Strategy for the conservation and management of Queensland's wetlands

QUEENSLAND GOVERNMENT
Environmental Protection Agency

Strategy for the Conservation and Management of Queensland Wetlands.

Bibliography

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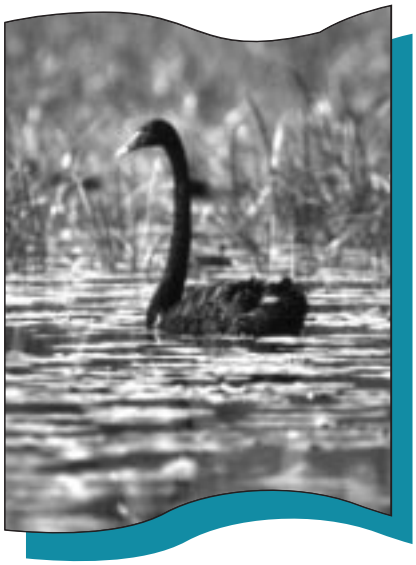


Queensland has the most diverse array of wetlands in Australia.

Introduction

Wetlands are widespread throughout Queensland. Although they are most commonly thought of as occurring only where land and sea join, natural wetlands are located in a range of landscapes. They include lakes, marshes, rivers, and springs. Artificial wetlands have also been constructed throughout the state.

Queensland has the most diverse array of wetlands in Australia. Of the 40 nationally recognised categories, all but one — alpine and tundra wetlands — occur here. Queensland differs from other parts of the world, particularly in the ephemeral nature of many of its freshwater wetlands, due mainly to the state's great climatic variation and seasonal variability. In the short term, droughts and floods have significant effects on wetlands, while in the long term, global warming could cause significant changes.

Wetlands are estimated to cover approximately 4·1 percent of Queensland's mainland area[1], or nearly 71 000sq.km. Coral reefs and areas on or surrounding islands increase that figure. Seasonally and intermittently inundated wetlands account for about 69 percent of the total, while tidal wetlands (mangroves and saline coastal flats) account for another 14 percent. The remaining 17 percent includes numerous types. Only 0·7 percent of Queensland's land area, or about 12 000sq.km, is permanently inundated, including more than 1 125 000km of major waterways. A map of Queensland, indicating the major types and occurrence of wetlands as defined in this Strategy, is provided at Appendix I (centre piece). Large artificial wetlands, or 'impoundments', number more than 250.

Queensland's wetlands support the most diverse freshwater fish fauna of any Australian state, providing essential habitat for the entire life cycle of 130 species. The state's wetlands also support 150 species of waterbirds, both resident and migratory, and more than 3000 species of plants. Many species, such as the Oxleyan pygmy perch, wallum froglet and false water-rat, are rare or threatened. Others, such as the barramundi, are economically valuable.

Because wetlands are an integral part of so many landscapes, many laws can affect them. (See Appendix II.) Legislation is administered by various government agencies, including the Queensland Environmental Protection Agency and the Departments of Health; Local Government and Planning; Mines and Energy; Natural Resources; Primary Industries; and Transport. Some are administered jointly with Commonwealth agencies or local government.

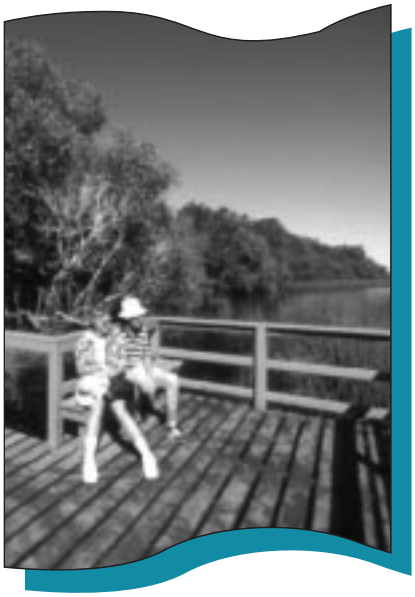
This document

This Strategy sets out:

- the Queensland Government's intent for conservation and management of wetlands,
- implementation methods,
- a definition of wetlands,
- a statement on the values and functions of wetlands,
- the Queensland Government's objectives for wetlands, and
- initiatives to achieve these objectives.

Notes to assist in interpreting sections of the Strategy are presented as 'comments' after each section. A Glossary of major terms in presented at Appendix IV.

[1] *Figures derived from AUSLIG GEODATA 1:250,000 topographical maps, and consequently only significant waterbodies and rivers have been taken into account.*



A co-operative approach is essential for the Strategy's implementation.

