, the impact of edge effects is likely to be only 5 per cent of the overall value.

Conversely, Saveall Creek is a linear corridor between the road and the creek, such as does exist often for TSRs in NSW. Edge effects are likely to be significant, and on both sides of the lineal corridor. In the case of this parcel edge effects are likely to be up to 50% of the overall value. This is a conservative estimate, as edge effects can extend up to 200 metres (decreasing) into a forest from an edge.

Using the median of the unimproved capital values, accounting for the status of the forest and edge effects, the dollar values of the ecosystem goods and services provided by these parcels of land are given in the table below.

Parcel	Area (Ha)	Per Ha Per Annum	Total	Status Open Forest Fig D16 contribution at 67%	Edge Effects	Total Value per Annum after edge effects
Borah Creek	261	$168	$44,555	$29,852	5%	$28,359
Saveall Creek	60	$168	$10,288	$6,893	50%	$3,446

These two areas represent just 321ha of a total of approximately 700,000ha of TSRs in New South Wales. To value the ecosystem services for these areas of public land at zero is clearly inappropriate. Despite this, putting a value on the entire network would take a considerable amount of work.

In order to put a value on the entire TSR network in New South Wales, site-specific ecological surveys would be required. These surveys would need to record the total area of the TSR, the vegetation type, density, adjoining land use and likely edge effects. Improved mapping would also be useful. These are not insurmountable barriers and this pilot study has shown that the ecosystem service values of TSRs to the public can be quantified. These values should be considered in ongoing discussion about the tenure and management of TSRs.

1.0 Introduction

The National Parks Association of New South Wales (NPA NSW) has an ongoing campaign to highlight the Travelling Stock Routes and Reserves (TSRs) network in NSW as a public resource linking critical habitats across the landscape.

The remnant vegetation within the TSR network is a significant national biodiversity asset but faces possible conversion due to grazing, logging, mining exploration and privatisation. The NSW Government has restructured the TSR management system with an emphasis on economic benefits of TSRs.

This report developed out of work done by Economists at Large outlining the various ways in which the economic benefits of TSRs could be estimated. This work was presented at the 2nd TSR conference held in Orange, NSW, in July 2011.

2.0 Scope of the Research

This report looks specifically at the economic value of the ecosystem services provided by TSRs, as a proxy for their economic benefit to society. Table 1 in Section 5 of this report provides a tabular summary of the different types of ecosystem services. Two TSR sites in NSW were selected for this pilot study. The study is intended to assess the feasibility of putting a value on the ecosystem services provided by two TSRs with a view to conducting a larger study into the value of the entire TSR network in NSW.

3.0 The Travelling Stock Routes

The Travelling Stock Routes (TSRs) comprise a vast network in New South Wales and Queensland of public land (some 3 million hectares), bordering roads and creeks and other private and public land, formerly used to drive stock to market. Today they are largely an anachronism, as graziers now largely use road transport to take animals to market. Nevertheless, they are often used by local graziers to rest stock and access is allowed to the public, who often camp alongside creeks and roads. They are acknowledged as a valuable conservation resource, often being the only intact native vegetation in a mosaic of cultivated and modified land.

The TSRs in NSW cover an area of approximately 700,000ha and are administered by the Livestock Health and Pest Authority (LHPA). Until 2009 they were administered by the Rural Land Protection Board (RLPB).

4.0 The Sites Selected for the Pilot Study

The Travelling Stock Routes (TSRs) used in this pilot study are Borah Creek and Saveall Creek, two larger TSR sites near Tamworth, north-east New South Wales. These sites were selected from a conservation assessment of reserves and TSRs in the Tamworth region, Spark (2010). Borah Creek and Saveall Creek are numbered 173 and 174 in Spark (2010), who describes them as follows:

> ***173 "Borah Creek":*** *Mature grassy Yellow Box, Blakeley's Red Gum, Roughbark Apple woodland, mixed age, natural tree and shrub density. Good riparian veg, River Oak, on lower slope/riparian. Very high native plant diversity, low exotic plant diversity, very high landscape connectivity. Linking hill remnant to creek roadside....Yellow Box woodland, good native ground cover, few weeds invading, Coolatai sparse, very controllable, good riparian veg*
>
> ***174 "Saveall Creek":*** *Linear shrubby/grassy mature woodland & open forest, White Box, Blakeley's Red Gum, Roughbark Apple, Stringybark, Mugga Ironbark, River Oak riparian; Very high native plant diversity, low exotic plant diversity, very high landscape connectivity. Linking corridor along creek and road....Linear roadside reserve, minimal disturbance, HCV woodland/open forest, few weeds, Coolatai controllable along roadside, northern granite end becomes widespread, Mugga Ironbark, fence off conservation area, with management to include 200m weed buffer, and exclude bees*

The LHPA provided maps of the sites with the following data. Maps are contained in the appendices, as the detail wasn't sufficient to be useful for inclusion in the body of this report.

