

Improving Our Waterways

Victorian Waterway Management Strategy



The Department of Environment and Primary Industries proudly acknowledges and pays its respects to Victoria's Native Title holders and Traditional Owners and their rich culture and intrinsic connection to Country.

The department also recognises and acknowledges the contribution and interests of other Aboriginal people and organisations in waterway management.

Finally, the department acknowledges that the past injustices and continuing inequalities experienced by Aboriginal people have limited, and continue to limit, their proper participation in land, water and natural resource management.

COVER: Baker's Swamp is one of over 60 wetlands in the Moolort Plains wetlands complex, located on the Victorian Volcanic Plain between Castlemaine and Maryborough in north central Victoria. This privately-owned swamp has recently been permanently protected with a Trust for Nature Covenant, as part of the Moolort Wetlands Project. Almost 400 hectares of wetland area have been protected through activities such as fencing, revegetation, covenant protection and the development of wetland management plans. This project has been delivered by the North Central Catchment Management Authority and jointly funded through the Victorian Government's Waterway Management Program and the Australian Government's Caring for our Country. Photographer: Nick Layne

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Ministerial Foreword

Victorians take so much pride in the rivers, estuaries and wetlands that are the lifeblood of our communities.

Our waterways sustain environmental values such as River Red Gum forests, threatened native fish species and platypus. Waterways provide many of Victoria's best fishing, swimming, camping, boating and scenic attractions.

As the source of our first class drinking water supplies and water for agricultural production, the health of our waterways is vital to support our quality of life and our important food and fibre sector.

The health of these waterways also underpins many aspects of regional tourism, jobs and investment; particularly in coastal areas like the Gippsland Lakes and along the Great Ocean Road.

Managing our waterways to ensure they keep providing these important environmental, social, cultural and economic values requires a strategic approach to direct government and community resources.

The challenging conditions of the recent drought, from 1997 – 2009, compounded by bushfires and record floods, provided invaluable experiences and lessons that have informed the development of this new Victorian Waterway Management Strategy.

The Strategy provides a framework for government, in partnership with local communities (both rural and urban), regional agencies and authorities, Traditional Owners and other key stakeholders to improve the health of Victoria's waterways over the next eight years. It includes:

- a more flexible approach to manage the challenges of drought, floods and bushfire in our variable climate;
- a framework focused on regional-decision making with community input to determine priority management activities in each region;
- a comprehensively integrated approach that manages rivers, wetlands and estuaries together and combines traditional works such as revegetation, fencing and erosion control with the most recent advances in environmental water management.



The Hon Peter Walsh MLA



The Hon Ryan Smith MP

The Strategy provides clear direction for the Victorian Government's significant investment of more than \$100 million over four years (beginning in 2012/13) to improve the health of Victoria's waterways.

This funding, coupled with additional investment by other state and federal government programs, and the exceptional contribution made by landholders and community groups, provides a strong foundation for achieving real outcomes over the next eight years.

We congratulate everyone who helped develop this Strategy.

We encourage you to read through this Strategy and get involved in local activities for waterway management in your region. We hope you feel a sense of ownership and pride for our waterways and that the strong partnership between government and communities will continue into the future.

The Hon Peter Walsh MLA
Minister for Water

The Hon Ryan Smith MP
Minister for Environment
and Climate Change



Improving Our Waterways

Victorian Waterway Management Strategy

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Executive summary

This *Victorian Waterway Management Strategy* (the Strategy) provides the framework for government, in partnership with the community, to maintain or improve the condition of rivers, estuaries and wetlands so that they can continue to provide environmental, social, cultural and economic values for all Victorians. The framework is based on regional planning processes and decision-making, within the broader system of integrated catchment management in Victoria.

The policies and actions in this Strategy have been the subject of extensive discussion and review as part of a strong consultation program. Four dedicated committees have met many times over the past three years and include a Stakeholder Reference Committee, Expert Scientific Panel, Internal Review Committee and the Victorian Waterway Managers' Forum. Additional stakeholders, such as water corporations and the Victorian Traditional Owner Land Justice Group, have been engaged on specific waterway management issues. Feedback was also invited from all Victorians during the six-week public consultation period for the *Draft Victorian Waterway Management Strategy*. This community input, and how it was considered in developing the Strategy, is outlined in the report *Community Feedback: Draft Victorian Waterway Management Strategy*.

