

THE UNIVERSITY OF
NEW SOUTH WALES



**Senate Environment,
Communications, Information
Technology and the Arts
References Committee Inquiry into
The funding and resources
available to meet the objectives of
Australia's national parks, other
conservation reserves and marine
protected areas**

Submission by

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Much of this submission relates to challenges of freshwater protected areas. This submission has two scientific papers that are relevant and represent the views of a number of scientists around Australia. Both scientific papers are attached with the submission as an email.

Kingsford, R.T. and Nevill J. (2005). Scientists recommend a systematic expansion of freshwater protected areas in Australia. *Ecological Management and Restoration* 6: 161-163.

Kingsford, R.T. and Nevill, J. (in press). Urgent need for a systematic expansion of freshwater protected areas in Australia. *Pacific Conservation Biology*

The relevance of the papers is indicated in each of terms of reference. I have also included the executive summary of a further paper about a conceptual framework for the protection of freshwater ecosystems in which the role of protected areas is identified and the challenges of managing freshwater areas (<http://www.deh.gov.au/water/publications/protecting-rivers.html>).

R.T. Kingsford, H. Dunn, D. Love, J. Nevill, J. Stein and J. Tait (2005) Protecting Australia's rivers, wetlands and estuaries of high conservation value. *Department of the Environment and Heritage, Canberra*

1. The values and objectives of Australia's national parks, other conservation reserves and marine protected areas

All three attached scientific papers deal specifically with some of the challenges and opportunities for environmental protection through the marine protected areas, as well as the values of conservation reserves.

There have been significant effects on landholders dependent on flooding for their grazing livelihoods as well as significant degradation of rivers. Many areas of floodplain eucalypts (river red gums, coolabahs and black box) are dying because they do not receive sufficient flooding. Native fish species are declining for the same reason while exotic fish species and weeds are increasing. Waterbirds have experienced declines of about 80% in some areas such as the Lowbidgee floodplain and the Macquarie Marshes.

2. Whether governments are providing sufficient resources to meet those objectives and their management requirements

Most of the resources provided for meeting the objectives of freshwater protected areas are similar to terrestrial areas: management of people, fire and pests. It is critical that often the greatest threat on which such areas depend, the water regime, is not addressed or resourced sufficiently well by governments. For freshwater protected areas, governments need to identify potential threats from parts outside the boundaries of the reserve.

3. Any threats to the objectives and management of our national parks, other conservation reserves and marine protected areas

References to a number of scientific papers are enclosed in this submission demonstrate the long-term effects of water resource development on freshwater protected areas that include downstream wetlands and floodplains. Essentially in such areas (e.g. Macquarie Marshes, Kinchega National Park, Yanga Nature Reserve, The Coorong, Hattah-Kulkyne National Park), the conservation objectives for which the reserves were originally declared are not being met. The critical resource of water that sustains the ecosystems on which the plants and animals depends is no longer available. Most of the floodplains and wetlands in the Murray-Darling Basin at the terminal end of rivers are in ecological crisis. The red gums are dying; native fish populations are declining; frogs, reptiles and waterbirds are all declining. For example, there have been significant declines in waterbird numbers in the Macquarie Marshes over a period of more than 20 years.

There are also references within the three papers that form part of this submission that further provide evidence of the significant threats to freshwater protected areas. These include issues such as declining river flows as a result of climate change.

Most of the more important protected areas in the Murray-Darling Basin where most development of rivers has occurred are becoming seriously degraded (e.g. Macquarie Marshes, Coorong, Chowilla, see Fig. 1). These areas clearly demonstrate that governments cannot guarantee the future protection of such areas without water protection (see below).