Table 1. TSR sites chosen for the pilot study

	Lot and DP numbers	Area (ha)
Borah Creek TSR	1054268/7011; 1054263/7005; 1086535/7007; 1086536/7001; 93874/7003, and 1114674/7001	260.935
Saveall Creek TSR	1110766/7005; 1130035/7300, and 1112850/7002	64.251

5.0 The Research Methodology

The methodology used in this study was developed by Dr Ian Curtis during his Doctor of Philosophy degree at James Cook University between the years 2000 to 2003. The methodology uses an opportunity cost approach to valuing ecosystem services. Dr Curtis' thesis has been downloaded nearly 4,000 times by researchers in 90 countries and his findings were published in the Elsevier Journal of Ecological Economics in 2004. This journal article was in the top 25 downloads for three consecutive quarters, and has been cited 67 times. This methodology has also been published in the Australian and New Zealand Property Journal, and utilised by government, private sector, legal bodies and NGOs to value environmental assets and damage, see table 1:

Table 1: Some significant uses of Curtis NRA ecosystems service valuation methodology

User	Year	Context/publication
Brisbane City Council	**2005**	Establishing market-based instruments for conservation initiatives on private land
Powerlink Queensland	**2006**	Valuation of transmission line clearing though Allies Creek State Forest (published in the *Australian Property Journal*: June 2006 Vol 39 No.2, pp 87-96)
National Court of PNG	**2011**	Basis of decision to award US$97.2 million in damages to four tribes in the Western Province of PNG for environmental destruction caused by illegal logging. (published in the *Australian and New Zealand Property Journal*: June 2011 Vol 3 No.2, pp 63-73)
Maules Creek Community Council	**2011**	Valued the pecuniary loss of ecological services due to the clear felling of Leard State Forest (Critically Endangered EEC.) to accommodate an open cut coal mine.

Dr Curtis's methodology is based on Land Economics theory and practice, utilising the current median unimproved land value in a bioregion to set a base value for land that is not traded, such as a National Park, or a TSR. Every use of land has an opportunity cost, that being the existing use or other uses to which the land could be put (Edwards 1987; McNeeley 1988; Frank 1991). As conservation areas cannot be developed or redeveloped, the value of conservation should be at least as much as the cost of preserving it, as measured by the cost of the foregone opportunities (Allison *et al.*, 1996).

Marginal opportunity cost can be expressed in terms of the annual net revenue foregone, in which case it would be capitalised, resulting in a land value in restricted and unrestricted use (McNeeley 1988). These concepts clearly link the natural production function of land (i.e. ecosystem services) with land valuation procedures. As ecosystem goods and services are the production function of land in its natural state (the *Usus Fructus per annum*), and as ecosystem goods and services are essential for planetary life support (Ke Chung and Weaver 1994), it could be argued that the provision of ecosystem goods and services are the 'highest and best use' of land.

Individuals in the community constantly reveal their preferences to purchase property for a multitude of uses. The pecuniary measures of these preferences are used as comparable sales by state agencies charged with the responsibility of valuing property and determining unimproved values as a basis for levying rates and taxes. The collective values thus underpin the costs of administration and provision of infrastructure in the bioregion (Lambert 1932; Herps 1942; Murray 1954; Blackwell 1994). Unimproved values are assessed on the principle of the highest and best legal use, yet assume that improvements do not and have never existed.

To rank and classify the relative value of the 20 individual ecosystem goods and services this methodology utilises the results of a Delphi Panel enquiry, which was comprised of up to 50 scientists and economists (see Table 2 on following page).

Table 2. The now commonly accepted suite of ecosystem goods and services (Curtis 2003; 2004, adapted and modified after Costanza 1997 and Cork and Shelton 2000).

