Policy Failure: Australian Freshwater Protected Area Networks

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The Australian (Commonwealth) Government, as well as Australia's eight state and territory governments, is committed (on paper) to the protection of representative examples of all major ecosystems including freshwater ecosystems within networks of protected areas. However, with the exceptions of the Australian Capital Territory, Victoria and Tasmania, no government has funded a systematic attempt to action the commitment to freshwater ecosystems – and programs in Victoria and Tasmania both appear to have made little recent progress. Several statutory provisions for the creation of aquatic protected areas remain, after many years, un-used in freshwaters.

The pervasive failure of Australian governments to implement important policy tools (and other aspects of policy relating to the protection of freshwater ecosystems) raises questions about the real commitment of governments to policies which have no strong political constituencies. Failures in the context of both Commonwealth and state freshwater policy, particularly that relating to the strategic and systematic development of protected area networks, are examined. The Victorian situation, marked by advanced policy development as well as implementation 'delays' of over a decade, is selected for more detailed discussion. The advantages and disadvantages of different procedural approaches to the establishment of freshwater protected area networks are summarised, following a tabulation of relevant Australian statutes. Different explanations of government inaction are listed; however, lack of hard evidence leaves most explanations in the realm of speculation.

Introduction

The world's first legislation establishing a national system for river protection was the USA's *Wild and Scenic Rivers Act 1968*, and since that time many USA states have passed mirror legislation – with 172 rivers or river reaches now receiving statutory protection. In 1984, Canada, one of the worlds wettest countries, created a system to protect the nation's most important rivers – the Canadian Heritage Rivers System (CHRS 2005). Twenty-two years later, 40 rivers (or river reaches) have been protected under this system, which is now so popular that nominations over the last several years have been driven solely by community pressure. The situation in Australia, one of the world's driest countries, is quite different. Here, most of the policy initiatives aimed at the protection of biodiversity through the creation of strategic freshwater (here meaning 'inland aquatic') protected area networks have been only partially implemented, after long delays.

This article examines one of the themes of a 270-page report, *The Australian Freshwater Protected Area Resourcebook* (Nevill and Phillips 2004) and so relies heavily on this report in citations. The purpose of this article is to chronicle Australian examples of freshwater protected area policy failure, within a framework which allows the reader to see the issue of failure in some perspective. The advantages and disadvantages of alternative approaches relating to the governance of freshwater protected area networks are briefly discussed.

In attempting to explain the failures discussed, this article does not conform to standard qualitative or quantitative scientific analysis in either forming and testing hypotheses or in developing testable arguments that can lead to firm conclusions. The reason for this is simple - the policy process, particularly with respect to the timing of implementation programs, is by-and-large conducted confidentially, and frequently involves Ministerial decision-making that is not made public. This leaves academics and members of the public ignorant as to the reasons behind the delays in implementation. When delays stretch into many years over which time the commitment is re-affirmed but implementation continues to be delayed, it is difficult or impossible to obtain a coherent explanation. Direct contact with government through the relevant Minister's office seldom yields useful information. This is an inevitable limitation of the article.

In democratic societies, policy development plays an important role in the function of governments. Broad policies feature heavily during election campaigns, providing voters with information on the general

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intentions of governments. Once elected, democratic governments commonly engage in policy development programs that provide stakeholders (and the public generally) with the opportunity to contribute views, values and information as policies are developed into more detailed strategies. Once developed, such strategies provide the rationale and priority to justify and direct government expenditure programs. Pubic participation in the development of detailed strategies is seen as enhancing, at least in theory, the relevance and public ownership of subsequent government programs. This is the commonly understood role of policy in democratic government (Bridgman and Davis 2004).

According to the United Nations *Convention on Biological Diversity 1992* (to which Australia is a signatory), the conservation of biodiversity, including aquatic biodiversity, requires the protection of representative examples of all major ecosystem types (especially those vulnerable to degradation), coupled with the sympathetic management of ecosystems outside those protected areas. These are the twin cornerstones of biodiversity conservation strategies throughout the world.[1] Although the Commonwealth Government, and all eight Australian state and territory governments are committed to this approach, only Victoria, Tasmania and the Australian Capital Territory (ACT) have funded specific programs aimed at establishing fully representative systems of inland aquatic protected areas. In Victoria and Tasmania, these systems remain substantially incomplete after delays of many years. Although all jurisdictions have established reserves (e.g. Ramsar sites, flora and fauna reserves) that protect aquatic ecosystems, the degree to which such reserves protect *representative* aquatic ecosystems has not been assessed systematically in any Australian state other than the ACT (Nevill and Phillips 2004). Generally speaking, protected areas are the single most important tool for the conservation of biodiversity worldwide (ESA 2003).

The scope of this article does not include discussion of the role or efficacy of freshwater protected areas. While the management of freshwater protected areas is often complicated by issues of cross-boundary connectivity, a variety of approaches are available to address these issues (Saunders *et al.* 2002). Although the history of freshwater protected areas contains examples of failures as well as successes (Keith 2000; Crivelli 2002), there is no doubt that freshwater protected area networks are valuable conservation tools, and their expansion in Australia is long overdue (Kingsford *et al.* 2005; Kingsford and Nevill 2006).

Due to the limitations on length of this article, it cannot present a 'balanced' picture in the sense that it does not examine areas where other aspects of freshwater policy have been successfully developed and implemented. For that discussion, readers are referred to Smith (1998), Nevill and Phillips (2004), and (with regard to environmental flows) to – for example – papers by Arthington *et al.* (1998) and Ladson and Finlayson (2002). Notable achievements of the last three decades include the expansion of the Ramsar network; the development of natural resource or catchment management frameworks which in part seek to protect aquatic ecosystems; national river health monitoring and reporting programs; progress in all states in delivering environmental flows; and improvements in inland water quality brought about by pollution control programs.

This article concludes that there is evidence of pervasive and long-standing failures to implement important government policy in the area under discussion. Although this conclusion has serious ramifications with regard to national biodiversity conservation goals, explanation of the reasons behind the failure ultimately rests on speculation rather than hard evidence.

National freshwater protected area policies

At a national level, the establishment of systems of representative protected areas has been identified as an important commitment of the Commonwealth Government in several key strategies, including the *National Strategy for Ecologically Sustainable Development* (COA 1992a), the *Intergovernmental Agreement on the Environment* (COA 1992b) and the *National Strategy for the Conservation of Australia's Biological Diversity* (COA 1996).

Objective 10.1 of the *National Strategy for Ecologically Sustainable Development* states that the objective for Australia's nature conservation system is:

> to establish across the nation a comprehensive system of protected areas which includes representative samples of all major ecosystems, both terrestrial and aquatic; manage the overall impacts of human use on protected areas; and restore habitats and ameliorate existing impacts such that nature conservation values are maintained and enhanced (COA 1992a, p. 54).

