Australian Government
Land & Water Australia

final report

knowledge for managing Australian landscapes

Improving the legislative basis for river management in Australia

Stage 2 Report

Project number: MMA2

Principal Investigator

Mary Maher
Mary Maher & Associates
17 Katrine Street
West End QLD 4101

Email: mail@marymaher.com.au
Telephone: 07 3844 9183
Facsimile: 07 3844 3357

Investigators

Jon Nevill, Only One Planet Consulting
Peter Nichols, Mary Maher & Associates

Published by:

Postal address: GPO Box 2182, Canberra ACT 2601

Office location: Level 1, The Phoenix, 86-88 Northbourne Ave, Braddon ACT

Telephone: 02 6263 6000

Facsimile: 02 6263 6099

Email: enquiries@lwa.gov.au

Internet: www.lwa.gov.au

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Improving the legislative basis for river management in Australia – Stage 2 Report

Volume 1 – Main Report

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Prepared by
Mary Maher, Jon Nevill, Peter Nichols

Mary Maher & Associates
17 Katrine Street
West End. 4101.

Project Coordinator:
Dr Phil Price

Australian Government
Land & Water Australia

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Client	National Rivers Consortium, Land and Water Australia
Project Director	Mary Maher, Mary Maher & Associates
Project Team	Mary Maher, Mary Maher & Associates Jon Nevill, Only One Planet Consulting Peter Nichols, Mary Maher & Associates
Peer review	Poh-Ling Tan, Lecturer, Faculty of Law, Queensland University of Technology Alex Gardner, Senior Lecturer, Law School, University of Western Australia Jason Alexandra, Alexandra & Associates, Victoria Jennifer McKay, Associate Professor of Business Law, School of International Business, University of South Australia
Consultancy details	Mary Maher & Associates 17 Katrine Street, West End 4101. Phone 07 3844 9183, Fax 07 3844 3357, Email mail@marymaher.com.au
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Acknowledgments	We wish to thank all those who participated in the workshop and interview program for their constructive comments and criticisms. Appendix C in Volume 2 of this report contains the full listing of workshop participants and interviewees in the four States. John Scanlon and Megan Dyson made major contributions to the design of the project. The project also owes a debt to those who contributed to the 1999 Stage One report (Maher, Cooper & Nichols, 1999) Special thanks go to *State organisers and respondents* Verity Klemm, Peter Howard, Alex Gardner, Rod Banyard, Marnie Leybourne, Luke Penn, Jade Coleman (Western Australia). Bernice Cohen, Stevie Austin, Birgitte Sorensen, Penny Paton, James Levinson, Kathryn Bellette (South Australia). Mike Temple-Smith, Jeff Gilmore, Lynne Powell (Tasmania). Jane Doolan, Carol Roberts, Ian Morgans, John Oates, Tim Fisher, Peter Lyon, Andrew Major, and Robin Sanders - for his insights on top-down and bottom-up approaches (Victoria). While the development of the report owes much to those who contributed through workshops and interviews, it has also been heavily influenced by current thinking on ecological systems, good governance, and organisational management.

ABSTRACT

The report reviews developments to April 2001 in Australian water resource law and in stakeholders' experiences. It analyses legislation through eight 'indicatory topics' and through questionnaires, interviews and workshops, in four voluntarily-participating States: South Australia, Tasmania, Victoria and Western Australia.

It proposes a Model Legislative Framework, based on earlier work, to guide development of water resource law in moving towards sustainable rivers. It calls for a catchment agency to manage all impacts on rivers; defined in their fullest sense. It calls for catchment strategic plans, to override conflicting mechanisms. It requires independent regular auditing and public reporting at State and catchment level, against defined provisions. The Framework is based on processes for good governance and systems management, with the onus on stakeholders to develop and deliver sustainable management as the way to ensure sound economies based around river and water resource use.

This Framework can generate debate about the role of a clarified and strengthened legal framework to achieve sustainable river management, including sustainable water use – increasing production while enhancing ecological assets. In addition, the project established that:

- the 'command and control' role of legislation has been extended in several States to contain a basis for stakeholder engagement and partnerships in sustainable river management

- the Framework's robustness was demonstrated through benchmarking the Framework against major national initiatives, and

- there has been indifferent performance by the participating States assessed against the water reform agenda of COAG 1994, this project's questionnaire and the Framework.

The process of a river's decline….

Keith Bradb,y when he was appointed coordinator of catchment management in the Peel Harvey catchment, considered the following answer to his question: 'what had gone wrong?'

> *In 1910, the Fisheries Inspector at Mandurah felt that drain construction had caused severe damage to the estuary. In the 1940s, fishers warned that serious changes were happening in the estuary. In the 1960s these changes were evident for all to see. In the 1970s, studies into the cause of the changes began. In the 1980s these studies continued, and some management measures were introduced. But it was not until the 1990s that management of the problem was consolidated into programs certain to improve the health of the waterway. The Dawesville Channel will remain a symbol of the risk and expense we must endure if we ignore, or are slow to act on, the warning our environment gives us. What vital early warnings are we currently ignoring? How desperate will be the next round of solutions?*
>
> (Bradby, K, (1997) *Peel-Harvey – The Decline and Rescue of an Ecosystem*, Greening the Catchment Taskforce, Mandurah, WA)

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EXECUTIVE OVERVIEW

Summary of the project

Following an earlier study in 1999 (the Stage One Report – Maher, Cooper & Nichols), this report for the National Rivers Consortium (NRC) of Land and Water Australia (LWA) puts forward a model legislative framework (MLF) for sustainable Australian river management.

The report reviews developments to April 2001 in Australian water resource law and stakeholders' experiences in its application. The report analyses legislation along eight 'indicatory topic' lines, as well as through questionnaires, interviews and workshops in the four voluntarily-participating States: South Australia (SA), Tasmania, Western Australia (WA) and Victoria.

This report discusses (Chapter 4) the contribution and role of legislation in natural resources management (NRM). Against a background of increasing national concern about natural resource sustainability, recent water policy imperatives and against a complex backdrop of legislative arrangements, the project puts forward (Chapter 4) a MLF to guide development of water resource law, with its focus on sustainability based on river / catchment integrity and health. The MLF proposes a custodial catchment agency managing all impacts on rivers; which are to be defined in their fullest sense. It calls for catchment strategic plans, which are to override conflicting mechanisms. It requires independent regular auditing and public reporting at State and catchment level, against defined provisions. The MLF is based on processes for good governance and systems management, with the onus on stakeholders to design development / delivery of sustainable river management as the way to economic river use.

The MLF can generate debate about the role and potential contribution and nature of a clarified and strengthened legal framework to direct and support sustainable river management. The MLF is a suitable vehicle for debate about sustainable water use – increasing production while enhancing our ecological assets (refer the Goulburn-Broken Catchment Management Authority's vision).

In addition to the MLF, this Stage Two project has established several key understandings:

- Legislation's conventional 'command and control' role has been extended and in several States contains strong emphasis on the regulatory basis for empowering and enabling stakeholder engagement / partnerships in planning and implementation of sustainable river management

- benchmarking of the MLF (Chapter 5) demonstrated its robustness in the face of detailed comparisons with the major national initiatives for achieving sustainable river management including the Water Reform agenda under COAG, the recent Inquiry into catchment management (HRSCEH 2000) as well as criteria emerging in the literature about effective and efficient watershed management partnerships

- and finally, the indifferent performance to date of the participating States, as against COAG 1994, this project's questionnaire and the MLF (Chapter 6).

- Project conclusions and recommendations about the future role and use of the MLF are in Chapters 7.

- The project's output is presented in two volumes. The first concentrates on the development and benchmarking of the model framework. It is intended to be a readable stimulating document to promote debate. The second volume contains the project data and supporting material in the form of several appendices.

Project approach

The project's approach involved four key steps --

A. research into existing arrangements and practitioners' needs for improvement

This step examining existing legislative arrangements for river management through:

- selection of the eight indicator topics for river management;
- the desk-top analysis of legislative frameworks within the four jurisdictions;
- an in-depth questionnaire and State workshops consulting over 80 people; and
- preparing State legislative framework review papers (Appendix B).

Of the 59 questionnaire points --

- 16 (27%) were *generally covered*, notably matters dealing with water resource planning, water quality and performance monitoring arrangements;
- 26 (44%) had *variable coverage*, reflecting the divergence in State approaches to legislation in delivering river management by end 2000, and the varying pace of legislative reform.
- 17 (28%) had *least coverage,* mostly relating to proactive river management (eg setting measurable river management standards), the comprehensiveness of planning, ensuring the powers of catchment agencies include fund-raising, and requiring comprehensive reporting.

B. developing the three principles and from them, the MLF

Analysis of the four States' existing situations, earlier work on the best-practice legal framework (Maher et al 1998, 1999; Nevill 2001) and three principles from ecological systems thinking, good governance and management system approaches, enabled development of the MLF, with 13 elements and 81 sub-elements. It outlines a process-based approach to catchment management, drawing on the functionality of legislation in defining structures, responsibilities and associated resourcing, outcomes approaches and plans, permitting and policing, and checks and balances. The MLF is based on the four components of ecologically sustainable development (ESD), namely economic prosperity, social equity, cultural connectedness and ecological integrity; recognising that economic, social and cultural values rest on sustainable NRM.

C. benchmarking the MLF, against --

- the objectives of the Council of Australia Government's water reforms of 1994;
- the objectives of the National Action Plan for Salinity and Water Quality of 2000;
- the House of Representatives' Standing Committee on Environment and Heritage's Report on Coordinating Catchment Management (2000) (hereafter HRSCEH 2000), and
- given the interest and focus on institutional arrangements and partnership mechanisms in all States, against key criteria in the literature on these aspects of effective catchment management.

D. an inventory of States' achievements against the MLF

The four States' performance on the MLF's elements and sub-elements is reviewed. Principles, clauses and other sections (where available) are identified to illustrate the scope of present coverage.

Health of rivers and recent national initiatives

Chapter 3 reviews some recent findings about the state of rivers (ANRA 2001 on Murray-Darling, *Commonwealth State of Environment (SoE) Report 1995; Murray-Darling Basin Ministerial Council, 1995).* The Commonwealth's SoE Report found

- 84 (26%) surface water management areas are either close to, or overused;
- irrigation uses 75% water, and such diversions have significantly altered some rivers;
- c. 70 (c. 28%) catchments have data for any key variable - turbidity, nutrients or salinity;
- major nutrients exceedances occurred in 43 basins (61% of those assessable);
- major turbidity exceedances occurred in 41 basins (61% of those assessable); and
- major salinity exceedances occurred in 24 basins (32% of those assessable).

The Chapter then considers threatening processes to river health and sustainability. It covers eleven erroneous assumptions which are traditional in Australian water management --

- small and medium-sized dams don't matter;
- small users of surface and groundwaters, and small constructors of levee banks, don't matter;
- harvesting surface flows away from watercourses does not need to be controlled;
- landholders should, by and large, be allowed to place dams across small watercourses;
- plants and animals living in the streams would look after themselves;
- a representative reserves system was unnecessary for freshwater ecosystems;
- provision of fish passage facilities was impractical, uneconomic, or unnecessary;
- ground and surface waters were separate, and could be managed independently;
- grazing wetlands and riparian zones would not produce long-term damage;
- there was no need for compliance auditing and enforcement; and
- it was unnecessary to value rivers as capital assets or to provide annual maintenance budgets.

The Chapter goes on to review recent national water policy initiatives, including COAG water reform, Fisher's (2000) overview of its environmental outcomes, Cullen's (2000) reservations about COAG's vagueness about the meaning and interpretation of broad ecological goals, the National Competition Policy and the *Annual Report* (NCC 2000) on second tranche assessment of States' progress on water reforms (non-compliance by all except Victoria and ACT), funding and the Natural Heritage Trust (NHT) [about 0.5% of Commonwealth budget for NRM, compared with social security 35% and education 7%], the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), the National Action Plan for Salinity and Water Quality (NAP), and the Inquiry into Coordinating Catchment Management (HRSCEH 2001) and its recommended 25 years levy of $60 billion (0.4% GDP).

The Chapter then examines States' responses through the activities of the High Level COAG Steering Group on Water, the Cooperative Research Centre for Freshwater Ecology (Cullen et al, 2000) and the Australian Conservation Foundation.

The role of legislation in water / NRM management

There was stakeholder concern about legislative versus non-legislative approaches. The project team's view is that if river managers are highly talented and committed; if 'local champions' are well spaced across the network of players and politically, legally and financially empowered; if all spheres of government invest in open and honest exchange to prepare plans and programs and agreements for timely implementation; if the business and community sectors feel optimistic about the prospects and purpose of engaging in river management, and if there is a learning community approach to the science underpinning the planning and management process, then maybe the need for a comprehensive legislative framework for river management is less pressing. Then again, all this can be enhanced and facilitated, but not replaced by, a good legislative framework.

Project limitations

There are limitations to the project, largely flowing from the brief. One is the non-participation of two key States, Queensland and New South Wales, together with two Territories (ACT and NT). No attempt has been made to examine the detail of their legislative frameworks, or to incorporate examples, except where relevant information was already to hand. Nor was an attempt made to incorporate information from New Zealand (NZ), although it is acknowledged that it has innovative NRM legislation, as well as a government structure with agencies based on catchment boundaries.

Another difficulty is that detailed *legal* analysis is often hard to do and hard to comment on without a large amount of time. This project was undertaken with a tight timeframe and limited budget. The product then is a strategic overview of developments in the four participating States and scoping of a model framework in response to insights gained from practitioners.

The project also does not deal with any legislative provisions regarding inter-state catchments and frameworks for sharing of resources through planning and other decision-making.

Also, there was a predominance of government attendees at the State-based workshops. Every attempt was made to invite a broad range of interest groups engaged in catchment management in the four States. People who displayed most interest were primarily agency staff with responsibilities in NRM; and primarily in water resources. In several States, environmental law and community sector interests were contacted and interviewed; however this was not uniform across all States.

A final limitation is that the project examined the implementation of legislation only through the anecdotes of stakeholders involved in the workshops or interviews. A thorough examination of implementation issues on the ground may, for example, reveal that key aspects of existing water resource law are not being effectively implemented.

Foundation principles for the MLF

Principles from NSESD generally underlie the approach to the MLF's development, especially economic well-being through sustainable use. In this project, the following meanings apply --

- 'Water system' refers to all surface and ground waters under all conditions including estuaries, wetlands, ephemerals, non-perennial and artificial watercourses.
- 'River' refers primarily to freshwater systems. The investigation applies equally to inland saline ecosystems, or coastal brackish systems heavily dependent on river or groundwater flow. The emphasis on rivers extends to all parts of the water cycle, including surface waters, wetlands and groundwater within the geographic spatial unit of the whole catchment.

- ‘Catchment’ is the watershed which defines the surface drainage area feeding the river system. Catchments vary in scale with a river basin generally used to describe a large system of several contributing rivers draining to one estuary.
- ‘Waterway’ or waterway corridor refers to the physical feature of the creek or river. It includes bank and corridor riparian vegetation
- 'River restoration' and 'management' are defined in their broadest sense. The two terms include protection of rivers in their wild or natural state, as well as the full range of actions associated with their sustainable use and rehabilitation. In this project, ‘river management’ or ‘river integrity management’ refers to the ongoing process which achieves a stated objective or condition for a river; and ‘river restoration’, to an improved condition of the river. River restoration is the restoration of the bed, banks and river ecosystem that requires management of any impacting activity within the spatial unit of the catchment and / or interlinked aquifer. This idea of restoration to an earlier state (an earlier state of 'naturalness') requires a prior condition to be defined as the objective, perhaps by reference to the condition at a specified date.
- Catchment management is the vehicle for achieving a range of natural resource management outcomes, including but not limited to river management and restoration. River integrity outcomes are dependent on effective catchment management and these concepts are used interchangeably in this project.
- ‘Ecological integrity’ of rivers, otherwise referred to as river health or river integrity, is possibly the most undervalued core concept for river restoration. Maintenance of river health is commonly understood to occur when the productivity, stability and resilience of a system are sustained; that is when the system is ecologically healthy and has the capacity to perform all essential ecological processes. It also includes the maintenance of evolutionary potential.
- ‘Cumulative effects’ means the cumulative effects of all incremental impacts on rivers. These include the extraction of water from surface and groundwater resources, the construction of dams, levee banks and agricultural drains, the development of irrigated crops, and the clearance of deep-rooted native vegetation. Cumulative effects, being typified by small developments which extend over time and generally escape any or detailed environmental assessment processes, can have major impacts on catchment water resources.
- ‘Partnerships’ refer to the collaborative, cooperative multi-sectoral and multi-agency institutional arrangements viewed as the preferred vehicle for meeting the challenge of the super-problems which natural resource management issues represent.

The basis of the MLF arises from ecological systems thinking for economic success, from management systems thinking, and from good governance principles. The team agrees with the Industry Commission (1998) that the incorporation of ecological sustainability into policy has been ad hoc, incomplete and tentative… “The central problem is that Australian governments have yet to put in place a comprehensive, integrated and far sighted way of promoting the ecologically sustainable management of natural resources".

Good governance lies at the heart of the model framework and it too has strong economic dimensions. The price of malpractice in governance, or deficient or ineffective administration of public policy is rarely calculated, probably in light of the enormity of the exercise and the resulting estimate.

The three main principles underlying the MLF are:

Ecological systems thinking for economic success:

- economic progress goes to those who compete best on improving productivity while providing for ecological protection and sustainable management;
- economic progress must occur within ecological and socio-cultural limits;
- social impacts and ecological impacts are to be viewed within the short and long term; short-term gains must be weighed up from a long-term perspective - sustainability must not be prejudiced by short-term gains achieved at the expense of declining ecological and social services
- economic progress works in a climate of ecological uncertainty, where there are no guarantees; the harvesting regime must work within these natural cycles of plenty and paucity of natural resources;
- the best insurance against the uncertainty in natural systems is to develop the understanding and conceptual frameworks about how they actually work
- economic progress works with the constancy of ecological and social change, and makes innovation integral to its *modus operandi;*
- economic progress works on the basis of no net loss of ecological assets – of give and take, and where there is taking there is also the need to give back;
- impactors, and beneficiaries of the actions causing those impacts, pay the full cost including estimates of costs to ecosystem services

Ecological thinking is about protection of economic interests in the long term in light of the limitations which market forces have with regard to protecting future values or ensuring equitable access.

Good governance principles:

- *Participation*: the process should include adequate opportunity for participation of all stakeholders.
- *Transparency*: assessment and approvals should be conducted through an established process. All elements of the process should be clearly understood by all participants.
- *Certainty:* the process should have clear objectives, be consistent, and be conducted within agreed time-frames.
- *Accountability:* decision makers within government need to be able to provide clear and detailed reasons for their decisions to all stakeholders. Appeal provisions to an independent authority should exist. The infrastructure assessment process should cover the life of the proposal, through project design, construction, operation and finally decommissioning: project operators must be accountable for commitments made during project approval.
- *Integrity:* decisions need to be based on the best available information, and all relevant factors need to be taken into account by decision-makers. Where impacts are uncertain, outcomes should rely on sound risk assessment and management.
- *Cost-effectiveness:* the process should meet its objectives while imposing the least cost to participants.
- *Flexibility:* the process should be able to accommodate proposals varying in type, scope of impact, and complexity. Flexibility is desirable in terms of the form of assessment and management processes, issues to be addressed, process time-frames, and degree of public participation. Also processes for evaluating options for achieving an end are to be available.
- *Practicality:* the process should recognise community concerns, commercial realities, best practice technology, and scientific uncertainties.

Management systems thinking:

- commitment is given to the steps of adaptive management systems - plan, do, monitor, report, review, revise;
- Adaptive management processes are used to achieve continuous improvement;
- producer responsibility remains, although attenuated, for indirect and long-term effects;
- governance is achieved through clear definition of responsibilities and clear delegation of powers.
- management is done by measurement; progress is made by working within a time frame, against targets, and reporting on their achievement
- there is regular strategic assessment of major directions and strategic planning is undertaken to address complex issues;
- there is coordination between all the critical players, and clear definition of their roles and responsibilities for the overall outcomes;
- there must be viable systems of monitoring and review to guide management decisions for example state of environment reporting in the case of environment.

The development of the framework owes much to those who contributed through workshops and interviews; their contribution is acknowledged, in more detail in Volume One.

The MLF and its thirteen elements

#1. Definition of river

River integrity management includes catchment and impact management, including above and below ground level. It is not confined to the water body, "bed and banks", or floodplain. Sub-elements include administering river management within catchment boundaries; include interconnected aquifers; require coordinated ground / surface water planning; where necessary, require provision of aquifer environmental flows; include interconnected floodplains and wetlands and water dependent / protective vegetation; require environmental flows; and provide for a system of freshwater reserves.

#2. Binding standards for river integrity and public policy consistency

ESD must be the primary object (not one of several) of catchment management, with measurable and binding standards. Sub-elements include embedding in law the ANZECC / ARMCANZ 1996 environmental flow principles; the precautionary principle to be applied and audited; a general duty-of-care should be legislated for all to manage water resources, related ecosystems and catchments sustainably; binding the Crown; provide for sustainable use; implement the NWQMS; compliance strategies; monitoring and reporting frameworks for ecosystem assessment; and catchment plans to be prepared within a specified time frame.

#3. Primacy of catchment legislation

A "more of the same" approach will simply not work for Australian rivers in crisis, where resources crucial to national survival, much of its capital and the quality of life of its people are at serious risk. Sub-elements include primacy over existing, future and emergency legislation.

#4. An integrated hierarchy of planning and management frameworks

A mix of both top-down and bottom-up planning approaches is required for catchment management to be both effective and efficient. Sub-elements include a hierarchy of planning instruments for all NRM management, integrated with State, regional, catchment and local plans; a hierarchy of

representative management structures across the same range; and high-level independent expert panels to advise on technical, institutional and procedural matters, assist in conflict resolution assist in reporting overall progress on State NRM framework.

#5. Catchment-based custodial agency

Have a single agency in each river basin, to be outcome-focused, equipped with strategic powers, funded in line with its responsibilities, and reporting publicly at legislated intervals against its strategic outcome objectives. Sub-elements include an independent Expert Panel where there is disagreement, eg about sustainable water extraction limits; catchment strategies should use incentive mechanisms; and the agency must ensure agreed river management objectives take precedence over sectoral / local objectives.

#6. Stakeholder-based structures and public involvement

The catchment agency is to include and engage representatives from all stakeholder groups in an open, equitable and adequately resourced manner, incorporate best-practice public consultation and provide structured on-going education. Sub-elements include an independent chairperson; representation of all stakeholders; no dominance by any sector; prefer local stakeholders over representatives living outside the catchment where practical; committees need a full range of relevant expertise; fiscal equity; upper and lower catchments represented; transparent member selection; adequate consultation programs for significant infrastructure developments; and effective mediation, conciliation and dispute resolution mechanisms.

#7. Coordinated and integrated strategic planning and implementation

The key vehicle for coordination is the catchment strategic plan, prepared by the custodial catchment agency. The plan should have comprehensive natural resource inventories; strategies to address cumulative effects of incremental impacts; primacy in development assessment; bind local government budgets and activities; comprehensive NRM coverage; a mandated review frequency; call-in powers; coverage of both surface- and ground-waters; assess both proposed activities and the additional impacts of associated land uses (irrigation programs, for example); separation of the roles of resource management, standard setting and regulation from the role of providing water services; provision for a working relationship between science and management and a whole-of-government approach.

#8. Capacity to self-fund

Catchment agencies must be adequately resourced, in line with their responsibilities and accountabilities. Local funding increases local ownership of programs, and underlines accountabilities. Sub-elements include Commonwealth and State funds tied to the achievement of national / State respectively NRM objectives, and only where local NRM levies pre-exist; differential Commonwealth funding for priority areas, or to achieve equity; and funds raised locally spent only on NRM objectives within that catchment.

#9. Engagement of local government

Local government representation must be included in catchment agencies, and vice-versa. Sub-elements include local government decisions must be consistent with the catchment strategic plan; and where opportunity presents, local government boundaries should be brought into line with catchment boundaries.

#10. Requirement for continuous improvement

"Adaptive management" or "the quality assurance principle" are to be required. These terms describe planning loops involving sequential logical steps: setting objectives and targets, planning to achieve these, implementing the plans, monitoring and reporting progress, reviewing achievements, and refining program objectives. These approaches have been used in industry routinely for many decades. Sub-elements include government, ministerial or agency discretions about the occurrence, timing and depth of plan reviews should be eliminated; and long-term resource allocations should be avoided - a suite of appropriate mechanisms for allocating resources within the constraints of adaptive management include short-term leases, or leases within the period of the adaptive management cycle.

#11. Custodial agency as catchment investment coordinator

Catchments provide essential infrastructure for the provision of a variety of economic, ecosystem, social and engineering services. The catchment is a unit for asset management, and the strategic catchment plan must form the basis for catchment / regional investment and asset management programs. Sub-elements include removal of perverse subsidies; channelling and prioritisation of NRM grants and funds only through the catchment strategic plan and subordinate certified property / EMS plans; water pricing based on full cost recovery; water subsidies removed or fully transparent; comprehensive systems of water allocations and entitlements prescribed, backed by separation of water property rights from land ownership; clear specification of water entitlements in terms of ownership, duration, volume, reliability, transferability and if appropriate, quality; and laws for development of an NRM trading "trust".

#12. Licensing, compliance and enforcement

Auditing and enforcing compliance is currently a major weak link in water management programs. Sub-elements include nature, volume and other allowances for environmental modification through licensing, permits and consents must be only on the basis of the strategic plan; licences to be based only on measurability; continuous improvement principle applied to licensing; licensing to be incentive-based, with fee scales linked to incentives for best practice production; maximum time frame in licence is to be the periodic review of the strategic plan; compliance enforcement recognised as a specific function within water agencies; third-party standing to undertake court enforcement action, supported by appropriate financial arrangements; on-the-spot fines should be considered for specific applications, particularly issues delegated to local government; minister obliged to report annually on matters set out in plans, including any non-compliance with Act / plan; licensing of polluting activities should be expanded from point sources to include semi-diffuse sources such as stormwater drains and intensive agriculture drains, and based on load-based planning addressed in the water quality management component of strategic plan.

#13. Required independent audit and reporting

Outcomes of the management process need to be audited and reported at appropriate, statutorily-fixed intervals. Accountability is facilitated by an independent auditor, to facilitate transparency, accuracy and credibility. Sub-elements include responsible minister required to table in parliament annually, an independently-prepared report on the achievement of the objects of the Water Act; catchment agencies should similarly produce an independently-prepared annual report against their strategic plan's objectives; all reports, licences and information about river integrity should be publicly available, free and including on electronic media; the 'non-performer pays' principle should be applied; and a natural resource accounting framework should be phased in nationally.

Benchmarking the MLF

Chapter 6 offers seven benchmarks against which the MLF was assessed - several national proposals for improved water management; and three papers which summarise characteristics or criteria for successful river / catchment management. The four national proposals are:

- the 59 questions used in the project's questionnaire
- the COAG 1994 principles;
- the NAP 2000; and
- the recommendations of *Coordinating Catchment Management* (HRSCEH 2000).

The three papers used for benchmarking the model framework are:

- the ten institutional attributes of successful NRM (Dover & Mobbs 1997); and
- the nine factors influencing watershed management success (Born & Genskow 2000)
- the Healthy Rivers Commission of NSW (2000) Independent inquiry into the Georges River – Botany Bay system.

As these three papers are not confined to solely legislative components, some of their attributes or factors are not relevant to this benchmarking of the legislative coverage in the model. Also, they deal at a more generic level than the four benchmarks above, and thus do not offer the same level of detail.

Present legislation against the MLF

Chapter 7 examines the extent to which the MLF sub-elements exist in Australian water resource legislation. Naturally, it concentrates on the four participating States, but where ready comparisons could be drawn, or have been drawn by others, with other jurisdictions, then this has been done. The table below attempts a quick summary of a large and detailed field.

MLF element	Provided in existing law
1. Definition of a river	2
2. Binding standards for river integrity	1
3. Primacy of catchment legislation	1
4. Hierarchical planning and management structures	2
5. Catchment-based custodial agency	2
6. Stakeholder-based structures and public involvement	3
7. Coordinated / integrated strategic planning and implementation	2
8. Capacity to self-fund	2
9. Engagement of local government	3
10. Requirement for continuous improvement	2
11. Custodial agency as catchment investment coordinator	1
12. Licensing, compliance and enforcement	3
13. Required independent audit and reporting	1

1 = nil or low degree of coverage; 5 = high degree

Role and use of the Model Legislative Framework

This project has reviewed recent developments in Australian water resource law, partly against a background of international concerns on natural resource sustainability, as well as policy imperatives (developed at both national and state levels) focused specifically on the water resource. The model framework arrived at in this Stage 2 project derived from a strategic analysis of four jurisdictions concerning the conduct of catchment management through their respective legislative frameworks (Appendix C).

The model framework builds strong foundations for the establishment and operations of the custodial catchment agency. It is imperative that the model framework also establishes the structures and processes for independent audit and review of achievements by these custodial agencies. Independent review is an essential element in designing adaptive management frameworks which are self-correcting and self-refining.

In addition to project findings concerning the MLF, its benchmarking against national initiatives and criteria for effective watershed management and the assessment of overall performance by the participating States, several more specific conclusions can be drawn from this study:

- Judged from the survey responses and the desk-top analysis of States' frameworks, States demonstrate mostly *variable* coverage of the river management indicator topics. This varied performance reflects the diversity of State approaches to river management in 2001, the varying pace of legislative reform and, possibly, the divergence of views about the value-adding done by legislation to the management process.
- There is old style legislation and there is the newer, more process- and performance-based legislation. The model framework is structured around the latter. Legislative frameworks can require governments to intervene where intervention is the required action. The question of the desirability and feasibility of greater comparability and even standardisation between States legislative frameworks for catchment management may be judged by each State's delivery of healthier rivers in the longer term. In the meantime, the MLF provides a vehicle for assessing State coverage of best practice river management, be it through a legislative emphasis or other means of addressing the same imperatives.
- While all States demonstrate a degree of compliance with most of the COAG Water Reform Framework, not all States demonstrate commitment to the catchment management criterion of COAG. One reason for this difference is perhaps a perceived disparity between the States in terms of the stressed condition of their rivers and catchments. This perception belies a key point about when catchment management is most pressing. All river management processes in all States need to acknowledge cumulative effects, and establish strategic caps to manage these effects ahead of catchment stress.
- The effectiveness of most legislation aimed at sustainable river management cannot be assessed in the short timeframe since that legislation has been introduced. However the MLF scopes the criteria or elements of best practice river management from the perspective of legislative coverage.
- Several States had key initiatives which extend aspects of the model framework further. The Healthy Rivers Commission in NSW conducts major independent reviews of the processes and achievements of river management. Though constrained to date to coastal river systems and to reviewing management arrangements and not water development plans or individual projects, the Commission has the potential to offer broader ranging reviews of the planning and decision-making process. Also the Environmental Protection

Authority in WA is empowered to assess the impacts of planning schemes and water plans with the potential to address matters such as cumulative effects and more comprehensive application of the precautionary principle. One other impressive model is the RMPS (Resource Management and Planning System) in Tasmania. The system is the only ambitious attempt to provide a consistent legislative framework for the coordination of natural resource management programs of any Australian jurisdiction. It involves integrated administration of four key pieces of legislation overseen by the Resource Planning and Development Commission whose charter is:

- to assess and approve local government planning schemes and relevant amendments;
- to assess projects of State significance;
- to assess draft State Policies prepared under the *State Policies and Projects Act*;
- to prepare the Tasmanian State of the Environment Report; and
- to conduct inquiries into the use of public land at the request of the Minister.

- The constrained legislative role of the Commonwealth Government is a recurring theme in light of the national context of river challenges and in light of major 'basket-case' rivers crossing boundaries between States.
- There is a need to establish a national agency with benchmarking and review functions to ensure that any agreed legislation reform is carried through similar the COAG water reform reviews. COAG Mark II should be convened in 2004 with a broader NRM focus, and the States should demonstrate how they are delivering sustainability objectives for rivers and catchment health. COAG III in 2014 would then review achievements and revise and upgrade if necessary the national framework for improved performance across Australia.
- Regional governance arrangements required for effective NRM could be readily built upon Local Government regional groupings. States have varied greatly in their emphasis on and the status awarded to Local Government in the institutional arrangements at regional level. The alternative and potentially less 'empowered' option is where catchment / regional agencies are established without due democratic processes.
- In terms of findings relating to the conduct of this project, the project team needs to highlight difficulties (and the extensive cost and time implications of these) we experienced working to engage the States in such a multi-jurisdictional, multi-agency research exercise

Project recommendations

The following recommendations are designed to communicate the findings of the report particularly the model framework, and to refine it as a research and management tool over time.

- Wide dissemination of Volume One of this report and a summary version of the model framework should be organised as a structured response process with the all States involved. A simple summary booklet would suffice to promote a lay-person's understanding of the building blocks of comprehensive catchment management. The booklet should have appeal to the full range of people engaged in catchment management, from the farm gate to the courthouse door. The process of distribution, communication, clarification and obtaining feedback needs to be designed.

- Community learning processes and catchment management legislation

The MLF is a vehicle for community review of catchment management arrangements and structured processes of education and review are recommended.

- 'Road test' the MLF

The model legislative framework provides the vehicle to generate vigorous debate about the role and potential contribution and nature of a clarified and strengthened legal framework to direct and support sustainable river management. The model framework is a suitable vehicle for debate about sustainable water use – increasing production while enhancing our ecological assets (refer the Goulburn-Broken Catchment Management Authority's vision).

