TERRESTRIAL BIODIVERSITY CONSERVATION AND NATURAL RESOURCE MANAGEMENT

TECHNICAL PAPER 3

APEEL

The Australian Panel of Experts on Environmental Law

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.About APEEL

The Australian Panel of Experts on Environmental Law (APEEL) is comprised of experts with extensive knowledge of, and experience in, environmental law. Its membership includes environmental law practitioners, academics with international standing and a retired judge of the Federal Court. APEEL has developed a blueprint for the next generation of Australian environmental laws with the aim of ensuring a healthy, functioning and resilient environment for generations to come. APEEL's proposals are for environmental laws that are as transparent, efficient, effective and participatory as possible. A series of technical discussion papers focus on the following themes:

1. The foundations of environmental law
2. Environmental governance
3. Terrestrial biodiversity conservation and natural resources management
4. Marine and coastal issues
5. Climate law
6. Energy regulation
7. The private sector, business law and environmental performance
8. Democracy and the environment

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Summary and Recommendations

Executive Summary

The ongoing ecological harm to Australia's land, water and air, and the loss of the species that depend on them, is overwhelming our environmental laws. Australia's large landmass and relatively small population, coupled with historical factors and poor environmental stewardship pose a significant management challenge.

Australia has international obligations to ensure biodiversity protection and the sustainability of land, water and air; and to protect places of cultural and environmental significance. Australia can show greater leadership as a biodiversity rich, wealthy country. Australia invests insufficient resources and energy in protection and restoration, due to factors including a lack of information about the condition of the environment and of long-term strategic natural resource planning. Public resources are inevitably limited and so attention must turn to using private sector resources more effectively to create greater national capacity. Fragmentation of governance institutions, laws and efforts, due to many factors, has added to the difficulties of achieving a sustained and coordinated response.[1] The problems Australia must deal with involve increasingly complex causes that demand a far more comprehensive and coordinated response in the future than has been demonstrated to date.

A multi-pronged approach to biodiversity conservation and natural resource management (NRM) law reform is needed. Real reform will be costly, and some initiatives will encounter opposition, but more effective environmental law is essential to the long-term viability of ecological systems, agricultural production, and community amenity and wellbeing. Meeting the challenges requires the commitment of the Commonwealth and state governments to implement an effective mix of land use and other environmental forms of regulation, economic incentives, and voluntary instruments.

Part 2 of this *Technical Paper* recommends a more strategic approach to the core problems.

Specific recommendations include:

GOVERNANCE FRAGMENTATION

3.1 The Commonwealth should ensure integrated resource governance, by undertaking landscape-scale planning at appropriate bioregional scales and establishing nationally coordinated frameworks for the implementation of bioregional plans. This will require a consistent hierarchy of rules, roles and responsibilities.[2]

THE NATIONAL RESERVE SYSTEM

3.2 The Commonwealth should ensure completion of the National Reserve System (NRS), to provide legal protection for the full range of ecosystems within bioregions and subregions.[3] Related steps are needed to safeguard climate refugia and ensure connectivity across the landscape.

1 In relation to systemic challenges for rural biodiversity protection see Paul Martin and Jacqueline Williams 'Next Generation Rural Natural Resource Governance: a Careful Diagnosis' in V Mauerhofer (ed) *Legal Aspects of Sustainable Development: Horizontal and Sectorial Policy Issues* (Springer Publishers, 2015) 607.

2 Note that Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017) elaborates on the specific means by which the Commonwealth could implement this recommendation.

3 Much of the necessary additions to the NRS will need to be made by the states, however the Commonwealth can play a significant role in securing state action through financial assistance and targeted disincentives (see Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017)).

MONITORING, EVALUATION AND IMPROVEMENT

3.3 The Commonwealth should perform enhanced environmental monitoring, evaluation and reporting tasks. This requires a strategic approach to determining what data is needed for effective decision-making, who should be responsible for providing and collecting it, how frequently it should be collected, how it should be made available and used, and who should pay for this intelligence.[4]

DEVELOPMENT APPROVAL[5]

3.4 A governance system is required at the Commonwealth and state levels which is more adaptive to environmental change. This will require outcome objectives for the state of environmental resources, quantitative and measurable thresholds, and legal tools to implement stronger protections if systems or species are at risk of exceeding these thresholds.[6]

NOTE: A comprehensive approach to landscape-scale planning (Recommendation 3.1) could also help overcome the deficiencies of fragmented project-specific development approval processes that do not address cumulative impacts.

IMPLEMENTATION

3.5 Stronger safeguards are needed to ensure the integrity of implementation of legal and administrative protections for the environment. These should include independent performance review, with clear reporting to the public, incorporated into Commonwealth and state legislation.

OTHER RECOMMENDATIONS

In addition to these legal recommendations, two other issues should be addressed to ensure effective and fair governance: more reliable and adequate funding of sustainability investments and a stronger role for indigenous communities in biodiversity conservation and natural resources management.

3.6 The Commonwealth should work with the states and the private sector to develop an effective fiscal model for natural resource governance. This should ensure that the costs of environmental stewardship can be met over the long term, and are borne equitably across the community.

3.7 The Commonwealth and state governments should make a clear commitment to ensure effective consultation with, and the active participation of, Aboriginal and Torres Strait Islander peoples in environmental protection measures, cultural heritage and natural resource management (NRM). This commitment requires support for robust and culturally appropriate governance for Indigenous Protected Areas (IPAs), co-managed areas and Aboriginal and Torres Strait Islander peoples' land and waters and respect for the principle of free, prior and informed consent in regard to Aboriginal and Torres Strait Islander land and waters.[7]

4 See Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017), for consideration of the functions of a new Commonwealth environmental institution.

5 Note that additional recommendations with respect to reform of the EIA provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (*EPBC Act*) are presented in Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017).

6 The means by which such a governance system could be developed across the Commonwealth and state levels of government is explored in Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017), in particular the idea of requiring state implementation plans (SIPs) to be developed and approved in relation to bioregional plans is advanced as a possible means of securing a consistent and coordinated approach to reform of the governance systems related to biodiversity and natural resources management.

7 APEEL acknowledges that free, prior and informed consent (FPIC) enjoys recognition as a 'soft law' principle in international law. Whilst it has not yet been afforded legally binding status in Australian law, APEEL is aware that it is being applied in practice in a range of contexts. In Australian Panel of Experts in Environmental Law, *Democracy and the Environment* (Technical Paper 8, 2017), the Panel presents a more detailed discussion of FPIC, including its procedural and substantive dimensions, and present some specific recommendations in relation to its future status in Australian law.

HOW TO CONTRIBUTE TO THE APEEL PROJECT

APEEL invites you to provide your responses to the ideas and recommendations presented in this paper. This will assist the development of our final proposals for the next generation of Australian environmental laws.

We look forward to your engagement on specific reform options as the APEEL journey progresses.

Please send your responses to: admin@apeel.org.au or go to www.apeel.org.au where you can do so online.

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1. Introduction

The Australian Panel of Experts on Environmental Law (APEEL) aims to make natural resource laws and institutions more effective, efficient and fair. Environmental governance, of which laws are a key part, is a system to manage land, water, biodiversity and habitat and the interactions between these. Natural resource management (NRM) concerns the conservation and ecologically sustainable use of natural resources (which include biodiversity and ecosystem processes). It involves many activities as well as conservation, including farming, mining, invasive species, water use, soils and salinity and many complex issues. Resource management issues often cross tenures (public, leasehold, private and indigenous) and involve competing interests. Management is required of both existing activities (for example, agricultural activities) and proposed developments (for example, mining).

This *Technical Paper* examines the laws that address these diverse management challenges. It focuses on three terrestrial issues: biodiversity, non-urban water, and invasive species, but these are representative of a much larger set. This selectivity means the paper will inevitably fail to capture all of the concerns involved in other areas such as forestry or mining, or deal with all legal mechanisms, such as environmental impact assessment (EIA). However, these three fields do provide windows into conservation and NRM more broadly, allowing insights relevant to the whole governance system.

This *Technical Paper* is in three parts:

- Part 1 defines key issues
- Part 2 outlines why reform is needed
- Part 3 outlines recommendations and questions for discussion.

2. Key issues

2.1 Status, pressures and outcomes

European settlement occurred only two centuries ago. In many parts of the country, the methods of land use and resource exploitation that accompanied colonisation rapidly replaced indigenous peoples' management that had developed over many thousands of years.[8] The expansion of European settlement has significantly affected Australia's unique biology and ecology and many resulting harms are ongoing.[9] Historically, clearing of land for agriculture had a significant impact on native biodiversity. By 2011, around 53% of Australia's land area had been converted to agriculture.[10] Threats to nature from human action include species and habitat loss; loss of connectivity across the landscape; development in peri-urban and rural areas; and in-fill development in urban areas.

Urbanisation and industrialisation, mining and other human uses have all had significant impacts, including on surface water and groundwater. Freshwater holds over 10% of all life on the planet and is central to terrestrial biodiversity.[11] Water policy reforms have attempted to manage changes to hydrology caused by over-allocation of water.[12] However, projected growth in population and food demands suggests that water needs will increase. Droughts also pose significant risks for Australia, one of the driest continents.[13]

Other impacts include diseases, fungi, parasites, vertebrate animals (including birds), fish (marine and freshwater), insects and weeds (aquatic and land). Australia now hosts more than 400 invasive species.[14] Invasive species constitute 16 of the 21 key threatening processes listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (*EPBC Act*) and the challenge is identified as one of five key priorities in the national biodiversity strategy.[15]

These are just some of the threats considered in the three interwoven areas this paper focuses on (biodiversity, freshwater and invasive species).

Climate change is predicted to exacerbate many biodiversity threats.[16] Ecological responses will be complex and impacts on species will be significant.[17] Vegetation communities will be replaced. Some species will become extinct. Much of this harm is no longer avoidable.[18] Impacts will need to be managed even as human uses of the landscape adjust to climate change, which may lead to more intense land use[19] and demands for new production areas. Proposals for greater exploitation of Northern Australia point to development pressures in areas that have previously not been intensively exploited.

8 See *Mabo v Queensland [No 2]* (1992) 175 CLR 1 [37].
9 State of the Environment 2011 Committee, *Australia State of the Environment 2011 – Independent report to the Australian Government Minister for Sustainability, Environment, Water, Population and Communities* (2011) 568.
10 Australian Bureau of Statistics, *Agricultural Commodities Australia 2010-11* (30 May 2013) <http://www.abs.gov.au/ausstats/abs@.nsf/Products/7121.0~2010-11~Main+Features~Land+Use?OpenDocument>.
11 United Nations Water, *Water and Biodiversity* (2013) <http://www.unwater.org/downloads/water_and_biodiversity.pdf>.
12 National Water Commission, *The National Water Initiative – securing Australia's water future: 2011 assessment* (2011).
13 Will Steffen, 'Thirsty Country: Climate change and drought in Australia' (Report, Climate Council of Australia Ltd, 2015) <http://www.climatecouncil.org.au/uploads/37d4a0d2a372656332d75d0163d9e8b8.pdf>; Wentworth Group of Concerned Scientists, 'Blueprint for a Healthy Environment and a Productive Economy' (Statement, Wentworth Group of Concerned Scientists, 2014) <http://wentworthgroup.org/wp-content/uploads/2014/11/Blueprint-for-a-Healthy-Environment-and-a-Productive-Economy-November-2014.pdf>.
14 Invasive Species Specialist Group, *Global Invasive Species Database* <http://www.issg.org/database/welcome/>.
15 Natural Resources Management Ministerial Council, *Australia's Biodiversity Conservation Strategy 2010-2030* (2010).
16 For an illustration of systemic effects of climate on invasive species see: Pippa Michael et al, 'Climate Change Impacts on Agricultural Weeds in Western Australia' (Report No.11/059, Australian Government Rural Industries Research and Development Corporation, October 2011); Rural Industries Research and Development Corporation, 'National Weeds Research: A summary of research outcomes from the National Weeds and Productivity Research Program 2011-2012' (Report, Australian Government, Rural Industries Research and Development Corporation, October 2012); Michael Dunlop et al, 'The implications of climate change for biodiversity conservation and the National Reserve System: Final Synthesis' (Report, Department of Sustainability, Environment, Water, Population and Communities, and the Department of Climate Change, September 2012) 31-32 <https://publications.csiro.au/rpr/download?pid=csiro:EP105380&dsid=DS4>.
17 Michael Dunlop et al, 'Climate-ready conservation objectives: A scoping study' (Final Report, National Climate Change Adaptation Research Facility, 2013) 12.
18 Ibid; Will Steffen et al, 'Australia's biodiversity and climate change: A strategic assessment of the vulnerability of Australia's biodiversity to climate change - summary for policy makers 2009' (Commonwealth of Australia, 2009) 13.
19 Dunlop et al, above n 16, 6, 57.