Item 13 of the *InterGovernmental Agreement on the Environment*, 'Schedule on Nature Conservation' states that:

1. See Principle Eight of COA (1996). This requirement was re-affirmed by the 2004 World Conservation Congress (see Appendix 18 of Nevill and Phillips 2004).

> the parties agree that a representative system of protected areas encompassing terrestrial, freshwater, estuarine and marine environments is a significant component in maintaining ecological processes and systems. It also provides a valuable basis for environmental education and environmental monitoring. Such a system will be enhanced by the development and application where appropriate of nationally consistent principles for management of reserves (COA 1992b, p. 40).

In the *National Strategy for the Conservation of Australia's Biological Diversity*, protected areas are to be integrated with other measures for achieving ecologically sustainable use of natural resources. Objective 1.4 is to:

> establish and manage a comprehensive, adequate and representative system of protected areas covering Australia's biodiversity (COA 1996, p. 9).

It has been recognised for many years that a system of protected areas needs to be representative of ecosystem biodiversity (UNEP 1972; Specht *et al.* 1974), and that such reserves need to be complemented by enthusiastic off-reserve protection (Frith 1973). Biodiversity will decline as ecosystems are modified and simplified by human use; without systems of representative reserves, species and ecosystems face very real risks of extinction.

A detailed discussion of national agreements and Australian Government programs is set out in Appendices 2 and 3 of Nevill and Phillips (2004). Under the Australian constitution, the powers of the Commonwealth Government to manage land are limited principally to land owned by the Commonwealth (of which there is comparatively little) and land affected by activities dependent on Commonwealth export or import powers (again, comparatively little). The *Intergovernmental Agreement on the Environment*, however, paved the way for the development of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), which significantly expanded the Commonwealth's scope and mandate in relation to the protection of natural areas – at least in theory.

The Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act, Part 3, Division 1 (matters of national environmental significance) and Part 15 (protected areas), Division 2 (wetlands of international importance) provide for the protection of wetlands of international importance, and together extend the limited powers of the Commonwealth under the Australian Constitution for area management. Under the Act, the Commonwealth has statutory power to designate 'wetlands' for inclusion in the Ramsar Convention List (s. 326). This provision applies broadly and is not restricted to land owned or managed by the Commonwealth. Under ss. 16-17, the Commonwealth can declare a wetland to be a 'declared Ramsar wetland', which is an interim listing while the wetland awaits formal designation under Article 2 of the Ramsar Convention (the *Convention on Wetlands 1971*; Ramsar Convention Secretariat 1971). An important point to note here is that, implicitly, the Ramsar definition of 'wetland' applies, thus providing Commonwealth authority over both flowing water (rivers and streams) and shallow marine waters (eg; estuaries) in addition to the lentic ecosystems more traditionally viewed as wetlands - see Nevill and Phillips (2004), Appendix 8.

The Commonwealth can only invoke these powers if it is convinced that the wetland is of national or international importance (according to Ramsar criteria – see Ramsar Convention Secretariat 2006 or Appendix 7 in Nevill and Phillips 2004) and that its ecological character is under threat (s. 17A). Once an area is declared or designated, actions that will have, or are likely to have, a significant detrimental impact on the wetland are prohibited, unless specific authorisations or exemptions apply (ss. 16, 17B). These provisions thus provide an avenue for Commonwealth authority over state land that is absent under Constitutional arrangements alone.

Amendments introduced to the EPBC Act in 2003 extend these provisions by allowing the Commonwealth to list *places* (including, for example, important freshwater ecosystems such as rivers) under a list called the National Heritage List, provided that they demonstrate nationally important environmental values. Once on this list, a river could be protected under the Commonwealth powers invoked by the Act in a similar way to that described above. However, the Commonwealth has already displayed a marked reluctance to use existing provisions within the Act to protect places: there have been administrative delays extending to several years in applying provisions relating to threatened species, critical habitat, and threatened ecological communities (Beynon *et al.* 2005).

The ability of the Commonwealth to protect important State sites *without the consent of the states* (using either of the two mechanisms outlined above) has not yet been applied. Indirectly, however, the existence of the possibility of Commonwealth intervention provides an additional incentive for states to enter bilateral agreements with the Commonwealth directed at sustainable use of natural resources and conservation of nationally and internationally important sites – as exemption provisions can be written into bilateral

agreements which return Commonwealth powers to the states. The existence of these Commonwealth powers also provides an incentive for the states to cooperate with the Commonwealth in developing programs aimed at achieving a national approach to the conservation of Australia's most important freshwater ecosystems (such as the programs outlined by Kingsford *et al.* 2005, or those described in Chapters 7 and 10 of Nevill and Phillips (2004)).

Bilateral Commonwealth-state agreements and MoUs may however allow the Commonwealth to take action where required action is not being taken by the state. The Commonwealth took legal action under the EPBC Act for the first time in 2003 in relation to landowner clearing in the Ramsar-listed Gwydir Wetlands; this presents an example of Commonwealth legal action in a situation where the State Government (NSW) had chosen not to enforce its own protective legislation (in this case, relating to the clearing of native vegetation).

An overview of the 2003 National Heritage List amendments, obtained from the Commonwealth's website, is included in Appendix 13 of Nevill and Phillips (2004). More details on the EPBC Act are found in section A3.5 of Nevill and Phillips (2004).

State and Territory freshwater protected area policy

Generally speaking, freshwater protected areas can be established either through:

- special purpose legislation (e.g. Victoria's *Heritage Rivers Act 1992)*
- legislation designed primarily for the purposes of creating terrestrial reserves (e.g. the ACT's River Reserves, created under the *Land (Planning and Environment) Act 1991)*
- fisheries legislation containing area protection provisions
- management plans having authority under a variety of different statutes (e.g. the Canadian Heritage River System (CHRS) works primarily through the development of river management plans authorised under various provincial statues. If a similar system was instituted in the Australian context, it could take advantage of area protection provisions within catchment legislation, such as Victoria's *Catchment and Land Protection Act 1994).*

Table 1 summarises information on Australian approaches to the establishment of aquatic protected areas. The Canadian and USA national systems are included by way of comparison, as they represent the two oldest, and arguably the two most successful, national river protection frameworks globally.

All Australian states have established protected areas over wetlands. In most cases, these reserves have been created using statutes focused on the creation of terrestrial reserves. The statutes authorising the creation of terrestrial reserves are often named by titles such as 'Land Act' or 'National Parks and Wildlife Act'. Table 1 is focused on mechanisms created or used (in part) to protect inland aquatic areas. It includes examples of different approaches that either have been used to protect inland waters (such as the ACT's land-based river reserves), or have been created with a clear intention of protecting inland waters (such as the as yet un-used provisions of Tasmanian fisheries legislation).