Intent

The Queensland Government aims to have wetlands, many of which are of international importance, managed in accordance with the goal, core objectives, and guiding principles set out in the National Strategy for Ecologically Sustainable Development (Commonwealth of Australia, 1992), which incorporates economic, social, and environmental considerations. (See Appendix III for the goal, core objectives, and guiding principles.)

To maintain the values and functions of wetlands for the long-term benefit of Queenslanders, the intent of the Strategy is:

- to provide an integrating framework to guide state agencies responsible for wetlands management, and
- to set out initiatives to encourage and assist landholders to sustainably manage wetlands under their control.

The Strategy aims to overcome threats to wetlands caused by individual decisions made in isolation. However, rather than creating a separate wetland planning and management legislative structure, the Strategy builds on and promotes existing mechanisms, such as regional planning, local planning schemes, industry policies, and whole-property planning.

Important wetland areas occur on private lands and activities on these lands can have a strong influence on downstream or adjacent wetlands. Incentives and education would encourage landholders to adopt sound management practices as part of a whole-of-catchment approach.

The Strategy does not alter existing use rights attached to freehold or leasehold land, or to the State's water resources.

Implementation

A co-operative approach — involving State, Commonwealth and local governments, landholders, the private sector, producer organisations, Aboriginal and Torres Strait Islander people, conservation groups, and other stakeholders — is essential for the Strategy's implementation.

Queensland Government's role

Many wetlands come under direct government control or ownership. The Queensland Government has a responsibility to identify, maintain and manage these wetland systems for the long-term public benefit, recognising national and international obligations.

The Strategy provides a consistent framework to assist in resolving cross-border wetland issues, such as those encountered in the Murray-Darling Basin, Great Artesian Basin, or Lake Eyre Basin.

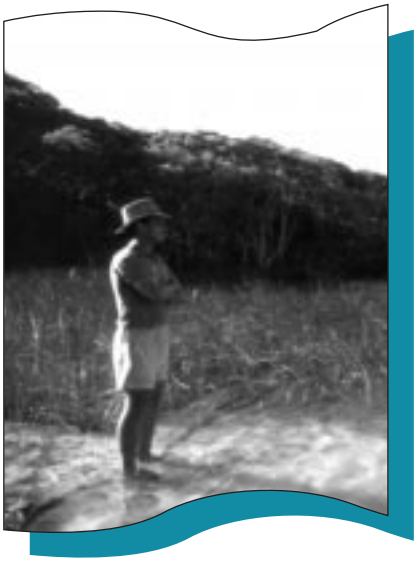
The Strategy's implementation will be carried out by the various Queensland agencies with legislative responsibility for wetland areas. The Environmental Protection Agency is the lead agency for co-ordinating the Strategy's implementation and so also has responsibility for reporting on progress and outcomes. In consultation with other agencies, the Environmental Protection Agency will develop a prioritised implementation plan. Implementation of actions by individual agencies will be a continuing process, dependent on the availability of funds.

Local government's role

Local government, through its responsibilities for many land-use decisions, plays an important part in managing and protecting wetlands. A number of existing legislative powers, notably under the *Local Government Act 1993* and the *Integrated Planning Act 1997*, are administered. Many local governments already acknowledge the value of wetlands and some wetlands have been protected in local government reserves (e.g. Boondall Wetland Reserve administered by Brisbane City Council).

Appreciation of wetlands and the importance of protecting their values can be strengthened by incorporating wetlands management objectives in regional plans, local planning schemes, and local laws, and by including wetlands issues in impact assessment.

Landholders' and other interest groups' roles



The Strategy promotes community-based initiatives and joint government/community programs.

The Queensland Government recognises that most wetlands on leasehold or freehold land are managed by private landholders who produce goods and services in an increasingly competitive market. The additional contribution that these wetlands make to wildlife abundance and health, particularly in times of drought, is substantial and should be recognised.

There are many stakeholders, (e.g. local progress associations, commercial, recreational and indigenous fishers, tourism interests and conservation groups) that are willing to be involved with government in restoring and managing tidal wetlands or those on public lands.

The Strategy promotes community-based initiatives and joint government/community programs (including the Integrated Catchment Management Program, and the Natural Heritage Trust programs Coasts and Clean Seas, National Wetlands Program, Fisheries Action Program and Rivercare), encouraged or rewarded by appropriate incentives, as the most appropriate vehicles for sound wetland management on private lands. Some industries have been pro-active in developing their own best practice guidelines. The Strategy recognises that some industries may benefit from government assistance in formulating and implementing wetlands best practice.

Some of the major wetlands in the State (notably in the Gulf of Carpentaria and Cape York Peninsula) are occupied and managed by Aboriginal and Torres Strait Islander peoples. Native title rights and interests may continue to exist over these and other wetland areas.

