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Building Nature's Safety Net 2008

Progress on the *Directions for the National Reserve System*

Paul Sattler and Martin Taylor





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Map sources and caveats

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Paul has a lifetime experience working professionally in nature conservation. In the early 1990's, whilst with the Queensland Parks and Wildlife Service, Paul was the principal architect in doubling Queensland's National Park estate. This included the implementation of representative park networks for bioregions across the State. Paul initiated and guided the comprehensive description of Queensland's bioregional ecosystems and assessment of their status, a vital planning tool for conservation and natural resource management. He was principal author of the National Land and Water Resources Audit's *Terrestrial Biodiversity Assessment of Australia*, the first detailed assessment of biodiversity at a range of scales nationally. He now manages his own specialised eco-consultancy business. Paul has been awarded an OAM for his services to biodiversity conservation, and is a WWF Fellow.

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Cover image: Late wet season billabong in the Blue Mud Bay area of the Laynhapuy Indigenous Protected Area, Northern Territory

© Laynhapuy Homelands Association



Foreword

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Magpie gress © WWF-Cannon/ Martin Harvey

Australia is uniquely placed to be a global leader in protecting the earth's wondrous diversity of plants and animals.

Our rich and distinctive Australian animals and plants make us one of the 17 countries considered to be global biodiversity hotspots or 'megadiverse'. We are the top megadiverse country for vertebrates and fifth for plants.

As a comparatively well off country, we can afford to be at the forefront of the efforts to retain 'life on earth' with all its ecological, economic and social importance. This historic task is especially urgent as climate change will add to many existing threats and create new stresses by moving whole climate zones around, changing ecosystems and habitats along with it.

We are now fast approaching a global deadline under the Convention on Biological Diversity to which Australia is a party. We have committed to make a significant reduction in loss of biodiversity by 2010. A critical step in achieving this goal is establishing a nationwide system of refuges and sanctuaries of the natural world – our national parks and reserves. We have achieved a framework – all governments federal, state and territory, have committed to developing a comprehensive, adequate and representative National Reserve System. Such a system is composed of more than traditional national parks and includes protected areas of all types on Indigenous, local government and private lands. A truly national system, taken together with other conservation measures will create a safety net for our irreplaceable wildlife - the result of millions of years of evolution.

This landmark report, using the latest figures from all jurisdictions, shows that there has been modest progress over recent years. This has included some tremendously important new protected areas highlighted in the report. But it also shows that, compared with the formidable array of threats faced by Australian natural systems, plants and animals, progress has not been anywhere near enough.

Australia can meet its targets and build a decent safety net. Rates of growth needed to meet the principal target of a representative reserve system are quite achievable, if we are prepared to make the relatively modest investments needed.

Saving our natural heritage is a wise investment which creates a return on investment many times over, in clean water and air, in climate and flood control and by protecting the most fundamental asset of our \$23 billion a year natural tourism industry.

This report forms a cogent and compelling case for government to take up this critical opportunity to be a global leader in building a National Reserve System appropriate to Australia's standing as a global centre of species richness, and deliver a concrete and effective rescue package for its native animals and plants in the face of climate change impacts.

Penelope Figgis AO,

Australia and New Zealand Vice-Chair,
IUCN World Commission on Protected Areas,
February 2008.

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Executive summary

Building Nature's Safety Net 2008
Progress on the Directions for the National Reserve System

3

Kaladu NP © WWF-Canon/James W. Thorsell

Australia's National Reserve System (NRS), the national network of public, Indigenous and private protected areas over land and freshwater, is the nation's premier investment in biodiversity conservation. Protected areas also contribute significantly to the economy through natural tourism, and provide many ecosystem services such as carbon sequestration.

The past decade saw significant underperformance in progress towards targets that Australia committed to under the Convention on Biological Diversity. Poor progress has been associated with a lack of federal government leadership and divergent agendas of states and territories.

Successive evaluations showed that the NRS and Indigenous Protected Area (IPA) funding programmes were among the highest performing and most cost-effective conservation streams with the first two rounds of the Natural Heritage Trust (NHT). Despite this high performance and despite that fact that meeting NRS targets is one of the eight core priorities for the NHT, the NRS programme has only received 3.4% of the combined funding to date, and the IPA programme much less.

There is an urgent need to make up for a decade of neglect of Australia's premier conservation asset and make the investments, estimated to be at least \$250 million over five years, needed to significantly progress protected area commitments agreed by all governments, as well as matching investments by states, territories and the non-government partners in both establishment and enduring, effective management of protected areas.

The current state of inclusion of Australia's land area in protected areas at the bioregional and sub-bioregional scales is shown in Fig 1, which is based on the latest release of the Collaborative Australian Protected Areas Database (CAPAD).

The overarching policy framework for the NRS is the *Directions for the National Reserve System: A partnership approach*. It was agreed to by Australian, state and territory governments in 2004. Progress on twelve key NRS targets from the *Directions* document is summarised in Table 1 and discussed below.

Fig 1b. Percent of area protected according to CAPAD 2006 in subregions (IBRA version 6.1)
 See Table 3 for codes. © WWF-Australia.

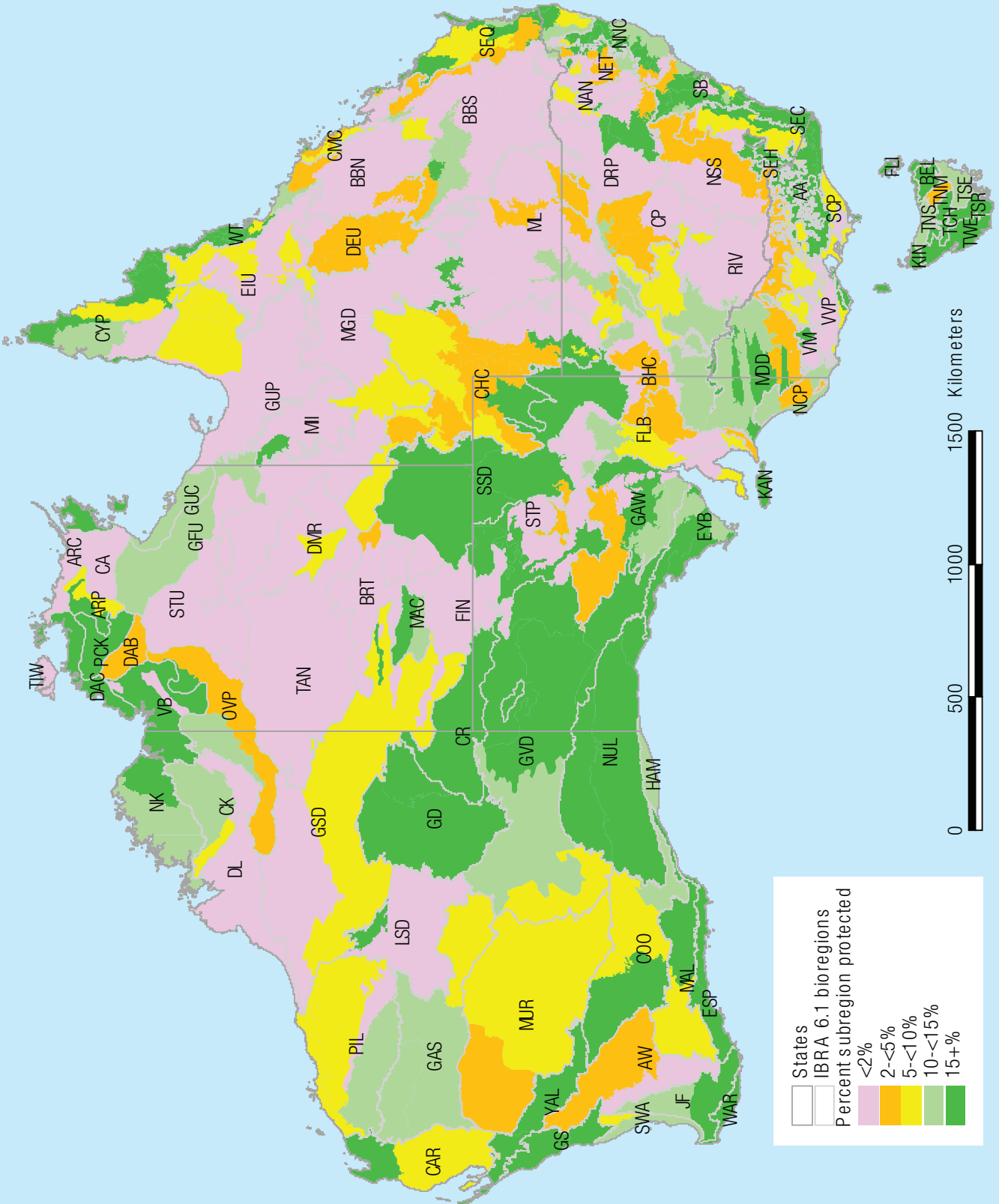


Table 1. Progress in meeting some of the key *Directions for the National Reserve System* as indicated by states and territories in response to a questionnaire (Appendix I)

(A 100%; B >66-<100%; C 33-66%; D <33% of bioregions meeting the target)

	ACT	NSW	NT	Qld	SA	Tas	Vic	WA
Direction 1. Bioregions with 80% comprehensiveness expected by 2010-2015 ^[1]	A	C	D	B	B	A	C	B
Direction 1, at June 2001 ^[2]	A	C	D	D	D	C	C	D
Direction 2. Bioregions expected to be managed in bioregional context for biodiversity 2010	A	C	C	B/C ^[3]	A	?	B	C
Direction 4. Bioregions expected to include all endangered species and ecosystems in NRS by 2010	A	D	C	B/C ^[4]	C	B/D ^[5]	C	B
Direction 8 (a) Pre-European vegetation mapping completed by 2006	A	B	D	A	C	D/A ^[6]	A	A
Direction 8 (b) Mapping of freshwater systems commenced 2006	A	D	C	A	A	A	A	D
Direction 10. NRS implementation plans for each priority bioregion by 2006	n/a	A	D none	B/D ^[7]	D none	A	B	D
Direction 28. Management plans or Management Intent in place by 2006	A	C ^[8]	C	A ^[9]	C	A	B	D
Direction 34 Management effectiveness reporting in place 2005	yes	yes	no	yes	no	yes	yes	no
Direction 36 (a) Change in funding ^[10] for acquisition from 2004 to 2006	n/a	up	none	up	static	static	static	up

[1] Agreed timeline for implementation in the *Directions*.

[2] Derived from Table 5 in Sattler and Glanznig 2006.

[3] Queensland's Environmental Protection Agency (EPA) reports most regions will have integrated bioregional strategies by 2010, but this awaits the leasehold land review in many bioregions and integrated conservation planning with other land uses and tenures.

[4] EPA reports unlikely in most bioregions as the mapping of endangered regional ecosystems is not complete and habitat requirements of many endangered species is unclear.

[5] B for ecosystems, D for species.

[6] Modelled pre-European coverage available based on detailed mapping in parts.

[7] Due primarily to incompleteness of regional ecosystem mapping.

[8] Calculated on a state wide basis.

[9] EPA reports they have not completed management plans for most reserves, but provisions of the *Nature Conservation Act* contain sufficient management direction.

[10] Trends are for absolute dollars not inflation corrected amounts, see Table 7.

Growth of protected areas, 2004 to 2006

Terrestrial protected areas grew by 1.1%, from 10.5% to 11.6% of Australia's land area, between 2004 and 2006. Almost all new protected areas were in interim status, yet to be gazetted as of 2006. Within this total, strictly protected areas (IUCN Management Categories I to IV, both interim and gazetted) increased by 1%, from 7.3 to 8.3%. Western Australia and Tasmania were the top ranking jurisdictions for growth of protected areas. Protected area growth was very unequal among bioregions and jurisdictions.

Australia does not rank highly among the 17 megadiverse countries in regard to protected areas, trailing behind Colombia, China, USA, Peru, Ecuador, Venezuela, and Malaysia in total percent of land area protected. China has declared its intent to protect more of its area by 2010 than would Australia, although this does not necessarily mean that China will have a more comprehensive, adequate or representative reserve system.

Priorities for reserve system growth

Seven bioregions still have less than 2% of their land area in protected areas and are high priority bioregions for strategic growth of the reserve system. These are Finke, Central Arnhem, Sturt Plateau, Burt Plain, Dampierland, Mitchell Grass Downs and Darling Riverine Plains (Fig. 1).

More effort in building the NRS was devoted to bioregions with over 10% of land area already protected in 2004 than to bioregions with less than 5% protected. It is recognised however, that even in bioregions with high levels of protection, there may be particular high priority biodiversity assets in need of further protection.

The 1999 *Australian Guidelines for Establishing the National Reserve System*, developed in cooperation with state and territory governments, identifies as priority assets:

- > Samples of all ecosystems identified at an appropriate regional scale.
- > Areas which are refugia or centres of species richness or endemism.
- > Habitats of rare or threatened species, ecological communities and ecosystems.
- > Habitats for specialised species such as migratory species, or even presently common species that may be vulnerable to threats like climate change.

High priority bioregions are those with very low levels of reservation and high levels of threat to native biota. Northern savannahs and our semi-arid lands, including eastern woodlands, grasslands and wetlands are generally poorly protected, and many suffer the significant accumulated impacts of pastoralism. In many cases, current pastoral land use is unprofitable and with increasing severity of droughts under climate change, and potential further degradation increases the urgency of expanding the NRS in these poorly protected areas.

Northern Australia represents a continental priority domain for protected area growth. Australia's northern savannah is an area rich in rivers and wetlands in natural or near natural condition and contains half of the high or very high priority bioregions for the National Reserve System as identified in the *Building Nature's Safety Net 2006* report.

As a result of this *Building Nature's Safety Net 2008* review, the intergovernmental NRS task group is undertaking a review of bioregional priorities for the NRS. This review should include further development of the database in Part C of the *Building Nature's Safety Net 2006* report, which identified priority regional ecosystems for reservation and highlighted pressing issues in each bioregion.

Financing to reach targets

The slow progress toward targets is reflected in the very low Australian Government investment which has averaged about \$8 million per annum for the NRS Programme. National leadership is vital to stimulate investments by the states, territories and private land trusts that have to bear the significant ongoing costs of protected area management.

Lack of stimulus from this program is matched by generally low and static acquisition budgets by many of the states and territories.

Only 12.8% of new protected areas have been associated with assistance from the National Reserve System programme, and 33.8% from the Indigenous Protected Areas programme.

Approximately 30 million hectares of new protected areas are thought to be needed to ensure at least 10% of each bioregion is protected, as a proxy for the primary comprehensiveness target (discussed below). The growth rates needed to achieve this are only about 1.4 times the rates achieved so far this decade but need to be strategically targeted to priority bioregions and the priority ecosystems with each bioregion.



Southern Hairy Nosed Wombat.

© WWF/Klein & Hubert

At least \$250 million over five years from NHT round 3, disbursed as grants for 67% (two-thirds) of acquisition and establishment costs is required of the Commonwealth to ensure significant progress toward this target, and to stimulate investment by states and territories. In addition, much greater Commonwealth and state investment is needed for Indigenous Protected Areas and for covenants on private land that meet the standards of the NRS.

Such investments are only sufficient to make significant progress towards meeting the priority comprehensiveness target. The total financial need to meet all NRS targets requires further analysis, particularly in the light of the challenge posed by climate change.

Comprehensiveness

The top priority target for the NRS is to protect a representative sample of at least 80% of regional ecosystems in each of Australia's bioregions. All states and territories, except Tasmania and the Australian Capital Territory, report that they will not meet this target within the agreed timeline of 2010-2015 (Table 1, line 2).

This is a serious shortcoming that repeats earlier policy failures to meet agreed reserve system targets. Delay becomes more serious as the opportunity to protect biodiversity in many bioregions is progressively lost through land modification and escalating land values.

Queensland, Tasmania, South Australia and Western Australia all report however, that they expect a major improvement relative to 2001 (Table 1, lines 1 and 2).

Protecting endangered species and freshwater systems

The agreed target of bringing endangered species and ecosystems into protected areas by 2010 will not be met at current rates and patterns of growth by any jurisdiction, except the ACT (Table 1, *Direction 4*).

The *Terrestrial Biodiversity Assessment* in 2002 found that a disturbingly high proportion of threatened species were still declining. Further analysis of *Assessment* data shows that subregions with a higher proportion of land set-aside in strictly protected areas have a significantly lower proportion

of threatened species reported as declining. This confirms that protected areas are effective at securing wildlife by saving their habitats.

However, it is not possible to plan efficiently for strategic growth of the NRS unless substantial new effort is devoted to mapping critical habitats for endangered species and ecosystems, particularly those most vulnerable to climate change.

A freshwater protected area system for Australia is still in its infancy. Australia's wetlands and rivers remain relatively poorly protected compared with land areas.

Adequacy: bioregional planning

The adequacy of the reserve system in protecting species and ecosystems is difficult to measure. However, the extent to which a comprehensive reserve system is systematically planned for each bioregion is one aspect of ensuring the development of an adequate reserve system. Few jurisdictions indicate that extensive bioregional planning or park system plans for each bioregion will be in place within the agreed timelines.

This lack of progress requires the Australian Government to take a much stronger leadership role in promoting systematic bioregional planning across each of Australia's 85 bioregions to ensure that not only are NRS *Directions* met but conservation expenditure overall is well targeted to biodiversity priorities.

Adequacy: protected area management

Jurisdictions reported that management plans or statements of management intent were generally not in place by the agreed 2006 timeline (Table 1, *Directions 28, 34*). Increased effort to produce management plans or at least statements of management intent, across most jurisdictions is needed to focus management on reducing threats and protection of natural and cultural values.

National principles for the management of protected areas and for monitoring management effectiveness are being developed though further work on assessing ecological integrity of protected areas is required. Management effectiveness assessment is particularly acute on multiple use-protected areas which allow land uses such as livestock grazing. Rigorous monitoring and evaluation processes must be

established as part of such conservation agreements to ensure there are no significant adverse impacts from such land uses.

Investment in management of protected areas declined in real terms on a per hectare basis across the country over the four year period 2002/3 to 2006/7, except in Victoria, the Northern Territory and perhaps also Tasmania.

Tasmania and the Australian Capital Territory advised they could not report on budget allocations for management of protected areas, which frustrates attempts to properly plan for adequate management.

Adequacy: resilience to climate change

Climate change is emerging as a matter of widespread concern. The release of the IPCC 4th working group report in 2007 on climate change impacts showed more severe predictions for impacts on biodiversity than previously anticipated.

Climate change raises fundamental questions about the design of protected area systems. A WWF and IUCN symposium on the key role of the protected area system in buffering nature against climate change was held in June 2007 with Parks Australia support. Several key conclusions came out of this symposium:

- > Meeting existing targets for a comprehensive, adequate and representative (CAR) NRS is the most important step needed to protect natural resilience to climate change. The NRS provides the best option for securing critical habitats for threatened species including refugia, climate corridors and stepping stones, whether in public, Indigenous or private protected areas or covenanted properties.
- > The established CAR criteria are robust in regard to climate change but could be enhanced by identification and protection of critical habitats for climate change vulnerable species.
- > Considerable shift and turnover of native animals and plants in existing protected areas is expected and should be prepared for.
- > The exacerbation due to climate change of impacts by other threats, such as increasing economic demands on water and land, fragmentation, changed fire regimes, weeds and pests, presents a major management challenge for protected areas and for the landscapes in which they are embedded. The extent to which such threats are reduced on a landscape scale is critical to the adequacy of protected areas.

- > Although restoring landscape connectivity through revegetation may be an important contributor to natural resilience to climate change, such efforts are typically expensive, not without problems and should not detract from the more urgent and cost-effective priority of securing critical intact habitats. Retaining or restoring connectivity should focus on the species with a critical need for connectivity and on cost-effective delivery mechanisms such as use of existing stock route networks and carbon market incentives to manage natural regrowth where such opportunities exist.
- > Planning for climate change should be part of systematic bioregional planning for identifying biodiversity priorities and cost-effective conservation management.

Notable new protected areas

Protected areas appearing for the first time in CAPAD 2006 that made notable additions to achieving the goals of the *Directions* include (see boxes 2-11):

- > Bimbowrie Conservation Park, South Australia
- > Craven's Peak Reserve, western Queensland
- > Flat Rock Reserve, Tasmania
- > Goorooyaroo Nature Reserve, Australian Capital Territory
- > Gundabooka State Conservation Area, western New South Wales
- > Humboldt National Park (awaiting gazettal), central Queensland
- > Kotta Nature Conservation Reserve, northern Victoria
- > Laynhapuy IPA, Northern Territory
- > Lorna Glen Station, Western Australia
- > Wongalara Wildlife Sanctuary, Northern Territory

State and territory summaries

- > The Australian Capital Territory expects to meet all major targets. This reflects to some extent the small size of the Australian Capital Territory which occupies only part of two bioregions. The Australian Capital Territory has the most extensive protected area system of any jurisdiction. The Territory continues to add new reserves to protect endangered ecosystems such as Goorooyaroo Nature Reserve (Box 5).
- > New South Wales has made modest progress in expanding the NRS with well targeted acquisitions such as

Gundabooka (Box 6). The steady annual acquisitions budget of \$17 million a year is the highest of all jurisdictions with the exception of the Queensland budget for the 2006-7 financial year. Only one bioregion was below 2% of land area protected in 2006, down from three in 2004. Nevertheless, New South Wales reports that it only expects to meet the overall comprehensiveness and endangered species targets for a few bioregions, a situation not much improved since 2001 (Table 1). The management budget has not grown in real terms on a per hectare basis.