It should be noted that Queensland 'fish habitat areas' and New South Wales 'aquatic reserves' have not yet been established in freshwater, although they have been established in estuarine and marine waters (Hankinson and Blanch 2002). Similarly, the 'aquatic reserve' provisions of SA's *Fisheries Act 1982* have not yet been used in freshwater, like the equivalent provisions of the Victorian *Fisheries Act 1995*. The Tasmanian 'fauna reserve' provisions have also not been used at this stage in freshwater. The New South Wales 'wild river' provisions *have* been recently used, many years after they were first introduced, and the Queensland Government has (somewhat slowly) nominated five rivers for declaration under the *Wild Rivers Act 2005* (Nevill 2006).

Table 1 includes mention of the 'special area' controls in NSW's *Sydney Water Catchment Act 1998* and Victoria's *Catchment and Land Protection Act 1994*, as well as the 'environmental protection provisions' in the NSW Water Management Act 2000 (see Chapter 6 and Appendix 4 of Nevill and Phillips 2004) – all of which could be used to protect discrete freshwater areas, although at this stage, they have not yet been utilised for this specific purpose.

International agreements and national policies relating to the protection of biological diversity encourage the protection of critical habitats. The Victorian *Flora and Fauna Guarantee Act 1988* provides powers to designate and protect critical habitat areas that could apply to aquatic ecosystems; however, it is noteworthy that these provisions have not yet been applied to protect freshwater areas.

Protected areas are created to protect the values of places and ecosystems, not to protect the areas themselves. There are a number of different techniques which

Table 1. Administrative models for establishing aquatic protected areas.

	Enabling Act	Clear statement of purpose/ objective	Scope				Public / private land may be declared	Area (reserve) controls are available	Catchment landuse (buffer) controls are available	Water use controls (extraction, dams etc) are available
			biodiversity protected	geodiversity protected	recreational, landscape protected	historical, cultural, spiritual				
USA Wild and Scenic Rivers	*Wild and Scenic Rivers Act 1968*	Yes, s. 1(b) and 1(c) emphasis protection of free flow	Yes (fish and wildlife)	Yes	Yes	Yes	Both	Type Bi, mining and dredging may be prohibited	Type 3 ('immediate environments')	Type 3 obligation to protect 'free flowing condition'
Canadian Heritage River Sys.	No specific enabling legislation	Yes, protection of river values	Yes	Yes	Yes	Yes	Both	Type Bii, using various provincial statutes	Type 3, under management plans.	Type 5, no dams
ACT river reserves	*Land (Planning and Environment) Act 1991*	Yes, s. 7 promote ecologically sustainable	Yes	Yes	Yes	Yes, historical, cultural	Public (no freehold land in the ACT)	Type Bi	Type 2	Type 2
Western Australian reserves	*Land Administration Act 1997*	Implicit aquatic purpose	Yes	Protect 'natural' values	Yes	Yes	Public	Type A	Type 1	Type 1
SA aquatic reserves	*Fisheries Act 1982*	Section 47 s. 48: protection of habitat	Yes	No	No	No	Public	Type Bi – see s. 48G	Type 1	Type 1
NSW 'special area' controls	*Sydney Water Catchment Management Act 1998*	yes – s. 44 protect water quality or ecological integrity	Yes – s.44 'ecological integrity' protected	No	No	No	Public	Type Bi	Type 1	Type 3 - water extraction may be controlled
NSW Aquatic Reserves	*Fisheries Management Act 1994*	Act s. 3 - includes conserve biodiversity	Yes	No	Recreation only	No	Both	Type Bi, mining is prohibited	Type 2	Type 1
NSW Wild Rivers	*National Parks and Wildlife Act 1974*	No statement as to purpose of WR designation	No guidance	No guidance	No guidance	No guidance	Public	Designated rivers are already in protected areas	Type 2	Type 2
NSW env protection (zone) provisions	*Water Management Act 2000*	S. 34 'to minimise harm to water sources'	Oblique - see s. 34.	No	No	No	Both	Type Bi – minister can veto a development application	Type 1	Type 2
Queensland fish habitat areas	*Fisheries Act 1994*	No statement as to purpose of FH area	Fish habitat protection only	No	No	No	Both	Type A	Type 1	Type 2
Queensland Wild Rivers	*Wild Rivers Act 2005*	Section 5, preserve natural values	Yes; protect natural values	Yes	Yes, implicitly	No	Both	Type Bi	Type 2 floodplain and subartesian areas can be defined	Type 5 declaration can control un-allocated water flow
Tasmanian Fauna Reserve	*Inland Fisheries Act 1995*	No statement of objective, but see Act ss. 154-155	Yes	No	No	No	Both	Type A	Type 1	Type 2
Victorian Critical Habitat	*Flora and Fauna Guarantee Act 1988*	Yes, s. 1 conserve flora and fauna	Yes	No	No.	No	Both	Type A	Type 2	Type 2
Victorian Heritage Rivers	*Heritage Rivers Act 1992*	Yes; see Act s. 1 and s. 7	Yes	Yes	Recreation only	No	Public	Type Bi; see s. 10.	Type 5; see s. 10, s. 12.	Type 5; obligation to maintain 'free flowing state' s. 9
Victorian Fisheries Reserves	*Fisheries Act 1995*	Yes, s. 88. protection of species and habitats	Yes	No	Passive recreation only	No	Both	Type Bi. see s. 89	Type 1	Type 1
Victorian 'special area' controls	*Catchment and Land Protection Act 1994*	Yes; s. 27 – protect land, water, aquifer and habitat quality	Yes – s. 27 protect aquatic habitat	No	Protect the 'quality and condition' of the land	No	Both	Type Bi.	Type 1	Type 3 – through referred controls

Table 2. Some general statutory techniques for protection of environmental values.