The Strategy replaces the policy framework of the *Victorian River Health Strategy* with a single, integrated management framework for rivers, estuaries and wetlands. The Strategy describes the Victorian Government's policy on regional decision-making, investment, management issues and roles and responsibilities of management agencies.

Specifically, the Strategy establishes:

- a vision, guiding principles and management approach
- a transparent, integrated waterway management framework that:
 - facilitates regional decision-making with community input
 - sits within an integrated catchment management context
 - comprehensively integrates waterway management activities
- an adaptive management framework and flexible approach to manage through the challenges of drought, flood, bushfire and the potential impacts of climate change
- aspirational Strategy targets that summarise key regional management activities over the next eight years that aim to maintain or improve the condition of waterways
- clear policy directions for waterway management issues
- specific actions that will deliver more effective and efficient management of waterways.

The vision for Victoria's waterways is:

Victoria's rivers, estuaries and wetlands are healthy and well-managed; supporting environmental, social, cultural and economic values that are able to be enjoyed by all communities.

Improving the environmental condition of waterways in priority areas is a critical task to sustain populations of native plants and animals, provide opportunities for recreation, protect cultural values and support economic development through important industries such as tourism and agriculture. Therefore, the overarching management objective is to maintain or improve the environmental condition of waterways to support environmental, social, cultural and economic values. Management activities will be focused on maintaining or improving the environmental condition of priority waterways to provide public benefits.

The approach for managing waterways involves four key elements:

- recognising the importance of waterways with formal international, national and state significance
- implementing and maintaining onground works and managing environmental water in priority waterways
- fostering strong community partnerships
- using regulation (legislation and statutory processes).

Development and implementation of regional Waterway Strategies for each of the ten catchment regions across Victoria will deliver key elements of the management approach outlined in this Strategy. The regional Waterway Strategies, required under the *Water Act 1989*, will identify high value waterways and priority management activities over an eight-year period. They will be based on a transparent, regional priority setting process and be developed in close consultation with key partners and the community. This process will ensure that investment in onground works and environmental water management is targeted at priority waterways to achieve the greatest community gain.

This Strategy is intended for State government, waterway managers, land managers, local government, other regional agencies and authorities or management partners, Traditional Owners and landholders or community groups involved in waterway management or activities that may affect waterway condition.



River Red Gums on the Murray River. Courtesy DEPI



1 About the Strategy

Kings Billabong, Courtesy Mallee CMA

About the Strategy

Guide to the chapter

1.1 Purpose of the Strategy

1.2 Policy context

- State
- Regional
- National
- International

1.3 The Strategy development process

1.4 Structure of the Strategy

1.1 Purpose of the Strategy

This *Victorian Waterway Management Strategy* (the Strategy) provides the framework for government, in partnership with the community, to maintain or improve the condition of rivers, estuaries and wetlands so that they can support environmental, social, cultural and economic values for all Victorians.

The framework is based on regional planning processes and decision-making within the broader system of integrated catchment management in Victoria. The Strategy addresses the community expectations and obligations for waterway management expressed in the *Victorian Water Act 1989*, *Catchment and Land Protection Act 1994*, other relevant state and national legislation and policies, and international agreements (see Box 1.1). The Strategy replaces the policy framework of the *Victorian River Health Strategy*¹.

Box 1.1: Legislative and policy obligations addressed by the Strategy

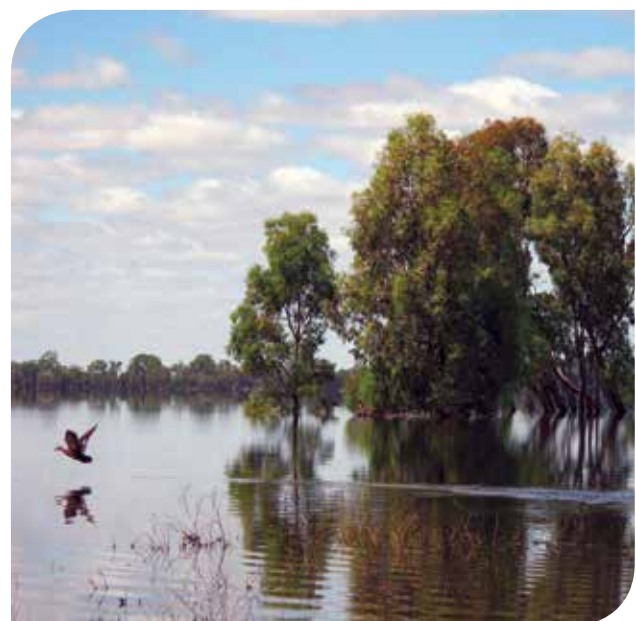
The Strategy provides a single framework for addressing the community expectations and obligations for waterway management outlined in relevant state, national and international legislation, policy and agreements. These include:

- state legislation (such as the *Victorian Water Act 1989*, *Catchment and Land Protection Act 1994*, *Heritage Rivers Act 1992*, *Flora and Fauna Guarantee Act 1988*, *Aboriginal Heritage Act 2006*, *Traditional Owner Settlement Act 2010*, *Conservation, Forests and Lands Act 1987*, *Crown Land (Reserves) Act 1978* and the *Marine Safety Act 2010*)
- national legislation (such as the *Commonwealth Water Act 2007* and *Water Amendment Act 2008* (Cth), the *Environment Protection and Biodiversity Conservation Act 1999* and the *Native Title Act 1993*)
- national water reform through the National Water Initiative
- Murray-Darling Basin Authority policies (such as The Living Murray initiative and the Murray-Darling Basin Plan)
- international agreements (such as the Ramsar Convention on Wetlands, the East Asian-Australasian Flyway Partnership, the Convention on Conservation of Migratory Species of Wild Animals, Japan-Australia Migratory Bird Agreement, China-Australia Migratory Bird Agreement, Republic of Korea-Australia Migratory Bird Agreement).
- United Nations Declaration of Rights of Indigenous Peoples.

The Strategy is intended for State government, waterway managers, land managers, local government, other regional agencies and authorities and management partners, Traditional Owners and landholders or community groups involved in waterway management or activities that may affect waterway condition (see Box 1.2 for definitions). It outlines the Victorian Government's policy on regional decision-making, investment, management activities and specific management issues for waterways. It provides clear guidance on the development and implementation of the regional strategies and management plans that are integral to the success of the waterway management program in Victoria. The Strategy also describes the institutional arrangements for waterway management in Victoria (Chapter 18).

Specifically, the Strategy establishes:

- a vision, guiding principles and management approach
- a transparent, integrated waterway management framework that:
 - facilitates regional decision-making with community input
 - sits within an integrated catchment management context
 - comprehensively integrates waterway management activities
- an adaptive management framework and flexible approach to manage through the challenges of drought, flood, bushfire and the potential impacts of climate change
- aspirational Strategy targets that summarise key regional management activities over the next eight years that aim to maintain or improve the condition of waterways
- clear policy directions for waterway management issues
- specific actions that will deliver more effective and efficient management of waterways.



Lake Boort. Courtesy DEPI

Box 1.2: Important concepts contained in the Strategy

The following important concepts are central to understanding the scope and intent of the Strategy.

Waterways

The Strategy focuses on the management of rivers, their associated estuaries and floodplains (including floodplain wetlands) and non-riverine wetlands. The Strategy refers collectively to these systems as 'waterways'. The use of the term 'waterways' in the Strategy does not replace other important definitions of the term (for example, the specific definition in the *Water Act 1989*).

The Strategy contains policy that applies to all rivers and estuaries across Victoria (with the exception of the Murray River channel that falls under the jurisdiction of New South Wales). The term 'reaches' is used to describe a section of a river (generally 20-30 km section) or a section of an estuary and is the common planning unit for management.

The focus for wetlands is largely on natural wetlands (including lakes). However, the Strategy also covers artificial wetlands such as reservoirs, salt evaporation pans, sewage treatment facilities and farm dams that provide substantial benefits to both individuals and the community. The Strategy does not include shallow marine waters except for those listed as internationally important wetlands (that is, Ramsar sites) or those listed in *A Directory of Important Wetlands in Australia*². Whilst the direct management of the marine environment is not a focus for the Strategy, it is recognised that activities in the catchment can affect marine receiving waters.

Rivers, as well as many wetlands and estuaries, have some dependence on groundwater. The Strategy includes groundwater-dependent ecosystems that are classed as rivers, wetlands and estuaries. It does not include management of groundwater fauna, wet cave ecosystems or terrestrial vegetation dependent on groundwater.

Waterway condition

Waterway condition (or waterway health) is an umbrella term for the overall state of key features and processes that underpin functioning waterway ecosystems (such as species and communities, habitat, connectivity, water quality, riparian vegetation, physical form and ecosystem processes including nutrient cycling and carbon storage). By maintaining or improving waterway condition the environmental, social, cultural and economic values that waterways provide can be preserved for both current and future generations. Waterway condition is measured by assessing a range of biological and physical factors.