2.2 The need for biodiversity stewardship and resource management

Biodiversity is a fundamental natural resource. In practice, this resource is taken for granted. The general community does not pay for most natural environmental services from which it benefits, nor generally are those who put these services at risk made to pay for the harm caused.[20] Plants produce the oxygen that we breathe and can prevent salts from rising to the surface, protecting the soil needed to grow crops. Vegetation traps and breaks down pollutants, purifying water, and it slows run-off, mitigating floods. Wetlands act as spawning and nursery grounds for fish. The myriad of other environmental services from which people benefit (but fail to value sufficiently), include pollination of crops, pest control by native predators and recreational opportunities. Many of these natural sources of value to human beings are being depleted or put at risk, highlighting the need for far more effective stewardship of the natural environment.

Invasive species illustrate the need for more effective stewardship. The Australian Bureau of Statistics reports the costs of weeds to agriculture as exceeding $3.4 billion annually.[21] Rabbits harm pastures, and have a harmful impact on 156 threatened species; wild dogs and foxes prey upon livestock, and also impact 76 threatened species; and feral pigs not only cause losses of sugar cane and grain, they also destroy up to 70% of sea turtle nests in north Queensland.[22] The Australian 2011 *State of the Environment Report* (at pages 641 and 237) indicates that the impact of invasive species on biodiversity is 'high' to 'very high' and conditions are deteriorating, and the impact on inland waters is 'high' and conditions are deteriorating. Systemic harms are less obvious, such as hotter fires in northern Australia from the burning of Gamba grass, potentially causing fundamental changes to tropical ecosystems. A recent study considering only six potential invasive plants and animals suggests that biosecurity is worth an average of $12,000 p.a. to $17,500 p.a. for each broad-acre farm.[23]

Ensuring sustainable high quality water supplies is central to the environment and the economy. Freshwater holds around 10% of all life on the planet, with Australian rivers, wetlands and groundwater systems providing habitat for flora, fauna and their linked catchments and climate.[24] While rivers and aquifers have different local ecologies, their health depends on their capacity to support key environmental functions (for example, temperature regulation, nutrient cycling and salt balance), as well as communities and populations of native species.[25] However, many inland water environments are in a degraded condition, particularly in southern Australia and the Murray Darling Basin.[26] There are numerous, often historic, causes of this degradation, including droughts, resource development and over-allocation, as well as pollution and habitat destruction.[27] While there have been major recent governance reforms for water and environmental flows, alterations to the natural flow regimes of rivers, streams and their flood plains and wetlands[28] have all changed ecological processes over the last 200 years. Ecosystem functions have been significantly affected, with significant declines in many native species populations.[29]

In economic terms, industry used approximately 16,772 gigalitres (GL) of water in 2013/14, with an Industry Gross Value Added per GL of water consumed of $88 million. In total, agriculture uses the largest volume of water (62% of Australia's total water consumption), with a gross value of irrigated agricultural production of $14.6 billion in

20 Department of the Environment and Heritage (Cth) 'Making economic valuation work for biodiversity conservation' (2005); K Whiteoak and J Binney, 'Literature Review of the Economic Value of Ecosystem Services that Wetlands Provide' (Final Report, Marsden Jacob Associated, 2012).
21 Australian Bureau of Statistics, *1301.0 - Year Book Australia Land and Biodiversity* (2012) <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1301.0~2012~Main%20Features~Land%20and%20biodiversity~278>.
22 Cost details provided in P Martin et al, 'Effective citizen action on invasive species: The institutional challenge' (Final Discussion Paper, Invasive Animals Cooperative Research Centre, 3 May 2016) <http://www.pestsmart.org.au/wp-content/uploads/2016/05/DiscussionPaper_InstitutionalChallenge.pdf>.
23 A Hafi et al, 'The value of Australia's biosecurity system at the farm gate: an analysis of avoided trade and on-farm impacts' (Australian Bureau of Agricultural and Resource Economics and Sciences, 2015).
24 State of the Environment 2011 Committee, above n 9, 201; Walter Reid et al, *Millennium Ecosystem Assessment* (Island Press, 2005).
25 State of the Environment 2011 Committee, above n 9, 201.
26 Commonwealth Scientific and Industrial Research Organisation, 'Assessment of the ecological and economic benefits of environmental water in the Murray-Darling Basin' (Final report to the Murray-Darling Basin Authority from the CSIRO Multiple Benefits of the Basin Plan Project, March 2012) <https://www.acfonline.org.au/sites/default/files/resources/MDBA-Assessment_Ecological_Economic_Benefits.pdf>.
27 Ibid; State of the Environment 2011 Committee, above n 9, 201.
28 Office of Heritage and Environment, *List of Key Threatening Processes* (30 June 2016) <http://www.environment.nsw.gov.au/threatenedspecies/KeyThreateningProcessesByDoctype.htm>; see also Whiteoak and Binney, above n 20.
29 State of the Environment 2011 Committee, above n 9, 201.

2013-14.[30] Water has value for many other purposes, including water supply, sewerage and drainage services, industry, household uses, mining and manufacturing. Alteration to the natural flow regimes of rivers and streams and their flood plains and wetlands has been identified as a key threatening process under NSW legislation.[31] With increased demands and climate change, the pressures on this resource will become more intense.

Existing environmental governance is straining under many pressures, and will need to become far more effective to cope in the future. Discussion of many other aspects of biodiversity and landscapes, or urban, coastal, ocean or other issues would show a similar pattern: environmental laws, and other environmental governance arrangements, which have struggled to deal with past challenges will need to become far more effective and efficient to deal with the issues that will soon be encountered.

2.3 Overview of institutional arrangements

Rules governing human use of the natural environment – land, water, air, minerals, species, and forests - have often failed to protect nature. Many early laws encouraged exploitation with little consideration of sustainability. Over the last 30 years, new laws have been made, aiming to preserve the environment, and encourage ecologically sustainable development (ESD). They promote ecologically sustainable practices on land controlled by the state, such as national parks, state forests and water catchments; and on private freehold or leasehold land. Aboriginal and Torres Strait Islander peoples have a connection to, and obligations of duty and respect for, traditional 'country'.[32] 'Co-management' arrangements for Aboriginal and Torres Strait Islander land typically promote sustainable practices alongside cultural heritage and indigenous communities' relationships to land and waters.[33]

Increasingly diverse land uses, interests and developments have led to NRM arrangements ranging from prescriptive regulation through to voluntary codes and standards. Formal arrangements include EIA, reserve systems, bioregional planning, species listing, pollution control, prohibitions on activities that may damage nature, and licences to use nature. Market instruments include tradeable rights in water, carbon and biodiversity. Voluntary approaches include Landcare and other 'care' activities, conservation agreements between landholders and government, industry and non-government standards and codes, environmental branding and consumer standards, and private philanthropy to fund conservation measures. Some of these arrangements are addressed by Commonwealth law (particularly the *EPBC Act*), while many fall under state law (for example, native vegetation laws). Some are addressed under both Commonwealth and state law (for example, threatened species). Even apparently voluntary arrangements such as environmental branding and standards depend upon the law, such as contract, property, or consumer protection laws, to protect interests or maintain the integrity of brands and standards.

Environmental governance is administered by many government and non-government bodies, often with roles that overlap and are poorly coordinated. This creates governance 'silos' which are ill-equipped to effectively manage the complex interactions between water, land, biodiversity and the many human activities such as land development, mining and irrigation. Adding to the complexity, natural and social systems constantly change. Climate change combined with other social, economic or demographic drivers will create new dynamics. The operation of different laws and instruments, administered by many government and non-government bodies at local, state and national levels of government, when coupled with the increasing diversity of land use and land tenures, and changing environmental and social conditions, will create many complications that will challenge environmental law.

30 This is a little over 2% of Australia's Gross Domestic Product. Of the $39 billion, $11.5 billion comes from irrigated agriculture. Australian Bureau of Statistics, *Water Account Australia 2012-13* (25 November 2015) < http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4610.02012-13?OpenDocument> (Noting that this represented a 36% increase from 2011-12); Australian Government, *Our North, Our Future: White Paper on Developing Northern Australia* (2015) 12; P Martin et al, 'Improving Invasive Animal Institutions: A citizen-focused approach. A citizen-focused review of institutional arrangements for Invasive Animal management' (Program 4 scoping document (unpublished) Invasive Animals CRC, 2014).

31 Office of Heritage and Environment, above n 28; see also Whiteoak and Binney, above n 20.

32 See for example, Rod Kennett et al, *Implementing native title: Indigenous leadership in land and water livelihoods* (Australian Institute of Aboriginal and Torres Strait Islander Studies, 2015).

33 Rosemary Hill et al, 'Workshop on Indigenous Co-management and Biodiversity Protection: Towards a framework for evaluation in Australia's wet tropics Report to the National Environmental Research Program. Reef and Rainforest Research Centre Limited' (The Reef and Rainforest Research Centre on behalf of the Australian Government's National Environmental Research Program Tropical Ecosystems Hub Cairns, 2012) 20.

2.3.1 Constitutional arrangements

Historically, the states had responsibility for land and NRM issues (with local government having varied roles in each state). However, the intersection of Australian Government responsibilities under international conventions, such as the United Nations *Convention on Biological Diversity*;[34] the fiscal power of the Commonwealth; and negotiated arrangements that have emerged over many years have resulted in an increasingly complex hybrid of government roles, and increasing Commonwealth involvement.[35]

Under the *Australian Constitution*, states have powers to make laws in respect of NRM or environmental issues provided they are not inconsistent with Commonwealth legislation made under its constitutional powers. For example, the external affairs power allows the Commonwealth to implement international conventions such as the United Nations *Convention on Biological Diversity*. Attempts by the Commonwealth to use constitutional powers to expand its involvement in NRM issues such as World Heritage management have led to conflicts with state governments. In recent years, the states and Commonwealth have tried to avoid these conflicts using cooperative approaches, with the constitutional arrangements for the Murray Darling Basin exemplifying these approaches.[36]

The *Intergovernmental Agreement on the Environment 1992* (*IGAE*) recognised that the Commonwealth's role is focused on national environmental issues, including international obligations, environmental effects that span state boundaries, and the marine environment.[37] This approach emphasises consultation with the states.[38]Working cooperatively, the Commonwealth and states have developed policies and strategies to coordinate action across the jurisdictions and the three levels of government. These include:

- *National Strategy on Ecologically Sustainable Development*;
- *National Water Initiative*;
- *Australia's Oceans Policy*;
- *National Forests Policy*;
- *Australian Weeds Strategy*;
- *National Cooperative Approach to Integrated Coastal Zone Management*; and
- *Biodiversity Conservation Strategy*.