Area or buffer *	Technique	Code
Area	Management plan may be prepared, values may be monitored and reported. Activities within the area must comply with the management plan once finalised.	Type A
Area	Management plan must be prepared and approved. Plan must seek to protect values. Activities within the area must comply with the management plan once finalised. Type Bii values must be monitored and reported.	Type Bi Type Bii
Buffer	Approvals for developments (including water use) within the buffer may consider likely effects on area values.	Type 1
Buffer	Approvals for developments (including water use) within the buffer must consider likely effects on area values.	Type 2
Buffer	Approvals for developments within the buffer must seek, amongst other objectives, to protect the area values.	Type 3
Buffer	Approvals for developments within the buffer must seek, amongst other objectives, to protect the area values. A precautionary approach must be applied to approvals relating to the cumulative effects of incremental buffer developments.	Type 4
Buffer	Approvals for developments within the buffer must seek, amongst other objectives, to protect the area values. Certain activities likely to prejudice area values are prohibited, subject to strict exemption clauses.	Type 5
Buffer	Approvals for developments within the buffer must conform to an approved catchment plan (or strategic environmental assessment) which seeks to limit the cumulative effects of incremental developments well before the catchment approaches a crisis point, or changes begin to degrade area values.	Type 6

* 'buffer' as used here means the land outside the boundary of the designated area which directly influences aquatic values within the area. In the case of surface flows, this will be the stream catchment; in the case of sub-surface flows, this will be the groundwater catchment.

governments can use to encourage the protection of such values. In order to simplify the listing of legislation in Table 1, a few general statutory techniques are coded as in Table 2.

A degree of licence and summary has been used in interpreting statutes in order to extract useful patterns of approach – and prevent the table clogging with detailed legal discussion.

Note that Table 1 does not contain examples of two mechanism types: Type 4 and Type 6. Type 4 is included in Table 2 as it is represented by an important example outside the area of land management: the Commonwealth *Fisheries Management Act 1991*, which, like catchment management controls, confronts difficult issues of the control of the cumulative effects of incremental development. The precautionary approach of the fishery model could well be applied to land management, and in fact the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, through its emphasis on the precautionary approach, provides a lead in this direction. Type 6 is included in Table 2 as this approach is strongly recommended by Nevill (2003) in a paper discussing the management of cumulative effects within catchments.

Table 1 illustrates that states have taken a variety of different policy approaches to freshwater area protection, using similar procedural 'building blocks'. A protected area system which places a high priority on minimising controls on surrounding land uses, and minimising adverse impacts on future land and water developments in the wider catchment, will favour a Type A area management approach together with buffer controls of Types 1, 2 or 3. On the other hand, utilising a Type Bii area management approach alongside buffer controls of Types 4, 5 or 6, places protection of important biodiversity values as a high priority, signalling a real commitment to biodiversity conservation – providing of course that the system is in fact implemented.

Table 1 indicates that no one model has been favoured across jurisdictions. An obvious question is (even given patchy implementation): what has been learned from the different approaches, and do some methods work better than others? This question is outside the scope of the present article, but it is worth noting that Saunders *et al.* (2002), in an important review, has addressed this issue in terms of general models for freshwater protected areas. With regard to the Australian scene, Cullen (2002a) extends some of the Saunders *et al.* (2002) concepts, while Cullen (2002b) suggests a national approach to conserving high-value rivers, borrowing some Canadian ideas. Maher *et al.* (2002) provide a comparative review of state water legislation, and recommend a 'model framework' for water legislation which in part addresses the issue of protected areas. Bennett *et al.* (2002) make similar, although more general, recommendations to guide the conservation of freshwaters. Nevill and Phillips (2004, chapter 7), focusing on river protection, discuss management elements likely to increase the effectiveness of conservation programs. Kingsford *et al.* (2005) examine Australian management systems, and recommend adoption of elements of the Canadian CHRS model.

These seven major papers all stress the perhaps obvious point that the values of freshwater ecosystems cannot be protected without protecting both surface flow regimes and the hydrology and water quality of the wider catchment.

Generally speaking, studies of comparative freshwater conservation programs do suggest that certain elements are critical:

- a clear statement of statutory purpose and management objectives, focusing on the protection of (natural and cultural) ecosystem values
- genuine stakeholder involvement through consultation, monitoring and reporting frameworks dedicated, in part, to promote adaptive management
- local management autonomy within a strong (and financially supportive) framework of national strategic conservation objectives and priorities
- obligations (not options) on decision-makers to apply a precautionary approach to the management of the cumulative effects of incremental developments within the catchment
- controls over both public and private land, with a development approvals process applicable to the wider catchment which *must* seek to protect identified ecosystem values, amongst other planning objectives
- use of natural resource accounting approaches aimed at measuring and maintaining both the overall value of natural assets, as well as the value of continuing ecosystem services
- multi-faceted management approaches, with the most important ecosystems largely managed within protected areas, surrounded by controlled buffers, with utilised ecosystems in the wider catchment managed sympathetically – all supported by comprehensive and accessible national freshwater ecosystem inventories.

Table 3. State representative freshwater reserve commitments and programs.

	Commitment contained in:	Specific implementation program
National	• *National Strategy for Ecologically Sustainable Development* (ESDSC 1992) • *Intergovernmental Agreement on the Environment* (DEH 1992) • *National Strategy for the Conservation of Australia's Biological Diversity* (DEST 1996)	*National Reserve System Program* NRS Directions Statement (NRMMC 2005) targets freshwater representation.
ACT	• *Nature Conservation Strategy* (Gov. ACT 1998)	*Nature Conservation Program* - effectively complete.
NSW	• Rivers and Estuaries Policy (Gov. NSW 1992) • Wetlands Management Policy (Gov. NSW 1996) • Biodiversity Strategy (Gov. NSW 1999)	*None.* The State Aquatic Biodiversity Strategy, due for release in 1999, has not yet been published.
NT	• Strategy for Conservation of the Biological Diversity of Wetlands (Gov. NT 2000)	*None.* Conservation strategies under review 2005.
Qld	• *Strategy for the Conservation and Management of Queensland Wetlands* (Gov. Qld 1999)	*None.*, However, a comprehensive state wetland inventory under preparation should enable identification of poorly represented freshwater ecosystems. The wild rivers program, although a separate commitment, seems likely to assist in meeting systematic conservation objectives.
SA	• Wetlands Strategy (Gov. SA 2003). The policy has an explicit commitment to representative wetland reserves, set against a wide interpretation of the meaning of 'wetland'.	*None* – however efforts are being made within the Parks program to purchase poorly represented wetland types (Nevill and Phillips 2004).
Tas	• Nature Conservation Strategy (Gov. Tas. 2000) • Water Development Plan (Gov. Tas. 2002) • Conservation of Freshwater Ecosystem Values (CFEV) Project (Gov. Tas. 2004)	State budget 2002 funded the *CFEV project* (see Appendix 10 of Nevill and Phillips 2004). No specific funds allocated for project implementation in the 2004 or 2005 State budgets.
Vic	• Conservation Strategy for Victoria (Gov. Vic. 1987) • Biodiversity strategy (Gov. Vic. 1997a, 1997b, 1997c) • Healthy Rivers Strategy (Gov. Vic. 2002)	*Heritage Rivers Program.* Representative wetlands component of the CS incomplete although progressing slowly. *Healthy Rivers Program.*
WA	• Wetland Conservation Policy (Gov. WA 1997) • This commitment was not reinforced by the *Draft Waterways WA* policy (WRC 2000) (Nevill and Phillips 2004).	*None.* The Waterways WA Policy, due for publication initially in 2003, has not yet been released.

