Agriculture and Resource Management Council of Australia and New Zealand and Australian and New Zealand Environment and Conservation Council

NATIONAL PRINCIPLES

For The Provision Of Water For Ecosystems

Sustainable Land and Water Resources Management Committee Subcommittee on Water Resources

Occasional Paper SWR No 3 July 1996

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AGRICULTURE AND RESOURCE MANAGEMENT COUNCIL OF AUSTRALIA AND NEW ZEALAND

The Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), established in 1993, is one of a number of Ministerial Councils set up by the Commonwealth and State Governments to further co-operation and collaboration in particular fields of mutual concern. ARMCANZ consists of Australian Commonwealth/State/Territory and New Zealand Ministers responsible for agriculture, land and water resources, and rural adjustment policy issues.

The Council is a non-statutory body. It provides a forum for the exchange of views on the development of policies, guidelines and programs to assist the beneficial and orderly assessment, development and management of Australia's resources. It is supported by a permanent Standing Committee, the Standing Committee on Agriculture and Resource Management (SCARM). Membership of the Standing Committee comprises relevant Departmental Heads/Chief Executive Officers of Australian Commonwealth/State/ Territory and New Zealand agencies as well as representatives of CSIRO and the Bureau of Meteorology.

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AUSTRALIAN AND NEW ZEALAND ENVIRONMENT AND CONSERVATION COUNCIL

The Australian and New Zealand Environment and Conservation Council (ANZECC) is a non-statutory Commonwealth, State, Territory and New Zealand Ministerial Council. It was formed in 1991 by amalgamation of the former Australian and New Zealand Environmental Council (ANZEC) and the former Council of Nature Conservation Ministers (CONCOM).

ANZECC provides a forum for member governments to exchange information and experience and develop coordinated policies in relation to national and international environment and conservation issues. Its members are the Commonwealth, State, Territory and New Zealand Ministers responsible for the environment and conservation, with the relevant Minister from Papua New Guinea as an observer.

The Council is supported by two Standing Committees of senior officials nominated by the Ministers, the Standing Committee on Environment Protection (SCEP) and the Standing Committee on Conservation (SCC). The Standing Committees are advised by specialist working groups, task forces and networks set up for specific purposes.

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EXECUTIVE SUMMARY

I. PURPOSE

Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) and Australian and New Zealand Environment and Conservation Council (ANZECC) have jointly developed a set of National Principles for the Provision of Water for Ecosystems.

The purpose of these National Principles is to provide policy direction on how the specific issue of water for the environment should be dealt with in the context of general water allocation decisions. **These Principles, in themselves, are not a framework for water allocation. They are one input to a much broader process that will consider all users in the mechanism of water allocation.**

Review of the broader process will be undertaken by ARMCANZ. This review will consider all water users including the environment and will provide a balanced framework for water allocation amongst these users.

2. GOAL

The goal for providing water for the environment is to sustain and where necessary restore ecological processes and biodiversity of water dependent ecosystems.

3. PRINCIPLES

Basic premise of principles

PRINCIPLE 1 *River regulation and/or consumptive use should be recognised as potentially impacting on ecological values.*

Determining environmental water provisions

PRINCIPLE 2 *Provision of water for ecosystems should be on the basis of the best scientific information available on the water regimes necessary to sustain the ecological values of water dependent ecosystems.*

Provision of water for ecosystems

PRINCIPLE 3 *Environmental water provisions should be legally recognised.*

PRINCIPLE 4 *to systems where there are existing users, provision of water for ecosystems should go as far as possible to meet the water regime necessary* to *sustain the ecological values of aquatic ecosystems whilst recognising the existing rights of other water users.*

PRINCIPLE 5 *Where environmental water requirements cannot be met due to existing uses, action (including reallocation) should be taken to meet environmental needs.*

PRINCIPLE 5 *Further allocation of water for any use should only be on the basis that natural ecological processes and biodiversity are sustained (i.e. ecological values are sustained).*

Management of environmental water allocations

PRINCIPLE 7 *Accountabilities in all aspects of management of environmental water provisions should be transparent and clearly defined.*