Group	Type
Stabilisation Services	Gas regulation (atmospheric composition)
	Climate regulation (temperature, rainfall)
	Disturbance regulation (ecosystem resilience)
	Water regulation (hydrological cycle)
	Erosion control and soil/sediment retention
	Biological control (populations, pest/disease control)
	Refugia (habitats for resident and transient populations)
Regeneration Services	Soil formation
	Nutrient cycling and storage (including carbon sequestration)
	Assimilation of waste and attenuation, detoxification
	Purification (clean water, air)
	Pollination (movement of floral gametes)
	Biodiversity
Production of Goods	Water supply (catchment)
	Food production (that sustainable portion of GPP)
	Raw materials (that sustainable portion of GPP, timber, fibre etc.)
	Genetic resources (medicines, scientific and technological resources
Life Fulfilling Services	Recreation opportunities (nature-based tourism)
	Aesthetic, cultural and spiritual, (existence values)
	Other non-use values (bequest and quasi option values)

A summary of the methodology as applied to the pilot study sites is outlined below.

Figure 1: Summary of research methodology

6.0 Applying the methodology to NSW TSRs

6.1 Ascertaining unimproved land values

In this study, the surrogate market is the broader property market in the bioregion where the travelling stock routes are located. However, it is also necessary to determine 'what' and 'how much' is being produced in the context of ecosystem goods and services. Two models, the LOP (Level Of Protection) model and the LUC (Land Use Characteristics) model, were chosen to properly reflect the type and status of the selected TSRs, namely 'Open Forest' and 'State Forest'. Open forest refers to the level of canopy cover, a surrogate for species richness. This categorisation is only used in the LUC (land use characteristics model). State Forest refers to the level of protection (LOP model), and gives an idea of the tenure of the land, which is important in the concept of conservation, and assessment of risk.

6.2 Estimating the annual flow of benefits

To estimate the annual flow of benefits from the TSRs, it is necessary to estimate the capitalisation rate. The capitalisation rate is similar to the concept of a return on investment, being the ratio of the annual net income to capital costs for a particular asset. In other words, if a TSR has a capital value based on land values, what is the annual income value derived from the asset? Once the capital value for the land is established, identifying a suitable capitalisation rate allows for estimates of the annual value to be calculated. The capitalisation rate is determined by a study of the market relevant to scarcity and risk and by using ecological models based upon the relationship between vegetation cover and species richness, land use characteristics and level of protection. The models are proprietary, however, they are based on the collective work of Holdridge (1967), Lugo (1988), Brown and Lugo (1982), Mooney (1988) and McArthur and Wilson (1967).

The LOP model uses Level Of Protection to set the capitalisation rate. As the level of protection decreases, the capitalisation rate increases reflecting risk (Figure D4).

The LUC model uses Land Use Characteristics to set the capitalisation rate. As human and climate induced modification increases, so does the capitalisation rate in order to reflect scarcity of ecosystem goods and services (Figure D16). Both models are also used to determine 'how much' ecosystem goods and services are being produced, which are expressed as a range.

The relationship between vegetation cover and species richness is generally 3:2, except for Mediterranean climate ecosystems, where it is generally 1:1 (Mooney 1988). As both alienated and un-alienated land provide ecosystem services it is important to be able to estimate the extent to which the land contributes to the overall contribution. Depending on the level of disturbance, other human activities on the land can co-exist with the provision of ecosystem services.

6.3 Factoring in edge effects

Edge effects is a term used in ecology to refer to the impact of two different habitats meeting at their respective boundaries. In the case of the sites selected, this refers to the effects at boundaries with cleared non-TSR land. Edge effects can encompass both human induced and other biophysical effects, including microclimate variables across the ecotone. Edge effects can serve to reduce the ecosystem service value of a TSR where the remnant vegetation is adversely impacted.

An example of an edge effect is the amount of photosynthetically active radiation (PAR) reaching the forest floor, which has a significant relationship with distance from clearing – the effect is greatest at the edge and decreases with distance from the edge. Increases in PAR cause increases in soil temperatures at the surface and to some depth and can lead to emergence of alien species. The effect extends inwards depending on the orientation of the corridor and season. Wide clearings or gaps without canopy retention allow greater invasion of weeds, and result in greater penetration of disturbance indicator species (Goosem and Turton 2000). Such effects can extend further into an open forest environment, such as these sites, though are often more pronounced in closed canopy environments, i.e. rainforest, as changes in air temperatures and vapour pressure deficits are caused by the edge (Goosem and Turton 2000).