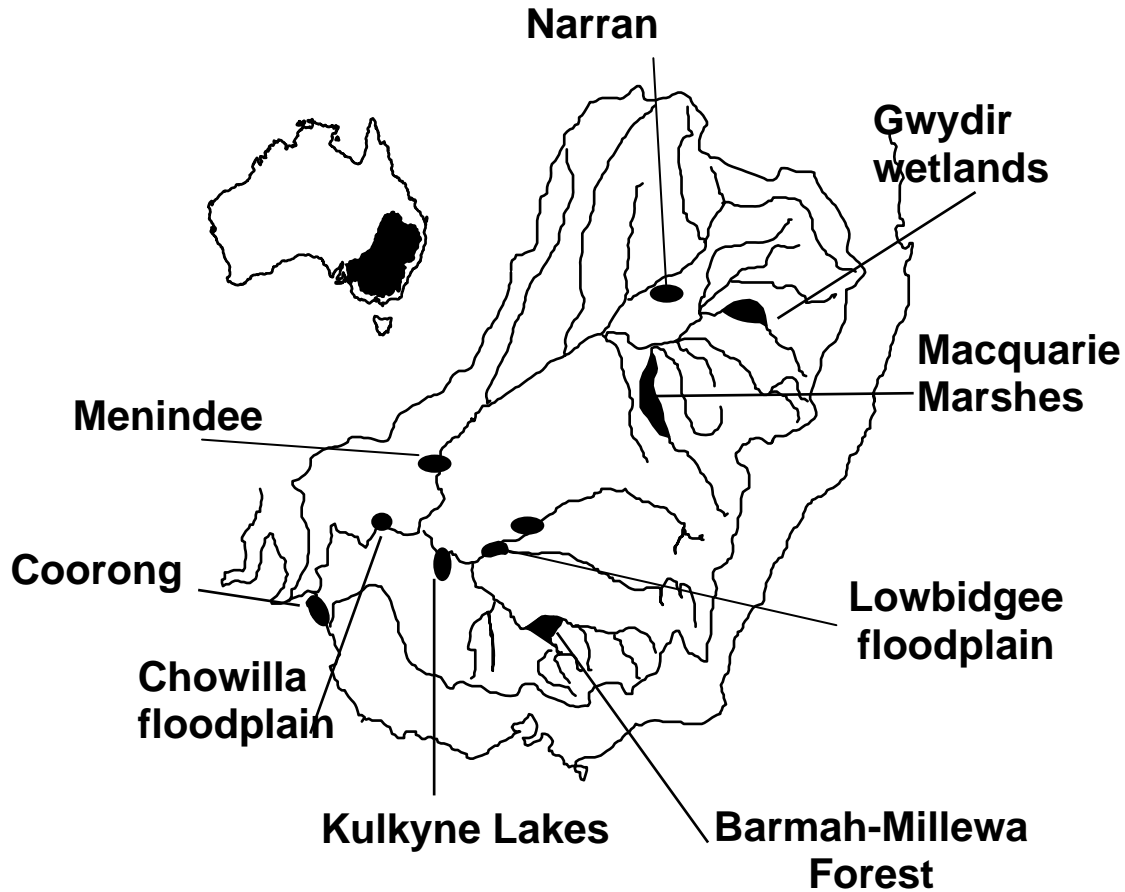


Fig. 1. Major wetlands and floodplain that are either protected areas or Ramsar sites that are in severe decline as a result of water resource development upstream. Parts of each are protected but continue to degrade.

4. The responsibilities of governments with regard to the creation and management of national parks, other conservation reserves and marine protected areas, with particular reference to long-term plans;

We have argued about the importance of identifying freshwater protected areas and commented that governments around Australia have not performed well in the area of identifying and protecting freshwater protected areas (see Paper 1 and 2).

5. The record of governments with regard to the creation and management of national parks, other conservation reserves and marine protected areas.

Once declared, governments have generally performed well in the areas of fire management, neighbour relations and pest management. For freshwater protected areas, the objectives of the protected areas, to essentially protect these areas, has often failed (see above and documentation in scientific papers).

Protecting Australia's rivers, wetlands and estuaries of high conservation value

R.T. Kingsford, H. Dunn, D. Love, J. Nevill, J. Stein and J. Tait (2005) Protecting Australia's rivers, wetlands and estuaries of high conservation value. *Department of the Environment and Heritage, Canberra*

See <http://www.deh.gov.au/water/publications/protecting-rivers.html>

Executive summary

Australia has a rich variety of different rivers, wetlands and estuaries that support a significant amount of its biodiversity and industry. Important social values of Australia's Indigenous and European culture are also intimately linked to the integrity of our rivers. Despite this, compared with terrestrial conservation (e.g. national parks and reserves, and regional forest agreements), there has generally been a lesser focus on conservation of these ecosystems in Australia. This report presents a conceptual framework for the protection of rivers, river reaches and estuaries of high conservation value. It was developed in conjunction with State and Territory agencies during 2003 and 2004 and provides an important foundation for developing future approaches to the conservation of these key areas.