The involvement and participation of all non-government interests will ensure the successful implementation of this Strategy.

Artificial wetlands

Artificial wetlands, such as dams, weirs, bore drains, ponded pastures, tailings dams, and sewage treatment facilities, provide substantial economic, social and ecological benefits for the community. With careful planning and management, many wetland functions can be created and maintained in these areas.

In applying this Strategy to artificial wetlands, priority is given to the primary purpose for which the wetland was created. In some cases (e.g. mine tailings dams), this purpose is environmental protection through the containment of harmful materials and other uses are not practical. However, the Strategy promotes management for ancillary ecological and other values wherever possible.

For example, water storages have been built throughout Queensland for various purposes, including the supply of water for irrigation, mining and industrial purposes, and drinking water. These storages can be managed for their primary productive purpose while providing habitat and recreation values. Similarly, other artificial wetland areas also benefit some wetland species.

Land-use planning and environmental impact assessment are regularly used as tools to assess and minimise the damage that may result from constructing artificial wetlands.

Definition

The definition adopted in this Strategy is based on that set out in the *Convention on Wetlands of International Importance* (Ramsar, Iran, 1971), sometimes called the 'Ramsar Convention on Wetlands'. Currently over 100 countries — including Australia — are signatories.

For the purpose of this Strategy, wetlands are defined as:

areas of permanent or periodic/ intermittent inundation, whether natural or artificial, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6m.

Comment

The Ramsar Convention on Wetlands adopted a broad definition to meet the needs of the international community. It has been recognised that there is no single definition for wetlands due to their diversity and the difficulty in establishing boundaries particularly for seasonal wetlands, and that there are different reasons or needs for a definition. The Ramsar definition has been acknowledged in the *Wetlands Policy of the Commonwealth Government of Australia* and other State wetlands policies. Various qualifications have been placed on the Ramsar definition in these policies to tailor it to the coverage of the policy and ensure its relevance to their conditions.

Similarly, minor changes have been made to the Ramsar definition to reflect the special features of Queensland's wetlands and to ensure that the definition is tailored to and meaningful to the Queensland community. Though the Ramsar definition refers to 'fens, peatlands and marshes' these terms are not commonly used in Queensland. The term 'temporary' which is used in the Ramsar definition is interpreted in the Queensland context as including 'periodic or intermittent' wetlands, to reflect cyclical inundation (e.g. tidal changes) and ephemeral wetlands formed as a consequence of Queensland's variable rainfall patterns.

Typically, wetlands include areas which show evidence of adaptation of soil or vegetation to periodic waterlogging — lakes, swamps, freshwater or brackish marshes, *Melaleuca* forests, lignum swamps, canegrass swamps, wooded swamps, claypans, ponded pastures and water storage dams; estuaries, rivers, streams, channels, waterholes and springs; intertidal sand flats, mud flats, salt flats, tidal marshes and mangroves; and shallow marine areas such as seagrass beds or fringing coral reefs.

Though entire floodplains could be interpreted as 'intermittent wetlands', this is not the definition's intention. Rather, intermittent wetlands — such as marshes, pot-holes, or shrub- or tree-dominated areas showing evidence of adaptation of soil to, or vegetation tolerant of, waterlogging — may occur as part of a mosaic of vegetation types on floodplains.

While management requirements for artificial and natural wetlands are different, they may have common values, such as flood mitigation, groundwater recharge, support of domestic and native animals, nutrient stripping, and water supply for domestic, industrial and agricultural use. Hydrological systems are interconnected and the natural values of one section will be dependent on the good management of many others.

Major wetlands defined in the Strategy are shown on the map at Appendix 1(centre piece). Though there are extensive floodplains associated with some of Queensland's major rivers, small, intermittent floodplain wetlands are difficult to depict graphically on small scale maps and consequently are not shown here. Similarly, due to the scale of the map, the depiction of mangroves and saline coastal flats does not represent the full extent of these habitats.

Values and functions

The Queensland Government recognises that wetlands:

- play a key role in supporting the diversity and abundance of plants and animals, and provide important habitat and refuges for many migratory, rare, or threatened species;
- are an essential part of natural hydrological cycles, provide water passage and storage, and may contribute to flood mitigation and the recharge of aquifers ;
- purify water by stripping nutrients and intercepting sediments;
- provide coastal protection against destructive natural events, such as cyclones;
- make a significant contribution to the economic productivity of the State by providing essential water sources for agricultural, urban and industrial uses, vital breeding, nursery and harvest sites for edible fish, molluscs and crustaceans, broodstock for aquaculture, and areas of pasture for stock;
- are used for navigation and port facilities essential for trade;
- feature significantly in the cultural heritage, spiritual values, and day-to-day living of Aboriginal and Torres Strait Islander peoples;
- contribute to the well-being of people through landscape diversity, heritage values, and aesthetic appeal; and
- feature strongly in the Queensland's tourism and recreational appeal

Comment

This section sets out the benefits of wetlands. The listed values are not arranged in order of importance.