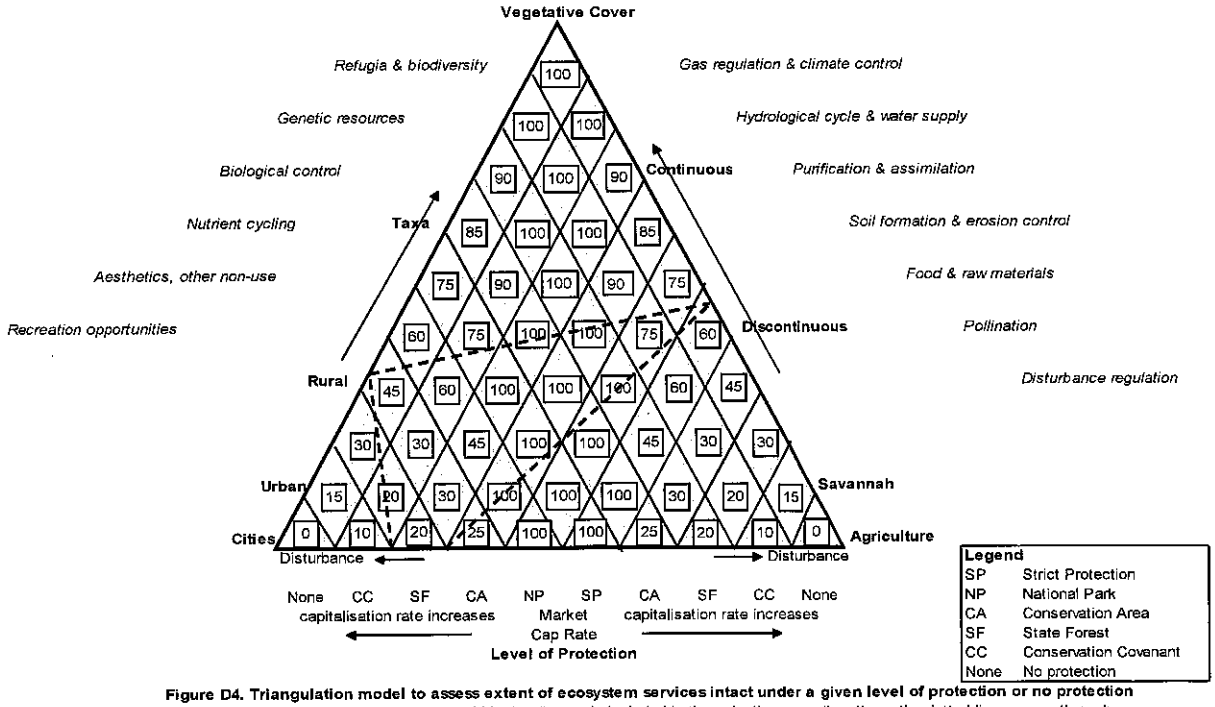

Figure D4. Triangulation model to assess extent of ecosystem services intact under a given level of protection or no protection
Scoring: Calculate the mean of the values within the diamonds included in the selection as well as those the dotted line passes through.
This example, State Forest: 66%