One major forum in each State for road testing the model would be in the Council of Ministers and / or CEOs established to address NRM issues and more specifically the National Action Plan for Salinity and Water Quality.

There are numerous forums at the national level and this would perhaps best be gauged through a review of Land and Water Australia's national strategy and also forums doing work derived from COAG and from the House of Representatives' Inquiry (HRSCEH)

One practical approach to promoting debate about the MLF and agency / community review is to arrange a 'road show' across specific catchments in Australia. It would be valuable to include presenters with direct experience in catchment management which has been successfully underpinned by legislation (for example the experiences of Onkaparinga Catchment Water Management Board).

- Review the model framework for portability overseas, including different socio-economic and cultural contexts.

Global water partnerships was a strong emerging framework for water management at the 2001 River Symposium in Brisbane. These partnerships are geared to development and promotion of a range of river management tools. The model framework has potential in these forums, to stimulate debate about the nature and emphasis placed on legislative approaches to water management across different socio-economic and cultural contexts.

- Undertake dialogue with States about benchmarking of their frameworks against the model framework

Legislation has a secondary role in some States and in these the pursuit of river management is either very limited or through lighthouse, catchment-specific, cooperation-based partnerships which are in their early years of development. In States where legislation has a primary role outstanding issues concern full integration of natural resource management planning and implementation, role of local government, funding, democracy and accountability at the catchment level. The model framework is a tool for continued debate at the State level as well as for review of achievements and the next era of management plans and structures.

The framework itself is a tool for a management system's approach to State-based legislative framework evolution.

- Identify the key issues / obstacles/ key strategic needs (in general, and individually) in relation to the model framework

There are issues – legal, economic, social, cultural– which challenge this model framework. Farrier, Dovers, Bates and others have identified key obstacles to sustainable river management . The MLF provides a means to comprehensively research and document these issues through dialogue as well as desk-top exercises.

- Complete the review of existing State legislation

In order to ensure that the review work is complete at this time, arrange survey coverage and workshop reviews of Queensland and NSW at the minimum, with the addition of the Territories of ACT and NT at the optimum.

- International benchmarking

The model provides a framework for collation and review of good examples, both in Australian States and overseas including but not limited to NZ, South Africa and Canada. This work should be ongoing and be used to refine the model. The aim could be to produce a data base of good practices and key options for elements and sub-elements of the model framework over time.

- Conduct of Land and Water Australia projects in the future

In the absence of any national level imperative for reporting on the State of our rivers or the effectiveness of river management, future proposed Land and Water Australia projects may fare better is they were the subject of 'sign-off' by for example the States' Councils of Ministers and / or CEOs working on coordinated NRM issues including NAP and river management.

1. BACKGROUND TO PROJECT

This report for Land and Water Australia reviews developments (to April 2001) in Australian water resource law, as well as investigating stakeholders' experiences in its practical application. The report analyses legislation along eight 'indicatory topic' lines, and the results of interviews and workshops held in the four participating States: South Australia, Tasmania, Western Australia and Victoria. This project reviewed these recent developments with an emphasis on examining processes and practices focused on resource sustainability.

Against this complex backdrop of legislative arrangements, the project puts forward a model legislative framework (MLF) to guide the development of water resource law. The MLF provides a basis for a focused discussion of the contribution and role of legislation in the development and delivery of natural resources policy.

The MLF identifies requirements for the effective working of a custodial agency for catchment management, provisions to ensure independent auditing and reporting, and provisions defining the nature of actual performance required. The MLF is essentially about processes for good governance and systems management.

As well as the MLF, four other components stood out from the project –

- legislation is important and can assist and support catchment partnerships;
- the satisfactory benchmarking of the MLF against national initiatives (Chapter 6);
- the indifferent performance to date of the participating States, as against COAG 1994, this project's questionnaire and the MLF (chapter 7); and
- the role and use of the MLF and the project's other recommendations.

1.1 Project approach

The project's approach involved four key steps.

Step One: Background research into existing arrangements and practitioners' needs for improved legislation

Examining existing legislative arrangements for river management through:

- selection of the eight indicator topics for river management;
- conduct of a desk-top analysis of legislative frameworks within the four jurisdictions;
- conduct of an in-depth survey of each State's legislation;
- State workshops consulting over 80 people; and
- preparing State legislative framework review papers (Appendix C in Volume 2).

The comparative analysis of State water resource legislation was structured around eight indicator topics. As well, practitioners were asked to outline the components of an ideal water management framework.

Of the 59 points surveyed under these eight topics:

- 16 (27%) were rated as *generally covered*, notably matters dealing with water resource planning, water quality and performance monitoring arrangements;
- 17 (28%) had *least coverage* mostly relating to proactive river management (for example, the setting of measurable river management standards, the comprehensiveness of planning, ensuring the powers of catchment agencies include fund-raising, and requiring comprehensive reporting); and
- 26 (44%) had *variable coverage*, reflecting the divergence in State approaches to legislation in delivering river management in 2001, and the varying pace of legislative reform.

Step Two: Development of the MLF

The strategic analysis of existing coverage in the four States, combined with the earlier work (Maher et al 1998, 1999, Nevill 2001) on criteria for best practice legislative framework, enabled the proposal of a MLF comprising 13 elements and 81 sub-elements. It outlines a process-based approach to catchment management. The framework focuses in issues of resource sustainability, as all other resource values (economic, social, and cultural) depend on sustainable management. The MLF was founded on principles derived from:

- ecological systems thinking;
- good governance, and
- management system approaches.

Table 1: The thirteen elements of the MLF

1. Definition of a river
2. Binding standards for river integrity and public policy consistency
3. Primacy of catchment legislation
4. Hierarchical planning and management structures
5. Catchment-based custodial agency
6. Stakeholder-based structures and public involvement
7. Coordinated and integrated strategic planning and implementation
8. Capacity to self-fund
9. Engagement of local government
10. Requirement for continuous improvement
11. Custodial agency as catchment investment coordinator
12. Licensing, compliance and enforcement
13. Required independent audit and reporting

Step Three: Benchmarking the MLF

The MLF is benchmarked against national-level initiatives for improving river management, specifically:

- the broad objectives of the Council of Australia Government's water reforms of 1994;
- the objectives of the National Action Plan for Salinity and Water Quality of 2000;
- the House of Representatives' Standing Committee on Environment and Heritage's Report on Coordinating Catchment Management [hereafter HRSCEH] (2000); and
- given the interest and focus on institutional arrangements and partnership mechanisms in all States, the MLF is also benchmarked against key criteria noted in the literature on these aspects of effective catchment management.

Step Four: An inventory of State examples of elements and sub-elements

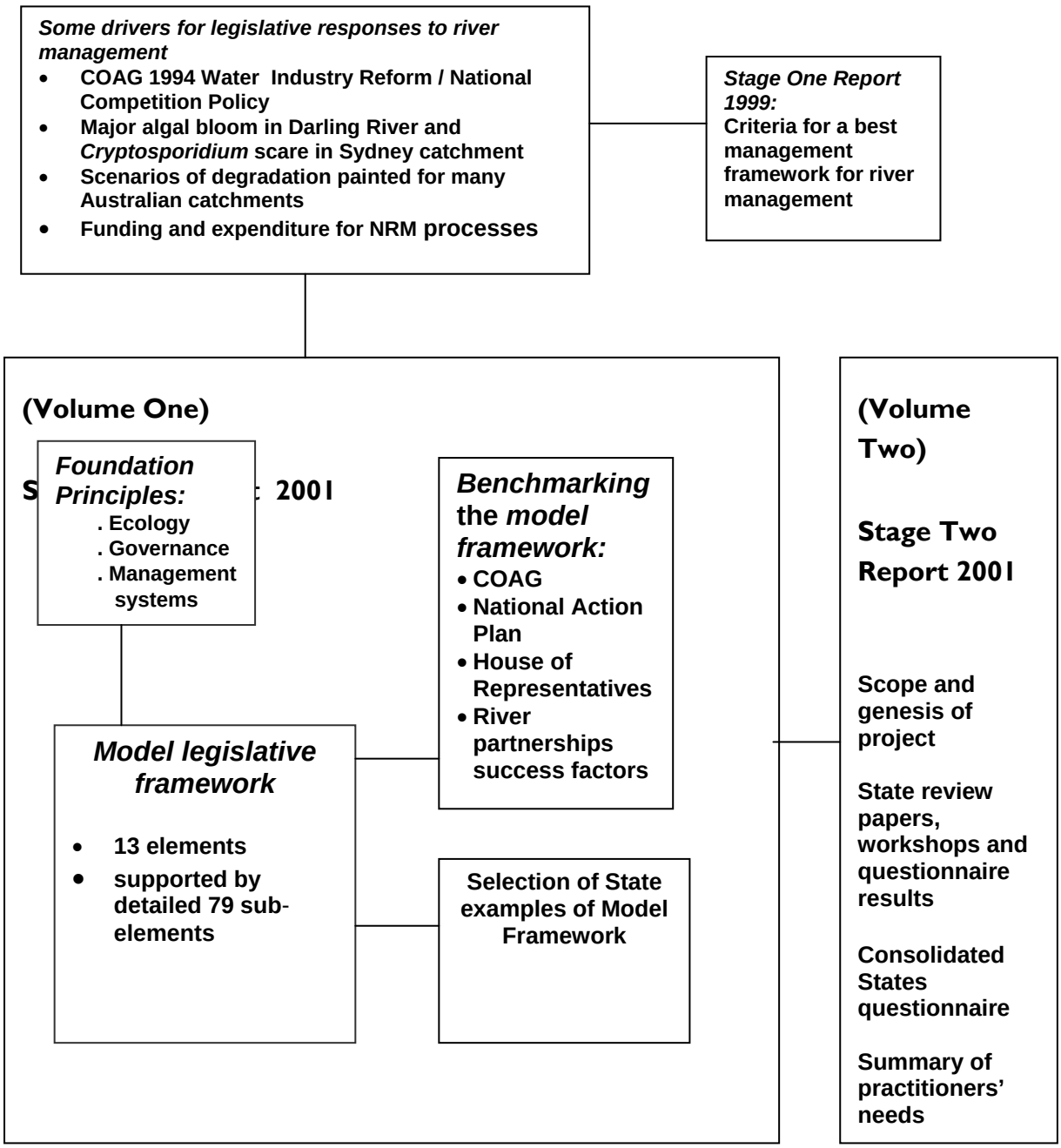
Review was undertaken of the four States' performance on the MLF's elements and sub-elements. Where possible, statutory principles, clauses and other sections were chosen to illustrate the scope of coverage within a State, as well as between the States.

This review step produced two products. First, Chapter 7 below which discusses each sub-element in State legislation. Second, model statutory objectives and principles were developed, largely derived from existing State legislation in Tasmania, Victoria and New South Wales. These are an appendix in Volume 2.

1.2 Report structure

The project report forms two volumes (refer Figure 1 next page). The findings from Steps Two to Four are in this Volume One. The comprehensive MLF, complete with explanatory notes, is Chapter 5. Chapter 6 benchmarks the MLF against the major national policy initiatives and best practice criteria. Chapter 7 contains selected examples of States' coverage of elements and sub-elements of the MLF. Chapters 8 contains conclusions and recommendations. Volume Two contains the report's Appendices.

Figure 1: Improving the legislative basis for river management in Australia – Stage Two project



This report is essentially about ways of improving the management of Australia's rivers and catchments. It focuses on legislative and management processes.

The MLF proposed is not a model to address just the ecological integrity aspects of river management. This MLF is based on the four pillars of ecologically sustainable development namely, economic prosperity, social equity, cultural connectedness and ecological integrity. The MLF recognises, however, that economic, social and cultural values rest on sustainable resource management. Limitations of short-term economic processes must be recognized - the present market gives a price for the fish catch, but not for the breeding stocks or habitat that form the basis of future fish catches.

Good governance lies at the heart of the MLF and it too has strong economic dimensions. The price of malpractice in governance, or deficient or ineffective administration of public policy, is rarely calculated.

The MLF is also benchmarked against major policy initiatives of the Council of Australian Governments (COAG) water reform agenda, the Commonwealth's National Action Plan on Salinity and Water Quality, and the Australian House of Representatives 2000 inquiry report on Coordinating Catchment Management.

The report is targeted towards all those who work with, and depend on, healthy rivers and catchments. The report is likely to be of particular interest to policy makers and managers - in all three government spheres - Commonwealth, State and local. The MLF is a tool to be used by a variety of operators and practitioners engaged in catchment management, as well as policy makers, performance auditors and legal advisers. Its primary purpose is to focus debate on the contribution and role of legislation in the development and delivery of resource management. The project team suggests that MLF represents current 'best practice' in water resource legislation, but not that such a model can be applied instantly or uniformly across the different administrative systems of different Australian jurisdictions which are moving from different origins, along different paths at different speeds, towards the agreed national goal of sustainable catchment management.

1.3 Terminology

Legislation affecting rivers includes water resource, water quality and catchment management legislation, as well as legislation covering management of specific natural resources or their integration. To this end, the terms used have meanings described below.

- ‘Water system’ refers to all surface and ground waters under all conditions including estuaries, wetlands, ephemerals, non-perennial and artificial watercourses.
- ‘River’ refers primarily to freshwater systems. The investigation applies equally to inland saline ecosystems, or coastal brackish systems heavily dependent on river or groundwater flow. The emphasis on rivers extends to all parts of the water cycle, including surface waters, wetlands and groundwater within the geographic spatial unit of the whole catchment.
- ‘Catchment’ is the watershed which defines the surface drainage area feeding the river system. Catchments vary in scale with a river basin generally used to describe a large system of several contributing rivers draining to one estuary.
- ‘Waterway’ or waterway corridor refers to the physical feature of the creek or river. It includes bank and corridor riparian vegetation
- 'River restoration' and 'management' are defined in their broadest sense. The two terms include protection of rivers in their wild or natural state, as well as the full range of

actions associated with sustainable use and rehabilitation of Australian rivers. In this project, 'river management' or 'river integrity management' is used as referring to the ongoing process which achieves a stated objective or condition for a river; and 'river restoration', to an improved condition of the river. River restoration is the restoration of the bed, banks and river ecosystem that requires management of any impacting activity within the spatial unit of the catchment and / or interlinked aquifer.

- Catchment management is the vehicle for achieving a range of natural resource management (NRM) outcomes, including but not limited to river management and restoration. River integrity outcomes are dependent on effective catchment management, and these concepts are used interchangeably in this report.
- 'Ecological integrity' of rivers, otherwise referred to as river health or river integrity, is possibly the most undervalued core concept for river restoration. Maintenance of river health is commonly understood to occur when the productivity, stability and resilience of a system are sustained; that is when the system is ecologically healthy and has the capacity to perform all essential ecological processes. It includes the maintenance of evolutionary potential.
- 'Cumulative effects' means the cumulative effects of incremental water developments. These include the extraction of water from surface and groundwater resources, the construction of dams, levee banks and agricultural drains, the development of irrigated crops, and the clearance of vegetation. Cumulative effects, being typified by small developments which extend over time and generally escape any or detailed environmental assessment processes, can have major impacts on catchment water resources.
- 'Partnerships' refer to the collaborative, cooperative multi-sectoral and multi-agency institutional arrangements viewed as the preferred vehicle for meeting the challenge of NRM issues.

1.4 Limitations

Limitations of the project include:

- non-participation of two States, Queensland and NSW, and two Territories (the NT and the ACT);
- no consideration of New Zealand, although it has innovative NRM legislation and structure;
- not dealing with any legislative provisions regarding inter-state catchments;
- a predominance of government attendees at the State-based workshops; and
- examining the implementation of legislation only through the stakeholders at workshops or interviews.

1.5 Legislative versus non-legislative approaches

The project team's view in essence is that if river managers are highly talented and committed; if 'local champions' are well spaced across the network of players and politically, legally and financially empowered; if all spheres of government invest in open and honest exchange to prepare plans and programs and agreements for timely implementation; if the business and community sectors feel optimistic about the prospects and purpose of engaging in river management, and if there is a learning community approach to the science underpinning the planning and management process, then maybe the need for a comprehensive legislative framework for river management is less pressing. Then again, all this can be enhanced and facilitated, but not replaced by, a good legislative framework.

2. The National Ecological Imperative and Responses 1994 - 2001

2.1 State of our rivers and catchments

The National Land and Water Resources Audit (ANRA 2001) provides a snapshot of these pressures:

- 84 (26%) of 325 surface water management areas are either close to or overused, when compared with sustainable flow regime requirements.
- Irrigation accounts for 75% of total water use. Diversion of water into irrigation has significantly altered and sometimes led to reversal of the flow patterns of water in some rivers.

Australia's surface water quality:

- Water quality data are limited, with between 67 and 75 out of Australia's 246 river basins (about 28%) able to be assessed in the Audit for any of the key variables - turbidity, nutrients or salinity
- 65 basins had major exceedances of nominated guidelines for nutrients, salinity or turbidity
- nutrients exceedances occurred in 43 river basins (61% of those able to be assessed)
- turbidity exceedances were found in 41 basins (61% of the basins assessed)
- salinity exceedances were found in 24 basins (32% of the basins assessed)

Australia's groundwater resources:

- 161 (30%) of Australia's 538 groundwater management units are either close to or overused when compared with their estimated sustainable yield.

Australia's water resource development:

- 241 surface water management areas and 265 groundwater management units are at low to medium levels of development. Many of these have limited capability for significant development, particularly the more arid basins of Australia.

Australia's water use:

- 31% of basins have no recorded use data.
- only 77% of diverted water reaches the customer with the remainder lost.

Australia's catchments:

- There is no comparable picture available As the NLWRA states:

  Compared with other developed nations, Australia has only rudimentary information on the condition and productive capacity of its land resources, and the potential hazards associated with their use. This limits our ability to use land in accordance with its capabilities and to monitor trends in its condition.

ARMCANZ *(*2000) underlined the degradation problems. Regions with less than 30% vegetation cover are predicted to lose biodiversity and have dryland salinity problems. Rising water tables and salinity are having serious and costly consequences already, with a worsening of these conditions predicted. A high proportion of our agricultural land is or soon will be affected by at least one form of land degradation. Up to one third of our rivers are in extremely poor condition and another 40 percent or more show clear signs of degradation. Many of these problems are insidious, having thresholds beyond which there is ecosystem collapse *(p 4).*

2.2 Threats to river and catchment integrity

Threats to freshwater ecosystems are discussed in a variety of references, including the Commonwealth Government's 1996 State of the Environment Report (refer also to the Report's technical background papers), and wetland strategies and policies developed by States. Major problems affecting many remaining rivers, wetlands and aquifers include:

- Extraction of surface or groundwater flows
- Alteration of streams
- Water pollution
- Habitat degradation
- Structures impeding fish passage

2.3 Key assumptions of traditional river management programs

Nevill (2001) suggests that the degradation of many waterways can in part be attributed to eleven assumptions underlying Australian water management frameworks. Most of these assumptions were once valid. The first three relate to the cumulative impacts:

- although very large dams were subject to environmental assessment, it was assumed that *small and medium-sized dams* needed only cursory assessment on a case by case basis. In other words, it was assumed that "the little ones don't matter";
- similar assumptions were made concerning *small users* of surface and groundwaters, and the *construction of levee banks*;
- that harvesting surface flows *away from watercourses* did not need to be controlled;
- that landholders should *be allowed to place dams across small watercourses*, on the basis of generally cursory case-by-case assessments and licensing arrangements;
- the plants and animals in the streams would look after themselves, without *environmental flows*;
- while the need to protect biodiversity necessitated the development of systems of *representative reserves* conserving key examples of terrestrial and marine ecosystems, it was *unnecessary and impractical* to apply this concept to freshwater ecosystems;
- the provision of fish passage facilities was either impractical, uneconomic, or unnecessary;
- that *groundwater and surface waterways were separate*, and could be managed independently;
- *grazing wetlands and riparian zones* would not produce significant long-term damage;
- there was no need for *compliance auditing and enforcement*; and
- it was unnecessary to value rivers as capital assets, or to provide annual maintenance budgets.

While the COAG water reform agenda signalled the death of some of these assumptions (eg environmental flows), others live on.

2.4 National responses 1994 – 2001

This section outlines the major policy and program initiatives considered to form the national response to the ever-increasing sense of crisis about the nation's river systems. Environmental, administrative and economic conditions vary across Australia. Any legislative framework for river integrity has to come to grips with different levels of urgency and scales for its application. Constitutional constraints and institutional arrangements have obstructed a national approach to managing Australia's natural resources through an integrated nationally driven and comprehensive approach. The result is a national agenda for river integrity operating through a mix of:

- high level multi- and bi-lateral agreements between Commonwealth and State governments usually about specific aspects of NRM,
- leverage exerted by the Commonwealth government through making State government access to Commonwealth financial resources based on meeting specified conditions,
- issue-based parliamentary inquiries and
- an emerging Commonwealth presence in impact assessment in relation to matters of national environmental significance.

The approach is one of a hybrid set of arrangements operating through a framework commonly referred to as cooperative federalism. Greater harmonisation of initiatives has been attempted mostly in the early 1990s through for example InterGovernmental Agreement on the Environment and multilateral endorsement of the National Strategy for Ecologically Sustainable Development. In the last decade, key national initiatives have recognised the need for and endorsement of improved water management - primarily its resource aspects, but also in terms of water's many environmental service functions. An overview of the key initiatives is presented in Table2.

Table 2: Overview of key river management related initiatives

1990	The National Water Quality Management Strategy by the Australian and New Zealand Environment and Conservation Council (ANZECC).
1991	World's largest blue-green algae outbreak, over 1000 km in length, in the Darling River
1992	The Inter-governmental Agreement on the Environment, National Landcare Program funding program initiated, National Strategy for Ecologically Sustainable Development, Industry Commission's Report into Water Resources and Wastewater Disposal
1993	Australian Water Resources Council amalgamated with Australian Soil Conservation Council to form the Agriculture and Resource Management Council of Australian and New Zealand (ARMCANZ)
1994	Council of Australian Governments (COAG) recommended key reforms to aspects of water services.
1995	Interim Cap on increased water allocations from Murray River
1996	Australia's first State of Environment Report. National Strategy for the Conservation of Australia's Biological Diversity.
1997	Natural Heritage Trust (NHT) funded from the sale of the first 33% of the sale of Telstra, aimed at providing $1.25 billion over six years; partnership agreements with States for multiple NRM projects under Commonwealth-States funding arrangements
1999	*Environment Protection and Biodiversity Conservation Act* enacted
2000	National Action Plan for Salinity and Water Quality announced by Prime Minister
2001	NHT II funded in the Budget
	Implementation of the National Action Plan for Salinity and Water Quality.

Several key national initiatives are reviewed here in terms of their features, strengths and limitations in setting the national framework for river management, and defining the need for and effectiveness of legislative frameworks primarily at State level.

2.4.1 COAG water reform

The impetus for water industry reform was given by the Industry Commission's 1992 Report into Water Resources and Waste Water Disposal which reinforced the need for water pricing reforms and curbing of excessive investment by big urban and rural water utilities. The COAG 1994 Water Reform Framework encompassed urban and rural water and wastewater industries and included economic, environmental and social objectives. This Framework proposed an integrated approach to water industry reform incorporating the need to address environmental degradation of river systems with key strategies for agreed reforms in pricing, cross-subsidies, future investment in irrigation, comprehensive systems of water allocations or entitlements, separation of water property rights from land, clear specification of entitlements in terms of ownership, volume, duration, reliability, transferability etc, allocations for the environment, trading, integrated catchment management, role separation, greater local management of irrigation, public education and water-related research.

Ecological outcomes are specified in the COAG Agreement:

- *Developments are to be ecologically sustainable*
- Actions are to be taken to *maintain the health and viability of river systems*
- The need to *consider ecological constraints of catchments* is required.
- Support for the National Water Quality Management Strategy.

Reporting on progress in each jurisdiction on each of the reforms listed above has involved independent assessments by a high level tripartite group comprising the High Level Steering Group on Water, the Committee on Regulatory Reform and the National Competition Council (NCC).

Fisher (2000), while recognising that the Framework had more to do with financial efficiency than its twin goal of sustainability, concludes that it has quite significant environmental policy requirements. He asserts that the whole package reinforces the legitimate role governments have in pursuing a range of policy objectives, several of which could not be delivered by market forces alone.

Cullen (2000) notes that the COAG documentation is vague about the meaning and interpretation of the broad ecological goals, presumably because a level of ambiguity was necessary to rally agreement between the governments as well as because more specific outcomes will vary between States. He reiterates the difficulties of defining river health and the poor state of the knowledge base about it in most States.

2.4.2 National Competition Policy

Water reform has been a major focus of the National Competition Policy (NCP) for six years. The COAG reform agenda was linked to the National Competition Policy in 1995, so payments to the States became linked to water reforms. The NCC's report (2000) on the second tranche assessment of progress on water reforms identified non-compliance with NCP requirements in all but two States (Victoria and ACT) and recommended suspension of 25% of Queensland's payments as a result.

Implementation of consumption-based pricing would not be complete until 2001, while water allocations and trading systems would not be complete until 2001. All States have progressed on identifying environmental flow needs. The Council concludes that:

> *An ongoing issue will be to assess the extent to which the NCP reforms are arresting environmental degradation. Future interventions may need to be identified and agreed upon* (NCC 2000 p 30).

2.4.3 Funding and the Natural Heritage Trust (NHT)

McDonald (2001) considers direct Commonwealth funding for river integrity:

> *Approximately $850 million was allocated …for NRM in 1999-2000, …about 0.5% of the Commonwealth budget. This compares with major items such as Social Security $57 billion (35%), Education $11billion (7%) and with less important areas such as Mining, Fuel and Energy $940 million (0.56%) or Transport $2 billion (1.25%).*

Over ten years, the Australian Conservation Foundation (ACF) / National Farmers Federation (NFF) program of rehabilitation of Australia's land and water environments is estimated to cost the public sector $33 billion, plus $321 million per year maintenance - approx $4 billion per year; or less than 3% of the total Commonwealth expenditures. This compares with $850 million departmental expenditures, $100 million NAP and whatever comes from NHT Mark II – say another $250 million - approx $1.2 billion per year. These data indicate a massive funding gap.

In this context, NHT funding has played an important role. No progress in catchment management would have occurred in some States without it. Again, the funding does not match the scale of the problem, as McDonald has calculated:

> *The total budget provided to the NHT over six years will be approximately $1.5 billion or about $250 million per year. The NHT did not consume a significant part of the Telstra revenue. In present value terms the NHT amounts to 5.0% of the Telstra sales revenue (first tranche only) or 3.2% of the full 49% share sale of Telstra. The NHT budget is split between the eight states and territories and for national programs such as the National Landcare ($326m), Bushcare ($306 m) Rivercare (including Murray-Darling) ($279m) and 19 other programs* (McDonald 2001).

Treasury has reportedly estimated the cost of repairing the Murray-Darling Basin alone as at least $30 billion. On that basis, the present $250 million per year is about 4% of the necessary expenditure. A national levy proposal has been recommended by the Inquiry into Coordinating Catchment Management (House of Representatives 2000) but the proposal is controversial.

2.4.4 Environment Protection and Biodiversity Conservation Act 1999

Recent Commonwealth legislation (the *Environment Protection and Biodiversity Conservation Act 1999)* has enlarged the Commonwealth's potential involvement where a number of important issues (like threatened species, and Ramsar sites) are concerned. This Act, through its identification of matters of national environmental significance (NES) and requirements for impact assessment of controlled actions by the Commonwealth Government or through Commonwealth-accredited State government procedures, represents a major upgrading of Commonwealth powers over individual developments beyond those on Commonwealth land.

The question of the Act's application to water-impacting proposals is still problematic however. Where proposals impact on the specified NES matters such as Ramsar wetlands, World Heritage areas, threatened species or migratory birds and these in turn impact on rivers, an indirect trigger for Commonwealth involvement in water-impacting development becomes available. Amendments have been sought to include a water development trigger as a NES matter, to cover the authorisation or construction of a dam, in- or off-stream, with a water storage capacity exceeding 10 000 megalitres.

2.4.5 The National Action Plan for Salinity and Water Quality

Many agriculture, forestry and fishery programs were brought together in the National Action Plan for Salinity and Water Quality (NAP, October 2000). It involves matching funding of $1.4 billion from the Commonwealth, States and Territories over a seven-year period; ie about $100 million per year from the Commonwealth - arguably far less than the amount needed. Also, NAP applies only to 20 key catchments. It addresses some of the limitations of the NHT.

The Plan's aspects impact strongly on the issues of this paper: The Plan promotes:

- establishment of performance targets relating to stream biodiversity
- implementation of NRM planning through catchment or regional plans.
- drainage in catchments/regions where agreed by affected land managers
- caps for all over-allocated or approaching full allocation surface and groundwater systems
- recognition of surface / groundwater interdependence, and the need for their joint management
- an NRM trading "trust"

Although the Plan acknowledges the need to manage cumulative impacts, it does so in way which, to a large extent, perpetuates the assumptions which caused the problem. Under NAP, caps are proposed *only* when a catchment is either over-allocated (when it's already far too late) or when it's approaching full allocation. Pannell maintains a sceptical approach, urging more concerted approaches to catchment management *(Pannell, 2000 p1).*

2.4.6 Inquiry into Coordinating Catchment Management

The HRSCEH bi-partisan report (2001) endorsed the problems of knowledge, resourcing and coordination confronting Australia as it moves to address land and water degradation through an integrated catchment management approach. It recommends a National Catchment Management Agency, an independent national audit agency and removal of inconsistent laws and programs administered by governments which aggregate to almost one thousand entities. It proposes a levy on all Australians to produce $60 billion over 25 years (0.4% GDP) to remedy the defects of Australian water management, the biggest public problem in our nation.

2.5 Progress on building a national approach

The void in national policy for water management pre-1994 has been replaced by an agreed water resource management framework. Specific achievements of the framework are in although States have adopted individual approaches to these reforms and worked at their own pace. Where the NCC has been vigilant and focused on introducing the competition policy into the water industry, progress on certain reforms has been apparent, measured and duly rewarded. However, the NCC has had to use its suspension of funding powers to influence the approach in several States.

With ongoing leadership at the Commonwealth level, **COAG II** in 2004 would report on:

- the achievements of the 1994 Framework, covering the extent to which the Framework was appropriate; and identifying underachieving States;
- update the Framework for the following decade, including remedying under-achievement;
- deal with management assumptions which are no longer valid;
- rectify gaps in States' achievements in legislation; and
- review progress on the NAP and the *Coordinating Catchment Management* recommendations (Nevill et al 2001).

COAG III (presumably, in 2014) and beyond should implement the same management review process, until Australian freshwater management is sustainable.

2.6 State responses in brief

States' legislative responses to this emerging national agenda have been assessed by:

- High Level COAG Steering Group on Water
- Cooperative Research Centre for Freshwater Ecology
- Australian Conservation Foundation.

High Level COAG Steering Group on Water

The High Level COAG Steering Group on Water, together with ARMCANZ and ANZECC, advises NCC about progress on the Framework. The Group's 1999 report found:

- the Framework has been positive for use efficiency in a number of urban and irrigation areas
- all jurisdictions were making progress on pricing, water allocations and entitlements, institutional reforms to separate functions in water services and regulation, and groundwater

The report concluded that

> *progress in implementing the reforms has varied amongst jurisdictions and there is a need to maintain the reform momentum particularly with respect to the environmental provisions in the Framework* (High Level Steering Group on Water 1999 p 5).

CRC for Freshwater Ecology

Cullen et al (2000) report on a similar review project. One example, defining 'stressed rivers', illustrates Cullen's findings about States' progress in delivering the ecological benefits of COAG. The States have calculated stress in a variety of ways and within quite different time frames:

- in simple terms by referring to land uses (South Australia),
- by levels of abstraction (Tasmania)
- by more complex calculations of abstraction relative to total divertible volume (WA)
- gross changes in flow volume (Victoria)
- by blanket declaration that all regulated rivers are stressed (NSW)

Queensland intends to calculate stress in the context of the Water Allocation Management Plans.

Australian Conservation Foundation

Fisher (for the ACF) concludes that progress in water reforms would have been less without the NCP framework. He considers that, even with the leverage of NCP cash payments, the States have put more emphasis on progress in microeconomic reforms than on environmental reforms. He regards NSW as the only State where environmental flow programs are being widely and consistently applied. Other States have been very slow to act, performed poorly or failed to complete implementation of measures addressing the environmental aspects which are most critical.

Volume Two of this report contains a detailed account of State reviews undertaken by these three assessing bodies as well as their performance on the project survey questions relating to river management legislation.

3. River management and the Contribution by legislation

3.1 The nature of legislation

Legislation is only one part of the total package used for restoring, rehabilitating and managing rivers and their catchments. For greatest effect, the package must incorporate:

- appropriate legislation
- ongoing consistent political will
- ongoing consistent agency commitment
- compatible and comprehensive market-based incentives and disincentives
- organisational arrangements which facilitate and enhance partnerships
- community access and involvement
- information access and communication / technological developments
- human factors such as leadership, attitudes, commitment and effective responses to crises
- comprehensive, adequate and consistent compliance audit and enforcement.

Despite the image that legislation consists mainly of 'command and control' penalty-based regulations, the nature of legislation itself is actually highly varied. Much of the most recent legislation in natural resource management could be described as a constellation of enabling, capacity building, planning and regulatory approaches, using a blend of performance-based and prescriptive mechanisms. The last 20 years has seen the emphasis move to enabling legislation and away from command and control legislation, towards taking the role of assigning legislative 'status' to management arrangements, plans, committees.

