

Freshwater protected areas in Australia

Author:

Jon Nevill, OnlyOnePlanet Consulting

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Freshwater plants and animals are particularly imperilled, both in Australia and globally. Although there are many threats (Nevill and Phillips 2004) the 'big three' are:

- (a) regulation and extraction of natural flows,
- (b) habitat destruction linked to catchment development, and
- (c) the effects of invasive species.

Protected areas are places where some major threats can be effectively managed. Amongst a wide variety of protective mechanisms (Nevill and Phillips 2004) the use of protected areas is the single most important tool available for biodiversity conservation. Protected areas also support ecosystem functions beyond their boundaries and have other economic and cultural benefits (Nevill and Phillips 2004). The protection of freshwater ecosystems on private land (as well as public land) is important, and incentive measures need to be more widely applied (Whitten et al 2002).

As a general rule, the long-term benefits of creating freshwater protected areas far outweigh short-term costs. Some freshwater protected areas will enhance recreational fishing and hunting opportunities outside the protected zone. Australian tourist operators will benefit from healthy and impressive rivers and wetlands. Farmers benefit from the protection of aquifer recharge areas. Indigenous groups supported the formation of the first listed Ramsar¹ site in the world: Coburg Peninsula in the Northern Territory. All Australians benefit from the protection of our living freshwater environments – which have huge economic, cultural, recreational, educational, spiritual and scenic values.

Management of freshwater protected areas must recognise the critical importance of connectivity – biological processes within a protected area will depend on flows through administrative boundaries. The management of the surrounding watershed will affect values within the protected area (Pringle 2001, Saunders et al 2002).

¹ Ramsar wetlands sites The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources

According to the *Convention on Biological Diversity 1992*, 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. This requirement was re-affirmed by the 2004 World Conservation Congress. Although the Australian Government, and all eight Australian state and territory governments are committed to this principle (Fitzsimons and Robertson 2005) only Victoria, Tasmania and the Australian Capital Territory have funded specific programs aimed at establishing fully representative systems of inland aquatic ('freshwater') protected areas. In Victoria and Tasmania, however, these systems remain incomplete (Nevill and Phillips 2004).

Although all Australian jurisdictions have established some reserves (Australia's 64 Ramsar sites for example) which protect freshwater ecosystems, the degree to which such reserves protect *representative* aquatic ecosystems has not been systematically assessed in any Australian state, although work is progressing in Tasmania. Rivers and subterranean ecosystems are undoubtedly neglected by the existing reserve network, although the fact that comprehensive inventories of freshwater ecosystems are incomplete in most Australian states makes this conclusion anecdotal rather than quantitative.

Australia has hundreds of substantial rivers (Nevill 2005). A comparison of national river and protected area databases shows that 14 Australian rivers have catchments almost completely protected within eight large national parks and/or Ramsar sites. The largest of these rivers is the South Alligator in the Northern Territory.

Approaches to protection

A variety of statutory and strategic approaches have been developed (if not always applied) for the protection of freshwater areas in Australia. Broadly, these can be divided into approaches which apply to specific areas, or general approaches such as those aimed at water quality controls, environmental impact assessment of proposed developments, land use zoning, and threatened species protection. In various states, statutes focusing on catchment management, fisheries, water resource management, national parks, or the protection of threatened species all have specific area-protection provisions which allow the development of aquatic protected areas. At this stage few of these provisions have been applied specifically to protect freshwater ecosystems (Nevill and Phillips 2004). At the national level, the *Environment Protection and Biodiversity Conservation Act 1999* provides mechanisms which can be used for area protection, including provisions relating to Ramsar sites which can over-ride state authority where an ecological asset of national or international importance is threatened.

National databases of assets

At the level of strategic catchment or land use planning, the most important national inventory of freshwater ecosystem assets is the *Directory of Important Wetlands in Australia* (DEH 2001) (<http://www.deh.gov.au/water/wetlands/database/directory/index.html>) which, as well as listing 'still' wetlands of national and international importance, includes 143 rivers or river sections. 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 include all wetland types in a comprehensive way, and certainly does not include sufficient rivers or underground ecosystems. This is because, historically, the Directory was first developed with a focus only on inland surface 'still' wetlands. Since the first edition of the Directory an effort has been made to expand coverage in line with the full Ramsar wetland definition – however coverage of other wetland types is still less than representative.

Other important national databases for the study and management of freshwater ecosystems are the national river condition database (formerly called the wild rivers database (<http://www.heritage.gov.au/anlr/code/arc.html>), the water and biodiversity databases of the National Land and Water Resources Audit (http://audit.ea.gov.au/ANRA/atlas_home.cfm), and the Commonwealth protected area database (CAPAD, <http://www.deh.gov.au/parks/nrs/capad/index.html>).

So far Victoria is the only State to have published a strategic review of river and stream protection, and is the only state to have passed legislation specifically to protect listed rivers (the *Heritage Rivers Act 1992*). Victoria has 18 designated Heritage Rivers and 15 Representative Rivers – the latter falling outside the provisions of the Act (Nevill and Phillips 2004). The Queensland Government nominated 19 rivers for consideration under their *Wild Rivers Act 2005*, and declarations are being prepared for some of these. In December 2005 the NSW Government announced the listing of five 'Wild Rivers' within existing terrestrial protected areas. A government report on aquatic ecosystem protection in Tasmania is expected in mid-2006.

At regional and national levels, the Murray Darling Basin Commission's Native Fish Strategy (MDBMC 2003) and the National Reserve System's Direction Statement (NRMMC 2005) both emphasise the need to expand freshwater protected areas, and these initiatives need strong support.

According to a recent scientists' consensus statement on the issue of freshwater protected areas (Kingsford et al 2006): "While there is no shortage of relevant policy in Australia, some protective mechanisms have not yet been used (many years after their development). (See for example see <http://www.ids.org.au/~cneville/PolicyFailure.doc>). In other cases 'protection' has been only partially applied without regard to important issues of hydrologic connectivity – with species extinction as a direct consequence. The most urgent initiative is to identify those ecosystems most at risk. A comprehensive national assessment of the

conservation status of freshwater ecosystems should be undertaken immediately. Such an assessment would provide both a platform and an impetus for the systematic expansion of the nation's freshwater protected areas.”

In conclusion, Australia's Ramsar sites, as well as a few of our largest national parks, do protect many important freshwater ecosystems. However the coverage of these reserves is neither representative nor comprehensive, and it is highly likely that many freshwater ecosystems are not represented at all within the protected area estate. The most urgent initiative, as Kingsford et al (2006) have suggested, is to identify which ecosystem types are not protected, and which are under most immediate threat.

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