Catchment management and waterway condition

The task of managing waterways cannot be conducted in isolation from the broader management of catchments and land, because the condition of catchments and land is a key driver of waterway condition (see Section 2.1.4). Some activities occurring on the land surrounding waterways can affect water quality, aquatic plants and animals and riparian vegetation. These linkages are recognised by the integrated catchment management framework that operates in Victoria. Waterway managers are encouraged to undertake management activities throughout catchments (in addition to activities in the channel of rivers and estuaries or within the boundary of wetlands) and consider broader issues such as connectivity, land use change and community participation, education and awareness raising.

Integrated catchment management

Integrated catchment management is the co-ordinated involvement of agencies, stakeholders and the community in policy making, planning, and management to promote sustainable use of natural resources. Integrated catchment management recognises the intrinsic linkages between land use in catchments and subsequent impacts on land, water and biodiversity and seeks a holistic approach to their management.

Waterway manager

In this Strategy, the term waterway manager describes an authority that is responsible for waterway management in a region (there are ten specified catchment management regions in Victoria, see Figure 3.4) in accordance with the *Water Act 1989* and the *Catchment and Land Protection Act 1994*. In the Port Phillip and Westernport region, Melbourne Water is the designated waterway manager. In each of the other nine regions the relevant catchment management authority (CMA) is the designated waterway manager. For further details on institutional arrangements see Chapter 18.

Marine Safety Act waterway manager

In this Strategy, the term *Marine Safety Act* (MSA) waterway manager applies to bodies appointed by the Minister for Ports as waterway managers under the *Marine Safety Act 2010*. MSA waterway managers are responsible for regulating vessel operations and on water activities by waterway users on Victorian State Waters.

1.2 Policy context

1.2.1 State

The *Victorian River Health Strategy* (VRHS) provided the state policy framework for managing river health over the decade 2002–2012. The VRHS was a significant milestone for river management in Victoria. It outlined clear principles for making regional decisions on river protection and restoration, identifying regional priorities for management activities and statewide direction on important management issues affecting river health. This Strategy replaces the VRHS and outlines the framework for government, in partnership with the community, to manage rivers, estuaries and wetlands so that they can support environmental, social, cultural and economic values now and into the future.

The policy framework outlined in the VRHS, and subsequently in this Strategy, incorporate State legislative obligations relevant to waterway management outlined in the *Victorian Water Act 1989*, *Catchment and Land Protection Act 1994*, *Heritage Rivers Act 1992*, *Flora and Fauna Guarantee Act 1988*, *Conservation, Forests and Lands Act 1987*, *Crown Land (Reserves) Act 1978*, *Aboriginal Heritage Act 2006*, *Traditional Owner Settlement Act 2010* and the *Marine Safety Act 2010*. Obligations relevant to waterway management under national legislation and international agreements (see Box 1.1) are also incorporated.

Victoria's water allocation framework provides the basis for the management of Victoria's water resources. Under the *Water Act 1989*, the Victorian Government retains the overall right to the use, flow and control of all surface water and groundwater on behalf of all Victorians. All water taken for consumptive purposes is done so under entitlements set out in the *Water Act 1989*. Like surface water, groundwater is allocated for commercial and irrigation purposes under strict licensing arrangements under the *Water Act 1989*. The *Water Act 1989* also defines the Environmental Water Reserve (EWR) as the amount of water set aside to meet environmental needs. The Victorian Environmental Water Holder was established in 2011, under the *Water Act 1989*, as an independent statutory body responsible for making decisions on the most efficient and effective use of Victoria's environmental water entitlements (see Chapter 8).

The Victorian Government is carrying out a comprehensive review of Victoria's water laws to deliver a streamlined and effective legislative framework for water management and use in Victoria. The revised legislation will provide for integrated and sustainable water management and use in Victoria, and give effect to new Victorian Government water policies, such as the *Living Victoria* policy (see Chapter 14).

The key statewide policy framework for water quality protection in Victoria is the *State Environment Protection Policy (Waters of Victoria)* under the *Environment Protection Act 1970*.