PRINCIPLE 8 *Environmental water provisions should be responsive to monitoring and improvements in understanding of environmental water requirements.*

Other uses

PRINCIPLE 9 *All water uses should he managed in a manner which recognises ecological values.*

PRINCIPLE 10 *Appropriate demand management and water pricing strategies should be used to assist in sustaining ecological values of water resources.*

Further research

PRINCIPLE 11 *Strategic and applied research to improve understanding of environmental water requirements is essential.*

Community involvement

PRINCIPLE 12 *All relevant environmental, social and economic stakeholders will be involved in water allocation planning and decision-making on environmental water provisions.*

1. Introduction

Most water allocation decisions in the past concentrated on the provision of water for urban, industrial and agricultural uses. Dams were built to stimulate rural and urban development rather than in response to demand and water was allocated as part of the process. Little or no attention was paid to the environmental consequences of these decisions. Even less consideration was given to the ecological consequences of disposing of water after use.

Over time, the scale of our water resource developments increased and impacts on the ecological values of waterways and other aquatic ecosystems became more evident. Seasonal and annual variability of the water regimes are essential for the maintenance of aquatic ecosystems. Both have been significantly modified in many surface water systems.

In addition, this problem has been exacerbated by changes in catchment land use, clearing of vegetation, disposal of sewage and other wastes. Although there have been many social benefits from water resource development, a number of environmental problems have become evident. Australia's rivers and wetlands are under stress. Algal blooms are increasing in number and severity. There has been considerable changes to stream integrity including significant river erosion and a widespread decline in native fish species.

Some aquatic ecosystems have been irreversibly changed by these stresses. In other aquatic ecosystems, wildlife habitats have been substantially degraded. Overall, there has been a diminution or loss of many aquatic species. Some impacts have been immediate and quite dramatic. Other impacts have been more gradual, with changes and losses becoming apparent only slowly over time.

Simultaneously, the decrease in the overall environmental quality of our rivers and streams has had a number of direct and indirect effects on our capacity to use our water resources for other purposes e.g. recreation, agriculture and drinking water.

Overall, there has been a general acceptance from all sectors of the community that aspects of our past approaches to water allocation and management were unsustainable. There is a need to review our water allocation procedures to allow use for agricultural, domestic and industrial purposes whilst ensuring that there is sufficient water allocated to maintain riverine and wetland ecosystem values. This is necessary to protect the long term viability of the water resource base to ensure that it can continue to meet all the needs of the community.

I . I NATIONAL DIRECTIONS

This need to improve our approaches to water resource allocation and management has been recognised in a number of Federal and State policies, particularly in:

- Principles of Ecologically Sustainable Development (1992);
- InterGovernmental Agreement on the Environment (1992); and

- Draft National Water Quality Management Strategy (1994).

However, most recently, the Council of Australian Governments (COAG) reviewed water resource policy in Australia and agreed to implement a strategic framework to achieve an efficient and sustainable water industry.

As one of the major components of this framework, the COAG recommended the introduction of comprehensive systems of water allocations including the determination of clearly specified water entitlements, the provision of water for the environment and water trading arrangements.

The COAG provided a clear, general direction for a major review of water resource allocation policies. Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) is currently undertaking this review which will consider the rights of all water users including the environment. It has developed a paper *Water Allocation and Entitlements. A National Framework for the Implementation* of *Property Rights in Water* (ARMCANZ, 1995). This will provide a balanced framework for water allocation amongst all users.

However, before undertaking this work, ARMCANZ considered that some direction was required on how the issue of water for the environment should be dealt with in water allocation decisions. Specifically, there was a need for policy on questions such as:

- the definition of environment in this context;
- the aim of providing water for the environment;
- methods of providing water for the environment; and
- management of environmental water provisions.

These basic policy issues are clear for all other users of the resource but there was no general agreement on these questions when considering the needs of the environment in the water allocation process. Therefore, ARMCANZ commissioned a set of National Principles for the Provision of Water for Ecosystems.