- > The Northern Territory has six of the nine most poorly protected bioregions across the continent. The Northern Territory Parks and Conservation Masterplan (NTPCMP) would comprehensively address NRS priorities and the *Directions* if the plan receives an adequate implementation budget. Most growth in protected areas has been in IPAs such as Laynhapuy (Box 9) or private protected areas like Wongalara (Box 11). The Australian Government should assist in implementing the masterplan given the territory's small population and low revenue base. Reform of laws to allow leasehold land conversion and covenanting for conservation could become important mechanisms to help implement the plan.
- > Queensland has the most bioregions poorly protected at the below 5% level. Queensland enjoyed a significant boost in acquisition funding in 2006/7 after a period of very limited funding. However, it remains to be clarified how much of this budget will go toward implementing the *Directions*. Queensland is celebrating its centenary of parks in 2008 and could celebrate most appropriately by meeting its commitments under the *Directions*, and through implementing the 20 key park proposals detailed in WWF's *Treasures for Humanity*, only two of which have been acquired to date (Box 7). The management budget has not grown in real terms on a per hectare basis. State forest conversions have dominated recent protected area growth while Nature Refuges on private lands have grown by about a million hectares in recent years. Nature Refuges often permit livestock grazing and it is critical that such uses which have led to widespread degradation across Australia's rangelands be closely monitored and regulated to ensure the primary conservation purpose is not compromised. The newly released leasehold land strategy could bring many priority areas and ecosystems into the NRS if pursued strategically.
- > South Australia already has a relatively high proportion of the state protected, but protected areas are unevenly distributed across bioregions. Disappointingly, the state showed no net growth in the 2004-2006 period despite valuable additions such as Bimbowrie Conservation Park (Box 2). South Australia is arguably more advanced in terms of state support for the conservation of Indigenous lands.
- > Tasmania made the second highest proportional contribution to the NRS despite being well advanced toward NRS goals. Tasmania is the only jurisdiction apart from the Australian Capital Territory reporting it will meet the comprehensiveness target in time. The Northern Midlands bioregion remains poorly protected (4.2% by area) but opportunity for expansion of the NRS there is limited by extensive clearing and fragmentation. Progress in meeting its comprehensiveness target is evident through such additions as Flat Rock Reserve (Box 4). However, further effort to protect endangered species habitats and ecosystems is required.
- > Victoria expects to meet its comprehensiveness and endangered species targets in only some bioregions. The acquisition budget remains small. Victoria was the only jurisdiction to have shown any significant increase in management budgets in real terms on a per hectare basis, from 2004 to 2006. However, Parks Victoria is not strictly comparable to other state parks agencies, because it also manages metropolitan parks. The Victorian Volcanic Plain remains poorly protected with only 1.4% in reserves and opportunities for expansion of the NRS are limited. Additions like Kotta Nature Conservation Reserve were well targeted to poorly protected bioregions and ecosystems (Box 8).
- > Western Australia showed the greatest proportional growth in extent. Strictly protected areas jumped by 2% from 6.8% to 8.8% of the state. However, many of the areas added were already committed but did not appear in the 2004 CAPAD. Western Australia reports that it expects to meet its comprehensiveness and endangered species targets for most bioregions, despite a very limited acquisitions budget. This optimism is largely due to an advanced program of pastoral lease review leading to additions such as Lorna Glen (Box 10). Management funding has contracted in real terms on a per hectare basis. Four predominantly Western Australia bioregions have less than 5% of land protected.

Key recommendations

- > All governments should allocate funding to levels appropriate to reach the targets for developing a well-managed, comprehensive, adequate and representative National Reserve System within timeframes agreed to in the *Directions for the National Reserve System: A partnership approach*.
- > The Australian Government should as a first step, invest at least \$250 million over 5 years to make significant progress toward the 2010-2015 comprehensiveness and endangered species targets for the NRS. Grants should be disbursed for up to two thirds of acquisition and establishment costs, in recognition of the significant long term commitment to reserve management by proponents.
- > The Australian Government should conduct a financial needs assessment of the total investment levels needed to implement all of the *Directions*, including the additional resources required to include practical climate change responses.
- > The Australian Government should make a special provision to assist the Northern Territory implement its Parks and Conservation Masterplan in consideration of the low population and revenue base of the Territory and the fact that the Northern Territory has six of the nine most poorly protected bioregions.
- > The Australian, state and territory governments should work together, and with appropriate Traditional Owners, to lift the percent of area protected for the most poorly protected bioregions, such as Finke, Central Arnhem (all Indigenous land), Sturt Plateau and Burt Plain (NT) and Dampierland (WA).
- > Prioritisation schemes for the NRS should be revised with further development of detailed data on priority biodiversity needs and threats within each bioregion as presented in the *Building Nature's Safety Net 2006* report (Part C). A particular focus on northern Australia and semi-arid lands is required.
- > The Australian Government should as a high priority identify critical habitats for threatened species with a priority to endangered species, to inform efficient planning of reserve system growth.
- > In light of the poor protection of freshwater ecosystems, the Australian Government should expedite identification and protection of high conservation value freshwater ecosystems.
- > The Australian Government should make significant new investment in bioregional conservation planning to ensure that all conservation effort, including NRS implementation plans, natural resource management and climate change adaptation strategies, is delivered in a coordinated and cost-effective way focussed on national biodiversity and reserve system goals.
- > Bioregional planning must be supported by increased investments in comprehensive ecosystem mapping and interpretation at a fine enough scale for both the intensive and extensive land use zones of Australia.
- > The Australian Government should ensure there is a repeatable and reliable national process of monitoring trends in ecosystem condition and threatened species populations, to permit accurate evaluation of effectiveness and cost-efficiency of different conservation actions. This would also contribute to efficient reserve system planning.
- > Protected area management funding should be increased by all jurisdictions to accommodate growth of the reserve system and to address the intensification of threats expected with climate change.
- > The Australian Government should fund a national program to identify refugia and other key habitats, to improve the resilience of native species and ecosystems to climate change, and to inform the requirements for a comprehensive, adequate and representative NRS across each bioregion.
- > Restoration of connectivity to facilitate climate change resilience should be closely linked to the identified needs of climate-vulnerable species, and should adopt the most cost effective solutions such as through enhancement of stock routes and investigating managed natural regrowth as an eligible carbon credit in the emerging Australian Emissions Trading Scheme.
- > The local government conservation estate represents a potentially significant contribution to the NRS. This contribution should be accounted more fully in future CAPAD releases, where appropriate security of tenure and management arrangements are in place.
- > Additional funding is urgently needed to secure effective ongoing management of Indigenous Protected Areas (IPAs) through Indigenous ranger employment and training programmes. Stable ongoing management funding, conservation security mechanisms and devolution of law enforcement should be developed through 'tripartite' partnerships with state and territory governments.
- > The Australian Government should encourage growth of the Indigenous conservation estate through increasing the funding available for Indigenous Protected Area acquisitions and by enhanced delivery of the environmental stream of the Indigenous Land Corporation.
- > Further reform of land laws is essential in the Northern Territory, Queensland and Western Australia to remove remaining impediments to acquisitions of pastoral leases to become private protected areas free of livestock.
- > The Australian Government should develop a National Reserve System Covenancing Initiative whereby all covenancing supported by Australian Government tax concessions or grants is coordinated through agreed criteria and standards of protected area monitoring and evaluation and oriented to advancement of NRS goals.
- > The Australian, state and territory governments should seek opportunities through rural assistance schemes to stimulate uptake of covenants that advance national biodiversity and NRS goals and to finance their effective long-term management, while also addressing any perverse incentives against national conservation goals that may be created through existing rural assistance programmes.

Introduction

12



Australia's National Reserve System (NRS), the collection of public national parks and nature reserves, Indigenous and private protected areas, is the country's premier investment in biodiversity conservation.

The National Reserve System provides significant benefits to society:

- > Providing major ecosystem services such as biodiversity protection, carbon sequestration, clean air and water.
- > Protecting the major refuges for native animals and plants from habitat loss and degradation.
- > Protecting natural resilience to climate change.
- > Providing public health benefits through outdoor recreation and relaxation.
- > Forming the fundamental asset and drawcard of Australia's \$23 billion a year natural tourism industry.¹

Ongoing assessment of progress toward a reserve system that adequately protects the nation's biodiversity is of central importance to Australia's obligations under the 1992 *Convention on Biological Diversity* (CBD) and *The National Strategy for the Conservation of Australia's Biological Diversity*.

WWF is committed to providing objective and independent assessment of progress in meeting NRS targets using the best available information in close cooperation with protected area agencies. This report is the second in the WWF's *Building Nature's Safety Net* series.²

This report:

- > Summarises the development of Australia's NRS for the period 2004 to 2006 based on the Collaborative Australian Protected Areas Database (CAPAD) 2004 and newly collated 2006 data.³
- > Reviews progress in implementing twelve key NRS targets agreed to by Australian, state and territory governments in the *Directions for the National Reserve System – a Partnership Approach*, the overarching policy framework for the NRS.⁴
- > Reviews climate change considerations in protected area planning.

The report does not review development of marine protected areas as these come under a separate policy framework.

The *National Strategy for the Conservation of Australia's Biodiversity*⁵ recognised the central role of the NRS in conserving Australia's biodiversity:

'Central to the conservation of Australia's biological diversity is the establishment of a comprehensive, representative and adequate system of ecologically viable protected areas integrated with the sympathetic management of all other areas, including agricultural and other resource production areas.'

Comprehensiveness is measured as the proportion of regional ecosystems sampled in the NRS in each bioregion.

Information on comprehensiveness is fundamental to efficient planning of strategic reserve system growth.

Representativeness is defined as the sampling of regional ecosystem variation at the sub-bioregional scale.

Adequacy is the protection of natural ecosystems and habitats to the level necessary to provide ecological and species viability, resilience and integrity. Extent, or the percentage of land area protected, is the most readily quantifiable albeit crude measure of adequacy.

In the 2002 *Terrestrial Biodiversity Assessment*⁶ a minimum reservation of 1000 hectares, or if less, all; was the cut-off for a regional ecosystem to be considered 'sampled' for the purpose of measuring comprehensiveness and representativeness. However, this may not be the same as 'adequate' in terms of species and ecosystem protection.

Other important elements of adequacy include:

- > Bioregional context – the degree to which conservation priorities are identified and management of surrounding lands is conservation oriented and sympathetic to the goals of protected areas.
- > Standard of management.
- > Connectivity and its inverse, fragmentation.
- > Protection of native species within the reserve and inclusion of critical habitats. In the context of climate change, this particularly concerns refugia.⁷

The Australian Government established the *National Reserve System Cooperative Programme* in 1992 to, amongst other things, provide grants for acquisitions to the states and territories to progressively develop the NRS. WWF-Australia played an instrumental role in securing these commitments, and published report cards on development of the NRS in 1994 and 1995.⁸

WWF's *Building Nature's Safety Net 2006* report built on these efforts, documenting the development of the NRS for

the period 1991 to 2004, highlighting priority bioregions and regional ecosystems for further strategic growth, and recognising outstanding contributions by conservation agencies and non-government bodies in the *Top Ten Protected Areas of the Decade* awards.

Recent policy milestones

Since the release of the *Building Nature's Safety Net 2006* report there have been several important reviews or statements of policy relevant to the National Reserve System:

- > The 2006 *National Reserve System Programme Evaluation* had several key recommendations:⁹
 - '6.1.2 The NRS Programme should be reinstated as a national programme focused on accelerating the reservation and protective management of bioregionally significant lands.
 - '6.1.3 Consideration should be given to re-badging the NRS Programme to more clearly identify its role in delivery of the NRS in a national context...
 - '6.2.1 NRS Programme funding levels should be reviewed. Additional targeted funding from the Australian Government will be required if the *Directions Statement* target of 80% representation of regional ecosystems in the NRS by 2010–2015 is to be met.
 - '6.2.2 NRS Programme acquisitions should be routinely funded by the Australian Government for at least two thirds of the total acquisition and establishment costs...'
- > The 2006 *Indigenous Protected Areas Programme Evaluation* noted that the programme is 'Australia's most successful innovation in protected area management and in Indigenous engagement in environmental management' which delivers dramatic successes across multiple government portfolios.⁹ The report recommended:
 - '6.1.1 Funding to at least a minimum base level of ongoing management of IPAs should be sought, within the supportive framework of tripartite agreements between owners, State or Territory governments and the Australian Government, if their full value to the National Reserve System (NRS) is to be realised.
 - '6.1.2 Management funds should be provided on the basis of three to five year forward estimates...'
 - '\$20–30 million per year might be able to be well invested by 2010–2011 rising to \$50 million thereafter.'The evaluation identified the lack of consolidated sources of stable long-term management funding as the greatest problem facing IPAs.
- > *Conserving Australia*, the report of the 2007 Senate Inquiry into National Parks and Marine Protected Areas was a comprehensive survey of protected area issues. Key recommendations were:¹⁰
 - 'that the Commonwealth review the funding formula under the NRS Programme to take greater account of the on-going management costs borne by the states and territories'
 - 'that in the upcoming NHT3 funding round the Commonwealth significantly increase the funding allocation directed to the National Reserve System Programme'

'that the Commonwealth substantially increase funding to the Indigenous Protected Areas Programme, and that funding for this Programme also be provided by state and territory governments.'

- > The 2007 *Natural Tourism Partnerships Action Plan* of the Tourism and Transport Forum noted that parks and reserves are the fundamental asset of the \$23 billion a year natural tourism industry. The Forum would like to see this asset grow strategically and be well managed. The Plan recommends that governments:¹¹
 - 'Increase budget funding to Park Agencies for land acquisition, climate change adaptation and ongoing conservation of the increasing park estate.'
- > The 2007 audit of *The conservation and protection of national threatened species and ecological communities* listed under the Commonwealth's *Environmental Protection and Biodiversity Conservation Act* found that:¹²
 - 'Only 126 species (22 per cent) of the 583 species committed had recovery plans completed by 2004. Fifteen (68 per cent) of the 21 ecological communities committed had recovery plans in place by 2004.'Recovery plans are the only legislated means by which critical habitats of threatened species are defined along with actions needed to conserve those habitats, such as through establishing protected areas. In the absence of defined critical habitats it is difficult to decide where to target protected areas efficiently. The audit also criticised the considerable delay in delivery of the Biodiversity Hotspots Programme and the funding of projects outside of the defined hotspots.
- > The June 2007, WWF and IUCN symposium *Protected Areas: Buffering nature against climate change* concluded that meeting National Reserve System targets is the best way to retain natural resilience to climate change and should form the basis of a comprehensive climate rescue package for biodiversity.
- > The Rudd Labor government has stated that it is committed to enhancing progress of the National Reserve System toward agreed goals and targets, recognising the importance of the NRS as a safety net for Australia's biodiversity in the face of climate change and as a key national priority within the Natural Heritage Trust. It has also committed to significant increases in support for Indigenous Protected Areas.
- > The Working Group on Protected Areas of the Convention on Biological Diversity (WGPA2) noted that Australia's financial need for meeting the agreed 2010 targets for the CBD programme of work on protected areas was in the range \$300–\$400 million (reported in US\$ equivalents) as recommended in 2002 by the *Setting Biodiversity Priorities* submission.¹³

Methods

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1. The Growth of Australia's protected areas was assessed using the recently released Collaborative Australian Protected Areas Database (CAPAD) 2006 and comparing with the earlier CAPAD 2004.

Care must be taken to distinguish CAPAD from the NRS, since jurisdictions are not yet unanimous on the inclusion of all protected areas appearing in CAPAD in the NRS.

This analysis does not include all the protected areas under local government, Indigenous or private ownership and management which may contribute to meeting national biodiversity and NRS goals. However, to the extent those types of protected areas are included in CAPAD 2006, their area contributions are reported.

2. The assessment of progress in meeting twelve of the key *Directions* was based on a self-assessment questionnaire completed by all state and territory conservation agencies (Appendix 1). The agencies were asked to categorise progress for each key *Directions* in relation to four broad classes where appropriate, based upon the number of bioregions where success was likely to be achieved within the agreed timeframe. In some cases we have revised rankings based on additional information from discussions with jurisdictions.

Progress on each key *Direction* was ranked as follows:

- A = Successfully implemented in all bioregions
- B = Implemented in most bioregions (>66% but <100%)
- C = Implemented in some bioregions (33-66%)
- D = Implemented in few bioregions (< 33%)

Progress reported by each state and territory in meeting the *Directions* is discussed, but no report card as produced for the 1991 to 2004 review is attempted here. CAPAD 2006 allows objective comparisons between states and territories only in growth of extent of the NRS.

3. Major government and non-government protected area agencies were asked to identify the most noteworthy addition for the period 2004 to 2006. These noteworthy protected areas are highlighted in Boxes 2 to 11 of this report.
4. With climate change increasingly being considered as a key issue in protected area planning, the states and territories were also asked:
 - > What climate change adaptation measures were being used in protected area planning and,
 - > Where climate change was of particular concern, and could be addressed through growth of the NRS (Appendix 1).

Growth of Australia's terrestrial protected areas, 2004 to 2006

Building Nature's Safety Net 2008
Progress on the Directions for the National Reserve System

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Mountain ash forest © WWF-Cannon/Martin Harvey

The most basic element of the adequacy of the reserve system is the percent of land area protected. Protected areas totalled 89,528,859 hectares or 11.6% of Australia's land area as of CAPAD 2006 (Table 2).

The IUCN classifies protected areas by management intent and governance as shown in Table 2 and Box 1. The vast

majority of Australia's protected areas are government run. Indigenous and private protected areas (IPAs and PPAs) represent minor though growing components. Non-government protected areas tend to fall in multiple use management categories V-VI (Table 2).

BOX 1 IUCN protected area categories

The IUCN definition of a protected area is: 'An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means'.

The guidelines for applying these categories are expected to be amended at the forthcoming 2008 IUCN World Congress in Barcelona.

The six Protected Area Management Categories are:

Ia 'Strict Nature Reserve' managed mainly for science; an area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring.

Ib 'Wilderness Area' managed mainly for wilderness protection; a large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition.

II 'National Park' protected area managed mainly for ecosystem protection and recreation; a natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.

III 'Natural Monument' managed mainly for conservation of specific natural features; an area containing one, or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance.

IV 'Habitat/Species Management Area' managed mainly for conservation through management intervention; an area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.

V 'Protected Landscape/Seascape' managed mainly for landscape/seascape conservation and recreation; an area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.

VI 'Managed Resource Protected Area' managed mainly for the sustainable use of natural ecosystems; an area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.

Categories I-IV are considered 'Strictly Protected Areas' while Categories V-VI are considered 'multiple use areas'.

The four Protected Area Governance Categories are:

A. Government Managed Protected Areas. Sub-national and municipal government bodies can be in charge. In some cases government might retain full land ownership and/or control and oversight of protected areas but delegate the daily management tasks to a para-statal organization, NGO, private operator or community.

B. Co-Managed Protected Areas. Decision making authority and responsibility may rest with one agency but the agency is required – by law or policy – to inform or consult other stakeholders. In stronger forms multi-stakeholder bodies have executive power. In Australia, CAPAD does not yet score this governance type reliably.

C. Private Protected Areas: Private governance comprises protected areas under individual, cooperative, NGO or corporate ownership and control, without any necessary accountability to government or the public.

D. Community Conserved Areas: Authority and responsibility rest with communities through a variety of customary forms of ethnic governance or locally agreed organizations and rules. In Australia, Indigenous Protected Areas fit this category.

Only modest growth in extent occurred over the period 2004 to 2006 with the protected area system growing by 1.1%, from 10.5% to 11.6% of Australia's total land area (Table 2). Almost all of this growth (0.97%) was in interim protected areas that have yet to be gazetted.¹⁴ For strictly protected areas within this total, there was an increase of 1%, from 7.3% to 8.3% over the same period (Table 2).

Growth was highly variable among jurisdictions over the period 2004 to 2006 (Table 2):¹⁵

- > The Australian Capital Territory increased its protected areas by 869 hectares (0.7%) as a result of new nature reserves (See Box 5) and small additions to existing reserves. The CAPAD 2006 figures show a net decline, but this was entirely due to boundary realignments resulting in removal of areas that were mistakenly included in CAPAD 2004.
- > In New South Wales, the Western Regional Assessment has led to the reservation of 350,000 hectares in the poorly conserved Brigalow Belt South bioregion. Despite this progress, New South Wales still has several bioregions that are a high priority for reservation (Table 3).
- > The Northern Territory showed a small increase in strictly protected areas, and tied with New South Wales in having the third highest growth in extent of all protected areas, primarily due to the Australian Government Indigenous Protected Areas Programme.
- > South Australia showed significant growth in strictly protected areas. However, the total area protected actually decreased due to corrections of boundaries of two large protected areas in the northeast (Table 2, Fig 4).
- > Tasmania reported an increase largely due to the inclusion of covenanted private protected areas in CAPAD 2006 for the first time.
- > Western Australia was the top performer in terms of growth of total extent of protected areas, with strictly protected areas jumping 2% of the state's area from 6.8% to 8.8%, and all protected areas increasing by 2.4%. However, this growth was mostly due to the fact that many new protected areas created before 2004 were withheld from CAPAD 2004 awaiting resolution of legal uncertainties.

Of Australia's 85 bioregions, several stood out as showing major improvements from 2004 to 2006 (Tables 3-4, Figs 3-4):

- > Central Arnhem (NT) gained a protected area for the first time due to the declaration of Laynhapuy IPA (Box 9).
- > Arnhem Coast (NT) increased from below 3.3% to 25.7% of area protected due to some major IPA declarations.
- > Gascoyne and Murchison bioregions (WA) went from below 2% to above 5% protected, largely as a result of the Gascoyne-Murchison pastoral leasehold land strategy.
- > Carnarvon (WA) went from below 5% to above 10% or area protected for similar reasons.

Despite positive trends, protected areas remain very unequally distributed among bioregions in CAPAD 2006 (Tables 3-4, Figs 1-2):

- > Nine bioregions have less than 2% of area protected, down from 14 in 2004: Finke, Central Arnhem (all Indigenous land), Sturt Plateau, Burt Plain, Dampierland, Mitchell Grass Downs, Tanami, Victorian Volcanic Plain, Darling Riverine Plains. All can be considered high priority for further reservation effort, and all are in inland arid and semi-arid environments including high productivity rangeland environments. The Tanami bioregion had less than 2% of area protected in CAPAD 2006, but has since increased to 10% with declaration of the Tanami IPA in 2007. The Victorian Volcanic Plain also had less than 2% protected in CAPAD 2006. However, potential for further growth is limited due to lack of intact remnant vegetation in this bioregion.
- > 27 bioregions have less than 5% of area protected, down from 33 in 2004 (Table 4). Queensland has the most bioregions (30%) in this poorly protected category. Queensland, Northern Territory, Western Australia and New South Wales combined account for 93% of the bioregions with less than 5% of area protected (Table 3).
- > 54 bioregions have less than 15% of area protected, down from 58 in 2004 (Table 4), while the remaining 31 bioregions have 15% or more of area protected (Table 4). However, within this highly protected group there may yet be ecosystems, endangered species habitats, and other biodiversity assets that still lack adequate protection.

Fig 2. Strictly protected areas (IUCN I-IV) and multiple use protected areas (IUCN V-VI) in CAPAD 2006 (see Box 1 for category definitions).