The SEPP(WoV) was first developed in 1988 and was updated in 2003. It provides a statutory framework for State and local government agencies, businesses and communities to work together to protect and rehabilitate Victoria's surface water environments. The SEPP(WoV) identifies beneficial uses of water and sets the environmental quality objectives and policy directions required to address higher risk impacts and activities. The Environment Protection Authority (EPA) Victoria and the Department of Environment and Primary Industries are jointly reviewing the framework for statutory policies (which includes the SEPP(WoV)).

1.2.2 Regional

The *Catchment and Land Protection Act 1994* establishes Regional Catchment Strategies (RCSs) as the primary framework for integrated management of land, water and biodiversity in each of the ten catchment regions of Victoria. Catchment management authorities (CMAs) are responsible for preparing an RCS for their region and co-ordinating and monitoring its implementation. The RCS is the overarching strategy, under which are a range of sub-strategies and action plans for each region. The long-term objectives and priorities for action in the RCSs that are related to waterways are reflected in the regional planning processes for waterway management (see Section 4.1).

Regional planning processes for waterway management were established in 2002 under the VRHS and implemented through ten regional River Health Strategies (RRHSs). Community input and participation in these regional planning processes was a critical element to ensure that RRHSs reflected the community values of waterways in each region. The RRHSs identified high value rivers and priority management actions to be undertaken over a six-year period. These RRHSs were the cornerstone of the regional planning framework for waterways (supported in some areas by regional wetland strategies), but have now passed their intended lifespan. The development of new regional Waterway Strategies is a statutory requirement under the *Water Act 1989* and these will replace the RRHSs (see Chapter 4).

Water resource planning in Victoria is addressed through development of regional Sustainable Water Strategies (SWSs) that set out long-term regional plans to secure water for regional growth, while safeguarding the future of rivers and other natural water sources. They investigate the range of potential changes to water availability under several climate change scenarios. The regional SWSs examine future consumptive demand and environmental needs and set out proposed options to balance and secure water for all users. The SWSs are where the Victorian Government, in partnership with regional communities, decides whether additional water is required for the environment.

1.2.3 National

At the federal level, water reform has been guided by the National Water Initiative (NWI) since 2004. Under this agreement, governments across Australia have committed to actions to achieve a more cohesive national approach to the way Australia manages, measures, plans for, prices, and trades water. The NWI recognises the need to build on the water reforms of the 1994 Council of Australian Government (COAG) agreement to ensure increased productivity and efficiency of Australia's water use. It includes clear steps to return river and groundwater systems to environmentally sustainable levels of extraction and achieve integrated management of environmental water.

There has also been significant legislative reform in water resource management at the federal level. The *Water Act 2007* (Cth) established the Murray-Darling Basin Authority (MDBA) and requires the MDBA to prepare the Basin Plan – a strategic plan for the integrated and sustainable management of water resources in the Murray-Darling Basin. The Act also established the Commonwealth Environmental Water Holder to manage the Commonwealth's environmental water. The *Water Amendment Act 2008* (Cth) transferred the functions of the Murray-Darling Basin Commission to the new MDBA. The MDBA is now the single body responsible for overseeing water resource planning in the Murray-Darling Basin. The Basin Plan sets legal limits on the amount of surface water and groundwater that can be taken from Victoria's share of the Murray-Darling Basin from 1 July 2019 onwards.

The Living Murray initiative is one of Australia's most significant river restoration programs. It aims to achieve a healthy working Murray River system for the benefit of all Australians. This includes returning water to the environment. The Living Murray has recovered almost 500 gigalitres of water to help improve the health of six icon sites.

The Living Murray program was established in 2002 in response to evidence showing the declining health of the Murray River system. It is a partnership of the New South Wales, Victorian, South Australian, Australian Capital Territory and Australian governments, co-ordinated by the MDBA.

The *Environment Protection and Biodiversity Conservation Act 1999* (Cth) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the Act as matters of national environmental significance. The *Native Title Act 1993* (Cth) provides a framework for the protection and recognition of native title. The Act gives Indigenous Australians who hold native title rights and interests—or who have made a native title claim—the right to be consulted and, in some cases, to participate in decisions about activities proposed to be undertaken on the land.

1.2.4 International

The Australian Government has ratified several international human rights agreements that recognise and protect Indigenous peoples' special connection to land and waters and provide for the right to practice, revitalise, teach and develop culture, customs and spiritual practices and to utilise natural resources (for example, the United Nations Declaration of Rights of Indigenous Peoples).

The Convention on Wetlands of International Importance (the Ramsar Convention) provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources (see Section 12.2)

Migratory species that use waterways (such as birds) and internationally threatened species are protected under a range of international agreements (see Box 1.1).