Even with coordinating arrangements like Ministerial Councils, conflict between overlapping state and federal legislation arises. To manage this overlap, the *IGAE* established a structure for the Commonwealth to accredit some state processes, resulting in collaborative implementation.[39] The environmental assessment process under the Commonwealth's *EPBC Act* uses this approach. The *EPBC Act* requires Commonwealth approval for activities that are likely to significantly affect 'matters of national environmental significance' (MNES) using a process of referral and assessment.[40] These include: national heritage places; RAMSAR wetlands of international importance; nationally listed threatened species and ecological communities; nationally listed migratory species; nuclear actions; the Commonwealth marine environment; the Great Barrier Reef Marine Park; and water resources in relation to coal seam gas (CSG) and substantial coal mines. A number of these MNES reflect legal responsibilities the Commonwealth has under international law.[41] The *EPBC Act* assessment process operates concurrently with state and territory EIA

34 It is the Australian Commonwealth government as the 'nation state' that enters into international treaties and conventions.
35 See for example, *Intergovernmental Agreement on Biosecurity* (January 2012).
36 In effect, there was a negotiated referral of state powers to the Commonwealth Government.
37 *Intergovernmental Agreement on the Environment* 1992, art 2.2.1. However, as noted above, the Commonwealth has undertaken consultation with the states before committing to any international agreements; Gerry Bates, *Environmental Law in Australia* (LexisNexis Butterworths, 2013) 141-142.
38 *Intergovernmental Agreement on the Environment*, above n 37. For further information, see Rosemary Lyster et al, *Environmental & Planning Law in New South Wales* (The Federation Press, 2012).
39 *Intergovernmental Agreement on the Environment*, above n 37, art 2.5, schedule 2; Lee Godden and Jacqueline Peel, *Environmental Law Scientific, Policy and Regulatory Dimensions* (Oxford University Press, 2009) 74-75.
40 See for example, J Johnson, 'Commonwealth Environmental Assessment and Approval' in D Farrier and P Stein (eds), *The Environmental Law Handbook* (Thomson Reuters, 5th ed, 2011) 274-303.
41 See for example, Bates, above n 37, 143; *EPBC Act* ss 15B, 16, 18, 20, 21, 23, 24B, 24D.

legislation.[42] Where a project requires federal assessment it may be assessed under accredited state or territory legislation on a one-off basis or though bilateral agreements.[43] The final decision on whether to give approval for actions under the Act currently still lies with the Commonwealth, as 'approval' powers have not been delegated to state and territory governments.[44] A different approach has been used to coordinate water management, discussed below.

2.4 Current arrangements for biodiversity conservation and NRM

The paper will now consider the laws which address the management challenges outlined above. It will focus on the following areas: biodiversity, non-urban water, and invasive species. As discussed in Part 2 below, the Panel has confined its discussion here to these three key areas to provide windows into conservation and NRM more generally.

2.4.1 Conserving Biodiversity

Conservation laws in Australia link environmental protection and land use in two main ways: a system of protected areas managed for conservation; and mechanisms relating to the use and development of private land, including restrictions to protect listed species and remnant vegetation, and voluntary management agreements.

The national reserve system (NRS) incorporates nature conservation areas protected under Commonwealth, state and territory legislation, including private land under perpetual covenant and Indigenous Protected Areas (IPAs). The traditional approach in Australia (under which protected areas were principally publicly owned) is changing. Over 5% of the NRS is made up of private land, managed under agreement between government (Commonwealth, state or territory) and the landholder.[45] Forty three per cent of the NRS (over 7% of Australia) comprises IPAs. IPAs become part of the NRS when indigenous peoples consent to manage 'country', in accordance with their law, custom and culture, and consistently with national and international conservation guidelines.[46] Some public funding for these areas has been provided under the National Landcare Programme. Well-established programmes such as 'Healthy Country Planning' for IPAs build on earlier 'co-management' and 'partnerships' approaches to biodiversity conservation, but institute a stronger model of governance by indigenous communities.[47] These programmes intend not only to conserve biodiversity, but also to provide employment and training opportunities for indigenous people in remote areas.[48] For indigenous communities in remote regions, participation in biodiversity conservation can promote a hybrid economy where cultural responsibilities for land and water management can coincide with economic opportunities to sustain communities in the longer term. Increasingly, Aboriginal and Torres Strait Islander peoples and their activities in caring for country are central to a range of conservation and environmental protection measures.[49]

The aim of the NRS is to protect a Comprehensive, Adequate and Representative selection of regional ecosystems representing Australia's bioregions and subregions, using the CAR principles.[50] Comprehensiveness requires inclusion of the full range of regional ecosystems at an appropriate scale within and across each IBRA region (Interim Biogeographic Regionalisation for Australia). 'Representativeness' is 'Comprehensiveness' at a finer scale: to protect sites that reflect the intrinsic variability of ecosystems.

42 *EPBC Act* s 10.

43 This process establishes requirements to be met by state and territory processes, but does not necessarily guarantee 'best practice' will be met. Godden and Peel, above n 39, 75-76. See *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth) sch 1; *EPBC Act* ss 48, 50.

44 Currently there are no state or territory bilateral agreements under the *EPBC Act* in place for approval of controlled actions, although in most instances draft agreements are being negotiated. By contrast, bilateral assessment agreements are in place for all states and territories.

45 Department of the Environment (Cth), *Ownership of protected areas* (12 February 2016) http://www.environment.gov.au/land/nrs/about-nrs/ownership (*Ownership of protected areas*). Agreements must last for at least 99 years, and ideally in perpetuity. While they can be terminated, both parties must first agree: *Standards for inclusion in the National Reserve System* in Department of the Environment (Cth), *Private landholders* (12 February 2016) <http://www.environment.gov.au/land/nrs/getting-involved/private-landholders>.

46 Lee Godden and Stuart Cowell, 'Conservation planning and Indigenous governance in Australia's Indigenous Protected Areas' (2016) 24(5) *Restoration Ecology: The Journal of the Society for Ecological Restoration* 692.

47 See for example, Lauren Butterly, 'Changing Tack: Akiba and the Way Forward for Indigenous Governance of Sea Country' (2013) 17 *Australian Indigenous Law Review* 2.

48 Department of the Environment (Cth), above n 45; Department of the Prime Minister and Cabinet, *IPAs – Indigenous Protected Areas* <https://www.dpmc.gov.au/indigenous-affairs/environment/indigenous-protected-areas-ipas>.

49 Jon Altman and Seán Kerins (eds), *People on country: vital landscapes indigenous futures* (Federation Press, 2012).

50 Department of the Environment, *Australian Bioregions (IBRA)* (12 February 2016) <http://www.environment.gov.au/land/nrs/science/ibra>; Comprehensiveness, Adequacy and Representativeness (CAR) principles: Task Force on Marine Protected Areas, *Understanding and applying the principles of comprehensiveness, adequacy and representativeness for the NRSMPA, Version 3.1* (Report prepared by the Action Team for the ANZECC Task Force on Marine Protected Areas. Marine Group, Environment Australia, Canberra, 1999) <https://www.environment.gov.au/system/files/resources/ef577ee6-e36e-4435-adf9-cbb5600728a3/files/nrsmpa-principles.pdf>.

There is general agreement that the NRS can remain vital to protecting nature, notwithstanding changes in species composition and habitats resulting from climate change,[51] because it reflects the geographic diversity of the landscape that generates ecosystem diversity (including soils, geology, topography, micro-climate).[52] However there are significant gaps in coverage.[53] Given the importance of the NRS to conservation, it is essential to address its shortcomings.

Even if the NRS were complete, there would be a need for further conservation across the landscape, including on private land, to provide connectivity between areas, to ensure adequate protection of species that are not located within the NRS, and as an important part of Australia's international carbon emission control programme. Both state and Commonwealth laws regulate land clearing and harm to threatened species. For example, the listing of a species as threatened under the *EPBC Act* triggers recovery planning, approval requirements and assessment of activities likely to have a significant impact on the species.

Among these controls are requirements for approval of land clearing for mining, tourism, agricultural expansion and residential development. Existing activities, such as established agriculture are generally exempted. Regulation is procedural: provided government approval is obtained, an activity can proceed even if it is likely to have a significant impact on a threatened species. This might occur if, for example, socio-economic considerations were considered to be more important than protection of the species. In these situations, those carrying out the activities may be required to provide conservation offsets (see below).

The approach varies between state and territory jurisdictions. For example, in Victoria activities on private land affecting a listed species are only restricted on a temporary basis; long-term protection requires agreement with the landholder. In NSW, on the other hand, listing results in a wide-ranging prohibition of damaging activities, unless approval is first obtained. Where a proposed activity is likely to have a significant impact, this must be considered in deciding whether approval should be given.

As a general rule, obligations to invest time or funds to conserve or restore nature are not imposed by law. Under state and territory legislation a landholder's duty of care might extend, for example, to eradicating declared invasive species and agricultural weeds, but not to active management to protect and recover threatened species. Regulation can help to control undesirable behavior, but is not good at forcing ongoing desirable action.

Instead, government agencies, local councils and private conservation groups rely on agreements with landholders to modify existing damaging activities or to carry out conservation activities. Contrasted with the requirement for long-term commitment for land to become part of the NRS, conservation or stewardship agreements can be far more flexible. For example, perpetual protective covenants, entered into with government agencies, bind future purchasers of the land as well as the existing landholder. However, there are also agreements that are largely symbolic, lasting for a small or indefinite period, aiming for an initial commitment that might be strengthened at a later date. In situations where management interventions are modest (for example, grazing management) agreements might only last for 5 years. A commitment by landholders of 15 years or more may be required where costly restoration is involved.[54] Agreements imposing positive stewardship obligations can involve payment for the environmental management services provided by the landowner. Typically, more substantial incentives are required to persuade landholders to forego production and enter into long-term conservation agreements compared with those not using their land for business purposes.[55] Those who enter into long-term conservation agreements may also be eligible for tax deductions,[56] rate relief and land tax concessions.

51 Steffen et al, above n 18, 13; Dunlop et al, above n 16, 57.

52 Michael Dunlop and Peter Brown, 'Implications of climate change for Australia's National Reserve System: A preliminary assessment' (Department of Climate Change, February 2008) 116.

53 See part 2.4.

54 David Farrier et al, 'The Legal Aspects of Connectivity Conservation - Case Studies' (IUCN, 2013) 11-12; David Farrier, 'Legal instruments: Great Eastern Ranges initiative' in Graham Worboys et al (eds), *Protected Area Governance and Management* (ANU Press, 2015) 880-881.

55 Katie Moon and Chris Cocklin, 'A Landholder-Based Approach to the Design of Private-Land Conservation Programs' (2011) 25(3) *Conservation Biology* 493-503; Vanessa Adams, Robert Pressey and Natalie Stoeckl, 'Estimating Landholders' Probability of Participating in a Stewardship Program, and the Implications for Spatial Conservation Priorities' (2014) *PLoS ONE* 8. See also Vanessa Adams, Robert Pressey and Natalie Stoeckl, 'Estimating land and conservation management costs: The first step in designing a stewardship program for the Northern Territory' (2012) 148(1) *Biological Conservation* 44-53; Katie Moon and Chris Cocklin 'Participation in biodiversity conservation: Motivations and barriers of Australian landholders' (2011) 27(3) *Journal of Rural Studies* 331-342.

56 See Australian Taxation Office, 'Claiming Conservation Covenant Concessions' (14 October 2015) <http://www.ato.gov.au/Non-profit/Gifts-and-fundraising/How-supporters-claim-tax-deductions/Claiming-conservation-covenant-concessions/>. See also Australian Panel of Experts on Environmental Law, *The Private Sector, Business Law and Environmental Performance* (Technical Paper 7, 2017) for detailed discussion on the potential of the taxation system to provide incentives for improved environmental outcomes, especially with regards to land management and conservation.

2.4.2 Managing rivers and aquifers

Early water law relied on the common law. However, from the late 1800s, state governments progressively displaced common law rights with a legislative system of water licensing.[57] Problems emerged, largely because of state governments handing out more rights to water than was sustainable.[58]

In response, Australia implemented national water reforms.[59] The defining features are consumption-based pricing; the separation of water rights from land title; the tradability of water rights; environmental water allocations and entitlements; and cooperative arrangements between the Commonwealth, states and territories through the Council of Australian Governments (COAG).[60] The 2004 intergovernmental *National Water Initiative* (*NWI*) aimed for a nationally compatible water market, a cooperative planning process for surface and groundwater resources and a compliance and enforcement system.[61] The 2004 *NWI* was the first major Australian natural resource policy to recognise indigenous interests in water. Since that time, the federal and state jurisdictions have been grappling with how to appropriately reflect the values and interests of indigenous people in water allocation.[62]

The *NWI* agreement set broad, nationally agreed goals (for example, return of all currently over-allocated or overused systems to environmentally-sustainable levels of extraction). However, it left state and territory governments with significant discretion to implement these goals within their respective jurisdictions. The *NWI* agreement accordingly created an independent National Water Commission (NWC) charged with information provision and monitoring of national and state performance.