Ministerial discretionary powers can reduce effectiveness of any comprehensive legislation, be it command and control based or enabling by nature.

Legislation is intended to provide consistency about how a matter is dealt with, both on the part of the people the matter affects and on the part of the authority with responsibility for decision-making. When a matter is dealt with in a statute, then there is understood to be a way of determining an outcome. Legislation can also support consistency across the jurisdiction, wherein all areas are treated equally in terms of planning and progressive implementation.

Legislation clarifies roles and processes, thus delivering "equitable and just" processes. Legislation also plays a critical part in establishing procedures that are capable of delivering "administrative justice", thus ensuring fair treatment of all parties engaged in decision making processes dominated by technical experts (specialists) and or elaborate or complex processes.

This focus on outcomes is critical in natural resources legislation. One person may be invested with rights of ownership; however use and ownership of these rights may be distributed amongst several persons or institutions. Natural resources legislation has turned its attention to regimes of management.

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Maher, Cooper and Nichols (1999) in this project's Stage One report described the suite of instruments which comprise the legislative framework. These fall into two broad areas; those

affecting land and water users impacting on rivers and their restoration, and those affecting governmental structures and inter-governmental and inter-agency relations and operations.

- The framework for the first group includes acts, regulations, state plans and planning policies, state environmental plans and policies, regional plans and planning policies, regional environmental plans and policies, codes of practice / guidelines constituting subordinate legislation, local or by-laws, town plans, local planning schemes and policies, and subordinate instruments such as local environmental (management) plans and policies, guidelines, environment best management practices (EBMPs) called up in statutory instruments. It can include voluntary land and river arrangements and covenants provided for by legislation.

- The second area is about government and inter-government / inter-agency administration, where the legislative framework covers constitution statutes, administrative arrangements instruments, financial powers, contracts and/or memoranda of understanding having legal effect, inter-government and / or inter-agency agreements, service and / or commercial provider contracts on a bipartite or multi-agency basis.

The functionalities of legislation can be described in a variety of ways, depending on the issue. In categorising legislation, the groups may not be mutually exclusive; one legislative group can merge towards others, almost in a continuum. Any one piece of statute law may have its components in more than one category. However, a functional categorisation of legislation for river restoration analysis can assist in evaluating the process areas covered by legislation, and how they may best assist in achieving desired river restoration outcomes. Many river functions may be in legislative form; others, even similar ones in adjacent jurisdictions, are addressed in policy. The legislative categorisation found useful in this project is:

3.1.1 Structures

This group includes legislation that establishes the structures through which river restoration is actioned, including policy, operation and service delivery aspects. It includes components such as any regional structure for the lead or other agency; and frameworks and processes for stakeholder and community involvement. The latter may be inter-and intra-governmental; on an interstate, state, regional and / or local basis; and includes structures addressing the inter-relationships between related functional areas and programs (e. g. Integrated Catchment Management and Landcare).

3.1.2 Responsibilities and resourcing

This group includes legislation which addresses roles and responsibilities in river restoration, particularly for agencies from each of the three spheres of government. The group includes inter- and intra-governmental matters, including in the Australian context, the relative river restoration responsibilities and roles of the Commonwealth and the States and Territories under the Constitution; the Administrative Arrangements Acts and related subordinate legislation of each jurisdiction, which establish government agencies, define lead agencies, define spatial, functional and statutory responsibilities, define the relationships between lead and related agencies in river restoration; define inter-agency jurisdictional boundaries, and establish coordination and resourcing mechanisms. Co-operative cross-jurisdictional arrangements such as the Murray-Darling legislation are in this group.

3.1.3 Outcomes, approaches and plans

This group sets out approaches for determining and planning for desired ecological and resource use outcomes such as water entitlements, environmental values and water quality objectives and catchment-specific management outcomes. The results may be legislated in the form of topic or area-specific plans, schedules or other subsidiary legislation.

3.1.4 Permitting and policing

This group includes legislation addressing the scope and outcomes intended for river restoration. It covers statutes setting standards applying to river restoration, such as minimum water quantity and quality specifications, processes and / or timetables for them to be established, and reviewed. It includes legislation which codifies the standing and entitlements of river water 'beneficiaries' (in the widest sense, including state and local governments, the environment, the community and classes in the community) to water meeting any specifications. It includes regulatory enforcement for example, anti-pollution and pollution licensing statutes, whether by public agencies or private recourse.

3.1.5 Checks and balances

This group has two main components. The first is monitoring and reporting legislation, including agency periodic reporting, external / independent performance auditing, River Ombudsman, State of River reporting including in State of Environment reports, and the like. The second relates to community empowerment, including generic and specific statutory review, public standing and appeal provisions, whether of public agencies or otherwise.

This functional breakdown defines the nature and scope of the legislative framework as it is discussed in this report.

3.2 Demonstrated need for legislation

There are several schools of thought about the function of and value added by legislation to the super-problem of river management. As Maher, Cooper and Nichols (1999) state

> *The nature of the legislative framework appears to be at a crossroads. The regulatory model is to move forward with structures, statutory plans, administrative processes, etc; and seems to be favoured by stakeholders generally outside decision-making circles and who are disaffected with river managers' performance and accountability to date. The other model is to move forward with inclusive, co-management, multiple mechanisms approaches, with a lower but critical profile for legislation* (p 126).

Bowmer (2001) emphasises this point about the cross-roads. As independent Chair of the Murrumbidgee River Management Committee, she argues that, on the one hand it is critical to know the extent of the Committee's influence, obligations and responsibilities and to what extent (its) recommendations, once accepted by the Minister, are enforceable. On the other, it is clear that many of the desired outcomes are better achieved by goodwill, shared investment and partnership than by statute, regulation, charges and compensation.

Another view takes this further and sees little need for legislation and places even greater emphasis on cooperation and collaboration, leadership and ownership by key stakeholders. Legislation is then viewed as an instrument that is hostile or obstructive to cooperation-based catchment management, as a product of top-down approaches and associated with bureaucratic structures and processes. These perceptions are responses to experiences within specific States, and are not necessarily the result of an assessment of cases where legislation is an effective policy instrument for motivating and delivering social and institutional change.

Pigram (2001) sees a role for a strong framework. In his analysis of *the myth of hydrosolidarity* in respect of the degree of institutional cooperation between upstream and downstream parts of the Murray Darling Basin, he states there is a need for an independent body to provide objective advice to governments about water allocation and policy. This needs to be backed by a combination of incentives and sanctions based on a strong authoritative position of the Commonwealth Government. This would then convince States to embrace 'cooperative federalism'. He argues that "when tested against specific decisions and initiatives designed to share the resources of the Basin between users, uses and communities, it becomes clear that much remains to be done before effective, integrated management of this important and productive region becomes a reality".

The same could be said for the decisions and initiatives in relation to water allocation and policy within the States.

The HRSCEH *Inquiry into Catchment Management* (2000) in its criticism that the NAP needed strengthening, argued that a multi-pronged approach was needed. This would include a mixture of revising the legislative frameworks through the Law Reform Commission, establishment of a National Catchment Authority and targets and timeframes, which would be legislated and mandatory. This approach had to be taken in light of the scale of the investment needed - $60 billion in capital over 10 years plus ongoing maintenance of about $500 million a year (about a 25-fold increase on present spending).

The capacity and authority provided within the legislative framework to implement whole of catchment management is paramount, argues the General Manager of South Australia's Onkaparinga Catchment Water Management Board (Bellette 2001). She argues for the vital combination of six factors for successful integrated catchment management on a long-term basis:

- sound legislative framework
- certainty of funding
- human resources
- partnerships including community participation
- government support
- integration with other land and water managers, and other mainstream managers.

The complex, multi-dimensional, multi-sectoral nature of catchment management she argues requires more than a sound legislative framework. She however identifies the fundamental contribution of a sound legislative framework to the workability of the whole (if not the vitality of the whole). Highlights provided about a 'sound legislative framework' includes:

- identification of geographic catchment boundaries as the core spatial area
- requirement for a catchment plan and for its implementation, review and regular updating, minimising the chance of leakages which routinely occur between plans and their implementation
- empowering catchment agencies to raise their own funds and directing the nature of expenditure
- community-including processes from on-ground activities through to decision making
- linkages to other Acts for example the Development Act 1993, and other natural resource legislation
- linkage between water-affecting activities and the catchment plan.

3.3 Legislation in perspective

The project brief assumes legislative change may not be easy or frequent, but that acting to manage rivers without legislation is a limited approach. This study expands on this with the following understandings:

- The downside of legislation in some jurisdictions is that it is slow to develop, cumbersome to change, sanitised for political acceptance at the last minute, onerous to service and lacking in resources for enforcement. Legislation can be oppositional, obstructive and even irrelevant.
- States differ, and key players within a State also differ, in their view of the role which is most appropriate for legislation to play in achieving the goals defined either within that jurisdiction for water management and / or in relation to the national agenda for water management. Legislation may play its role centre stage or back stage; from a high profile role of actively assisting or even requiring catchment management through to a low profile role of not hindering voluntary initiatives efforts for catchment management.
- It is acknowledged that there are different pathways to delivering river management. It is not about having one framework and one point in time but about changes in each State leading towards achieving the desired degree of protection and sustainable use, and how these changes are generated, directed and evaluated.
- Legislation results from forces, which are both universal and context-dependent. It is evolved within, as well as imposed upon a jurisdiction; it usually results from a degree of learning from other jurisdictions as well as from assessing the aspirations and political sensitivities within a jurisdiction. The degree of crisis about a natural resource issue then will play a substantial role in defining the scope of the legislative provisions and their degree of command and control. Legislation can be introduced overnight or it can be an extensive 5 year gestation including policy discussion papers, consultation, using the approach that there will be no regulation without participation.
- There are examples where legislative frameworks have had the leading role in delivery of river management, particularly in terms of specifying government commitment and structures for enabling accountable plans and implementation structures;

Legislation is not separate from community enthusiasm, political commitment and adequate resourcing.. In essence, the approach to river management should not be one of either legislating *or* using other approaches. River management stands to benefit considerably from lessons learned by all the players. The way forward would seem to lie with combining the best approaches, summarised here as:

- Educate *and* legislate
- Collaborate *and* legislate
- Facilitate (with adequate resources) *and* legislate
- Motivate (through incentives) *and* legislate.

Recognition of the importance of legislation in supporting community-based partnerships is one of the main outcomes of this project.

4. Model legislative framework

Australian water legislation has undergone considerable change over the last decade, prompted in particular by the COAG water reform agenda initiated in 1994. Many innovative and interesting approaches have been developed by different Australian jurisdictions. These developments have taken place against an international background of growing environmental awareness, marked by major conferences and conventions. These conventions have seen considerable interest focused on statements of key principles governing environmental management processes: for example, the precautionary principle is one of the best known.

Against this background, the model framework for water legislation has been prepared in an attempt to:

- acknowledge the intrinsic, social, economic and environmental importance of Australia's waterways;
- acknowledge the severity of threats to these systems: threats which are underwriting the general decline of freshwater ecosystems across much of the Australian continent;
- stop the huge capital losses in natural and constructed infrastructure being caused by freshwater resource mismanagement;
- learn from the development of Australian water statutes, particularly over the last seven years;
- learn from the practical experience and knowledge of stakeholders involved in waterway management; and
- build a framework, which incorporates the most important principles, collected from global and national statements relating to:
- (a) principles of good governance and environmental practice, and
- (b) those principles focused specifically on the management of waterways and other freshwater ecosystems (see Appendix F).

Major limitations of the process used in developing the framework are discussed in the Introduction, and include the lack of detailed consideration of NSW and Queensland legislation (as these States did not participate), as well as overseas legislation, and the absence of highly detailed legal analysis of the practical operation of the key Acts.

The model framework is a tool for use by the full range of catchment practitioners as well as policy makers and legal advisers. It has been prepared in the belief that every new management process designed to achieve sustainable management of natural resources requires benchmarking against relevant principles and guidelines.

Potential use of the model framework is broad-ranging but could include assistance in the development of new legislation in any or all aspects of catchment management. It could also be applied in the conduct and measurement of the effectiveness of broader NRM processes e.g. practical application in reporting and evaluation exercises. The model framework could inform catchment practitioners about options for institutional arrangements. The model also is intended to stimulate debate amongst policy makers and key stakeholders concerning:

- the role of legislation in delivering desired sustainability outcomes,
- the contribution which legislation has the potential to make and challenging notions of narrow command and control functionality of legislation.

The development of the model below has been strongly influenced by both general and water-specific management principles. This model legislative framework could form the basis of either the revision of water statutes, or the consolidation of several existing Acts into a revised comprehensive statute.

Environmental, good governance, and water management principles have been discussed in a variety of international, national and State documents (Nevill 2000). Their use in Australian water legislation is most highly developed in the NSW Water Management Act (2000). Statements of statutory objectives and principles can play an important role in clarifying the purpose and processes of statutory frameworks, and Appendix F provides an example of the way in which statutory objects and principles might be used in legislation. This example is largely a blend of approaches used in three jurisdictions: NSW, Tasmania and Victoria.

We propose the thirteen elements of the model (together with their sub-elements) set out below as an appropriate basis for a best-practice framework for river / water management legislation in Australian jurisdictions. The model has been derived from the analysis required by the NRC project brief:

- a detailed analysis of existing Australian legislation in the four voluntarily-participating States against best practice criteria, to develop a suite of general principles, approaches and specific clauses that could be used by governments and statutory bodies to provide a sound legal basis for actions in the sustainable management of rivers and water resources;
- examining how this is expressed in regulation, planning and permitting powers and other means that directly influence riverine and water resource development and management. as for legislation, identify best practice and examples of these aspects; and
- undertaking these tasks in close collaboration with State agencies and statutory bodies such as Catchment Management Authorities.

In proposing the model, it is recognised that Australian hydrological regimes differ widely, and consequently catchments and waters are highly diverse across the continent. While the model will need some adaptation to different situations, it is considered to have wide applicability. In applying the model, we recommend that every effort should be made to ensure it is followed as a comprehensive package, rather than use the all-too-frequent excuse "things are different here" to adhere to outmoded and demonstrably unsuccessful processes and practices.

It is recognised that this is a model applicable to the longer term. Not all its elements and sub-elements may be achievable in full in the next phase of water legislation reform. We consider the post-COAG 1994 water legislative changes, which have recently taken place in all Australian jurisdictions, as the first phase in legislative reform aimed at achieving sustainable water management in Australia. Although we envisage that the reform of water management frameworks will be an ongoing process over the next several decades, the next few years are likely to be a critical period. Freshwater ecosystems are in general decline, and decisive action is needed to reverse this situation.

Without healthy freshwater ecosystems, and without resource management processes in place designed to achieve resource sustainability, all other values placed by society on the resource will continue to deteriorate. The project team therefore makes no apology for focussing on sustainability issues, although this has placed specific economic, social and cultural values (to varying extents) in the shadow of this overarching primary concern.

Some reviewers of the draft report for this project (ref: National Competition Council Secretariat's response, Paul Swan, NCC email, 4/9/01) have expressed concern at its lower emphasis on 'economic issues';. It is clear (eg House of Representatives Standing Committee on the Environment and Heritage (2000) that present econometrics omit many major and adverse costs and losses of Australian water management. It is also clear (eg State of Rivers reports) that 'more of the same' will not conserve Australian rivers. It is in particular clear that the hitherto over-concentration on economic impacts and outcomes has been a major force in bringing our rivers to their present parlous condition.

The COAG water reform is, at the national level, managed by the National Competition Council. Detailed discussion of the NCC's recommendations in these areas can be found in the NCC's second tranche assessment (June 1999) and the third tranche assessment (June 2001) which is available on the NCC website. The project team supports the economic reform elements of the COAG agenda, which for the most part build on the good governance principles discussed above, as well as principles of market optimisation. Markets, in particular markets where ALL costs and benefits are included – and this is rare indeed -- can provide efficient and effective mechanisms for adapting human activities to changed circumstances, particularly with respect to the use of resources *within the short term*. Markets, however, cannot predict the future, nor do they respond appropriately to key mechanisms, which degrade finite resources, such as the tragedy of the commons, or the tyranny of small decisions (see Nevill 2001 for further discussion). This 'blindness of the market' can be seen in two examples – today's oil prices are set by the availability of oil now and not by its scarcity in future – a litre of oil continues to be cheaper than a litre of bottled water or orange juice; the price paid for edible seafood does not include costs estimates for breeding stocks or habitat to ensure future supplies of that seafood.

The project has therefore proceeded on the basis that sustainability means long-term economic, ecological, social and cultural sustainability, in line with the precautionary principle. The inertia of existing short-term processes and perspectives, economic or otherwise, must be resisted if we are to avoid continued incremental degradation of Australia's freshwater ecosystems.

In terms of our approach to building the model legislative framework, the project team endorses the 1994 COAG water reform agenda, and its immediate background, articulated through the COAG water agreements of 1992, 1993, the 1994 water reform agreement, and their extension through agreements of COAG 1995 and ARMCANZ 1998 (see *Water Resource Policy* on the National Competition Council's website: www.ncc.gov.au.)

The 1994 agreement identified a number of economic elements relating to the water industry generally:

- approaches to pricing that often result in commercial and industrial users of water services, in particular, paying more than the costs of service provision (while in many cases irrigators paying less than the costs of service provision);
- major asset refurbishment needs in rural areas for which, in general, adequate financial provision has not been made;
- impediments to irrigation water being transferred from low value broad-acre agriculture to higher value uses in horticulture, crop production and dairying;
- service delivery inefficiencies; and
- a lack of clear definition concerning the role and responsibilities of a number of institutions involved in the water industry.

The COAG water reform agreements include key recommendations in relation to:

- the specification of water property rights (including consideration of matters of compensation and a registry system for water rights),
- institutional reform,
- pricing and asset management reform, and
- provisions for water trading to facilitate the movement of water to its most productive use.

The COAG framework embraces pricing reform based on the principles of consumption-based pricing (pay for what you use) and full-cost recovery, the reduction or elimination of cross-subsidies, and (where subsidies remain) making subsidies transparent. The reform agenda requires that, where service deliverers are required to provide water services to classes of customer at less than full cost, the cost of this be fully disclosed.

Implementation of the strategic framework was expected to result in a restructuring of water tariffs and reduced or eliminated cross-subsidies for metropolitan and town water services, with the impact on domestic consumers of water services being offset by cost reductions achieved by more efficient, customer-driven, service provision.

In the case of rural water services, the framework was intended to generate the financial resources to maintain supply systems and, through a system of tradable entitlements, to allow water to flow to higher value uses subject to social, physical and environmental constraints. Where they have not already done so, States were required to give priority to formally determining allocations or entitlements to water, including allocations for the environment.

The full text of the detailed COAG 1994 agreement addendum together with the guidelines agreed upon at the ARMCANZ Hobart 1998 meeting are contained in Annexure A to this report.

Managing the economic effects of the long-term sustainable management of rivers is a transition task. ESD does not mean reduced economic well-being. Sustainability in river management terms means working to increase productivity and prosperity within the ecological limits of a river as an ecosystem service provider; and achieving this prosperity and ecological integrity within the context of social needs and cultural sensitivities. 'Sustainability' is truly the over-arching principle under which all governance sits. The model legislative framework proposes a set of processes for ensuring this comprehensive set of sustainability objectives is defined and delivered for a river system in any jurisdiction. The project team had seen nothing to indicate that sustainable rivers cannot support at least as much economic activity as the present exploited ones – albeit not necessarily the same components as at present.

One example of sustainability as the core goal of a river management agency:

Goulburn Broken Catchment Management Authority (Vic)
Mission Statement
As a peak natural resource management organisation, the GBCMA will lead the cost-effective protection and enhancement of the Catchment's land and water resources to improve social well being, environmental quality and the sustainable productive capacity of the Catchment

4.1 Foundation principles for the framework

The basis of the model arises from a merging of ecological systems thinking, good governance principles, and management systems thinking.

4.1.1 Ecological systems thinking for economic success:

- economic progress goes to those who compete best on improving productivity while providing for ecological protection and sustainable management;
- economic progress must occur within ecological and socio-cultural limits;
- social impacts and ecological impacts are to be viewed within the short and long term; short-term gains must be weighed up from a long-term perspective - sustainability must not be prejudiced by short-term gains achieved at the expense of declining ecological and social services
- economic progress works in a climate of ecological uncertainty, where there are no guarantees; the harvesting regime must work within these natural cycles of plenty and paucity of natural resources;
- the best insurance against the uncertainty in natural systems is to develop the understanding and conceptual frameworks about how they actually work

- economic progress works with the constancy of ecological and social change, and makes innovation integral to its *modus operandi;*
- economic progress works on the basis of no net loss of ecological assets – of give and take, and where there is taking there is also the need to give back;
- impactors, and beneficiaries of the actions causing those impacts, pay the full cost including estimates of costs to ecosystem services

Ecological thinking is about protection of economic interests in the long term in light of the limitations which market forces have with regard to protecting future values or ensuring equitable access.

4.1.2 Good governance principles:

- *Participation*: the process should include adequate opportunity for participation of all stakeholders.
- *Transparency*: assessment and approvals should be conducted through an established process. All elements of the process should be clearly understood by all participants.
- *Certainty:* the process should have clear objectives, be consistent, and be conducted within agreed time-frames.
- *Accountability:* decision makers within government need to be able to provide clear and detailed reasons for their decisions to all stakeholders. Appeal provisions to an independent authority should exist. The infrastructure assessment process should cover the life of the proposal, through project design, construction, operation and finally decommissioning: project operators must be accountable for commitments made during project approval.
- *Integrity:* decisions need to be based on the best available information, and all relevant factors need to be taken into account by decision-makers. Where impacts are uncertain, outcomes should rely on sound risk assessment and management.
- *Cost-effectiveness:* the process should meet its objectives while imposing the least cost to participants.
- *Flexibility:* the process should be able to accommodate proposals varying in type, scope of impact, and complexity. Flexibility is desirable in terms of the form of assessment and management processes, issues to be addressed, process time-frames, and degree of public participation. Also processes for evaluating options for achieving an end are to be available.
- *Practicality:* the process should recognise community concerns, commercial realities, best practice technology, and scientific uncertainties.

4.1.3 Management systems thinking:

- commitment is given to the steps of adaptive management systems - plan, do, monitor, report, review, revise;
- Adaptive management processes are used to achieve continuous improvement;
- producer responsibility remains, although attenuated, for indirect and long-term effects;
- governance is achieved through clear definition of responsibilities and clear delegation of powers.
- management is done by measurement; progress is made by working within a time frame, against targets, and reporting on their achievement
- there is regular strategic assessment of major directions and strategic planning is undertaken to address complex issues;
- there is coordination between all the critical players, and clear definition of their roles and responsibilities for the overall outcomes;

- there must be viable systems of monitoring and review to guide management decisions for example state of environment reporting in the case of environment.

These three system approaches together with the more traditional contents of legislation (prohibitions, management structures, infringements and penalties) underpin the logic of the model framework.

As legislation becomes more comprehensive, responsibilities for achieving compliance and furthering the objects of the legislation need to be shared between government and the beneficiaries of the resource use. Co-management arrangements are increasingly used for this purpose. Legislative responses to this challenge may include a 'triage' approach to regulation for example decisions can be addressed at three levels:

- high impact projects will require full impact assessment and compliance control by government
- moderate impact projects will use a co-management approach, based on government approved codes, technical guidelines and prescriptive policies
- lower impact projects may use industry self-regulation methods where accountability is addressed through spot checks and public annual reporting programs.

4.2 The thirteen elements of the model framework

14. Definition of a river
15. Binding standards for river integrity
16. Primacy of catchment legislation
17. Hierarchical planning and management structures
18. Catchment-based custodial agency
19. Stakeholder-based structures and public involvement
20. Coordinated and integrated strategic planning and implementation
21. Capacity to self-fund
22. Engagement of local government
23. Requirement for continuous improvement
24. Custodial agency as catchment investment coordinator
25. Licensing, compliance and enforcement
26. Required independent audit and reporting

Note: the elements, and their sub-elements, are not arranged in rank order.

These elements and their supporting sub-elements and explanatory notes are presented below:

#1. Definition of river

"River" must be defined in its catchment context. River integrity management includes the management of its catchment - above and below ground level, as well as management of the immediate river environment and its waters. River / water management is not confined to the water body, "bed and banks", or floodplain, where river means catchment and catchment means river.

This is not intended to be a broad legal definition. Depending on the issue, the river must be understood in its wider context. Problems of river salinity and water quality, for example, must be defined in a context, which takes account of catchment land use

River management necessitates whole-of-catchment management for all factors that impact individually or cumulatively on the water system. The following terms are relevant:

- water system - all surface and linked ground waters under all conditions, including estuaries, wetlands, ephemerals, and non-perennial water;

- the waterway or waterway corridor refers to the physical feature of the creek or river…including its riparian vegetation;
- river restoration is the restoration of the bed, banks, riparian areas and the full set of components and processes comprising river ecology which requires management of any impacting activity within the spatial unit of the catchment and / or interlinked aquifer; and
- The catchment is the watershed unit that defines the surface drainage area feeding the river system. Catchments vary in scale with a river basin generally used to describe a large system of several contributing rivers draining to an estuary.

SUB-ELEMENTS:

1a. Define the administration of river management within physical surface catchment boundaries (watershed boundaries).

This sub-element requires that legislation specify that the spatial unit for river / water management is the whole of the physical surface catchment (or watershed). For ease of administration it is desirable that all other administrative units with different boundaries acknowledge the primacy of the catchment spatial unit in natural resource management. It is critical that upper and lower areas of the one catchment are not separated. In very large catchments this can only be achieved by tiered planning structures working from sub-catchments, to catchment to basins. Management of the water body or stream should not be separated from activities in the surrounding areas which impact on it.

Statute should enable water management processes to control all water, at surface level or below ground. Surface water should be defined (as it currently is in all States except Victoria) to include overland flow outside defined watercourse.

1b. Define the river to included interconnected aquifers specified in a conservative and precautionary way. Require coordinated ground / surface water planning, and where necessary, require the provision of aquifer environmental flows.

The river (ie: the catchment) definition is to include all interconnected aquifers, while recognising that groundwater systems may extend more or less than the physical surface catchment. Separate management of interlinked aquifers and surface waters is unacceptable. The definition of the aquifers is to be both conservative and precautionary. In many cases the exact nature of the link between the river and its supporting surface aquifer is not known or unclear, so the approach should be a precautionary one which assumes significant links until it is established otherwise.

1c. Define the river to include interconnected floodplains and wetlands and water dependent / protective vegetation specified in a conservative and precautionary way. Require the provision of environmental flows to support water-dependent ecosystems.

Rivers and their floodplains, wetlands and billabongs need to be understood as a single complex system, and not managed independently. Floodplains provide important breeding grounds for native water-dependent fauna. Floodplains contain complex vegetation communities dependent on occasional inundation. Floodplain wetlands store flood waters, thus decreasing peak flood levels, and extending the duration of water flows from a heavy-rainfall event. They reduce a very high level of variability inherent in Australia's river systems.

1d. In situations of purely ephemeral rivers, in extremely flat arid country, and in short coastal catchments, adjustments to the catchment context can be made on bioregional or administrative boundaries, retaining focus on the water system.

This sub-element acknowledges that there are some types of Australian landscapes where a whole-of-catchment water management unit may not be the best option; for example, where several adjacent short coastal stream catchments could be more effectively managed as one administrative unit by an agency.

1e. Legislation should provide for the identification, selection and protection of freshwater ecosystems of high ecological or representative value.

One State, VICTORIA, has enacted specific legislation to achieve this goal, while most States have endorsed the general principle of protecting special and representative ecosystems. The NSW Water Management Act contains a provision enabling classification of waterways by value and by threat. This provision is aimed in part at protecting special and representative ecosystems. Most other States have yet to give effect to existing commitments on this issue.

#2. Binding standards for river integrity and public policy consistency

Ecologically Sustainable Development (ESD) must be the primary object (not one of several) of catchment management, and its achievement must incorporate measurable and binding standards. While the ESD objective is to have primacy, it is recognised that there must be other catchment management objectives as well. However, given the focus of common law on equity, for example, placing this objective beside ESD at an equal level will result in judicial decisions placing prime emphasis on equity rather than sustainability. In many cases, being fair to current generations will result in penalties to future generations; such a result will undermine sustainable decision-making.

Within the phrase "river management" lies a suite of approaches to address protection, management of sustainable use, and restoration of rivers (including their catchments). Standards must relate to key performance indicators, set within each major catchment through community-supported plans, within a framework agreed upon at the COAG level. Monitoring programs must be professionally designed and costed prior to final adoption at catchment and State levels.

A general duty-of-care should be legislated for all landholders, local and state agencies and others to manage water resources, their dependent and related ecosystems and their support catchment systems sustainably.

SUB-ELEMENTS:

2a. Statutory object places ESD as the primary management objective for catchment management, supported by statements of principles and operational ways to make decisions between the elements of ESD. The ANZECC / ARMCANZ 1996 environmental flow principles should be embedded in the objects and principles and in the environmental flow determination mechanisms of the legislation. The precautionary principle is one of the most important of the agreed sustainability principles and needs to be constantly applied and audited in terms of management processes.

This element is in pursuance of the NSESD, and seeks to avoid the insufficient statutory regard for ESD in water management and other legislation to date, especially where ESD is only one of a number of legal objectives of equal standing, or where functionaries must only "have regard to", rather than achieve, ESD. This means that the achievement of ESD will need to have priority over all other social and economic objectives.

In 1998 the Industry Commission found that the incorporation of ecological sustainability into policy has been ad hoc, incomplete and tentative. "The central problem is that Australian governments have yet to put in place a comprehensive, integrated and far sighted way of promoting the ecologically sustainable management of natural resources" (Industry Commission 1998).

The following comment about ESD in best-practice water legislation should be borne in mind (Bates 2000)

> *The Inter-Governmental Agreement on the Environment (IGAE) recognises that implementation of ESD requires an " effective integration of economic and environmental considerations in decision-making processes" and that to promote this approach four particular principles "should inform policy making and program implementation". These are the precautionary principle; intergenerational equity; conservation of biological diversity and ecological integrity, and improved valuation, pricing and incentive mechanisms. This approach has been adopted as the focus of much state based legislation.*
>
> *In my opinion there are serious deficiencies in the translation of ESD into a legal criteria for decision-making. This is because ESD is usually mandated as something to which regard must be had (see above) in decision-making and not as an objective that must be pursued or fulfilled. In my opinion ESD is, or should be, the fundamental objective and outcome of decision-making, not a factor to be balanced against others in reaching a decision. In designing legislation that seeks to incorporate ESD as a fundamental management approach, as suggested in the report, then very careful consideration needs to be given to determining the role of ESD in the decision-making process.*

The Productivity Commission in its major review of the implementation of ESD through Commonwealth Government programs (Productivity Commission 1999) stressed the essential nature of ESD in policy making in meeting multiple objectives, a process which challenges hierarchies within policy frameworks as well as single objective government programs and structures. The result is that after less than ten years of implementation of the NSESD, a wide variety of statutory definitions of ESD have appeared in Australian legislation (81 in Queensland's subordinate legislation alone). The definition of ESD in the NSESD (1992) should be universally used for clarity and consistency.

Within the legislation, the requirement to achieve ESD should be at a higher level than specific social or economic objectives. Given the historic focus of common law on equity considerations, placing all objectives on an equal legal footing will inevitably result in long-term sustainability objectives being delegated to second place.

Statements of principle, supporting the central objective of achieving ESD, can assist considerably in providing guidance to detailed management processes developed under the broad umbrella of legislation. The use of these principles, coupled with a statutory requirement for functionaries under the Act to pursue these principles in the conduct of their duties, is a mechanism which both guides processes towards agreed outcomes, and frees the legislation from the necessity to prescribe highly detailed, and possibly unnecessarily inflexible, management processes. Appendix F provides examples of the use of both broad environmental principles in establishing a whole-of-government approach to natural resource management, as well as examples of detailed principles applying specifically to waterway management.

> *2b. Legislation should incorporate a statutory requirement binding all functionaries under the Act to further the objects and principles of the Act.*

This sub-element is self-explanatory. It is included because there are legislative examples that omit it. The Victorian Water Act, for example, has a clear statement of purpose, but contains no obligation for functionaries to further this purpose in the course of their duties. There is little practical value in legislation that sets out an adequate set of objectives, but then fails to require functionaries to achieve them. Functionaries are identified explicitly in the legislation as those charged with specific powers and duties. Accountability for this sub-element is assisted by third party standing provisions (see element 12g (check numbering) below).

Using similar logic, the statute should bind functionaries into the use of listed principles in the course of their duties. The NSW Water Management Act 2000, for example, contains a provision along these lines relating to its list of principles.

2c. Legislation should create and enforce a statutory duty-of-care for catchment management.

Water management and the resultant outcomes are a matter of concern to all, and are influenced by all. Thus, a comprehensive duty-of-care is needed. This also emphasises that all Australians, in their every-day lives, impact on water management. The duty-of-care should not be limited, as often in the past, to functionaries under that particular legislation. Duty-of-care includes not only land or water-based activities but also immediate and eventual consequences of budgetary and capital works and other decisions that may not appear to have a direct impact on water in the first instance. Duty-of-care encompasses inaction, failure to act, as well as action.

Examples include the *Environment Protection Act 1994* (Qld) where s. 36 (1) states "

A person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm (the general environmental duty).

The explanatory notes provide the following information:

"What is the general environmental duty?