Barmah Forest in flood on Steamer Plain. Photographer: Keith Ward

1.3 The Strategy development process

The Strategy has been developed over four years in collaboration with key stakeholders in waterway management, independent experts and the broader Victorian community (see Figure 1.1).

A Stakeholder Reference Committee was appointed to provide advice, direction and review of draft policies and actions, particularly in relation to the implications for stakeholder groups (see Appendix 1.1 for members and Terms of Reference). An Expert Scientific Panel was appointed to review the draft policies and actions to ensure that the scientific concepts that underpin the policy are accurate and based on best available science (see Appendix 1.1 for members and Terms of Reference).



Kayaking on the Yarra River. Photographer: Alison Pouliot

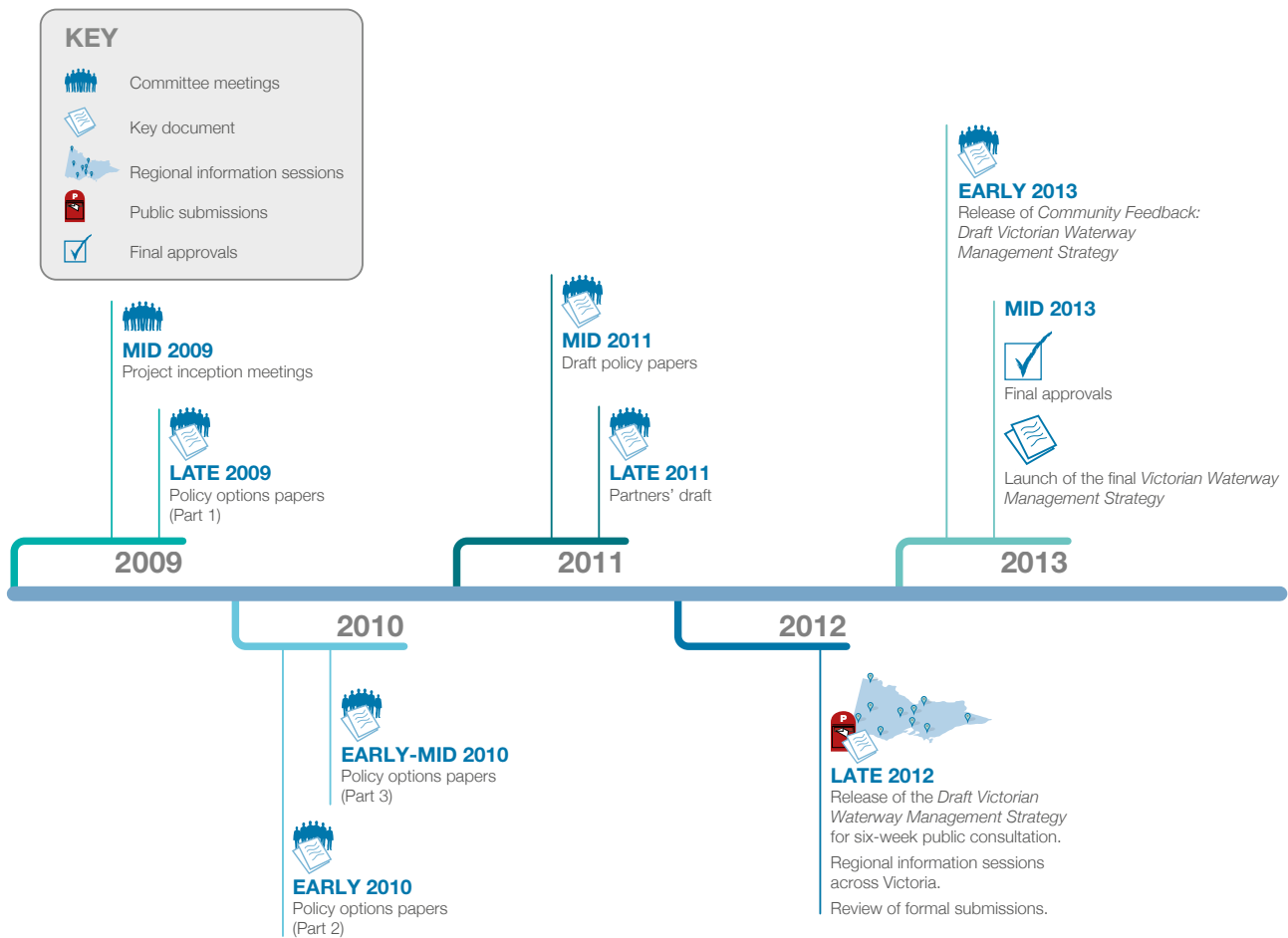


Figure 1.1: Timeline of key events in developing the Strategy.