Many of Australia's rivers, wetlands and estuaries are affected by river regulation, catchment disturbance and pest species, and opportunities to effectively conserve riverine biodiversity and landscapes are limited. There are opportunities to protect Australia's most important aquatic areas so that future generations do not have to pay the high costs of rehabilitation (e.g. as has happened for the River Murray). This may begin with a comprehensive national framework that identifies and protects rivers, wetlands and estuaries that have high, national conservation value. States and Territories are primarily responsible for their protection, but a national framework could support consistent identification and strategic investment in the protection of nationally important aquatic ecosystems.

All Australian governments have invested in programs and projects aimed at protecting rivers, wetlands and estuaries. There is national recognition of the importance of this issue across all jurisdictions. In 1994, the Council of Australian Governments (CoAG) agreed that the environment was a legitimate user of water. In 2004, CoAG agreed to the National Water Initiative (NWI), which will chart the future responsibilities and progress towards sustainable management of the nation's rivers and aquifers. Provisions in the associated intergovernmental agreement commit most governments to identify, protect and manage high-conservation-value rivers and aquifers and their dependent ecosystems.

To effect protection of high-conservation-value rivers and their dependent ecosystems, national conservation goals are essential. They may be used also to determine short-term and specific goals developed from a national vision statement for rivers. This recognises that it is not possible to single out high-conservation-value rivers or their dependent ecosystems and expect to protect only these and achieve conservation of their values. River conservation requires a network approach that recognises that many processes and organisms may use all parts of rivers and even different rivers during their lives. A protection framework focused on only high-conservation-value rivers will not work.

Rivers and dependent ecosystems with nationally high conservation values are a subset of the country's aquatic ecosystems. Conservation value is a relative measure, established through a comparison of all rivers and dependent ecosystems. This discussion paper focuses on ecological conservation values, but recognises that rivers also have considerable cultural, economic and ecosystem service values.

There are two key questions for this framework.

- *What rivers, floodplains, wetlands and estuaries are of high conservation value?*
- *How can these be protected?*

Elements of a national framework

A national framework of river protection could be built around three main elements:

- 1 nationally consistent collection of information on rivers, wetlands and estuaries, which will entail agreement on spatial scale and classification and evaluation systems for identification of rivers and dependent ecosystems of high conservation value
- 2 protection schemes that operate at different scales such as :
 - a ‘whole-of-river’ approach that could include establishment of an ‘Australian Heritage Rivers’ system
 - protection of high-conservation-value rivers, river segments and dependent ecosystems (floodplains, wetlands, estuaries) in a national, State, regional and local context (using current legislative and policy tools; i.e. environmental flows, protected areas, natural resource planning and management, and incentives)
3. operational and institutional arrangements— coordinated programs involving jurisdictions in implementation of a national framework.

Nationally consistent collection of information

All rivers, wetlands and estuaries have conservation values, but we need methods to identify which of them have the highest national conservation value to assist decision makers to determine priorities.. To do this, we must first have a method that can operate at various and agreed spatial scales. To achieve a relative comparison of conservation value, consistent and agreed approaches to classification and evaluation are needed to work across all rivers, wetlands, floodplains and estuaries. The following conservation criteria could be utilised to assess high-conservation-value rivers and their dependent ecosystems.

The river or dependent ecosystem:

- is largely unaffected by the direct influence of land and water resource development
 - is a good, representative example of its type or class
 - is the habitat of rare or threatened species or communities, or the location of rare or threatened geomorphic or geological feature(s)
 - demonstrates unusual diversity and/or abundance of features, habitats, communities or species
 - provides evidence of the course or pattern of the evolution of Australia’s landscape or biota
- OR
- performs important functions within the landscape.

Spatial framework

An agreed spatial framework is essential for undertaking national assessments.

Recommendations

- a. *Use current drainage divisions, river basins and river segments for initial implementation of this framework. These map layers, and the sub-catchments and catchments they support, should be publicly available.*
- b. *River ecosystem data should be labelled according to resolvable hierarchical scales, allowing for future evaluation and reassessment of classifications.*
- c. *Develop a new hierarchical spatial framework for managing aquatic systems and rivers, based on topography and drainage networks and without the problems of current spatial layers.*

Classification and evaluation systems

Collation of all available attribute data for the criteria, and gap-filling where necessary, at the finest spatial scale possible (i.e. river segment), is important to make a national assessment of rivers, wetlands, floodplains and estuaries.