The *Water Act 2007* (Cth), the *2008 Intergovernmental Agreement on Murray–Darling Basin Reform* and the *2013 Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin* established water allocation arrangements for the Murray Darling Basin. The Commonwealth, through the independent Murray Darling Basin Authority, became responsible for Basin-wide planning and management. Basin states remained responsible for water resources within their jurisdictions, but agreed to align their management with the *Basin Plan 2012* (Cth) (*Basin Plan*) and its cap by 1 July 2019.[63] Despite many challenges, a *Basin Plan* was agreed in 2012 setting extraction caps to recover 2,750 GL of water, using infrastructure improvement and water buybacks by the Commonwealth Environmental Water Holder.[64]

After the *Basin Plan*, increased mineral and gas extraction led to growing social concern. The *NWI* was slow to integrate water extraction for mining into the water management framework.[65] Conflicts over CSG led to the 'water trigger' amendment to the *EPBC Act*. This amendment requires an environmental approval to be obtained from the federal Environment Minister where a project is likely to have a significant impact on a water resource.[66] An Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining was established to help assess developments. States attempted to integrate CSG and coal mining into the *NWI* framework.[67] Cooperative reforms were adopted to improve assessment and scientific knowledge about the impact of mining and unconventional gas on water.[68]

57 Alex Gardner, Richard Bartlett and Janice Gray, *Water Resources Law* (Lexis Nexis, 2009)
58 National Water Commission, 'Sustainable Levels of Extraction: National Water Commission Position' (Commonwealth of Australia, National Water Commission, 2010).
59 Lee Godden and Anita Foerster, 'Introduction: institutional transitions and water law governance' (2011) 22(2-3) *The Journal of Water Law* 53.
60 Commonwealth of Australia, 'Report of the Independent Review of the Water Act 2007' (Independent Review, 2014); Council of Australian Governments, 'The Council of Australian Governments' Water Reform Framework' (Environment Australia, Marine and Water Division, 25 February 1994) Attachment A Water Resource Policy, 3.
61 *Intergovernmental Agreement on a National Water Initiative between the Commonwealth of Australia and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory* (National Water Initiative, 2004) 3 [23] (*Intergovernmental Agreement on a National Water Initiative*).
62 Sue Jackson and Marcus Barber, 'Recognition of indigenous water values in Australia's Northern Territory: current progress and ongoing challenges for social justice in water planning' (2013) 14(4) *Planning Theory & Practice* 435.
63 *Water Act 2007* (Cth) pt 9.
64 Murray-Darling Basin Authority, *Sustainable Diversion Limits* (2015) <http://www.mdba.gov.au/what-we-do/water-planning/sdl>; Kathleen Bowmer, 'Water Resources in Australia: Deliberation on Options for Protection and Management' (2014) 21(3) *Australasian Journal of Environmental Management* 228.
65 Isabelle Whitehead, 'Better protection or pure politics? Evaluating the 'water trigger' amendment to the EPBC Act' (2014) 1 *Australian Environmental Law Digest* 23; *Intergovernmental Agreement on a National Water Initiative*, above, n 61, 6; National Water Commission, 'Water for Mining and Unconventional Gas under the National Water Initiative' (Commonwealth of Australia, National Water Commission, 2014).
66 *EPBC Act* s 24E.
67 See for example, *NSW Aquifer Interference Policy 2012* (NSW).
68 These include Australian Government initiatives such as the *National Harmonised Regulatory Framework for Natural Gas from Coal Seam 2013* (Cth) and the Department of the Environment's 'Bioregional Assessment program' (2016) for an understanding of the impacts of large coal mines and CSG operations.

In 2015, the NWC was abolished and its statutory functions were transferred to other Commonwealth agencies. **The states and territories continue to implement the** *NWI*, *Basin Plan 2012* **and related reforms, using their different** legislative frameworks**, statutory and non-statutory planning instruments and institutions, such as the Commonwealth Environmental Water Holder.**[69] **Balancing** water allocation between consumptive and environmental uses has been plagued by conflicts and reform fatigue exists**.**[70]

2.4.3 Controlling invasive species

There are four main activities in invasive species governance. These are (1) biosecurity to prevent new invasions; (2) responses to invasive species before they become naturalised; (3) control of established invasive species, to minimise their harm; and (4) coordination, to optimise effectiveness and investment. Each activity involves specialised institutions and laws.[71] Effective efforts rely upon science, education and extension, financial support, public works, voluntary action, and peer group pressure and support, as well as the law. Invasive species laws have traditionally focused upon controlling specific harmful species and the behaviour of the individual land steward, rather than managing systems.

Biosecurity Australia is responsible for pre-border entry approvals, and border inspection is the responsibility of the Australian Quarantine and Inspection Service. The Office of the Chief Plant Protection Officer and Office of the Chief Veterinary Officer, working with states and territories, respond to new invasions. Emergency responses can involve many organisations depending on the nature and location of the outbreak. States have their own quarantine arrangements. The National Biosecurity Committee coordinates implementation of a national agreement on biosecurity. The Invasive Plants and Animals Committee reports to that body. There are different arrangements for dealing with marine pests and with diseases. For more on marine biosecurity, see Australian Panel of Experts on Environmental Law, *Marine and Coastal Issues* (Technical Paper 4, 2017).

Controlling established invasive plants and animals is largely a landholder and state or local government responsibility. Many invasive species spread naturally across boundaries. They can contaminate places even if people have been diligent in control, so long as there is a 'seed' population. Where there is an economic reason for landholders to control a species then management is more likely than when the harms are purely environmental. Regardless of private incentives, invasive species problems can be beyond the capacity of a landholder to control because of cost. Invasive animals pose particular challenges because many move easily and can adapt, and control typically involves lethal methods that give rise to animal welfare and political issues.

State legislation has traditionally created offences of harbouring or failing to control particularly harmful species, such as 'noxious' plants or animals, with different approaches and listings between states. The states have also taken different approaches to enforcement. Queensland, for example, places primary responsibility on local government, whereas NSW and Victoria focus prosecutorial responsibility on state agencies. Whilst prosecution is rare, warnings of potential prosecution have been widely used to encourage control of agriculturally harmful species. Variations between state approaches seem largely to reflect historical, political or cultural preferences, and generally there is far more attention paid to invasive species that affect human health or agricultural production than those that impact the environment. Because control of established species often requires action by landholders on private land and because of pressure on government budgets, the Commonwealth and many states are moving towards a general obligation on landholders to manage established pests under a general stewardship obligation, focusing government resources

69 See for example, Poh-Ling Tan, Kathleen Bowmer and John Mackenzie, 'Deliberative tools for meeting the challenges of water planning in Australia' (2012) 474 *Journal of Hydrology* 2.

70 Ibid; Cameron Holley and Darren Sinclair, 'Rethinking Australian water governance: successes, challenges and future directions' (2016) 33(4) *Environmental and Planning Law Journal* 275; G Syme and B Nancarrow, 'The social and cultural aspects of sustainable water use' in Lin Crase (ed), *Water Policy in Australia* (Resources for the Future, 2008).

71 See 'A Comparative Assessment of Existing Policies on Invasive Species in the EU Member States: Country Assessment, Australia' in Bio Intelligence Service for the European Commission, *A Comparative Assessment of Existing Policies on Invasive Species in EU Member States and in Selected OECD Countries* (16 September 2011). <http://ec.europa.eu/environment/nature/invasivealien/docs/IAS_policies_country assessments2011.pdf>. (Note, this summary does not address disease and matters like legal controls on hunting, and the registration of poisons).

on prevention and early response.[72] There are concerns about this approach to the management of established pests, unless investments and institutional reforms are implemented to strengthen landholder motivation and capacity.[73]

Other apparently unrelated laws affect invasive species management. These include:

- animal welfare rules, which limit what control methods can be used.[74] Political action over animal welfare can limit invasive animal control, particularly affecting government agencies. One example is political opposition to the culling of feral horses.
- human health and safety laws affect invasive species management, through operator and poisons licensing and protocols, and restricting control methods in particular situations (for example, close to residences).[75]
- the rules governing NRM programs (such as funding body requirements) affect invasive species management, which is often conducted as part of broader projects.
- rules that control hunting, on both private and public land.

The many criticisms of the legal and administrative regime for both new and established invasive species include concerns about an insufficiently precautionary approach to biosecurity, weak efforts to control harm to biodiversity where there is no harm to agriculture, the inability to ensure sufficient 'whole of landscape' control for problems that span land tenures, and legal and institutional failings. A consistent concern is that resources to respond to the increasing problems are chronically inadequate.[76]

72 National Biosecurity Committee, 'Modernising Australia's approach to managing established pests and diseases of national significance: Discussion paper' (Department of Agriculture Forestry and Fisheries (Cth), July 2015); NSW Government, 'Proposed Framework for a NSW Biosecurity Act' (Department of Primary Industries (NSW), 2014) 46.

73 See Martin et al , above n 22.

74 For a listing of relevant laws see RSPCA, *What is the Australian Legislation Governing Animal Welfare?* (12 February 2016) <http://kb.rspca.org.au/What-is-the-Australian-legislation-governing-animal-welfare_264.html>; Trudy Sharp and Glen Saunders, 'A Model for Assessing the Relative Humaneness of Pest Animal Control Methods' (Department of Agriculture, Fisheries and Forestry (Cth), June 2011).

75 See for example, Australian Pesticides and Veterinary Medicines Authority, *Registration and use controls on chemicals* (Australian Government, 12 February 2016) <http://apvma.gov.au>.

76 See for example, Andrew Cox, 'Submission: Stopping New Invasive Species: Melbourne Australia' (Invasive Species Council, 10 September 2014); Martin et al, above n 22.

3. Critique of current arrangements

This part highlights four major concerns in the implementation of laws and programs: governance fragmentation; problems with development approval processes; gaps in management and evaluation information; and failures of implementation. These issues affect biodiversity protection generally and many can be extrapolated to environmental law as a whole. This paper uses examples from the key areas of biodiversity conservation, water governance and the management of invasive species as illustrations of the broader challenges.

3.1 Fragmentation of governance

A major problem is fragmented natural resource governance institutions. Even though the environmental effects of particular activities are cumulative and inter-related, sustainability is pursued through many agencies with distinct roles, strategies and governance arrangements. Having a federal government, six state legislatures, ten territories, and over 500 local government bodies, all pursuing different aspects of environmental management, has led to poorly coordinated rules, weak implementation and a lack of transparency about performance. There are many opportunities for confusion, problems in implementing technical rules, difficulties in communication, inflexibility and the risk that important issues may 'fall between the cracks'.

Biodiversity conservation and the management of invasive species often require coordinated action across large areas, spanning public and private property tenures. Water governance must respond to diverse environmental, agricultural, mining and urban situations. Overlapping urban and industrial land uses, increasingly diverse farming, mining and gas extraction, 'lifestyle' activities, indigenous people's land stewardship and public and private conservation together make it very difficult to achieve coordinated environmental management.

Land use planning is carried out by the states and territories, with local councils playing a major role. A specific approval is required for particular development proposals (see 2.2 below), but plans can also prohibit development and activities in particular areas (for example, where nature conservation is the priority). However, land use plans do little to manage existing activities (for example, industrial or agricultural activities); their focus is on regulating *development*.

Regulation of development through land use plans is framed by landholder expectations of a freedom to exploit their land as they see fit, constrained only when there is a specific public interest or competing private interest that must be accommodated. A common environmental criticism is that when nature conservation conflicts with development, particularly in urbanising areas, the latter take precedence in decisions on project approval.[77]

The plans developed by natural resource management bodies such as the regional catchment management organisations in various states generally set priorities and develop strategies for persuading landholders to modify land uses that are harming biodiversity or other environmental values. These are not regulatory plans. They use persuasion and incentives to pursue their goals. These types of instrument are not integrated with regulatory land use plans.

The Commonwealth has powers to develop bioregional plans, but in practice this has been limited to marine planning.[78] Under the Commonwealth *EPBC Act,* bioregional plans are not restricted to dealing with environmental conservation, but can also address 'important economic and social values'. A bioregional plan is not a regulatory instrument, but must be taken into account by the federal minister. The minister can also exempt actions/development from the need to obtain specific approval, if they are carried out in accordance with a bioregional plan.[79]

Bioregional planning may be a way to reduce fragmented management, by creating a framework (or, if necessary, legal requirements) within which environmental, land use, social and other plans can be brought together into a

77 David Farrier, 'Biodiversity offsets and native vegetation clearance in New South Wales: The rural/urban divide in the pursuit of ecologically sustainable development' (2007) 24(6) *Environmental and Planning Law Journal* 427.