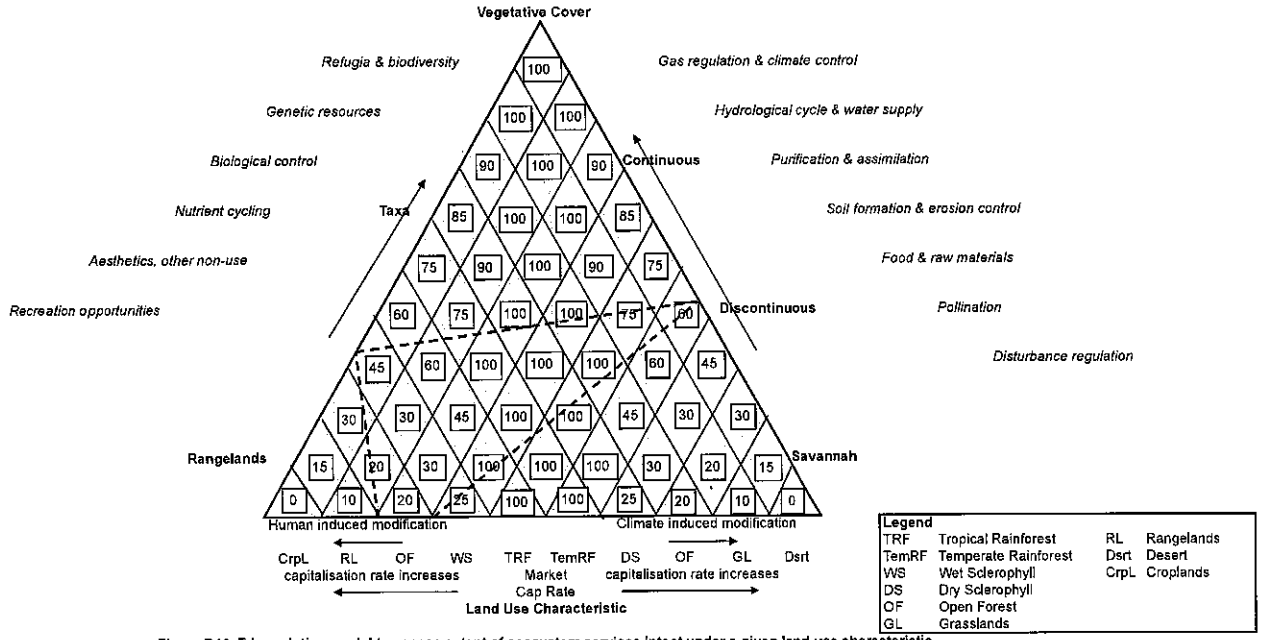

Figure D16. Triangulation model to assess extent of ecosystem services intact under a given land use characteristic
Scoring: Calculate the mean of the values within the diamonds included in the selection as well as those the dotted line passes through.

7.0 Applying the methodology to the pilot sites

The TSRs selected for this pilot study were both located near to each other in the New England Bioregion. The local government areas (LGAs) that are contained wholly within or that administer parts of the bioregion were ascertained and consulted as to the total rateable value of alienated land within their jurisdiction, and the total area of that land. A dollar value per hectare was calculated for each LGA (total rateable value/total area). Statistical analysis was performed on the resulting set of dollar values for the LGAs, and the range, mean, median, mode, standard deviation and skewness calculated. Owing to the variability in the data (range), due to varying degrees of urbanisation, development, use, distance from services, and average parcel size, the data set could have been expected to have a high degree of positive skewness (in this case Armidale Dumaresq). The measure of central tendency most commonly accepted for this type of skewed data set is the 'median', which will provide the fairest approximation of all of the uses to which land is put in the bioregion on a *broadacre* basis and will take into account all of the various principles and factors that affect the value of land.

7.1 Ascertaining unimproved land values

The median unimproved value per hectare of the alienated (rateable) land in the bioregion was then used as a surrogate for the median unimproved capital value per hectare of the un-alienated (public or unrateable land). This is consistent with valuation practice (McNamara 1983). However adoption of the median unimproved capital value as a surrogate value implies that the value is for the 'median' use in the region and not the single 'highest and best' use. It is thus a conservative estimate, allowing that other uses of land can co-exist with the provision of ecosystems services.

Table 3. The current real property valuation calculations for each shire in the New England Bioregion (as supplied to the relevant Shire Councils by the NSW Valuer General).

LGA	Total VG valuation (for rating purposes)	Gross Shire Area (Ha)	$ value per hectare
Tenterfield	$891,963,115	713,439	$1,250.23
Glenn Innes Severen	$988,291,300	548,700	$1,800.15
Guyra	$847,776,537	436,900	$1,940.44
Uralla	$700,628,210	321,500	$2,179.25
Armidale Dumaresq	$1,881,029,555	432,500	$2,938.98
Walcha	$920,052,917	640,028	$1,437.52

The mean of this data set is $1,924.43 per ha, and the median is $1,870.30 per ha. However, the 'per' hectare value to be used in this study is only the median ($1,870 per ha).

Using the LOP and LUC models for 'open forest' and 'state forest', the level of contributions of ecosystem services compared to the highest level, which is a closed canopy tropical rainforest, are 66% and 67%.