Table 3 lists specific state commitments to the development of systems of representative freshwater protected areas, and the programs developed to put these commitments in place. More detail on state programs is contained in Nevill and Phillips (2004), particularly in Chapter 6 and Appendix 4.

All states have programs in place designed to meet commitments under the Ramsar Convention - these commitments include the development of freshwater ecosystem inventories, and (in theory, although usually not in practice) the establishment of systems of reserves covering the full range of wetlands included in the Ramsar definition of the term. In no state are these programs complete and up-to-date, although work, particularly on ecosystem inventories, continues - with Victorian, Tasmanian and ACT inventories being the most advanced. Approaches used in Queensland are perhaps the most ambitious; however, this program, and the also-ambitious NSW program, are advancing slowly under present funding arrangements.

The ACT is the only jurisdiction to successfully establish a reasonably comprehensive system of representative freshwater protected areas including both still and flowing ecosystems (Nevill and Phillips 2004). The ACT has the advantage of being the smallest Australian jurisdiction, as well as having, historically, the most favourable funding. As discussed above, the ACT, Victoria, and Tasmania are in fact the only jurisdictions to attempt to directly action their 'representative freshwater protected area' commitments. The Victorian program, while seemingly ambitious, has not been completed and is currently under review as part of the Healthy Rivers Program, with major commitments dating back more than a decade incomplete (Nevill and Phillips 2004). The Tasmania system is under development, with the inventory phase due for completion at the close of 2006. No specific funds for program implementation were allocated in the 2004/05 or 2005/06 state budgets.

Of the five remaining jurisdictions, Queensland and New South Wales have commenced the construction of state-wide freshwater ecosystem inventories, and South Australia is committed to doing so (building on existing regional wetland inventories). In Western Australia and the Northern Territory, action has not been taken to put in place either comprehensive state ecosystem inventories or state-wide systems of representative freshwater protected areas. Instead, these states have concentrated on the broader bioregional framework of the Commonwealth's National Reserves System Program (NRSP), which itself did not highlight the freshwater reserve issue until 2004 (see discussion in Nevill and Phillips 2004). It is to be hoped that action will be taken within the NRSP to establish a nationally agreed approach to the classification of freshwater ecosystems into categories or types, which could provide a framework for the long-term development of a national system of representative freshwater reserves.

Victorian State Government freshwater protected area programs

Victoria, although a long-standing leader in protected area policy, suffers from serious implementation problems relating to freshwaters. Major commitments relating to two important areas: protection of representative rivers, and protection of heritage rivers, remain substantially incomplete after nearly two decades. The systematic analysis of wetland ecosystems within the state's protected area network – necessary to ensure full representation – has also not been completed, many years after the initial policy commitment in 1987.

Victoria's *Reference Areas Act 1978* was the first Australian legislative expression of a commitment to protect representative ecosystems, and pre-dates Australia's support for the United Nations *World Charter for Nature* (UN 1982). Victoria's state Conservation strategy (Gov. Vic. 1987) committed the government to the strategic development of systems of protected areas which would include examples of all major ecosystem types – including rivers and wetlands. The strategy also committed the government to identify and protect Victorian rivers of high conservation value. This strategy predates all other similar state strategies[2] by more than five years, and predates renewed national and international interest in representative protected area policy in the early 1990s. However, after 19 years, commitments to the comprehensive protection of representative freshwater ecosystems, as well as commitments relating to the protection of important rivers ('representative rivers' and Heritage Rivers), have not yet been met.

A program of systematic terrestrial reservation commenced in Victoria under the recommendations of the Land Conservation Council in the 1980s, and has been continued by the agencies which in turn replaced the LCC: the Environment Conservation Council and the present Victorian Environment Assessment Council. Representative marine protected areas have also been established after a systematic examination of marine ecosystems within state waters.

Victoria's rivers were analysed to identify suitable 'representative' river ecosystems by the Land Conservation Council's *Rivers and Streams Special Investigation* (LCC 1989), which also identified rivers of high conservation value. Following the Victorian Government's acceptance of the Land Conservation Council's final recommendations in 1991 (LCC 1991), the government instructed its departments to protect 15 'representative rivers' through the development of appropriate management arrangements. Over 14 years later, of the 15 required management plans, only 11 have been drafted (Nevill and Phillips 2004), and none finalised. The Victorian Government has not reported publicly on the implementation of its representative rivers (or its heritage rivers) program. Protection of representative river ecosystems re-appeared as a commitment in Victoria's *Healthy Rivers Strategy 2002:* however, if this commitment receives the same level of action as the previous commitment, it appears likely that little will be done.

2. It should be noted, however, that Queensland has had a long-standing commitment to bioregional planning, dating as far back as 1978.

Following the LCC Rivers and Streams Investigation, Victoria passed a Heritage Rivers Act in 1992, nominating 18 rivers and 25 'natural catchments' to be protected. The Act requires a management sequence: (a) preparation of draft management plans, (b) public comment and review, (c) ministerial endorsement of the plans, and (d) implementation. In preparing a report to the Commonwealth Government on its Ramsar program, the Victorian Government committed to finalising the management plans by 1998. However, 14 years after the passage of the Act, all 18 river management plans remain as drafts without the required ministerial endorsement (Nevill and Phillips 2004).

While there is a clear gap between rhetoric and reality in relation to freshwater ecosystem protection, it should be noted that many significant wetland additions to Victoria's Nature Conservation Reserves have occurred through land purchases over the last decade (Fitzsimons *et al.* 2004, 2006).

Although Victoria has completed inventories of both wetlands and rivers, the state's wetland reserve system has never been fully analysed for inclusive representation of all major ecosystem types - a commitment now 19 years old - in spite of the 1987 commitments (to ensure the wetland reserve system is fully representative) reappearing in the Victorian Government's 1997 biodiversity strategy. However, the issue has been addressed in some regions, such as the Wimmera, by specific independent studies (Fitzsimons and Robertson 2003). Victoria's current use of Ecological Vegetation Class (EVC) data in efforts to systematically review wetland coverage has been retarded by data inaccuracies (Robertson and Fitzsimons 2004).

Policy failure: An overview

The examination above of Australian Commonwealth and state government policy related to freshwater protected areas reveals, generally speaking, a pervasive and long-standing failure in implementation.