I .2 PURPOSE OF THE NATIONAL PRINCIPLES FOR THE PROVISION OF WATER FOR ECOSYSTEMS

The purpose of these National Principles is to provide policy direction on how the issue of water for the environment should be dealt with in the context of general water allocation decisions. It should be noted that **these Principles, in themselves, are not a framework for water allocation. They are one input to a much broader process that will consider all users in the mechanism of water allocation.**

A general review of water allocation processes and the development of a framework for property rights for water is being undertaken by ARMCANZ.

Adopting the principles set out in `National Principles for the Provision of Water for Ecosystems' is one step towards sustainable water management. However, it will not solve

all of the problems confronting aquatic ecosystems in Australia. Although very important, water quantity addresses only one of the needs of aquatic ecosystems. Attention needs also to be directed to the degradation caused by changes in catchment land use, clearing of vegetation, draining of wetlands and the disposal of sewage and other wastes. All of these have played a part in affecting river flows, groundwater and water quality.

1.3 PROCESS

The development of these National Principles has been undertaken jointly by the Agriculture and Resource Management Council of Australia and New Zealand and the Australian and New Zealand Environment and Conservation Council. This document forms part one of a three part report series:

- Part 1. National Principles for the Provision of Water for Ecosystems.
- Part 2. Provision of Water for Ecosystems - Current status in States and Territories.
- Part 3. Provision of Water for Ecosystems - Issues and approaches to implementation.

DEFINITIONS

To ensure a common understanding, the following represent useful definitions of the terms used in this report:

The term **ENVIRONMENT** as used in this document refers to the natural components of aquatic ecosystems, the flora and fauna, and the natural ecological processes that take place between individual plants and animals, their surroundings, and between each other. The maintenance of species biodiversity, community structure and functioning and natural ecological processes are important elements (and indicators) of the maintenance of overall environmental integrity.

WATER DEPENDENT ECOSYSTEMS are those parts of the environment, the species composition and natural ecological processes of which are determined by the permanent or temporary presence of flowing or standing water. The instream areas of rivers, riparian vegetation, springs, wetlands, floodplains and estuaries are all water dependent ecosystems.

ECOLOGICAL VALUES are defined as the natural ecological processes occurring within water-dependent ecosystems and the biodiversity of these systems.

ENVIRONMENTAL WATER REQUIREMENTS are descriptions of the water regimes needed to sustain the ecological values of aquatic ecosystems at a low level of risk. These descriptions are developed through the application of scientific methods and techniques or through the application of local knowledge based on many years of observation.

ENVIRONMENTAL WATER PROVISIONS are that part of environmental water requirements that can be met. Environmental water provisions may refer to:

- unregulated flows in rivers and water in wetlands and aquifers;
- specific volumetric allocations and/or releases from storages;
- water levels maintained in wetlands; and
- water in transit for other users, the pattern of flow of which may be defined to meet an environmental need.

2 GOAL FOR THE PROVISION OF WATER FOR THE ENVIRONMENT

Water plays a fundamental role in all ecosystems. All of Australia's flora and fauna are dependent on water to some extent for survival. Many species are totally dependent on rivers or the flow regimes for either all or part of their life cycles. For these species, water provides habitat, enables their movement or migrations, facilitates chemical processes, delivers or removes nutrients or assists in the dispersal of genetic products including eggs and offspring and the recolonisation of ephemeral habitats. Providing water for the environment is one action that will assist in the protection of natural ecological processes and biodiversity in aquatic ecosystems. Therefore the overall objective for providing water for the environment is as follows:

GOAL *To sustain and where necessary restore ecological processes and biodiversity of water dependent ecosystems.*

The adoption of this goal provides direction on the major aim for which water is to be provided for the environment i.e. the protection of ecological values. It is not intended to address the protection of other values provided by the instream (i.e. in situ) use of water for the community. These include provision of water for hydroelectric power, for navigation, for recreational uses and the improvement of water quality. It should be noted, however, that in many cases, the requirements for these other instream uses of water may be compatible with the primary objective of providing water for the environment. Where they are not compatible, the provision of water for the environment will be directed at the protection of ecological values. The requirements of these other instream uses as well as other consumptive uses will then be considered in the broader review of water allocation to be undertaken by ARMCANZ.