Objectives	*Comment*
The Queensland Government's objectives for wetlands are:	These objectives provide a framework for a range of wetlands initiatives.
1 Avoid further loss or degradation of natural wetlands, unless overriding public interest can be shown.	**Objective 1:** In this objective, 'overriding public interest' should be interpreted as applying where the long-term social benefits of any modification outweigh the loss of natural wetland benefits, and no other site is available. Determining the existence of 'overriding public interest' is best achieved through a land-use planning framework and an appropriate impact assessment process. Important examples of 'overriding public interest' include port facilities for which modification of the surrounding area is necessary for the safety of navigation and trade; and dams or weirs where further water supplies are required after water conservation measures have been adopted. The impacts of such uses may be mitigated through appropriate design and management. The role of wetlands in the life cycles of disease-carrying mosquitoes and other nuisance insects is a prominent consideration in determining 'overriding public interest'. Strategies for limiting the spread of disease, including vector control, should take into account the need to minimise adverse ecological impacts.
2 Ensure a comprehensive and adequate representation of wetlands in the conservation reserve system.	**Objective 2:** A specific objective (Objective 1.4) of the National Strategy for Biodiversity is 'to establish and manage a comprehensive, adequate and representative system of protected areas'. This necessarily includes a specific focus on wetlands which are currently inadequately represented in Queensland conservation reserves.
3 Base the management and use of natural wetlands on ecologically sustainable management and integrated catchment management practices.	**Objective 3:** Individual wetlands are part of larger hydrological and ecological systems. Commercial users of wetlands should take this into account in their management practices.
4 Develop community awareness of, and respect for, the values and benefits of wetlands, and involvement in their management.	**Objective 4:** Education and community and industry involvement is essential in attaining high standards of management of any resource. A balanced approach to wetlands use should continue to be developed. Increased recognition by landholders, managers, and visitors of the long-term benefits of maintaining healthy wetlands is a primary goal of any education program.

Initiatives for implementation

Objective 1—
Avoid the further loss or degradation of natural wetlands unless overriding public interest can be shown.

To achieve objective 1:	*Comment*
1.1 Develop a wetlands evaluation process with statewide applicability, including assessment of ecological, social, cultural, and economic values in a local, regional, national and international context.	**1.1** International guidelines for evaluation have been developed as part of implementing the Convention on Wetlands. Related evaluation criteria have also been developed by the Environmental Protection Agency and the Department of Natural Resources. Evaluation should be the basis for establishing management and funding priorities.
1.2 Carry out and/or support research to clarify taxonomy and distribution of wetland-dependent species, ecological roles and requirements of species, and the influence of water chemistry, hydrology, and microbiology on wetlands ecosystems.	**1.2** Organisations such as CSIRO, the Queensland Museum, universities, and co-operative research centres are already researching many of these issues.
1.3 Document Queensland's wetlands so that planning and management decisions concerning wetlands are based on the best available knowledge.	**1.3** State and local governments have recognised that it is essential to carry out accurate large-scale mapping of Queensland's wetlands. The Environmental Protection Agency is documenting the state's natural wetlands as part of an Australia-wide Commonwealth/State funded program. The Department of Natural Resources has information on major impoundments, and the Fisheries Group of the Department of Primary Industries, has documented many coastal wetlands. However, this information is not yet available for the whole state.
1.4 Develop criteria (including ecological and hydrological criteria) to assess the impact of development applications where these are likely to affect wetlands.	**1.4** Information on hydrological and ecological functioning and the vulnerability of various types of wetlands to changing landuse would be useful in developing such assessment criteria.
1.5 Periodically review and report on the condition of Queensland's wetlands through comparative inventories and monitoring on a catchment or regional basis, to prioritise actions for achieving this strategy's objectives.	**1.5** Monitoring programs are in place in some areas (e.g. state streamflow, groundwater, and water quality monitoring network, Waterwatch, and Murray-Darling Basin studies). The challenge will be to ensure the quality of data collected by such programs meets established standards. Only then can meaningful comparisons be made. State of the Environment reporting may be a suitable framework for this. A Queensland Government steering committee for water quality monitoring has been established.
1.6 Undertake and/or encourage research aimed at developing soundly based and cost-effective wetland conservation, management and rehabilitation.	**1.6** Some research has already occurred. However, further effort is required to address the needs of all wetland classes across Queensland, including research into the needs of groundwater-dependent wetlands.
1.7 Consult with local communities regarding wetlands heritage values and management.	**1.7** Local knowledge of changes in landscape, land management, and use of wetlands is invaluable in ensuring ecologically sustainable management. Documenting heritage values can deepen a community's sense of stewardship for local wetlands. Community consultation is an essential component of planning and assessment processes.
1.8 Consult with Aboriginal and Torres Strait Islander peoples regarding cultural and spiritual values and traditional uses of wetlands.	**1.8** Aboriginal and Torres Strait Islander peoples maintain close connections with, and interests in, wetland areas in many parts of Queensland.
1.9 Promote community involvement in documenting wetland habitat and wetland-dependent wildlife, and in maintaining wetland values on public and private land.	**1.9** The NatureSearch database coordinated by the Environmental Protection Agency has been very useful for local governments, consultants and Queensland Government agencies. In addition, the Integrated Catchment Management Program offers a process to help identify wetland values at a local or catchment level.