The Environmental Protection Act 1994 states that *we all have a general environmental duty. This means that we are all responsible for the actions we take that affect the environment. We must not carry out any activity that causes or is likely to cause environmental harm unless we take all reasonable and practicable measures to prevent or minimise the harm. For example, we must not burn rubbish in our backyards (unless permitted by local government), pour oil and other wastes down the stormwater drain or cause unreasonable noise. To decide what you need to meet your general environmental duty, you need to think about these issues:*

- *the nature of the harm or potential harm;*
- *the sensitivity of the receiving environment;*
- *the current state of technical knowledge for the activity;*
- *the likelihood of successful application of the different measures that might be taken; and*
- *the financial implications of the different measures as they would relate to the type of activity* (Queensland Environmental Protection Agency, Guidelines to the Environmental Protection Act 1995)

The Queensland Water Act does not establish a duty of care, thereby relying only on the EPAct's duty to prevent environmental harm. Enforcement of the duty of care through penalty provisions is essential.

2d. Inclusion of a statutory provision binding the Crown

It is necessary to bind the Crown in the part of the State, and as far as legislatively possible, in the part of the Commonwealth as well. This is because impacts by any land manager affect water management and values, and is necessary in pursuance of principles of accountability and producer responsibility. Further, governments should comply with at least the same standards as they set for others, and should go further as leaders by example. Again referring to the explanatory notes to the *Environmental Protection Act 1994* (Qld), they state:

The Act binds everyone including the Queensland Government and its agencies and, as far as legislative power permits, the Commonwealth Government and other state governments.

Duty-of-care includes not only land or water-based activities but also immediate and eventual consequences of budgetary and capital works and other decisions that may not appear to have a water impact in the first instance. Duty-of-care encompasses inaction, and failure to act, as well as action.

2e. Legislation should establish a framework, which provides for protection, management of sustainable use, and restoration including implementation of the National Water Quality Management Strategy.

The activity of river management not only should extend to all impacting activities in the physical surface catchment (see discussion above). The legislation should also specify that there are three components of river management, each an essential and mandatory part of the water management activity:

- protection - the first component is aimed at achieving conservation of the status quo in respect of river values, and arresting the continuing deterioration taking place daily in most Australian rivers. The identification and management of high ecological value rivers could be facilitated by legislative provisions requiring the classification and prioritisation of different waterways (as is currently the case in NSW and Victorian water legislation). Such provisions should also be designed to support the development of systems of representative reserves covering freshwater ecosystems, noting that all States except SA are currently committed to developing such reserve systems (Nevill 2001);
- management of sustainable use - this second component is about establishing strategies and other planning and implementation tools which ensure sustainable levels of ongoing use and other activities do not threaten catchment health / river integrity; and
- restoration - the third component aimed at undoing at least some of the damage caused by water managers to our Australian rivers in the past, including the recent past. Again, statutory frameworks which enable the classification of rivers by value, and the prioritisation of river management funds according to that classification, may assist.

2f. Catchment strategic plans are to include compliance strategies; they are to establish monitoring and reporting frameworks developed for ecosystem assessment in each catchment.

Specialised scientific input is essential to defining practical, informative and cost-effective monitoring and reporting frameworks. Design of these frameworks is a key part of coordinated planning between catchment partners.

Examples of monitoring parameters include:

- Physical / chemical water quality parameters (sampling locations, parameters, sampling frequency).
- AusRivAS macro-invertebrate data.
- Index of Stream Condition (ISC) or related monitoring system which seeks to monitor the health of the river and its riparian surrounds.
- Index of Aquifer Condition (this index has not yet been developed).
- Biodiversity monitoring indicators using keystone vertebrate species (eg: waterfowl breeding success - long-term averages
- Water allocation and usage (surface and ground waters).
- Cumulative effects indicators: farm dams, drains, levee banks, irrigated crop area, native vegetation area).
- Catchment-specific indicators monitoring density of invasive pest species.
- Type and position of barriers to fish passage.

Standardised classifications and consistent measurement protocols for data collection, natural resource management and sustainable development should be done a national basis by the Australian Bureau of Statistics as recommended by the Productivity Commission (1999 p xxxii):

Key characteristics of effective monitoring systems for ESD issues include:

- performance is measured against clearly defined objectives and outcomes in all relevant social, economic and environmental areas;
- indicators need to be measurable, representative and as cost effective and practical as possible (however, they should not only be developed for areas that are easy to measure);
- the monitoring system should be developed early in the decision making cycle and updated as appropriate in the light of experience;
- information should be shared with other agencies and stakeholders to provide an opportunity to learn from the experiences of others grappling with similar issues;
- regular reviews of the usefulness of performance information should occur;
- commitment by policy makers to the monitoring system is required to ensure its effective implementation;
- support for users of the system should be provided through appropriate training programs;
- performance indicators should relate to outcomes and outputs as well as inputs or processes;
- the limitations of indicators should be well understood and reported;
- performance monitoring tasks should be separated from policy makers, wherever possible, to promote their use as a tool for improving accountability and incentives;
- stakeholders should be involved in both planning and conducting monitoring wherever possible;
- consideration of a complaints mechanism for stakeholders to provide feedback;
- consideration of sunset clauses in policies and programs to ensure comprehensive reviews of programs are conducted;
- monitoring of environmental issues based on ecosystems rather then geographical or sectoral boundaries;
- consideration of a full set of reporting options, including reporting in annual reports and agencies' web sites;
- participating in necessary research and cooperating with others in these tasks;
- noting and recording useful lessons in a systematic and accessible manner; and
- institutionalisation of monitoring systems, including provision of adequate resources and support from upper management.

Source: Productivity Commission (1999) p. 118.

Monitoring strategies will attract greater attention as catchment management becomes more target-based (see *Coordinated Planning and Implementation* below). Rigorous and purposeful monitoring in a strategic framework is part of the catchment management challenge. One recent example of multiple monitoring projects running in a Queensland coastal Council highlights the need for a more strategic and coordinated approach to data collection. The following is a list of the water quality and quantity monitoring taking place, the responsible party and the purpose. No figures were available to indicate the costs of these multiple and largely parallel monitoring exercises.

Table 3: Fragmented monitoring framework

Water monitoring task	Responsibility	Focus / Purpose
Ambient water quality in streams	State EPA	State-wide Water Quality reports
Water supply dams	Water Corporation of Council	Water supply protection
Wastewater Treatment Plants	Water Corporation of Council	Licence conditions
Ambient water quality in streams	Health section	• Checking licence compliance for point source discharges • Council's State of Environment Report
Diffuse source monitoring in selected catchment	Planning section	Calibration of pollutant export rates from land uses to run in catchment water quality model
Water quantity in stream flows	Engineering section	Flood gauging
Regional water quality monitoring (proposed)	Regional Water Quality Management Study	Planning tasks under the regional catchment management strategy

The funding agency must specify in advance the monitoring systems/regime to be used to determine accountability.

2g. Catchment plans are to be prepared for all State catchments within a specified time frame.

This provision would avoid the tendency for States to focus their river management efforts only on stressed catchments, resulting in other systems gradually moving to stressed status. Victoria's methodologies currently being trialed for rapid assessment should provide a means to achieve such coverage of catchment planning across all States in a context of limited planning resources.

#3. Primacy of catchment legislation

It must be recognised that Australia's rivers are in crisis. An approach based on "more of the same" will simply not work in a situation where resources crucial to the survival of the nation, much of its capital and the quality of life of its people are at serious risk. It must also be acknowledged that management of the water resource presents particularly intractable problems - examples include: difficulties in achieving integrated decision-making, the management of the cumulative effects of incremental development, and the control of salinity.

All legislation with a direct or indirect effect on river integrity needs to have and maintain primacy over all other legislation, including that applying to utilities and for emergencies. In other words, for the avoidance of doubt, legislation which implements the suggested criteria should be given ongoing legislative priority despite the provisions of any other law, including subsequent law. Achieving the suggested criteria should be given greater statutory weight than any other objective. Consequentially, any legislation which ignores the criteria above needs to be reviewed or eliminated to bring it into consistency, and kept so reviewed. Integration and consistency are key issues in river restoration.

SUB-ELEMENTS:

3a. Primacy over existing legislation.

It is straightforward parliamentary draughting for a piece of water management legislation to provide that it takes precedence over all legislation. Conflicting provisions should be explicitly repealed.

3b. Primacy over future legislation.

It is not difficult for a draftsperson to ensure that all subsequent legislation explicitly recognises the primacy of the water management legislation. This technique is reasonably common practice in some areas.

3c. Primacy over emergency legislation (eg: firefighting etc).

Again, it is not difficult for a draftsperson to ensure that existing or subsequent legislation for emergency situations explicitly recognises the primacy of the water management legislation. This appears to be uncommon practice at present. It will mean that the designated water manager has overall charge in emergency situations, not fire, police or emergency services; at least as far as matters concerning river integrity.

It should be acknowledged that, in practice, this may create significant complications, and there will be many who find this approach unsatisfactory. The essential point relates to the crisis faced by Australia's freshwater ecosystems. Major changes to existing procedures are necessary. There may be many different approaches to the difficulties faced in resolving matters of primacy, and ultimately each jurisdiction must tailor solutions within an array of existing statutes and procedures.

Another alternative would be to say that all agencies, including those with emergency responsibilities, with an interest in a catchment have to resolve conflict on a strategic basis between their activities.

#4. An integrated hierarchy of planning and management frameworks

Bottom-up approaches often gain strong community support, but alone will inevitably be faced with 're-inventing the wheel' over a wide variety of catchment issues and problems. Top-down approaches can provide information and decision processes efficiently, as well as delivering high-level funding, but alone will not have the necessary on-ground support to ensure implementation. Local communities will not participate in what they perceive to be a predetermined, tokenistic process.

A mix of both top-down and bottom-up planning approaches is required for catchment management to be both effective and efficient. The essential logic of hierarchical management structures must be to empower local communities within a framework which is supportive, adaptive and accountable. It is our view that a suitable mix of top-down and bottom-up approaches can best be achieved through an integrated hierarchy of planning and management structures, driven by legislative objects and guided by principles (set out either in legislation or in State-level policy). Such a framework incorporates both elements of national and State consistency, and public accountability, as well as providing a reasonably large number of grass-roots planning groups handling detailed local planning issues within the broader funding and planning agendas. Feedback mechanisms which allow grassroots knowledge to permeate and inform changes to the structures over time are essential.

There are a variety of ways in which an integrated hierarchy of NRM plans and management structures might be established to bring about good catchment management. An integrated hierarchy of NRM plans and management structures must be informed by a set of coherent principles which ensure that is a congruent hierarchy - not a confused mass. Examples of possible approaches are given under the sub-elements below.

SUB-ELEMENTS:

4a. There needs to be a hierarchy of planning instruments for the management of all natural resources. This hierarchy should proceed from, and integrate with, State, regional, catchment and local plans (as appropriate).

The following is one possibility.

- a national NRM plan with supporting policies, strategies and funding programs;
- a State NRM plan with a supporting funding program.
- strategic catchment plans
- local plans, including water allocation, river management, native vegetation, irrigation development, water infrastructure, aquifer protection, fish passage, weed and pest control, agricultural drainage, water quality plans for diffuse sources, stormwater plans, flood and floodplain management plans, salinity action plans, biodiversity protection plans, invasive specie control plans, riparian zone plans, and production and property plans.

4b. There needs to be a hierarchy of appropriately representative management structures ranging across, and with assured integration of, State, regional, catchment, and local levels (as appropriate).

The following is one possibility:

- a State Cabinet NRM committee comprising key Ministers;
- the responsible minister;
- a ministerial catchment advisory council;

- catchment agency and supporting arrangements with relevant other agencies;
- local planning committees.

This suggested hierarchy of management structures appears most likely to lead to river integrity. It will demonstrate government leadership in acknowledging the significance of water management, and providing management resources, as well as providing structures for encouraging local participation, ownership, and the use of local knowledge.

4c High level independent expert panels should to be utilised to advise on technical matters, assist in the resolution of conflict, advise on institutional and procedural matters, and assist in reporting overall progress on the implementation of the State NRM framework.

The NSW Water Management Act 2000 includes a provision for the Minister to appoint, at his/her discretion, an Independent Expert Panel to provide advice to the Minister and Water Management Committees on matters aimed at improving water management processes and decisions.

In our opinion, this provides an efficient, credible and flexible model useful for both information transfer and conflict resolution. Skills on the Panel should include planning, engineering, hydrology, economics and governance.

#5. Catchment-based custodial agency

Natural resource planning should (wherever possible) be integrated through a single agency within each major river basin or biophysical region. The agency needs to be outcome-focused, equipped with strategic powers, funded in line with its responsibilities, and should be required to report at appropriate legislated intervals against its strategic outcome objectives.

There is deliberately no prescription in this MLF for what constitutes the 'agency'. The management board of the agency could be some or all of the following:

- entirely elected;
- a mixture of elected / nominated / appointed / staff
- entirely public or private sector personnel

Provided the other elements of this model are met, particularly regarding stakeholder involvement, and the provision of appropriate expertise to the board. Board members need to be appointed for a reasonable length of time (say 5 years) to ensure stability and commitment.

The above possibilities include the Victorian Catchment Management Authority (CMA) model, upgrades of catchment bodies in other jurisdictions to provide the statutory basis in this model, a regional reformatting of State agencies related primarily but not solely to the water management agency, or an amalgamation / restructure of local government arrangements in a catchment, or a combination of State and Local governments (cross sectoral cooperative model) organised along catchment lines.

The agency must have concurrence powers in relation to significant proposals impacting on catchment management, which fall outside the provisions of the strategic catchment plan. Planning approvals must follow the specific recommendations of this catchment agency where they do not meet the requirements of the strategic catchment plan.

SUB-ELEMENTS:

5a An Independent Expert Panel mechanism is to be utilised in instances where there is disagreement, for example about sustainable water extraction limits. The panel would review the options and mediate / negotiate the outcomes between the parties.

This is an important part of the planning process which works with the stakeholder parties, the knowledge base available, and supports and mediates the negotiation process. Enduring solutions for complex problems such as catchment management require clear ground rules and operating procedures. The panel is a procedural option which provides a resource for catchment agency processes. It requires appropriate recognition / standing with government agencies, powers to access information as needed, and appropriate resourcing to be effective.

The NSW Nature Conservation Council has discussed the powers of the Independent Expert Panel which may be requested by the Minister to reports on matters referred to it which may include:

- State Water Management Outcomes Plan (s. 6 WMA 2000)
- Terms of reference for the preparation of Minsters plans
- Adequacy and appropriateness of Draft Management Plans submitted to the Minister
- Effectiveness of furthering the water sharing principles of any water sharing regime established by a Management Plan
- The review of a Management Plan
- Any implementation programs established (Cleary et al 2001).

5b. Catchment strategies should be implemented utilising incentive mechanisms such as rate rebates or tied grants wherever practicable.

In addition to statutory measures, non-statutory measures combined with financial incentive measures have a strong part to play in catchment management particularly at the coalface of property management. Water statutes can take these mechanisms into consideration, and provide appropriate frameworks to facilitate their use.

While economic incentives should be used these must be monitored to ensure capital works developed under incentives continue to be maintained. The fair distribution of incentives also needs to be addressed.

5c. The catchment agency must be able to ensure agreed river management objectives take precedence over sectoral / local objectives.

Once agreed, the objectives of the catchment strategy, and the controls developed by that strategy, need to have statutory force against in other decision-making contexts, for example local government development approval processes. Statutory assessment and reporting frameworks will also assist.

#6. Stakeholder-based structures and public involvement

Whichever structure is chosen for the custodial catchment agency, it needs to include and engage representatives from all stakeholders groups in an open, equitable and adequately resourced manner. The preparation and review of strategic plans and implementation programs needs to incorporate best-practice public consultation. Structured on-going education plays a fundamental role in effective public and stakeholder involvement.

While many sub-elements here relate to composition and processes of the agency, governance issues are also to be addressed in legislation. One options is for the agency's governance arrangements to mirror those of a Board of Directors performing in accordance with codes and statutes which set the standards for companies and public sector bodies.

SUB-ELEMENTS:

6a. Composition of the statutory catchment agency should allow for an independent chairperson and representation of all stakeholders, including urban, environmental and non-commercial, to ensure there is cross-community involvement in, and commitment to river management.

It is clear (from the literature, from the practitioners in this study, and from the study team's experience) that ownership is an important component of improved water management; and that this, in turn, requires genuine, long-term and mutually trusting stakeholder co-operation. The legislation should play its part in achieving this end, establish management and consultation groups, and by prescribing some of their operating parameters.

The legislation should provide directions about obtaining stakeholder involvement, including provision for an open and public call for nominations.

Composition should provide for collegiate elections at a range of levels; for example election of the independent Chairperson, members of the agency and others as relevant. Where appropriate, ministerial appointment from stakeholder nominees should be used. Several State water statutes use this technique, combined with prescriptions relating to knowledge or experience of the combined members.

6b. A dominance of any sectoral group should be avoided.

To an extent, this sub-element repeats the last one. However, it is made explicit because numerous concerns were expressed on this issue, in the workshops and in submissions to the Causley Inquiry (House of Representatives Standing Committee on the Environment and Heritage (2000)). Particular concerns were about irrigator and public servant over-representation on existing advisory catchment structures. The Boards of Victorian CMA's for instance are weighed heavily in favour of consumptive users and therefore are unlikely to be effective river custodians (peer reviewer, pers.comm).

Certain State water statutes specify that some planning groups should comprise a majority of water users. Such prescriptions may well work against the imperative to make sustainable decisions.

6c. Composition should prefer local stakeholders over representatives living outside the catchment where practical.

This sub-element is not intended to exclude extra-catchment representation on catchment agencies. However, it may become the determining factor in selecting between two equally-appropriate representatives, as the use of local representatives will foster the use of local knowledge and ownership of the plans and decisions make by the group. Local representatives should represent the interests of a group and not just the interests of individual people.

Without bottom-up support, programs will not be effectively implemented. Without top-down guidance, planning will not be efficient or consistent. A mixture of top-down and bottom-up support is essential for the effective and efficient operation of tiered planning structures.

6d. Equitable representation of catchment stakeholders should be provided for.

The balance of representation will vary with the catchment. In a democratic system, it will rest with the judgement of the elected representatives of the day, both as to the representative composition provided in statute and with the subsequent selection for appointment.

6e. Committees need to contain, amongst all representatives, a full range of relevant expertise.

Stakeholders may be selected using a mixture of the following criteria:

- by skills and expertise; and
- by representativeness for example, of key interest groups in a catchment area.

Expertise in the management of various aspects of water resources should be specified. These should explicitly include expertise in the conservation of aquatic ecosystems, as well as expertise in hydrology and river geomorphology. Wherever possible there should be an independent ('agency-free') water scientist included.

Achieving appropriate representation is context-dependent in terms of the issues and management arrangements sought. Representation may vary depending on the degree to which the agency is focused on partnerships between government agencies and the local community (including but not limited to 'water users' community); local governments and State agencies; expert and political interest groups such as farmers and environment groups.

6f. Fiscal equity (no taxation without representation) should be considered.

This sub-element means that those who pay levies should be represented but not over-represented on the catchment agency. One method of doing this is by funding the catchment agency directly or indirectly through local government income, and selecting a local government representative onto the catchment agency.

6g. Both upper catchment and lower catchment areas should be represented.

Integrated water management and accountability are best achieved through a whole-of-catchment agency. This is particularly important so that those who permit activities in upper catchment areas are accountable to those who receive the consequences downstream.

6h. The process of selection should be transparent.

The selection process applying to stakeholders should be transparent, and could include a public call for nominations from the public at large or from sectoral interests as appropriate. The public should have ready access to information on those nominated / under consideration, and there should be public dissemination of the decision about selection, with explanations.

One model of interest involves expert based boards recommended to a minister by a separate selection committee, thus minimising the risk of direct interference by politicians.

6i. Best practice principles of incorporating and resourcing public input should be required.

In designing consultative frameworks, and the legislation to enable and support them, attention should be given to discussions of best practise in this area as they evolve. Good recent examples include the ANZECC NWQMS *Implementation Guidelines 1998*, and The Productivity Commission 1999 (p.10).

The ANZECC document, which deals with water quality planning within a catchment management framework, lists five key themes which may be applied in a systems approach to management:

> **Strategic planning**
> Policies, planning and action should be linked to achieve an agreed vision or outcome. Important elements are:

- setting of integrated objectives and priorities to protect the environmental values (beneficial uses) of fresh and marine water bodies
- design of management options to directly or indirectly influence environmental outcomes, and which may have complementary benefits (eg wastewater treatment and wetland rehabilitation)
- co-ordination of action plans for different aspects of resource management initiated by government, industry, landholder and community organisations.

Active partnership
Collaboration among key stakeholders is encouraged to generate credibility, commitment and co-operation. Conflict-mediating processes are important.

Integrated approach
Effective assessment of impacts and variables which affect water quality and overall catchment health requires a holistic approach. The emphasis is primarily technical and implications of catchment conditions and management actions are directly relevant. At times, skills in resolving conflicts will be required Key aspects of an integrated approach include:
- analysis of aspects of the catchment system (eg water quality, streamflows, riparian conditions) impinging upon relevant values or uses of waterways
- assessment of the ecological, economic and social values or beneficial uses of waterways and related impacts of management actions
- monitoring of environmental conditions and related socio-economic factors.

Long term view of social, economic and environmental impacts
Evaluation of the overall merits of alternative combinations of technical solutions and implementation devices is required. River integrity and sustainability is the basis on which long term social, economic and ecological values rest. The evaluation must identify options to assess social, economic and environmental impacts with respect to:
- the efficient use of public and private economic resources
- the effectiveness of actions in achieving desired outcomes
- the equitable distribution of costs and benefits
- progress towards sustainable systems of production.

Adaptive management
Effective catchment management depends upon a reasonable understanding of:
- major factors influencing water quality in the catchment or coastal waters
- the impact of past changes and development on current water quality.

While it is recognised that an optimal knowledge and information base for catchment management is not available, there is usually sufficient information to identify and quantify the important local water quality issues. Key requirements are:
- a sound overview of the effect of various activities on water quality, making maximum use of existing knowledge
- a shared understanding by managers and stakeholders
- good 'feedback' systems to monitor responses to management action.

6j. Ongoing and structured programs of education are a priority.

Practitioners and others have urged adequate stakeholder and general community education programs in water management (good examples exist, eg: the July 2001 Healthy Waterways print media advertisements showing pelicans killed by shopping bags washed into Moreton Bay). Such programs should be comprehensive, precede enforcement programs and need adequate funding at a suitably early stage.

6k. The engagement of stakeholders in catchment agency structures needs to be effectively resourced.

This sub-element includes a range of appropriate resources, including expert advice, compensation for time, travel, self-education and incidental expenses (eg childcare / babysitting), for those involved in the catchment agency and its subordinate processes.

6l. Adequate consultation programs must be provided in relation to significant infrastructure developments (such as large dams).

The objective of consultation programs is to increase understanding of the likely effects of a proposal. Consultation programs aim to avoid disputes as far as possible by sharing information between all interested parties. The fundamental principle behind consultation is that full and open sharing of relevant information among all stakeholders is likely to avoid disputes based on misunderstanding of the likely effects of the proposal.

6m. Agreed processes should be developed relating to major water development proposals incorporating effective mediation, conciliation and dispute resolution mechanisms.

Mediation is the informal intervention of a third party with the object of finding mutually beneficial or at least mutually acceptable solutions. Conciliation is the formal intervention of an independent third party (usually an accredited conciliator) in an attempt to find a mutually acceptable position or compromise.

Mediation and conciliation are both dispute resolution mechanisms based on a recognition by the disputing parties that other views need to be considered; they assume a desire to cooperate to find mutually satisfactory solutions. The conciliator or mediator acts as an independent assistant to the parties in finding their own solutions. The difference between mediation and conciliation is largely related to formality and accountability. The results of mediation meetings are not always recorded; however the results of the more formal conciliation meetings are always recorded in writing.

Arbitration is the imposition of a decision (to resolve a dispute), after due consideration, by a person with acknowledged standing (eg: government minister, delegated public servant (eg: CEO of the department responsible for State NRM), or court judge).

Arbitration rests on the mutual recognition by the disputing parties of the authority of the arbitrator to impose a solution. It is essential, however, that the arbitrator should be seen as impartial, and the decision should only be made after both parties have had an adequate opportunity to present their views. The arbitrator should be accountable for his/her decision to the extent that a written explanation of the decision should be provided.

#7. Coordinated and integrated strategic planning and implementation

The coordination and integration of NRM plans is necessary within each catchment. The key vehicle for this coordination is the catchment strategic plan, prepared by the custodial catchment agency. For example, existing landuse planning frameworks are focused on approving (under appropriate conditions) new developments. They generally lack incentive or comprehensive natural resource management provisions.

Meanwhile, catchment strategies in several Australian jurisdictions have 'regard to' status only. In these instances, while State and local governments must have regard to catchment strategy plans, they have no obligation to seek to further catchment outcomes when making budget, grant, capital works or development decisions, and may make decisions which run directly counter to the recommendations of the catchment strategy plan.

Given the declining state of many catchments, and the inherent difficulties in managing many aspects of the water resources (such as the effects of invasive species, or the cumulative effects of

incremental developments) decisive action must be taken to coordinate all decisions affecting catchments.

The catchment strategic plan on a catchment-wide spatial basis is the primary vehicle for delivering river integrity outcomes at catchment level. It should incorporate at least the matters listed below.

SUB-ELEMENTS:

7a. Comprehensive natural resource inventories, by catchment, are fundamental to an informed and integrated strategic plan.

This sub-element is self-evident: you must know what you have at the start of each year, and what you have at the end of each year, to be able to assess your performance during the year. This has been axiomatic within the accounting profession for many decades. Natural resource accounting processes are developing in Australia from a very low base. For example, in spite of the fact that the Australian government signed the Ramsar convention in 1971, Australia has yet to develop comprehensive inventories of freshwater ecosystems at a State or national level, even though the development of such inventories is a requirement of the convention (see Nevill 2001 for a discussion of the need for such inventories). Few Australian catchments would be able to boast such an inventory even at catchment level. Comprehensive catchment health assessments are an emerging science, and their compilation represents a significant investment, necessary at an early stage of catchment planning.

The best available information on catchment health parameters will form the basis of the first strategic plan. Standard methodologies should be developed and applied to assessment processes to establish catchment, natural resources and river values, to define threats or risks to these values, and to develop priority areas and priority actions into the strategic plan.

Priorities need to be set on the basis of key outcomes, with targets specified for measuring progress on the achievement of these outcomes. Target-based plans are increasingly gaining acceptance as the mechanism for managing natural resources and environmental legislation in most States, and over time will provide a comprehensive set of benchmarks for protection and prevention strategies, as well as best practice processes for their development and measurement.

The strategic plan should also incorporate a knowledge management strategy to ensure database development for key catchment issues, and to ensure planning and review have adequate databases for reviewing progress and upgrading plans (supporting adaptive management).

7b. Legislation must require catchment strategies to address the cumulative effects of incremental developments, particularly in water infrastructure, irrigation, and vegetation clearance, through a process of establishing agreed limits to development.

The management of cumulative effects has often been ignored in Australian water and other NRM management. Even today, the need for their general control is explicitly acknowledged in only one Australian water statute: that of NSW. Not only must cumulative effects be considered, but new processes are urgently needed to ensure the control of such impacting activities - which at present go ahead outside statutory approval provisions operated under State and local government assessment frameworks.

On- and off-stream impoundments of small and medium sizes, domestic and stock water extractions, and small-scale vegetation clearing tend to escape most statutory approval thresholds. All tend to escape controls through agreed strategic limits. These, as well as levee banks, bores and agricultural drains are prime examples of activities which need control through strategic limits set within catchment contexts.

There are equity reasons why assessment processes should place a substantial part of the onus of impact assessment on the proponent. Small scale case-by-case assessments, however, will inevitably fail to control cumulative effects. Catchment limits on development must be set well ahead of a catchment entering a condition of stress. If limits are only set on stressed catchments, this process will see all catchments move incrementally towards a stressed condition (Nevill 2001).

In many catchments, strategic limits will also need to be set on the development of irrigated agriculture, and the clearing of native vegetation.

In many catchments, strategic limits will also need to be set on the development of irrigated agriculture, and the clearing of native vegetation. Procedures to establish strategic limits are not sufficient in themselves. Three core elements are necessary: (a) procedures must be established to set development limits on a catchment-wide basis; (b) these limits must be put in place while the catchment is still healthy; and (c) the limits must be set in a precautionary way. These three elements are discussed in more detail in Chapter 7.

Another example could be that a catchment strategic plan might place a permeability limit on the surface treatment of all land in an urbanised catchment, so as to control the volume and periodicity of stormwater runoff. This could lead to a trading market in transferable permeability entitlements. These limits may be interim at first and finalised in the process of the strategic plan's adoption.

> *7c. Catchment strategies need to have primacy in development approval mechanisms. Local government plans and decisions need to further the objectives and action programs set out in catchment strategies.*

This sub-element builds further on the concept of the primacy of water management. The catchment strategy will override all other plans within its area, and its provisions be binding on all who are bound by the water legislation. As with the legislation itself (see element 3 above), the catchment strategic plan needs its primacy asserted over both existing and subsequent plans; one mechanism for achieving this goal is to legislate that inconsistencies in either case are void.

This means the adoption of a catchment strategic plan would automatically override State and local government planning instruments to the extent of their inconsistencies.

> *7d. The custodial catchment-based agency must be charged with developing a statutory strategic plan (within a specified timeframe) to ensure the protection, management of sustainable use, and restoration of the catchment. Such a plan will recognise and protect the environmental values of the catchment, including those identified under the National Water Quality Management Strategy.*

This sub-element firstly requires the legislation to charge the catchment agency with the role of the "River Custodian". This concept has frequently been raised; for example, the review of the Hawkesbury-Nepean (Healthy Rivers Commission 1997) focused on generic impediments to effective management and progress towards healthier rivers. Management of the Hawkesbury-Nepean uses a Catchment Management Trust, an Environmental Planning Strategy, a statutory Regional Environmental Plan and Action Plan, a number of locally-based subcatchment management committees and a community awareness program. The report's findings in its section on 'institutional issues' include:

> *institutional arrangements do not provide for an unambiguous role of 'river custodian / manager'. There is a perception that because 'everyone' is (apparently) responsible, no-one can be held responsible* (Healthy Rivers Commission, 1997 p12);

In establishing that maturer river management agencies showed a progression through six models from simple to effective (Maher *et al* 1999), these were the last two models ---

- Establishment of a statutory river custodian, preferably apart from line agencies; eg. Swan River Trust; New Zealand's Parliamentary Commissioner for the Environment; as recommended in 1984 and 1997 for the Hawkesbury-Nepean; and
- All planning, all levels of government services, enforcement and auditing are delivered by one statutorily constituted agency. A refinement of this model is for a separate independent audit of river restoration achievements.

7e. The strategic plan needs to be comprehensive in the sense of addressing all NRM issues impacting on river integrity and must meet national and State strategic requirements.

Mandatory components of the strategic plan for management of the catchment are to include the following *outcomes* for river integrity:

- quantity of water sources;
- quality of water sources
- use of water sources;
- rehabilitation of water ecosystems;
- protection of biodiversity dependent on surface or groundwaters;
- management measures for securing the health of aquatic and water dependent ecosystems, including the protection of special and representative areas;
- compliance requirements with water quality, quantity and ecosystem objectives;
- implementation programs – scope, key plans and their audit reporting requirements.

Matters concerning how these outcomes are to be achieved need not be mandated unless they directly relate to outcomes; for example the following is a list of possible mechanisms for achieving river integrity outcomes could all be used:

- corporate plan for the agency
- processes for water management planning
- processes for water quality management.

However the legislation may define achievement mechanisms with a direct bearing on the outcomes for example:

- reporting standards and processes to be used by all contributing agencies

7f. A review period for the strategic plan should be mandated; as also should be the maximum time period for those reviews necessary to bring the strategic plan within any new Commonwealth or State strategic requirements.

Strategic plan updates will obviously be required when the Commonwealth and / or State governments' strategic requirements change. For example – consider the changes that might be needed under the requirements of the Commonwealth National Action Plan on Salinity and Water Quality, or those contained in the relevant State Water Plan (or State Catchment Strategy) or inter-state plan where there is one).

The review must be transparent in process and involve independent collection of data.

7g. Catchment strategies are to recognise and protect freshwater ecosystems of high ecological or representative value.

See 1e for discussion. One danger is that operational works functions may dominate strategic and sustainability-focused functions of catchment agencies. The catchment strategies need to clearly define the functionalities of the catchment agency in priority order.

7h. Where a proposed development does not meet the requirements of the catchment strategic plan, the development application must be referred to the catchment agency. Local government must adhere to any conditions recommended by the catchment agency if approving the development. Local government is to resource this referral function.

The purpose of this sub-element is to require standard 'concurrence' or 'call-in' powers to the catchment management agency over statutory development proposals. The decision of the catchment agency shall bind the development determining agency (usually, the local government). However, the catchment agency must defend its decision on any appeal.

As well as this sub-element addressing developments as presently defined in the landuse approval legislation of jurisdictions, it also needs to cover in the same way any activity in the catchment which can or does impact, including cumulatively, on the river. This provision will include many activities which at present are not covered by statutory land use / development and other approval provisions, and will need to include most or all agricultural activities and changes (intensification, drainage, filling land, vegetation removal / alteration, changes to and from grazing to arable, chemical utilisation, etc.).

However, to the extent that comprehensive controls can be built into the strategic plan, and development proposals are in line with the plan, there will be no need for this referral mechanism.

7i. Water plans need to be prepared for the total connected resource - surface and groundwaters.

The administrative disconnection of water management between linked water bodies has undermined water resource planning mechanisms, and cannot continue. Most of the time, Australian rivers are fed by surface aquifers, yet catchment caps addressing both ground and surface water resources are not being applied (with a very small number of exceptions in WA, Victoria and NSW).