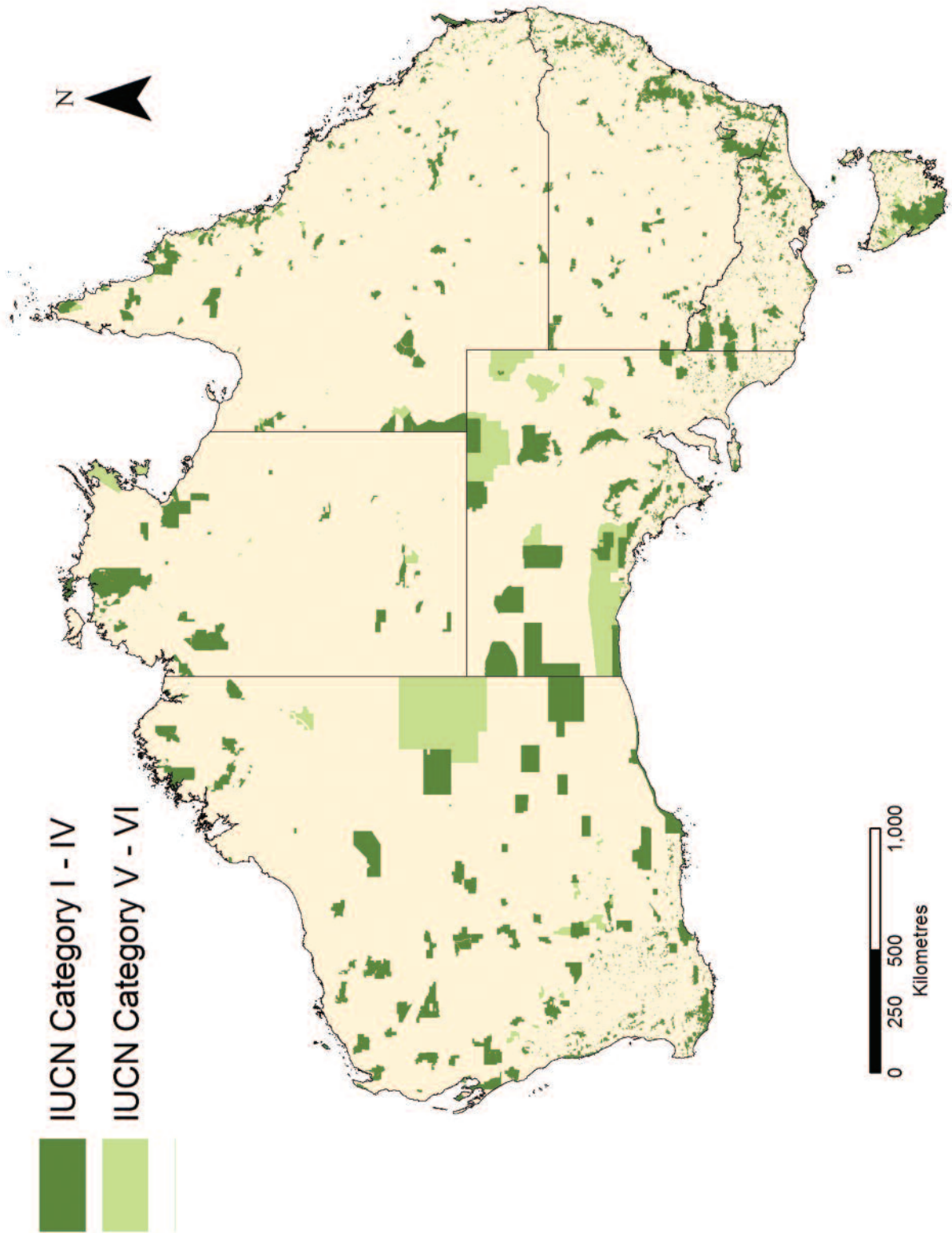


Fig 3. Protected areas established through the NRS and IPA programmes, and other protected areas in CAPAD 2006.

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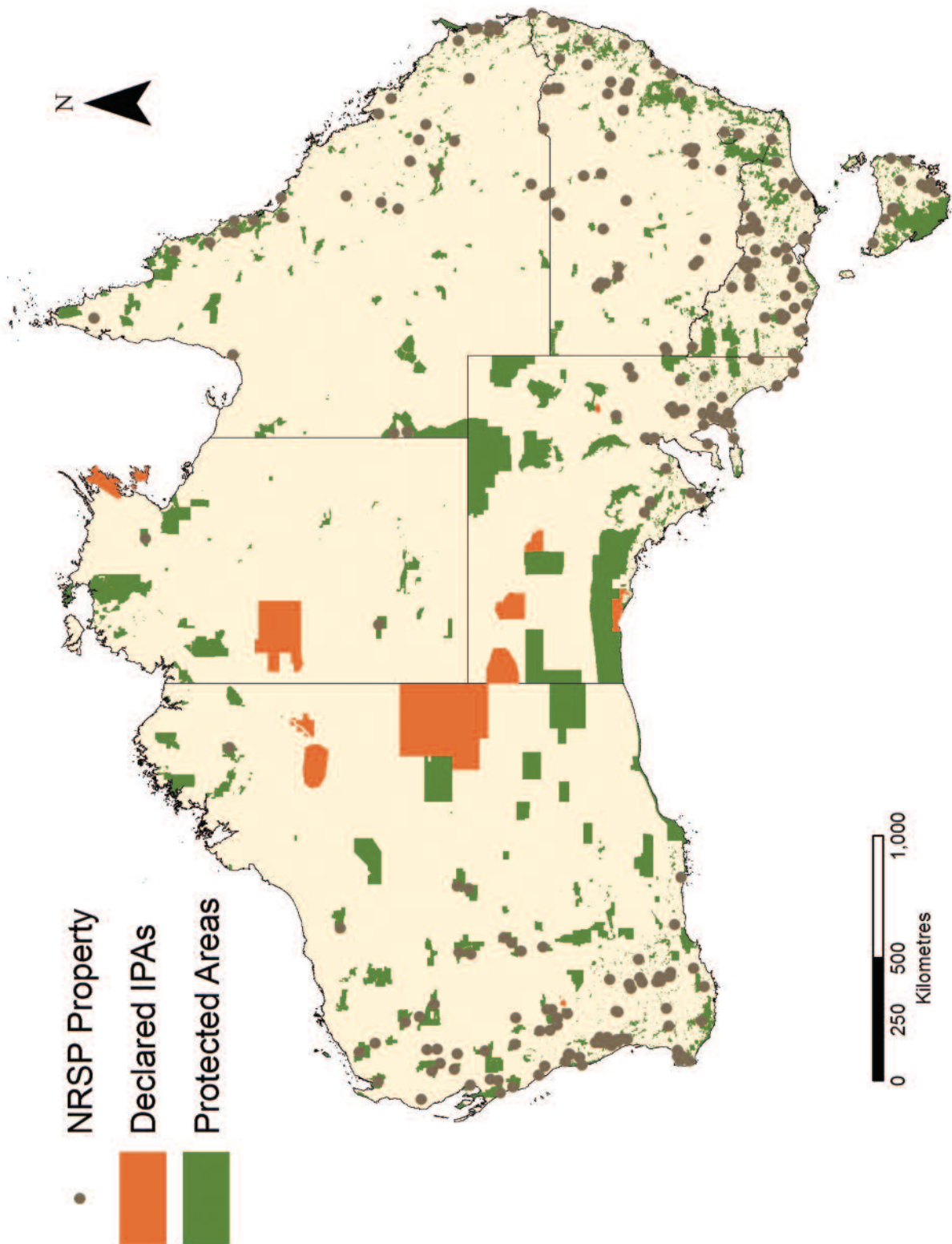
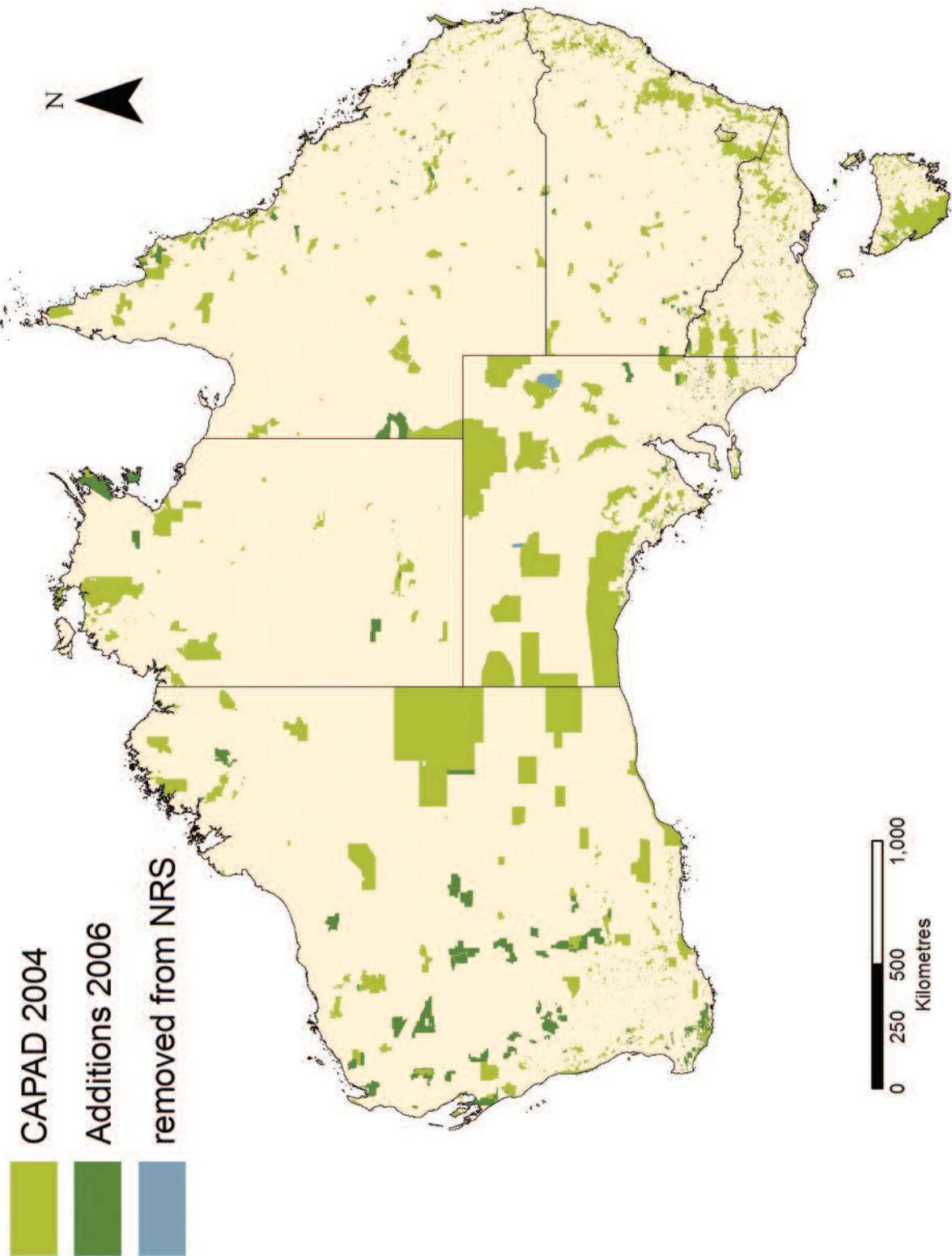


Fig 4. Additions and removals of protected areas in 2006 relative to 2004 CAPAD (refer Tables 2,3).



International comparisons

In *Building Nature's Safety Net 2006*, Australia ranked 16th among the 30 OECD countries based on extent of all terrestrial protected areas in 2003. However, Australia ranked second in terms of strictly protected areas.

In a recent paper, the World Conservation Monitoring Centre ranked the Australia and New Zealand region 10th among the 16 IUCN World Commission on Protected Areas regions in 2004, ranking below (in order) Central, South and North America, East and South East Asia, Eastern and Southern Africa, the Caribbean, South America (Brazil) and Europe. By contrast, the region had the largest absolute size of Marine Protected Areas of all the regions.¹⁶

Australia is believed to be the most diverse of the 17 recognised megadiverse countries for vertebrates and the fifth most diverse for plants (Table 6). However, Australia is by no means a leader in progressing its protected area commitments under the Convention on Biological Diversity (Table 6).

Australia trails Colombia, China, USA, Peru, Ecuador, Venezuela, and Malaysia in extent of area protected. China plans to protect more of its area by 2010 than does Australia, although whether that will result in a more comprehensive, adequate or representative reserve system has yet to be evaluated. Australia is certainly much more wealthy than most other megadiverse countries, excepting the US, and is in a much better position to meet its protected area commitments (Table 6).

Compared with a sample of 50 representative countries across the globe, Australia ranked 10th in spending on protected areas as a percentage of Gross Domestic Product and 18th in spending per hectare in US dollar equivalents, below countries like Cuba and Thailand. However, these figures span several years and are not comparable for a given year.¹⁷

Table 2. Percentages of Australia's land area protected in the two major IUCN management classes and three IUCN governance classes in each jurisdiction in CAPAD 2006, and change in percentages of land area protected from CAPAD 2004.

	Area (ha)	MC ^[2]	2004 CAPAD (ha)	2004 (%)	2006 CAPAD (ha)	2006 (%)	Change	IUCN Governance class ^[1]		
								Government	Indigenous	Private
ACT ^[3]	238,813	I-IV	129,151	54.10%	129,040	54.00%	-0.10%	100.00%	0.00%	0.00%
		V-VI	-	-	-	-	-	-	-	-
NSW ^[4]	80,121,268	I-IV	5,908,118	7.40%	6,229,686	7.80%	0.40%	98.90%	0.10%	1.00%
		V-VI	226,165	0.30%	526,112	0.70%	0.40%	99.90%	0.10%	0.00%
NT ^[5]	134,778,762	I-IV	6,517,405	4.80%	6,727,053	5.00%	0.20%	93.30%	0.00%	6.70%
		V-VI	414,430	0.30%	1,162,712	0.90%	0.60%	26.80%	73.20%	0.00%
Qld ^[6]	172,973,671	I-IV	7,136,167	4.10%	8,217,695	4.80%	0.70%	93.80%	0.00%	6.20%
		V-VI	1,483,260	0.90%	1,390,787	0.80%	-0.10%	66.20%	0.00%	33.80%
SA ^[7]	98,422,137	I-IV	13,757,306	14.00%	14,532,548	14.80%	0.80%	77.80%	17.50%	4.60%
		V-VI	11,494,374	11.70%	10,582,572	10.80%	-0.90%	91.60%	8.40%	0.00%
Tas ^[8]	6,840,133	I-IV	1,723,795	25.20%	1,832,864	26.80%	1.60%	98.50%	0.00%	1.50%
		V-VI	866,649	12.70%	888,529	13.00%	0.30%	98.60%	0.10%	1.30%
Vic ^[9]	22,754,364	I-IV	3,456,046	15.20%	3,555,729	15.60%	0.40%	99.20%	0.00%	0.80%
		V-VI	290,037	1.30%	276,365	1.20%	-0.10%	99.70%	0.30%	0.00%
WA ^[10]	252,700,808	I-IV	17,059,112	6.80%	22,255,745	8.80%	2.0%	98.30%	0.00%	1.70%
		V-VI	10,340,422	4.10%	11,221,420	4.40%	0.30%	8.30%	91.70%	0.00%
National	768,826,956	I-IV	55,779,762	7.30%	63,480,361	8.30%	1.00%	92.60%	4.00%	3.40%
		V-VI	25,115,337	3.30%	26,048,498	3.40%	0.10%	51.90%	46.20%	1.80%
		All	80,895,099	10.50%	89,528,859	11.60%	1.10%	80.80%	16.30%	2.90%

[1] Governance category *Jointly managed* cannot be reliably scored as yet. *Government* includes about 500 hectares of local government protected areas mostly in Qld.

[2] Management classes are strictly protected areas I-IV and multiple use areas V-VI (see Box 1).

[3] Includes Australian National Botanic Gardens (90 hectares). Canberra Nature Park was revised downward 110 hectares to remove road reserves. 2004 CAPAD figures were therefore erroneously high by that amount.

[4] Includes Australian Government's Booderee NP in Jervis Bay territory (6,312 hectares).

[5] The large increase in V-VI area is largely due to IPAs. Areas Include Australian Government's Kakadu (1,980,400 hectares) and Uluru-Kata Tjuta National Parks (132,566 hectares).

[6] Small decline in categories V-VI was due to transfer of Category VI Forest Reserves to Cat. II National Parks under the State Forests process.

[7] Mt Willoughby IPA and Strezlecki regional reserve boundaries both Multiple Use Protected Areas revised since 2004.

[8] Growth largely due to inclusion of covenanted areas on private lands for the first time.

[9] Small decline in categories V-VI due to reclassification.

[10] Growth primarily due to older reserve projects included in 2006 CAPAD that were unreported in 2004 CAPAD.

Table 3. Total area of protected areas listed in CAPAD 2006 in each bioregion (IBRA 6.1) and changes from CAPAD 2004.

State(s) ^[1]	Bioregion	Code	Bioregion Area (ha)	All protected areas 2006 (ha)	Strictly protected areas (% of all)	Extent 2004 (%)	Extent 2006 (%)	Change 2004-6 (%)
Vic (ACT,NSW)	Australian Alps	AA	1,214,902	773,233	99.8	63.7	63.6	-0.1 ^[2]
NT	Arnhem Coast	ARC	3,331,785	856,368	0	3.3	25.7	22.4
NT	Arnhem Plateau	ARP	2,306,023	486,613	100	21.1	21.1	0
WA	Avon Wheatbelt	AW	9,517,104	252,882	98.1	2.4	2.7	0.3
Qld	Brigalow Belt North	BBN	13,612,982	267,305	81.5	1.6	2	0.4
Qld (NSW)	Brigalow Belt South	BBS	27,224,832	1,214,016	79	3.2	4.5	1.3
Tas	Ben Lomond	BEL	657,500	100,044	79.2	14.6	15.2	0.6
NSW (SA)	Broken Hill Complex	BHC	5,682,303	151,766	100	1.4	2.7	1.3
NT	Burt Plain	BRT	7,379,719	19,212	99.5	0.3	0.3	0
NT	Central Arnhem	CA	3,462,370	2,689	0	0	0.1	0.1
WA	Carnarvon	CAR	8,427,563	963,864	100	3.7	11.4	7.7
Qld (NSW,NT,SA)	Channel Country	CHC	30,619,374	2,196,076	42	6.9	7.2	0.3
WA	Central Kimberley	CK	7,675,587	639,008	100	4.4	8.3	3.9
Qld	Central Mackay Coast	CMC	1,462,845	153,567	95.8	9.7	10.5	0.8
WA	Coolgardie	COO	12,912,209	1,790,493	78.5	10.3	13.9	3.6
NSW	Cobar Penepplain	CP	7,385,325	176,175	82.8	2	2.4	0.4
WA(NT,SA)	Central Ranges	CR	10,117,588	4,983,557	5.7	49.3	49.3	0
Qld	Cape York Peninsula	CYP	12,115,829	1,944,256	85.5	13.8	16	2.2
NT	Daly Basin	DAB	2,092,229	52,358	57.2	2.5	2.5	0
NT	Darwin Coastal	DAC	2,842,385	829,100	96.3	29.2	29.2	0
Qld	Desert Uplands	DEU	6,885,344	208,128	80.4	2.8	3	0.2
WA	Dampierland	DL	8,361,739	86,241	100	1	1	0
NT	Davenport Murchison Ranges	DMR	5,805,108	115,815	98.4	2	2	0
NSW (Qld)	Darling Riverine Plains	DRP	10,698,821	187,491	97.6	1.6	1.8	0.2
Qld	Einiasleigh Uplands	EIU	11,718,580	443,187	66.9	3	3.8	0.8
WA	Esperance Plains	ESP	2,917,610	836,855	99.5	28.6	28.7	0.1
SA	Eyre Yorke Block	EYB	6,090,925	849,185	99.8	13.3	13.9	0.6
NT(SA)	Finke	FIN	7,379,573	2,549	16.1	0	0	0
SA	Flinders Lofly Block	FLB	7,126,303	398,718	85.4	4.6	5.6	1
Tas	Flinders	FLI	533,745	160,608	56.3	30.4	30.1	-0.3 ^[3]
WA	Gascoyne	GAS	18,075,257	1,861,552	100	1.9	10.3	8.4
SA	Gawler	GAW	12,364,064	1,599,168	85.6	12.9	12.9	0
WA	Gibson Desert	GD	15,628,918	5,578,384	33.1	34.6	35.7	1.1
NT(Qld)	Gulf Fall and Uplands	GFU	11,847,905	1,339,493	93.9	9.7	11.3	1.6

State(s) ^[1]	Bioregion	Code	Bioregion Area (ha)	All protected areas 2006 (ha)	Strictly protected areas (% of all)	Extent 2004 (%)	Extent 2006 (%)	Change 2004-6 (%)
WA	Geraldton Sandplains	GS	3,140,477	548,335	99.9	15.2	17.5	2.3
WA(NT)	Great Sandy Desert	GSD	39,525,125	1,678,591	70.5	4.3	4.2	-0.1 ^[4]
NT	Gulf Coastal	GUC	2,710,522	295,306	100	11	10.9	-0.1 ^[5]
Qld(NT)	Gulf Plains	GUP	22,058,321	562,145	98.4	2.5	2.5	0
WA(SA)	Great Victoria Desert	GVD	41,875,441	10,791,871	74.1	25.8	25.8	0
WA(SA)	Hampton	HAM	1,088,245	159,365	100	14.6	14.6	0
WA	Jarrah Forest	JF	4,509,046	637,238	99	5.1	14.1	9
SA	Kanmantoo	KAN	812,302	161,948	99.9	19.2	19.9	0.7
Tas	King	KIN	425,021	75,006	49.8	16.4	17.6	1.2
WA	Little Sandy Desert	LSD	11,089,857	514,039	100	4.6	4.6	0
NT	MacDonnell Ranges	MAC	3,929,444	548,745	62.1	13.7	14	0.3
WA	Mallee	MAL	7,397,573	1,329,146	99.9	17.9	18	0.1
NSW(SA,Vic)	Murray Darling Depression	MDD	19,656,427	3,074,606	94.7	15.4	15.6	0.2
Qld(NT)	Mitchell Grass Downs	MGD	33,531,807	400,372	92.5	1.2	1.2	0
Qld(NT)	Mount Isa Inlier	MI	6,664,129	187,019	92.9	2.8	2.8	0
Qld(NSW)	Mulga Lands	ML	25,167,322	711,589	99.9	2.6	2.8	0.2
WA	Murchison	MUR	28,120,554	1,882,873	83.6	1.1	6.7	5.6
NSW(Qld)	Nandewar	NAN	2,700,444	75,899	93.7	1.9	2.8	0.9
SA(Vic)	Naracoorte Coastal Plain	NCP	2,457,565	224,550	97.8	9	9.1	0.1
NSW(Qld)	New England Tablelands	NET	3,002,211	272,463	85.8	8.6	9.1	0.5
WA	Northern Kimberley	NK	8,406,766	1,250,432	97.2	14.5	14.9	0.4
NSW	NSW North Coast	NNC	3,995,653	946,012	95.4	22.6	23.7	1.1
NSW(Vic)	NSW South Western Slopes	NSS	8,775,266	206,212	97.7	2.3	2.3	0
WA(SA)	Nullarbor	NUL	19,722,824	6,233,558	51.4	31.6	31.6	0
NT(WA)	Ord Victoria Plain	OVP	12,540,701	889,304	100	7.1	7.1	0
NT	Pine Creek	PCK	2,851,777	1,213,683	99	42.6	42.6	0
WA	Pilbara	PIL	17,821,310	1,512,634	98.8	6.3	8.5	2.2
NSW(SA, Vic)	Riverina	RIV	9,713,013	263,683	77.8	2.2	2.7	0.5
NSW	Sydney Basin	SB	3,809,596	1,418,036	92.6	37	37.2	0.2
Vic	South East Coastal Plain	SCP	1,749,226	162,252	65.5	7.4	9.3	1.9
Vic(NSW)	South East Corner	SEC	2,555,337	873,529	97.9	33.8	34.2	0.4
NSW(ACT,Vic)	South Eastern Highlands	SEH	8,095,195	1,467,341	95.7	17.5	18.1	0.6
Qld(NSW)	South Eastern Queensland	SEQ	7,859,467	1,044,044	75.9	13.2	13.3	0.1
SA(NSW,NT,Qld)	Simpson Strzelecki Dunefields	SSD	27,291,945	7,866,584	45.8	28.8	28.8	0
SA(NT)	Stony Plains	STP	13,419,619	964,836	74.7	7.3	7.2	-0.1 ^[6]
NT	Sturt Plateau	STU	9,857,531	20,281	100	0.2	0.2	0
WA	Swan Coastal Plain	SWA	1,525,637	158,426	100	10.2	10.4	0.2
NT(WA)	Tanami	TAN	25,997,275	353,705	0	1.6	1.4	-0.2 ^[7]
Tas	Tas Central Highlands	TCH	767,849	430,726	53.3	55.8	56.1	0.3
NT	Tiwi Cobourg	TIW	1,010,442	204,778	100	20.3	20.3	0
Tas	Tas Northern Midlands	TNM	415,445	17,527	35.5	3.5	4.2	0.7
Tas	Tas Northern Slopes	TNS	623,100	84,967	75.4	12.6	13.6	1
Tas	Tas South East	TSE	1,106,108	155,040	81.7	12.4	14	1.6
Tas	Tas Southern Ranges	TSR	781,781	323,889	95.8	40.8	41.4	0.6
Tas	Tas West	TWE	1,564,045	1,324,901	65	82.1	84.7	2.6
NT (WA)	Victoria Bonaparte	VB	7,300,896	1,099,747	100	15.1	15.1	0
Vic	Vic Midlands	VM	3,469,776	378,372	98.6	10.7	10.9	0.2
Vic (SA)	Vic Volcanic Plain	VVP	2,440,320	33,401	77.3	1.4	1.4	0
WA	Warren	WAR	844,473	392,968	99.8	31.3	46.5	15.2
Qld	Wet Tropics	WT	1,998,793	973,177	78.5	47.2	48.7	1.5
WA	Yalgoo	YAL	5,087,154	1,215,943	82.8	9.8	23.9	14.1

Table above

- [4] Correction of erroneous inclusion of stock route in IPA.
 [5] Correction of Lemon Gate National Park boundary.
 [6] Correction of Mt Willoughby IPA boundary.
 [7] Correction of erroneous inclusion of stock route in IPA.