1.10 Ensure consultation, co-ordination and co-operation between government agencies to avoid decisions made in isolation.	**1.10** Decisions made in isolation are perceived to be the single largest threat to wetlands. Many State, local and Commonwealth agencies and authorities have roles in wetlands management, and a co-ordinated approach is required. This Strategy will pursue a co-ordinated approach by all agencies.
1.11 Develop and implement management programs, including feral animal, weed and eutrophication control, for significant natural wetlands under Queensland Government control, in consultation with the community, including Aboriginal and Torres Strait Islander peoples.	**1.11** Appropriate management ensures as area's integrity is sustained in the long term. The involvement and participation of non-government interests can lead to more effective management of the wetlands. Community consultation on management plans is required under the *Nature Conservation Act 1992*. Regional coastal management plans under the *Coastal Protection and Management Act 1995* are required to take coastal wetlands into account.
1.12 Manage all natural wetland habitats under Queensland Government control so that rare or threatened wildlife which depend on them have optimum conditions for continued survival.	**1.12** Where rare or threatened wildlife depends on specific wetlands, these areas should receive priority in management strategies and plans.
1.13 Encourage and assist local government to conserve and protect natural wetlands through the planning and development assessment process.	**1.13** Data on wetlands and areas of high conservation value should inform local government planning schemes and the assessment of development applications. When State and local agencies assess development applications, they should explore development alternatives and consider all impacts, including downstream effects.
1.14 Encourage local governments, water boards, and other water management bodies to develop and implement management plans for wetlands under their control, in consultation with the community.	**1.14** Many local governments are developing plans in consultation with the public (e.g. Brisbane City Council for the Boondall Wetland Reserve), because community participation can lead to more effective management of the wetlands. While water boards must manage wetlands (e.g. impoundments) for the primary purpose of water supply, community consultation might assist in a greater range of uses or better public understanding and acceptance of why access may be restricted. Planning within a regional context is also important, in order to prioritise and integrate conservation needs of wetlands with regional conservation strategies. Water Management Plans (WMPs) and Water Allocation and Management Plans (WAMPs) provide a framework for managing water use at the catchment level.
1.15 Adopt guidelines and methods to ensure that development and management of water infrastructure is undertaken in accordance with the principles of ecologically sustainable development and management.	**1.15** Major water infrastructure projects involve complex ecological and engineering issues. The planning stages of these projects must include a consideration of environmental impacts.
1.16 Develop guidelines and methods for ecologically safe control of vectors with an aquatic stage in their life cycle, and ensure co-operation and co-ordination between State and local government to minimise exposure of human populations to vectors.	**1.16** The maintenance of healthy wetland ecosystems may sometimes compete with the objective of effective mosquito and biting midge control. Alternative methods of disease control can reduce the need to use traditional insecticides. Laboratory studies sponsored by the Local Authorities Research Committee have shown that some available products have no detrimental effect on a range of non-target wetland species. Some local government agencies have developed guidelines for vector control based on ecologically sustainable principles. However, continued research is essential and guidelines which could be adopted by local governments across Queensland need to be developed.
1.17 Encourage restoration and rehabilitation of degraded natural wetlands.	**1.17** Wetland rehabilitation is an important component of efforts to maintain and restore ecological processes and functions within a catchment.

Objective 2 —
Ensure a comprehensive and adequate representation of wetlands in the conservation reserve system.