At the Commonwealth level, the area protection provisions of the *Environment Protection and Biodiversity Conservation Act 1999* have, after a long period of inactivity, recently been used to protect freshwater ecosystems. However, the *development and application where appropriate of nationally consistent principles for management of [freshwater] reserves* (see above) has not taken place. Although various statements of freshwater management principles have been published, none has received endorsement at the national level, and in fact there has been no attempt at establishing a national consensus, with one exception: principles relating to environmental flows. The National Reserves System has recently highlighted the need for expansion of freshwater protected areas (NRMMC 2005), and it is important that this initiative receives strong support – especially given the increasing political focus on scarcity of freshwater resources for agriculture, industry and urban uses. It would be very disappointing to see this long-awaited initiative lapse when it is so urgently needed.

The United Nations Food and Agriculture Organisation's (FAO) *Code of Conduct for Responsible Fisheries 1995* requires compliant states to protect 'critical habitats'. Section 6.8 (FAO 1995, p. 6) states that: 'all critical fisheries habitats in marine and freshwater ecosystems, such as wetlands, mangroves, reefs, lagoons, nursery and spawning areas, should be protected and rehabilitated as far as possible and where necessary.' As noted above, all Australian states have developed fisheries legislation, with area protection provisions appearing in statutes developed by Queensland, New South Wales, Victoria, Tasmania and South Australia. Many years after the passage of legislation, however, none of these provisions has been used to protect freshwater areas, in spite of progress in marine and estuarine environments.

Commitments contained in the Ramsar *Convention on Wetlands 1971* require the development of inventories of freshwater ecosystems, including rivers, streams and some subterranean ecosystems. Of Australia's eight state and territory jurisdictions, ecosystem inventories covering both wetlands and rivers are nearing completion only in Victoria, Tasmania and the ACT - after 33 years. Tasmania, New South Wales and Western Australia are the only states to partially address subterranean ecosystems in state-sponsored ecosystem inventories, and even here, collected data is very uneven (Nevill and Phillips 2004).

Victoria, although a leader in policy development, has failed to implement important commitments relating to the systematic development of protected area networks containing fully representative wetland ecosystems. Victoria has failed to implement commitments relating to the management of heritage rivers and representative rivers, 19 years after these commitments first appeared in state policy documents. The 'critical habitat' provisions of Victoria's endangered species legislation (the *Flora and Fauna Guarantee Act 1988)* have not been used to protect freshwater ecosystems. Similarly, the 'special area' provisions of Victoria's *Catchment and Land Protection Act 1994* have not been used to protect

freshwater ecosystems, nor have the area protection provisions of Victoria's *Fisheries Act 1995* been used to protect freshwater ecosystems.

The protection of representative and important rivers and wetlands foreshadowed by Western Australia's *Wetlands Conservation Policy 1997* has not yet taken place, and the state's Waterways WA Policy, due in 2003, has not yet been released. In New South Wales, the Aquatic Biodiversity Strategy, promised for 1999, has not yet appeared.

Explanations of policy failure

Why is much important policy failing through lack of implementation, and why do existing protection tools, like the area management provisions of fisheries legislation, remain unused many years after declaration? As noted in the introduction, explanations for the lack of implementation action must remain largely speculative due to difficulties in penetrating the mists which surround high-level political and bureaucratic decisions.

As an example of these difficulties, I have written several times to the Victorian Minister for Sustainability and Environment, asking for explanations of the long delays in implementing both policy and statutory commitments. In my most recent letter I asked specifically for an explanation of the eight-year delay in finalising the draft Heritage River management plans. The reply came not from the Minister's office, but from a senior officer within the Department. The letter stated, '... it is intended the [draft] plans be reviewed to ensure they reflect the Government's current initiatives in river health and the extended role of Catchment Management Authorities' (Backhouse 2006, p. 1). However the reply provided no explanation of the delay, no commitment to report to the public on the implementation process, or new target dates for action.

Although it seems implausible, one explanation for the lack of enthusiasm for policy implementation could be that such policy has been developed without any real intention of implementation, presumably to demonstrate, at a superficial level, compliance with national and international conservation agendas.

Perhaps a more likely possibility is that freshwater ecosystems remain without a voice that can be heard at the political level. Australian stakeholders, such as fishers, landholders, Indigenous groups and conservationists, do not present, or attempt to present, a cohesive voice advocating freshwater ecosystem protection. Mainstream conservation lobby groups in general focus on more 'popular' terrestrial issues such as forest conservation. Scientists, academics and freshwater managers remain silent – with a few notable exceptions, and professional groups, such as the Australian Society for Limnology, speak only in muted tones. Where scientific conferences have published recommendations and press releases[3], media coverage has been minimal. Given that readily accessible freshwater is a scarce commodity in Australia, this creates a political and economic environment in which consumptive users have by far the loudest voice.

Bureaucratic inertia and poor strategic management may also be important factors.

A common feature of this situation is that even though there may be a range of river protection systems on the books, they are plagued by a lack of integration within (and across) jurisdictions, and each is established with little in the way of implementing and reporting mechanisms which encourage adaptive management or a system for assessment and evaluation to provide public feedback about success. The fact that such matters are implemented within a plethora of Acts leads naturally to such lack of integration. In Canada, the CHRS (see above) has been used as a coordinating mechanism by providing national goals and procedures within which different provincial management approaches are focused, and a similar national approach could be established in Australia using the Canadian system as a model (Nevill and Phillips 2004; Kingsford *et al.* 2005).

The absence of use of fisheries powers to protect rivers is perhaps not surprising; most fisheries agencies are assessed on their effectiveness to maintain fish catches for the commercial and recreational sectors, not on protecting freshwater habitats important to fish. The links between long-term conservation goals and short-term objectives are lost, and the downsides of failure usually easily worked around by agencies adept at managing public image and their relevant minister.

Additional problems are generated through the modern trend towards issue-driven and election-driven governance, slimming of government system capacity through dispatch of skilled workforce, and failure to base quality policy on quality science and knowledge. Another issue is the failure by governments to actually use adaptive management processes, such as environmental

3. The Fenner Conference on Freshwater Biodiversity (Canberra) 2000 and the National Conference on Freshwater Protected Areas (Sydney) 2005 both published recommendations and issued press releases. Mainstream media displayed little interest.

management systems, in spite of lip-service to these tools. The Victorian Government's failure to report on its Heritage Rivers Program is a case in point.

Concluding remarks

All Australian states are committed to the establishment of representative freshwater protected areas. However, in most cases, no systematic approach to their establishment has been attempted, or where it has been attempted (e.g. Victoria and Tasmania), it has been poorly implemented.