78 See Department of Environment (Cth), *Marine bioregional plans* (12 February 2016) <http://www.environment.gov.au/marine/marine-bioregional-plans>; for more on marine planning, see Australian Panel of Experts on Environmental Law, *Marine and Coastal Issues* (Technical Paper 4, 2017).

79 *EPBC Act* ss 37, 37A.

unified system. Without trivialising the challenges of doing so, the use of bioregional planning, if well implemented, could provide more systemic protection of biodiversity and other values, provide greater clarity for land users and developers, and reduce the transaction costs of fragmentation. This idea is developed further in the next section of this paper, where specific reforms are proposed.

BOX 1: FRAGMENTATION AND WATER GOVERNANCE

The next few decades may see a 60% increase in Australia's population, coal and gas developments, doubling of Australia's food production (dependent on energy and water), and water scarcity due to droughts and climate change.[80] **The** *NWI* **sought '**Integrated Management of Water for Environmental and Other Public Benefit Outcomes', but **water law and policy still struggle to address systemic connections such as between** water and energy/mining developments; water quantity and water quality; natural resource management; and land use planning.

Recent attempts to integrate mining, unconventional gas and other extractive industries through state and national reforms (for example, the 'water trigger') have been only partially successful.[81] Remaining challenges include: developing a coordinated approach involving industry and multiple government agencies; water planning linked to gas project approval; accurate accounting of water takes; and implementing adaptive management as conditions of approvals.[82]

Water quality has only been encompassed in minor ways by water law and policy reform. The *NWI* does not specify quality as a fundamental characteristic of water in planning or water rights arrangements.[83] In the Murray Darling Basin, quality issues are to be incorporated in water resource plans (by 2019) and a water quality and salinity management plan (WQSMP). There is increasing awareness of environmental flow impacts on ecosystem health and water quality,[84] but significant gaps remain in understanding the water quality needs of environmental assets. Where plans do include water quality objectives, limited attention has been given to issues other than salinity or diffuse nitrate pollutants.[85]

Coordination between the *NWI* and other natural resource management is also insufficient. Partly funded under the National Action Plan for Salinity and Water Quality, the Natural Heritage Trust, Caring for our Country and now the National Landcare Programme, regional natural resource management bodies have an important role in managing landscape impacts on water quality. The *NWI* recognised their important complementary role in sustainable management of water, but this has not been translated into action.[86]

Despite aspirations for integrated water and regional natural resource management plans nationally,[87] or at the state level (for example, reviews by the Natural Resources Commission in NSW), success has been limited.[88] Environmental objectives could be achieved more efficiently by coordinating water with other aspects of natural resource management. For example, protecting low flows to preserve

80 Wentworth Group of Concerned Scientists, above n 13.
81 National Water Commission, 'Water for Mining and Unconventional Gas', above n 65; National Water Commission, *Australia's Water Blueprint: National Reform Assessment* (Australian Government, 2014) 10.
82 National Water Commission, 'Water for Mining and Unconventional Gas', above n 65.
83 National Water Commission, *Australia's Water Blueprint*, above n 81, 132.
84 See also Standing Council on Environment and Water, 'Next Steps in National Water Reform: Preparation for the Future' (Council of Australian Governments, 2013).
85 National Water Commission, *Australia's Water Blueprint*, above n 81, 132.
86 *Intergovernmental Agreement on a National Water Initiative* above n 61.
87 National Water Commission, *Australia's Water Blueprint*, above n 81, 19.
88 See for example, Natural Resource Commission, *2015 Water Sharing Plan Reviews* (2015) <http://www.nrc.nsw.gov.au/2015-wsp-reviews>.

in-stream habitat could fail if the impacts of cattle or sheep are not well-managed. Cost-effective options for achieving the environmental objectives of water allocation plans may be missed if on-ground natural resource management and water regimes are not integrated.[89]

There is a lack of integration between water and land use planning. Integrated catchment management goals have been deferred under the pressure to deal with over-allocation and volumetric sustainability.[90] However, changing land uses (for example, hobby farms and the increasing number of dams) have the potential to affect water quality and volumes.[91] Decisions on water availability have significant consequences for communities that rely on irrigation, and will shape future land use and have urban planning considerations.[92] Ensuring effective and efficient management of land use and water systems requires that they be managed as closely coupled systems.[93]

3.2 The limitations of EIA and development approval processes

The principal legal instrument for controlling development is the requirement for developers to obtain prior approval and to comply with approval conditions. Underpinning this traditional regulatory approach is a historical centerpiece of state and federal environmental laws - EIA and decision-making guided by statutory criteria.[94] Under the *EPBC Act*, Commonwealth approval is only required where a proposed development is likely to have a significant impact on MNES.[95] The principles of ESD, including the precautionary principle must be considered when making decisions.[96]

The project-by-project approach to protecting listed species or safeguarding environmental quality has deficiencies. It does not deal with the cumulative effects of activities and does not deal adequately with uncertainty about populations, impacts, and future stressors. Other problems with front-end EIA processes include claims of pro-development bias and failures to monitor and enforce compliance with approval conditions intended to control social or environmental harm.

3.2.1 Cumulative impacts

There is no legal mechanism ensuring that the cumulative impacts of separate development approvals are taken into account. This has been a major issue in expanding CSG development, but this is only the latest illustration of the ongoing problem. Despite increased strategic planning at state levels and scope under the *EPBC Act's* 'water trigger', federal assessment of projects does not account for cumulative impacts of CSG development on groundwater

89 National Water Commission, above n 12, 4.
90 Tan, Bowmer and Mackenzie, above n 69, 2 and 8.
91 National Water Commission, *Australia's Water Blueprint*, above n 81.
92 Tan, Bowmer and Mackenzie, above n 69, 8; see also Anthony Keim, 'Drought and Water Policy in Australia: Challenges for the future illustrated by the issues associated with water trading and climate change adaptation in the Murray–Darling Basin' (2013) 23(6) *Global Environmental Change*, 1615.
93 Keim, above n 92; Wentworth Group of Concerned Scientists, above n 13.
94 See for example, *EPBC Act* s 66.
95 Ibid ss 82, 527E.
96 Ibid ss 130, 133, 136-140A, 391. Note that there are some exceptions to actions that require approval. For example, if the action is undertaken in accordance with the *Great Barrier Reef Marine Park Act 1975* (Cth): *EPBC Act* s 43. For further exceptions see *EPBC Act* ss 29-32, 32, 38-42, 159-164; Johnson, above n 40; Bates above n 37, 146-147.

resources and groundwater dependent communities.[97] The Australian Government is undertaking strategic assessments under Part 10 of the *EPBC Act* to better understand the potential impacts of CSG and large coal mining developments. While this is a step in the right direction, it is in its initial phases, and does not reflect the need for a change in the law and practice of EIA to account for cumulative impacts.[98] Bioregional planning has the potential to fill this significant gap, forming the basis of comprehensive plans which integrate ecological, economic and social criteria for land development and land use adaptation.

3.2.2 Accommodating uncertainty and change

Natural systems constantly change. This dynamism will increase with climate change. Traditional legal approaches focus on protection and restoration of existing systems and assume that ecosystems are stable and should be managed for their current values. The focus of nature conservation policy and law is thus 'preservationism',[99] aiming to maintain species in their present locations and ecosystems with their present composition, or in some cases returning conditions to historical baselines.

Climate change is likely to exacerbate stressors such as resource extraction or exploitation, land clearing, pollution and invasive species. Changes in rainfall patterns will mean greater scarcity in some places, and more variability. If biodiversity and other natural values are to be protected it is essential that laws facilitate adjustment to address changing circumstances. The objectives of the *EPBC Act* do not specify the need to respond to the impact of climate change on biodiversity, although this should be implicit in a commitment to protect species and ecosystems.[100]

3.2.3 Market instruments including biodiversity offsets

Market instruments and 'market-like' mechanisms are increasingly important in environmental management, as is illustrated with water rights. Whilst these are important innovations for which there is a great deal of enthusiasm in some quarters, the risks and problems are not well understood and managed. Some of the issues are demonstrated by the discussion of water management. Other challenges are illustrated by the growing use of biodiversity offsets and new legal interests in land, which have the potential to complicate property transactions and land management.

Biodiversity offsets are intended to compensate for the remaining impacts of an approved project after measures to avoid or mitigate impacts have been exhausted. They may be required as a condition of approval under the *EPBC Act* and project development or planning legislation in most states. Offsets are not specifically addressed in the *EPBC Act*. Relevant provisions are found in the *EPBC Act Offsets Policy* which requires that offsets 'directly contribute to the ongoing viability of the protected matter impacted by the proposed action, and deliver an overall conservation outcome that *improves or maintains* the viability of the protected matter as compared to what is likely to have occurred under the status quo, that is if neither the action nor the offset had taken place'.[101] Offsets are designed, over the long term, to ensure that there is no net loss as management actions on the offset site replace biodiversity values lost on the development site. The intention is that the status quo is maintained, although under the Commonwealth policy up to 10% of an offset can be indirect (for example, funding research on the natural values damaged by the development).

97 Emma Carmody and Kirsty Ruddock, 'Coal seam gas and water resources: a case for Commonwealth oversight?' (2013) 28(3) *Australian Environment Review* 501; Poh-Ling Tan, David George and Marla Comino, 'Cumulative risk management, coal seam gas, sustainable water, and agriculture in Australia' (2015) 31(4) *International Journal of Water Resources Development* 2.

98 Further, projects with existing approvals are to be undertaken in accordance with the conditions attached to that approval only, and any subsequent Part 10 strategic assessment under the *EPBC Act* will not apply even if the action is yet to commence; Damian Barrett et al, 'Methodology for bioregional assessments of the impacts of coal seam gas and coal mining development on water resources' (Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development through the Department of the Environment, 2013); see generally Department of the Environment, above n 68.

99 Benjamin Ruhl, 'Climate Change Adaptation and the Structural Transformation of Environmental Law' (2010) 40 *Environmental Law* 363, 392-397.

100 *EPBC Act* s 3(2)(e).

101 Department of Sustainability, Environment, Water, Population and Communities (Cth), '*Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy' (October 2012) 8.

One justification for offsets is that they create a price for habitat loss, which should promote protection.[102] The risks include: (1) the impossibility of achieving 'like for like' offsetting; (2) offsets entrenching rather than reversing downward trajectories; and (3) the focus on economic efficiency while discounting social considerations, including fairness.[103] Practical problems include: using offsets without first seeking to avoid or minimise loss to the maximum possible extent; failure to establish 'red flag' or 'no go' areas where offsets cannot be used; approving projects or allowing an activity to commence before offsets have been secured; poor success rates of restoration activities; failure to monitor offset implementation and effectiveness; and lack of long-term security afforded to offset sites.[104]

Seeking 'like-for-like' replacement of natural values (ecological equivalence) is often seen as an essential part of offsetting.[105] However, *status quo* replacement for damaged habitats is questionable, because many existing associations of plant species will not be sustainable under a changed climate. Some offset schemes have considered the need for flexibility to ensure sustainability, abandoning attempts at 'like-for-like' replacement of natural values in some circumstances. Under South Australian legislation,[106] for example, offsets must provide an overall 'significant environmental benefit', such as by establishing or managing vegetation or fencing off land. Where this is not possible, then a payment can be made to the Native Vegetation Fund. The only requirement is that these funds are spent on conserving vegetation 'within the same region'. Even this requirement can be bypassed, for example, where a greater environmental benefit is expected by investing in threatened species or communities in another region.[107]

The next section of this *Technical Paper* does not make specific recommendations on the subject of market mechanisms generally or the specific tool of biodiversity offsets. However, the discussion in the present section emphasises the need for greater caution in their use given the risks and concerns that have been discussed.

