

Australia's Internationally Important Wetlands – Managing Change

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Wetlands have an important function in Australia's environment and often support high biodiversity. Wetlands protect our shoreline from wave action, mitigate the impacts of floods, absorb pollutants and provide habitats for animals and plants, including a number of species that are threatened or endangered.

The social and cultural values of wetlands to Australian people are long established. They purify our water and are a focal point for recreational activities. Wetlands also provide tangible benefits to the Australian economy, such as employment opportunities. They form nurseries for fish and other freshwater and marine life and as such are of critical importance to Australia's commercial and recreational fishing industries. In some areas, wetlands support grazing, forestry and cropping.

Despite a growing understanding of their many values and functions, wetlands remain one of our most threatened resources. Since European settlement, the condition and extent of many wetlands have decreased substantially. Many wetlands have experienced significant decreases in area due to isolation from floodplains, reduced flows and flooding associated with river regulation and water extraction for irrigated agriculture, increased salinity from groundwater inflows and higher in-stream salinities, drainage modifications, grazing and reclamation, rapid urban development and the introduction and spread of exotic species. There is now increasing awareness of threats to water resources linked to climate change.

This paper describes the context for wetlands protection work being undertaken by the Australian Government in cooperation with the Australian State and Territory governments. It details the development of a framework for describing the ecological character of wetlands – a key basis for identifying and preventing adverse **change** to Australia's important wetlands.

Wetlands protection in Australia

One important way that Australia seeks to protect its valuable wetlands is through participation in the Convention on Wetlands (Ramsar Convention) – an international intergovernmental treaty for the protection and wise use of wetlands and their resources. Australia is one of 150 contracting parties to the Convention and 64 of the 1591 wetlands designated worldwide are in Australia.

Under the Ramsar Convention Contracting Parties are required to designate at least one wetland to the List of Wetlands of International Importance (Ramsar Convention 1987). Article 3.2 of the Ramsar Convention requires that “each Contracting Party shall arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the list **has changed, is changing or is likely to change.**”

Australia implements its obligations under the Ramsar Convention through the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the *Environment Protection and Biodiversity Conservation Regulations 2000* and national, state and territory wetland policies and natural resource management programmes.

The EPBC Act identifies Ramsar sites as matters of national environmental significance and provides the legal framework for the listing, protection and management of Ramsar wetlands and for ensuring that ‘ecological character’ of all Australian Ramsar sites is retained. Section 16 (1) states:

A person must not take an action that:

- (a) has or will have a significant impact on the ecological character of a declared Ramsar wetland; or*
- (b) is likely to have a significant impact on the ecological character of a declared Ramsar wetland.*

Wetlands, including Ramsar wetlands, have come into focus in recent years with drought, increased water extraction and inappropriate management practices resulting in the death of River Red Gums along the River Murray, failed bird breeding and reduction in total bird numbers at the Macquarie Marshes and Gwydir Wetlands, and the clearing by a landholder of part of the Gwydir Ramsar wetland to name a few issues. Along with wetland condition decline, other important issues include Ramsar site boundary definition, tenure and the capacity of site managers to maintain the ecological character of their sites.

The Australian Government in cooperation with the Australian state and territory governments is currently working on a strategic national approach to Ramsar nomination, listing and management. This incorporates the development of detailed guidance on mapping specifications, management planning, describing ecological character, defining change in ecological character and monitoring for change in ecological character. The aim of this work is to underpin effective implementation of the EPBC Act and to help

Ramsar site managers to improve the management of Ramsar wetlands in Australia.

Given the emphasis on **ecological character change** within the Ramsar Convention and the EPBC Act the work on describing ecological character and change in ecological character is extremely important. This paper focuses on the development of guidance on describing ecological character.

What is Ecological character?

The Ramsar Convention definition of ecological character recognises that wetlands are complex systems. The definition emphasises the links between the ecological components, their processes or interactions and the benefits or services they support.