The failure of the Victorian Government to implement its Heritage Rivers Program is of considerable concern and needs detailed investigation, especially given Victoria's 'leading' position with respect to policy development. It appears that no (or very little) action has been taken to finalise and implement the 18 draft Heritage River management plans, prepared about a decade ago. It is noteworthy that none of the Heritage Rivers would (in a strict sense) meet the definition of 'protected area' discussed above, as no agreed management plans exist and no monitoring of heritage river values has been reported.[4] The draft management plans need to be re-examined in detail, and the current condition of the sites checked against any available historic data on condition and value. The results of such an investigation may show that no ecosystem deterioration has occurred, or they may indicate substantial deterioration. Such deterioration, if it has occurred, may be related to actions listed in the as-yet unimplemented management plans. Until the issue is examined independently, no clear conclusions can be drawn.

While the actual reasons for pervasive policy failure in the freshwater area may well be complex, there can be little doubt as to the ultimate outcome. Freshwater ecosystems, particularly those in the southern part of the Australian continent (where agricultural and urban demands for water are substantial) are degrading (NLWRA 2002a, 2002b), and this degradation will continue in the absence of well-managed reserve systems protecting viable examples of the full range of freshwater ecosystems, as well as provisions to protect ecological processes and biodiversity at catchment scales.

Acknowledgments

Professor Angela Arthington and Dr Martin Wardrop provided important comment on the manuscript. Dr Trevor J. Ward and Ms Rosemary Abbott (Monash University) provided helpful comments and additions to the text. This paper owes a considerable debt to those who assisted in preparation of the Australian Freshwater Protected Area Resourcebook (acknowledged in chapter 2, Nevill and Phillips 2004), as well as the scientists supporting the recent consensus statement (Kingsford and Nevill 2006).

References

Arthington, A.H., Brizga, S.O. and Kennard, M.J. 1998. *Comparative Evaluation of Environmental Flow Assessment Techniques: Best Practice Framework.* LWRRDC Occasional Paper 25/98. Land and Water Australia, Canberra.

Backhouse, J. 2006. Letter from Judy Backhouse, Executive Director, Conservation and Recreation, Department of Sustainability and Environment, Victoria, to Jon Nevill, dated 9 March 2006, departmental reference DSE020136.

Bennett, J., Sanders, N., Moulton, D., Phillips, N., Lukacs, G., Walker, K. and Redfern, F. 2002. *Guidelines for Protecting Australian Waterways.* Land and Water Australia, Canberra.

Beynon, N., Kennedy, M. and Graham, A. 2005. Grumpy old Greenies - Lament Waiting Lists, Wasted Opportunities and Wayward Pork Barrelling in Australia's Biodiversity Programs, Humane Society International Australia, Sydney.

Bridgman, P. and Davis, G. 2004. *Australian Policy Handbook. Third edition.* Allen and Unwin, Sydney.

Canadian Heritage Rivers System (CHRS). 2005. *The Canadian Heritage Rivers System.* CHRS, Ottawa, Canada. Online at http://www.chrs.ca (accessed 12 December 2005).

Commonwealth of Australia (COA). 1992a. *National Strategy for Ecologically Sustainable Development.* Prepared by the Ecologically Sustainable Development Steering Committee, endorsed by the Council of Australian Governments. Australian Government Publishing Service, Canberra. Online at http://www.deh.gov.au/esd/national/nsesd/strategy/index.html (accessed 13 November 2006).

Commonwealth of Australia (COA). 1992b. *Intergovernmental Agreement on the Environment.* An agreement by the Council of Australian Governments. Department of Environment, Sport and Territories, Canberra. Online at http://www.deh.gov.au/esd/national/igae/ (accessed 13 November 2006).

Commonwealth of Australia (COA). 1996. *National Strategy for the Conservation of Australia's Biological Diversity.* Department of the Environment, Sport and Territories, Canberra. Online at http://www.deh.gov.au/biodiversity/publications/strategy/index.html (accessed 13 November 2006).

Crivelli, A.J. 2002. The role of protected areas in freshwater fish conservation. In: Collares-Pereira, M., Cowx, I.G. and Coelho, M.M. (eds) *Conservation of Freshwater Fishes: Options for the Future.* Blackwell Science, Oxford.

Cullen, P. 2002a. *Conserving Natural Rivers: A Guide for Catchment Managers.* Cooperative Research Centre for Freshwater Ecology, University of Canberra, Canberra.

4. Refer Department of Sustainability and Environment annual reports and website: http://www.dse.vic.gov.au.

Cullen, P. 2002b. *The Heritage River Proposal: Conserving Australia's Undamaged Rivers.* Paper presented to the World Congress on Aquatic Protected Areas, Cairns Australia, August 14-17 2002.

Ecological Society of Australia (ESA). 2003. *Protected Areas: A Position Statement by the Ecological Society of Australia.* ESA, Canberra. Online at http://www.ecolsoc.org.au (accessed 12 April 2005).

Food and Agriculture Organisation of the United Nations (FAO). 1995. *Code of Conduct for Responsible Fisheries.* FAO, Rome.

Fitzsimons, J.A. and Robertson, H.A. 2003. Wetland reservation status and reserve design in the Wimmera, Victoria. *Ecological Management and Restoration,* 2(4): 140-143.

Fitzsimons, J.A., FitzSimons, P. and Ashe, C. 2004. Further strategic additions to Victoria's public protected area system. *The Victorian Naturalist,* 121(5): 215-225.

Fitzsimons, J.A., Williams, C. and FitzSimons, P. 2006. Ecological attributes of strategic land acquisitions for addition to Victoria's public protected area estate: 2004-2005. *The Victorian Naturalist,* 123(3): 134-145.

Frith, H.J. 1973. *Wildlife Conservation.* Angus and Robertson, Sydney.

Government of New South Wales (Gov. NSW). 1992. *New South Wales State Rivers and Estuaries Policy.* NSW National Parks and Wildlife Service, Sydney.

Government of New South Wales (Gov. NSW). 1996. *The New South Wales Wetlands Management Policy.* Department of Land and Water Conservation, Sydney.

Government of New South Wales (Gov. NSW). 1999. *New South Wales Biodiversity Strategy.* Department of Land and Water Conservation, Sydney.

Government of Queensland (Gov. Qld). 1999. *Strategy for the Conservation and Management of Queensland Wetlands.* Environmental Protection Agency, Brisbane.

Government of South Australia (Gov. SA). 2003. *Wetlands Strategy for South Australia.* Department of Environment and Heritage and Department of Water Resources SA, Adelaide.

Government of Tasmania (Gov. Tas.). 2000. *Developing Tasmania's Nature Conservation Strategy.* Department of Primary Industries, Water and the Environment, Hobart.

Government of Tasmania (Gov. Tas.). 2002. *Water Development Plan for Tasmania.* Department of Primary Industries, Water and Environment, Hobart.

Government of Tasmania (Gov. Tas.). 2004. *Conservation of Freshwater Ecosystem Values Project: Project Update June 2004.* Department of Primary Industries, Water and Environment, Hobart.

