

Scientists urge expansion of freshwater protected areas

By Richard T. Kingsford and Jon Nevill

Most Australians are familiar with the protection of terrestrial environments with national parks, and oceans with marine reserves. However, protected rivers, or the general concept of freshwater protected areas, are seldom discussed (freshwater meaning 'inland aquatic'). This is despite evidence that freshwater biota are imperilled both locally and globally.

According to the international *Convention on Biological Diversity 1992* (CBD), the conservation of biodiversity, including aquatic biodiversity, requires the protection of representative examples of all major ecosystem types, coupled with the sympathetic management of ecosystems outside those protected areas. These twin concepts underpin all Australian biodiversity protection programs. Yet, are freshwater systems receiving this protection in Australia?

The importance of protected areas. Protected areas are places where some major threats can be effectively managed and are the most important tool used in biodiversity conservation throughout the world. They support ecosystem functions beyond their boundaries and have other economic and cultural benefits. Systematic conservation planning is essential for identifying and selecting protected areas. This aims to maximize biodiversity conservation from a reserve system that comprises a relatively small part of the total landscape. Systematic planning techniques have not yet been applied to freshwater protected areas in a coherent and focused way by Australian state agencies.

The long-term benefits of creating freshwater protected areas far outweigh short-term costs. Freshwater protected areas can directly benefit fishers, hunters, tourist operators and agriculturalists through increased production and protection of aquifer recharge areas. All Australians will benefit from the protection of our living freshwater environments – which have major economic, cultural, recreational, educational, spiritual and scenic values.

International initiatives. The international *Ramsar Convention on Wetlands 1971* created the world's largest and most widely applied protected area system for freshwater habitats, supported by 145 member countries including Australia. It commits parties to a 'Strategic Framework for the Ramsar List' based on

criteria that include 'representative wetland types' – a goal not fully realized in Australia.

Other countries have advanced the protection of freshwater ecosystems, with notable achievements for rivers. The United States passed its *Wild and Scenic Rivers Act* in 1968 after public campaigns to stop the damming of several major rivers (172 rivers are now listed). In Canada, the *Canadian Heritage Rivers System* (1984) is now so popular that nominations to protect more rivers come entirely from community pressure (40 rivers are listed).

Australian freshwater ecosystems. Australia is the driest inhabited continent, and southern river systems have been extensively degraded by water extraction and regulation, and by other forms of habitat destruction. Many major river systems are in a state of ecological crisis, and their inhabitants (e.g. the iconic Murray Cod, colonial water birds, Tasmania's giant freshwater crayfish, and floodplain eucalypts) are in decline. Increased protection for the ecosystems of Australia's rivers (and lakes, wetlands, springs, subterranean ecosystems and estuaries) is long overdue.

The National Audit and State of Environment reports show extensive and continuing degradation of Australia's rivers and estuaries, mostly from recent developments. Existing water planning, land use planning, and development assessment frameworks are not adequately protecting Australia's freshwater ecosystems.

Overview of aquatic protected areas in Australia. The history of freshwater protected areas in Australia is largely a story of good intentions not carried through. Australia's three-tiered government system places most resource management responsibilities with the states and territories (the 'States'). The Australian (Commonwealth) government is responsible for international treaty obligations, cooperating with the States, local government, and regional resource management planning bodies.

As a signatory to the Ramsar Convention, Australia has agreed to conserve all wetland types. The first listed Ramsar site in the world was in Australia: Coburg Peninsula in the Northern Territory, and there were 64 Australian wetlands listed at the close of 2004. Rivers are defined as wetlands under the Ramsar definition but, after 34 years, only a handful of rivers and streams are protected, with the South Alligator being the largest. Ramsar sites receive limited protection under the Commonwealth's *Environment and Biodiversity Protection Act 1999* (EPBC Act). Australia's obligations under the Ramsar Convention to recommend reserves and develop ecosystem inventories are progressing slowly.

Some discharge springs from the Great Artesian Basin (GAB) and other aquatic ecosystems are listed as 'threatened ecological

Richard Kingsford is Professor of Environmental Science at the School of Biological, Earth and Environmental Sciences at the University of New South Wales, NSW 205, Australia. Email: richard.kingsford@unsw.edu.au. *Jon Nevill* is Director of OnlyOnePlanet Consulting, PO Box 106, Hampton, Vic. 3188, Australia. This guest editorial is a summary of an 11-page consensus statement signed by 40 scientists. The full statement can be obtained from: www.bees.unsw.edu.au/school/staff/kingsfordpublications.html or www.onlyoneplanet.com.au/documents/freshwater.

communities' under the EPBC Act. Many GAB springs, home to endemic aquatic invertebrates, are already extinct from overuse of artesian water. The EPBC Act can protect against major developments threatening listed aquatic ecosystems but cannot deal with threats beginning before its enactment in 1999: enforce proactive biodiversity management; or control small cumulative threats or potentially threatening management regimes in the wider catchments.