The adoption of this goal also provides some direction as to the level of environmental protection to be offered in allocating water for the environment. The objective is not to return all rivers to a pristine condition but rather to ensure that the needs of the water dependent ecosystems are considered and catered for in water allocation decisions. In general, the aim is to protect and sustain current environmental values. The exception will be those cases where there is a community decision to provide further water for the restoration or enhancement of their aquatic ecosystems.

Given that the major objective of providing water for the environment will be to maintain water dependent ecosystems and not to provide for other instream uses - these National Principles will be known as the National Principles for the Provision of Water for Ecosystems.

3 PRINCIPLES FOR THE PROVISION OF WATER FOR ECOSYSTEMS

The following section presents the principles for allocating water for ecosystems together with the rationale behind each principle. These principles will provide the policy direction for the provision of water for ecosystems in the broader process of water allocation.

The principles address seven major issues related to the provision of water for ecosystems. They are listed below with some of the main discussion points addressed by these National Principles:

1. Basic premise

2. Determining environmental water provision

   - determining the basis for environmental water requirements

3. Provision of water for ecosystems

   - need for legal recognition

   - in relation to existing users

   - in overcommitted systems

4. Management of environmental water allocations
   - accountability of management
   - uncertainty

5. Management of allocations for other uses

6. Further research

7. Community involvement

3.1 BASIC PREMISE OF PRINCIPLES

The introduction of darns, regulating structures and water diversions to improve the availability of water for consumptive uses has altered the flow regimes of rivers and streams. Such operations have caused significant flow deviations away from natural conditions along stream reaches with the inevitable result that instream and wetland processes have been adversely affected. It must be recognised at the outset that provision of water for consumptive uses will have impacts on ecological values. This is the basic premise behind these National Principles.

PRINCIPLE 1	*River regulation and/or consumptive use should be recognised as potentially impacting on ecological values*

3.2 DETERMINING ENVIRONMENTAL WATER PROVISION

Clear, consistent objectives provide a focus for the management activities of those agencies with direct responsibilities for the protection of aquatic ecosystems and those agencies responsible for activities which may impact on ecological values. These management objectives should include the maintenance of ecological values of aquatic ecosystems. The identification of ecological values is then an essential prerequisite to sustainable management. Once ecological values have been identified, then work can be undertaken to determine their environmental water requirements i.e. the water regimes necessary to maintain these values. On this issue, it should be noted that the COAG recommended that environmental water requirements, wherever possible, will be determined on the best scientific infornnation available.

PRINCIPLE 2	*Provision of water for ecosystems should be on the basis of the best scientific information available on the water regimes necessary to sustain the ecological values of water dependent ecosystems.*

3.3 PROVISION OF WATER FOR ECOSYSTEMS

Studies of environmental water requirements will provide information on the water regimes required to sustain ecological values. These studies where available will be used as a basis for the provision of water for ecosystems. However, determining environmental water requirements is only the first step in providing water for ecosystems. The actual provision of water requires the resolution of a number of issues including:

- the process for providing water to the environment;
- the interactions between environmental water provisions and other users;
- reallocation of water in overcommitted systems; and
- protecting the environment in future water allocation decisions.

The following principles provide direction on these points.

3.3.1 Process for providing water for ecosystems

Environmental water has been typically that which remains after all other users in the system have taken their share. Most water law in Australia was enacted to assist the development of water resources for consumptive uses. Where there has been a reference to protection of the environment, it has generally been too vague to guide management decisions. As a consequence, the rights to water of existing consumptive users are provided for in legislation whilst the rights of the environment are less clear.

Water for environmental purposes should be recognised as a legitimate use of water; as legitimate as any other use. In order to ensure full protection of the aquatic environment, environmental water provisions should have formal recognition under law. Recognition should encompass provisions enabling the allocation of water to the environment and/or provisions enabling constraints to be placed on other uses so as to achieve protection of ecological values.

PRINCIPLE 3	*Environmental water provisions should be legally recognised*

3.3.2 Interactions with other users

In providing water for ecosystems, it must be recognised that, in many cases, other users will have some existing legal rights to water. Therefore it may not be possible to meet the full environmental water requirement due to the need to provide water for these other uses of the system. In these cases, provision of water for ecosystems should go as far as possible to meet the environmental water requirements whilst recognising the existing rights of other water users.