Regional waterway managers have played a vital role in the development and detailed review of the draft policies and actions through the long-running Victorian Waterway Managers' Forum. The Forum provided advice regarding the regional implementation of the draft policies and actions.

An Internal Review Committee of the (then) Department of Sustainability and Environment (DSE), (then) Department of Primary Industries (DPI), Parks Victoria, Melbourne Water and EPA Victoria staff members ensured that the proposals in this Strategy are aligned with broader natural resource management directions and principles in Victoria.

The Stakeholder Reference Committee, Expert Scientific Panel and Internal Review Committee met seven times prior to the release of this Strategy. The Victorian Waterway Managers' Forum met 15 times.

All Victorians were invited to provide feedback on the *Draft Victorian Waterway Management Strategy* during a six-week public consultation period. Twenty regional information sessions were held at ten locations across Victoria during this period. A total of 78 formal submissions were received during the public consultation period. The key themes from the formal submissions, and how these were considered in developing the final Strategy, are outlined in the report *Community Feedback: Draft Victorian Waterway Management Strategy*³.

The public consultation period and community feedback report keeps the Victorian Government promise to keep

people informed, listen to their concerns and aspirations, and provide feedback on how their input was used in developing the final strategy (see Appendix 1.2).

Consultation with Traditional Owners has occurred primarily through the Victorian Traditional Owner Land Justice Group. Although each Traditional Owner group has its own unique way of operating and its own issues and aspirations, several key points were consistently made in relation to future waterway management in Victoria, including:

- the importance of healthy waterways to support Aboriginal cultural heritage and other values associated with waterways
- ensuring that there are opportunities for Traditional Owners and Aboriginal people to be partners and active participants in waterway management.

Traditional Owners were invited to attend the regional information sessions for partners (along with other agencies involved in waterway management) during the public consultation period, reflecting the aim to involve Traditional Owners as key partners in regional waterway management.

Input and advice was also sought from Native Title Services Victoria, the (then) DSE and Department of Justice Native Title Units, the (then) DSE Indigenous Facilitators Network, Catchment Management Authority Indigenous Facilitators Network, Aboriginal Affairs Victoria and the Victorian Aboriginal Heritage Council.

1.4 Structure of the Strategy

The Strategy is divided into four parts.

Part 1 – Strategy background (Chapters 1–2)

This part outlines the purpose of the Strategy (Chapter 1) and the importance of rivers, estuaries and wetlands (Chapter 2). It describes the different types of values associated with waterways with varying levels of environmental condition. It provides an overview of achievements from the past decade of waterway management, and the next steps that are required to improve the management framework for the coming decade (Chapter 2).

Part 2 – Strategy fundamentals (Chapters 3–6)

This part provides a vision, guiding principles, broad management approach and aspirational Strategy targets that summarise key regional management activities over the next eight years that aim to maintain or improve the condition of waterways (Chapter 3). It describes the integrated waterway management framework and provides direction for the regional implementation of waterway management programs (Chapter 4). This section also outlines principles for community participation and the strong Government commitment to a partnership approach with communities (Chapter 5). It includes the important role of Victorian Traditional Owners in waterway management and protection of Aboriginal cultural heritage and other Aboriginal values associated with waterways (Chapter 6).

Part 3 – Management issues (Chapters 7–16)

This part outlines the principles, policies and actions for specific waterway management issues relating to:

- recreational use of waterways (Chapter 7)
- environmental water management (Chapter 8)
- riparian management (Chapter 9)
- water quality (Chapter 10)
- the river channel (Chapter 11)
- wetlands (Chapter 12)
- estuaries (Chapter 13)
- waterways in urban areas (Chapter 14)
- extreme events of flood and bushfire (Chapter 15)
- invasive species management in waterways (Chapter 16).

Part 4 – Management arrangements (Chapters 17–18)

This part describes the updated adaptive management approach for the Victorian Waterway Management Program (Chapter 17) and the institutional arrangements for waterway management (Chapter 18).