Although there have been recent legislative changes in several jurisdictions over the last four years which provide frameworks for the integrated management of surface and ground waters, there has been relatively little application of these frameworks in practice. (Nevill, Maher and Nichols 2001, Nevill 2001).

7j. Environmental assessment processes applying to large infrastructure should take account of the effects of both the proposed activity and *the associated additional impacts of the land uses on which the project depends on for its financial viability (irrigation programs, for example). Inclusive boundaries should be drawn around assessable projects to take into account all relevant direct and indirect impacts.*

There are regrettable examples of inappropriately narrow boundaries being used for environmental impact assessment (EIA) processes; this is, in fact, the traditional approach to large dam EIA in Australia. Most major dams have had EIA confined to their physical structure, their impounded area, and emitted water aspects. These processes have omitted from EIA the major catchment and land use changes on which the proposals are predicated, such as extended irrigated areas and other agricultural intensification; as well as the "knock-on" effects of those – including changes and additional transport, noise, chemical utilisation, etc.

As a recent example, the Port of Brisbane expansion (another 1.8 km into Moreton Bay, a Ramsar site) EIA omitted to assess the impacts of sourcing the fill because it was to be obtained over some decades from ongoing navigational dredging.

7k. Separation of the roles of resource management, standard setting and regulation from the role of providing water services

This is a key element of the COAG 1994 water reform agenda. The requirement to demonstrate effective separation of these functions is noted as an outstanding one for several States in the NCC tranche assessment reports.

7l. Provision for a working relationship between science and management within both State and catchment management structures.

Use of best available science is a principle that is widely applied now to planning of environmental flows. This principle needs to be applied to all aspects of catchment management, from State to catchment to local level. See also 5d - role of the Independent Expert Panel.

7m. Assurance of a whole of government approach to the State's natural resource management through a formal integrated management system.

In addition to water resource and water quality management arrangements, a whole of government approach to the full suite of natural resource management programs requires a formal coordination structure. The Tasmanian government has set up one example of this formal coordination arrangement – the Resource Management and Planning System under the Resource Management and Planning System Act (1994).

#8. Capacity to self-fund

Catchment agencies will not be effective unless they are adequately resourced, in line with their responsibilities and accountabilities. Local funding increases local ownership of programs, and underlines accountabilities. This local funding should be supplemented by State and Commonwealth funds commensurate with the strategies and expectations of each of these levels of government, as well as equity considerations.

SUB-ELEMENTS:

8a Availability of Commonwealth funds tied to the achievement of national natural resource management objectives, through programs such as the National Action Plan.

So as to clarify responsibilities and accountabilities, this sub-element proposes that Commonwealth funding be provided only for the achievement of national NRM objectives. The funds and their purpose should be publicly disclosed, and reports required to discharge accountability requirements should be readily accessible to the public.

8b. Availability of State funds tied to State objectives and management frameworks.

The previous principle should also apply to State funds and objectives. There have been recent adverse examples of State refusals to fund State objectives once Commonwealth funds were reserved solely for national NRM objectives. Another poor recent example is of States transferring NRM cost centres to the responsibility of catchment agencies without the previous program funding, which was reabsorbed into consolidated revenue.

8c. Funds raised locally by catchment agencies are to be spent only on NRM objectives within that catchment.

This sub-element is to ensure accountable links between catchment agency fundraising and the purposes on which it can be spent - not an unusual feature to see in legislation. Catchment agencies may elect to use existing local government rating systems to raise part or all of the catchment funding, for example.

8d. One of the conditions for any tied funding should be the pre-existence of local NRM levies.

This sub-element requires local fundraising by a catchment agency under and for the implementation of its strategic plan, as a prerequisite to obtaining funds from another tier of government. It is based on self-help, 'ownership' and coordination principles.

8e. Differential Commonwealth funding should be available to assist priority areas, or to achieve equity between catchments.

This sub-element recognised variation in population density (and thus the availability of local funds) resulting in disadvantage and limited capacity, across the wide range of Australian catchments. It is, for water management, essentially a continuation of the horizontal equalisation principle - a principle which recognises the need for both Commonwealth and State governments to provide subsidies to support rural regions with low population densities; these regions provide important ecological services to the nation as a whole, and the value of these services needs to be recognised.

#9. Engagement of local government

State and Commonwealth governments should provide legislative and funding frameworks aimed in part at fostering local government involvement in strategic catchment planning. Local government representation must be included in catchment agencies. Catchment agency representation must be included on local government planning committees. Arrangements must be made to integrate decision-making across local government and catchment boundaries.

The New Zealand model, where regional governments are constituted on catchment boundaries, bears close examination. Institutional boundaries create impediments to integrated planning. Logically, boundaries should be removed wherever this is practical.

This element aims at providing a framework which will facilitate, to the greatest extent practicable, co-ordination and cooperation between catchment agencies and local governments.

In the long term, it is our view that Australia would gain very significant advantages by a move towards a two tier system of government, with local and State governments replaced by provincial governments, based on broad catchment boundaries. In this case, coordination between catchment agencies and 'local' government would be unnecessary, as they would in fact be the same.

SUB-ELEMENTS:

9a. Local government representatives must be included in catchment agencies, and catchment agency representatives must be included on local government planning committees.

Integration of decision-making will not occur in any effective or consistent sense without management structures designed to foster the passage of information across administrative boundaries. Cross-membership of committees is one important mechanism enabling this information flow.

9b. Local government decisions must be consistent with the catchment strategic plan.

This sub-element seeks planning consistency, and reflects the primacy of water management legislation and strategic catchment plans (as discussed above). Inadequate attention to catchment management by governments has resulted in the present unsatisfactory condition of the nation's water resources, underpinned by many unsatisfactory aspects of Australian water management structures.

Referrals of development applications from local government to catchment agencies are to be avoided wherever practical, due to the need for efficient decision-making processes. Establishing a

strategic catchment framework which will provide a high degree of certainty to developers and council, as well as protecting sustainable natural and productive values within the catchment, but defining limits and conditions to development.

Constant referral of routine development applications from local government to the catchment agency would be impossibly difficult to resource.

To the extent that the catchment agencies referral review service does need to be adequately resourced, council should meet most or all of these costs.

9c. Where the opportunity presents itself, local government boundaries should be brought into line with catchment boundaries.

This sub-element is self-explanatory in view of the above discussion. While the study team prefers a two-tiered system of government, with the lower tier using catchment boundaries for better natural resource management, we recognise that such a substantial change does not appear likely in short (or even the medium) term. However, realignment of local government boundaries to catchment boundaries (and possibly to sub-catchment boundaries in the initial stages), is more feasible, and should be attempted whenever the opportunity presents itself.

#10. Requirement for continuous improvement

"Adaptive management" or "the quality assurance principle" are terms variously used to describe planning loops involving a sequence of logical steps: setting objectives and targets, planning to achieve these, implementing the plans, monitoring and reporting progress, reviewing achievements, and refining program objectives. These steps recognise the difficulties in managing complex systems, and acknowledge that objectives are unlikely to be achieved without a feedback loop incorporating reviews of progress. Using such a planning loop provides opportunities to improve performance over time. These approaches have been used in industry routinely for many decades. They offer the water industry important opportunities to enhance effectiveness, efficiency, transparency and accountability.

The key to effective functioning of adaptive management principles is the length of the planning cycle – reasonably short planning cycles underpinned with strong monitoring frameworks are essential to continuous improvement. The selection of a longer planning cycle (7 to 10 years outside arid areas) should be accompanied by a requirement for a review and tabling of a Ministerial report to Parliament in the mid-term to enable management plans to be adjusted if progress towards targets is not evident.

SUB-ELEMENTS:

10a. Water management frameworks established by legislation or high-level policy should acknowledge and facilitate the use of adaptive management principles.

This sub-element is explained in the introductory paragraph above. It merely constitutes normal business and management practice.

10b. Key elements of goal-setting, planning, implementation, monitoring, review, and re-evaluation should be embedded in key tiers of planning and management.

This sub-element is self-explanatory, given the foregoing. Best practice principles should be followed for accessing, commissioning and utilising research and development to support adaptive management.

10c. Government, ministerial or agency discretions about the occurrence, timing and depth of plan reviews should be eliminated as far as practicable.

This sub-element is to ensure reviews are regular and take place when they are appropriate in the best interests of the natural resource; rather than to suit the expediencies of one individual momentarily holding a public position of influence.

Amongst Australian water legislation, that of the Northern Territory is noteworthy for the extraordinary degree of discretion provided to the Minister and the NT Controller of Water Resources.

10d. Adaptive management has a tension with "resource security". Long-term resource allocations should be avoided. A suite of appropriate mechanisms for allocating resources within the constraints of adaptive management include short-term leases, or leases within the period of the adaptive management cycle.

This sub-element is an integral component of adaptive management. While it is recognised that it may not mesh fully with the present preferences of some of those who use natural resources for commercial gain, the needs of the natural resource are more important in the long term, and should take precedence.

#11. Custodial agency as catchment investment coordinator

Catchments provide essential infrastructure for the provision of a variety of ecosystem, social and engineering services. The catchment is a unit for asset management, and the strategic catchment plan must form the basis for catchment / regional investment and asset management programs. Legislation should support, encourage and not obstruct the use of market mechanisms to target natural resource goals efficiently and effectively. This last point is a key principle pursued by the Commonwealth's National Action Plan.

The breath of incentive mechanisms should be expanded. For example there are opportunities to tie resource use consents to fulfil specific conditions for example a water right is granted for x years but requires restoration of riparian zone etc.

SUB-ELEMENTS:

11a. Removal of perverse subsidies.

This sub-element refers to financial and non-financial incentives, pressures and policies that are environmentally damaging, and contra-indicated in the pursuit of river integrity. Their removal is frequently recommended (for example, House of Representatives Standing Committee on the Environment and Heritage (2000), pp. 125 – 128). It is, nevertheless, a significant task that should be a statutory requirement as an immediate priority for governments and their agencies.

Guaranteeing water use rights at current levels is a perverse incentive and it restricts an adaptive approach to water allocation rights (peer reviewer, pers.comm).

11b. Channelling and prioritisation of NRM grants and funds.

NRM grants from agencies other than the catchment agency shall only be made where they are prioritised according to the catchment strategic plan, and certified by the catchment agency. This sub-element will enable the catchment agency to ensure coordination of expenditure in accordance with its strategic plan. It is also proposed in pursuance of the primacy principle above (see *inter alia* sub-elements 7a and 7b).

11c. Governments may not make NRM or related grants until the recipient demonstrates that these will implement a property plan and / or an conditional environmental management system which the catchment agency has certified as being in accordance with the catchment strategic plan.

This sub-element is another aspect of the catchment agency's role in coordinating expenditure in accordance with it strategic plan, and pursues principles of accountability and transparency.

11d. Water pricing should be based on the principles of full cost recovery and cost subsidies should be removed or made fully transparent.

This is a fundamental principle of the COAG 1994 water reform agenda.

11e. Comprehensive systems of water allocations and entitlements should be prescribed. These should be backed by the separation of water property rights from land ownership. There should be clear specification of entitlements in terms of ownership, volume, reliability, transferability and if appropriate, quality.

This is a fundamental principle of the COAG 1994 water reform agenda.

11f. Legislation should encourage or support the development of a NRM trading "trust".

As stated in the NAP, such a "trust" would be the market intermediary between investors with interests in improved environmental management outcomes for salinity, carbon, biodiversity etc (such as lowered water tables, reduced stream salinity, cleaner water and air, nature conservation) and landholders who would provide those outcomes (for example, through tree planting and habitat protection) in selected salinity/water quality impacted catchments/regions. These "credits" would be tradeable on private markets.

#12. Licensing, compliance and enforcement

Auditing and enforcing compliance is currently a major weak link in water management programs in all Australian States. Generally speaking, compliance enforcement is patchy, processes are not transparent, and the results are not generally readily accessible to the public.

SUB-ELEMENTS:

12a. The nature, volume and other allowances for environmental modification through licensing, permits and consents must be allocated on the basis of the strategic plan and conditioned accordingly.

The specifications and allowances for land use approvals, vegetation clearance, irrigation extraction and application rates, and point source discharges or other catchment-based activities are only permitted as an outcome of comprehensive ecological assessments and planning of the strategic plan.

12b. Licences and licence conditions are to be based on proven measurability.

Measurability of conditions refers to not only measurability of the outputs or activities (volumes, concentrations, and others) but also measurability of outcomes in terms of environmental impacts or betterment.

12c. The principle of continuous improvement is to be applied to licensing.

Damage to the environment is to be contained to the minimum acceptable level as defined in the strategic plan and re-issue of a licence for that same activity should be on the basis of reducing impacts per unit of activity.

12d. Licensing is to be incentive-based, with fee scales linked to incentives for best practice production.

A licence application cannot be made without a prior property or production plan approved by the catchment agency in accordance with the strategic plan. Licence fees are to be scaled to provide incentives for innovation and pursuit of best practice methods. Penalties could also apply to those engaged in 'worst practice' (peer reviewer, pers. comm).

12e. The maximum time frame allowed for in the licence is to be limited to the time period of the periodic review of the strategic plan.

There is a dilemma relating to the issue of security of access to the water resource. Major new infrastructure relating to water storage and the development of irrigated crops is likely to require significant finance. Financial institutions are likely to be unwilling to provide loans without a degree of resource security covering at least an initial payback period. On the other hand, both the principle of adaptive management, and the ARMCANZ environmental flow principles, require the ability for water managers to wind back water allocation licences in the light of new information which necessitates increased water allocations for the environment.

A strategic approach is necessary, devising individual solutions to particular catchments. Where catchment water resources are utilised at only a low level, and environment values are not under risk, high levels of resource security may be provided. However, where catchment water resources are highly utilised, providing a high degree of resource security runs directly counter to adaptive management and precautionary principles, and must be resisted. In such cases water allocation licences must be designed to provide the catchment agency with an ability to wind back allocations, and ideally the date at which the licence falls due for renewal should be such as to occur a short time after the date at which the results of the scheduled review of the catchment strategic plan are presented. An alternative approach is simply to condition the licences so that they accept changes subject to any new strategic plan.

This approach will result in some water users having a high degree of resource security, while other users in catchments where water resources are heavily utilised will not have this level of security. However, security will be defined in both cases, and both users will certainty of access, under defined conditions, for defined periods of time. It will, however, be easier in these circumstances to finance major investment in 'under-utilised' catchments.

Temporary status or limited time frames for allocation licences are important control mechanisms for critical management issues addressed in the strategic plan. Once the strategic plan is complete, the maximum time frame for any relevant licence has to be the same as the periodic review time. In heavily used catchments, a sunset clause on licences should apply within 6 months of a new plan's gazettal. An agency should be able to vary all approvals, generically or individually, within three months of the new plan's gazettal. Within four months of gazettal, all licences unless reissued, become null and void.

12f. Compliance enforcement should be recognised as a specific function within water agency management structures.

This sub-element is aimed at overcoming the under-achievement of compliance enforcement in some at least of Australia's present water management agencies. The Queensland agency reported in 2000 that it was aware, from aerial photography, of over 3,000 illegal structures on Cooper Creek, a major water resource in the west of that State. Resourcing for enforcement is a critical issue for this provision.

12g. Third party standing to undertake court enforcement action should be enabled by legislation, and supported by appropriate financial arrangements.

This sub-element is to increase effective compliance enforcement by catchment agencies. It is to give third parties standing to take enforcement action where the responsible catchment agency has failed to do so. Community groups should have access to funding or legal aid to ensure actions are initiated when community concerns are significant.

12h. On-the-spot fines should be considered for specific applications, particularly those issues which might be delegated to local government for enforcement

This sub-element is in accordance with recent practice regarding on-the-spot fines and their effectiveness in discouraging non-compliance with community standards.

12i. The minister should be obliged to report on matters set out in plans, including information about any non-compliance with the plan and its resource implications.

This sub-element seeks transparency and public awareness. All non-compliances known to the minister / agency must be part of the annual report, with reasons given for non-enforcement.

12j. Licensing of polluting activities should be expanded from point sources to include semi-diffuse sources such as stormwater drains and intensive agriculture drains. Such licensing should be based on load-based planning addressed in the water quality management component of the catchment strategic plan.

The application of traditional concentration-based limits allows incremental creep of polluting activities. The move to load-based licensing represents best practice at this time. Stressed rivers will not be effective managed however through best practice discharge limits placed only on point sources and licensing will be required for high impact discharges from semi-diffuse sources.

12k. Compensation should be provided in cases where the protection of catchment values involves the removal of existing rights. Compensation should only apply where there are identifiable and measurable impacts for example on income or capital value.

Many highly stressed catchments are already over-allocated including allocations that are as yet unused. The protection and restoration of these catchments must involve the removal of existing rights particularly to water extraction.

Generally speaking, under the original water acts that granted the licenses there was never any recognition of the property right in water in a form that would require compensation (if and when the said was changed by governments). The nature of a licence was that government could change, by decree, the amount available or that they could take away or make it conditional (peer reviewer, pers. comm).

The question inherent in the point on compensation is the issue of who pays for the environment? Should this be exclusively the government(s) or should users (both rural and urban) also pay for environmental allocations? Jurisdictions are only now beginning to turn their minds to charging for environmental externalities in pricing, although the principles relating to externalities have been discussed in the literature of economics for over three decades. Of course, another way this could be handled is to establish property rights for environmental allocations. This has often been accompanied by (at least a perception of) existing users' water rights (both in terms of ownership and the nature of the right) being eroded. This then has led for calls in some jurisdictions for compensation. Victoria is a case in point, where the existing Water Act 1989 contains compensation provisions which in some cases appear to disadvantage any attempt to wind back water allocations in over-used catchments (see the Victorian Review Paper for more details). For more information on property rights see the NCC's background paper on property rights on their website.

The NCC's general view is that compensation is an issue for individual State governments, and is not an issue requiring prescriptive treatment within the COAG agreements. There is a need to balance adaptive natural resource management with a property right to allow for security of investment while recognising the dependence of economic activity on the sustainable management of the resource.

In some jurisdictions (eg, Qld and NSW) compensation provisions are part of legislation and are payable if changes are made during the term of a water allocation plan. As to the length of the property right, the need for compensation etc may vary depending on the State in question.

#13. Required independent audit and reporting

Plans are essential, as are resources to implement those plans. Outcomes of the management process need to be audited and reported at appropriate, statutorily-fixed intervals. Accountability is facilitated by an independent state auditor, a role that has been carried out in financial matters by State Auditor-General's Departments. Catchment agencies, as well as State agencies, need to be accountable, particularly where planning decisions affecting major public resources, or large public budgets, are involved.

To the greatest extent practical, audits need to be carried out, or at least supervised, by an independent agent - to facilitate transparency, accuracy and credibility.

SUB-ELEMENTS:

13a. The responsible minister should be required to table in the parliament annually, an independently prepared report on the achievement of the objects of the Water Act.

'Independent' refers to the report's preparation by person or persons outside the responsible Minister and portfolio agencies. It is the same principle which requires that a company's annual report be signed off by an accredited financial auditor.

The Minister's report will not need to handle every issue comprehensively in any one year (this would be repetitive, inefficient and unnecessary). However each year at least one key issue should be handled in depth, through an independent audit.

The role of an auditor proposed by the NSW Nature Conservation Council (Guice 2001) might include the following responsibilities:

- adopt an audit methodology prepared by the Independent Expert Panel with support of the environment agency;
- audit the effectiveness of the Independent Expert Panel;
- audit the content and implementation of catchment strategic plans;
- audit any structural adjustment package, content and implementation;
- audit outcomes, to the extent that they can be benchmarked by monitoring programs;
- audit water trading and license compliance; and
- audit administrative processes.

Monitoring, auditing and reporting programs should follow national guidelines as soon as these are available. It is understood they are being developed by the National Land and Water Resources Audit. Also the Productivity Commission (Recommendation 7.5, 1999) recommended the Australian Bureau of Statistics assist in developing such guidelines.

The ministerial catchment advisory council could be given a "peer review" role in the preparation of the above report. This peer review role could be contracted. This would assist with transparency, as the findings of the peer review should, following normal professional practice, be publicly available; thus increasing accountability. The function of peer review could, of course, be a contracted arrangement in assessing the draft annual report. The peer review should be tabled in Parliament at the same time as the minister's annual report.

These Ministerial reports, aggregated over a nominated period for example five years, constitute essential components of the State's *State of Environment Report.*

13b. Catchment agencies should similarly produce an independently prepared annual report against their strategic plan's objectives.

This sub-element continues the nature of audit and accountability at the catchment and catchment agency level. These annual reports should be reviewed by the Minister's catchment advisory council, by the Independent Expert Panel, and should form the basis of the Minister's annual report and State of Environment Report.

The nature of performance must be addressed. Performance measures must be developed which respect the magnitude of the causes, demonstrate an understanding of the complexity of the system, and respect the magnitude of the desired outcomes.

13c. All relevant reports, licences and information about river integrity should be publicly available.

Access should be through modern media including internet sites, libraries, and CD collections, and should, to a large extent, be free of charge. Similarly there should be registers of baseline data, monitoring data, plans, inventories, permits, licences, enforcement activities, and public submissions, together with agency responses, subsequent decisions and reasons.

This sub-element further enables an informed public, enhances 'ownership' and reinforces accountability.

13d. The 'non-performer pays' principle should be applied.

Funding for annual audits and reports is to come from the minister if catchment performance objectives have been met, or from the catchment agency if its objectives have not been met.

This sub-element places a financial incentive on catchment agencies to achieve agreed objectives. If the objectives have not been met, the catchment agency pays for the report or audit, and if they have, the minister pays. This concept was introduced for inquiries into local governments in the Northern Territory in 1990.

13e. A natural resource accounting framework should be phased in, using a priority area / issues approach.

This sub-element pursues the principle of 'green accounting' or 'natural capitalism' (Hawken *et al* 1999). It brings into regular reporting frameworks, those many important issues neglected by current economic and auditing orthodoxies.

To repeat a point already made above, if you don't know what you've got at the start of the year, and compare it to what you've got at the end of the year, you've no way of quantifying your progress during the year. This is a standard accounting principle.

For example an early application might well identify the Murray-Darling as a priority area. Natural resource accounting could be phased-in initially based only on salinity. Managers of land over a prescribed size should be required to submit an annual salinity report, reporting on salinity levels in soils, near-surface aquifers, and in drainage from their properties. The report would need a similar standing to the standard annual tax return, with prescribed time lines, enforcement and sanctions.

Over time, this approach should be extended to all landholders, and to other issues such as nutrient budgets. Much farther down the track, pest control, native vegetation, and wetland management could be introduced, depending on the success and acceptance of the program.

5. Some benchmarking of the model legislative framework

5.1 Introduction

This Part offers six benchmarks against which the model framework is assessed - several proposals for improved water management; and three papers which summarise characteristics or criteria identified in the literature for successful river and catchment management. A feedback loop operated in the project, to improve the draft MLF from this benchmarking.

The six proposals used for benchmarking the model framework are:

- the 59 questions used in the statutory analysis questionnaire
- the COAG 1994 principles;
- the NAP 2000; and
- the 26 recommendations and more sub-recommendations of the *Coordinating Catchment Management* report (House of Representatives Standing Committee on Environment and Heritage 2000).

The three papers used for benchmarking the model framework are:

- the ten institutional attributes of successful NRM (Dover & Mobbs 1997); and
- the nine factors influencing watershed success (Born & Grenskow 2000)
- the Healthy Rivers Commission of NSW (2000) Independent inquiry into the Georges River – Botany Bay system.

As these three papers are not confined to solely legislative components, some of their attributes or factors are not relevant to this benchmarking of the legislative coverage in the model. Also, they deal at a more generic level than the four benchmarks above, and thus do not offer the same level of detail as them. However, they are a useful check for the model framework.

5.2 Against the 59 points in the project survey

Table 4 sets out the eight topic headings and the 59 more detailed questions, using the numbering and sequence of the April 2001 survey sent to the four jurisdictions which accepted the invitation to participate in this review.

The box to the right of each question shows the element and / or sub-element of the proposed model legislative framework which addresses the issue in the question.

While both documents have been complied as part of this project, appropriate allowances should be made for differences in terminology which flow from the different purposes of, and primary audiences for, the two documents – the survey was written as a starting survey with a specified catchment in mind in each participating jurisdiction to the Federal Parliament; the other, for State-level jurisdictions.

Table 4: Model framework compared with project Survey

1. Overview of primary Act for river management

Component	Model
1.1 Does the primary river / water management Act have a clearly stated object?	See 1 and 2a
1.2 Does the primary Act set out guiding principles?	See 2a
1.3 Does the Act require functionaries under the Act to further the objectives / principles of the Act?	See 2b
1.4 Does the primary Act create a tiered water planning structure?	See 4a and 4b
1.5 Does the primary Act create a tiered water management structure?	See 4a and 4b
1.6 Does natural resource planning in the State integrate land use and water management issues within a catchment or biogeographic framework?	See 2 and 7b, 7c, 7h to 7j
1.7 Do ICM or NRM plans have statutory standing?	See 3 re statutory standing and primacy
1.8 Does the primary water Act recognise the need for quality assurance / adaptive management?	See 10

2. Environmental flows & cumulative effects -

2.1 Is the achievement of ESD one of several statutory objects, or is it the primary object of the legislation?	Latter – see 2a
2.2 Does the framework created by legislation incorporate a commitment to achieving measurable river management / protection standards?	See 2f
2.3 Does the primary water statute require the management of surface waters and related groundwaters in an integrated way?	See 1b and 7i
2.4 Is the Act's reference to environmental flows in line with the ANZECC/ARMCANZ 1996 environmental flow principles?	See 1c and 2a
2.5 Does the Act or associated policy provide clear guidance on how environmental flows are to be determined, particularly with respect to flow variations to meet holistic ecosystem needs?	Not a suitable topic for legislation; See 2a for the fundamental principles for environmental flows
2.6 Must water allocation plans prepared under the Act contain environmental flow provisions?	See 1c and 2a
2.7 Are water allocation plans and catchment plans integrated in a formal way? eg: must catchment management plans incorporate, or take into account, water allocation plans?	See 2f and 5a particularly
2.8 Does the Act explicitly acknowledge the need to manage cumulative effects?	See 2f, 7b and 7i
2.9 Are processes in place which routinely establish the size and limits to the available water resource within a catchment, well before the catchment comes under stress?	See 7 generally
2.10 If so, are clear limits (caps) established in regard to water extraction, well before such limits are approached?	See 7d to 7f in particular
2.11 Does legislation provide for controls over the harvesting of surface flows?	See 2, 5 and 7

3. Protecting special areas and representative reserves

3.1 Does legislation enable special protection for high-value rivers?	See 1e
3.2 Is the State committed to the establishment of representative freshwater ecosystem reserves?	See 1e
3.3 Does legislation or related policy allow for special management of high-value rivers or representative reserves?	See 1e
3.4 Does legislation or related policy *require* that catchment plans (or other relevant decisions) take into account, and protect, representative reserves or prescribed high-value areas?	See 7g
3.5 Does legislation provide mechanisms for the protection of riparian, wetland, or spring-fed vegetation?	See 1, especially 1b and 1c

4. Water quality

4.1 Does the legislation endorse the National Water Quality Management Strategy?	See 2e
4.2 Are the environmental values of the NWQMS incorporated into legislation related to managing water quality through controls on polluting activities?	See 2 and 12 a to 12j.
4.3 Are the environmental values of the NWQMS incorporated into legislation related to waterway management?	See 2 and 12 a to 12j.
4.4 What percentage of the State's major waterways has prescribed environmental values?	See 2g
4.5 Is local government required to incorporate environmental values into strategic planning and landuse zoning schemes?	See 7b, 7c and 7h
4.6 Are catchment planning agencies or groups required to incorporate environmental values into strategic catchment planning?	Fundamental to the model framework, see 6 and 7d

5. Stakeholder involvement

5.1 Does statute prescribe the inclusion of all major stakeholders in catchment planning groups or bodies?	See 6, particularly 6a
5.2 Do catchment planning bodies have statutory status?	See 5
5.3 Does legislation or policy establish links between catchment plans and landuse planning frameworks? - in other words, does legislation require that local government landuse plans take into account the recommendations of catchment plans?	See 7 especially 7c
5.4 Does legislation or related policy prescribe the functions, duties or responsibilities of catchment bodies?	See 5 and 6 in particular
5.5 Does legislation or related policy prescribe the knowledge or skills of members of catchment bodies?	See 6e
5.6 Does legislation provide transparent and accountable review provisions for major administrative decisions?	See 12f and 13
5.7 Where decisions are taken which are likely to affect the livelihood of those using catchment resources, does legislation provide a framework enabling compensation measures?	See 12k

6. Catchment-level planning and implementation

6.1 Does legislation or related policy provide clear guidance on the purpose and content of a catchment plan?	See 7d and 7e
6.2 Are plans required to be comprehensive - eg: are they required to examine links between landuse in the catchment, water abstraction, ground and surface water interaction, and the health of the catchment's rivers?	See 7d and 7e
6.3 Does legislation establish mechanisms requiring compliance with water allocation plans, river management plans, and/or catchment plans?	See 5b and 7, including 7e and 7f
6.4 Does legislation provide catchment authorities or groups with the ability to veto proposed development within the catchment, (for example, where such development would extract water above the established catchment cap)?	See 5b and 7b, 7c and 7h
6.5 If not, does legislation require that planning authorities notify catchment agencies of proposed development which may indirectly affect water availability, and take their views into account in a transparent and accountable way?	See 5b and 7b, 7c and 7h
6.6 Does water legislation provide an explicit role for local government in catchment bodies or in catchment planning?	See 9, particularly 9a
6.7 Does legislation require that local government, in strategic landuse planning and in statutory development approvals, consider the need to maintain healthy rivers and catchments?	See 7b, 7c and 7hin particular
6.8 Does legislation or related policy provide mechanisms enabling catchment planning bodies access to adequate and appropriate expertise?	See 6k
6.9 Does statute explicitly deal with the issue of raising or attracting funding for the implementation of catchment plans?	See 8, especially 8d

7. Adaptive management

7.1 Are monitoring arrangements in place to measure the achievement of the outcomes of water management programs; to audit compliance with permits and licences; and to detect non-compliance with permits or licences?	See 2f in particular
7.2 If so, are reports available from these monitoring programs?	Se 12c
7.3 Are regular reviews undertaken to assess the results of monitoring, and to re-evaluate program implementation?	See 12a and 12b

8. Adequacy of powers and accountability requirements

8.1 Does legislation establish a single agency as the primary river custodian?	See 5 and 7d
8.2 Are "state of the river" reports prepared by government, or are they contracted to independent agents?	See 12a and 12b
8.3 Does the State's primary water management Act require the minister to report annually or bi-annually on progress in achieving the objectives of the Act?	See 12a
8.4 Where non-compliance is detected, is effective action taken to enforce compliance?	See 13
8.5 Are compliance reports available?	See 13d
8.6 Do catchment bodies report to a State water agency, or do they report direct to a Minister?	See 12b
8.7 If catchment plans are endorsed by government, is this done at the ministerial level?	See 12b
8.8 Does the Minister have discretionary powers to implement catchment plans, or exercise other controls, where either no plans have been developed, or where he/she considers that a plan prepared by a catchment body will not meet legislative objectives? .	See 7d in particular
8.9 Have such discretionary powers been used to protect high-value rivers (or other aspects of freshwater resource protection) to date?	Not applicable under proposed model
8.10 Can activities carried out under the requirements of other Acts override the requirements of the primary water statute? If so, what are these Acts?	See 3 re primacy

5.3 Against the COAG 1994 principles

Table 5 sets out in its left hand column, the summarised principles of the federal and all States' agreement incorporated into the COAG 1994 Water Reform Framework. The Agreement proposed an integrated approach to water industry reform, incorporating the need to address environmental degradation of river systems with key strategies for agreed reforms.

The box to the right of each question shows the element and / or sub-element of the proposed model legislative framework which addresses the issue in the COAG principle.

Appropriate allowances should be made for differences in terminology which flow from the different purposes of, and primary audiences for, the two documents – one is written as an agreement between high-level governments; the other, for State-level jurisdictions.

Table 5: Model framework compared with COAG 1994 principles

COAG principle	Model
Pricing based on principles of full cost recovery and removal (or transparency) of cross subsidies.	See 11d
Future investment in new irrigation schemes, or extensions to existing schemes, to be undertaken only after appraisal indicates it is economically viable and ecologically sustainable.	See 2a, 2d, 3, 7b, 7c, 7j, 9b and 12g
Comprehensive systems of water allocations or entitlements; backed by separation of water property rights from land, and clear specification of entitlements in terms of ownership, volume, reliability, transferability and, if appropriate, quality	See 11e
Formal determination of water allocations or entitlements, including allocations for the environment as a legitimate user of water	See 1c and 11e; this is a mechanism issue subordinate to 2 and 5
Trading, including cross-border sales, of water allocations and entitlements, within the social, physical, and ecological constraints of catchments	See 1c and 11e; this is a mechanism issue subordinate to 2 and 5
Providing an integrated catchment management approach to water resource management including water quality	The essence of the whole framework, especially 1, 2, 3, 4, 5, 7, 8 and 12
The separation of resource management, standard setting and regulatory roles of government, from the role of providing water services	See 7k and 13
A greater degree of responsibility for local management of irrigation areas	As in 5 and 6
Public education about water use and consultation in implementing the water reforms	Supported, see 6j --- but largely not a legislative matter for State-level jurisdictions – but see 6 and 9 re public involvement
Appropriate water-related research and use of efficient technologies	Supported; but not a legislative matter for State-level jurisdictions

5.4 Against the NAP 2000

Table 6 sets out in its left hand column, the summarised principles of the National Action Plan for Salinity and Water Quality (NAP), which the Commonwealth Government announced in October 2000. Many agriculture, forestry and fishery programs were brought together in the NAP, which involved matching funding of $1.4 billion from the Commonwealth, States and Territories over a seven-year period; ie about $100 million per year from the Commonwealth.