7.2 Estimating the annual flow of benefits

Capitalisation rates for this 'land use characteristic' would normally be 7 – 8 %, while for this 'level of protection' they would be, say 9%, that is higher than for say, a Wet Tropics World Heritage Area rainforest, as the higher capitalisation rate reflects an elevated risk. In the case of these TSRs, clearly there has been little formal protection afforded by their status, or the native vegetation clearing laws. Under these circumstances, the higher capitalisation rate of 9% will be adopted for the purpose of this report.

Applying the capitalisation rate to the median capital value, results in an annual value $168.30 per hectare of ecological values, or the production function of the land in its natural state.

7.3 Factoring in edge effects

In considering the ecological service values of these sites, it is important to note the location of the two sites in the broader landscape. As Saveall Creek is a linear reserve with frontage along a road and a creek, it will have more pronounced edge effects than Borah Creek.

Borah Creek and Saveall Creek have significant ecological value, as being largely undisturbed, and with minimal threatening processes in play. Borah Creek, being midslope, and extending down to the roadside, has limited edge effects, that is to say the edge effects are limited to the road boundary. Borah Creek is also a large parcel (260.935 hectares), majority hillside remnant, adjoining other like vegetation, rather than roadside, and as such the impact of edge effects is likely to be only 5 per cent of the overall value.

Conversely, Saveall Creek (60.251ha) is a linear corridor between the road and the creek, such as does exist often for TSRs in NSW. Edge effects are likely to be significant, and on both sides of the lineal corridor. In the case of this parcel edge effects are likely to be up to 50% of the overall value. This is a conservative estimate, as edge effects can extend up to 200 metres (decreasing) into a forest from an edge.

7.4 Annual ecosystem service value estimates

Using the median of the unimproved capital values in Table 2 above, the dollar values of the ecosystem goods and services provided by these parcels of land are given in Table3 below.

Table 4. Estimates of ecosystem service values of pilot TSR sites

Parcel	Area (Ha)	Per Ha Per Annum	Total	Status Open Forest Fig D16 contribution at 67%	Edge Effects	Total Value per Annum after edge effects
Borah Creek	261	$168	$44,555	$29,852	5%	$28,359
Saveall Creek	60	$168	$10,288	$6,893	50%	$3,446

7.0 Conclusions and recommendations

This pilot study estimated the ecosystem service values per annum for two travelling stock route sites within New South Wales, Borah Creek and Saveall Creek. The study used unimproved land valuations for the region to estimate a proxy value for the annual flow of ecosystem services. After considering edge effects, the total per annum value of ecosystem services is estimated at $28,000 for Borah Creek and $3,400 for Saveall Creek. These two areas represent just 321ha of a total of 700,000ha of TSRs in New South Wales. To value the ecosystem services for these areas of public land at zero is clearly inappropriate. Despite this, putting a value on the entire network would take a considerable amount of work.

In order to put a value on the entire TSR network in New South Wales, site-specific ecological surveys would be required. These surveys would need to record the total area of the TSR, the vegetation type, density, adjoining land use and likely edge effects. Improved mapping would also be useful. These are not insurmountable barriers and this pilot study has shown that the ecosystem service values of TSRs to the public can be quantified. These values should be considered in ongoing discussion about the tenure and management of TSRs.