PRINCIPLE 4	*In systems where there are existing users, provision of water for ecosystems should go as far as possible to meet the water regime necessary to sustain the ecological values of aquatic ecosystems whilst recognising the existing rights of other water users.*

3.3.3 Overcommitted water allocation situations

In systems where the environmental water provisions do not meet environmental water requirements, it is expected that environmental degradation will occur. These systems should be regarded as overcommitted. Where it is established on the basis of best available scientific knowledge that ecological values are not being sustained, then action should be taken to increase the environmental water provisions. Such action may include mechanisms for reallocation and water conservation. Such action should be undertaken in conjunction with appropriate monitoring to allow evaluation of the effectiveness of the action in achieving the environmental objectives.

PRINCIPLE 5	*Where environmental water requirements cannot be met due to existing uses, action (including reallocation) should be taken to meet environmental needs.*

3.3.4 Protecting the environment in future water allocation decisions

Historically the environment's requirement for water has rarely been considered in water allocation decisions. Water was extracted on the basis of actual or anticipated demand. There is now a growing concern to protect the environment in all future water allocation decisions to ensure that the mistakes of over allocation are not repeated. Therefore, all new developments should ensure that the needs of the environment are met.

PRINCIPLE 6	*Further allocation of water for any use should only be on the basis that natural ecological processes and biodiversity are sustained (i.e. ecological values are sustained).*

3.4 MANAGEMENT OF ENVIRONMENTAL WATER

Once an environmental water provision has been determined it should be managed in the best possible way to ensure ecological processes are maintained or restored. To achieve appropriate management of environmental water allocations, accountability needs to be defined, and be transparent. Monitoring is required to ascertain how adequately the objectives of environmental water provisions are being met, and hence to enable adaptive management to be implemented.

3.4.1 Accountability

Accountability in the management of environmental water provisions is an essential component in achieving community acceptance of the need to set aside water for the environment. Accountability takes on even greater importance where reallocation of water to the environment is proposed. Thus the authority, organisation or individual responsible for managing an environmental water provision, and in particular any environmental water allocations, should be clearly defined and be accountable to both the Government and the community. The authority, organisation or individual will need to establish management objectives for the ecological values to be sustained and clearly specify the way in which environmental water provisions will be managed to protect these. This will allow others in the system to manage their entitlements accordingly.

PRINCIPLE 7 *Accountabilities in all aspects of management of environmental water provisions should be transparent and clearly defined.*

3.4.2 Uncertainty in environmental water provisions

The techniques available for determining environmental water requirements cannot specify an environmental flow or regime that will conclusively ensure the protection of the environment. What the techniques serve to do is highlight the risks to ecological values of pursuing particular flow or watering strategies. In situations where environmental water requirements have been investigated, monitoring programs need to be established to ensure the environmental water provisions are maintaining ecological values. Monitoring programs allow for continuous or periodic review of flow or watering strategies and provide a means for assessing whether or when risks to ecological values are occurring. Where observed environmental impacts are less than anticipated monitoring programs can be scaled down accordingly. Where monitoring indicates that ecological values are at risk, monitoring programs enable immediate remedial action thereby minimising risk of permanent degradation of ecological values.

PRINCIPLE 8 *Environmental water provisions should be responsive to monitoring and improvements in understanding of environmental water requirements.*

3.5 OTHER USES

Water which has been allocated for other uses may contribute to the maintenance of ecological values. Water in transit to other uses may be part of an environmental water provision (without affecting the primary purpose of the allocation) provided the pattern of flow is defined in reference to specified environmental objectives. Operating rules that are sympathetic and account for environmental requirements need to be developed for both new and existing situations and implemented.

PRINCIPLE 9 *All water uses should be managed in a manner which recognises ecological values.*

The impact of other water uses on the environment can be lessened if those uses are as efficient as possible. Ways to encourage the efficient use of water include:

demand management; and

appropriate pricing mechanisms which reflect the true costs of supplying water.