However, the National Action Plan applies only to 20 key catchments and addresses some limitations of NHT by requiring:

> *high priority, immediate actions to address salinity, particularly dryland salinity, and deteriorating water quality in key catchments and regions across Australia - to ensure that our land and water management practices will sustain productive and profitable land and water uses as well as our natural environments.*

The box to the right of each question shows the element and / or sub-element of the proposed model legislative framework which addresses the issue in the NAP principle.

Appropriate allowances should be made for differences in terminology which flow from the different purposes of, and primary audiences for, the two documents – one is written as a national strategic document; the other, for State-level jurisdictions.

Table 6: Model framework compared with the National Action Plan (2000)

Component	Model
Increased integration of different aspects of NRM, within catchment frameworks where appropriate;	See 7e in particular
Increased community involvement, and accountability of management programs; and.	See 6 re community involvement (and also 9); and see 12 in particular re accountability (and some of 8)
Use market mechanisms to target natural resource goals efficiently and effectively.	See 11
Establishment of performance targets relating to stream biodiversity.	See especially 2f
Implementation of NRM planning through catchment or regional plans. "The Commonwealth and States/Territories will need to agree on targets and outcomes for each integrated catchment/region management plan, in partnership with the community, and accredit each plan for its strategic content, proposed targets and outcomes, accountability, performance monitoring and reporting".	See 7d and 7e in particular
Drainage in catchments/regions where agreed by affected land managers, the downstream impacts are positive, and the overall benefits of the scheme provide substantial long-term results over other approaches.	A subordinate issue to 2, 5, 6g, 7, etc.
Caps to be set for all surface and groundwater systems identified as over-allocated or approaching full allocation.	See 2f, 7b, and 7i. Should go further and provide these caps BEFORE over-allocation or near over-allocation arises
Introduction of a new approach to groundwater and surface water administration that recognises their interdependency and the need for their joint management for salinity and water quality outcomes.	See 2f, 7b and 7i. Anyway, should go further and remove the need for 'joint management' by managing both linked resources by one agency, as 7i
A NRM trading "trust". The "trust" would be the market intermediary between investors with interests in improved environmental management outcomes for salinity, carbon, biodiversity etc (such as	See 11f

lowered water tables, reduced stream salinity, cleaner water and air, nature conservation) and landholders who would provide those outcomes (for example, through tree planting and habitat protection) in selected salinity/water quality impacted catchments/regions. These "credits" would be tradeable on private markets.	
Commonwealth funding will only be available to States implementing the NAP as a package. That is, including the governance and capacity building initiatives, as well as the support for the development of integrated catchment/region management plans which address salinity and water quality and other related NRM issues in an integrated way;	This applies the same principle as 8a and 8b
Regional communities will need to be organised into appropriate catchment / regional based bodies, and be accountable for spending public funds including block funding and for acquittal reporting against well defined delivery requirements;	As 6 for catchment bodies; 8 re some funding aspects; and 12 re independent audit reporting
Commonwealth and States need a single NRM Council to sign off on targets and standards, and to arrange for monitoring their achievement;	Extends 2e and 2f, which requires a national basis for measurable parameters in ICM
A COAG agreement should ensure that the NRM Council has the necessary powers to undertake this role with rigour, transparency and decisiveness;	Supported – see previous note for team in red
A new NRM council would replace existing Commonwealth / States councils on salinity, water quality, biodiversity and other NRM and related environmental issues.	Entirely follows our principles!

5.5 Against the Coordinating Catchment Management report

The following Table 7 sets out in its left hand column, the summarised recommendations of Coordinating Catchment Management (HRSCEH 2000), which *inter alia* criticised the NAP as weak in some areas.

The box to the right of each question shows the element of the proposed model legislative framework which addresses the issue in the question.

Appropriate allowances should be made for differences in terminology which flow from the different purposes of, and primary audiences for, the two documents – one is written as a guide to the Federal Parliament; the other, for State-level jurisdictions.

Table 7: Model framework compared with HRSCEH's recommendations

Component	Model Framework
1. Commonwealth adopt a lead role in terms of: • facilitating the development of principles, priorities, targets and programs for the ecologically sustainable use of Australia's catchment systems (ESU);	Supported; not a legislative matter for State-level jurisdictions
• implementing appropriate legislative and institutional arrangements to attain ESU;	Supported; not a legislative matter for State-level jurisdictions
• obtaining from the community the funding necessary to ensure that the problems facing Australia's catchment systems	Supported; not a legislative matter for State-level jurisdictions – see 8a, 8b, 8c, and 8d.
2. The Government ask and resource the Australian Law Reform Commission to examine the feasibility or and options for a national body of law to deal with the ecologically sustainable use of land and in particular report on the feasibility of options for:	

Component	Model Framework
• consolidating Commonwealth laws;	Strongly supported; but not a legislative matter for State-level jurisdictions
• consolidating State and Territory laws;	Strongly supported; not a legislative matter for State-level jurisdictions See 3 – primacy
• integrating laws at all levels into a consistent body so as to provide ESU	See 3 – primacy
The Government work towards an agreement through COAG that requires each jurisdiction to enact complementary legislation to establish an independent statutory authority, the National Catchment Management Authority (NCMA). This authority should have a division corresponding to each of Australia's catchment systems and should have the following powers and functions: To accredit and assist in the development of whole of catchment	Supported; see 5 and 7d
To coordinate ESU	Should go further; see 7 and especially 7d - the development of strategic catchment plan
To fund research on ESU	See 2a, 2b, 2c Supported; not a legislative matter for State level jurisdictions
To apply the findings of that research to the development of ESU	Part of continuous improvement – see 10
To facilitate the dissemination of information and access to skills, data and educational programs for ESU	Supported; not a legislative matter for State level jurisdictions – see 6j
To monitor implementation of whole of catchment management plans	Should go further – see 13
With the support of the States and Territories, ensure compliance with nationally mandated principles and targets and whole of catchment plans for ESU	As 2f
That: If the report of the Australian Law Reform Commission referred to in recommendation 3 reports that it is feasible for the Commonwealth to enact a single piece of legislation; If agreement can be reached through COAG for such legislation and	Question of need for COAG agreement on matters within Commonwealth jurisdictions
Then such legislation be enacted to apply to all aspects of the ESU that are within the jurisdiction of the Commonwealth	See 2a, 2b, 2c and 2d.
That, in consultation with stakeholders, national catchment management principles be developed and enacted in comprehensive, national catchment management legislation. The committee further recommends that: These principles should be enacted no later than the end of 2001 and	See particularly 2f
All programs in Australian that have an effect upon the use of catchment systems should, no later than 2005, be assessed against these principles and by 2007, modified if necessary to ensure that they comply with them	See 3 and 11a
That: the government work through COAG to set targets for ESU under the national catchment management legislation as soon as possible;	See 2
These targets be mandatory, reviewable and disallowable instruments	See particularly 7d and 7e
Funding be dependent upon partner organisations accepting and aiming for these targets and	As 8a, 8d, and 8e
The Government in conjunction with the States and Territories, conduct a stocktake of current data and the usefulness of that data when determining national targets	As 7a
7. The Government ask and resource the ALRC to report on options for	Supported; not a legislative

Component	Model Framework
resolving in a cost effect and speedy manner cross-jurisdictional environmental disputes	matter for State-level jurisdictions
8. The National Land and Water Resources Audit be formally established as an ongoing independent statutory Commonwealth authority called the National Environment Audit Office with the: Power to collect relevant data and maintain an ongoing audit of the state of Australia's catchment systems and Purpose of educating the community on the need for and effective measures to attain ESU	Productivity Commission recommended (1999) that this be a function of ABS. See 2f re national basis for measurable parameters in ICM
9. The NLWRA should be provided with sufficient funding to enable it to complete within the next five years a comprehensive audit of Australia's catchment systems and sufficient ongoing funding thereafter to enable it to maintain an ongoing audit of Australia's catchment systems and the policies and programs designed to ensure ESU. The Committee further recommends that funding for the Audit should not come from the NHT or from asset sales but from general taxation revenues and that any products of the Audit should be made available free of charge	See 7a, 13e
The Government enter into negotiations with all State and Territory governments to establish clear protocols for the exchange of information concerning ESU and that: • Funding to the States and Territories be dependent, in part, upon entering into information sharing protocols	See for example 8a
• This information be collected and maintained on a national basis in a national database maintained by NLWRA and • This information be freely publicly available through catchment area district offices and over the internet	See 13c and also 13d
The Government develop and implement an education strategy, including appropriate on ground activities on ESU	Not a legislative matters for State level jurisdictions but see 6j
The Government work through COAG to create in legislation, catchment management authorities (CMAs) and that these authorities form the basic administrative element of each catchment system and, overall of the NCMA	Supported – see 5 and 6
All programs that affect the ESU of a catchment area, region or system be accredited by the proposed NCMA or local CMA or its equivalent and that funding be provided only to accredited programs	Supported; see 3 re primacy and 8 re accreditation especially 8a
When local government boundaries are revised they be, as far as practicable, aligned with the natural divisions within catchment systems	See 9c
The Government work through COAG to obtain agreement from state governments that they will enact such legislation as is needed to require local governments to exercise such powers as they possess in ways that are consistent with the national principles and targets for ESU	See 3, 5e, 7b, 7h and 9b
That: Formal recognition be given to 'partner organisations' Eligibility criteria for accreditations as a partner organisation be enacted; That accreditations as a partner organisation be reviewable and subject to special conditions and All contracts with partner organisations and between partner organisation and other suppliers or clients, be tables within three months of signature if the contract involves the expenditure of public monies	See 6 and 9
All programs that affect ESU of a catchment area, region or system be accredited by the proposed NCMA or local CMA or its equivalent and that funding be provided only to accredited programs.	As 8a, 8b, 8d and 8e
The Government develop a program to foster the development of and access to the internet for rural Australians and the development of information data bases pertaining to ESU	Supported; but not a legislative matter for State-level jurisdictions. Also see 8f
The Government expand the operation and purpose of the rural	See 13c

Component	Model Framework
transaction centres to include but not be limited to: • Providing ready access to information and expertise on the ESU and access to education and advice services	
• Acting as a shopfront for regional management authority offices and A base for catchment management extension officers and program coordinators	13c and 6j
The government, in cooperation with the States: • Establish a network of local people who can act as local area coordinators and catchment extension officers who will advocate for ESU • Provide appropriate training to these people • And encourage with the States, the re-establishment of a system of extension officers whose duty will be to facilitate the development and implementation of local catchment programs	Supported but not a legislative matters for State-level jurisdictions
Funding systems be open, understandable and accountable and that any allocations made under a system be reported in the annual report of the Department that administers and funds	See 8, particularly 8a, 8d
An audit of policies be conducted to identify counter-productive incentives in respect of promoting ecologically sustainable land use that are contained in Commonwealth, State and Territory programs and that proposals be developed for their removal	Supported; see 3 re statutory primacy and 11a re removal of perverse subsidies
All Commonwealth funding for programs for ecologically sustainable land use be aggregated and coordinated for performance monitoring and reporting purposes and be aligned with national plans	Supported, see 8, 11b and 11c
The Government develop options for increasing taxation incentives to participate in Landcare activities for landholders on low incomes	Supported; but not a legislative matter for State-level jurisdictions
The government conduct a public inquiry into the disincentives for ESU contained in the present taxation arrangements at all levels of government, and make recommendations for change, including costings	Supported; see 11a removal of perverse subsidies
Government examine the feasibility of introducing an environment levy to pay for the public contribution to implementing the policy of ESU; the committee further recommends that such a levy: Remain in place for no less than 25 years and Be clearly marked on each taxpayers taxation assessment notice.	Supported; but not a legislative matter for State-level jurisdictions

(HRSCEH 2000).

5.6 Against institutional attributes of NRM

The model has also been assessed against ten institutional attributes of successful NRM as identified by Dovers. In his work on institutional design for NRM he defined the criteria for successful institutional arrangements derived from case studies of:

- Murray Darling Basin arrangements
- Great Barrier Reef Marine Park Authority
- Commonwealth Resource Assessment Commission
- Land and Water Resources Research and Development Corporation
- Victoria's Land Conservation Council.

He proposed ten institutional attributes of successful NRM. These are matched against the model framework in the table below.

Table 8: Model framework compared with sixteen attributes of successful NRM (Dovers 1999)

Component	Model
Sufficient longevity and continuity to experiment, adapt and learn	See 10 especially 10d
Sufficient resources in human, financial and informational areas	See 8
A statutory base providing transparent and accountable processes and a higher probability of persistence	Model framework itself; 7d statutory catchment plan; 6a – statutory catchment agency
Integration of research and policy foci and / or roles	See 5a and 7l
A degree of applied or grounded focus (region, sector, specific problem focus)	Model framework itself.
Cross-sectional and cross-problem mandate	See 6 & 7
Ability for comparative analysis - concurrent or sequential	See 7l and 10
A clear predictable and maintained participatory structure and approach to investigation	See 6
Mandate and ability to experiment with approaches, methodologies and instruments; and to move across professional and disciplinary boundaries	See 7
Political context favouring establishment and continued operation	See 7d, 6a and 8

The model framework addresses all ten attributes relating to institutional design and numerous others.

5.7 Against critical success factors for catchment partnerships

In recent literature, the "new" catchment management models embrace the concepts of watershed or catchment partnerships. Research by Born & Grenskow (2001) highlights the six key features which in combination characterise these partnerships. These six are as follows:

- Partnerships adopt catchments and sub-catchments as the fundamental analytical and management units
- Partnerships address a broad range of issues
- Partnerships use biophysical-science, social and economic information and local knowledge to form assessments and decision processes
- Partnerships include interactions among agencies and levels of government
- Partnerships emphasise influential and voluntary participation and partnerships between public and private interests
- Partnerships use a collaborative, problem-solving, planning and management orientation.

The following table examines the nine factors, albeit presented here at a high level of generalisation, proposed as influential in the success of watershed management against the elements and sub-elements of the model framework. *(Born & Grenskow 2001)*

Table 9: Model framework compared with nine factors influencing watershed success

Born & Grenskow's factors	Model framework
1. Partnership initiation	See 5 and 6
2. Composition	See 6
3. Statement / clarity of purpose	See 1, 2 and 7d
4. Organisational process, direction-setting and structure	See 5, 6 and 7
5. Leadership	See 6a
6. Staffing	See 8
7. Governmental commitment and support	See 2b and 2d
8. Funding	See 8
9. Catchment plans	See 5

5.8 Against the Healthy Rivers Commission of NSW (2000) Independent inquiry into the Georges River – Botany Bay system

One of a series, this report (Healthy Rivers 2000) sets out some well-known Commission approaches to strategic, economically and ecologically sustainable river management. In summary, these are –

a) manage rivers as whole systems: i.e. at least the entire catchment (p. 2);
b) value rivers as productive assets, but recognise their capabilities and limits (and so internalise costs associated with development based on their resources;
c) prepare rigorous and directive plans that help in making difficult choices about long standing problems;
d) require accountability for outcomes after each management action;
e) establish genuine government-community partnerships in which the accountabilities for all parties are clear; and
f) respond to feedback and scientifically valid information by managing adaptively.

The Commission concludes in this case, as in previous cases, that "fragmentation of responsibilities and lack of clear strong accountability for results is at the heart of many of the problems identified for the state's rivers and coastal areas" (p. 4). The Commission (p. 5) "has invariably concluded that the most effective means of *ensuring* integration in complex river and bay systems is perhaps the most obvious – namely, the establishment of a single entity which has overriding accountability for the *system* outcomes, and which is equipped with commensurate decision-making powers." The Commission footnotes that "Peter McClellan QC expressed similar findings in his Inquiry into the Sydney water catchment alert of 1998".

In the absence of this preferred solution which it acknowledged as not easily achieved, the Commission examined alternatives and proposed the formulation of a 'Statement of Joint Intent" (SOJI) as "a means of maximising the integration of the total management effort as all parties implemented their individual responses to the Inquiry recommendations that had been endorsed by government" (p.5).

The Commission puts forward nine Critical Success Factors (CSFs) for achieving integrated management –

1. attainment of sign-off on strategic direction and commitment to management outcomes;
2. establishment of defined leadership and champion roles;
3. integration of powers and interests across government agencies, councils, industry and community interests;
4. maintenance of rigorous scientific input, *inter alia*, to aid key decision making;
5. attraction of significant funding from private and public sectors directed to implementation of highest priority programmes'
6. integration of environmental outcomes with economic/social/cultural requirements;
7. development of strong links between bay outcomes and waterway and catchment management processes;
8. public definition of accountability for implementation; and
9. establishment of inclusive community and stakeholder information and participation programs.

Table 10 --- NSW Healthy Rivers Commission's nine CSFs for river management

Healthy Rivers Commission factors	Model framework
1. strategic direction / commitment to outcomes	See 2, 7, 10
2. defined leadership and champion roles	See 4 and 6
3. integration of powers and interests	See 4, 7 and 9
4. maintenance of rigorous scientific input	See 1, 2, and 13
5. funding from private and public sectors	See 8
6. integration of environmental outcomes with economic /social / cultural requirements	See 6
7. strong links between (downstream) outcomes and waterway and catchment management processes	See1, 10 and 13
8. public definition of accountability	See 5, 7 and 13
9. inclusive community and stakeholder information and participation programs	See 5, 6, 13

The Commission also lists (2000) some common characteristics of international case studies of successful river and catchment management, presented at the River*symposium* in Brisbane in 2000 --

- a defined regional or catchment-based entity with defined responsibility for river and catchment health outcomes;
- an independent funding source that includes contributions (or sponsorship) from private enterprise, community groups and individuals interested in contributing to river health partnerships;
- defined avenues for community consultation and participation; and
- regular public reporting of results and public celebration of outcomes.

In summary, the model legislative framework appropriately reflects, encompasses and builds upon the recommendations of the principal national reviews and programs aimed at sustainable water use including catchment protection. It incorporates the factors which current research has identified as influential and even determining successful catchment and natural resource management.

The generally satisfactory benchmarking of the recommended MLF against these six initiatives is one of the main outcomes of this project.

6. Model framework: State examples

This chapter examines the extent to which the model framework sub-elements are already in existence in Australian water resource legislation. The discussion is presented below under each sub-element heading:

Although this Chapter concentrates on the four participating States, material from the other four jurisdictions has been included where readily available.

6.1 Definition of river

1a. Define river management within physical surface catchment boundaries (watershed boundaries).

South Australia, Tasmania and Victoria have developed statutory catchment-based management structures. Western Australia defines NRM regions on catchment or biogeographic boundaries. The development of catchment plans in Queensland, Tasmania and the Northern Territory tends to be ad-hoc.

1b. Define the river to included interconnected aquifers specified in a conservative and precautionary way. Require coordinated ground / surface water planning, and where necessary, require the provision of aquifer environmental flows.

The issue of managing surface water and interlinked groundwater in an integrated way is key to sustainable water programs. Groundwaters are fed by rain and surface waters. Ground waters ultimately discharge to surface waters or the sea. Surface waters are fed by groundwaters, and feed groundwaters. Surface and groundwaters are parts of one form interlinked system.

Most aquatic ecosystems depend, in part (and in the case of stygofauna and spring-fed ecosystems, in whole) on groundwater. Most of the time, Australian rivers are fed by surface groundwater, not by surface runoff, snowmelt, or direct rainfall (with a few exceptions in southwest Tasmania). This is obvious: we know that large Australian rivers generally flow all year round, and of those 8766-odd hours, we know that it might be raining somewhere in their catchments for maybe 400 or 800 hours, in a good year. So we know that, generally speaking, our rivers are fed by surface aquifers for most of the time.

Comparisons of annual rainfall and annual evaporation data indicate that, for the bulk of the continent, evaporation exceeds rainfall on a yearly basis. In these circumstances, permanent standing water looses more by evaporation than it gains from direct rainfall. Except for those areas of Australia with exceptionally high rainfall and surface runoff, the existence of permanent standing water indicates substantial dependence on surface groundwater inflows.

As mentioned, prior to recent reforms, groundwaters and surface waters were managed with little coordination, and the legacy of this mistake remains. For example, until the new *Water Management Act* was passed by the Tasmanian Parliament in 1999, groundwater and surface water flows were managed by different State government departments, under different pieces of legislation and policy, for different objectives and within different government programs.
In some locations around Australia, groundwaters have been so heavily used that springs have dried up, along with their associated local ecosystems. Where aquifers are heavily used, and these aquifers feed rivers and streams, streamflow must be affected.

Table 11: State comparisons; groundwater / surface water management:

State	Act	Ref:	Comments
WA	*Rights in Water and Irrigation Act 1914* (modified to meet COAG agenda in 2000).	The Act does not identify the need for integrated management.	The WA WRC believes such a policy is unnecessary, as the few catchments where strong surface / groundwater links exist are already under integrated management programs (Rod Banyard, pers.comm 23/1/01).
NT	*Water Act 2000*	The Act does not identify the need for integrated management	22B(5)(b)"the total water use for all beneficial uses is [to be] less than the sum of the allocations to each beneficial use". The definition of 'water' includes surface and groundwater. s.22B provides an ability to develop integrated water allocation plans. However, neither the Act nor associated policy encourages the development of such plans.
Qld	*Water Act 2000*	s.38(6), 47(k)&(l), 60(3) & 95(2) The Act does identify the need for integrated management.	While the Act does not *require* that Water Resource Plans develop integrated management for surface and interlinked groundwater, according to DNR: " where [ground and surface] water resources are linked, their management will progressively be incorporated into a single Water Resource Plan covering both surface and groundwater." (DNR email 20/2/01)
NSW	*Water Management Act 2000.*	The Act does not identify the need for integrated management.	While the Act has little to say in this regard, the management plan framework provided by the Act clearly enables integrated plans to be prepared. Existing NSW policy promotes such integrated management, which has recently been put into practice in the Apsley area.
ACT	*Water Resources Act 1998.*	s.5, s.19 s.19 identifies the need for env flows in both surface and groundwaters. The Act does encourage integrated development.	Through the Act and the *Water Resources Management Plan 1999, t*he ACT has a requirement for the integrated management of interlinked surface and groundwater. This requirement is in place for all groundwater under the control of the Territory Executive.
Vic	*Water Act 1989,* modified 1999 to meet COAG agenda.	The Act does not identify the need for integrated management	The Act does not encourage integrated management of interlinked resources. Examination of the draft Wy Yung groundwater plan 2000 suggests that no effective attempts are being made to implement integrated management (Nevill 2001).
Tas	*Water Management Act 1999.*	The Act does not identify the need for integrated management	However, the provisions of the Act (eg: s.14 - scope of water management plans) can be used to develop integrated management plans. This has not yet commenced.
SA	*Water Resources Act 1997.*	The Act does identify the need for inter-linked management plans.	The issue of groundwater / surface water links is clearly identified in the Act, however instead of encouraging single integrated plans, the Act requires links between different plans (see s.101(6)-(7).

Integrated surface / groundwater management: summary:

The key question to ask is: *do management processes reflect a commitment to integrated surface/groundwater management?* Improved integration of groundwater and surface water management is part of the Framework, as advocated by ARMCANZ in 1996. Early in 2000, there was little indication of action by the States. That situation, at least regarding statute and policy, has changed in the last 12 months. New South Wales, Queensland, and Western Australia have commenced the development of integrated plans. South Australia appears to be approaching the issue from a different angle, having legislation which forces integration between, not within, management plans. However, even in these States, the concept has not been widely or enthusiastically implemented. The ACT has an advanced policy and operational framework, and is in perhaps the best position at this stage. Victoria, Tasmania and the Northern Territory have been slow to act.

The issue has been recently taken up by the Commonwealth's Action Plan on Salinity and Water Quality (see below). It is hoped that this new initiative will hasten the implementation of integrated groundwater / surface water planning.

> *1c. Define the river to include interconnected floodplains and wetlands and water dependent / protective vegetation specified in a conservative and precautionary way. Require the provision of environmental flows to support water-dependent ecosystems.*

All States have established environmental flow programs which attempt to define and provide flows necessary to protect ecosystems heavily dependent on surface and groundwaters. SA and NSW have the best programs in this area; these States are developing plans which include floodplains, wetlands, and groundwater-dependent ecosystems.

Thanks partly to the high profile which the Framework has taken on environmental flows, all States have commenced environmental flow programs, and all except the NT have published policy or guideline documents describing how environmental flows will be determined within the broader water allocation processes.

An essential and important step involved agreement on the principles to use in determining environmental requirements. These principles were developed by a taskforce combining representatives from all States and Territories (ANZECC 1996b).

It is important to note that establishing environmental flows is not a matter of simply setting a minimum flow requirement. The ecologies of many riverine and wetland communities are dependent not only on the amount of flow, but its quality (eg: temperature, oxygen content, nutrient status, turbidity) and seasonal or weather-dependent variation (Boulton and Brock 1999). Moreover, stream geomorphology depends on the varying ability of flows to convey and deposit sediment. Deep holes and channels, essential for the provision of drought habitat to many species, are dependent on occasional major flood flows. Warm, rising flood waters provide breeding signals to several species of native fish and waterfowl. River regulation can destroy the high flows needed for these vital ecological functions. Setting environmental flows requires a holistic approach, which, in some cases, can be made almost impossible by the existence of either of both major dams and water allocations. Table 12. identifies statutory provisions dealing with environmental flows:

Table 12: State statutory comparison; environmental flows:

State	Act	Ref:	Comments
WA	*Rights in Water and Irrigation Act 1914* (modified to meet COAG requirements in 2000).	s.26GW: s.26GY:	The modified Act does not mention environmental flows, rather it requires Regional Management Plans to make provision for the protection of environmental values, and Local Area Management Plans must determine how "rights in respect of water are to be allocated, and water may be taken and used, to meet various needs including the needs of the environment."
NT	*Water Act 2000*	s.22B	The Act provides that, where the Minister declares a Water Allocation Plan in respect of a Water Control District, the plan must include an allocation for the environment. Amongst Australia's water statutes, the NT Act stands alone in the use of an extraordinary degree of discretion (Nevill 2001).
Qld	*Water Act 2000*	s.38, s.46-47, Div.4	The Minister may prepare a Water Resource Plan for an area, and this plan may state "environmental flow objectives". In preparing the plan, the minister must consider "the duration, frequency, size and timing of water flows necessary to support natural ecosystems".
NSW	*Water Management Act 2000.*	Parts 1, 3.	Important guidance is provided by the Act's objects and principles. Classes of env. water are established (s.8). Comprehensive env flow provisions are established (eg: s.16, 20)
ACT	*Water Resources Act 1998.*	s.19	The Act provides for the development of Water Resource Management Plans, which must describe environmental flows - for both surface and groundwaters. Environmental flows must first be provided before an allocation can be made.
Vic	*Water Act 1989*		While the Water Act contains general provisions regarding environmental and catchment protection, it does not require the allocation of environmental flows. These are currently developed through non-statutory Streamflow Management Plans.
Tas	*Water Management Act 1999.*	s.13-27, esp 14(2).	s.14(2)(a): A management plan is to include "an assessment of the quantity of water needed by the ecosystems that depend on a water resource and the times at which, or the periods during which, those ecosystems will need that water".
SA	*Water Resources Act 1997.*	s.45(2), 92(3), 101(4).	Water management decisions must take ecosystem needs into account. A Catchment Water Management Plan must assess ecosystem water needs. A Water Allocation Plan must assess water ecosystem needs, provide a balance between competing needs, and only provide allocations which are sustainable.

One benchmark which is available is the existence of State environmental flow policies, guidelines, or technical reports. While we have not attempted to examine these reports in detail, their listing provides some insight into the degree to which the States are accepting responsibility for the providing these flows. (Table 13)

Table 13: Environmental flow policy and guidelines documents:

State	Policy / guideline	Comments
WA	Water and Rives Commission, Western Australia (2000) *Environmental water provisions policy for Western Australia; Statewide Policy Number 5.* . Water and Rivers Commission; Perth WA.	A fairly general document, setting the broad "sustainability" framework. It does not describe technical detail setting out how environmental flows are to be determined.
NT	No public document is available, although an internal draft guideline is being prepared.	As noted above, the procedures established under the Water Act rely heavily on ministerial and bureaucratic discretion.
Qld	Qld has been allocating environmental flows under their WAMP process for some time.	WAMP: water allocation and management plan. Draft WAMPs are published for public comment, then reviewed. Under revised legislation, the minister must state environmental flow objectives (EFOs) in WRPs where allocations are being granted (Water Act 2000 s.46(3)). Not all catchments have EFOs at this stage. No policy guideline detailing EFO principles is available.
NSW	Policies covering 'rivers and estuaries', 'biodiversity' and 'wetlands' all support env flows (see Nevill 2001, Fisher 2000)	NSW has implemented environmental flow provisions in all "regulated" rivers which has reduced historical usage by around 5 to 6% in most rivers. We are doing the same for unregulated rivers (Allan Lugg, pers.comm.5/5/00).
ACT	Environmental Flow Guidelines 1999.	Guidelines are required by statute and provide a framework for the determination of environmental flows.
Vic	Various environmental flow guidelines dating back to 1989.	In spite of a long-standing commitment to environmental flows, Fisher (2000) has argued that results to date have been disappointing.
Tas	Fuller and Read 1997	Environmental flows are being implemented - first of all in stressed rivers.
SA	State Water Plan 2000.	Provides a general framework for allocating environmental flows. Each Catchment Water Management Board must develop sustainable Water Allocation Plans including env flows.

Environmental flows: summary:

It is evident that the Framework has been successful in encouraging the States to provide clear statutory requirements for the provision of environmental flows within water allocation processes. At this stage only Victoria relies on policy rather than statute, however it seems possible that this may be remedied by legislative amendments late in 2001.

It is less clear that these processes are being enthusiastically and widely applied, and are effective in providing adequate environmental flow regimes to support the full range of water-dependent ecosystems. The Northern Territory in particular appears to be lagging other jurisdictions. This issue cannot be adequately treated in a paper such as this.

It is predictable, perhaps, that there will be considerable variation around Australia in this regard, and it is worth noting that Tim Fisher (Fisher 2000) regards New South Wales as the only State where environmental flow programs are being widely and consistently applied. Even there, where many rivers west of the Great Dividing Range are heavily utilised, the outcomes are not as widely effective as one might hope; although the Government announced a stop to new and in-progress irrigation schemes (Sydney Morning Herald 22 February 2001).

Coffey (2001) has examined the extent to which Queensland's determination of environmental flow regimes meets the object of sustainability of Queensland's *Water Act 2000*. Her important finding is that, in practice, environmental flow regimes are not being set in a precautionary way - contravening a fundamental element of sustainable decision-making. It seems highly likely that a careful

examination of mechanisms used in other States to set environmental flows would reveal similar gaps between the high ground of policy rhetoric and statutory objectives, and the reality of day-to-day decision-making. Studies such as Coffey's add weight to calls for management procedures to be audited against sustainability objectives and principles.

1d. In situations of purely ephemeral rivers, in extremely flat arid country, and in short coastal catchments, adjustments to the catchment context can be made on bioregional or administrative boundaries, retaining focus on the water system.

This concept is followed, to a lesser or greater extent, in most Australian jurisdictions, without a statutory basis.

1e. Legislation should provide for the identification, selection and protection of freshwater ecosystems of high ecological or representative value.

One State, Victoria, has enacted specific legislation to achieve this goal, while most States have endorsed the general principle of protecting special and representative ecosystems. Victoria's Heritage Rivers Act 1992 protects a number of prescribed "natural catchments" and "heritage rivers". Victoria also protects 15 "representative rivers" under a policy framework (Nevill 2001). The NSW Water Management Act 2000 contains a provision enabling classification of waterways by value and by threat; this provision is aimed in part at protecting special and representative ecosystems. Most other States have yet to give effect to existing commitments on this issue. All States and Territories except South Australian and Tasmania have made commitments, largely through policy documents, for the establishment of systems of representative freshwater reserves. Tasmania has recently (June 2001) made a draft commitment along these lines (Government of Tasmania 2001).

6.2 Binding standards for river integrity and public policy consistency

2a. Statutory object placing ESD as the primary management objective for catchment management, supported by statements of principle.

SA, Tasmania, WA, NSW and (to a lesser extent) Queensland identify ecologically sustainable management as the primary objective. See, for example, the NSW Water Management Act 2000 s.3.

2b. A statutory requirement binding all functionaries under the Act to further the objects and principles of the Act.

WA, SA, NSW, Tasmania and Queensland have incorporated this concept in their water legislation. See, for example, the Tasmanian Water Management Act s.6(2); or the WA Rights in Water Irrigation (RiWI) Act s.4(3); NSW WM Act s.9.

2c. Creation of a statutory duty-of-care for catchment management.

With some qualifications, WA, Queensland, NSW and SA have moved significantly towards this concept. See the SA Water Resources Act 1997 ss.14, 17.

2d. Inclusion of a statutory provision binding the Crown

For examples, see:

- the NSW Water Management Act 2000, s.396;.
- Queensland's Water Act 2000 s.4 (with some exclusions);
- Tasmania's Water Management Act 1999 s.4; and
- Victoria CaLP Act s.5.

2e. Legislation should establish a framework which provides for protection, management of sustainable use, and restoration including implementation of the National Water Quality Management Strategy

All States have developed this concept to a lesser or greater extent.