Table left

- [1] Leading jurisdiction is that in which bioregion predominantly lies. Bracketed jurisdictions have lesser coverage of bioregion.
 [2] See note for ACT in Table 2.
 [3] Hand-back of reserve to Traditional Owners without declaration of IPA.

Key

- Pink indicates <2%
 Orange 2% to <5%
 Yellow 5% to <10%
 Light green 10% to <15%
 Dark green over 15% of the bioregion in protected areas of all classes (see Fig. 1)
 Red indicates bioregions where extent declined or was unchanged
 Blue indicates extent increased by >2%

Table 4. Numbers of IBRA bioregions in different classes of percent area protected in CAPAD 2004 and 2006.

% of bioregion area protected	Number of bioregions	
	CAPAD 2004	CAPAD 2006
<2%	14	9
2-<5%	19	18
5-<10%	11	10
10-<15%	14	17
15+%	27	31
Total	85	85

Table 5. Numbers of IBRA sub-bioregions in different classes of bioregional percent area protected and subregional percent area protected in CAPAD 2006.

% of bioregion area protected	% of subregion area protected					All sub regions
	<2%	2-<5%	5-<10%	10-<15%	15+%	
<2%	31	3	2	1		37
2-<5%	70	19	10	8	10	117
5-<10%	17	12	13	11	9	62
10-<15%	5	5	14	18	15	57
15+%	17	8	10	9	86	130
Total	140	47	49	47	120	403

Table right

- [1] Australian State of the Environment Committee, 2001. *Australia State of the Environment 2001: The meaning, significance and implications of biodiversity*. Australian Government, Canberra.
- [2] From National Reports of countries under the Convention on Biological Diversity and Sattler & Glanznig 2006.
- [3] Secretariat of the Convention on Biological Diversity 2007. Review of Implementation of the Programme of Work on Protected Areas for the Period 2004-2007. UNEP/CBD/WG-PA/2/2, 26 November 2007.
- [4] Secretariat of the Convention on Biological Diversity 2007. Exploration of Options for Mobilizing, As a Matter of Urgency, Through Different Mechanisms Adequate and Timely Financial Resources for the Implementation of the Programme of Work. UNEP/CBD/WG-PA/2/4, 16 October 2007.
- [5] 30 million hectares of new protected areas is considered by the Australian Government to be needed to ensure at least 10% of each bioregion is protected, in line with the commitment at the CBD CoP8 to 'effectively conserve' 10% of the world's ecological regions by 2010. This also may be considered a proxy for the 80% comprehensiveness target.
- [6] Maria Cecília Wey de Brito, Ministry of the Environment, Brazil, stated that the protected area network in Brazil will be increased to cover "15% of its territory, including 30% of the Amazon rainforest" *Earth negotiations Bulletin* Volume 9 Number 418 - Tuesday, 12 February 2008
- [7] Consejo Nacional del Ambiente-CONAME 2001. *Perú: Estrategia Nacional sobre Diversidad Biológica*. p. 38.

Table 6. Protected area targets, progress, financial need and shortfalls for the 17 megadiverse countries in country reports to the UN for the Convention on Biological Diversity, where known. (pa = per annum)

Country	Megadiversity rank ⁽¹⁾		Land area protected ⁽²⁾	2010 Target ⁽³⁾	Progress 2004-2007	Financial need (US\$ million) ⁽⁴⁾	Unfunded need
	Vertebrates	Plants					
Australia	1	5	10.52% (2004)	15.5% ⁽⁵⁾	7.6 million ha land added	250-350 (A\$300-400)	
Indonesia	2	2	10.6% (2006)	4.3 million ha added	3 million ha added	40.50 pa	35 pa
Mexico	3	7	5.1% (2003)		9.8 million ha added		
Brazil	4	1	7% (2004)	15% of territory and 30% of Amazon ⁽⁶⁾	11.9 million ha added		142.25
Colombia	5	4	11.4% (2000)		11.8 million ha added	180.86	116.02
Madagascar	6	10	2.8% (land & sea, 2004)	10% land & sea			
China (+Taiwan)	7	8	14.8% (2004)	17%		60	
Philippines	8	9	5.3% (2003)	6.336 million ha added land & sea		110.4	85.5
India	9	11	4.74% (2005)	278 new Parks	0.55 million ha added	840	
USA (non party)	10	16	16% (2003)				
Papua New Guinea	11	6	1.6% (2003)				
Peru	12	14	15.31% (2001) ⁽⁷⁾		0.75 million ha new national parks	48 pa	27 pa
Ecuador	13	15	16%		2 new PAs	55.40 pa	29.2 pa
Venezuela	14	13	15.7% (2000)				
Malaysia	15	12	15.30%				
South Africa	16	3	6.20%	8%			
Democratic Republic of the Congo	17	17	8%	15%			

Rates of growth toward targets

The Australian Government estimated in 2007¹⁸ that approximately 30 million hectares of new protected areas would be needed to ensure at least 10% of each bioregion is protected. This would implement the commitment under the *Convention on Biological Diversity* to 'effectively conserve' 10% of the world's ecological regions by 2010.¹⁹

This target is not the same as, but may be considered a proxy for the agreed 80% comprehensiveness target discussed below, depending on configuration. Getting to 10% protected area coverage in a bioregion is not a guarantee of meeting the 80% comprehensiveness target however. Of the 85 bioregions, 22 had 10% or more of their area under protected areas, but nevertheless had fewer than 80% of regional ecosystems represented in protected areas in earlier analyses.²⁰

Strictly protected areas grew by 1.06%, and all protected areas by 2.75%, in the four years from CAPAD 2000 to CAPAD 2004, representing 0.27% and 0.69% of Australia's land area added per annum respectively.

Growth in the period 2004 to 2006 was 0.45% and 0.55% per annum respectively for strictly protected and all protected areas. This growth rate was well above the average for the earlier part of the decade for strictly protected areas, but below average for all protected areas.

To add the 30 million hectares thought necessary to bring every bioregion to 10% reservation level by 2010 would require a growth rate of 0.878% of Australia's land area per annum, about 1.4 times the growth rate of 0.642% per annum achieved between CAPAD 2000 and 2006.

This is not a dramatically higher rate than earlier in the decade and hence meeting this target should be achievable, depending on land markets and willingness to invest by governments.

However, achieving the required growth must address the primary comprehensiveness target and such strategic commitment will require a highly focussed programme addressing the priority unreserved and threatened ecosystems and species in each bioregion.

Rates of growth needed to meet all targets in the *Directions* have yet to be estimated.

Commonwealth financing to reach targets

The major Australian Government programmes that deliver protected areas include:

- > The National Reserve System Programme, which disburses grants for acquisition and establishment of new protected areas based on applications from government and non-government proponents. Covenanting programmes are also pursued by the NRS section.²¹ The programme has committed \$86.73 million since 1996.²²
- > The Managing Australia's Biodiversity Hotspots Programme, which committed \$36 million over four years (2004-2008) supporting both acquisitions and landholder stewardship tenders from private conservation sector proponents. It is particularly apt for addressing *Direction 4* for inclusion of endangered species habitats. Three major new protected areas have been acquired through this programme including Brooklyn Station Nature Refuge in north Queensland, although these have yet to be included in CAPAD.²³
- > The Indigenous Protected Area Programme grants, which provide for establishment and, to a limited degree, management costs for IPAs. The programme has committed \$18.28 million since 1996.

Additionally, a few Indigenous Protected Areas have been acquired for traditional owners through the Indigenous Land Corporation's (ILC) environmental stream. In 2006 to 2007, the ILC entered a \$7 million, three year partnership with the IPA programme to increase land management support for existing IPAs, train and employ Indigenous rangers, and help establish at least ten new IPAs.²⁵

The NRS and IPA programmes have been funded to date out of the Australian Government's Natural Heritage Trust (NHT).

Although the National Reserve System is one of eight core purposes of the Natural Heritage Trust Act,²⁶ and despite the high rating given the programme by successive evaluations,²⁷ the NRS Programme (NRSP) funding has averaged only 3.4% of all NHT funds.²⁸

A key finding of the 1999 NRS programme review was never acted on:

'The NRS as a whole, including those areas acquired through the NRSP, constitutes an asset of substantial biological and economic value. The value of this asset is

not currently reflected in funding for the management of parks and reserves, or in funding for their acquisition and creation. The NHT has provided a substantial boost to the level of funding available to the Program, nevertheless, the current level of funding is inadequate to achieve the goals of the Program.²⁹

The 2006 Gilligan review of the NRS Programme essentially repeated the same message.

In contrast, regional delivery of natural resource management, which receives a large part of combined NHT and National Action Plan for Salinity and Water Quality funding, has been criticised by the Auditor General for poor or unmeasurable performance:

‘At the time of the evaluations there was little evidence that there has been any substantial movement towards landscape scale repair and replenishment of natural resources as envisaged by the NHT. Nor was there evidence of significant progress towards preventing, stabilising and reversing salinity trends as envisaged by the NAP. From the evidence reviewed as part of this audit, this is still the case which suggests that stronger targeting of NHT 3 towards the highest priorities and most critical national assets is necessary to achieve measurable results.’

Estimates of investments by the Commonwealth and partners required to meet targets are very crude at present and urgently in need of rigorous land valuation advice at the bioregional scale.³⁰

The NRS programme only accounted for 12.8% of all additions to the NRS since 1996 and the IPA programme accounted for 33.8%.³¹ Other lands brought into the NRS include protected areas acquired by state and territory governments or non-government organizations without Australian Government contributions, and covenants over private lands (see section on Pathways below).

We believe that the NRS programme, to provide the appropriate incentive and leadership, should be contributing to at least 50% of all new acquisitions on the basis of two thirds of investment from the Commonwealth and one third from partners.

The 2002 *Setting Biodiversity Priorities* report to the Prime Minister's Science Engineering and Innovation Council³² estimated it would cost \$300-\$400 million to acquire an estimated 22 million hectares of new protected areas needed

to reach the *Direction 1* target for comprehensiveness (80% of regional ecosystems sampled in the NRS by 2010-2015). This includes spending by all partners (see following section). This is the total financial need for meeting targets that has been reported by the Australian Government to the parties to the Convention on Biological Diversity.³³

The upper \$400 million bracket of the range is however, considered to be a minimum considering the rise in rural land values since 2002.

If NRSP grants are disbursed for two thirds of acquisition costs this indicates at least a \$250 million Commonwealth commitment is required.

The recommendation that the Commonwealth bear two-thirds of acquisition costs comes from the 1993 HORSCERA inquiry as well as the recent Gilligan evaluation of the programme, to take account of the substantial ongoing management costs borne by proponents. Jurisdictions spend roughly \$8 for every Australian Government dollar invested in the NRS after adding in 10 years of management costs.³⁴

This arrangement was adopted for grants to the states and territories until 2001 when total budget fell to impractically low levels.³⁵ In practice, NRS programme grants totalling \$86,730,003 were less than the \$105,409,249 invested by partners in acquisitions.³⁶

The above crude estimate is only directed at the single target of 80% comprehensiveness. Estimates of costs for meeting the representativeness and endangered species targets and building reserve system adequacy in the face of climate change have yet to be developed, particularly for priority bioregions.

Table 7. Levels of investment in reserve acquisition and management as reported by jurisdictions.

Financial year	NRSP, IPAP ^[2]	C'with ^[3]	NSW	NT	Qld	SA	Tas ^[4]	Vic ^[5]	WA ^[6]
Acquisition (\$millions)									
2003/4	3.5, 2.5		10	0	7.15	1.35		2	0.76
2004/5	4.1, 2.5		12	0	5.77	1.8		2	0.19
2005/6	7.8, 2.5		17	0	3.69	0.27		2	3.7
2006/7	6.1 ^[7] , 3.0		17	0	34.62	0.9		2	2.75
Management (\$millions)									
2003/4		57.55	199	25	62 ^[8]	70	29.09	50.38	89.22
2004/5		58.69	189	29.01	72	70	30.36	50.93	105.1
2005/6		56.98	186	33.83	76	70	34.74	58.98	110.28
2006/7		59.29	194	33.08	76	70	34.2	61.71	118.5
Management spending in inflation-corrected 2006 dollars per hectare in CAPAD 2004 and 2006 ^[9]									
2004/5		28.21	33.1	4.98	9.97	3.5	12.65	14.56	6.34
2006/7		26.8	29.01	5.02	8.81	3.33	12.75	16.23	5.2
Change		-1.41	-4.09	0.04	-1.16	-0.17	0.1	1.67	-1.14

[1] Responses to questionnaire in Appendix 1 or other sources as indicated. ACT advised that there is no consolidated management budget and acquisition budget is not relevant. No consolidated figures are available for spending by non-government reserve owners.

[2] Total expenditures as advised by the NRS and IPA programmes.

[3] From Parks Australia annual reports.

[4] Not supplied. Figures shown are taken from state budget papers.

[5] Unlike other state parks agencies, Parks Victoria manages metropolitan parks.

[6] Does not include Perth Metropolitan Region Improvement Fund purchases.

[7] Does not include the special purchase of the Steve Irwin Wildlife Reserve for inclusion in the NRS.

[8] Does not include capital works.

[9] 2004/5 spending inflation adjusted according to Reserve Bank <http://www.rba.gov.au/calculator/calc.go>. Total area under government control in CAPAD 2004 and 2006 respectively as denominators from Table 2. Governance was not explicitly reported in CAPAD 2004 and thus government protected areas were assumed to represent the same proportions of all protected areas as found in CAPAD 2006 Table 2. Commonwealth parks and reserves covered 2,212,030 hectares in both CAPADs.

State and territory financing to reach targets

All jurisdictions have agreed to consider the appropriate quantum of funding for strategic growth of the NRS through Direction 36: a 'joint partnership approach be maintained for funding NRS acquisitions and new partnerships ... be considered... governments to consider sources and quantum of funding for the NRS'

Table 7 shows the quantum of funding allocated for acquisitions as reported by each jurisdiction for 2004 – 2006. Acquisition funding in absolute terms have grown only in New South Wales, Queensland and Western Australia (Tables 1, 7).

The very significant budget increase for the 2006/7 financial year in Queensland should be applied to acquire long standing park proposals across priority bioregions, where limited representation exists, and major threats continue, as identified for example in WWF's *Treasures for Humanity*.³⁷

Acquisition funding has remained static in Victoria, Tasmania and South Australia and no funding was allocated in the Northern Territory.

Clearly, the comprehensiveness target will not be met across Australia unless there is a substantial growth in funding commensurate with the required growth in the NRS by most jurisdictions.

- > All governments should allocate funding to levels appropriate to reach the targets for developing a well-managed, comprehensive, adequate and representative National Reserve System within timeframes agreed to in the Directions for the National Reserve System: A partnership approach.
- > The Australian Government should as a first step, invest at least \$250 million over 5 years to make significant progress toward the 2010-2015 comprehensiveness and endangered species targets for the NRS. Grants should be disbursed for up to two thirds of acquisition and establishment costs, in recognition of the significant long term commitment to reserve management by proponents.
- > The Australian Government should conduct a financial needs assessment of the total investment levels needed to implement all of the Directions, including the additional resources required to include practical climate change responses.

- > The Australian Government should make a special provision to assist the Northern Territory implement its Northern Territory Parks and Conservation Masterplan in consideration of the low population and revenue base of the Territory and the fact that the Northern Territory has six of the nine most poorly protected bioregions.

Bioregional priorities

Figure 1 shows bioregions and subregions on a graded scale of percent of area protected based upon CAPAD 2006. Table 3 shows percent of area protected in each bioregion and changes since CAPAD 2004. Table 4 shows the change in overall reservation class by bioregion, and Table 5 cross references extent of protection between bioregional and subregional scales.

Of the 14 bioregions with less than 2% protected in 2004 only two, both in the Gascoyne-Murchison strategy area in WA, saw a 2% or greater increase in protected areas in the period 2004 to 2006 (Table 3).

In contrast, of the 41 bioregions with 10% or more protected in 2004, five underwent a 2% or greater addition in area protected over the period (Table 3).

These results suggest that protected areas growth has been focussed in regions already well protected while poorly protected bioregions have been relatively neglected. This is a matter of concern.

However, the fact that a bioregion has a high proportion of area protected does not mean that no more protected areas are needed there to secure particular ecosystems and species.

Of the 130 subregions in the 31 bioregions with 15% or more in protected areas, 17 had less than 2% of subregion area protected (Table 5). Even more significantly, 109 of the 140 subregions (78%) with less than 2% of area protected fell in bioregions that were 2% or more of area protected (Table 5). For example, within the Sydney Basin bioregion, the Ettrema subregion has 75% of its land area protected while the Cumberland subregion has only 1.5% protected.³⁸

The 1999 *Australian Guidelines for Establishing the National Reserve System* developed in cooperation with state and territory governments suggests the NRS should.³⁹

- > Contain samples of all ecosystems identified at an appropriate regional scale.
- > Contain areas which are refugia or centres of species richness or endemism.
- > Consider the ecological requirements of rare or threatened species and rare or threatened ecological communities and ecosystems, in particular those listed in the *Environment Protection and Biodiversity Conservation Act 1999* and other state, territory and local government legislation or policy instruments.
- > Take account of special groups of organisms, e.g. species with specialised habitat requirements, wide-ranging or migratory species, or species vulnerable to threatening processes that may depend on reservation for their conservation.

High priority bioregions are those with very low levels of reservation and high levels of threat to native biota.

Direction 9 requires that: 'priority IBRA regions be reviewed for the NRS and updated regularly by 2005.'

Direction 10 requires that jurisdictions 'review bioregional ecosystem priorities as identified by NLWRA assessment project' (that is, the National Land and Water Resources Audit's *Terrestrial Biodiversity Assessment*).⁴⁰

The 2002 *Terrestrial Biodiversity Assessment* considered factors such as urgency of threats to biodiversity and existing biases of the NRS within each bioregion, to establish a priority bioregional map for Australia.⁴¹ *Building Nature's Safety Net 2006* presented a database of regional ecosystem priorities within bioregions prioritised according to this *Assessment*.

Priorities for growth of the NRS at the bioregional scale are greatest in the northern savannahs and semi-arid lands including the eastern woodlands, grasslands, and wetlands where the accumulated impacts of agriculture, drought and pastoralism are extensive and where mammalian extinctions have been greatest. Political urgency is often lacking when it comes to protection of the drier parts of Australia. In the past the focus has been on reserving lush forests, scenic areas and regions close to large urban populations (Fig. 1).⁴²

Many of the semi-arid and poorly protected bioregions will be significantly impacted by climate change, especially from the

BOX 2



Yellow footed rock wallaby. © WWF-Canon/Martin Harvey.

Bimbowrie Conservation Park, South Australia

Bimbowrie Conservation Park (CP) was one of South Australia's most significant acquisitions for contribution to the NRS from 2004 to 2006. Bimbowrie CP covers about 73,000 hectares, sampling a variety of high priority ecosystems within two priority IBRA regions, Flinders Lofty Block (Olary Spur subregion) and Broken Hill Complex (Barrier Range subregion). This purchase helped increase the Broken Hill Complex from 1.4% to 2.7% protected and the Flinders Lofty Block from 4.6% to 5.6% protected (Table 3).

Bimbowrie CP is also important for conserving a number of nationally threatened plants and animals. It protects habitat for yellow-footed rock wallaby (*Petrogale xanthopus*) (vulnerable C'wlth, SA), one of only two sites in the Olary Ranges and the western most population in SA; and the thick-billed grasswren (eastern sub-species) (*Amytornis textilis modestus*) (vulnerable C'wlth, rare SA).

Two nationally threatened plants are found on the property: a major population of purple wood (*Acacia carniei*) (vulnerable C'wlth, SA), and the slender bell-fruit (*Codonocarpus pyramidalis*) (vulnerable C'wlth, endangered, SA).