PRINCIPLE 10 *Appropriate demand management and water pricing strategies should be used to assist in sustaining ecological values of water resources.*

3.6 FURTHER RESEARCH

Techniques for estimating environmental water requirements for Australian conditions are limited. Both the environment and potential developers would benefit if more rigorous techniques were available. For example, more water may be available for harvesting or abstraction while still maintaining a low risk of impacts on ecological values. Conversely, the case for maintaining environmental water requirements or for restoring water to the environment would be strengthened if techniques for estimating environmental water requirements were more rigorously substantiated. The need for further research on this issue should be regarded as a priority for water management and this should be recognised in the program and budget of water management agencies.

PRINCIPLE 11 *Strategic and applied research to improve understanding of environmental water requirements is essential.*

3.7 COMMUNITY INVOLVEMENT

Decisions on water allocation may affect many groups and individuals. Groups and individuals which benefit from water supplied from water resource developments have a direct interest in decisions on water allocations. This is especially so where decisions may affect the overall availability of water or the security or reliability of supply, thereby directly impacting on the investment decisions of these groups and individuals. However the broader community, both within and outside a specific catchment, also has interests in decisions on water allocations and any associated costs. Accordingly, all parties with interests in decisions on water allocations (the stakeholders) should be involved in the decision-making processes, particularly where these involve decisions on environmental water provisions. An important prerequisite to involvement and consultation is fully informing and raising awareness within the community.

PRINCIPLE 12 *All relevant environmental, social and economic stakeholders will he involved in water allocation planning and decision-making on environmental water provisions.*

4. FUTURE DIRECTIONS

In the `National Principles for the Provision of Water for Ecosystems', the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) and the Australia and New Zealand Environment and Conservation Council (ANZECC) are seeking to move beyond the rhetoric towards action on the water needs of aquatic ecosystems. The principles developed here will guide the granting and management of environmental water allocations. Implementation of these principles will ensure that the importance of properly functioning aquatic ecosystems is recognised and proper consideration of environmental requirements will be given in decisions on water resource allocations.

`National Principles for the Provision of Water for Ecosystems' constitutes Part I of a three part report series. Reports to follow include:

Part 2.	Provision of Water for Ecosystems - Current status of States and Territories.
Part 3.	Provision of Water for Ecosystems - Possible approaches to implementation.

State and Territory adoption of the principles developed in the report is necessary to achieve sustainability. Part 2 will outline the current legislation and administrative arrangements and Part 3 the possible approaches for implementation.

Appendix 1

The National Principles for the Provision of Water for Ecosystems were developed by a joint ARMCANZ/ANZECC Working Group.

Membership of Working Group comprised:

Mr Noel Ryan (Convenor)	Department of Conservation & Natural Resources, Vic (7/92 -12/93)
Dr Jane Doolan (Convenor)	Department of Natural Resources & Environment, Vic (1/94 - *present)*
Dr Phil Suter	Office of the Environment Protection Authority, SA (7/92 - *present)*
Ms Janine Cullen	Department of Environment, Land & Planning, ACT (12/92 - *present)*
Mr Rod Usback	Department of Environment, Land & Planning, ACT (7/92 - 10/92)
Mr Jeff Kite	Water Authority of Western Australia, WA (7/92 - *present)*
Mr Bob Phillips	Department of Primary Industry & Fisheries, Tas (7/92 - *present)*
Mr Peter Johnston	Department of Primary Industries - Water Resources, Qld (7/92 - *present)*
Dr Penny Knights	Department of Water Resources, NSW (10/92 -*present)*
Dr Jane Chrystal	Environment Protection Authority, NSW (7/92 - *present)*
Mr Ian Smith	Power and Water Authority, NT (4/93 - *present)*
Mr Chris Holland	Commonwealth Department of Primary Industries & Energy (4/93 - *present)*
Mr David Mortimer	Commonwealth Department of Primary Industries & Energy (8/94 - *present)*
Mr David Forsyth	Commonwealth Department of Environment, Sports & Territories *(4/94 - present)*
Mr Paul Bennett (Executive officer)	Department of Conservation & Natural Resources, Vic (7/92 - 4/93)
Ms Shelley Heron (Executive officer)	Department of Natural Resources & Environment, Vic (4/94 - *present)*
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