Government of the Australian Capital Territory (Gov. ACT). 1998. *Nature Conservation Strategy.* Australian Capital Territory Government, Canberra.

Government of the Northern Territory (Gov. NT). 2000. A Strategy for Conservation of the Biological Diversity of Wetlands in the Northern Territory of Australia. Parks and Wildlife Commission of the Northern Territory, Darwin.

Government of Victoria (Gov. Vic.). 1987. *Protecting the Environment – A Conservation Strategy for Victoria.* Victorian Government Printing Office, Melbourne.

Government of Victoria (Gov. Vic.). 1997a. *Victoria's Biodiversity - Our Living Wealth.* Department of Natural Resources and Environment, Melbourne.

Government of Victoria (Gov. Vic.). 1997b. *Victoria's Biodiversity - Sustaining our Living Wealth.* Department of Natural Resources and Environment, Melbourne.

Government of Victoria (Gov. Vic.). 1997c. *Victoria's Biodiversity - Directions in Management.* Department of Natural Resources and Environment, Melbourne.

Government of Victoria (Gov. Vic.). 2002. *Healthy Rivers, Healthy Communities and Regional Growth: Victorian River Health Strategy.* Department of Natural Resources and Environment, Melbourne.

Government of Western Australia (Gov. WA). 1997. *Wetland Conservation Policy for Western Australia.* Department of Conservation and Land Management and the Water and Rivers Commission, Perth.

Hankinson, A. and Blanch, S. 2002. Freshwater reserves in New South Wales Australia: A powerful but unused tool for conserving freshwater biodiversity. In: Beumer, J.P., Grant, A. and Smith, D.C. (eds) *World Congress on Aquatic Protected Areas,* pp. 583-592. Conference held August 2002, Cairns, Queensland. Australian Society for Fish Biology, Sydney.

Keith, P. 2000. The part played by protected areas in the conservation of threatened French freshwater fish. *Biological Conservation,* 92: 265-273.

Kingsford, R.T., Dunn, H., Love, D., Nevill, J., Stein, J. and Tait, J. 2005. *Protecting Australia's Rivers, Wetlands and Estuaries of High Conservation Value: A Blueprint.* Report to Land and Water Australia. Department of the Environment and Heritage, Canberra.

Kingsford, R.T. and Nevill, J. 2006. Urgent need for a systematic expansion of freshwater protected areas in Australia; A scientists' consensus statement. *Pacific Conservation Biology,* 12(1): 7-14. Also online at OnlyOnePlanet Australia, http://www.ids.org.au/~cnevill/freshwater.htm (accessed 19 August 2005).

Ladson, A.R. and Finlayson, B.L. 2002. Rhetoric and reality in the allocation of water for the environment: A case study of the Goulburn River, Victoria, Australia. *River Research and Applications,* 18(6): 555-568.

Land Conservation Council (LCC). 1989. Rivers and Streams Special Investigation: Study Background Report. LCC, Melbourne.

Land Conservation Council (LCC). 1991. *Rivers and Streams Special Investigation: Final Recommendations.* LCC, Melbourne.

Maher, M., Nevill, J. and Nichols, P. 2002. *Improving the Legislative Basis for River Management in Australia.* Volumes 1 and 2. Land and Water Australia, Canberra.

National Land and Water Resources Audit (NLWRA). 2002a. *Australian Catchment, River and Estuary Assessment 2002.* Volumes 1 and 2. Commonwealth of Australia, Canberra.

National Land and Water Resources Audit (NLWRA). 2002b. *Australian Biodiversity Assessment 2002*. NLWRA, Canberra.

Nevill, J. 2003. Managing the cumulative effects of incremental development in freshwater resources. *Environmental and Planning Law Journal*, 20(2): 85-94 (April 2003). Updated version online at http://www.ids.org.au/~cnevill/freshwater.htm (accessed 2 May 2006).

Nevill, J. 2006. *Counting Australia's Protected Rivers*. OnlyOnePlanet Australia, Melbourne. Online at http://www.ids.org.au/~cnevill/freshwater.htm (accessed 11 August 2006).

Nevill, J. and Phillips, N. (eds). 2004. *The Australian Freshwater Protected Area Resourcebook*. OnlyOnePlanet Australia, Melbourne. Online at http://www.ids.org.au/~cnevill/FW_ProtectedArea_SourceBook.doc (accessed 1 June 2006).

NRM Ministerial Council (NRMMC). 2005. *Directions for the National Reserve System - A Partnership Approach*. Prepared by the National Reserve System Taskforce of the NRM Ministerial Council's Land, Water and Biodiversity Committee. Department of the Environment and Heritage, Canberra.

Ramsar Convention Secretariat. 1971. *The Ramsar Convention on Wetlands: The Text of the Ramsar Convention and Other Key Original Documents*. Ramsar Convention Secretariat, Gland, Switzerland. Online at http://www.ramsar.org/index_very_key_docs.htm (accessed 12 December 2005).

Ramsar Convention Secretariat. 2006 *The Ramsar Convention on Wetlands: The Criteria for Identifying Wetlands of International Importance*. Ramsar Convention Secretariat, Gland, Switzerland. Online at http://www.ramsar.org/key_criteria.htm (accessed 12 December 2005).

Robertson, H.A. and Fitzsimons, J.A. 2004. Hydrology or floristics? Mapping and classification of wetlands in Victoria, Australia, and implications for conservation planning. *Environmental Management*, 34(4): 499-507.

Saunders, D.L., Meeuwig, J.J. and Vincent, A.C.J. 2002. Freshwater protected areas: Strategies for conservation. *Conservation Biology*, 16(1): 30-41.

Smith, D.I. 1998. *Water in Australia*. Oxford University Press, Oxford.

Specht, R.L., Roe, E.M. and Broughton, V.H. (eds). 1974. *Conservation of Plant Communities in Australia and New Guinea*. CSIRO, Melbourne.

United Nations (UN). 1982. *World Charter for Nature*. Annex resolution 37/7. United Nations General Assembly, New York. Online at (accessed 13 November 2006).

United Nations Environment Program (UNEP). 1972. *Declaration from the United Nations Conference on the Human Environment, Stockholm*. UNEP, Nairobi, Kenya. Online at http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=97&ArticleID=1503 (accessed 12 December 2005).

Water and Rivers Commission (WRC). 2000. *Draft Waterways WA - A Policy for Statewide Management of Waterways in Western Australia*. Statewide Policy No. 4. Water and Rivers Commission, Perth.

For additional background, readers are referred to the ASL representative reserves bibliography, online at http://www.ids.org.au/~cnevill/ASL_bibliography.htm.