Bimbowrie adjoins Bush Heritage Australia's 63,000 hectare Boolcoomatta Reserve which was also added since CAPAD 2004 with NRS Programme funds. Management is coordinated with the SA government.

increasing severity of droughts, which will exacerbate the impact of current land uses and interact with a range of threats.⁴³

Northern Australia is rich in rivers and wetlands in natural or near natural condition, and contains half of the high or very high priority bioregions for the NRS as identified in the *Building Nature's Safety Net 2006* report. It should be considered a continental priority domain for protected area growth. As a result of this review, the NRS task group has undertaken to revise the bioregional priority map for protected areas as a separate exercise.

- > **The Australian, state and territory governments should work together, and with appropriate Traditional Owners, to lift the percent of area protected for the most poorly protected bioregions, such as Finke, Central Arnhem (all Indigenous land), Sturt Plateau and Burt Plain (NT) and Dampierland (WA).**
- > **Prioritisation schemes for the NRS should be revised with further development of detailed data on priority biodiversity needs and threats within each bioregion as presented in the *Building Nature's Safety Net 2006* report (Part C). A particular focus on northern Australia and semi-arid lands is required.**



The endangered mulgara, *Dasyurus cristicaud*.

© Jiri Lochman, Lochman Transparencies.



Red dunes and ephemeral wetlands of Craven's Peak.

© Wayne Lawler, Ecopix.

Craven's Peak reserve, western Queensland

Purchased by Bush Heritage Australia in 2005 with NRS Programme assistance, this former cattle station is located in central west Queensland, about 135 kilometres south west of Boulia. The 233,000 hectare reserve lies on the northern end of the Simpson Desert, across the boundary of the Simpson-Strezlecki Dunefields and Channel Country bioregions, and accounts for the entire increase in reservation of the latter bioregion from 6.9% to 7.2% between CAPAD 2004 and 2006 (Table 3).

Most of the 21 known vegetation communities on Craven's Peak were either unprotected or poorly protected in Queensland. The reserve provides refuge for more than 220 species of animals, notably small mammals, migratory birds and reptiles. Wetlands on the reserve are habitat for a range of waterbirds, including nine species listed under international treaties. The dunes are home to one of the richest reptilian faunas of any desert area in the world. Reptiles are the major reason why Australia is considered megadiverse. Sixteen threatened plant and animal species are protected on this reserve, including the feisty mulgara (*Dasyurus cristicaud*), a small carnivorous marsupial.

Knowledge of this rich diversity of life on Craven's Peak results from 17 years of research by Professor Chris Dickman's team from The University of Sydney, and a recent scientific survey by the Royal Geographical Society of Queensland.

Progress in Implementing *Directions for the National Reserve System*

32

Black-footed rock wallaby © WWF/Klein & Hilbert



The twelve *Directions* selected for review provide an overview of the progress in building a comprehensive, adequate and representative National Reserve System for Australia (Appendix 1).

Table 1 shows that, at the current rate of progress, most states and territories will fail to meet the targets outlined under these key *Directions* to build Australia's National Reserve System by the agreed deadlines. This has serious ramifications for biodiversity conservation particularly with the biological impacts expected due to climate change.

Comprehensiveness

Calls by conservationists and scientists for Australia's biodiversity to be fully protected in protected areas go back nearly a century. Commitments to create a comprehensive reserve system have been reiterated for nearly two decades now.

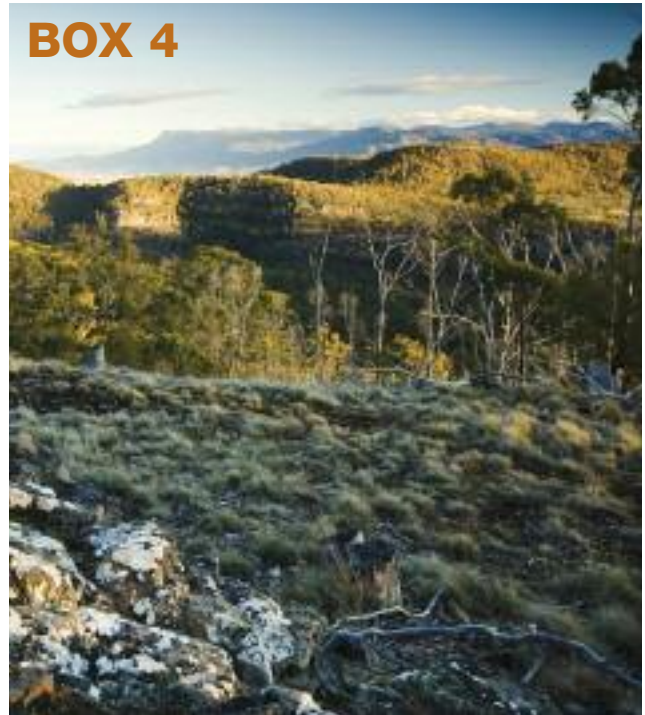
Comprehensiveness is a key criterion guiding strategic growth of Australia's NRS as laid out in the *Australian Guidelines for Establishing the National Reserve System*.⁴⁴

The first *Direction* (*Direction 1*) requires that: 'at least 80% of the extant regional ecosystems in each IBRA region (bioregion) are to be represented in the NRS by 2010 to 2015'.

The majority of jurisdictions report that they will not be able to meet this primary *Direction* at current rates of NRS investment. The exceptions being Tasmania and the Australian Capital Territory (Table 1). This is a matter of concern as this will be the third time a target to build a comprehensive, adequate, and representative (CAR) NRS for Australia has been committed to by governments but has not been achieved due to lack of serious investment.⁴⁵ This lack of progress is correlated with generally small acquisition budget allocations in all jurisdictions, the exception being a recent rise in funding in Queensland (Table 7).

The limited progress toward a comprehensive reserve system is corroborated by the CAPAD 2006 data showing slow growth of protected areas for the period 2004 to 2006, particularly in high priority jurisdictions like Queensland and the Northern Territory (Table 2).

BOX 4



© Matt Newton

Flat Rock Reserve, Tasmania

This 455.4 hectare purchase by the Tasmanian Land Conservancy in August 2006 provides a valuable linkage between the Chauncy Vale Wildlife Sanctuary and the Alpha Pinnacle Conservation Area in the Tasmanian South East Bioregion. The total protected area of the complex is now 1000 hectares.

Funds for the acquisition came from the NRS Programme, the Private Forest Reserve Program of the Natural Heritage Trust, and private donors.

The property contains suitable habitat for several threatened species that have been recorded in the vicinity, and three priority forest communities including: blue gum (*Eucalyptus globulus*) dry forest, which is considered to be a vulnerable community at both state and bioregional levels, it has suffered a loss in area extent of 71.4% in the bioregion since European settlement; and silver peppermint (*Eucalyptus tenuiramis*) dry forest, which is also considered to be a vulnerable community at both state and bioregional levels. It has suffered a loss in area extent of 20.9% in the bioregion since European settlement.

- > New South Wales was until recently the highest ranking state in terms of acquisition funding. This consistent attention to state-wide acquisition has led to valuable recent additions in priority western bioregions like the Brigalow Belt South. Nevertheless, NSW reports that it expects to meet its comprehensiveness target in relatively few bioregions (Table 1).
- > In the Northern Territory, lack of progress is a major concern. Few bioregions would be comprehensively protected within the 2010 to 2015 timeline under current arrangements. The Northern Territory is to be congratulated on preparing the Northern Territory Parks and Conservation Masterplan (NTPCMP)⁴⁶ to guide future expansion of protected areas, and for initiating reform of the *Pastoral Act* to remove barriers to protected area covenants on pastoral leases. The NTPCMP should be approved and fully funded as a matter of urgency.
- > In Queensland, the recent significant growth in acquisition funding and reform of leasehold land law should build on previous work in the 1990s toward developing a comprehensive reserve system and lead to improved progress toward agreed targets.
- > In some Victorian bioregions, such as Victorian Volcanic Plains and the Victorian Riverina, the long history of alienation for grazing and cropping means that few intact sites remain to include in protected areas. This foreclosure of opportunity to secure Australia's biodiversity and wildlife habitats will become an increasing problem throughout Australia unless urgent action is taken to implement NRS targets. The Department of Sustainability and Environment considers the Plains Grassland and Plains Grassy Woodland communities the highest priority for conservation through purchase and perpetual covenants (see Box 8).
- > In Western Australia, growth has relied heavily on use of pastoral lease review. Funding remains at low levels relative to the size of the task in this the largest state. Western Australia also shows the largest growth in the Indigenous conservation estate.

A concerted effort is required by all state and the Northern Territory governments to meet the primary criterion of a comprehensive NRS by the agreed timeline of 2010-2015.

Adequacy: protecting endangered species and ecosystems

Direction 2 requires that the NRS be expanded strategically so as to maximise adequacy with a specific target to 'maximise the probability of survival of their biota'.

Direction 4 elaborates that, 'as a priority, critically endangered and endangered species and regional ecosystems in each IBRA region are included in the NRS by 2010'.

Direction 5 is similar in intent, requiring 'significant progress' be made on including vulnerable species and regional ecosystems. A fundamental aspect of adequacy of the reserve system is the extent to which it protects critical habitats of threatened species.

State and territories report that there will be a generally poor level of inclusion of endangered ecosystems and species in the NRS by 2010, the exception being the Australian Capital Territory (Table 1).

This is a matter of great concern, as Australia's record of protection and recovery of endangered species is poor.

- > Australia is among the 17 'megadiverse' countries, and is the top ranking country for endemic vertebrate diversity, mostly due to high reptile diversity (Table 6).⁴⁷
- > 22 species of mammals are extinct in Australia, with eight other species remaining only on islands.⁴⁸ Nearly half of all known mammal extinctions in last 200 years have occurred in Australia.⁴⁹ Extinctions have been biased towards mid-sized, ground dwelling mammals in the drier interior of the continent, precisely the area that is most poorly protected. This is believed to have resulted from exotic cat and fox predation, facilitated by loss of ground cover, suppression of top predators like dingoes by the pastoral industry, and the impact of total grazing pressure.⁵⁰
- > Of 1,711 threatened species with known population trends in the 2002 *Terrestrial Biodiversity Assessment*, 72% were reported as declining in all subregions where trends were known.⁵¹

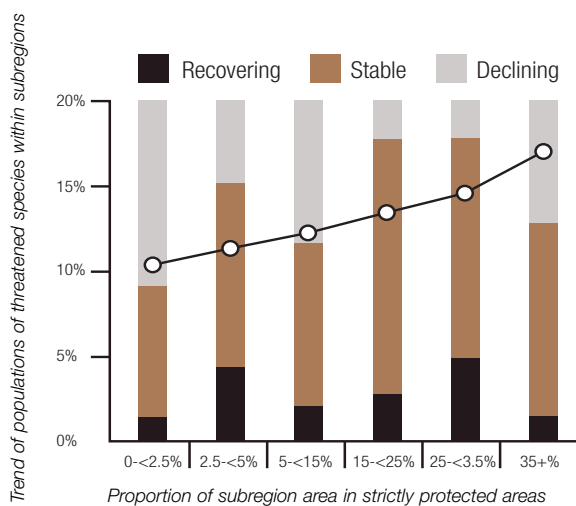


Fig 5. Proportion of threatened species with declining, stable or recovering population trends within IBRA 5.1 subregions in relation to proportion of the subregion protected in IUCN I-IV strictly protected areas (X axis). Line shows fitted logistic regression for proportions stable or recovering (Taylor and Sattler forthcoming).

The effectiveness of protected areas in preventing habitat loss and reversing the decline in populations of threatened species is supported by a significant observed correlation between the proportion of land set-aside in strictly protected areas and the proportion of threatened species reported as stable or recovering within sub-bioregions in the 2002 *Terrestrial Biodiversity Assessment*.⁵² No other factor, apart from the jurisdiction in which species and subregion occurred, was found to be significantly correlated with threatened species trends. Threatened species in subregions with extensive protected areas (35% or more) were roughly 1.7 times more likely to be stable or recovering than populations in subregions lacking significant protected areas (i.e. below 2.5%, Fig. 5). This analysis will be greatly improved when overlaps of species critical habitats with protected areas can be estimated.

In a similar global scale study, amphibian and bird species were more likely to be declining if their ranges did not include protected areas than if they overlapped protected areas.⁵³

Protected areas provide the most secure and complete protection from habitat loss. However, there is still a continuing need for effective management of pervasive threats such as fire, feral pests, and weeds on protected areas and adjoining lands.

Endangered ecosystems in Australia are spatially defined for many bioregions. In contrast the habitat requirements of endangered species are comparatively poorly characterised or identified, and are often not well indicated by any particular regional ecosystem. As a result, progress toward this important target is difficult to assess. It is not clear if the responses of the states and territories regarding bioregional level protection of endangered species habitats is based on a uniform, rigorous methodology (Table 1).

Strategic growth of the NRS to secure climate-critical habitats is now recognised as a primary element of an effective climate response, coordinated with landscape scale threat reduction both inside and outside the NRS. Climate-critical habitats include refugia, corridors and stepping stones. For example, the mesotherm archipelago through Queensland is a chain of climatically similar altitudinal 'islands' which is home to resident, breeding populations of temperate bird species that would otherwise not occur so far north. The identification of detailed species habitat requirements such as these is required to ensure cost effective conservation action before broad corridors are embraced as a universal climate change response. Connectivity is discussed in more detail in the climate change section below.

The Australian Government's *Environmental Protection and Biodiversity Conservation Act* (EPBC Act) (s270 (2)(d)) requires 'habitats critical to survival', as well as actions needed to protect those critical habitats, to be identified as part of a recovery plan. Many, but not all, recovery plans have identified critical habitats. The Act does not require registration of such critical habitats, which would provide statutory habitat protection. Only five critical habitats have been placed on the register, only two of which occur on the mainland where they fall within existing protected areas. A 2007 audit of implementation of the EPBC Act found only 22% of listed species had recovery plans completed by 2004.⁵⁵

Recovery plans are the only legislative provision at the national level that compels the delineation of critical habitats of threatened species and actions needed to conserve habitats, such as protected areas and stewardship contracts. In the absence of defined critical habitats it is difficult to efficiently plan for conservation actions to protect those habitats.

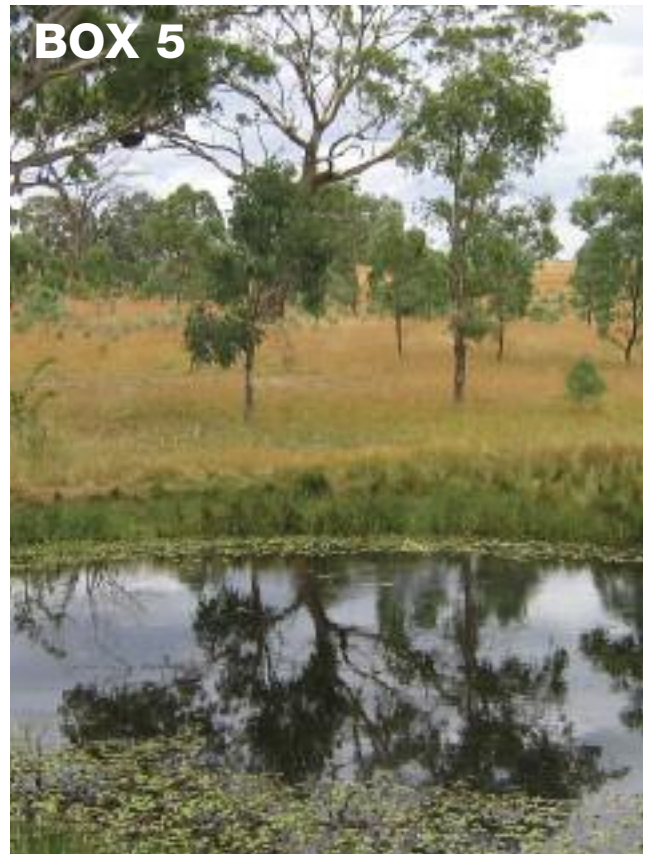
- > **The Australian Government should as a high priority identify critical habitats for threatened species with a priority to endangered species, to inform efficient planning of reserve system growth.**

Protection of freshwater ecosystems

Freshwater systems across Australia are critical habitats for many threatened and keystone species and are even more poorly represented in the NRS than terrestrial ecosystems.⁵⁶ Moreover, the condition of many freshwater systems is declining, particularly in southern Australia.⁵⁷

- > Only 14% of Australian rivers remain unmodified (highest in NT at 66%) and they are also mostly unprotected.⁵⁸
- > Only 7.2% of the 3 million km of rivers and creeks identified at 1:250,000 map scale are protected within the NRS, and a significant portion of this length involves rivers and creeks at protected area boundaries where degree of protection depends on activities on the opposite bank.
- > Only 4.5% of the total area of catchments of rivers in natural or near natural condition is protected in the NRS and even streams in protected areas are at risk of water pollution and extraction in unprotected upstream catchments.
- > 55% of nationally important wetlands are protected in the NRS.⁵⁹
- > Only around 2% by length of entire rivers fall within protected areas, free of dams and degradation of catchments.⁶⁰
- > 50% of Australia's inland waterbirds are threatened, mainly from loss of wetland and riparian habitat.⁶¹

The inclusion of priority freshwater systems in the NRS would make a significant contribution to their protection, at the same time recognising that environmentally sensitive management of entire catchments and securing of minimum environmental flows are also required through water law reform.



Yellow box-red gum grassy woodland. © Parks Conservation and Lands ACT.

Goorooyaroo Nature Reserve, Australian Capital Territory

Goorooyaroo Nature Reserve comprises 702 hectares of woodland, including 580 hectares yellow box – red gum grassy woodland (critically endangered C'with, endangered ACT). It significantly improved protection of habitat for eight threatened species: the Golden Sun Moth, Perunga Grasshopper and six woodland birds.

It adjoins Mulligan's Flat Nature Reserve, creating a continuous woodland reserve of 1500 hectares, the largest yellow box – red gum woodland reserve in Australia.

It also forms part of a continuous woodland and forest corridor from Hall in the north-west of the ACT to south-eastern ACT and into NSW.

WWF reviewed the policy options for protection of freshwater ecosystems in the 2006 report *Securing Australia's Natural Water Infrastructure Assets*.⁶²

Following *Direction 7* all the states and territories are participating in a scientific advisory group of the Aquatic Ecosystems Task Group, Wetlands and Water Birds Task Force, and the National Water Commission's Aquatic Ecosystems Expert Advisory Group to progress the national framework for the protection of high conservation value aquatic ecosystems. Significant progress has been made on bioregionalisation of aquatic ecosystems, a classification system and criteria for identifying high conservation value aquatic ecosystems at a national and regional scale. This framework will be used to review the NRS Scientific Guidelines.

Direction 8(b) required that: 'the identification and mapping of freshwater systems at an appropriate scale is commenced by 2006'.

Responses from states and territories indicate that, with the exception of Western Australia, New South Wales and the Northern Territory, the identification and mapping of freshwater systems across all bioregions has commenced.

> **In light of the poor state of protection of freshwater ecosystems the Australian Government should expedite identification and protection of high conservation value freshwater ecosystems.**

Adequacy: bioregional planning and mapping

Bioregional planning

Protected areas have the central role to play in building resilience and adaptive capacity for biodiversity in the face of climate change. This contribution is much enhanced when the impact of other threatening processes are minimised at a landscape scale through bioregional scale coordination and planning.⁶³

One key aspect of reserve system adequacy identified by *Direction 2* requires that protected areas be managed within a bioregional context by 2010.

The state and territory responses indicate that integrated bioregional planning has not been widely adopted for most bioregions and that this *Direction* will not be met by 2010 to 2015, except in South Australia and the Australian Capital Territory (Table 1).

In Victoria, existing bioregional action plans provide an overview for landscape planning on a bioregional level and landscape plans for subregions. This indicates that measures will be in place in most bioregions for protected areas to be managed in a regional context by 2010.

Direction 10 requires that: 'State, Territory and Australian Government NRS implementation plans ... be developed for each priority IBRA region by 2006'.

This *Direction* is interpreted as requiring that specific plans be developed for each priority bioregion (or subregion) setting out the strategic growths of the NRS needed to ensure that it is comprehensive, adequate and representative.

Implementation plans for NRS priority bioregions should be fully costed with a view to securing appropriate budget allocations and making cost-effective decisions.

BOX 6



Red kangaroos. © Andrew Hull, NSW Dept of Environment and Climate Change.



Billabong on the Darling River, Gundabooka SCA.
© Andrew Hull, NSW Dept of Environment and Climate Change.

Gundabooka State Conservation Area, NSW

The 25,200 hectare property Yanda was acquired to become Gundabooka SCA in July 2005. It lies adjacent to Gundabooka National Park (63,902 hectares) and is located in the semi-arid environment of north western New South Wales, approximately 50 kilometres south-west of Bourke. It is situated in the Darling Riverine Plains and Cobar Peneplain bioregions, both of which have 2% or less of land area protected.

The acquisition increased the extent of the Gundabooka complex by about 31% and, importantly, connected Mt Gundabooka to the Darling River, incorporating floodplain habitat along the Darling River (30 km) and Yanda Creek (20km), black box - coolibah woodlands, belah-rosewood-ironwood open-woodland, and floodplain grasslands.

Mt Gundabooka is of great significance to the region's traditional owners, and was traditionally a meeting place for neighbouring groups from the Cobar Peneplain ('Ngemba' or 'stone country') and the Darling River ('Paakandji' or 'river people') and was used for ceremonial purposes, as well as providing an important food and water resource.

The complex protects habitat for many threatened birds such as the pink cockatoo (*Cacatua leadbeateri*), pied honeyeater (*Certhionyx variegatus*), painted honeyeater (*Grantiella picta*), square-tailed kite (*Lophoictinia isura*), brown treecreeper (eastern subsp.) (*Climacteris picumnus victoriae*), diamond firetail (*Stagonopleura guttata*), hooded robin (*Melanodryas cucullata cucullata*), and greycrowned babbler (eastern subsp.) (*Pomatostomus temporalis temporalis*).

Four threatened mammals have been recorded there: the little pied bat (*Chalinolobus picatus*), hairy-nosed freetail bat (*Mormopterus 'species 6'*), the yellow-bellied sheath-tail-bat (*Saccolaimus flaviventris*), and the kultarr (*Antechinomys laniger*).

The park also contains populations of four threatened plant species: *Phebalium glandulosum*, *Prostanthera stricta*, *Hedyotis galioides*, and the curly bark wattle (*Acacia curranii*).

These plans should include elements of *Direction 2*, particularly in relation to building ecosystem and species resilience through the NRS and the wider landscape to deal with the impacts of climate change.