The definitions of ecological character and associated terms are outlined below:

Ecological character is the combination of the ecosystem components, processes and benefits/services that characterise the wetland at a given point in time¹ (Ramsar Convention 2005, Resolution IX.1 Annex A).

Ecosystem components include the physical, chemical and biological parts of a wetland (from large scale to very small scale e.g. habitat, species and genes) (Millennium Ecosystem Assessment 2005)

Ecosystem processes are the changes or reactions which occur naturally within wetland systems. They may be physical, chemical or biological. (Ramsar Convention 2002, Resolution VI.1 Annex A)

Benefits/services are defined in accordance with the Millennium Ecosystem Assessment definition of ecosystem services as "the benefits that people receive from ecosystems (Ramsar Convention 2005, Resolution IX.1 Annex A).

Change in ecological character is defined as the human-induced adverse alteration of any ecosystem component, process, and/or ecosystem benefit/service (Ramsar Convention 2005, Resolution IX.1 Annex A).

A framework for describing ecological character – a benchmark for identifying change

While there has been a focus on describing ecological character in the Ramsar Information Sheets (RIS) which are required by the Ramsar Bureau before a site can be listed (Ramsar Convention, Res vi.1), it has been found

¹ The phrase "at a given point in time" refers to Resolution VI.1 paragraph 2.1, which states that "It is essential that the ecological character of a site be described by the Contracting Party concerned **at the time of designation for the Ramsar List**, by completion of the Information Sheet on Ramsar Wetlands (as adopted by Recommendation IV.7)

that the level of information in these documents is not sufficiently detailed to adequately understand ecological character change.

The publication of a pilot *Framework for describing the Ecological Character of Ramsar Wetlands* in 2005, by the Victorian Department of Sustainability and Environment (DSE 2005) in collaboration with the Australian Government and other State and Territory jurisdictions, went a long way towards redressing this deficiency. It was agreed that, following application of the framework to a number of wetlands across Australia, the effectiveness of the framework should be assessed.

The framework was peer reviewed with reference to existing ecological character descriptions and other approaches to describing ecological character (Davis and Sim 2006; Sorrell 2006). The reviewers suggested a number of changes to improve the DSE framework. This work was presented at a national workshop which sought to determine the key elements required in an ecological character description and to progress the development of a nationally agreed framework for describing the ecological character of Australia's Ramsar listed wetlands that could also be applied to other wetlands.

After the peer review and workshop, it was agreed that the DSE framework should be revised to address some of the issues raised in the reviews and the workshop. The revised framework, once finalised, will be agreed to at a national level and will be a standardised approach to describing the ecological character of Ramsar wetlands in Australia. It will also be applicable to other wetlands, in particular those nationally important wetlands listed in the Directory of Important Wetlands in Australia (DIWA).

The revised framework is a work in progress and will build on the existing DSE framework. The revision is being undertaken as a project of the Wetlands and Waterbirds Taskforce, a body comprising members of the Australian Government (Chair) and Australian State and Territory government agencies with responsibility for wetlands management. The Taskforce reports through a structure of committees to the Australian Natural Resource Management Ministerial Council.

The preferred approach focuses on describing the ecosystem components, processes and services of the wetland and the relationship between them. The approach also emphasises the ecologically significant thresholds of change. The rationale for this approach is as follows.

In order to assess change in ecological character at a Ramsar site, a description is required that establishes quantitative benchmarks. Managers also need to know the range of variation for ecosystem services and their related components and processes that can occur without the ecological character changing. This information can then be used to identify indicators for monitoring and set targets for management. However, resources are often insufficient to undertake the level of research and data collection required to underpin a *comprehensive* description of ecological character of this quality.

Therefore, for practical reasons, it will usually be necessary to take a strategic approach and limit the components and processes described (DSE 2005).