To achieve objective 2 —	*Comment*
2.1 Ensure representation of all natural wetlands ecosystem types in reserves large enough to protect their biodiversity, and nominate internationally outstanding sites for listing under the Convention on Wetlands.	**2.1** This initiative is directly addressed by the Environmental Protection Agency through the protected area estate; the Department of Primary Industries, through their Fish Habitat Area reserve system; and local governments through the reserves they control or administer. Wetlands can also be included in Control Districts under the *Coastal Protection and Management Act 1995* or in marine parks under the *Marine Parks Act 1982*. Where larger reserves are not practical, small interconnected reserves protecting genetic diversity should be considered.
2.2 Develop and implement management programs, including feral animal, weed and eutrophication control, for wetland conservation reserves under Queensland Government control, in consultation with the community, including Aboriginal and Torres Strait Islander peoples.	**2.2** Appropriate management ensures an area's integrity is sustained in the long term. Community consultation on management plans is required under the *Nature Conservation Act 1992*. Regional coastal management plans under the *Coastal Protection and Management Act 1995* are required to take coastal wetlands into account.

Objective 3 —
Base the management and use of natural wetlands on ecologically sustainable management and integrated catchment management practices.

To achieve objective 3 —	*Comment*
3.1 Manage water allocations to ensure that the quality, quantity, timing, and duration of water-flows through wetlands are appropriate to maintain the natural values and functions identified in catchment-based water allocation and management planning processes.	**3.1** When considering ground and surface water allocation to agriculture and industrial and urban use, maintenance of environmental requirements should be a major consideration. Water Management Plans and Water Allocation and Management Plans should be progressively developed for priority catchments.
3.2 Work with industry to ensure wetlands established for agricultural, pastoral, recreational, industrial, or water supply purposes do not jeopardise the long-term sustainability of natural wetlands and adjacent ecosystems.	**3.2** Artificial wetlands, such as ponded pastures, water supply dams and recreational lakes, can impact on natural wetland ecosystems if not carefully designed and managed.
3.3 Strictly limit the release of damaging substances or species into natural wetlands.	**3.3** Release of substances or non-indigenous species into artificial wetlands built for purposes such as sewage polishing, collecting mine tailings, and ponded pastures may be appropriate for those wetlands. However, the escape of such substances or species into natural wetlands must be avoided. Legislation — such as the *Fisheries Act 1994* and the *Environmental Protection Act 1994* (under which the *Environmental Protection (Water) Policy 1997* has been prepared) — deals with such releases. Weed and feral pest control should also be undertaken, consistent with restoring the integrity of a wetland.
3.4 Manage the use, where permitted, of wetland plants and animals to ensure harvests are ecologically sustainable in the long term, and the ecosystems from which they are derived are not irreversibly damaged.	**3.4** Statutory controls exist over the use of some plants and animals (e.g. protected wildlife under the *Nature Conservation Act 1992*). Where no such statutory controls exist (e.g. 'as-of-right' landuse for agricultural or pastoral pursuits), best practice guidelines should be adopted to avoid unsustainable use.
3.5 Extend the integrated catchment management process to all Queensland catchments.	**3.5** Integrated catchment management is a soundly based process with broad community acceptance. A broad perspective representing all interests is required.
3.6 Support the voluntary incorporation of wetland conservation measures in property management plans developed under the 'Future Profit Program'.	**3.6** Voluntary property management planning encouraged by the Queensland Government's 'Future Profit Program' provides opportunities to incorporate wetlands conservation into farm management. Provision should be made for public recognition of private wetlands management achievements where the landholder agrees to this.

Objective 4 —
Develop community awareness of, and respect for, the values and benefits of wetlands, and involvement in their management.