Recommendations

- a. *Develop agreed approaches for assessing criteria and use of attributes for rivers, river reaches and dependent ecosystems.*
- b. *Develop agreed national classifications of rivers and dependent ecosystems, with agreed objectives, to support evaluation and assessment.*
- c. *Apply a nationally agreed set of evaluation criteria and significance thresholds, compatible with Ramsar and National Heritage, with nationally available data, aggregated to the smallest resolvable scales of assessment (i.e. river segments and their sub-catchments). This could be done to assess all river segments to identify nationally important rivers, wetlands (greater than 200 ha) and large estuaries. This initial assessment could be reported at a range of scales, informing a national assessment but also State and regional assessments.*
- d. *Establish long-term collection and storage of nationally consistent data on rivers and their dependent ecosystems that allows for comparison across the country.*

Protection scheme

Once identified, the challenge is to ensure protection of rivers, wetlands and estuaries at different scales and contexts. We propose consideration of a protection scheme with two approaches: establishment of an Australian Heritage Rivers system in conjunction with better use of existing protection mechanisms. There are generally sufficient mechanisms available within jurisdictions for protection of aquatic ecosystems, but implementation of a multi-scale system would improve effectiveness at a catchment level.

Australian Heritage Rivers system

Potential candidate rivers could be identified that are of high conservation value, generally at a large scale (i.e. river basin, tributary river), using the methods identified above. While identification of candidates could be a national process, nominations for listing as Australian Heritage Rivers could also come from communities. Designation as an Australian Heritage River could signify sustainable use rather than a moratorium on development. There could also be parallel development of a process that identifies and assesses cultural values.

Recommendations

- a. *Identify potential candidate river basins as Australian Heritage Rivers. This process could be done*

immediately, using current data, but nomination and designation would not occur without community support.

- b. Identify institutional arrangements that would deliver an Australian Heritage River system, including current models, and whether there is a need for legislation. Essential steps in the arrangements would be nomination, designation, consultation and administration. The Canadian Heritage Rivers System is a model worth considering.*
- c. Largely unmodified river basins designated as Australian Heritage Rivers could be priority areas for funding river management plans that protect ecological values, prevent environmental problems, encourage uses compatible with protection of ecological values and promote understanding of ecological values and processes.*

Protecting nationally important rivers, river segments, floodplains, wetlands and estuaries using current mechanisms

There are many tools within jurisdictional, legislative and policy frameworks for protecting nationally important high-conservation-value rivers, wetlands and estuaries. These can be grouped under four, main, interrelated mechanisms: environmental flow management; protected area acquisition and management; natural resource management; and incentives. These preferably operate within a catchment planning and management framework that logically follows the rivers and recognises their connectivity.

Priorities for protection could be defined by working from quantitative national conservation targets for rivers, wetlands and estuaries. Actual protection may be effected through jurisdictional policies and management, and the regional bodies responsible for catchment management. The following recommendations for environmental flow management, protected areas, natural resource management and planning, and incentives should apply to rivers, river segments, floodplains, wetlands and estuaries identified as having high national conservation value.

Recommendations—environmental flow management

- a. Environmental flows for long-term sustainability of rivers and their dependent ecosystems need to be identified at catchment scales.*
- b. Environmental flows should be managed within an adaptive management framework that ensures the best environmental outcomes.*
- c. Targets for flow restoration may need to be developed with a focus on better management of flows and access to additional flows if required (e.g. improving water-use efficiency, purchase of water).*

Recommendations—protected areas

- a. Aquatic ecosystems should be considered for future acquisition of protected areas (e.g. national parks, nature reserves, conservation areas, or aquatic reserves), or nominations of important wetland areas (e.g. National Heritage, World Heritage and Ramsar sites). This may also include Indigenous protected areas.*
- b. Policies and management practices and documents for protected areas with rivers and dependent ecosystems should include how management or policies will meet long-term ecological outcomes of sustainability (e.g. upstream environmental flows, pest control strategies and impacts of catchment disturbance).*
- c. These ecosystems could be the focus for the development of cooperative protective management arrangements with landholders (e.g. voluntary conservation agreements and other protected area programs).*
- d. They could be considered for heritage listing under the National Heritage List of the Environment Protection and Biodiversity Conservation Act 1999.*
- e. They could be listed under relevant threatened-species legislation as endangered or threatened ecological*

communities if they satisfy appropriate criteria.