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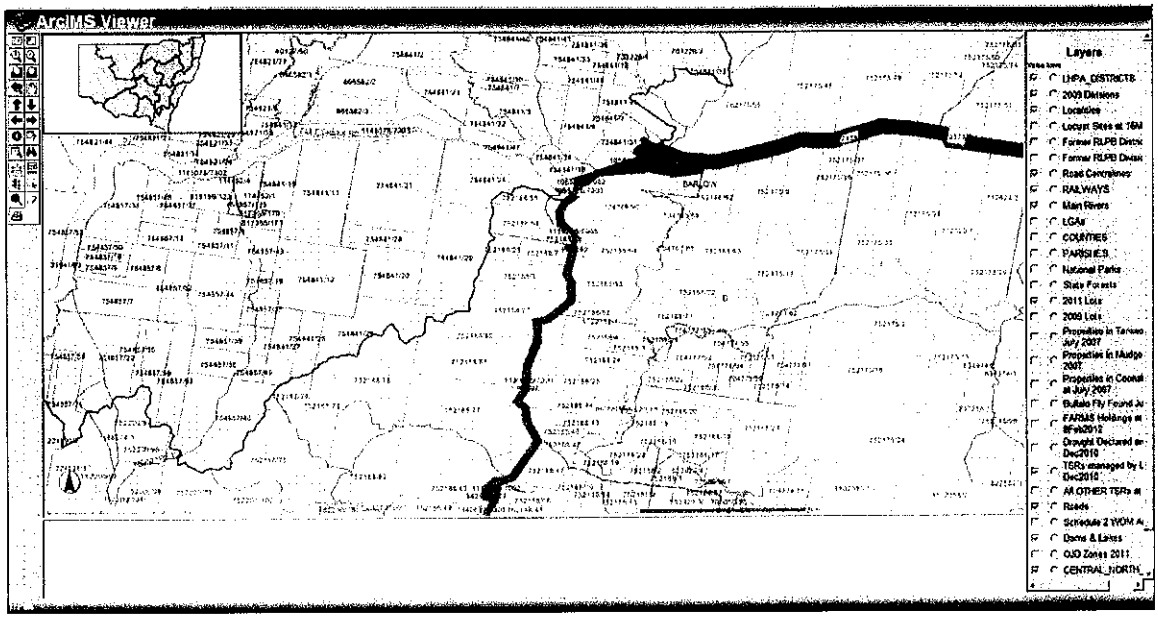
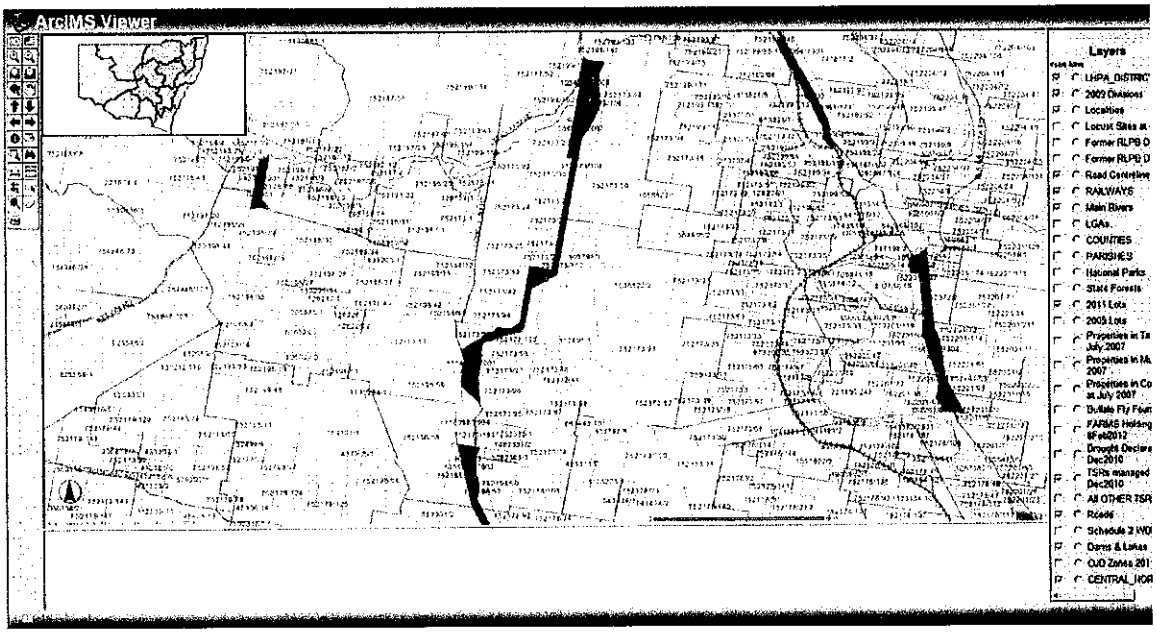
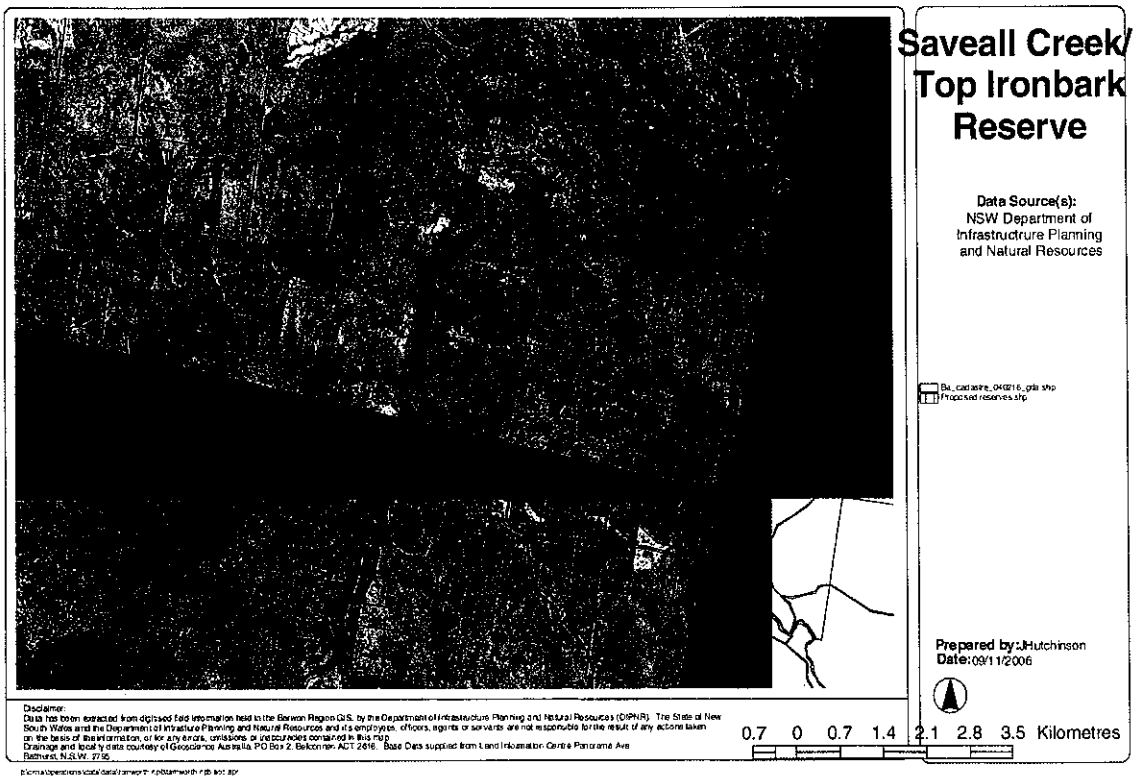
Appendices