To achieve objective 4 —	*Comment*
4.1 Encourage preparation and dissemination of a range of educational material and activities programs for wetlands managers, schools, tertiary institutions, industry, and community groups.	**4.1** A well-researched educational component in the school curriculum has long-term benefits. Some of the Department of Education's Environmental Education Centres (e.g. at Nudgee Beach and Jacobs Well) are located near wetlands and offer programs relating to wetlands for school children. Soundly researched factual material should also be developed for adult audiences. Many educational materials already exist and co-ordination and exchange of materials will facilitate this initiative. The Convention on Wetlands recommends that contracting parties develop and promote wetlands training programs for wetlands managers. Wetlands managers should be encouraged to attend seminars or workshops as part of their training, and circulate information in their organisations, and through other organisations such as Catchment Management and Landcare groups.
4.2 Encourage the establishment and operation of strategically located wetlands interpretation and education centres.	**4.2** Wetlands interpretive centres or areas can be very effective in promoting the values of wetlands. The Boondall Wetlands Centre was established specifically for this purpose. Many national parks have interpretation programs, and areas around Queensland (including Cairns, Cardwell, Hinchinbrook, Townsville, Boondall, and Wynnum) have boardwalks or viewing platforms in wetlands.
4.3 Investigate opportunities for encouraging recreational and tourist use and enjoyment of public natural wetlands by providing minimum-impact access and interpretive facilities in appropriate locations.	**4.3** Further promotional opportunities for public wetlands need to be explored and developed. The Queensland Ecotourism Strategy encourages ecotourism across a broad range of tenures. However, any ecotourism venture must ensure a positive net gain for wetland conservation. Landholders should be encouraged to consider appropriate ecotourism activities on wetlands in private ownership.
4.4 Ensure that tourist and recreational access to, and use of, public wetlands — where provided — does not detract from other wetland values, or inappropriately disturb wetland-dependent wildlife.	**4.4** Developing appropriate management plans and facilities before providing access would address this issue. Seasonal closures may be needed to minimise impacts on wildlife.
4.5 Encourage individuals to take personal responsibility for avoiding health risks associated with vectors that have an aquatic stage in their life cycle.	**4.5** Current methods of publicly funded mosquito control can never totally remove the need to take personal responsibility for disease prevention. Information is available from local authorities on ways to minimise risks from disease carried by vectors, including insect screens for homes, and use of insect repellent.
4.6 Encourage community awareness and monitoring of wetlands and associated wildlife through programs, such as the Integrated Catchment Management Program, Coasts and Clean Seas, Fisheries Action Program, Waterwatch, and Waterwise, and promote community involvement in managing local wetlands.	**4.6** Inclusion of wetland components in community projects helps people to understand the many values of wetlands and creates a sense of ownership and responsibility. Some local communities are actively involved in managing and rehabilitating local wetlands.

4.7 Compile a list of sources of information and technical products (e.g. leaflets, manuals, and videos) concerning wetlands management, conservation, creation and restoration, and make this available to planners, managers, advisers, private landholders, and other interested people.	**4.7** Adult educational materials, particularly for wetlands managers, can sometimes be difficult to locate. The Commonwealth Department of the Environment is currently compiling a resource library that State Governments can access. As information is received, it could be circulated to wetlands managers, or its availability advertised via electronic media, including existing services such as LGAQNet. Tertiary institutions and some Queensland Government departments and conservation groups also provide information or tuition.
4.8 Ensure natural resource management and conservation grant programs — including those provided through the Natural Heritage Trust — include wetland conservation in their objectives.	**4.8** Privately owned and managed wetlands play a substantial role as wildlife habitat, particularly as drought refuges. Community wetlands initiatives can be supported under the national programs mentioned. Recognition of community efforts by appropriate rewards or incentives should be considered. Opportunities exist under the *Nature Conservation Act 1992* for landholders to enter into voluntary conservation agreements with the State Government to protect areas of significant value on private land.

Appendix II —

Major legislation or agreements applicable to wetlands

State legislation

Environmental Protection Agency

Canals Act 1958
Coastal Protection and Management Act 1995
Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987
Environmental Protection Act 1994
Environmental Protection (Water) Policy 1997
Marine Parks Act 1982
Nature Conservation Act 1992
Transport Infrastructure Act 1994
(as it relates to approvals under the *Harbours Act 1955*)

Department of Primary Industries

Agricultural Chemicals Distribution Control Act 1966
Chemical Usage (Agricultural and Veterinary) Control Act 1988
Fisheries Act 1994

Department of Communication, Information, Local Government and Planning

Local Government Act 1993
Integrated Planning Act 1997

Department of Health

Health Act 1937
Health Regulation 1996 — Part 8
Health Regulation 1996 — Part 10

Department of Natural Resources

Aboriginal Land Act 1991
Land Act 1994
River Improvement Trust Act 1940
Rural Lands Protection Act 1985
Torres Strait Islander Land Act 1991
Water Resources Act 1989

Department of the Premier and Cabinet

Native Title (Queensland) Act 1993

Department of Transport

Transport Infrastructure Act 1994
Transport Planning and Co-ordination Act 1994
Transport Operations (Marine Safety) Act 1994
Transport Operations (Marine Pollution) Act 1995

Department of Mines and Energy

Mineral Resources Act 1989

Commonwealth legislation

Great Barrier Reef Marine Park Act 1975
World Heritage Properties Conservation Act 1983
Australian Heritage Commission Act 1975
Endangered Species Protection Act 1992
Environmental Protection (Impact of Proposals) Act 1975
Native Title Act 1993

Intergovernmental agreements relating to wetlands

International

Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds in Danger of Extinction and their Environment (1976) (CAMBA)

Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (1974) (JAMBA)

Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, 1971)

Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979)

Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972)

Convention on Biological Diversity (1992)

National

Intergovernmental Agreement on the Environment 1992

National Strategy for Ecologically Sustainable Development 1992

National Water Quality Management Strategy 1992

National Principles for the Provision of Water for Ecosystems 1996

National Strategy for Ecologically Sustainable Development

Ecologically sustainable development (ESD) is defined as:
using, conserving and enhancing the community's resources so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.