A commitment to the NWQMS is a key component of the COAG water reform agenda. Most States have developed statutory or semi-statutory water quality policies which extend the NWQMS "environmental value" framework within the context of that particular State's administrative statutes and frameworks.

2f. Catchment strategic plans are to include compliance strategies; they are to establish monitoring and reporting frameworks developed for ecosystem assessment in each catchment.

SA's Water Resource Act 1997 s.92(f) probably represents the best example of this requirement.

2g. Catchment plans are to be prepared for all State catchments within a specified time frame. Time frames for review should also be specified.

In practice, the statutory frameworks established by South Australia and Victoria have produced strategic catchment plans reasonably quickly. Review periods of five years are required by both States in relation to these strategic plans. However, generally speaking, requirements for review of component plans, including water allocation plans, are not handled in any consistent way across all jurisdictions (see discussion of review periods below). Under South Australia's Water Plan, Water Allocation Plans must be reviewed at five-yearly intervals.

6.3 Primacy of catchment legislation

3a. Primacy over existing legislation.

Not implemented in existing Australian legislation.

3b. Primacy over future legislation.

Not implemented in existing Australian legislation.

3c. Primacy over emergency legislation (eg: firefighting etc).

Not implemented in existing Australian legislation.

6.4 A hierarchy of planning and management frameworks

4a. There needs to be a hierarchy of planning instruments.

All States use hierarchies of planning instruments, however comprehensive statutory frameworks to support these plans exist only in SA, Victorian and NSW legislation. Both WA and Tasmania have simple hierarchical plans, developed by a central State department.

4b. There needs to be a hierarchy of management structures.

SA, Victorian and NSW legislation has established management hierarchies based on catchments. WA's hierarchies are established partly by legislation (one of the five waterway management authorities established under the WCA is catchment based) and partly by the Cabinet NRM Policy, where the non-statutory NRM regional groups are based on catchment or bioregional boundaries. As the Tasmanian catchment groups have no management role under either statute or State policy, it can be said that Tasmania does not use hierarchical management structures.

4c High level independent expert panels need to be utilised.

The use of independent expert panels to resolve conflict or to provide specialist advice is an option which, by and large, has not been consolidated by legislation. It should be noted, however, that the Victorian Water Act provides an option for the minister to create discretionary and temporary advisory groups. The NSW Water Management Act, s.387, provides for the establishment of Expert Advisory Panels.

6.5 Catchment-based custodial agency

5a An Independent Expert Panel mechanism is to be utilised in instances where there is disagreement, for example about sustainable water extraction limits. The panel would review the options and mediate / negotiate the outcomes between the parties.

The water legislation of most jurisdictions provides for the establishment of ministerial advisory panels; however their use is not a mandatory conflict resolution mechanism. See, for example, Queensland's Water Act 2000 s.41; or Victoria's Water Act 1989 s.29. South Australia utilises the Environment, Resources and Development Court which can require mediation, and can then make a decision on all aspects under the Water Resources Act including the plans and decisions of the Minister.

5b. Catchment strategies should be implemented utilising incentive mechanisms such as rate rebates or tied grants wherever practicable.

No jurisdictions have statutory provisions encouraging this. However, some CWMBs in SA (Onkaparinga, for example) are developing the use of such mechanisms in consultation with constituent local governments.

5c. The catchment agency must be able to ensure agreed river management objectives take precedence over sectoral / local objectives.

SA's Water Management Act 1997, and Victoria's CaLP Act 1994, both provide mechanisms which *can* require the alteration of local government planning schemes to bring them into line with the catchment strategy. See the CaLP Act ss. 25 and 31.

6.6 Stakeholder-based structures and public involvement

6a. Composition should allow for the representation of all stakeholders, including urban, environmental and non-commercial, to ensure there is cross-community involvement in, and commitment to river management.

Although several Acts attempt to establish this requirement, there is no agreement amongst stakeholders that mechanisms have been successful, with environment stakeholders often expressing concern that at inadequate representation. For example, Tasmania's Assessment Committee for Dam Construction does not include an environmental representative, although there is a prescription that the committee contain environmental expertise. See the Water Management Act s.139.

6b. A dominance of any sectoral group should be avoided.

See comments above. Another common complaint concerns Acts which require water users to be a majority on committees (WA's RiWI Act, for example).

6c. Composition should prefer local stakeholders over representatives living outside the catchment where practical. Bottom-up support for planning processes is essential.

Western Australia's RiWI Act establishes water planning committees incorporating local water users (see comments above). See RiWI Act s.26GL(3).

6d. Equitable representation of catchment stakeholders should be provided for.

This has not been accomplished, to the satisfaction of all stakeholders, in any Australian jurisdiction (see comments above).

6e. Committees need to contain, amongst all representatives, a full range of relevant expertise.

The legislation of most jurisdictions attempts to address this point. See, for example, the requirements of s.7(b) of Victoria's CaLP Act.

South Australia's legislation provides a good example of the way in which expertise and local representation may be handled:

South Australia: Water Resources Act 1997
Summary of s. 57 - 59: **Council to advise the minister**.

- 5 to 9 members (at least one male and one female)
- Presiding member appointed by Minister's nomination; managerial skills and expertise and not an employee of Crown or constituent Council member or employee
- One member must be a community member of the catchment area, with active participation in community affairs
- One must be a person or two or more must be persons who collectively have knowledge / experience in:
  - water resource management
  - water use
  - conservation of ecosystems
  - local government through employment or membership
- other members knowledge / experience should include:
  - public or business administration
  - regional economic development
  - other relevant experience.

The Minister must seek and have regard to advice of the Water Resources Council, and must endeavour to include in the Council persons with interests in water resources and knowledge and experience of land and water use in a relevant locality.

As mentioned above, the requirements of statutes in some States appears unnecessarily restrictive. Tasmania's statutory Assessment Committee for Dam Construction, for example, contains no provisions to ensure that a person representing the needs of the environment is included on the Committee.

In Western Australia, the RiWI Act contains no requirement for Water Resource Management Committees to include persons of expertise in aquatic ecosystems - any expertise in ecosystem management will do.

In relation to the preparation of water resource plans, section 41 of Queensland's Water Act 2000 requires that a community reference panel include representation for environmental interests, but it fails to specify that person should have relevant expertise.

6f. Fiscal equity (no taxation without representation) should be considered.

This aspect has not been explicitly considered in the legislation of Australian jurisdictions.

6g. Both upper catchment and lower catchment areas should be represented.

Although no States *require* whole-of-catchment statutory planning, most States encourage this. Notable exceptions relate to estuaries, such as the Derwent in Tasmania, and the Peel-Harvey in WA.

6h. The process of selection should be transparent.

Tasmania, with its ad-hoc catchment planning process, probably has the most transparent technique of appointing catchment planning group members - most are simply elected at a public meeting held in the catchment. It should be noted, however, that Tasmania also has one of the most ineffective catchment planning frameworks. Most States use semi-transparent processes, where the minister (or the minister's delegate) selects from nominees put forward by stakeholder groups, without having to justify why a particular person was chosen.

6i. Best practice principles of incorporating and resourcing public input should be required.

The States with statutory catchment planning frameworks (SA, Victoria and NSW) have established resourcing procedures to support catchment agency members. However environment groups complain that no sitting fees are provided to support representatives on advisory committees.

6j. Ongoing and structured programs of education are a priority.

Public and stakeholder education and awareness programs are a function of all State environment department / natural resource department programs. Victoria has identified the special needs of NRM / catchment planning committees, and is seeking to address these with a focused program.

6k. The engagement of stakeholders in catchment agency structures needs to be effectively resourced.

The States with statutory catchment planning frameworks (SA, Victoria and NSW) have established resourcing procedures to support catchment agency members. However environment groups complain that no sitting fees are provided to support representatives on advisory committees.

6l. Adequate consultation programs must be provided in relation to significant infrastructure developments (such as large dams).

6m. Agreed processes should be developed relating to major water development proposals incorporating effective mediation, conciliation and dispute resolution mechanisms.

All four jurisdictions currently have legislation dealing specifically with the impact assessment of major development proposals. All jurisdictions incorporate statutory requirements for public consultation programs in relation to major development proposals. All four jurisdictions have also, within impact assessment legislation, established arbitration provisions aimed at reaching decisions on project approval. However, legislative provisions at this stage do not generally incorporate provisions for the intermediary mediation and conciliation mechanisms – these currently being conducted under more informal arrangements established on a case-by-case basis.

6.7 Coordinated and integrated strategic planning and implementation

7a. Comprehensive natural resource inventories, by catchment, are fundamental to an informed and integrated strategic plan.

All States have commenced the preparation of wetland inventories to meet the requirements of the Ramsar Convention. No States have comprehensive State-wide inventories of freshwater ecosystems. Victoria had one of the most highly developed and accessible databases in the early 1990s (to support the LCC Rivers and Streams Investigation). This database appears to need revision and consolidation. In SA, WA and Tasmania, inventory work is focused on catchments which are stressed or at risk.

7b. Legislation must require catchment strategies to address the cumulative effects of incremental developments, particularly in water infrastructure, irrigation, and vegetation clearance, through a process of establishing agreed limits to development.

This is, at present, a major gap in the management frameworks of all States. The NSW Water Management Act s.5(2)(d) is the only Australian statute to clearly identify the need to manage cumulative effects. The Victorian non-statutory 'rapid assessment' concept, as yet not fully applied, appears to offer the most advanced method for establishing catchment development limits. In SA and WA, although procedures exist for establishing caps, they are in practice only applied to stressed catchments - where it is already too late to protect a full suite of water values.

Climate change has significant long term implications for catchment and water resource management. For example preliminary studies by CSIRO indicate that climate change is likely to reduce stream flows in the Murray Darling Basin. This has implications such as increasing competition between consumptive and environmental water needs, increasing salt concentrations and algal blooms, and agricultural productivity losses. Addressing cumulative effects therefore has to involve addressing these longer term, major trends such as climate change (Paul Ryan, Greenhouse and Land Management Team, Australian Greenhouse Office, pers.comm. Dec 2001).

The difficulty and importance of managing the cumulative effects of incremental development has been seriously underestimated. Most recent water legislation, with the exception of the *NSW Water Management Act 2000*, ignores the issue almost completely (see below). The only way to manage cumulative effects is to establish caps (or limits) on water developments (dams, weirs, water abstraction from surface and groundwaters, drains, and levee banks) *well ahead of developments reaching the level of the cap* (Nevill 2001a). Caps should not be limited to water use and infrastructure, but should extend to vegetation clearance, in-stream disturbance, and the management of wetland and riparian vegetation.

Let us take water extraction as an example. In theory, managing the cumulative effects of water allocations sounds straightforward. Firstly, identify the catchment, and work out: (a) the size of the stocks and flows of surface and ground waters, (b) how they are linked, and (c) how they vary over seasons, years and decades. Secondly, identify their dependent ecosystems, in rivers, riparian areas, floodplains, wetlands, lakes and aquifers - and work out the environmental flows (quantity, quality, and timing) necessary to sustain each of these ecosystems at whatever quality level you designate (quality will be defined in terms of ecosystem values and services). In calculating these environmental flows (which will vary within timeframes of seasons, years and decades), the precautionary principle must be applied - with the most conservative estimates applying to the most highly-valued ecosystems (which you have identified). Thirdly, flows necessary to sustain other recreational, geomorphic, hydraulic, cultural or landscape values need to be factored in. Fourthly, what is left can be allocated for present and future human use. This is your cap - which clearly must be set in terms of water availability, and measured in levels which will vary over time. In times of drought, accepted national principles require that two classes of water use must have priority: environmental flows, and stock and domestic use.

Explicit caps on development must be established to prevent these sustainable levels being exceeded. These caps *must* be established well ahead of demand; if this is not done, their establishment becomes socially, politically and economically impossible within the framework of a democracy where tomorrow's water users (the ones who will pay for our mistakes) do not vote.
The degraded (and still degrading) state of Australia's largest and most important river basin, the Murray-Darling, bears testament to the difficulty of managing cumulative effects. No-one ever intended the damage which has occurred. It happened incrementally, little by little, because the processes we put in place could not (and still cannot) manage to control cumulative effects. (Table 14)

Table 14: State comparisons: management of cumulative effects:

State	Act	Ref:	Comments
WA	*Rights in Water and Irrigation Act 1914* (mod. to meet COAG requirements in 2000).	The Act contains no reference to cumulative effects.	According to WRC 2000, a water allocation process is established which routinely sets a catchment cap, then allocates water under that cap. However, in spite of this progressive policy position, the lack of reference to the management of cumulative effects in the Act appears to be a major oversight. See Appendix C.
NT	*Water Act 2000*	The Act contains no reference to cumulative effects.	Water Allocation Plans could, in theory, implement catchment caps – essential for the management of cumulative effects; see s.22B which requires that allocations must be within the sustainable yield of the catchment. However the heavy reliance on the discretion and judgement of the Minister and the Controller of Water Resources makes the NT framework exceptionally vulnerable to pressure from short-term or vested interests.
Qld	Water Act 2000	The Act's only reference to cumulative effects is s.268.	Plans are established under s.38-47 of the Act. According to DNR: "Water Resource Plans … set clear limits on the water available for consumptive purposes. Additional water development is not permitted if these limits would be exceeded. (DNR email 20/2/01). Section 268 deals with river 'interference' permits.
NSW	*Water Management Act 2000.*	s.5(d)(d) - statement of principle.	"the cumulative impacts of water management licences and approvals and other activities on water sources and their dependent ecosystems should be considered and minimised".
ACT	*Water Resources Act 1998.*	The Act contains no reference to cumulative effects.	Under the *Water Resources Management Plan 1999,* once necessary environmental flows have been set, water resources available for diversion or abstraction can be allocated - a similar approach to WA. The Territory Plan, the Water Resources Act and the Environment Protection Act all focus on outcomes to be achieved - which implies (probably requires) management of cumulative effects.
Vic	*Water Act 1989; Catchment and Land Protection Act 1994.*	s.20(1)(d) requires consideration of the cumulative effects of agricultural drains. Apart from this, neither Act contains any reference to cumulative effects	While the management of cumulative effects is not identified in 'purpose' or 'matters to be considered' statements in either Act, the framework resulting from the CLPAct provides for regional Catchment Management Authorities to develop Catchment Management Strategies, which can then achieve subordinate legislation status through the Env Protection Policy process (Env Prot Act 1970). However, the two Victoria statutes are deficient regarding objects and principles.
Tas	*Water Management Act 1999.*	The Act contains no reference to cumulative effects.	Tasmania's integrated catchment management program lacks a statutory base, and clear policy guidance. It is under-funded and poorly coordinated with other policy areas. Neither the Act nor this program provide effective management provisions regarding cumulative effects (Nevill 2001a).
SA	*Water Resources Act 1997.*	The Act contains no reference to cumulative effects.	The Act Part 7 provides a general framework for allocating environmental flows. Each Catchment Water Management Board must develop sustainable Catchment Water Management Plans, including Water Allocation Plans.

Cumulative effects: summary:

The difficulty and importance of managing cumulative effects has been seriously underestimated. Most recent water legislation, with the exception of the *NSW Water Management Act 2000*, ignores the issue almost completely (see the discussion in the sections on State water resource legislation below).

The only way to manage cumulative effects is to establish caps (or limits) on water developments (dams, weirs, water abstraction from surface and groundwaters, drains, and levee banks) *well ahead of developments reaching the level of the cap* - in other words, well ahead of the catchment entering a stressed condition. Caps should not be limited to water use and infrastructure, but should extend to vegetation clearance, in-stream disturbance, and the management of wetland and riparian

vegetation, and should be set in a precautionary way. In managing riparian and wetland vegetation, the concept of 'no net loss' may prove useful.

Within a democratic government framework committed to transparency and accountability, the only tool capable of controlling cumulative effects is strategic natural resource management within catchment boundaries – in other words: integrated catchment management (ICM). As a matter of urgency, ICM programs must be expanded to set such development limits, taking account of a full range of catchment values, including biodiversity. Moreover, steps must be taken to ensure such catchment plans integrate the management of surface and groundwaters, and incorporate quality assurance (adaptive management) principles.

Coffey (2001) has examined the extent to which Queensland's determination of environmental flow regimes meets the object of sustainability of Queensland's *Water Act 2000*. Her important finding is that, in practice, environmental flow regimes are not being set in a precautionary way - contravening a fundamental element of sustainable decision-making. It seems highly likely that a careful examination of mechanisms used in other States to set environmental flows would reveal similar gaps between the high ground of policy rhetoric and statutory objectives, and the reality of day-to-day decision-making. Studies such as Coffey's add weight to calls for management procedures to be audited against sustainability objectives and principles.

To repeat the key message: cumulative effects will not be effectively controlled unless State governments set in place management processes containing three critical elements:

- the need to establish strategic development caps on a catchment basis must be formally recognised, and appropriate management procedures (with adequate community consultation) must be established to set and implement the caps;
- the caps on development must be set well ahead of the point where the catchment enters a stressed or crisis situation; and
- the caps must be set in a precautionary way.

The adoption of the critical three elements is summarised in the table below: Note that the information in row 2 relates only to water extraction and allocation. It is essential that these provisions which States have established to limit water extraction be expanded to cover the areas listed above (such as farm dams, levee banks and agricultural drains). Note also that the information in row four is based on anecdotal information, other than the recent paper by Coffey.

Table 15: Management elements in controlling cumulative effects

	WA	NT	Qld	NSW	ACT	Vic	Tas	SA
The need to manage cumulative effects in general is explicitly recognised in key statute or policy.	no	no	no	yes	no	no	no	no
Statute or policy has established mechanisms which allow the development of strategic catchment-based caps on development.	yes	yes	yes	yes	yes	yes	yes	yes
Caps are being established well ahead of catchment crisis.	no	no	no	no	yes	no	no	no
Where caps are established, they are being set at precautionary levels.	no	no	no	no	no	no	no	no

The ICM frameworks established by Victoria, New South Wales and South Australia are foundered on statute, and in our opinion, empowered by this approach. Queensland and the ACT have catchment frameworks established by substantive policy, and Queensland may move towards a statutory ICM base. However Tasmania and the Northern Territory, and to a lesser extent

Western Australia, have weak and poorly guided ICM frameworks. Such frameworks, in our opinion, are likely to be almost completely ineffective in managing cumulative effects over long time scales.

7c. Catchment strategies need to have primacy in development approval mechanisms. Local government plans and decisions need to further the objectives and action programs set out in catchment strategies.

See 8b below. The WA, SA, Qld, Tas and NSW statutes require functionaries under the Act to further the objects of the Act. The Victorian Water Act, although it has a clear purpose (or object) it does not require functionaries to further the purpose of the Act. However, provisions applying to functionaries do not apply to local governments making development approval decisions which have indirect affects on the water environment. This sub-element needs further development within Australian planning frameworks.

7d. The custodial catchment-based agency must be charged with developing a strategic plan (within a specified timeframe) to ensure the protection, management of sustainable use, and restoration of the catchment

South Australia's Water Management Act 1997 Division 2, and Victoria's CaLM Act 1994 s.24 provide examples. However the legislation of all jurisdictions is deficient in that statutory prescriptions for catchment plans fail to identify the need to control cumulative effects through the establishment of sustainable limits to catchment development.

7e. The strategic plan needs to be comprehensive in the sense of addressing all NRM issues impacting on river integrity and must meet national and State strategic requirements.

No jurisdiction has this concept well developed. The initial draft of SA's Water Management Bill 1997 provided the closest approach (see the SA Review Paper).

7f A review period for the strategic plan should be mandated; as also should be the maximum time period for those reviews necessary to bring the strategic plan within any new Commonwealth or State strategic requirements.

Victoria's CaLP Act 1994 s.97, requires a review of each catchment plan after 5 years. SA legislation requires that catchment plans be consistent with the State Water Plan, which is in practice, but is not required to be, consistent with national strategies like the NWQMS or the National Action Plan.

7g. Catchment strategies are to recognise and protect freshwater ecosystems of high ecological or representative value.

This requirement is substantially missing from the water resource management frameworks of all Australian jurisdictions. This is partially due to the fact that, in all cases, State freshwater inventories have not been completed in a comprehensive and readily accessible form. The most well developed are inventories of 'slow moving' wetland waterbodies; however even these are not generally comprehensive or readily accessible by regional and local planners, and the public.

Nevill (2001) has argued that Commonwealth initiative is urgently needed in this area.

Victoria's Water Act (s.40) lists 'matters to be considered' in the issue of bulk water allocations and irrigation licences. These matters also influence the development of regional catchment strategies under the Catchment and Land Protection Act. Notably, while the list contained in s.40 included heritage river and natural catchments (protected under the Heritage Rivers Act) it does not list Victoria's 15 representative rivers (Nevill 2001*).*

7h. Where a proposed development does not meet the requirements of the catchment strategic plan, the development application must be referred to the catchment agency. Local government must adhere to any conditions recommended by the catchment agency if approving the development. Local government is to resource this referral function.

Although this mechanism has been considered by SA, Victoria and NSW (see comments above) it has not been formally introduced into statute at this stage. Existing mechanisms to some extent approach this concept. Local government would need to resource the referral staff in the catchment agency, which invariably is under-resourced to carry out the proposed function.

7i. Water plans need to be prepared for the total connected resource - surface and groundwaters.

WA, Tasmania and Victoria have no statutory requirement s in this regard, although WA has in practice developed integrated plans. The SA Water Resources Act s.101 does not require integrated plans, but does require that plans for interlinked resources take the nature of the link into account. NSW and Queensland are developing integrated plans, although their statutes, strictly speaking, do not require this (Nevill, Maher and Nichols 2001).

7j. Environmental assessment processes applying to large infrastructure should take account of the effects of both the proposed activity and *the associated additional impacts of the land uses on which the project depends on for its financial viability (irrigation programs, for example). Inclusive boundaries should be drawn around assessable projects to take into account all relevant direct and indirect impacts.*

This is not being undertaken by any Australian jurisdiction at this stage, although there are moves to introduce the concept. A Commonwealth-funded assessment guideline recommends the approach (Nevill 2001).

7k. Separation of the roles of resource management, standard setting and regulation from the role of providing water services

This is a key element of the COAG 1994 water reform agenda. Recent changes in water resource legislation introduced by all Australian jurisdictions in the late 1990s put this requirement into effect.

7l. Provision for a working relationship between science and management within both State and catchment management structures.

Use of best available science is a principle that is widely applied now to planning of environmental flows, although generally without a statutory mandate. This principle needs to be applied to all aspects of catchment management, from State to catchment to local level. See also 5d - role of the Independent Expert Panel.

There are opportunities, wherever legislation specified the expertise of committees, to reinforce the use of scientists, either as permanent members of committees, or as a temporary resource (with appropriate funding) to support the work of committees.

7m. Assurance of a whole of government approach to the State's natural resource management through a formal integrated management system.

The Tasmanian government has set up one example of this formal coordination arrangement – the Resource Management and Planning System under the Resource Management and Planning System Act (1994). Here a suite of legislation (including Acts covering planning, water management, and pollution control, as well as statutory policies dealing with coastal management, pollution control, and the protection of agricultural land) all have identical objectives. These objectives contain the primary goal of ecologically sustainable development.

The model statutory objectives and principles, contained in an appendix to this report, draw heavily on the Tasmanian example.

6.8 Capacity to self-fund

8a Availability of Commonwealth funds tied to the achievement of national natural resource management objectives, through programs such as the National Action Plan.

The COAG water reform agenda and the Commonwealth National Action Plan on Salinity and Water Quality have both tied funding to the achievement of program milestones.

8b. Availability of State funds tied to State objectives and management frameworks.

SA and Victorian statutes require consistency between catchment based plans and State Strategies. See the SA Water Resources Act s.92 and s.18(3). WA has introduced this concept (if loosely) within the non-statutory management framework defined by the Cabinet NRM Policy. Tasmania has no similar requirements, although in practice the NHT funding process, which has to date supported most Tas catchment strategies, does impose consistency as a funding condition.

8c. Funds raised locally by catchment agencies are to be spent only on NRM objectives within that catchment.

This was the case in Victoria prior to the abolition of the catchment levy which supported the activities of the CMAs.

8d. One of the conditions for any tied funding should be the pre-existence of local NRM levies.

This concept does not appear in the policy or statutory frameworks of any Australian jurisdiction at this stage.

8e. Differential Commonwealth funding should be available to assist priority areas, or to achieve equity between catchments.

This has been a feature of Commonwealth funding over many years, but is not cemented by a statutory commitment, which could list principles used in establishing such subsidies.

6.9 Engagement of local government

9a. Local government representatives must be included in catchment agencies, and catchment agency representatives must be included on local government planning committees.

This is a feature of SA and NSW legislation. The Victorian CaLPAct (ss.7, 12) merely specifies that a member of the CMA should have experience in local government.

One example of the range of models available for representation can be seen under *the Conservation Authorities Act*, Ontario, Canada. Under the terms of this Act, the initiation for the establishment of a Conservation Authority must come from the municipalities within a watershed. Once established, participating municipalities are entitled to representation on the Authority membership. In keeping with the idea of a local-provincial partnership, the Province (State) has the opportunity to appoint representatives as well. The Grand River Conservation Authority represents 45 participating municipalities within the Grand River watershed. Municipalities are levied for funds by the Authority (Grand River Conservation Authority Annual Report 1991-92).

9b. Local government decisions must be consistent with the catchment strategic plan.

Victoria, NSW and SA have the best statutory links connecting catchment values, catchment plans, and development approvals under local government planning assessment mechanisms. In Victoria,

the SEPP (Waters of Victoria) requires both local government and catchment authorities to seek to protect waterway values. Under Victoria's CaLPAct s.25, a regional catchment strategy can be declared a SEPP under the Environment Protection Act, thus requiring compliance by local government planning decisions. Both SA and NSW have provisions which can require local government plans to be brought into line with catchment plans, with the agreement of the minister responsible for the State planning Act. This sub-element needs further development within Australian jurisdictions. See also above.

9c. Where the opportunity presents itself, local government boundaries should be brought into line with catchment boundaries.

This concept would eliminate a superfluous administrative boundary as local governments across Australia become more involved in NRM. New Zealand has had a regional government structure partly based on catchment boundaries for some years. Tasmania tried to re-organise its local municipalities partly along catchment boundaries in 1998, but withdrew its proposals in the face of concerted opposition from existing councillors. The concept needs to be revisited, and possibly tied to funding proposals.

6.10 Requirement for continuous improvement

Mandatory review periods incorporated in Australian legislation relating to water resource statutory plans, strategies or programs: (Table 16)

Table 16: Statutory review periods

ACT	Water Resources Act 1998		No requirement for regular reviews
Vic	Catchment and Land Protection Act 1994	CaLP Act s.24	Regional Catchment Strategies: s.24 requires a review period to be set: normally 5 years. The Water Act 1989 does not require the review of bulk entitlements (or other permits and licences), inhibiting potential allocation windbacks to support increased environmental flows.
NSW	Water Management Act 2000	s.10; s.14 s.43; s.50; s.51; s.70 s.282	The Minister must ensure that the activities of the department are reviewed at 5 year intervals. Management committees must review management plans (period unspecified). Management plans have effect for 10 years, and must be audited by the minister or his delegate every 5 years. The Minister's plans must be reviewed every 5 years. Implementation plans must be reviewed annually. Major utility access licences must be reviewed at 5 year intervals. Water entitlements to irrigation corporations are established for 15 years, while bulk access regimes (s.(4)(b) have effect for 10 years. A Water Management Outcomes Plan has effect for 5 years.
Qld	Water Act 2000	s.411; s.415 s.499	Water Resource Plans are reviewed every 10 years. Service Provider 'approved plans' and 'strategic asset management plans' must be reviewed at intervals (not specified by the Act). Flood mitigation manuals must be reviewed at (unspecified) intervals.
Tas	Water Management Act 1999	s.34	Water Management Plans must be reviewed at intervals no longer than 5 years.
WA	Rights in Water and Irrigation Act 1914	s.26GZG	Local area management plans must be reviewed at least once every seven years.
SA	Water Resources Act 1997	s.97	Catchment Water Management Boards must review Catchment Water Management Plans each 5 years, with the plan implementation program reviewed every year. Under requirements of the State Water Plan (ie policy rather than statutory requirements) Water Allocation Plans must be reviewed at 5-yearly intervals.
NT	Water Act 2000	s.22B	Water Allocation Plans must be reviewed at intervals not exceeding 5 years.

10a. Water management frameworks established by legislation or high-level policy should acknowledge and facilitate the use of adaptive management principles.

The NSW Water Management Act specifically lists the adaptive management principle, and establishes fairly comprehensive reporting and review requirements. No other Act acknowledges the principle, although most statutes make some attempt to develop reporting and review provisions

10b. Key elements of goal-setting, planning, implementation, monitoring, review, and re-evaluation should be embedded in key tiers of planning and management.

Like NSW, the legislation of SA and Queensland establish fairly comprehensive reporting and review provisions. The statutes of Victoria, WA, and Tasmania incorporate progressively weaker provisions (in that order).

10c. Government, ministerial or agency discretions about the occurrence, timing and depth of plan reviews should be eliminated as far as practicable.

SA and Victoria have hard requirements for the review of catchment plans / strategies. The provisions of WA and Tasmanian legislation are much weaker on the matter of comprehensive reporting and review. The water legislation of the NT is remarkable for its extraordinary reliance on ministerial discretion.

10d. Adaptive management has a tension with "resource security". Long-term resource allocations should be avoided. A suite of appropriate mechanisms for allocating resources within the constraints of adaptive management include short-term leases, or leases within the period of the adaptive management cycle.

The legislation of most jurisdictions recognises this tension (in providing the minister with the power to reduce a water allocation, for example) although there is seldom explicit acknowledgment of the need to wind back (for example) water allocations in the light of new evidence on ecosystem effects. An exception is the SA Water Resources Act s.37, where clear provision is made for allocation windback. The Victorian situation is complicated by explicit compensation provisions in cases where an allocation is reduced, or a dam removed (see ss.30, 82 of the Water Act).

6.11 Custodial agency as catchment investment coordinator

11a. Removal of perverse subsidies.

Perverse subsidies have tended to persist long after their environmental costs have become evident. Tax subsidies have now been removed for the clearing of native vegetation; however draining wetlands for agricultural purposes can still be claimed.

11b. Channelling and prioritisation of NRM grants and funds.

Although attempts were made in administering Natural Heritage Trust funds to avoid subsidising damaging projects, this was not entirely successful, with some NHT funds, for example, used for river de-snagging in Tasmania in 1997-98. Current grants under the National Action Plan are likely to be more carefully targeted.

11c. Governments may not make NRM or related grants until the recipient demonstrates that these will implement a property plan and / or an conditional environmental management system which the catchment agency has certified as being in accordance with the catchment strategic plan.

Conditional grants tied to environmental management plans, or certified environmental management systems, have not been a feature of Australian funding programs to date, however this may change in the current NAP funding program over the next few years.

11d. Water pricing should be based on the principles of full cost recovery and cost subsidies should be removed or made fully transparent.

This is a fundamental principle of the COAG 1994 water reform agenda, and has been incorporated in the amendments to water resource legislation introduced by all Australian jurisdictions during the late 1990s.

11e. Comprehensive systems of water allocations and entitlements should be prescribed. These should be backed by the separation of water property rights from land ownership. There should be clear specification of entitlements in terms of ownership, volume, reliability, transferability and if appropriate, quality.

This is a fundamental principle of the COAG 1994 water reform agenda, and has been incorporated in the amendments to water resource legislation introduced by all Australian jurisdictions during the late 1990s.

11f. Legislation should encourage or support the development of a NRM trading "trust".

As stated in the Commonwealth's National Action Plan for Salinity and Water Quality, such a "trust" would be the market intermediary between investors with interests in improved environmental management outcomes for salinity, carbon, biodiversity etc (such as lowered water tables, reduced stream salinity, cleaner water and air, nature conservation) and landholders who would provide those outcomes (for example, through tree planting and habitat protection) in selected salinity/water quality impacted catchments/regions. These "credits" would be tradeable on private markets.

These trusts have not yet been established by Australian jurisdictions.

6.12 Licensing, compliance and enforcement

12a. The nature, volume and other allowances for environmental modification through licensing, permits and consents must be allocated on the basis of the strategic plan and conditioned accordingly.

Most jurisdictions are moving towards this goal, although at a slow pace. Catchment-based strategic planning represents the only way in which the cumulative effects of incremental water infrastructure development can be adequately controlled. Such developments include ground and surface water allocations, construction of dams, levee banks and agricultural drains, the expansion of irrigated crops, and the clearance of native vegetation.

Movement towards this goal can be seen in requirements for each planning tier to be consistent with the one above, coupled with requirements that allocation and other licensing must be consistent with the relevant catchment or local plan.

Section 35, for example, of SA's Water Resources Act requires that licensed water allocations must be consistent with the relevant water allocation plan. Western Australia, although using a similar statutory planning framework, does *not* require that licensing decisions (in this case made by the Water and Rivers Commission) be consistent with the relevant local water allocation plan. Although this casts the SA legislation in a good light, comparatively speaking, it should be noted that licensing only applied to prescribed areas, which are quite limited. This presents a major impediment in the control of cumulative effects in SA.

12b. Licences and licence conditions are to be based on proven measurability.

Measurement of water allocations presents a major problem at present in all jurisdictions. In many cases volumetric water allocations, established by licences or permits, contain no requirements for

accurate measurement of flows (let alone credible reporting provisions). In some cases, volumes are not even specified. South Australia, for example, has allocated water in some areas on non-volumetric criteria - for example, "sufficient water to service x acres of y crop".