- > New South Wales reports that they have developed implementation plans for priority bioregions as part of a state-wide implementation plan. Under the NSW Government's State Plan, this reserve establishment plan is due for release in mid 2008.
- > The Northern Territory has developed the *Northern Territory Parks and Conservation Masterplan*.
- > Queensland reports that implementation plans have been developed for most bioregions. However, this appears to be considered equivalent to Queensland's Biodiversity Planning Assessments which generate maps of local, regional and state significant biodiversity assets primarily for consideration in development applications. These maps may or may not be an appropriate guide to strategic growth of the NRS where detailed analysis of CAR criteria is needed.⁶⁴
- > Unfortunately, no implementation plans are reported from South Australia and few for Western Australia. Nevertheless, South Australia does have regional biodiversity plans with strategic actions to protect biodiversity. The South Australian Murray Darling Basin NRM Group also developed a CAR strategy for bioregions within their area in 2005.
- > Tasmania has developed a specific plan for their highest priority bioregion - Tasmanian Northern Midlands.
- > Victoria has developed bioregional reports for two of the three highest priority bioregions.
- > **The Australian Government should make significant new investment in bioregional conservation planning to ensure that all conservation effort, including NRS implementation plans, natural resource management and climate change adaptation strategies, is delivered in a coordinated and cost-effective way focussed on national biodiversity and reserve system goals.⁶⁵**

Mapping

Systematic planning for progressing reserve system goals requires reliable and complete vegetation spatial data as well as mapping of other biodiversity resources such as wetlands and river ecosystems, threatened species critical habitats, and special resources such as climate change corridors and stepping stones.

Considerable progress has been made through the National Vegetation Information System (NVIS) but there are still many gaps in mapping and definitions of native ecosystems across Australia.

Direction 8(a) requires that: 'pre-European vegetation mapping coverage at 1:250,000 scale or better to be completed to assist with planning priorities in the intensive land use zone... by 2006'.

Responses from states and territories indicate that this *Direction* was met only in Queensland, Victoria, Western Australia and the Australian Capital Territory.

- > In the Northern Territory, it is estimated on current trends that comprehensive vegetation mapping at this scale will not be completed within 20 years.
- > Queensland expects to complete mapping of the whole state by 2012 after a very concerted programme over recent years.⁶⁶
- > South Australia is aiming to have pre-European mapping at a 1:250,000 map scale completed for the intensive land use zone by 2015 but no target has yet been set for completion of mapping in the rest of the state.
- > In Tasmania, although there is no complete spatial mapping of pre-European vegetation, there are estimates of extent based on mapping and modelling as well as detailed mapping in parts. This included 1:25,000 *Tasveg* mapping for six of Tasmania's nine bioregions.

BOX 7



Brigalow scaly-foot (Paradelma orientalis).
© Luke Hogan, Queensland Environmental Protection Agency.

Humboldt National Park (awaiting gazettal), central Queensland

Humboldt station was acquired by Queensland, with NRS programme assistance, in 2005 and is awaiting gazettal. The proposed park protects 13,100 hectares in the Brigalow Belt North bioregion, helping raise the reservation level of this highly modified bioregion from 1.6% in CAPAD 2004 to 2% in 2006 (Table 3).

In 2003, WWF's *Treasures for Humanity* report identified Humboldt as one of 20 key parks proposals for Queensland. Humboldt, along with the Beeran Holding in the Brigalow Belt South bioregion, are the only two of these proposals that have subsequently been acquired.

The park protects an extensive environmental gradient from the eucalypt woodlands on the lower slopes of the Shotover Range down to the eucalypt and brigalow forests along Shotover Creek. In addition, a continuous tract of native forest and woodland is now protected extending from Blackdown Tableland National Park, along the Shotover Range and down onto the brigalow plains, thus providing substantial climate change resilience value.

The park contains 18 regional ecosystems of which six are endangered, including brigalow and three are of concern (vulnerable). One of only two populations of the endangered plant *Babingtonia brachypoda* occurs on the park. Habitat for brigalow endemics such as brigalow scaly foot (*Paradelma orientalis*) (vulnerable, C'with) is protected by the park.

These responses provide little comfort as to whether we will have suitable spatial vegetation data over the next decade to help guide the development of the NRS and conservation planning more generally. While we may have broad vegetation grouping for gaining national snapshots of native vegetation, we do not yet have comprehensive mapping at the appropriate scale for conservation planning across large areas. Perhaps the most urgent need is for the improved interpretation of existing vegetation information to determine the conservation and reservation status of ecosystems or vegetation communities in each bioregion. Again, this could be a key component of systematic bioregional planning for conservation across Australia.

Nor do we yet have a nationally agreed list of regional ecosystems to support reserve system planning and conservation effort more generally. Calculating the fundamental indicator of comprehensiveness remains problematic for bioregions that lack mapping, or that cross borders between states with different schemes for classifying regional ecosystems.

> **Bioregional planning must be supported by increased investments in comprehensive ecosystem mapping and interpretation at a fine enough scale for both the intensive and extensive land use zones of Australia.**

Adequacy: protected area management

Plans of management

Direction 28 required that: 'Management plans, or where this is not possible, statements of management intent, (are) to be in place for all existing NRS protected areas and for any new protected areas within 3 years of establishment unless Native Title Act considerations preclude this by 2006'.

Ongoing management of Australia's protected areas is a critical factor to ensuring they are effective in protecting biodiversity, and the other natural and cultural values for which they were acquired. Reserve management was found to be less than desirable in a number of jurisdictions in the *Building Nature's Safety Net 2006* review.⁶⁷

The NRS Task Group has made significant progress towards developing a national consensus on appropriate approaches to protected area management. The development of national principles for the management of protected areas is well advanced and this work is being expanded to include conservation organizations and local governments.

For the current review, information on the standard of management of protected areas in each bioregion and subregion was not available. Rather, the questionnaire asked jurisdictions whether management plans or statements of management intent at least, have been prepared for protected areas under their control (Appendix 1).

Responses from the agencies indicate that management plans or statements of management intent were in place in 2006 for all bioregions in Tasmania and the Australian Capital Territory (Table 1). Various plans or statements were also in place across other jurisdictions:

- > In New South Wales, between a third and two-thirds of all protected areas across the jurisdiction have plans of management.
- > In Tasmania, management plans or statements of management intent are also reported as being in place for various private protected areas.
- > In Victoria, all national parks and state parks have management plans either adopted or in preparation whereas few other conservation protected areas have individual management plans.

- > Western Australia reports that most bioregions have plans or statements.
- > Management plans are a requirement for the establishment of IPAs under the Australian Government programme.

Effectiveness

Direction 34 required that: a 'reporting system, such as State of the Parks report, which identifies programs to monitor management effectiveness and progress towards achieving protected area objectives ... be in place in each jurisdiction by 2005'.

All jurisdictions with the exception of South Australia, Western Australia and the Northern Territory indicate that a management effectiveness reporting system is in place (Table 1).

- > In the Australian Capital Territory, State of Environment reporting is considered sufficient given the size of the Territory.
- > In South Australia, a model system for ensuring park management effectiveness is being developed for implementation in 2007 to 2008.
- > Victoria's *State of the Parks 2000* focused on the natural values protected within parks and the issues that impact on their condition. The *State of the Parks 2007* report for 2000 to 2005 encompassed a broader set of values - natural, cultural and recreational - and the social and economic benefits that Victoria's parks provide. This new approach also establishes a baseline set of indicators to monitor trends.

There is currently a joint NSW, Victorian and Australian Government project funded through the Australian Research Council for developing management effectiveness frameworks managed by Professor Marc Hockings from the University of Queensland. This project will help facilitate a State of the Parks reporting system in all jurisdictions.

The focus of the state systems is collating information on a park by park basis. There is a need for a national approach to measure the management effectiveness of management across the whole protected area estate to better understand progress against nationally agreed conservation objectives.

Though state reporting systems may be in place, state reporting typically does not cover *all* protected areas, in particular local government, private and Indigenous protected areas within the

jurisdiction may be omitted. The major protected area non-government organizations such as Bush Heritage Australia, Australian Wildlife Conservancy and Trust for Nature are currently developing their own approaches. It is important that such reporting systems be shared and discussed by all protected area sectors to ensure broad consistency of approaches.

Ten bioregions had less than 50% of protected areas as strictly protected areas in 2006 (Table 3). Multiple use areas grew by nearly one million hectares from 2004 to 2006 (Table 2). The rapid growth of multiple use protected areas (IUCN categories V-VI) creates an imperative for regulation and monitoring of the impacts of multiple land uses, principally livestock production, to be certain that the primary conservation purpose is not compromised.

The growth of non-government ownership (Table 2) underlines the importance of ensuring that governance arrangements are producing desired conservation outcomes, through appropriate management and high standards of monitoring and evaluation equivalent to those on public reserves.⁶⁸

Ultimately, the effectiveness of protected areas in conserving biodiversity is measured by threatened species trends (Fig 5), as well as trends in condition of other important natural and cultural resources.

The *2002 Terrestrial Biodiversity Assessment* collated a large amount of data on threatened species trends down to subregional scale. This process relied less on direct measurement than on the opinion of expert panels owing to the lack of information and resource constraints. A more objective framework is being developed for the *Assessment* now in progress, but this may not be comparable to the original *Assessment*. Species trends should ideally be assessed in successive periods in the same areas using the same methodology, to form an overall and ongoing picture of the effectiveness of conservation actions, including protected areas.

> **The Australian Government should ensure there is a repeatable and reliable national process of monitoring trends in ecosystem condition and threatened species populations to permit accurate evaluation of effectiveness and cost-efficiency of different conservation actions. This would also contribute to efficient reserve system planning.**

Investments in management

Recurrent management funding represents the major component of the total cost of protected areas. Acquisition and establishment are relatively minor costs compared with the demands of fulfilling a commitment to manage an area for conservation in perpetuity. Table 7 shows the level of annual recurrent management funding by jurisdictions for the years 2004 to 2006.

Increased absolute dollars for management were reported by Queensland, Victoria, Western Australia and South Australia. However, inflation-corrected investment per hectare of government protected areas actually declined in all jurisdictions except Victoria, the Northern Territory and perhaps Tasmania (Table 7).

Tasmania and the Australian Capital Territory did not report annual management budgets however, because responsibilities for reservation and management are spread across more than one agency or for other administrative reasons. Tasmanian budget data was acquired from published sources. The lack of consolidated estimates of public investments in the NRS prevents accurate assessment of progress to agreed targets on an ongoing basis, and represents a barrier to cost-effective decision making.

Table 7 also shows that substantial per capita management costs must be borne by less populous jurisdictions which are large and where the required growth of the NRS is substantial to secure biodiversity. The Australian Government must provide the leadership needed to encourage increased reserve acquisitions by allocating financial assistance in such a way that recognises the significant ongoing costs per capita borne by agencies and by non-government organizations that acquire land for nature conservation.

> **Protected area management funding should be increased by all jurisdictions to accommodate growth of the reserve system and to address the intensification of threats expected with climate change.**

BOX 8



Red Swainson's pea on Kotta Reserve. © Terri Williams, DSE Vic.



Plains wanderer. © Mark Antos, DSE Vic.

Kotta Nature Conservation Reserve, Victoria

Kotta Nature Conservation Reserve (NCR), along with Tomara Gilgais NCR, were the two grassland protected areas which made notable contributions towards the comprehensiveness of the NRS in Victoria.

These grasslands contain priority vegetation communities in a high priority bioregion, the Victorian Riverina helping to raise the area protected from 2.2% to 2.6% between CAPAD 2004 and 2006. Both reserves are in the north of the state, in the Northern Plains Grasslands area, on the Patho Plains near Bendigo and Echuca. The reserve is an example of native grasslands in a landscape from which they have largely been lost due to agriculture and grazing.

Kotta NCR contains habitat for the plains-wanderer (*Pedionomus torquatus*) (vulnerable, C'wlth) and the brolga (*Grus rubicunda*) (vulnerable, Vic). The red Swainson's pea (*Swainsonia plagiotropis*) (endangered, Vic, C'wlth) is an endemic of Riverina grasslands.

Adequacy: resilience to climate change

Adequacy of the NRS must now include an element of ensuring natural resilience of species and ecosystems to the disruptions and displacements caused by climate change.

Climate change represents a major challenge for the maintenance of biodiversity and natural systems. The reduction in the global emissions of greenhouse gases is a critical necessity. However, even if emissions came to a halt, the earth will experience significant climate change due to accumulated emissions. It is vital therefore that steps be taken to insulate and buffer natural systems against the now inevitable impacts of climate change.

The persistence of the present Australian fauna and flora through repeated glacial-interglacial cycles of the last several million years indicates substantial capacity of animals and plants to persevere in specialised habitats, migrate to adjust to major climate change or adapt, a phenomenon termed resilience.

Resilience of native animals and plants to climate change is presumed to have been eroded greatly due to loss and fragmentation of natural habitats through land clearing and conversion to settlements and agriculture, dams and water diversions, loss of genetic diversity, and pervasive threatening processes such as fire, feral pests and weeds.⁶⁹

Protected areas present the best option for retaining natural ecosystem resilience, reducing threats, and protecting refuges and other critical habitats that will be needed by Australia's native animals and plants to adapt to climate change.

Shifts in climate zones and sea level rise under climate change are expected to result in:

- > Shifts in species ranges and assembly of new ecological communities.
- > Increasing fire frequency and severity.
- > Increasing exotic animal and plant problems.
- > Inundation of coastal low lying areas and wetlands.
- > Loss of mountaintop habitats.
- > Increasing severity of droughts and impacts on arid lands, particularly the closer settled semi-arid lands.
- > Increased pressure for water extraction and land conversion to agriculture and settlements.⁷⁰

A recent symposium *Protected Areas: Buffering nature against climate change* dealt with these issues in more depth.⁷¹

Key findings arising from the symposium were:

- > Fulfilling existing commitments to a comprehensive, adequate and representative NRS is the most important and immediate step to be taken to protect natural resilience.⁷¹ The protected area system provides the best option for securing climate-critical habitats such as refugia, climate corridors and stepping stones for key species, either as government reserves or covenants on private lands.
- > The established scientific criteria for a comprehensive, adequate and representative NRS are robust but could be enhanced with the identification and protection of climate-critical habitats and other areas needed to maintain natural ecological processes across the landscape, also known as connectivity.
- > The interaction of climate change with other threats represents key management challenges for protected areas and for the whole landscape in which they are embedded.
- > The extent to which threats are reduced on a landscape scale is critical to the adequacy of protected areas. It is likely that larger areas and more populations of species will need to be brought under protection to provide the same level of viability for species as could be expected without climate change.⁷² Reserve system targets will need to be revised progressively in an adaptive manner to account for new information and to take account of shifts in species distributions. Appropriate monitoring and evaluation frameworks to measure the on-ground success or failure of management actions are pivotal to the implementation of effective threat abatement measures.
- > Considerable shift and replacement of species in existing protected areas is expected and should be prepared for. Expectations of management of protected areas must change from preserving biodiversity 'frozen in time' to managing unavoidable shifts and changes in native species distributions so as to minimise losses.⁷³ Some species may be unlikely to survive without special interventions such as translocations or artificial habitat maintenance.
- > Although restoring connectivity through revegetation may be an important element of natural resilience to climate

change such efforts should not detract from the more urgent priority of securing valuable intact habitats.

- > Planning for climate change should be part of systematic bioregional planning for identifying biodiversity priorities and cost-effective conservation management.

- > **The Australian Government should fund a national program to identify refugia and other key habitats, to improve the resilience of native species and ecosystems to climate change, and to inform the requirements for a comprehensive, adequate and representative NRS across each bioregion.**

All jurisdictions except the Northern Territory, reported that climate change was being factored into NRS planning and some have identified specific bioregions where NRS enhancements were a priority with regard to climate change (Table 8).

- > The Australian Capital Territory released a Climate Change Strategy in 2007, but this did not contain specific prescriptions regarding biodiversity. The Australian Capital Territory as the jurisdiction with the highest extent protected indicated that while there are a few small areas earmarked for reservation in the near future, options for protected area expansion to adapt to climate change are limited.⁷⁴ However, a detailed connectivity study will identify opportunities for habitat protection and/or improvement to provide additional security for biodiversity in the face of climate change.

- > The New South Wales Climate Adaptation Framework recognises that communities of native species on protected areas will undergo turnover, and that coordinated off-reserve conservation effort will become more important.

The framework proposes to:

‘Improve current conservation planning including programs in and outside of protected areas, to incorporate knowledge of ecosystem responses to climate change, and implement regional investment strategies that protect and improve links and corridors.’⁷⁵

The Department of Environment and Climate Change considers enhancements of the NRS in all bioregions is required, with special attention needed for mountain habitats, coastal areas at risk of inundation, and semi-arid or arid environments where heat and drought effects will be pronounced (Table 8).

- > The Northern Territory’s Greenhouse Strategy contains an adaptation section that does not deal with biodiversity or parks.⁷⁶ The *Northern Territory Parks and Conservation Masterplan* however, has four recommendations dealing with climate change.⁷⁷
- > Queensland has released a series of policy documents on climate change, most recently the *Climate Smart 2050* framework released in 2007, which recognises that protected areas play a key role in retaining natural resilience. A concrete adaptation plan has yet to be developed.⁷⁸
- > South Australia released a Climate Change Strategy in 2007, which provides for risk assessments for biodiversity. However the only practical action proposed in terms of protected areas is restoration of natural flows to the Murray River.⁷⁹
- > Tasmania has released a draft discussion paper towards a Climate Change strategy.
- > Victoria released a 2005 Action Plan Update to its 2002 Greenhouse Strategy⁸⁰ which states that its actions with respect to biodiversity were governed by the *National Biodiversity and Climate Change Action Plan*.
- > Western Australia released a strategy in 2004 which proposed a Biodiversity and Climate Change strategy by the Department of Conservation and Land Management. A formal strategy document has not yet been released.

All jurisdictions committed to the *National Biodiversity and Climate Change Action Plan 2004-2007*, which awaits review and updating.⁸²

All major ecosystems of northern Australia are considered to be at medium to high risk due to climate change. A recent review recommended as key actions to build resilience to climate change:

- > Maintaining native vegetation and free-flowing rivers.
- > Reducing landscape scale threats such as fire, weeds and invasive pest species.
- > Establishing protected areas as buffers to climate change.
- > Supporting Traditional Owners and land managers who conserve natural ecosystems.⁸³

Table 8. Accounting for climate change in NRS planning (jurisdictional responses to questionnaire Appendix 1).

	ACT	NSW	NT	Qld	SA	Tas	Vic	WA
Is climate change being factored into protected area selection & management?	yes	yes	no	yes	yes	yes	yes	yes
Priority bioregions, subregions, landscapes with regard to climate change where NRS could be enhanced	AA (options limited)	All, priority to habitats at extremes of latitude and altitude, coastal regions (sea level rise) and central & far western bioregions (drought, heat)	DAC ARC MAC ARP, other coastal bioregions: VB TWI CA GUC GUP	All	EYB, EYB 1 EYB 2, fragmented, productive, aquatic habitats	No details provided	VVP RIV 4 MDD2,5 VM 4 SCP 1 NCP 2 NSS	No details provided

Connectivity

Native animals and plants may only avoid extinction due to climate change by either staying and adapting to new climatic zones or by shifting ranges to follow the shifts in climate zones or rising sea levels.⁸⁴

The ability of species to shift ranges depends on the extent to which natural pathways (natural vegetation, undisturbed streams) or 'stepping stones' (such as wetlands for frogs or waterbirds) through the landscape are available.

Connectivity and more generally maintenance of environmental flows and natural ecological processes at the landscape scale requires improved management on all lands, not just the reserve system. The extent to which off-reserve management is sympathetic to NRS goals is a key component of the adequacy of the NRS itself.

Nevertheless, connectivity is a complex issue for the following reasons:

- > In cases such as high mountain fauna, connecting natural lowland vegetation between protected mountain tops may not be of much help, since such habitats may be unsuitable for transit of high altitude fauna and flora. Moreover, suitable habitat in new climate zones may be located too far south of the present range for migration to be feasible, or may not be available at all.⁸⁵
- > Climate shifts may occur much faster than the dispersal rate of all but the most mobile species.⁸⁶
- > Many successful conservation projects in Australia have entailed isolating or quarantining threatened species populations on islands or inside predator exclusion fences, rather than connecting them to the wider landscape. Connectivity in such cases has been found to be disadvantageous to species survival.
- > Active restoration of already cleared and damaged landscapes is typically many times more expensive than protecting intact habitats.⁸⁷
- > Restoring connectivity necessitates additional major investments in management to ensure that flows of undesirable agents, such as weeds, pests, diseases and excessive fires, are minimised while flows of desired agents such as migrating native animals and plants, pollinators and keystone species are facilitated.⁸⁸

- > There is a risk that a major investment in replanting native vegetation to restore connectivity would widen the existing imbalance in funding between revegetation and the primary objective of securing still intact refugia, core habitats and sampling ecosystem diversity through the NRS Programme.

Two options to promote connectivity that may be cost-effective include:

- > Enhancing travelling stock route networks to also act as climate corridors where indicated as effective.
- > Forest carbon sinks.

Travelling stock routes

In Queensland there are some three million hectares of stock routes and 'camping reserves.' In New South Wales, the area of stock routes is nearly as great as that of national parks. In some heavily cleared areas the only remnant vegetation remaining is along stock routes. Stock routes as linear strips of remnant vegetation covering continental scale distances may provide valuable habitat for and facilitate migration of some native species and so contribute to maintaining resilience to climate change.⁸⁹

Stock routes, particularly in New South Wales and Queensland, could be enhanced through rehabilitation and management to improve conditions for native species in addition to their primary purpose. In many cases however, they may be too narrow and might need to be enhanced by facilitating regrowth of natural vegetation on adjacent lands. Stock routes could form the core of such a connectivity recovery network.

Because of low recovery of the public costs of stock route administration, many stock routes have not been managed to a sustainable natural condition. In some areas stock routes are in good condition. Elsewhere the invasion of weeds, soil erosion and the loss of natural perennial ground cover species has occurred to the detriment of biodiversity values as well as pastoral productivity. The restoration and enhancement of stock routes as corridors for both the highly controlled movement of stock and as climate change corridors for wildlife is desirable where it is established that they will indeed act as effective corridors. For many decades, there has been pressure for their incorporation into adjoining properties. This has been resisted until now owing to their recognition as a valuable state land asset.

Stock route management in Queensland is the responsibility of local governments and is funded by stock travel and agistment permits. However, local governments recover only a small portion of the costs.⁹⁰ As a result there is pressure to remove many stock routes from the network and open them up for permanent leasing so that upkeep becomes a responsibility of the lessee, not local government. Stock routes once exposed only to intermittent grazing could be then opened up to year-round heavy grazing pressure and even clearing.

Many riparian strips also lie on state lands, together with associated camping and water reserves, and could function as climate corridors if managed appropriately.

Forest carbon sinks

Restoration of native vegetation corridors is normally very expensive compared with protecting intact vegetation. The imminent development of an emissions capping and trading scheme to implement the recent ratification of the Kyoto Protocol on Climate Change by the new Australian Government presents a new opportunity for financing such revegetation.⁹¹

Restoration of native vegetation on formerly cleared lands may take several forms:

- > Regrowth of previously logged forests.
- > Managed natural regrowth on cleared lands.
- > Plantings of simulated natural forests on cleared lands.
- > Monocultural plantations on cleared lands.