Maps of sites for pilot study






Borah and Borah Creek Reserves
Data Source(s):
NSW Department of Infrastructrure Planning and Natural Resources
Prepared by:JHutchinson
Date:09/11/2006
Disclaimer:
Data has been extracted from digitised field information held in the Barwon Region GIS, by the Department of Infrastructure Planning and Natural Resources (DIPNR). The State of New South Wales and the Department of Infrastructure Planning and Natural Resources and its employees, officers, agents or servants are not responsible for the result of any actions taken on the basis of the information, or for any errors, omissions or inaccuracies contained in this map.
Drainage and locality data courtesy of Geoscience Australia, PO Box 2, Belconnen ACT 2616. Base Data supplied from Land Information Centre Panorama Ave, Bathurst, N.S.W. 2795.
0.5 0 0.5 1 1.5 2 2.5 Kilometres


Saveall Creek/ Top Ironbark Reserve
Data Source(s):
NSW Department of Infrastructrure Planning and Natural Resources
Ba_cadastre_040216_gda.shp
Proposed reserves.shp
Prepared by:JHutchinson
Date:09/11/2006
Disclaimer:
Data has been extracted from digitised field information held in the Barwon Region GIS, by the Department of Infrastructure Planning and Natural Resources (DIPNR). The State of New South Wales and the Department of Infrastructure Planning and Natural Resources and its employees, officers, agents or servants are not responsible for the result of any actions taken on the basis of the information, or for any errors, omissions or inaccuracies contained in this map.
Drainage and locality data courtesy of Geoscience Australia, PO Box 2, Belconnen ACT 2616. Base Data supplied from Land Information Centre Panorama Ave, Bathurst, N.S.W. 2795.
0.7 0 0.7 1.4 2.1 2.8 3.5 Kilometres