The goal of ESD is:
development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

The core objectives are:

- to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- to provide for equity within and between generations;
- to protect biological diversity and maintain essential ecological processes and life-support systems.

The guiding principles are:

- decision-making processes should effectively integrate both long- and short-term economic, environmental, social and equity considerations;
- where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- the global dimension of environmental impacts of actions and policies should be recognised and considered;
- the need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised;
- the need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised;
- cost-effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms;
- decisions and actions should provide for broad community involvement on issues which affect them.

These guiding principles and core objectives need to be considered as a package. No objective or principle should predominate over the others. A balanced approach is required that takes into account all these objectives and principles to pursue the goal of ESD.

From: National Strategy for Ecologically Sustainable Development, December 1992, Commonwealth of Australia.

Appendix IV —

Glossary

artificial wetland: wetlands made by human skill or labour.

Bonn Convention: The Convention on the Conservation of Migratory Species of Wild Animals (or Bonn Convention, after its place of adoption in Germany in 1979) is an international treaty which aims to secure the effective conservation of species of animals which undergo cyclic migration across international boundaries. Australia became a party to the Convention in 1991. Species found in Queensland and listed under this Convention include turtles, dugong and numerous migratory shorebirds.

Convention on Wetlands: The Convention on Wetlands of International Importance especially as Waterfowl Habitat (or Ramsar Convention, from its place of adoption in Iran) is an intergovernmental treaty to promote the wise use and protection of wetlands throughout the world. The Ramsar Bureau in Switzerland is closely linked to the International Union for the Conservation of Nature and Natural Resources (IUCN).

degrade: to lower in character or quality or reduce from a higher to a lower rank; hence degradation: the act of degrading or the state of being degraded.

ecologically sustainable development: see Appendix III.

ecologically sustainable management: management and use of natural resources which is ecologically sustainable, using to guide decision-making, the goal, core objectives and guiding principles of ecologically sustainable development (see Appendix III).

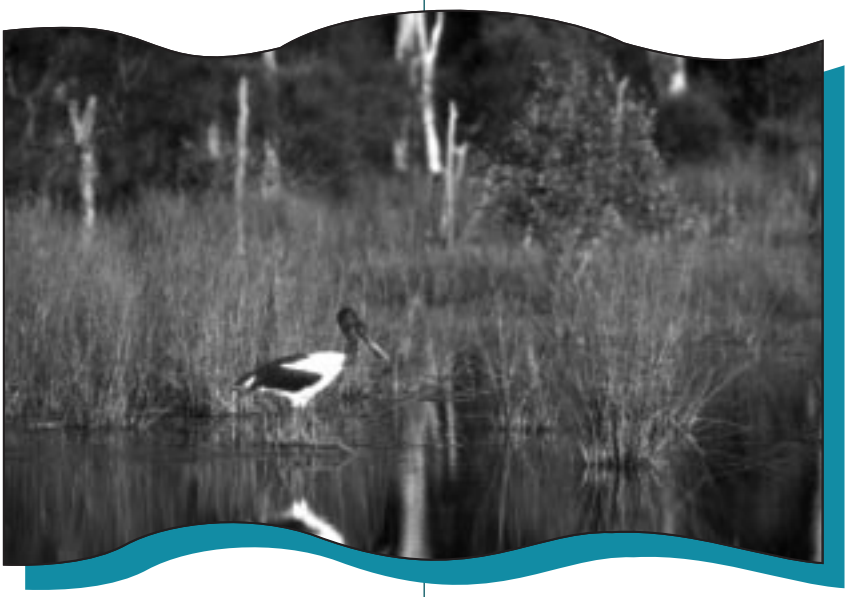
environmental water: the goal in providing water for the environment is to sustain and, where necessary, restore ecological processes and biodiversity of water-dependent ecosystems. Environmental flows refer to the release or passage of such water along or through wetlands.

integrated catchment management: a community-based approach to managing natural resources, which focuses on developing strategies to achieve the integrated management of land, water, and related biological resources within a river catchment.

natural wetland: wetlands existing in or formed by natural processes.

ponded pastures: permanent pasture systems where water is impounded by banks, and adapted grasses (generally of exotic origin) are grown in the water to produce green fodder when the water dries off.

vector: an insect or other organism transmitting agents of disease.



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