The *Directory of Important Wetlands in Australia* (the 'Directory') includes significantly more parts of rivers (143) and a few additional rivers (e.g. Prince Regent Biosphere Reserve and Cotter River). Additional creeks and rivers are protected within the reserve system (e.g. Tasmania's South-west World Heritage Area, the Rudall River National Park). While not formally linked to government protection programs apart from Queensland's *Integrated Planning Act 1997*, the Directory is considered in the planning processes of many local government and regional resource planning bodies. At this stage the Directory does not comprehensively cover all wetland types in Australia, and certainly does not include sufficient rivers or underground ecosystems.

Australia's reserve system has made some profound achievements, but inherent limitations now demand new approaches to ensure adequate representation and conservation of freshwater ecosystems. The existing national reserve system includes some important freshwater ecosystems. However, the reserve system has not been systematically created to include wetland types, and there is little published evidence of the *representativeness* of freshwater ecosystems protected within existing reserves. We are not protecting all of our most important aquatic ecosystems. A more detailed assessment needs to identify the original extent, current extent and condition of different ecosystem types, and their protection status.

The most significant gaps in the existing reserve system relate to river, floodplain and subterranean ecosystems. Development of an 'interim freshwater bioregionalization of Australia' has been proposed to support a national assessment of the conservation status of freshwater ecosystem types. The identification of Australian freshwater biodiversity hot spots is also important and needs ongoing support from the government.

State programs. In theory, all States are committed to the establishment of reserve systems with representative examples of *all* major ecosystem types, including aquatic types. Such policies appear to meet Australia's obligations under the *World Charter for Nature 1982* (a resolution of the United Nations General Assembly) and the *Convention on Biological Diversity 1992*. However, with respect to freshwater protected areas, State implementation programs so far are not comprehensive, effective, or systematic – except in the Australian Capital Territory. Across Australia therefore, river and wetland protection is in a parlous state.

Several States have legislation to protect threatened species and ecological communities; but these are rarely used to protect freshwater environments. The 'critical habitat' provisions of Victoria's *Flora and Fauna Guarantee Act 1988*, for example, have not yet been used to protect freshwater habitats. Queensland, New South Wales, Victoria, South Australia and Tasmania all have fisheries legislation to establish aquatic protected areas, yet none have established freshwater areas, in spite of advances in marine areas. In May 2005, the

Queensland government introduced legislation to protect wild rivers. No rivers were identified, although 19 rivers were previously proposed. Hopefully, such legislation will be fully implemented and effective. South Australia and the Northern Territory have policy statements to protect representative freshwater ecosystems; however, neither jurisdiction has so far funded a program to systematically achieve this. The Tasmanian government in 2002 committed to the 'comprehensive, adequate and representative' protection of the state's freshwater ecosystems; but, the 2005/6 State Budget contained no specific allocation to support implementation.

There are solutions. Australia should implement existing State policies to establish systems of representative protected areas for freshwater ecosystems, in line with our international commitments. Appropriate classification and mapping techniques exist, and must be used thoughtfully in reserve design and selection. Major rivers where ecosystems remain substantially intact should be protected. Proposed models of protection for these include the establishment of a four-tiered river classification system, including 'heritage rivers' and 'conservation rivers' for special protection. Alternatives could include a river protection system modelled on the *Canadian Heritage River System*, or the inclusion of rivers as Ramsar sites. The *2004 Sydney Conference on Freshwater Protected Areas* recommended that all Australian jurisdictions accelerate the development of freshwater protected areas. Adequate ecosystem inventories, still largely undeveloped, will be critical to the identification and selection of protected areas, and to guide 'sympathetic' management of biodiversity values within regional resource planning frameworks. The control of cumulative effects outside boundaries of protected areas needs much greater attention while the rehabilitation of significant aquatic sites should remain a priority. Stakeholders with common interests need to start building consensus.

The National Reserve System (NRS) *Directions Statement* signalled a new emphasis on freshwater ecosystems: *Review the current understanding of freshwater biodiversity in relation to the NRS CAR [comprehensive, adequate and representative] reserve system, and finalize an agreed approach, which may include future amendments of the NRS Guidelines, to ensure freshwater ecosystems are appropriately incorporated within the NRS.* This initiative needs strong support.

The need to establish comprehensive and representative freshwater protected areas is urgent, given increasing concerns about limited water availability for Australia's cities, industries and agriculture and the ongoing degradation of aquatic ecosystems. This should be accompanied by effective land and water management that pays more than lip service to the environmental requirements of aquatic ecosystems. Consultation with stakeholders should incorporate local and regional values. State governments should act with the support and collaboration of the Commonwealth.

The most urgent initiative is to identify those more important ecosystems most at risk and protect these. A comprehensive national assessment of the conservation status of freshwater ecosystems should be done immediately. This would be a platform for the systematic expansion of the nation's freshwater protected areas as well as a catalyst for innovative 'bottom-up' approaches driven by local stakeholders.