The framework emphasises the importance of quantifying the ecosystem services and the components and processes used in the ecological character description. In practice, very little quantitative information on ecological processes is likely to be available compared to that for components. It is expected that the information on ecosystem services and ecological components will generally make up the ecological character description (DSE 2005).

The work undertaken to date suggests that the following elements could comprise an adequate ecological character description:

- **Executive Summary:** a plain English summary that synthesises the ecological character of the site to ensure that it can be understood by all potential users of the description not just those with technical expertise on wetlands. The executive summary should set the scene for the ecological character description; summarise the data collected; summarise the most important components, processes and services/benefits and the limits of ecological change; include the conceptual model for the site; and summarise the threats/risks to the ecological character of the wetland.
- **Acknowledgements:** a description or list of the people and organisations involved in developing or contributing to the ecological character description.
- **Table of Contents:** a clear table of contents to help users find their way around the ecological character description
- **Introductory details of the site:** this section should provide introductory details about the site and the preparation of the ecological character description for example, the name and location of the site; date the site was listed; date the ecological character description was made; name of the compiler; references to the Ramsar Information Sheet and management plans; and the name of the management authority responsible for managing the wetland.
- **Statement of purpose of the ecological character description:** The statement of purpose should clearly explain the intended legal status and role of the ecological character description. This will assist readers of the description and ensure the author(s) of the descriptions are clear about what they are trying to achieve.
- **Overview of the site:** This section should provide an overview of the site to set the scene and provide context to the description of the site. It should include information on the Ramsar Criteria; wetland type; maps, images and photographs of the wetland; and any other general information about the site.
- **A conceptual model of the wetland:** Include a conceptual model for the site that identifies the major components, processes, services, threats and risks to the site.

- **The components, processes and services/benefits of the site:** This should describe the key components, processes and services/benefits that most strongly influence or determine the ecological character of the site. The key components, processes and services/benefits that support the Ramsar or DIWA criteria should be identified.
- **Limits of ecological change:** Quantitative limits of ecological change for all important parameters of the wetland ecosystem should be included in the ecological character description, where possible. Where the information available is not comprehensive, meaningful items for which thresholds can be identified should be included.
- **Key threats/risks to the site:** a summary of the possible threats and risks to the wetland helps to identify what aspects of the ecological character might be more likely to change.
- **Knowledge gaps:** a summary of the knowledge gaps identified during the development of the ecological character description.
- **Changes in Ecological Character:** a statement of whether the ecological character of the site has changed since time of listing. For example any changes in components, processes and services/benefits, whether the changes were adverse and human induced, or whether they were beyond the natural variability.
- **Glossary:** The Glossary should contain definitions of all the major terms used in the ecological character description and the source of the definition. Ramsar definitions should be used where possible. Ideally, the glossary should adopt the terms as explained in the revised Framework for describing ecological character. Where alternative definitions or words are used, the reasons for this should be described.
- **References:** This section should include a comprehensive reference list to ensure that scientific and technical can find the original sources of information.
- **Appendices:** The appendices provide additional information relevant to the ecological character description. The appendices should include information such as:
 - Appendix of one page curriculum vitae for each author
 - Appendix that describes the methods used to prepare the description (including site visits), and how these methods differed, if any, from the ECD guidance document
 - Appendix of the list of community assemblages (presence / absence taxa lists, taxa counts, rapid biological assessment survey results, taxonomic and population studies, etc)
 - Appendix of a revised draft RIS and Ramsar site map for the wetland
- **Key site monitoring needs:** a summary of the sites key monitoring needs that may have been identified from the conceptual model, limits of ecological change, threats/risks, management actions or other parts of the ecological character description.

- **Triggers for management action:** a summary of the some of the triggers or priority areas for management action that may have been identified from the threats to EC, the knowledge gaps and monitoring requirements.

The revised Framework for describing the ecological character of Ramsar wetlands outlined above is part of detailed guidance being prepared to promote effective management of Ramsar sites in Australia. The revised Framework is in the early drafting stages and may therefore be subject to change before it is finalised.

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