3.3 Inadequacies in monitoring, evaluation and reporting

Monitoring provides essential information to regulators, legislators, industry, and the public about the condition of ecosystems, species abundance and location, and the volume and quality of water.[108] This helps legislators to hold regulators accountable; regulators to improve regulatory programs and markets; industry to manage their obligations; and the public to make decisions about environmental risks and about the effectiveness of governance.[109] Good monitoring is essential to ensure that resource, environmental and water laws and policies adapt.[110] However Australia's environmental data infrastructures are under-developed, which severely constrains the ability of Australian governments to develop and enact evidence-based environmental policy.[111]

Reliable monitoring will be increasingly important as climate change impacts on the environment, exacerbates drought[112] and produces more variability.[113] As part of Australia's *Biodiversity Conservation Strategy* 2010-2050, the Australian Natural Resource Management Ministerial Council committed to a national long-term biodiversity monitoring and reporting system by 2015.[114] A review by Humane Society International in March 2015[115] found that good progress had been made in achieving this target, with government funding for the Terrestrial Ecosystem Research Network (TERN), a collaboration of universities and state/territory and Commonwealth agencies. A recent TERN newsletter reflected optimism about long-term support following a National Science and Innovation Agenda.[116]

102 Sarah Bekessey et al, 'Policy Perspective: The Biodiversity Bank Cannot be a Lending Bank' (2010) 3 *Conservation Letters* 151, 152.
103 Ibid.
104 Martin Fallding 'Biodiversity offsets: Practice and promise' (2014) 31 *Environmental and Planning Law Journal* 11, 19-20.
105 Rachel Walmsley et al 'Fundamental Principles for Best Practice Biodiversity Offsets' (2014) *Impact* 96; Senate Environment and Communications References Committee (Cth), 'Environmental offsets' (Commonwealth of Australia, 2014), ch 3.
106 *Native Vegetation Act 1991* (SA) ss 28, 29(11)(d), 21(6), (6a).
107 See also NSW Office of Environment and Heritage, *NSW Biodiversity Offsets Policy for Major Projects* (2014) <http://www.environment.nsw.gov.au/biodivoffsets/bioffsetspol.htm>.
108 Eric Biber, 'The problem of environmental monitoring' (2011) 83(1) *University of Colorado Law Review* 5.
109 Ibid.
110 Ibid.
111 State of the Environment 2011 Committee, above n 9, 2.
112 Steffen, above n 13.
113 Ian Neave et al, 'Managing water in the Murray-Darling Basin under a variable and changing climate' (2015) 42(2) *Water Journal* 102, 106.
114 State of the Environment 2011 Committee, above n 9, 581.
115 Humane Society International 'Australia's Biodiversity Conservation Strategy 2010-2030: An Independent Review of Progress' (April 2015) 45-47.
116 Terrestrial Ecosystem Research network, *Director's update* (December 2015) <http://www.tern.org.au/Newsletter-2015-Dec-Directors-Update-pg31218.html>.

Monitoring and evaluation for water management has often proven inadequate to determine sustainable water allocations and the achievement of environmental objectives.[117] Despite significant investment, deficiencies in information infrastructure adversely affect decision-making, especially about environmental watering.[118] The Improving Water Information Program and the Bureau of Meteorology have made substantial progress in water information (for example, water storage information, water accounts, stream flow forecasts, market information and water resource assessments). [119] However, adequate coverage and completeness is still not assured.[120]

Deterioration in the monitoring network and uncertainty over funding beyond 2016 raise serious concerns.[121] The accuracy of meters measuring water extraction is unreliable because of the age of the infrastructure, inadequate maintenance or poor installation.[122] Even given efforts to improve this, the use of telemetry (sending of metered data wirelessly to a database that can be accessed remotely) is limited. Without telemetered data, market information and transparency will be less than optimal, and self-monitoring of compliance may be discouraged.[123]

Monitoring and intelligence deficiencies exist for most aspects of environmental governance. As was highlighted in the Australian 2011 *State of the Environment Report*,[124] without sound management data it is not possible to manage many environmental issues reliably, and it is not possible to ensure transparent evaluation of the performance of the environmental governance laws and other arrangements.

3.4 mplementation deficits

Laws and other governance arrangements are only as good as their implementation. There are many deficiencies in the implementation of conservation and NRM law, resulting in the failure to achieve ecological and social outcomes.[125] Implementation requires many actions by many people and organisations, and it will not happen without sufficient resources. Some examples serve to illustrate the larger problem.

Implementing the *Basin Plan* and its Water Resource Plans involves many changes to integrate connectivity between groundwater and surface water and to re-engage with communities who feel marginalised by the reforms, plus it requires substantial investment by both citizens and governments.[126] Over-allocation persists in many catchments. The achievement of indigenous peoples' objectives for water rights and effective participation in water management is a further illustration of implementation failure.[127] As of 2014, there had been no substantial increase in water allocations for indigenous purposes - social, economic or cultural since 2010.[128]

A further implementation concern is the abolition of the NWC. The NWC played a key role in the accountability of governments and government-owned enterprises, and provided a strong impetus for implementation and innovation. Commissioners provided a skills-based national perspective that was not likely to be obscured by immediate interests.[129] With its loss, governments are left to self-assess and self-report. This reduces transparency and compromises the comparison of performance between states. This lack of an independent body to drive innovation and accountability is a significant concern not only in relation to water. It is a further illustration of a lack of Australian

117 National Water Commission, *Australia's Water Blueprint*, above n 81, 82.
118 Ibid 116.
119 *Water Act 2007* (Cth) pt 7; Australian National Audit Office, 'Administration of the Improving Water Information Program' (Audit Report No.18, *Administration of the Improving Water Information Program*, 2013-14); *Australia's Water Blueprint*, above n 81.
120 Australian National Audit Office, above n 119; National Water Commission, *Australia's Water Blueprint*, above n 81.
121 National Water Commission, *Australia's Water Blueprint*, above n 81.
122 Department of the Environment, Water Heritage and the Arts (Cth), 'National Framework for Non-urban Water Metering Regulatory Impact Statement' (2009); Ann Hamblin, 'Policy Directions for Agricultural Land Use in Australia and other Post-industrial Economies' (2009) 26(4) *Land Use Policy*, 1195, 1198.
123 Cameron Holley and Darren Sinclair, 'Governing water markets – achievements, limitations and the need for regulatory reform' (2016) 33(4) *Environmental and Planning Law Journal* 301; Clare McKay and Alex Gardner, 'Water accounting information and confidentiality in Australia' (2013) 41(1) *Federal Law Review* 127; Department of Environment (Cth), 'National Framework on Non-Urban Water Metering: Policy Paper' (7 December 2009).
124 State of the Environment 2011 Committee, above n 9, 2, 343, 649, 656.
125 See IUCN, *Law for sustainability* (12 February 2016) <http://www.lawforsustainability.org>, with Australian case studies of the implementation of the precautionary principle in relation to the white shark, and participatory requirements in relation to market-protected areas.
126 **S**ee for example, Poh-Ling Tan et al, 'Water planning in the Condamine Alluvium, Queensland: Sharing information and eliciting views in a context of overallocation' (2012) 474 *Journal of Hydrology,* 38.
127 National Water Commission, *Australia's Water Blueprint*, above n 81, 4.
128 National Water Commission, *A review of Indigenous involvement in water planning, 2013* (2014) 5.
129 National Water Commission, *Australia's Water Blueprint*, above n 81, 108.

mechanisms to ensure implementation of environmental governance arrangements, and to ensure that there is transparent evaluation of the effectiveness of legal and market instruments and public policies.

Problems implementing national biodiversity policy are illustrated by the gaps in the NRS. The NRS covers 17% of Australia's land, up from 9.5% in 2002, with highly protected areas, such as national parks, covering over 8.5%. The increase is largely attributable to the growth in IPAs,[130] but there is a need to ensure sufficient resources and capacity for indigenous communities who are expected to be the stewards of this vital part of the reserve system.[131] Despite the increased coverage, the NRS is far from complete with under-representation of bioregions in the central and parts of western NSW, and significant gaps at the sub-bioregional level across the country.[132] The World Wide Fund for Nature (WWF) has calculated that 1,655 of 5,815 terrestrial ecosystems have no representation in the NRS. Over 2000 are less than halfway towards meeting WWF's target of 15% of pre-clearing extent. As of 2012, reservation of an additional 57 million hectares was needed if all ecosystems were to satisfy the 15% target. In some cases, filling the gaps would require protection of all the remaining uncleared areas, regeneration of other areas, and possibly replanting.[133]

The NRS does not adequately protect Commonwealth listed species. In 2010, over 12% of threatened species were not found in the NRS, including 21% of critically endangered species. Target levels of geographic range protection (1000 sq kms or 100% of the range of the species, whichever was smaller, or 10% of the range where it exceeded 10,000kms) were met for less than 20% of species, meaning that over 80% were not adequately protected. Even where a species is found in a protected area, it may lack effective protection. Over 48% per cent of the NRS consists of IUCN categories V and VI, which may allow grazing and mining to threaten many species.[134]

The NRS can be criticised for not adequately providing for climate change refugia or conservation connectivity across the landscape. Refugia are areas that species can retreat to, persist in and potentially expand from under changing climate conditions. Recent assessments suggest that only 14% of identified climate refugia fall within the existing NRS.[135]

In relation to invasive species management, there are concerns that preventative biosecurity is insufficiently precautionary, insufficiently coordinated and under-resourced.[136] The control of established species is plagued by institutional problems, including the inability to effectively require and resource legally required controls of declared agricultural pests, failures to achieve comprehensive and coordinated control at a sufficient landscape-scale to be effective, legal and institutional impediments to frontline action, and chronic under-resourcing of all aspects of management.[137]

130 MFJ Taylor, J Fitzsimons and P Sattler, *Building Nature's Safety Net 2014: A decade of protected area achievements in Australia* (WWF-Australia, 2014) 56.
131 H. Moorcroft et al, 'Conservation planning in a cross-cultural context: the Wunambal Gaambera Healthy Country Project in the Kimberley, Western Australia' (2012) 13(1) *Ecological Management & Restoration* 16.
132 Office of the Environment and Heritage, 'Biodiversity Legislation Review OEH Paper 3: Conservation Action' (2014) 20.
133 Taylor, Fitzsimons and Sattler, above n 130; see the pie chart on the extent of achievement of the 15% target in relation to all ecosystems at page 63. The maps at page 64 show that on the east coast the standard is reached across many ecosystems, but not inland.
134 Department of Environment (Cth), *Protected area locations* (12 February 2016) <http://www.environment.gov.au/land/nrs/science/protected-area-locations - cat>; J E M Watson et al, 'The Capacity of Australia's Protected-Area System to Represent Threatened Species' (2010) 25(2) *Conservation Biology* 324; Vanessa Adams and Katie Moon, 'Security and equity of conservation covenants: Contradictions of private protected area policies in Australia' (2013) 30 *Land Use and Policy* 114.
135 April Reside et al, '*Climate change refugia for terrestrial biodiversity: Defining areas that promote species persistence and ecosystem resilience in the face of global climate change*' (National Climate Change Adaptation Research Facility, 2012) 216 [3.4.8].
136 Roger Beale et al, 'One Biosecurity: The Independent Review of Australia's Quarantine and Biosecurity Arrangements' (Report to the Australian Government; 2008); A Cox, Submission No 74 to Senate Standing Committee on Environment and Communications, *Inquiry into Environmental Biosecurity,* 10 September 2014.
137 Martin and Williams, above n 1; Martin et al, above n 22.

4. Reform

Stemming Australia's rate of environmental harm requires strong mechanisms to ensure individual and corporate accountability and motivation. It also requires investment to ensure good stewardship. While more coherent national environmental laws are needed to better manage biodiversity, water, and invasive species, legal instruments alone cannot overcome the insufficiency of resources, limits to government power, and community norms that limit the effectiveness of legal arrangements.

4.1 Challenges

Significant barriers to more effective environmental governance must be overcome to achieve enduring improvement. Some of these pervade all of Australia's attempts to create a more effective, efficient and fair national system of environmental stewardship on behalf of future generations. There are two fundamental challenges: managing the tension between private rights to exploit nature and the public interest in the sustainable use of nature, and the fundamental problem of finding sufficient resources for effective stewardship.