Regrowth of previously logged forests. A 'Kyoto-eligible' forest must have been established on land that was cleared as of December 1989. This rule prevents forest sink credits for regrowth of forests that were but not cleared as of Dec 1989 but have been logged or degraded and are now regrowing toward climax communities. Carbon stocks could increase substantially as Australian forests recover from past logging and degradation.⁹² If the Kyoto forest sink rules were relaxed to allow forest sink credits for regrowth of previously logged or degraded forests, many former state forests converting to national parks under various Regional Forest Agreements might attract carbon credits thus helping to fund park management. However, such land use changes may fail the additionality test for offsets, which requires that the forest sink would not otherwise have happened were it not for the carbon value.

Managed natural regrowth is likely to provide the best carbon sink and biodiversity adaptation value for the lowest cost in terms of restoring natural habitats and connectivity. In northern Australia considerable natural regrowth potential exists.⁹³ At present, it is unclear if managed natural regrowth will be eligible as a carbon sink in the emerging Australian emissions trading scheme. Managed natural regrowth is little used in current voluntary carbon offset markets, with preference being given to plantations. Carbon accounting is more complex for natural regrowth than for plantations, but certainly achievable, and likely to cost less due to the high cost overheads involved in active plantings.

Plantings of simulated natural forest or native vegetation are very popular and represent a major endpoint of government funding through many programmes including the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality. However, plantings are very expensive relative to natural regrowth, entailing substantial costs of seedling production, ground preparation, planting and nurturing planted trees, as would be required for forestry plantations. There is also the risk of inappropriate selection of species for climate and a tendency toward commercial species or simple species mixes at the expense of achieving mixed stands more appropriate for biodiversity conservation.

Monocultural plantations of native hardwoods may provide faster carbon uptake value than natural or simulated natural forest sinks if fast growing species are selected. However, mature native hardwood forests can store much more carbon in total than forestry plantations in the long term even with recurrent stand-destroying fires.⁹⁴ Moreover, monoculture plantations typically have lower natural habitat value compared with natural forests. Landscape heterogeneity and stand structural complexity are vital for fauna conservation.⁹⁵ Plantations can also have negative impacts on native water dependent ecosystems by lowering water tables. Plantation forestry on already cleared land could have significant biodiversity benefits to the extent to which it avoids logging and deforestation of native forests elsewhere.

The key questions are: if forest sinks are a feasible mechanism for rebuilding connectivity where it has been lost through land clearing and will eventual carbon pricing make it worthwhile for landholders to pursue sink projects?

Recent estimates suggest that forest sinks could bring between \$367 million and \$918 million in new annual revenue to rural landholders across the country depending on the carbon price.⁹⁶ Poor uptake by landholders to date suggests that:

‘verification and marketing requirements of offsets consume a large part of the available revenues at current [carbon] prices’⁹⁷

Forest sinks could be made more economically attractive to landholders by:

- > Reducing establishment overheads, for which natural regrowth is likely to present the lowest cost option.
- > Streamlining verification and reducing other transaction costs.
- > Maintaining high carbon prices through a rigorous and tightly controlled emissions capping and trading scheme.
- > Allowing linkage to stewardship and other incentives for connectivity conservation.

Most land clearing in the past has been to expand livestock pasture. Therefore placement of forest sinks on cleared land effectively also entails destocking or much reduced stocking. Destocking has the additional value of reducing methane emissions while removing one of the most pervasive threatening processes affecting Australia’s inland ecosystems.⁹⁸ Livestock digestion and manure account for 90% of agricultural sector methane emissions.⁹⁹ Destocking and conservative, or highly managed grazing, has the potential to restore soil carbon sinks.

The new Australian Government made an election commitment of \$10 million to develop carbon credits opportunities for Indigenous fire management.¹⁰⁰

- > **Restoration of connectivity to facilitate climate change resilience should be closely linked to the identified needs of climate-vulnerable species, and should adopt the most cost effective solutions such as through enhancement of stock routes and investigating managed natural regrowth as an eligible carbon credit in the emerging Australian Emissions Trading Scheme.**



Late wet season billabong in Blue Mud Bay area, Laynhapuy IPA.
© Laynhapuy Homelands Association.

Laynhapuy Indigenous Protected Area, NT

The Laynhapuy Indigenous Protected Area was declared in 2006 over 450,000 hectares of land and sea. The land portion encompasses 13% of the entire Arnhem Coast bioregion, which was only 3.3% protected in CAPAD 2004 (Table 3). Laynhapuy is managed under IUCN Protected Area Category VI (Box 1).

Inland vegetation is mostly eucalypt forest and woodlands with tussock grass understorey. Coastal vegetation includes well developed heathlands, mangroves, wetlands, saline flats and floodplains.

Laynhapuy IPA abuts the Dhimurru IPA, greatly enhancing connectivity and adequacy. IPAs such as these are unique among Australian protected areas in also including sea country that is home to endangered turtles and dugong. In contrast, government marine and terrestrial protected areas are treated quite separately.

Laynhapuy IPA protects habitats for the palm *Arenga australasica* (vulnerable, C’w’th) and many Commonwealth endangered or vulnerable animals such as the Gouldian finch (*Erythrura gouldiae*), red goshawk (*Erythrotriorchis radiatus*), golden bandicoot (*Isodon auratus*), northern quoll (*Dasyurus hallucatus*), Gove crow butterfly (*Euploea alcatheae enastr*), the freshwater sawfish (*Pristis microdon*), and four species of marine turtles including the native flatback turtle (*Natator depressus*). Large areas of important waterbird habitat are also protected.

There are many cultural sites on the IPA including shell middens, a rock art gallery, and historic Macassan occupation sites on the coastline. The Laynhapuy community and the local Yirralka Ranger group are working to protect culture and cultural sites, prevent unauthorised access, and control weeds and feral pests like pigs and buffalo. Traditional burning techniques are used, and management of the sea and coast includes removal of marine debris and monitoring of turtle habitats.

Main pathways for growth of protected areas

Building Nature's Safety Net 2008
Progress on the Directions for the National Reserve System

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In this section the main pathways to creation of new protected areas are summarised and highlights discussed.

The major pathways are:

- > Legislation.
- > Acquisitions by state/territory governments.
- > Conversion of state/territory lands.
- > Local government Protected Areas.
- > Indigenous Protected Areas.
- > Private Protected Areas.

Legislation

Legislated protection of specific biodiversity assets does not necessarily create protected areas. For example, matters of national significance are considered 'protected' under the *Environmental Protection and Biodiversity Conservation Act*. However, the Act does not prohibit developments in any given area, even on Commonwealth land, but only sets out a process of referral, assessment and approval or rejection of developments that may significantly impact protected matters.

Legislation can drive the creation of protected areas without the need for purchase by the state, through linkage of protection of biodiversity assets to covenanting agreements supported by appropriately scaled incentives such as tax relief, biodiversity fee-for-service contracts or management assistance.

In South Australia, the *Native Vegetation Act 1991* regulates the clearing of native vegetation but also provides for protected area Heritage Agreements over high conservation value native vegetation, equivalent to a covenant on the land title. Landholders of properties subject to such statutory agreements have guaranteed access to management funding and rate rebates. These Agreements areas are included in CAPAD.

Victoria includes in CAPAD sections of rivers that are protected under the state's *Heritage River Act*. The Act identifies 18 Heritage River Areas and protects public lands in specific parts of Heritage Rivers or river catchment areas, by prohibiting or regulating actions like dams, diversions, clearing and livestock. There are 62 distinct protected areas within the 18 heritage river areas, 112,155 hectares in strictly protected areas and 68,763 hectares in multiple use areas.¹⁰¹

Queensland's *Wild Rivers Act 2005* has resulted in declarations of six *Wild Rivers*. Three of these occur almost entirely in already gazetted National Parks (Staaten, Fraser, Hinchinbrook). The High Preservation Zones of Wild Rivers may qualify for an IUCN protected area category, but have not yet been included in CAPAD by Queensland.

Purchases by state/territory governments

Purchase of properties by state and territory governments is a major pathway for creation of new protected areas, and allows the careful selection of those areas of greatest priority to achieve comprehensiveness and other targets and to secure those areas most threatened. The only barriers are landholder willingness to sell and rising market prices of land. However, in time, most properties circulate onto the market and can be acquired at fair market value.

The NRS Programme has been a significant driver for purchase of both freehold and leasehold lands by state and territory governments. From 1997 to 2006, the NRS Programme invested \$49,484,178 and state and territory governments invested \$55,988,013 in acquisitions of 5,165,928 hectares of new protected areas.¹⁰²

In 2006, the Queensland Government announced the first of several new national parks arising out of an earlier programme of acquisition of pastoral leases along the east coast of Cape York Peninsula. These parks appear in CAPAD 2006 for the first time. Special legislation passed in late 2007, the *Cape York Heritage Act*, places new national parks under Indigenous ownership subject to joint management arrangements.¹⁰³

Acquisitions by local government and non-government land trusts are discussed below.

Conversion of state/territory lands

State forests

The majority of state land conversions to nature reserves and national parks in the last decade have come from state forests under various Regional Forest Agreements (RFAs) and similar forest agreements. The scope of RFAs may also include private land forestry.

National drivers of RFAs were:

- > The multilateral adoption of the *National Forest Policy Statement* in 1992 and the *Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia* in 1997 (JANIS).
- > Australian Government funding of Comprehensive Regional Assessments to provide the planning basis for RFAs, including identification of new protected areas that meet JANIS criteria.
- > Exemption for forestry operations in RFA areas from the approvals process of the Environmental Protection and Biodiversity Conservation Act 1999 with some reservations for World Heritage and wetlands (EPBC Act ss. 40,42).

Transfer of state forests to national parks requires termination not only of logging interests, but also grazing leases or permits, mining, beekeeping, rock fossicking, horse riding, and off road vehicle users that traditionally enjoyed access to state forests depending on the jurisdiction.

Most of the 2.9 million hectares of state forests transferred to protected areas under the ten RFAs had already taken place by 2004 CAPAD.¹⁰⁴

Queensland follows a unilateral state forest process which is not based on JANIS criteria, but rather aims to transition all logging out of native forests into plantations by 2024.¹⁰⁵

- > The South East Queensland Forest Agreement was signed in 1999. Under the agreement some 425,000 hectares were closed to logging and prioritised for transfer. By October 2006, 52% of state forests had been gazetted as new protected areas. Timber harvest will cease by 2024 on the remaining 375,000 hectares when they also will be transferred to protected areas.¹⁰⁶
- > 80% of the 480,000 hectares of Wet Tropics state forests earmarked for transfer were gazetted as protected areas by October 2006.¹⁰⁷

In Victoria, native forest logging still continues on a large scale. The Mid Murray Forest Management Area is not subject to a RFA but about 28% of the area is subject to logging.¹⁰⁸ A recent Victorian Environmental Assessment Council (VEAC) report known as the 'River Red Gums' investigation, recommended:¹⁰⁹

- > The conversion of state forests in the study area to increase protected areas from 23% to 65%.
- > Phasing livestock out of all public lands except road reserves.
- > A 4000 gigalitre flow allocation for floodplain inundation every 5 years.

Implementation of these recommendations would make a significant contribution to the NRS and the protection of biodiversity. One of the notable additions proposed in the River Red Gums Investigation is an addition to Terrick Terrick National Park, which received WWF's *Top 10 Protected Areas of the Decade* award in 2006.

The flow allocation proposed raises the interesting possibility that minimum environmental flow allocations for rivers, streams and wetlands comprise a form of protected 'asset' that perhaps should be recognised in CAPAD's list of protected assets.

Western Australia's *Forest Management Plan 2004-2013* will transfer 662,150 hectares from state forests to the NRS to meet JANIS criteria. This is a substantial increase over the 150,000 hectares committed in the original RFA.¹¹⁰ 195,000 hectares had yet to transfer to the NRS as of mid 2006.¹¹¹

Leasehold land

State lands under primarily pastoral leases may be converted to protected areas in several ways:

- > Acquisition of the leasehold interest by the state and transfer to the NRS.
- > Acquisition of the lease by a land trust or other entity.
- > Protected area covenants attached to the lease title.

The last two items are discussed under private protected areas below.

New South Wales reorganized its crown lands law in 1989. The *Crown Lands Act of 1989* requires assessments of unallocated crown lands to determine whether they should be sold, leased or transferred to the parks estate. The assessment method has been criticised for not explicitly taking into account the value of crown lands for advancing national biodiversity and NRS goals.¹¹² Already leased/licensed crown lands in New South Wales come under the *Crown Lands (Continued Tenures) Act 1989*. Some 11,500 crown leases cover 3.4 million hectares of New South Wales. From 1990 to 2004, a moratorium on

divestment of crown leases was in place. By 2008, holders of perpetual leases must seek to convert to freehold tenure at a concessional purchase price of 3% of land value, after which market rents will be charged rather than the subsidized rents of the past.¹¹³ The Minister may decide to place covenants over divested properties to protect environmental values pursuant to the provisions of the *Conveyancing Act*, rather than the *Nature Conservation Act*, a mechanism that has been criticised as inadequate. A \$13 million fund was established from the state's Waste Levy to finance voluntary acquisitions of perpetual leases of high conservation value. This is likely to fund the purchase of around 25-30 leases. Leasing or disposal of lands in the western half of the state comes under the *Western Lands Act 1901*.

In Queensland, significant areas were added in the past to the conservation estate from leasehold lands as part of conversion to higher forms of lease, upon freeholding or upon renewal of lease. This relied in the past on leases being much larger than needed to be economically viable, so that excision of portions of the lease for protected areas did not greatly affect production. In some bioregions such as the Channel Country some leases are still large enough that the surrender of parts upon lease renewal may be possible and still leave the property viable for production. However, with property sizes in most parts now being too small to be viable or ecologically sustainable such opportunities are limited. In more recent years, leasehold land has been generally acquired on the open market at fair market value.

Recent amendments to Queensland's *Land Act 1994*, provide explicitly for mapping of 'Future Conservation Areas' over priority properties, for non-renewal of term leases, and eventual inclusion in the NRS. These amendments form part of a larger 'Rural Leasehold Land Strategy' that includes incentives of longer lease terms if land is in good condition, has conservation agreements and guarantees for Traditional Owner access. Many key reserve proposals on leasehold land have been held in abeyance, sometimes for decades, with lessees unwilling to sell and such provisions should now ensure that these key proposals are brought to fruition. Protection of biodiversity values in the interim is a key issue that appears to be addressed in the recent amendments and will rely upon appropriate enforcement. The poor enforcement

of conditions on pastoral leases in the past has been a major issue leading to degradation in some areas.

Western Australia has the most advanced programme of lease conversion among the jurisdictions. As of mid 2006, over five million hectares of former pastoral leases, of high conservation interest were earmarked for exclusion from the lease area. Significantly, much of this area was identified through the Gascoyne-Murchison Strategy, a rural structural adjustment scheme also aimed at achieving sustainable pastoral management. Another 1.4 million hectares of pastoral leases are earmarked for transfer to the NRS when leases come up for renewal in 2015.¹¹⁴



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Lorna Glen Station, WA

This property on the border between the Gascoyne and Murchison bioregions contains four vegetation types which were previously unrepresented in the reserve system. One vegetation type is restricted to the lease itself. There will also be an improvement to the representation of another seven vegetation types.

Its proximity to the former Earahedy Pastoral Lease, acquired by WA with assistance from the National Reserve System Programme, will add significantly to the conservation values of both sites through improving the viability of the biota found on both of these former pastoral leases.

Local government protected areas

Local governments received \$3,886,471 in NRS Programme funds to buy 908 hectares in twelve separate properties.¹¹⁵

Current CAPAD statistics exclude many other local government protected areas. In addition to acquiring or creating protected areas, local governments undertake a diversity of activities for the conservation of biodiversity, such as zoning of land for protection from development and rate rebates.¹¹⁶

Environmental levies are used by some councils to fund growth of their conservation estate. Fifty percent of responding Queensland councils collect an environmental levy. Only 9% of councils responding to a survey in South Australia, Western Australia, Victoria and Tasmania, collected an environment levy from their constituents, the majority being in South Australia. The size of the levy ranged from below \$10 per ratepayer to \$30-40 per ratepayer.¹¹⁷

> **The local government conservation estate represents a potentially significant contribution to the NRS. This contribution should be accounted more fully in future CAPAD releases, where appropriate security of tenure and management arrangements are in place.**

Indigenous Protected Areas

The Indigenous conservation estate covers some of the most poorly-protected bioregions. The Indigenous conservation estate includes:¹¹⁸

- > Indigenous lands under state, territory or Australian Government national park leaseback and joint management arrangements.
- > Indigenous Protected Areas over Indigenous owned/leased lands under the specific Australian Government programme.
- > Non-Indigenous owned lands with overlaid native title interests, Indigenous Land Use Agreement (ILUA) areas or joint management arrangements. A successful native title determination can rise to exclusive possession. Five separate exclusive possession determinations have been made covering 9% of Western Australia's land area.¹¹⁹ One of these successful claims is also resulting in transfer of title for an embedded reserve and national park with leaseback and joint management arrangements to settle outstanding liability of the state for compensation.¹²⁰

IPAs are comparable to protected areas owned by non-government conservation organizations and land trusts. Title is a community form of title held by an Indigenous corporation.

IPAs can bring significant social and economic benefits to remote communities if they manage to attract income that allows Traditional Owners to stay on and care for their country.¹²¹ Traditional Owners can bring to biodiversity conservation their unique contribution of traditional knowledge of, and strong cultural attachment to, the living landscape.

Growth of IPAs has been significant since the programme began in 1997. 20.2 million hectares of IPAs were added to the NRS over the period 1997 to 2007 at a cost of \$18.3 million to the Australian Government, an average of only \$1.11 per hectare added, but representing 33.8% of total growth of the NRS over the period. 16.3% of all protected areas are now under Indigenous governance (equivalent to the IUCN's Community Conserved Areas category, Table 2).¹²²

Although the cost to the Australian Government of the IPA programme has averaged only \$1.11 a hectare, this 'cost-effectiveness' is somewhat illusory as it does not include all of the recurrent funding needed for effective ongoing management (see further below). IPA ranger groups make up the need for additional funding by applying for short term grants from a plethora of government and non government sources such as:¹²³

- > Community Development and Employment Programme (CDEP).
- > Aboriginal Benefits Account (Northern Territory only).
- > 'Healthy Country, Healthy People' schedule of the Northern Territory – Australian Government overarching Indigenous affairs agreement.
- > Indigenous Land Corporation.
- > Natural Resource Management (NRM) funds under the Natural Heritage Trust.
- > Landcare.
- > Ecosystem and other services arrangements (such as the West Arnhem Fire Management carbon offset project).
- > State and territory grant programmes.
- > Ecotourism business ventures.
- > Private philanthropy.

Although states and territories reported that they generally have in place legislation to support IPAs in practice they contribute little to IPA management, although they may have indirect arrangements not specifically targeted to Indigenous owners.¹²⁴

Western Australia recognises IPAs as a valuable type of conservation activity, but one lacking long term legal security of purpose.¹²⁵

South Australia in 2004 amended the *National Parks and Wildlife Act 1972* to allow for proclamation of national parks over Indigenous owned land, with the permission of the owners, and subject to the continuance of a co-management agreement. Co-management boards may also assume executive control over certain parks on crown lands.¹²⁶

The state has a greater stake in assuring ongoing effectiveness of management of such parks since they are gazetted under state legislation. Also Indigenous rangers can be appointed as wardens with law enforcement powers.

IPA rangers do not have law enforcement powers unless they qualify for them through relevant state and territory legislation. The engagement and cooperation of states and territories is essential to devolution of such powers and to ensure underlying conservation security.¹²⁷

The Gilligan evaluation of the IPA programme stressed the importance of such 'tripartite' arrangements to strengthen IPAs and to move them onto a stable recurrent funding base.¹²⁸

The IPA programme evaluation suggested IPAs should be receiving \$30-\$50 million a year in recurrent funding within a 'tripartite' framework of Australian Government, state and territory support.¹²⁹

In 2007, a major source of funding for Indigenous rangers, the Community Employment and Development Programme (CDEP) was terminated by the Australian Government and the ranger element of it replaced with a four year \$47.6 million *Working on Country* programme to employ a ranger workforce using prescribed Indigenous land-owning corporations to deliver the programme money on a tender basis rather than through the government-run Centrelink.

The lack of recurrent funding stability for Indigenous ranger work is identified as a major problem. A recent forum concluded:

'an urgent need was identified for recurrent core funding for Indigenous land and sea management agencies to

enable them to fulfil their responsibilities to care for country and to deliver broader environmental benefits, including through fee-for-service activities, to the Australian community.'¹³¹

The new Australian Government promised leading up to the election:

- > To reinstate CDEP.
- > To allocate \$50 million for the IPA programme, including ranger positions.
- > To allocate \$90 million for Indigenous ranger positions outside of IPAs.
- > To allocate \$10 million to develop emissions trading opportunities for Indigenous fire managers.¹³²

The Indigenous estate is not static, but has potential to grow, presenting a unique opportunity to simultaneously promote conservation and Indigenous social and economic development.

Since only 16% of the Australian land mass is currently under indigenous ownership or control,¹³³ the capacity for future growth of IPAs to advance NRS goals is likely to be more constrained than it has been during the recent period of rapid growth, unless there is significant added impetus for growth in the Indigenous owned and controlled conservation estate.

Principal avenues for additions to the Indigenous conservation estate are:¹³⁴

- > Acquisitions through the Indigenous Land Corporation's Environmental stream or similar state programs.
- > Successful Native Title claims or Indigenous Land Use Agreements that entail grants of title or exclusive possession.
- > Land claims over state lands under relevant state legislation.

At present Indigenous protected area proponents who do not yet own their country have limited options to realise their goal other than through the above means. Partnerships with established land trusts or states could provide Traditional Owners with the capacity to put successful bids for new protected area acquisitions before a wider spectrum of funding sources.

- > **Additional funding is urgently needed to secure effective ongoing management of Indigenous Protected Areas (IPAs) through Indigenous ranger employment and training programmes. Stable ongoing management funding, conservation security mechanisms and**

devolution of law enforcement should be developed through 'tripartite' partnerships with state and territory governments.

- > The Australian Government should encourage growth of the Indigenous conservation estate through increasing the funding available for Indigenous Protected Area acquisitions and by enhanced delivery of the environmental stream of the Indigenous Land Corporation.

Private Protected Areas

Private protected areas encompass diverse levels of security and protection across different agencies and fall into two major types:

- > Protected areas owned and run by non-government conservation organisations.
- > Properties under a conservation covenant or agreement owned and managed by a private landholder or pastoral company.