Recommendations—natural resource management and planning

- a. Statutory resource and land-use plans, including river- management plans, should assess and control potentially deleterious impacts on these ecosystems at catchment scales.*
- b. Environmental objectives in water plans should adequately acknowledge high-conservation-value rivers and their dependent ecosystems and water regimes that maintain their ecological values.*
- c. River-management planning of these areas needs to explicitly incorporate rivers and their dependent ecosystems within management plans, recognising catchment processes and hydrological connections.*
- d. For those aquatic ecosystems that cross management borders, river planning should incorporate all of a catchment, taking account of different jurisdictional water legislation.*
- e. Water-quality policies and management should link to planning, assessment and controls that protect identified aquatic ecosystems.*
- f. Introduction of exotic species (plants or animals) should be controlled in these aquatic ecosystems and their catchments.*
- g. River management planning should involve communities early and involve effective community consultation and communication.*
- j. Planning should be culturally sensitive (e.g. respect Indigenous decision-making and governance processes) and involve traditional owners for identified ecosystems.*
- i. For improved management, research and development should focus on threats that affect conservation values of high-conservation-value rivers, reaches and dependent ecosystems.*

Recommendations—incentives

- a. These ecosystems need to be identified and included in Australian Government, State and regional investment frameworks.*
- b. These aquatic ecosystems could receive priority in monitoring and assessment of ecological values (e.g. Rivercare, Water Watch, auditing).*
- c. These ecosystems could be a focus for tax and rate- relief programs and new incentive schemes for landholders committed to protecting these areas.*

Making it happen

Implementation of the national framework would require cooperation between jurisdictions and the Australian Government. To that end, it could be best progressed under the aegis of the Natural Resource Management Ministerial Council and the National Water Initiative.

References to scientific papers identifying the impacts to rivers and protected freshwater areas

- Kingsford, R.T. and Thomas, R.F. (1995) The Macquarie Marshes in arid Australia and their waterbirds: a 50 year history of decline. *Environmental Management* **19**, 867-878.
- Kingsford, R.T. and Johnson, W.J. (1998) The impact of water diversions on colonially nesting waterbirds in the Macquarie Marshes in arid Australia. *Colonial Waterbirds* **21**, 159-170.
- Kingsford, R.T., Boulton, A.J. and Puckridge, J.T. (1998) Challenges in managing dryland rivers crossing political

- boundaries: lessons from Cooper Creek and the Paroo River, central Australia. *Aquatic Conservation: Marine and Freshwater Ecosystems* **8**, 361-378.
- Kingsford, R.T. (1999a) Managing the water of the Border Rivers in Australia: irrigation, Government and the wetland environment. *Wetlands Ecology and Management* **7**, 25-35.
- Kingsford, R.T. (1999b) Social and economic costs and benefits of taking water from our rivers: the Macquarie Marshes as a test case. In *"Preserving Rural Australia: Issues and solutions"*. Robertson, A.I. and Watts, R.J. (Eds). CSIRO Publishing, Melbourne 125-143.
- Kingsford, R.T. (2000) Ecological impacts of dams, water diversions and river management on floodplain wetlands in Australia. *Austral. Ecology* **25**, 109-127.
- Lemly, A.D., Kingsford, R.T. and Thompson, J.R. (2000) Irrigated agriculture and wildlife conservation: conflict on a global scale. *Environmental Management* **25**, 485-512.
- Kingsford, R.T. (2003) Social, institutional and economic drivers for water resource development - case study of the Murrumbidgee River, Australia. *Aquatic Ecosystem Health and Management* **6**, 69-79.
- Kingsford, R.T., Brandis, K., Thomas, R.F., Crighton, P., Knowles, E. and Gale, E. (2004) Distribution and conservation of wetlands in New South Wales, Australia. *Marine and Freshwater Research* **55**, 17-31.
- Kingsford, R.T. and Thomas, R.F. (2004) Destruction of wetlands and waterbird populations by dams and irrigation on the Murrumbidgee River in arid Australia. *Environmental Management* **34**, 383-396.