4.1.1 Public interests and private property

The tension between private freedom to exploit property and the public interest in limiting this freedom to satisfy broader social interests has deep historical roots. The boundaries between private and public rights are constantly evolving, as social conditions change and, in particular, as the inter-dependency of interests in society become greater with population growth and demands on nature. These boundaries will continue to change. Changing circumstances lead to different pressures, and thus to changes in the legal treatment of private property.[138]

The common law does not give private landholders absolute rights over their land. The common law of nuisance has long recognised the need for restrictions on land use to protect private landholders from each other. The early common law riparian doctrine managed landholder impacts on other riparian users by imposing requirements of reasonableness when using water. It has always been possible for governments to adjust rights to use privately owned land to ensure responsible use and to protect the public interest, though regulation can cause political disputes. Legislation has imposed land use controls and made some actions on privately owned land illegal (for example, growing illegal crops and clearing native vegetation). In practice, however, the Australian tradition is to protect some private rights. In particular, legislation that restricts development, including land use planning and biodiversity legislation, usually exempts existing uses of land on the basis of fairness.[139]

The Australian government has powers to regulate the use of land and water; for example through legislation such as the *EPBC Act*, notwithstanding private ownership.[140] The *Australian Constitution* requires that the Commonwealth pay compensation on just terms only when acquiring property.[141] The circumstances under which this applies are very limited, because good governance often requires that private property be used in a way that is consistent with the public interest.[142] Simply regulating the use of land - without acquiring any interest in the property - does not require compensation, even when the restrictions are significant.[143]

Most land use planning and water regulation occurs at the state and territory level, where there is no constitutional requirement for compensation. Consistent with common law traditions, state governments do not have an obligation to provide compensation where land use regulation affects private land use.[144] In practice, state governments generally

138 Australian Law Reform Commission, *Traditional Rights and Freedoms—Encroachments by Commonwealth Laws*, Interim Report No 127 (2015) ch 8.
139 For example, *EPBC Act* s 43B.
140 Sangeetha Pillai and George Williams, 'Commonwealth Power and environmental management: Constitutional questions revisited' (2015) 32 *Environment Planning and Law Journal* 405.
141 *Australian Constitution* s 51(xxxi); these obligations are reiterated in many federal statutes.
142 *Newcrest Mining (WA) Ltd v Commonwealth* (1997) 147 ALR 42.
143 *Spencer v Commonwealth of Australia* [2015] FCA 754.
144 Sangeetha Pillai and George Williams, above n 140, 405.

provide compensation for land acquisition (typically there will be a statutory duty to do so), and occasionally for land use restrictions where the specific legislation prescribes such payments.

This paper does not propose specific recommendations concerning this matter, as the treatment of this balance will continue to evolve under the supervision of the courts, to meet changing circumstances. Section 51(xxxi) of the *Australian Constitution* is discussed in the Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017).

4.1.2 Funding sustainability

Australian policy makers often prefer to use incentives rather than regulation, but their ability to use payments is limited by what funds are available. In particular, where it is necessary for landholders to carry out active management to ensure sustainability, the preference is to encourage this as good citizenship, supported by limited financial support or by the use of private markets.

The benefits of good environmental governance are immense, but the expenditure needed to achieve this is substantial. Reliable data on what amounts are actually spent by the public or the private sector in this area are not available. Estimates of what investment is needed to ensure sustainable resource use depends on contestable assumptions about the desirable state of the environment and how this might be achieved.[145] It has been estimated (subject to many assumptions) that an amount roughly equivalent to the national expenditure on defence is required for landscape protection and restoration. Only a fraction of what is required is being invested.[146] An international study found that Australia was substantially underfunding biodiversity conservation.[147] Average annual spending in Australia was estimated to be $US526.113 million, ranking Australia among the 40 most underfunded countries. The model indicated that Australia's investment is falling short by approximately $US275.36 million per annum. This is probably a conservative estimate of the funding gap.

Funds are essential to motivate and enable environmental stewardship; pay for technical support and training; fund labour and materials; and support research and measurement. 'Science-informed' environmental regulation also implies investment in obtaining the necessary data. Insufficient investment in the required science affects, for example, implementation of the protection of endangered species under the *EPBC Act*, including attempts to use scientifically rigorous methods to manage land-clearing. Another illustration is the cost of the science needed to properly manage aquifers or the Murray-Darling river system.

Regulation can also impose costs on people who lack the capacity to pay; market instruments can increase the costs for struggling enterprises; and even voluntary work imposes costs on those who volunteer that are not shared by the general public. Resourcing difficulties limit the effectiveness of environmental laws, and can generate perceptions of unfairness, contributing to resistance to environmental protection.

The Commonwealth Government's current budget on NRM is estimated to be $2 billion over four years, split between the National Landcare Programme No 2, the Green Army, Working on Country, the Land Sector Package, the *Reef 2050 Plan*, the Great Barrier Reef Foundation, and the *Whale and Dolphin Protection Plan*. Non-grant government costs include indirect expenditures such as research and development, planning, administration, political negotiation, regulatory or market-trade infrastructures, participating in markets and measuring, monitoring and evaluation. Unaccounted expenses include coordination between government agencies that have overlapping roles and between government and citizens.

Much of the federal front-line investment is delivered via collaborative projects with co-funding from the states and territories, from industry and from landholders and citizen groups. The federal government also makes specific

145 For a detailed analysis see Kip Werren, Utilising Taxation Incentives to Promote Private Sector Funded Conservation, (PhD Thesis, University of Western Sydney, 2015). See also Australian Panel of Experts on Environmental Law, *The Private Sector, Business Law and Environmental Performance* (Technical Paper 7, 2017) for more information on the role of the private sector.

146 Paul Martin and Kip Werren, 'Discussion paper: An industry plan for the Victorian environment?' (Department of Sustainability and Environment (Vic) 2009).

147 Anthony Waldron et al, 'Targeting Global Conservation Funding to Limit Immediate Biodiversity Declines' (2013) 110 *Proceedings of the National Academy of Sciences of the United States of America* 12144.

purpose payments to support state and territory environmental investments (much of it for infrastructure such as water and sewerage systems), but reporting complexities make it impossible to determine how much funding arrives 'at the front line' of sustainability investment.

State, territory, and local governments contribute substantially to the management of public lands, bushfire mitigation, waste management, water management, environmental research and development, biodiversity programs, and environmental policies.

Governments are increasingly reluctant to commit to conservation funding, in part because of fiscal difficulties.[148] As government budgets shrink, public agencies reduce their investment in administration and enforcement, and industry is always pressing to reduce legal complexity.

Government is however, only a small part of the investment story. Private landholders, businesses, communities, indigenous Australians, and non-government organisations significantly invest in NRM, with much of this investment being unaccounted for. This includes expenditures for compliance with regulation; private restraint (for example, 'green consumerism' and voluntary conservation areas); philanthropy and other volunteer activity; private stewardship; industry initiatives such as 'chain of responsibility' management or voluntary environmental reporting; environmental codes and standards; and citizen activism for the environment.[149] It is often suggested that a greater use of market instruments could narrow the funding gap for strategies to achieve national sustainability objectives, but if it is assumed that government will be the buyer of services, the constraints on public investment make such proposals questionable. Far more private funds, probably from diverse sources, will be needed.

4.2 Reform proposals

In earlier times, NRM law was concerned with managing harms that generally had easily identified causes and effects, using straightforward regulatory approaches. The examples of biodiversity conservation, water governance and the management of invasive species have demonstrated that modern legal arrangements must deal with far more complex issues, and involve more complicated governance instruments. Fixing problems of regulatory fragmentation, poor coordination, and case-specific decision-making requires integrated approaches, at various spatial scales. The analysis also highlights that law reform needs to take place within a framework that includes initiatives such as the encouragement of voluntary stewardship, and the funding of sustainability. Among the options for reform are the wider use of bioregional planning as the basis for more strategic decision-making, better national coordination of the management of high priority environmental issues, and the development of a national investment strategy for the environment.

From among many possibilities, this *Technical Paper* identifies six priorities for reform. These are: (1) coordinated bioregional planning and management, including coordinated responses to major issues; (2) completion of the NRS so that a representative sample of all ecosystem types is conserved; (3) monitoring, evaluation and reporting of biophysical conditions to ensure transparency and support continuous improvement; (4) legal arrangements that enable adaptation, particularly given the contingencies of climate change; (5) a funding strategy to ensure resources for implementation; and (6) a stronger role for indigenous communities in biodiversity conservation and NRM. These proposals are interwoven, together constituting systemic reform of natural resource governance laws and related institutions.

148 The Treasury '2015 Intergenerational Report' (Australian Government, 5 March 2015).

149 See for example, Australian Bureau of Statistics, *4620.0 - Natural Resource Management on Australian Farms, 2006-07* (25 June 2008) <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4620.0>. Further indications are provided by the Australian Environmental-Economic Accounts 2015 'experimental' supply estimates of environmental services by industry and product for 2010-11, but the data do not provide information on investments in biodiversity, water and invasive species management expenditures.

4.2.1 Bioregional plans

An integrated strategic planning approach is needed to meet anticipated challenges. A bioregional planning process led by the Commonwealth and drawing on Commonwealth powers, working collaboratively with the states, local government and communities, could provide this. The coordinating structure used for the Murray Darling *Basin Plan* suggests a possible approach. Holistic regional planning could ensure that activities on one parcel of land do not undermine conservation or restoration undertaken on others, taking a landscape-scale approach to land management. The Hawke Review of the *EPBC Act* advocated this type of bioregional planning. Landscape-scale planning could determine areas for conservation as well as the areas most suitable for development, and provide a framework for managing cumulative impacts.[150] A properly implemented approach would protect ecological integrity, whilst ensuring that economic uses are located in the most appropriate places.

Effective bioregional plans should provide a framework to respond to stressors, including climate change, and help to determine areas to be included in the NRS under the Comprehensive, Adequate, and Representative (CAR) principles. This approach would also assist in planning connectivity linkages and buffers to be implemented through conservation agreements negotiated with landholders.[151] Land use would need to be adaptive over time, for example in response to shifts in the ranges of species requiring protection.[152]

Bioregional planning would also support landscape-scale invasive species management. Control of many invasive species requires a sustained programme across a sufficiently large area of landscape, overcoming the limitations imposed by individual tenure and diverse land manager motivations. It could also provide a framework for more integrated water and land use management, discussed above at 2.1.

Many issues need to be addressed in designing a bioregional approach, so consultation is essential. Among the questions are: what issues should be part of the bioregional planning approach? What matters need to be nationally coordinated, and what should be regionally adaptive? What should be the roles and responsibilities of the Commonwealth, states and local government in bioregional planning?[153] How should communities and industry be involved, and how is effective engagement with key stakeholders, such as indigenous communities to be achieved? What should be the balance between regulation and incentives? What safeguards should there be for the quality and integrity of plans and their implementation? Though implementation of bioregional planning will be complicated, comprehensive bioregional management could help overcome important failings of current natural resource governance.

RECOMMENDATION 3.1

The Commonwealth should ensure integrated resource governance, by undertaking landscape-scale planning at appropriate bioregional scales and establishing nationally coordinated frameworks for the implementation of bio-regional plans. This will require a consistent hierarchy of rules, roles and responsibilities.

150 See Commonwealth of Australia, 'The Australian Environment Act – Report of the Independent Review of the Environment Protection and Biodiversity Conservation Act 1999' (Hawke Report Department of Environment, Water, Heritage and the Arts, 2009) [3.17].

151 Taylor, Fitzsimons and Sattler, above n 130, 10.

152 L Hannah and L A Hansen, 'Designing landscapes and seascapes for change' - in T E Lovejoy and L Hannah (eds), *Climate change and biodiversity* (Yale University Press, 2005) 329.

153 Note that this particular issue is addressed in considerable detail in Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017), which calls for greater strategic leadership by the Commonwealth in the development of national strategic environmental instruments, including regional instruments that involve landscape-scale plans at appropriate bioregional scales (see Recommendations 1 and 3 of that Paper).

4.2.2 Completion of the National Reserve System (NRS)

As the backbone of the conservation regime in Australia, the NRS should be completed and its status formalised. The NRS is established under national policies, funding arrangements, contractual agreements and state and territory laws. It is not yet underpinned by a national legal instrument. This could be achieved by amendment to the *EPBC Act*. As discussed in 3.2.1, the NRS would be a key component of bioregional plans. Consistent with the call in Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017) for greater strategic leadership by the Commonwealth on environmental matters, it should take the initiative in working with the states to ensure completion of the NRS.

High ecological values identified for incorporation in the NRS should be assigned an IUCN protected area category (Categories Ia-VI) to ensure that the environmental status of areas is specified. IUCN categories range along a continuum. At one extreme are highly protected areas, such as wilderness areas and national parks. At the other, Category VI allows low-level non-industrial and sustainable use of natural resources compatible with nature conservation in part of the area. A nationally consistent and transparent process and set of standards for IUCN categorisation and the auditing of management effectiveness needs to be established.[154]

There are opportunities to extend the NRS through the inclusion of further IPAs on land and in the offshore. Any inclusion of these IPAs should occur with the consent of the relevant communities and be supported by adequate funding and capacity building to develop culturally appropriate environmental governance practices.