Acquisitions

As of 2006, conservation organisations were awarded \$13,315,227 in NRS Programme funds to acquire 1,244,088 hectares of protected areas in 28 different properties. Additional grants went to community groups and individual applicants.¹³⁵

Acquisitions by conservation organisations have grown significantly due to the valuable stimulus of the federal government NRS and Hotspots programmes.¹³⁶

Because the priority areas for reserve system growth lie in the rangelands, non-government land trusts and conservancies have purchased some very large pastoral leases such as Brooklyn Nature Refuge, Ethabuka Station, Carnarvon Station and Craven's Peak (Box 3) in Queensland, and the Mornington Wildlife Sanctuary in Western Australia, which received a *Top Ten Reserves of the Decade Award* by WWF in 2006. In some cases, such leasehold properties have been purchased with NRS Programme assistance.

Technically speaking, however these properties are still 'pastoral leases' under the respective land acts of these two states although the primary intent of the new lessee is conservation, not livestock production.

BOX 11



Northern quoll. © Lochman Transparencies.

Wongalara Wildlife Sanctuary, NT

Acquired by the Australian Wildlife Conservancy with support from the NRS Programme, the Wongalara Wildlife Sanctuary effectively doubled the comprehensiveness of the National Reserve System within the very high priority Gulf Fall and Uplands bioregion.

Covering 190,000 hectares 120 kilometres southeast of Kakadu National Park, Wongalara protects eucalypt woodlands, heathlands, lancewood scrubs, gallery forests, open grasslands, monsoon rainforests, wetlands, melaleuca woodlands and 55 kilometres of permanent river communities. Included among these ecosystems are three broad vegetation types that are not protected on any other reserve. Embedded within a landscape that has retained its structural integrity, the Wongalara acquisition provides an opportunity to halt regional species declines caused by introduced pests and unmanaged fire, and could catalyse cooperative ecosystem stewardship on the lands that surround it.

Wongalara supports populations, or habitat for, the Commonwealth endangered Gouldian finch (*Erythrura gouldiae*) and northern quoll (*Dasyurus hallucatus*), as well as the Commonwealth vulnerable species red goshawk (*Erythrotriorchis radiates*), eastern partridge pigeon (*Geophaps smithii smithii*), masked owl (*Tyto novaehollandiae kimberli*), and crested or northern shrike-tit (*Falcunculus frontatus whitei*).

Inflexibility in pastoral lease legislation, principally in Queensland and Western Australia, has meant that any conservation organisation acquiring pastoral leases is formally at risk of violating lease conditions unless they engage in livestock production as the primary purpose for holding the lease.

In the Northern Territory, a review of the *Pastoral Lands Act* has been in progress since 2004. The reforms recommended would allow lessees to diversify their operations by subleasing for non-pastoral purposes, which include conservation. Incentives are recommended for conservation set-asides and to prevent waters being placed in water remote habitats. A new fee formula could effectively result in no fee for conversion to entirely conservation use of former pastoral lands.¹³⁷

> **Further reform of land laws is essential in the Northern Territory, Queensland and Western Australia to remove remaining impediments to acquisitions of pastoral leases to become private protected areas free of livestock.**

Covenants

Covenants are dedications of land for a conservation (or other) purpose registered on the land title. They can be for a fixed period of time such as 10 years or in perpetuity.

Covenancing is conducted under the relevant land title legislation of the respective states and territories. Under state laws, states or local governments usually act as the *covenantee* (The landholder is the covenantor). However in many jurisdictions, non-government land trusts may be authorised by statute to be covenantees such as the Nature Foundation South Australia, Trust for Nature Queensland, Trust for Nature Victoria, Nature Conservation Trust of New South Wales, National Trust of Australia (Western Australia). Covenants entered into by such Trusts may still require ministerial approval.

States and territories reported that they generally have in place legislation to support private protected areas (per *Direction 33(b)*). The Northern Territory is in the process of amending legislation to remove some ambiguities.

Protected areas owned and managed by private land trusts are not necessarily secured through covenants over land titles. In practice however, the large conservancies do place covenants over their properties as a means of ensuring in perpetuity

protection.¹³⁸ All private protected areas acquired with NRS Programme funds must place a protected area covenant over the acquired property.

Land trusts may buy properties only to place them under a conservation covenant and on-sell, a scheme known as 'revolving fund.'

In Queensland, private properties can be gazetted as Nature Refuges under the *Nature Conservation Act 1994*, a protected area category listed in the statute. This is a distinct type of encumbrance against a land title, not a covenant. Queensland local governments typically covenant areas under section 97A of the *Land Title Act 1994*.

Under Phase 1 of the Natural Heritage Trust, 368,706 hectares were covenanted, but only 16,840 hectares were covenanted under the NRS Programme.¹³⁸

Covenancing programmes funded under the NRS programme cost from \$12 per hectare to \$667 per hectare but may be more cost effective than acquisition in locations with high land values and may be the only means of securing protection for priority ecosystems and habitats.¹⁴⁰

It is unclear to what extent covenants under other programmes also deliver NRS outcomes.

Tender payments for stewardship as part of natural resource management programmes are often based on agreed management arrangements for a limited term, rather than covenants attached to the land title. Whilst such arrangements may be the only practical approach to develop landholder interest, perpetual protected area covenants with clear biodiversity management objectives and monitoring and evaluation arrangements are necessary for conservation benefits to be secured in the long term.

The most uncertain aspects of covenancing and other agreements to protect and manage areas of conservation value on private lands is the general lack of secure long term management funding and the lack of monitoring and evaluation standards with regard to achieving agreed conservation outcomes.

The approval of covenancing programs for tax concessions by the Australia government provides a mechanism that can help coordinate and direct covenancing effort toward national biodiversity and NRS priorities.¹⁴¹

- > **The Australian Government should develop a National Reserve System Covenanting Initiative whereby all covenanting supported by Australian Government tax concessions or grants is coordinated through agreed criteria and standards of protected area monitoring and evaluation and oriented to advancement of NRS goals.**

Recurrent management funding for non-government protected areas

Management of protected areas to NRS standards necessitates a long term secure source of management funding. Over and above the cost of management, landholders can only be expected to place covenants over their land if they are provided with sufficient incentives to make it more economic for them to do so than to use the same land for production. In time this may lead to a greater cost burden to secure the area and its biodiversity assets than if the area was acquired by the state. However, in many situations it is not feasible to acquire parts of properties or areas where it would be highly inefficient to manage them for the State.

Non-government land trusts and conservancies try to solve this problem by establishing a donor-supported fund for management and by attracting a voluntary workforce of supporters.¹⁴²

Individual landholders and Traditional Owners have much less access to such sources of support and generally rely on repeated applications for short term grants from many different sources as discussed above.

Perpetual covenants do attract incentives in the form of federal tax concessions, but this is not enough to finance ongoing management.¹⁴³

Environmental stewardship payments for providing biodiversity conservation services could bring in substantial additional revenue to enable landholders to secure a return from conservation, but has been estimated to require \$739 million to \$1,627 million annually. By comparison, the Australian Government's Environmental Stewardship Programme is funded only at about \$50 million over four years, and is not targeted to covenanted properties.¹⁴⁴

In many of the arid and semi-arid bioregions that are high priority for reservation (Fig 1), livestock production may be already unprofitable or would be in the absence of subsidies.¹⁴⁵ Carbon credits, biodiversity fee-for-service (stewardship) contracts, and ecotourism could provide a sustained alternate livelihood for many rural landholders, Indigenous and non-Indigenous, effectively helping landholders move to a new livelihood as conservators of biodiversity, natural and cultural heritage.

This signals the need for greater whole-of-government flexibility with rural assistance programs for agricultural properties with high conservation value that cannot return a reasonable profit, and a review to consider if rural assistance should be redirected to incentives for perpetual protected area covenants.

- > **The Australian, state and territory governments should seek opportunities through rural assistance schemes to stimulate uptake of covenants that advance national biodiversity and NRS goals and to finance their effective long-term management, while also addressing any perverse incentives against national conservation goals that may be created through existing rural assistance programmes.**

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Appendix 1: Questionnaire

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Building Nature's Safety Net

Growth of the National Reserve System 2004-2006

A number of the key *Directions* to progress the comprehensive, adequate and representative National Reserve System as adopted by the Natural Resource Ministerial Council (2005) have been chosen by WWF to see if Australia is on target to achieve the agreed targets in a timely manner and to identify what issues should be specifically addressed.

In addition, this questionnaire seeks information on funding trends and your local knowledge to update bioregional priorities for the National Reserve System, including consideration of climate change.

The original *Building Nature's Safety Net* review was aligned to CAPAD 2004 and earlier data on bioregional priorities identified through the National Land and Water Resources Audit in 2002. With CAPAD 2006 about to become available, the opportunity exists to update *Building Nature's Safety Net* and to include additional considerations in terms of progress on key *Directions*.

WWF greatly appreciates your assistance in completing this questionnaire. Please tick the appropriate category for each question, attach such specific information as requested and return to WWF by **31 May 2007**.

Should you have any queries, please contact Paul Sattler on 07 3206 6041 or

0414 641 604 or email paulsattler@bigpond.com

Questionnaire

Progressing comprehensiveness (Direction 1)

The *Directions* Statement states that 80% of extant regional ecosystems are to be represented in each bioregion by 2010-2015. Is this target likely to be met with current policies and funding.

Q 1: *How many bioregions in your jurisdiction are likely to meet the 80% target by 2015 at current growth rates?*

- ALL bioregions 100%
- Most bioregions i.e. >66%
- Some bioregions i.e. 33-66%
- Few bioregions i.e. <33%

It is appreciated that information may not be available to readily calculate the actual percentage comprehensiveness per bioregion and that in some bioregions meeting targets may not be possible.

Progressing adequacy (Direction 2)

This overall target is difficult to quantify, however one component in the *Directions* Statement is definable:

Q 2: *For how many bioregions will measures be in place for protected areas to be managed within a bioregional planning context by 2010? This includes conservation measures on other lands, building connectivity, protecting refugia, etc.*

- ALL bioregions 100%
- Most bioregions i.e. >66%
- Some bioregions i.e. 33-66%
- Few bioregions i.e. <33%

Protecting threatened species and ecosystems (Direction 4)

Q 3: *For how many bioregions will all critically endangered and endangered species and regional ecosystems in each bioregion be included within the NRS by 2010?*

- ALL bioregions 100%
- Most bioregions i.e. >66%
- Some bioregions i.e. 33-66%
- Few bioregions i.e. <33%

Assessing priorities (Directions 8, 9,10)

Q 4: Per Direction 8 is pre-European vegetation mapping coverage at 1:250 000 scale or better completed for the intensive land use zone?

- ALL bioregions 100%
- Most bioregions i.e. >66%
- Some bioregions i.e. 33-66%
- Few bioregions i.e. <33%

Q 5: When will mapping for your whole jurisdiction be completed at this scale or better?

Q 6: Per Direction 8 has the identification and mapping of freshwater systems commenced?

- ALL bioregions 100%
- Most bioregions i.e. >66%
- Some bioregions i.e. 33-66%
- Few bioregions i.e. <33%

Q 7: Per Direction 9 regarding priority IBRA regions to be reviewed for the NRS.

Please review the attached Table 33 from Building Nature's Safety Net and map 10 from the 2002 Audit on bioregional priorities using the same criteria as used for the Audit, viz:

- > the extent of reservation
- > the level of threat that exists
- > the level of bias in terms of representation of ecosystem types.

Also attached for comparison is the CAPAD map of extent of representation in 2004. Examples showing how priorities were previously assessed beyond the consideration of just extent include: BBS which was upgraded to Priority 1 because of the biased representation of some subregions and ecosystems; and, SEQ which was upgraded to Priority 3 because of the significant threats that exist due to demographic change.

It is acknowledged that there are also many subregions and ecosystems within lesser priority bioregions where acquisitions are critically important and it is understood that your jurisdiction is providing this information to the NRS Section of the Department of Environment and Water

Resources. However, to maintain an overview of where much still needs to be done to develop a truly representative protected area system across the continent, it is important that the bioregional picture is available.

Please adjust the priorities in the table of *Bioregional priorities* attached below in accord with the above criteria and where the majority of acquisitions have occurred since June 2001 (this being the date Audit data was collected) or where major threats may have changed.

Q 8: Direction 10 calls for NRS Implementation Plans to be developed for each priority IBRA region by 2006. Have implementation plans been developed for priority IBRA regions?

- ALL priority IBRA regions i.e. 100%
- Most priority IBRA regions i.e. >66%
- Some priority IBRA regions i.e. 33-66%
- Few priority IBRA regions i.e. <33%
- None of priority IBRA regions i.e. 0%

Management of protected areas (Direction 28)

Q 9: per Direction 28 are management plans or statements of management intent in place for all existing NRS reserves or will be within three years for new reserves?

- ALL bioregions 100%
- Most bioregions i.e. >66%
- Some bioregions i.e. 33-66%
- Few bioregions i.e. <33%

Legislative mechanisms (Direction 33)

Q 10: Do relevant laws exist to assist in the protection of values in your jurisdiction on:

- (a) Indigenous Protected Areas Yes No
- (b) Private Protected Areas Yes No

Management effectiveness (Direction 34)

Q 11: per Direction 34 is a reporting system, such as the State of Parks report, which identifies programs to monitor management effectiveness in achieving protected area objectives in place in your jurisdiction?

- Yes No

Funding (Direction 36)

Q 12: *Per Direction 36, what has been the trend in total annual funding allocation in successive budgets for your jurisdiction over the four years from 2003/4 to 2006/7 for:*

(a) acquisition

- Upward
 Static
 Downward

(b) management

- Upward
 Static
 Downward

Q 13: *Please tabulate total amounts expended in each of the four financial years from 2003/4 to 2006/7 for:*

(a) acquisition (not including Commonwealth funding – this will be separately obtained)

(b) management

Year	Total reserve system acquisition spending	Total reserve system management spending
2003/4		
2004/5		
2005/6		
2006/7		

Climate change

Q 14: *What particular bioregions and environments (subregions and/or habitats) within bioregions in your jurisdiction are of particular concern in terms of protecting biodiversity with predicted climate change and could be addressed by further enhancement of the protected area system?*

Please list bioregions and subregions/habitats

Q 15: *Is climate change being factored into reserve selection and management?*

- Yes No

If yes what measures are being taken?

**Bioregional priorities to consolidate Australia's protected area system
(Table 33 from *Building Nature's Safety Net 2006*, after NLWRA 2002).**

Reservation Priority 1 (Highest)	Reservation Priority 2	Reservation Priority 3	Reservation Priority 4	Reservation Priority 5 (Lowest)
Avon Wheatbelt (WA)	Arnhem Coast (NT)	Ben Lomond (Tas)	Arnhem Plateau (NT)	Australian Alps (NSW,Vic,ACT)
Brigalow Belt North (Qld)	Central Arnhem (NT)	Broken Hill Complex (NSW,SA)	Cape York Peninsula (Qld)	Esperance Plains (WA)
Brigalow Belt South (Qld,NSW)	Carnarvon (WA)	Central Mackay Coast (Qld)	Darwin Coastal (NT)	Great Victoria Desert (WA,SA)
Burt Plain (NT)	Channel Country (Qld,SA,NT,NSW)	Coolgardie (WA)	Flinders (Tas,Vic)	NSW North Coast (NSW,Qld)
Central Ranges (WA, NT,SA)	Central Kimberley (WA)	Eyre Yorke Block (SA)	Gibson Desert (WA)	Pine Creek (NT)
Daly Basin (NT)	Cobar Peneplain (NSW)	Gawler (SA)	Geraldton Sandplains (WA)	Sydney Basin (NSW)
Dampierland (WA)	Desert Uplands (Qld)	Gulf Fall and Uplands (NT,Qld)	Hampton (WA,SA)	South East Corner (Vic,NSW)
Darling Riverine Plains (NSW,Qld)	Davenport Murchison Ranges (NT)	Jarraah Forest (WA)	New England Tableland (NSW,Qld)	South Eastern Highlands (NSW,Vic,ACT)
Finke (NT,SA)	Einasleigh Uplands (Qld)	Kanmantoo (SA)	Tasmanian Central Highlands (Tas)	Simpson Strzelecki Dunefields (SA,NT,NSW,Qld)
Gulf Coastal (NT)	Flinders Lofty Block (SA)	King (Tas)	Tasmanian Southern Ranges (Tas)	Warren (WA)
Mitchell Grass Downs (Qld,NT)	Gascoyne (WA)	MacDonnell Ranges (NT)	Tasmanian West (Tas)	
Murchison (WA)	Great Sandy Desert (WA,NT)	Mallee (WA)	Wet Tropics (Qld)	
Nandawar (NSW,Qld)	Gulf Plains (Qld,NT)	Northern Kimberley (WA)		
NSW South Western Slopes (NSW,Vic)	Little Sandy Desert (WA)	Nullarbor (WA,SA)		
Riverina (NSW,Vic, SA)	Murray Darling Depression (Vic,NSW,SA)	Ord Victoria Plain (NT,WA)		
Sturt Plateau (NT)	Mount Isa Inlier (Qld,NT)	South Eastern Queensland (Qld)		
Tasmanian Northern Midlands (Tas)	Mulga Lands (Qld,NSW)	Swan Coastal Plain (WA)		
Victorian Volcanic Plain (Vic, SA)	Naracoorte Coastal Plain (SA,Vic)	Tasmanian Northern Slopes (Tas)		
	Pilbara (WA)	Victoria Bonaparte (NT,WA)		
	South East Coastal Plain (Vic,NSW)	Victorian Midlands (Vic)		
	Stony Plains (SA,NT)	Yalgoo (WA)		
	Tanami (NT,WA)			
	Tiwi Cobourg (NT)			
	Tasmanian South East (Tas)			

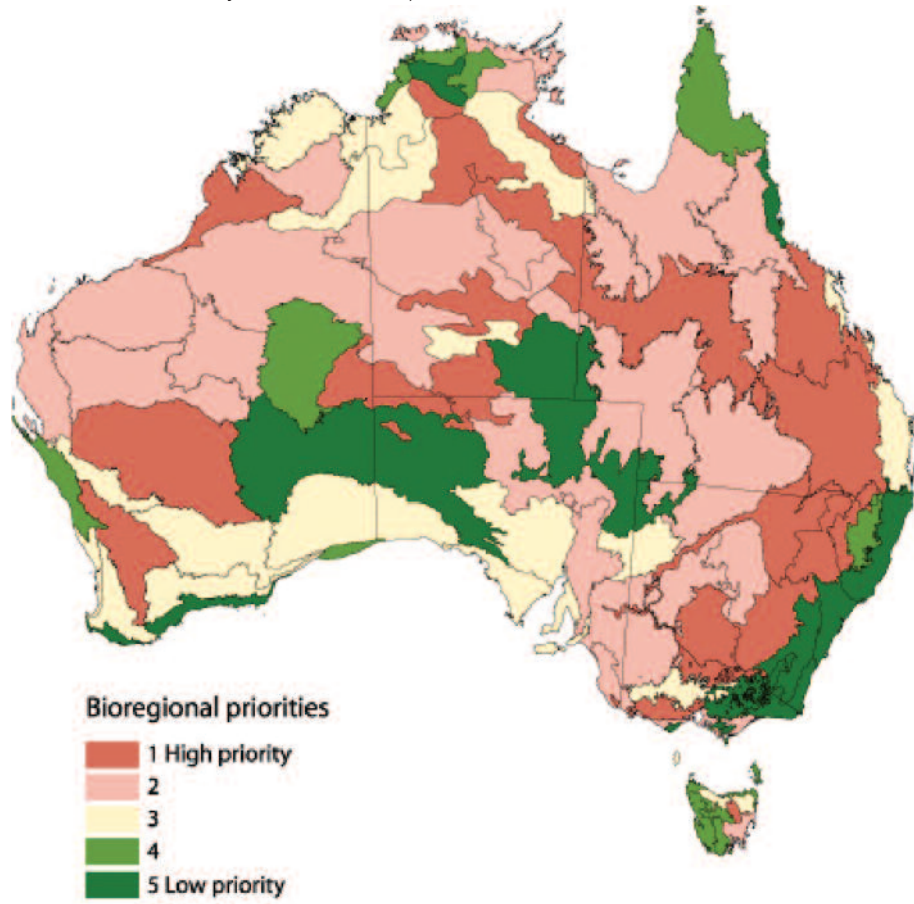
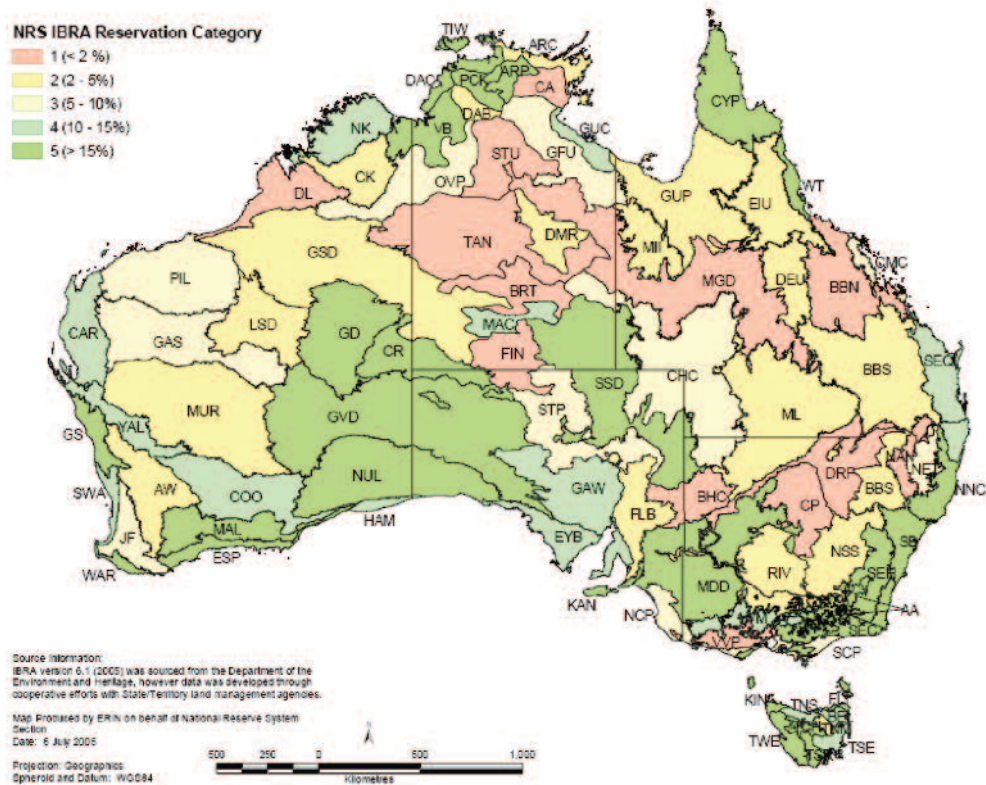


Figure 10 Bioregional priorities for consolidating Australia's protected area system.

(from CAPAD 2004)



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