12c. The principle of continuous improvement is to be applied to licensing.

The NSW Water Management Act, with its commitment to adaptive management and continuous improvement, has at least established a philosophy to support this approach.
In other jurisdictions, reducing water allocations, or tightening controls on as-of-right water usage, is often seen as simply "too difficult".

12d. Licensing is to be incentive-based, with fee scales linked to incentives for best practice production.

Although this concept is not currently used in any jurisdiction, it is being discussed. The Commonwealth's National Action Plan seems likely to provide pressure to introduce this concept.

12e. The maximum time frame allowed for in the licence is to be limited to the time period of the periodic review of the strategic plan.

As above, although this concept is not currently used in any jurisdiction, it is being discussed. The Commonwealth's National Action Plan seems likely to provide pressure to introduce this concept. Generally speaking, statutory water allocations which cannot be reviewed for long periods of time are proving to be major impediments in addressing the problems of stressed catchments.

12f. Compliance enforcement should be recognised as a specific function within water agency management structures.

In SA, both the EPA and the Dept of Water Resources have established Compliance Units. These not, however, required by legislation.

12g. Third party standing to undertake court enforcement action should be enabled by legislation, and supported by appropriate financial arrangements.

This aspect is generally absent from the water and environmental legislation of most jurisdictions. The Queensland Environment Protection Act, for example, contains these provisions, but the government, after 7 years, has still not declared these particular provisions. The Commonwealth Environment Protection and Biodiversity Conservation Act does provide for third party appeals.

Queensland's Water Act 2000 contains third party provisions (s.785) in relation to enforcement orders. There are also third party provisions for appeal, although they are rather convoluted. First any person may make a submission where there has been public notices regarding transfers or leases of water entitlements (ss.132(3)(b) and 134(4)) and where there is no WRP for that area, the grant of a water licence (s.208(4)(c). A person who has made a submission will be given information about the decision, and subsequently comes within the definition of an interested person, and may ask for a review and later appeal that decision (ss.851,862,87).

The use of appeals to ensure equity and good process needs to be balanced against the possibility that appeals are used for gaming purposes and to delay reform. Issues include whether the appeal is on the full merits of the decision or the process used to reach the decision and whether there should be timeframes on when appeals can be lodged.

12h. On-the-spot fines should be considered for specific applications, particularly those issues which might be delegated to local government for enforcement

On the spot fines have been introduced in Queensland in 2000, and are being used for a number of minor offences under the Environment Protection Act. They have potential application in water resource management, but are not currently a feature of water legislation.

12i. The minister should be obliged to report on matters set out in plans, including information about any non-compliance with the plan and its resource implications.

Requirements for the reporting of compliance audit and enforcement programs is not currently a strong feature of the water legislation in most Australian jurisdictions. However, section 10 of the NSW Water Management Act requires the minister to "ensure that the work and activities of the Department are reviewed at intervals of not more than 5 years for the purpose of determining whether they have been effective in giving effect to the water management principles of this Act, and the State Water Management Outcomes Plan". This provision seems likely to oblige the minister and his department to embark on a rigorous compliance auditing and enforcement program.

12j. Licensing of polluting activities should be expanded from point sources to include semi-diffuse sources such as stormwater drains and intensive agriculture drains. Such licensing should be based on load-based planning addressed in the water quality management component of the catchment strategic plan.

All jurisdictions, except the Northern Territory, are actively considering the control of semi-diffuse sources of pollution through licensing. As yet there has been little action, although South Australia has moved to licence effluents from intensive animal husbandry operations. Victoria has the ability to licence stormwater discharges into rivers and waterways, and has taken steps to introduce such controls only in metropolitan Melbourne.
Strategies for the control of diffuse sources (such as the application of fertilisers or pesticides on agricultural land) rest largely on the development of education programs and voluntary codes of practice.

12k. Compensation should be provided in cases where the protection of catchment values involves the removal of existing rights. Compensation should only apply where there are identifiable and measurable impacts for example on income or capital value.

Of the four States examined in detail in this study, the Victorian Water Act probably handles compensation in the most comprehensive way. Refer to the Review Paper (in the Appendices) for more details.

6.13 Required independent audit and reporting

13a. The responsible minister should be required to table in the parliament annually, an independently prepared report on the achievement of the objects of the Water Act.

The concept of tabling an *independent* report is not a feature of any Australian legislation. However, SA, NSW and Queensland statutes require the minister to report annually on the achievement of the objectives of the Act.

13b. Catchment agencies should similarly produce an independently prepared annual report against their strategic plan's objectives.

As above, a requirement for independently audited reports is not a feature of Australian legislation. However, both SA and Victorian legislation requires catchment management agencies to report to the minister annually.

13c. All relevant reports, licences and information about river integrity should be publicly available.

Most Australian jurisdictions have public reporting programs, supplemented by freedom of information legislation. However some type of information, such as information about compliance programs, is uniformly difficult for the public to access.

13d. The 'non-performer pays' principle should be applied.

This principle, linked to awarding of costs in court actions and to downstream costs of planning decisions, has not been introduced to the water resource industry at this stage.

13e. A natural resource accounting framework should be phased in, using a priority area / issues approach.

No Australian jurisdiction has moved to introduce statutory requirements for natural resource accounting. The issue was considered by a Victorian parliamentary inquiry in 2000, but without making recommendations for implementation.

Role and use of the Model Legislative Framework

7.2 Conclusions

This project has reviewed recent developments in Australian water resource law, partly against a background of international concerns on natural resource sustainability, as well as policy imperatives (developed at both national and state levels) focused specifically on the water resource. The model framework arrived at in this Stage 2 project derived from a strategic analysis of four jurisdictions concerning the conduct of catchment management through their respective legislative frameworks (Appendix C). This was undertaken in the context of examination of those key initiatives at national level pressing for widespread adoption of radical measures to address resource use impacting on rivers and improve the basis of management to involve all key stakeholders (see Appendix A on needs of practitioners – Volume Two). Against this complex backdrop, the project has put forward a model framework to guide the development of not only water resource law, but statutory and policy frameworks for natural resource management in general.

The model framework builds strong foundations for the establishment and operations of the custodial catchment agency. This structure and these operational processes are to be geared to demonstrating the principles of good governance. This structure cannot be viewed in isolation however. It is imperative that the model framework also establishes the structures and processes for independent audit and review of achievements by these custodial agencies. Independent review is an essential element in designing adaptive management frameworks which are self-correcting and self-refining.

In addition to the MLF, this Stage Two project has established several key understandings:

- Legislation's conventional 'command and control' role has been extended and in several States contains strong emphasis on the regulatory basis for empowering and enabling stakeholder engagement / partnerships in planning and implementation of sustainable river management

- benchmarking of the MLF (Chapter 6) demonstrated its robustness in the face of detailed comparisons with the major national initiatives for achieving sustainable river management including the Water Reform agenda under COAG, the recent Inquiry into catchment management (HRSCEH (2000) as well as criteria emerging in the literature about effective and efficient watershed management partnerships

- and finally, the indifferent performance to date of the participating States, as against COAG 1994, this project's questionnaire and the MLF (chapter 7).

Other key conclusions to be drawn from this study are as follows.

- While there has been a marked increase in understanding of the water resource debate in general in recent years, there has not been the same rise in understanding about the full suite of arrangements to deliver integrated sustainable catchment management. The debate is still a narrow, resource-focused one. Judged from the survey responses and the desk-top analysis of States' frameworks, States demonstrate mostly *variable* coverage of the river management indicator topics. This varied performance reflects the diversity of State approaches to river management in 2001, the varying pace of legislative reform and, possibly, the divergence of views about the value-adding done by legislation to the management process.

- Another finding is the conflicting perceptions about the functionality of legislation. The reluctance to engage in legislative initiatives in several States is the result of a multitude of factors. One critical one is the perception that legislation precludes or hampers partnerships or institutional arrangements based on collaboration and cooperation. This view that legislation is about regulation and enforcement is a narrow and outdated one, existing alongside of alternative views which see legislation as enabling, empowering and providing the means and authority for key stakeholders to act. As is evidenced by the model framework and by specific States' frameworks such as in South Australia and Victoria, legislation has a major role to play in setting the right conditions for collaborative, empowered and accountable arrangements. This myth about the core function being command and control is entrenched and may prove difficult to debunk.

  There is old style legislation and there is the newer, more process- and performance-based legislation. The model framework is structured around the latter. One notable feature of more recent process-based ('enabling') legislation is that it is designed to bind not just the private operator, but the government as well. Legislative frameworks can require governments to intervene where intervention is the required action. While it may not go as far as dictating the nature of that intervention, it does make the government accountable for the outcomes.

  The question of the desirability and feasibility of greater comparability and even standardisation between States legislative frameworks for catchment management may be judged by each State's delivery of healthier rivers in the longer term. In the meantime, the MLF provides a vehicle for assessing State coverage of best practice river management, be it through a legislative emphasis or other means of addressing the same imperatives.

- While all States demonstrate a degree of compliance with most of the COAG Water Reform Framework, not all States demonstrate commitment to the catchment management criterion of COAG. One reason for this difference is perhaps a perceived disparity between the States in terms of the stressed condition of their rivers and catchments. This perception belies a key point about when catchment management is most pressing. Catchment management is as needed for rivers which are not sending out distress signals presently as it is for those which are decidedly stressed. The myth that investing in catchment management is required as and when rivers are stressed paves the way for expensive and potentially futile efforts at addressing degradation when it is at its worst. *Closing the gate after the horse has bolted* might be the best way to describe this approach. Given that rivers, unlike protected forest areas, are subject to catchment pressures and cannot be effectively isolated to ensure protection, the best value approach is to direct management systematically across a number of fronts - protecting the pristine and least modified aspects while at the same time dealing with degradation. Management processes must acknowledge cumulative effects, and establish strategic caps to manage these effects ahead of catchment stress.

- The notion that a set of best practice clauses or excerpts of legislation can be identified in different legislative frameworks is misleading. It requires the evaluation of legislation in practice and the 'construing' of the intent and impact of that legislation in a level of detail which is not possible in the time or money available to this project. The effectiveness of most legislation aimed at sustainable river management cannot be assessed in the short timeframe since that legislation has been introduced. However the MLF scopes the criteria or elements of best practice river management from the perspective of legislative coverage.

- Several States had key initiatives which extend aspects of the model framework further. The Healthy Rivers Commission in NSW conducts major independent reviews of the processes and achievements of river management. Though constrained to date to coastal river systems and to reviewing management arrangements and not water development plans or individual projects, the Commission has the potential to offer broader ranging reviews of the planning and decision-making process. Also the Environmental Protection Authority in WA is empowered to assess the impacts of planning schemes and water plans with the potential to address matters such as cumulative effects and more comprehensive application of the precautionary principle. One other impressive model is the RMPS (Resource Management and Planning System) in Tasmania. The system is the only ambitious attempt to provide a consistent legislative framework for the coordination of natural resource management programs of any Australian jurisdiction. It involves integrated administration of four key pieces of legislation overseen by the Resource Planning and Development Commission whose charter is:
  - to assess and approve local government planning schemes and relevant amendments;
  - to assess projects of State significance;
  - to assess draft State Policies prepared under the *State Policies and Projects Act*;
  - to prepare the Tasmanian State of the Environment Report; and
  - to conduct inquiries into the use of public land at the request of the Minister.

- The constrained legislative role of the Commonwealth Government is a recurring theme in light of the national context of river challenges and in light of major 'basket-case' rivers crossing boundaries between States. The result is a less satisfactory reliance on indirect (vicarious) means of directing a national natural resource management program through funding provision hinged upon States' agreement with new directions and preferred implementation measures;

- There is a need to establish a national agency with benchmarking and review functions to ensure that any agreed legislation reform is carried through similar the COAG water reform reviews. COAG Mark II should be convened in 2004 with a broader NRM focus, and the States should demonstrate how they are delivering sustainability objectives for rivers and catchment health. COAG III in 2014 would then review achievements and revise and upgrade if necessary the national framework for improved performance across Australia.

- The lack of coincidence of administrative with bio-physical boundaries together with lack of independent status of Local Government continues to constrain the roll out of smooth governance arrangements at the level below State government. Regional governance arrangements required for effective NRM could be readily built upon Local Government regional groupings. States have varied greatly in their emphasis on and the status awarded to Local Government in the institutional arrangements at regional level. The alternative and potentially less 'empowered' option is where catchment / regional agencies are established without due democratic processes. Those without formal status as catchment agencies then operate without explicit financial and regulatory accountabilities as seen in Queensland, NT, Tasmania and WA;

In terms of findings relating to the conduct of this project, the project team needs to highlight difficulties (and the extensive cost and time implications of these) we experienced working to engage the States in such a multi-jurisdictional, multi-agency research exercise. Though there was no opportunity to formally evaluate the cause of these difficulties, factors which may have contributed to this situation include:

- internal delegation problems following senior management commitment to participate;
- limited profile for or support of national level evaluation / benchmarking research;

- staff overload / lack of availability of personnel as major water initiatives are underway in each State; and
- limited for people to work strategically on sustainable river management as they are focused on multiple operational demands including regional investment strategies and water allocation arrangements.

7.1 Project recommendations

The following recommendations are designed to communicate the findings of the report particularly the model framework, and to refine it as a research and management tool over time.

- Wide dissemination of Volume One of this report and a summary version of the model framework should be organised as a structured response process with the all States involved. A simple summary booklet would suffice to promote a lay-person's understanding of the building blocks of comprehensive catchment management. The booklet should have appeal to the full range of people engaged in catchment management, from the farm gate to the courthouse door.

The process of distribution, communication, clarification and obtaining feedback needs to be designed.

- Community learning processes and catchment management legislation

The MLF is a vehicle for community review of catchment management arrangements and structured processes of education and review are recommended.

- 'Road test' the MLF

The model legislative framework provides the vehicle to generate vigorous debate about the role and potential contribution and nature of a clarified and strengthened legal framework to direct and support sustainable river management. The model framework is a suitable vehicle for debate about sustainable water use – increasing production while enhancing our ecological assets (refer the Goulburn-Broken Catchment Management Authority's vision).

One major forum in each State for road testing the model would be in the Council of Ministers and / or CEOs established to address NRM issues and more specifically the National Action Plan for Salinity and Water Quality.

There are numerous forums at the national level and this would perhaps best be gauged through a review of Land and Water Australia's national strategy and also forums doing work derived from COAG and from the House of Representatives' Inquiry (HRSCEH)

One practical approach to promoting debate about the MLF and agency / community review is to arrange a 'road show' across specific catchments in Australia. It would be valuable to include presenters with direct experience in catchment management which has been successfully underpinned by legislation (for example the experiences of Onkaparinga Catchment Water Management Board).

- Review the model framework for portability overseas, including different socio-economic and cultural contexts.

Global water partnerships was a strong emerging framework for water management at the 2001 River Symposium in Brisbane. These partnerships are geared to development and promotion of a range of river management tools. The model framework has potential in these forums, to stimulate

debate about the nature and emphasis placed on legislative approaches to water management across different socio-economic and cultural contexts.

As reported in the AWA News for the week ending 9 December 2001,

> *At the conclusion of the FRESHWATER CONFERENCE in Bonn, Margaret Catley-Carlson (Global Water Partnership Chairman) highlighted the move from a diversity of positions to a consensus on specifics. She said we must provide greater access to water and sanitation, and reduce vulnerability todisaster. She highlighted calls for: decentralised management; new partnerships; cooperative arrangements at the water basin level; and stronger governance arrangements. Concluding, she stressed that "we can act, and must."* http://www.water-2001.de/

- Undertake dialogue with States about benchmarking of their frameworks against the model framework

Legislation has a secondary role in some States and in these the pursuit of river management is either very limited or through lighthouse, catchment-specific, cooperation-based partnerships which are in their early years of development. In States where legislation has a primary role outstanding issues concern full integration of natural resource management planning and implementation, role of local government, funding, democracy and accountability at the catchment level. The model framework is a tool for continued debate at the State level as well as for review of achievements and the next era of management plans and structures. The framework itself is a tool for a management system's approach to State-based legislative framework evolution.

- Identify the key issues / obstacles/ key strategic needs (in general, and individually) in relation to the model framework

There are issues – legal, economic, social, cultural– which challenge this model framework. Farrier, Dovers, Bates and others have identified key obstacles to sustainable river management . The MLF provides a means to comprehensively research and document these issues through dialogue as well as desk-top exercises.

- Complete the review of existing State legislation

In order to ensure that the review work is complete at this time, arrange survey coverage and workshop reviews of Queensland and NSW at the minimum, with the addition of the Territories of ACT and NT at the optimum.

- International benchmarking

The model provides a framework for collation and review of good examples, both in Australian States and overseas including but not limited to NZ, South Africa and Canada. This work should be ongoing and be used to refine the model. The aim could be to produce a data base of good practices and key options for elements and sub-elements of the model framework over time.

- Conduct of Land and Water Australia projects in the future

Projects such as this one which extend beyond desk top reviews of work by the States would operate more smoothly if they were the result of negotiation about purpose, deadlines and inputs with the States. In the absence of any national level imperative for reporting on the State of our rivers and the effectiveness of river management, proposed Land and Water Australia projects may fare better is they were the subject of 'sign-off' by for example the States' Councils of Ministers and / or CEOs working on coordinated NRM issues including NAP and river management.

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Abbreviations

ACF	Australian Conservation Foundation
ACT	Australian Capital Territory
AFFA	Agriculture, Fisheries and Forestry Australia
AGPS	Australian Government Publishing Service
AHC	Australian Heritage Commission
ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ASL	Australian Society for Limnology
Audit (the)	The National Land and Water Resources Audit
AWWA	Australian Wastewater Association
CALM	Western Australia Department of Conservation and Land Management
CAMBA	China – Australian Migratory Birds Agreement
CAR	Comprehensive, adequate and representative
Ces	Cumulative effect of incremental water infrastructure development
CITES	Convention on International Trade in Endangered Species (of Wild Fauna and Flora
CMA	Catchment Management Authority (Victoria)
CMC	Catchment Management Committee
CRC	Cooperative Research Centre
COAG	Council of Australian Governments
CRCFE	Cooperative Research Centre for Freshwater Ecology
CRES	Centre for Resource and Environmental Studies (Australian National University)
CSIFE	Comprehensive State Inventory of Freshwater Ecosystems
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DCNR	Department of Conservation and Natural Resources
DEHAA	South Australia Department of Environment, Heritage and Aboriginal Affairs
DENR	South Australian Department of Environment and Natural Resources
DLPE	Northern Territory Department of Land Planning and Environment
DLWC	New South Wales Department of Land and Water Conservation
DNR	Queensland Department of Natural Resources
DNRE	Victorian Department of Natural Resources and Environment
DPI	Queensland Department of Primary Industries
DPIE	Commonwealth Department of Primary Industries and Energy
DPIWE	Tasmania Department of Primary Industries, Water and Environment
DWR	New South Wales Department of Water Resources
EA	(Commonwealth Department of) Environment Australia
ECC	Environment Conservation Council (Victoria)
EIA	Environmental Impact Assessment
EPA	Queensland Environmental Protection Agency
EPP	Environment Protection Policy (statutory policy under Qld's Environment Protection Act)
ERIN	Environment Resource Information Network (EA)
ERISS	Environmental Research Institure of Supervising Scientists
ESD	Environmentally Sustainable Development
ESWM	Ecologically Sustainable Water Management
EWR	Ecological Water Requirement (used by the WRC in WA)
EWP	Environmenalt Water Provision (used by the WRC in WA)
GDE	Groundwater-dependant Ecosystem
GIS	Geographical Information Systems
GL	Gigalitre
GSL	Great Southern Land: see the section titled: "Hypothetical case study"
IBRA	Interim Bioregionalisation of Australia
ICM	Integrated Catchment Management
IGAE	Intergovernmental Agreement on the Environment (Commonwealth/State/Local government agreement)

IMCRA	Interim Marine and Coastal Regionalisation for Australia
JAMBA	Japan – Australia Migratory Birds Agreement
LCC	Land Conservation Council, Victoria
LUP	Land Use Planning
LWRRDC	Land and Water Resources Research and Development Corporation
MDBC	Murray-Darling Basin Commission
MDBMC	Murray-Darling Basin Ministerial Council
ML	Megalitre
MLF	Model Legislative Framework
NAP	National Action Plan for Salinity and Water Quality
National Biodiversity Strategy	National Strategy for the Conservation of Australia's Biological Diversity 1996
NCC	National Competition Council
NCS	Nature Conservation Strategy (ACT)
NES	National Environmental Significance
NFF	National Farmers Federation
NGO	Non-Government Organisation
NHT	National Heritage Trust
NLWRA	National Land and Water Resources Audit
NPWS	National Parks and Wildlife Service
NRC	National Rivers Consortium
NRHP	National River Health Program
NRM	Natural Resource Management (a framework similar to the ICM concept)
NRMS	Natural Resource Management Strategy
NRS	National Reserves System
NRSP	National Reserves System Program
NSESD	National Strategy for Ecologically Sustainable Development (1992)
NSW	New South Wales
NT	Northern Territory
NWQMS	National Water Quality Management Strategy
QCC	Queensland Conservation Council
QLD	Queensland
RFA	Regional Forest Agreement(s)
RR's	Representative Reserves
SA	South Australia
SPP	Statement of Planning Policy (WA)
State	Used here to include all Australian States and Territories
TAS	Tasmania
TCM	Total Catchment Management
UNESCO	United Nations Economic, Social and Cultural Organisation
VIC	Victoria
WA	Western Australia
WAMP	Water Allocation and Management Plan
WC	Western Australian Water Corporation
WCP	Wetlands Conservation Policy
Wetlands	Used in two meanings in this paper, depending on context. The Ramsar definition of wetlands includes rivers and streams; while the more common understanding of the term in Australia excludes rivers and streams. See discussion at section 3.6.3.
WISE	Water Information System for the Environment (NSW)
WMA	Water Management Act
WRC	Western Australian Water and Rivers Commission
WRMC	Water Resources Management Committee (WA)

Annexure A: COAG 1994 agreement addendum, & guidelines agreed upon at the ARMCANZ Hobart 1998 meeting

Water resource policy, COAG 1994

In relation to water resource policy, the Council agreed:

1. that action needs to be taken to arrest widespread natural resource degradation in all jurisdictions occasioned, in part, by water use and that a package of measures is required to address the economic, environmental and social implications of future water reform;

2. to implement a strategic framework to achieve an efficient and sustainable water industry comprising the elements set out in (3) through (8) below;

3. in relation to pricing:

(a) in general:

(i) to the adoption of pricing regimes based on the principles of consumption-based pricing, full-cost recovery and desirably the removal of cross-subsides which are not consistent with efficient and effective service, use and provision. Where cross-subsides continue to exist, they be made transparent, ï Queensland, South Australia and Tasmania endorsed these pricing principles but have concerns on the detail of the recommendations;

(ii) that where service deliverers are required to provide water services to classes of customer at less than full cost, the cost of this be fully disclosed and ideally be paid to the service deliverer as a community service obligation;

(b) urban water services -

(i) to the adoption by no later than 1998 of charging arrangements for water services comprising an access or connection component together with an additional component or components to reflect usage where this is cost-effective;

(ii) that in order to assist jurisdictions to adopt the aforementioned pricing arrangements, an expert group, on which all jurisdictions are to be represented, report to COAG at its first meeting in 1995 on asset valuation methods and cost-recovery definitions;

and

(iii) that supplying organisations, where they are publicly owned, aiming to earn a real rate of return on the written-down replacement cost of their assets, commensurate with the equity arrangements of their public ownership;

(c) metropolitan bulk-water suppliers:

(i) to charging on a volumetric basis to recover all costs and earn a positive real rate of return on the written-down replacement cost of their assets;

(d) rural water supply:

(i) that where charges do not currently fully cover the costs of supplying water to users, agree that charges and costs be progressively reviewed so that no later than 2001 they comply with the principle of full-cost recovery with any subsidies made transparent consistent with 3(a)(ii) above;

(ii) to achieve positive real rates of return on the written-down replacement costs of assets in rural water supply by 2001, wherever practicable;

(iii) that future investment in new schemes or extensions to existing schemes be undertaken only after appraisal indicates it is economically viable and ecologically sustainable;

(iv) where trading in water could occur across State borders, that pricing and asset valuation arrangements be consistent;

(v) where it is not currently the case, to the setting aside of funds for future asset refurbishment and/or upgrading of government supplied water infrastructure; and

(vi) in the case of the Murray-Darling Basin Commission, to the Murray-Darling Basin Ministerial Council putting in place arrangements so that, out of charges for water, funds for the future maintenance, refurbishment and/or upgrading of the headworks and other structures under the Commission's control be provided;

(e) groundwater:

(i) that management arrangements relating to groundwater be considered by Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) by early 1995 and advice from such consideration be provided to individual jurisdictions and the report be provided to COAG; [Author's note: a key recommendation of the subsequent 1996 report recommended the integrated management of inter-linked ground and surface water resources]

4. in relation to water allocations or entitlements:

(a) the State government members of the Council, would implement comprehensive systems of water allocations or entitlements backed by separation of water property rights from land title and clear specification of entitlements in terms of ownership, volume, reliability, transferability and, if appropriate, quality;

(b) where they have not already done so, States, would give priority to formally determining allocations or entitlements to water, including allocations for the environment as a legitimate user of water;

(c) in allocating water to the environment, member governments would have regard to the work undertaken by ARMCANZ and Australian and New Zealand Environment and Conservation Council (ANZECC) in this area; [Author's note: agreed principles relating to water allocations for the environment were published in 1996]

(d) that the environmental requirements, wherever possible, will be determined on the best scientific information available and have regard to the inter-temporal and inter-spatial water needs required to maintain the health and viability of river systems and groundwater basins. In cases where river systems have been over-allocated, or are deemed to be stressed, arrangements will be instituted and substantial progress made by 1998 to provide a better balance in water resource use including appropriate allocations to the environment in order to enhance/restore the health river systems;

(e) in undertaking this work, jurisdictions would consider establishing environmental contingency allocations which provide for a review of the allocations five years after they have been determined; and

(f) where significant future irrigation activity or dam construction is contemplated, appropriate assessments would be undertaken to, inter alia, allow natural resource managers to satisfy themselves that the environmental requirements of the river systems would be adequately met before any harvesting of the water resource occurs;

5. in relation to trading in water allocation or entitlements:

(a) that water be used to maximise its contribution to national income and welfare, within the social, physical and ecological constraints of catchments;

(b) where it is not already the case, that trading arrangements in water allocations or entitlements be instituted once the entitlement arrangements have been settled. This should occur no later than 1998;

(c) where cross-border trading is possible, that the trading arrangements be consistent and facilitate cross-border sales where this is socially, physically and ecologically sustainable; and

(d) that individual jurisdictions would develop, where they do not already exist, the necessary institutional arrangements, from a natural resource management perspective, to facilitate trade in water, with the provision that in the Murray-Darling Basin the Murray-Darling Basin Commission be satisfied as to the sustainability of transactions;

6. in relation to institutional reform:

(a) that where they have not already done so, governments would develop administrative arrangements and decision-making processes to ensure an integrated approach to natural resource management;

(b) to the adoption, where this is not already practised, of an integrated catchment management approach to water resource management and set in place arrangements to consult with the representatives of local government and the wider community in individual catchments;

(c) to the principle that, as far as possible, the roles of water resource management, standard setting and regulatory enforcement and service provision be separated institutionally;

(d) that this occur, where appropriate, as soon as practicable, but certainly no later than 1998;

(e) the need for water services to be delivered as efficiently as possible and that ARMCANZ, in conjunction with the Steering Committee on National Performance Monitoring of Government Trading Enterprises, further develop its comparisons of inter-agency performance, with service providers seeking to achieve international best practice;

(f) that the arrangements in respect of service delivery organisations in metropolitan areas in particular should have a commercial focus, and whether achieved by contracting out, corporatised entities or privatised bodies this be a matter for each jurisdiction to determine in the light of its own circumstances; and

(g) to the principle that constituents be given a greater degree of responsibility in the management of irrigation areas, for example, through operational responsibility being devolved to local bodies, subject to appropriate regulatory frameworks being established;

7. in relation to consultation and public education:

(a) to the principle of public consultation by government agencies and service deliverers where change and/or new initiatives are contemplated involving water resources;

(b) that where public consultation processes are not already in train in relation to recommendations (3)(b), (3)(d), (4) and (5) in particular, such processes will be embarked upon;

(c) that jurisdictions individually and jointly develop public education programs in relation to water use and the need for, and benefits from, reform;

(d) that responsible water agencies work with education authorities to develop a more extensive range of resource materials on water resources for use in schools; and

(e) that water agencies should develop individually and jointly public education programs illustrating the cause and effect relationship between infrastructure performance, standards of service and related costs, with a view to promoting levels of service that represent the best value for money to the community;

8. in relation to the environment:

(a) that ARMCANZ, ANZECC and the Ministerial Council for Planning, Housing and Local government examine the management and ramifications of making greater use of wastewater in urban areas and strategies for handling stormwater, including its use, and report to the first Council of Australian Governments' meeting in 1995 on progress;

(b) to support ARMCANZ and ANZECC in their development of the National Water Quality Management Strategy, through the adoption of a package of market-based and regulatory

measures, including the establishment of appropriate water quality monitoring and catchment management policies and community consultation and awareness;

(c) to support consideration being given to establishment of Landcare practices that protect areas of river which have a high environmental value or are sensitive for other reasons; and

(d) to request ARMCANZ and ANZECC, in their development of the National Water Quality Management Strategy, to undertake an early review of current approaches to town wastewater and sewage disposal to sensitive environments, noting that action is underway to reduce accessions to water courses from key centres on the Darling River system (It was noted that the National Water Quality Management Strategy is yet to be finalised and endorsed by governments.);

9. in relation to water and related research, member governments would:

(a) give higher priority to the research necessary to progress implementation of the strategic framework including consistent methodologies for determining environmental flow requirements; and

(b) to greater coordination and liaison between research agencies to more effectively utilise the expertise of bodies such as the Land and Water Research and Development Corporation, the Murray-Darling Basin Commission and other State and Commonwealth organisations;

10. in relation to taxation:

(a) that a sub-committee of Commonwealth and State officials, established by the Working Group on Microeconomic Reform, meet to discuss taxation issues of relevance to the water industry with a view to reporting, through the Working Group, to the Council within 12 months;

(b) to support water-related taxation issues being examined in the proposed Industry Commission Inquiry in Private Sector Infrastructure Funding; and

(c) to accept any future consideration of tax compensation payments involving the water industry being dealt with through the Commonwealth State Working Group established at the July 1993 financial Premiers' Conference; and

11. in relation to recommendations (3) through (8):

(a) that the Working Group on Water Resource Policy would coordinate report to the Council for its first meeting in 1995 on progress achieved in implementing this framework including reductions in cross-subsidies, movement towards full-cost recovery pricing in urban and rural areas and the establishment of transferable water entitlements; and

(b) that as part of the monitoring and review process, ARMCANZ, ANZECC and, where appropriate, the Murray-Darling Basin Ministerial Council and the Ministerial Council for Planning, Housing and Local Government would report annually over the succeeding four years, and again at its first meeting in 2001, to the Council of Australian Governments on progress in implementing the various initiatives and reforms covered in this strategic framework.

Guidelines for the Application of Section 3 of the Strategic Framework and Related Recommendations in Section 12 of the Expert Group

Principles:

1. Prices will be set by the nominated jurisdictional regulators (or equivalent) who, in examining full cost recovery as an input to price determinations, should have regard to the principles set out below.

2. The deprival value methodology should be used for asset valuation unless a specific circumstance justifies another method.

3. An annuity approach should be used to determine the medium to long term cash requirements for asset replacement/refurbishment where it is desired that the service delivery capacity be maintained.

4. To avoid monopoly rents, a water business should not recover more than the operational, maintenance and administrative costs, externalities, taxes or TERs [tax equivalent regime], provision for the cost of asset consumption and cost of capital, the latter being calculated using a WACC [weighted average cost of capital].

5. To be viable, a water business should recover, at least, the operational, maintenance and administrative costs, externalities, taxes or TERs (not including income tax), the interest cost on debt, dividends (if any) and make provision for future asset refurbishment/replacement (as noted in (3) above). Dividends should be set at a level that reflects commercial realities and stimulates a competitive market outcome.

6. In applying (4) and (5) above, economic regulators (or equivalent) should determine the level of revenue for a water business based on efficient resource pricing and business costs. Specific circumstances may justify transition arrangements to that level.

Agreements on Related Reforms

7. In determining prices, transparency is required in the treatment of community service obligations, contributed assets, the opening value of assets, externalities including resource management costs, and tax equivalent regimes.

A number of terms used require further comment in the context of these guidelines:

The reference to or equivalent *in principles 1 and 6 is included to take account of those jurisdictions where there is no nominated jurisdictional regulator for water pricing.*

The phrase not including income tax *in principle 5 only applies to those organisations which do not pay income tax.*

Externalities *in principles 5 and 7 means environmental and natural resource management costs attributable to and incurred by the water business.*

Efficient resource pricing *in principle 6 includes the need to use pricing to send the correct economic signals to consumers on the high cost of augmenting water supply systems. Water is often charged for through a two part tariff arrangement in which there are separate components for access to the infrastructure and for usage. As an augmentation approaches, the usage component will ideally be based on the long-run marginal costs so that the correct pricing signals are sent.*

Efficient business costs *in principle 6 are the minimum costs that would be incurred by an organisation in providing a specific service to a specific customer or group of customers, or the minimum amount that would be avoided by not providing the service to the customer or group of customers. Efficient business costs will be less than actual costs if the organisation is not operating as efficiently as possible.*