RECOMMENDATION 3.2

The Commonwealth should ensure completion of the National Reserve System (NRS), to provide legal protection for the full range of ecosystems within bioregions and subregions.[155] Related steps are needed to safeguard climate refugia and ensure connectivity across the landscape.

4.2.3 Effective monitoring, evaluation and reporting

Many studies highlight that better information is essential for effective natural resource governance, to help manage environmental issues and to ensure transparent evaluation of the effectiveness of governance. As environmental variability increases due to climate change, decision-making will need to respond to dynamism and uncertainty.[156] This will require better monitoring of ecological baselines and the effectiveness of environmental management actions.[157]

National *State of Environment* reports are irregular. They do not directly evaluate the performance of governance arrangements, but could do so. Ensuring that independent *State of Environment* reporting does evaluate and report on the effectiveness of natural resource governance arrangements is likely to increase transparency and encourage improved governance.

154 Taylor, Fitzsimons and Sattler, above n 130, 50.

155 Much of the necessary additions to the NRS will need to be made by the states, however the Commonwealth can play a significant role in securing state action through financial assistance and targeted disincentives (see also Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017)).

156 Robyn Craig, 'Stationarity is Dead' – Long Live Transformation: Five Principles for Climate Change Adaptation Law' (2010) 34 *Harvard Environmental Law Review* 9, 65.

157 J B Ruhl, 'Climate Change Adaptation and the Structural Transformation of Environmental Law' (2010) 40 *Environmental Law* 392-397, 420.

Other necessary improvements to monitoring, reporting and evaluation include:

- specifying in legislation and inter-government agreements what information should be collected and reported to monitor the effectiveness of governance;[158]
- requiring government agencies to share data and publicly report performance audits, including on environmental infrastructure, data systems and data gaps;[159]
- nationally consistent standards for monitoring and reporting of environmental data, ensuring 'openness' so that the data can be used for many purposes;[160]
- periodic review, upgrade and/or extension of monitoring infrastructure; and[161]
- improving the transparency and sharing of private environmental data.

RECOMMENDATION 3.3

The Commonwealth should perform enhanced environmental monitoring, evaluation and reporting tasks. This requires a strategic approach to determining what data is needed for effective decision-making, who should be responsible for providing and collecting it, how frequently it should be collected, how it should be made available and used, and who should pay for this intelligence.[162]

For an effective approach to these tasks, it is essential that national coordination and leadership is ensured. The Commonwealth is best-placed, both in terms of resources and its capacity to influence outcomes, to pursue the various improvements outlined above, whilst at the same time working to achieve state collaboration through a range of incentives and disincentives, as outlined in Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017).

4.2.4 Responsiveness to environmental change

Conservation in the context of climate change should not aim to prevent change, but should manage it to minimise loss of valued aspects of nature.[163] The principle of environmental restoration, recommended in Australian Panel of Experts on Environmental Law, *The Foundations of Environmental Law: Goals, Objects, Principles and Norms* (Technical Paper 1, 2017) is not focused on re-establishing ecosystems as they may once have existed, but on ensuring their complexity, structure and resilience to changing conditions.

While climate change and other variables will demand greater flexibility in how the environment is governed, without objective outcome standards (as well as reliable governance procedures) flexibility can result in continuing

158 National Water Commission, 'Water for Mining and Unconventional Gas', above n 65, 110. Mandatory reporting of data as a condition of development approval, for example, might capture some of the substantial amounts of information generated by EIA procedures.
159 See Alejandro Camacho, 'Can regulation evolve? Lessons from a study in maladaptive management' (2007/2008) 55 *University of California Law Review* 293; Melinda Benson, and Ahjond Garmestani, 'Embracing panarchy, building resilience and integrating adaptive management through a rebirth of the National Environmental Policy Act' (2011) 92 *Journal of Environmental Management* 1420, 1421.
160 Camacho, above n 159; B Karkkainen, 'Managing transboundary aquatic ecosystems: lessons from the Great Lakes' (2006) 19 *Pacific McGeorge Global Business and Development Law Journal* 209, 230–1.
161 Stephen Dovers, 'Reflecting on three decades: a synthesis' in Stephen Dovers and Su Wild-River (eds), *Managing Australia's Environment* (Federation Press, 2003) 521–2.
162 See Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017), for consideration of the functions of a new Commonwealth environmental institution.
163 Dunlop et al, above n 16.

deterioration. There is a need for clear, objective and measurable triggers that, if exceeded, will require more precautionary responses.[164] Responses to this challenge could include:

- strategic planning (including regional planning) that anticipates future changes (see 3.2.1);
- mechanisms to regularly revise plans, programs, or resource allocation arrangements to respond to changes;
- wider use of stepped or staged development approvals so that initial investment and impacts are limited, to make adaptation more feasible;
- framing approval conditions so that they can be modified if predefined thresholds relating to nature conservation or other natural resources are not being met.[165]

The question of what to preserve involves prioritising components of biodiversity, based on human interests. It raises questions about whether conservation should be aimed at individual species, ecosystems or landscape complexes. These questions are both scientific and political, as both environmental attributes and human values are not constant. Broad community participation in this process is crucial.

Creating responsiveness will require adaptive governance. This should be done whilst maintaining a clear precautionary approach so that flexibility is achieved without erosion of substantive safeguards for nature. Strong integrity protections with independent accountability (for example, tribunals or agencies with monitoring responsibilities) are needed to ensure that environmental governance standards are not weakened whilst reducing complexity and improving the responsiveness of environmental law.

RECOMMENDATION 3.4

A governance system is required at the Commonwealth and state levels that is more adaptive to environmental change. This will require outcome objectives for the state of environmental resources, quantitative and measurable thresholds, and legal tools to implement stronger protections if systems or species are at risk of exceeding these thresholds.[166]

NOTE: A comprehensive approach to landscape-scale planning (Recommendation 3.1) could also help overcome the deficiencies of fragmented project-specific development approval processes that do not address cumulative impacts.

4.2.5 Addressing implementation deficits

It has been noted above that significant implementation deficits exist with respect to the application of biodiversity conservation and NRM laws, for example, concerning the Murray Darling *Basin Plan* and its Water Resources Plans, gaps in the NRS and the management of invasive species. In addition to specific measures to address these particular contexts, there is a need for a broader system of safeguards and accountability with respect to the implementation of biodiversity conservation and NRM laws more generally.

164 Jessica Lee, 'Theory to practice: Adaptive management of the groundwater impacts of Australian mining projects' (2014) 31(4) *Environmental and Planning Law Journal* 251.

165 P McCormack and J McDonald, 'Adaptation strategies for biodiversity conservation: Has Australian law got what it takes?' (2014) 31 *Environmental and Planning Law Journal* 114.

166 The means by which such a governance system could be developed across the Commonwealth and state levels of government is explored in Australian Panel of Experts on Environmental Law, *Environmental Governance* (Technical Paper 2, 2017). In particular, the idea of requiring state implementation plans (SIPs) to be developed and approved in relation to bioregional plans is proposed as a possible means of securing a consistent and coordinated approach to reform of the governance systems related to biodiversity and NRM.

RECOMMENDATION 3.5

Stronger safeguards are needed to ensure the integrity of implementation of legal and administrative protections for the environment. These should include independent performance review, with clear reporting to the public, incorporated into Commonwealth and state legislation.

4.2.6 Funding for NRM governance

A fundamental challenge to NRM is funding the work of government and providing support and incentives for private landholders. Market instruments, information programs, industry and civilian volunteer activities, and regulation, all require money and labour. Traditionally a substantial part of these funds has been provided through government and it will be necessary for this investment to continue. However, given the scale of the challenge and the competing demands on the public purse, alternative and innovative sources of funding must be found. The rise of social entrepreneurship (for example) represents an opportunity to leverage investment from the private sector for conservation and NRM (see also Australian Panel of Experts on Environmental Law, *The Private Sector, Business Law and Environmental Performance* (Technical Paper 7, 2017) for an in-depth discussion on such a role for the private sector). It is important, however, that government maintains, and preferably increases, its investment even as new funding sources are found.[167]

Australia does not have an investment strategy for the environment. It has many disconnected and discontinuous programs, market and market-like experiments, and many private initiatives. There is no consensus about how much money is needed, from where it will come, and what strategies will be needed. Whilst the aspiration is often expressed that private funds, coupled with private stewardship, will reduce the need to rely upon regulation and provide more resources to protect and restore the environment, not enough practical work has been done to turn this hope into reality.

For private conservation investment to become the economic foundation for Australia's sustainability objectives, systematic reform is needed. The Industry Commission has suggested that three pillars are needed to support ESD and land management objectives:[168]

- Use regulatory mechanisms to ensure that landholders and land managers properly manage the environmental impacts of their actions;
- Create or expand markets for natural resources and use economic instruments, in preference to command and control; and
- Encourage conservation philanthropy and conservation on private land.

A comprehensive environmental investment strategy would involve many elements. A new partnership between government, landholders, business and the broader volunteer community is essential. This may require reforms to: better define eco-service proprietary rights and the limits to those rights, clarify stewardship obligations, create eco-service markets that are transaction-cost efficient, provide more robust oversight and support for eco-service markets, reduce regulatory and administrative impediments to conservation on private landholdings, provide information and advice, set up institutions to collect and maintain environmental data, encourage corporate investment in the environment, for example through regulatory requirements, and implement appropriate institutional arrangements for environmental investment strategies that minimise transaction costs while maximising voluntary engagement.[169]

167 M Maron et al, 'Stop misuse of biodiversity offsets' (2015) 523 *Nature* 401.
168 Industry Commission, 'A Full Repairing Lease: Inquiry into Ecologically Sustainable Land Management' (Report No. 60, Industry Commission, 1998), 125.
169 Stephen Polasky, Holly Doremus and Bruce Rettig, 'Endangered Species Conservation on Private Land' (1997) XV(4) *Contemporary Economic Policy* 66; Productivity Commission, 'Promoting Better Environmental Outcomes' (Roundtable Proceedings, Productivity Commission, 2009); Martin and Werren, above n 146.

RECOMMENDATION 3.6

The Commonwealth should work with the states and the private sector to develop an effective fiscal model for natural resource governance. This should ensure that the costs of environmental stewardship can be met over the long term, and are borne equitably across the community.

4.2.7 A stronger role for indigenous communities

Aboriginal and Torres Strait Islander peoples have a connection to traditional land and waters that extends over many thousands of years prior to European colonisation of Australia.[170] That relationship includes cultural responsibilities to care for country that are transmitted across generations and which are embedded within the fabric of Aboriginal and Torres Strait Islander communities.[171] Within Australia, various laws acknowledge and protect the unique relationship that Aboriginal and Torres Strait Islanders have with the environment. Agreement-making and co-management models have been significant in providing a platform for shared environmental governance in biodiversity protection, water management and NRM.

Increasingly, indigenous communities are leading efforts to implement conservation programs and ecological restoration measures. Considerable scope remains, however, for stronger inclusion of Aboriginal and Torres Strait Islander peoples in environmental protection measures; to build indigenous community capacity; to enhance the use of traditional knowledge in conservation and NRM and to recognise indigenous peoples' rights in traditional lands and waters. Environmental laws and institutions charged with responsibilities for environmental management can demonstrate principled leadership in this regard.

RECOMMENDATION 3.7

Commonwealth and state governments should make a clear commitment to ensure effective consultation with, and the active participation of, Aboriginal and Torres Strait Islander peoples in environmental protection measures, cultural heritage conservation and NRM. This commitment requires support for robust and culturally appropriate governance for Indigenous Protected Areas (IPAs), co-managed areas and Aboriginal and Torres Strait Islander peoples' land and waters and respect for the principle of free, prior and informed consent in regard to Aboriginal and Torres Strait Islander land and waters.[172]

170 *Mabo v Queensland [No 2]* (1992) 175 CLR 1; *Members of the Yorta Yorta Aboriginal Community v Victoria* (2002) 214 CLR 422, 37.
171 M Langton, 'The estate as duration: "Being in place"' in L Godden and M Tehan (eds) *Comparative perspectives on communal lands and individual ownership: Sustainable Futures* (Routledge, 2010).
172 See above n 7.

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