2

Introduction

Introduction

Guide to the chapter

2.1 The importance of rivers, estuaries and wetlands

- Communities value their waterways
- Good waterway condition supports social, cultural and economic values
- Environmental values of waterways
- Understanding the factors that contribute to waterway condition
- Impacts of declining waterway condition

2.2 The types of waterways based on their environmental condition and values

2.3 Achievements of the Victorian River Health Program (2002–2012)

2.4 The next step: progressing the policy framework

- Managing all waterways within a single framework
- Directing investment to regional priorities
- Setting practical objectives for waterways
- Using environmental water efficiently and effectively
- Recognising working waterways need ongoing management
- Strengthening community partnerships in waterway management
- Managing through droughts, bushfires and floods
- Planning for the potential impacts of climate change
- Using new knowledge and an updated adaptive management approach

2.1 The importance of rivers, estuaries and wetlands

2.1.1 Communities value their waterways

Rivers, estuaries and wetlands (waterways) are the lifeblood of many towns and communities. Waterways provide places to relax, holiday, exercise, fish, bird watch, hike and swim. From cool mountain streams in alpine areas to popular estuaries along the coast, waterways underpin the well-being and productivity of individuals, communities and regional economies. Waterways also provide water for irrigation and fertile floodplain soils that support agriculture. A recent survey of 7,140 Victorians found that waterways are vitally important to community members, with 99 per cent of respondents having high aspirations for waterways (see Box 2.1).



*The annual Dimboola Regatta on the Wimmera River.
Photographer: Sarina Loo*

Box 2.1: Survey shows Victorians want healthy waterways

In 2009, the *My Victorian Waterway* survey was carried out with 7,140 Victorians taking part. The results offer an insight to community expectations, attitudes and behaviours regarding waterway management. The results provide waterway managers with critical information for developing regional waterway management programs and for guiding community engagement activities. In the future, the results may also be used to assess and evaluate long term effectiveness of community education and engagement activities.

Ninety-nine per cent of survey respondents had high aspirations for our waterways. Nearly all participants (98 per cent) agreed that it is important for waterways to be as healthy as possible so they continue to provide for our needs and 99 per cent of respondents want healthy waterways in their areas. An overwhelming majority of respondents (96 per cent) stated that they have a personal responsibility to do the right thing for waterways.

The majority of Victorians surveyed (83 per cent) felt most personally connected to a local waterway, usually the stretch of river or creek closest to where they live.

Most respondents visited waterways for recreational purposes:

- 92 per cent of people surveyed visit waterways to enjoy the scenery
- 85 per cent to enjoy native animals, plants and birds
- 76 per cent to walk, hike or cycle
- 68 per cent for picnics and barbeques
- 37 per cent to plant native trees and clear weeds
- 36 per cent to fish.

More than 67 per cent of people surveyed had a good or excellent knowledge of what makes a waterway healthy. Less than 2 per cent had little or no knowledge.

Understanding how Victorian communities feel about, and use, waterways is an essential component of waterway management. For more information on the results of the *My Victorian Waterway* survey visit: www.water.vic.gov.au/environment/rivers/community-connections-to-local-waterways



Cyclist on the Main Yarra Trail. Photographer: David Hannah

Waterways can play a vital role in the physical and mental well-being of people and communities. Our social and recreational activities often revolve around waterways and many Victorians, especially Traditional Owners and Aboriginal people, have deep social, cultural and historical connections to them. The comments below show how important waterways are to people's lives:

The fishing is good. There's lots of bird life. Water birds come to nest. And kids love fishing and swimming.

Glenelg River resident, Casterton¹

I once farmed along 2.5 km of Tullaroop Creek and loved to see the platypus, trout and yabbies. The River Red Gums are magnificent and the bird life, Water Rats and possums are a joy.

Carisbrook Resident¹

The Barwon estuary is as much a part of our lives as breathing.

Geelong resident¹

My children play there, so its health is important to the family.

Ivanhoe resident about Darebin Creek¹

The Gunai Kurnai people have strong cultural and social connections to the region's water bodies. Our people traditionally used the waterways for fishing, collecting mussels, catching eels, hunting animals, collecting swan eggs, gathering of various plants for food and medicine, and basket weaving.

Traditional Owners about waterways in the Gippsland region²

We love our swamp – visitors come up and are amazed, they love it, it's one of the first places to visit

Farmer from west Wimmera³

Box 2.2: Indicative economic value of rivers, estuaries and wetlands

Waterways in good environmental condition can provide many economic benefits (for example, water quality in the Gippsland Lakes is important to support regional tourism). Some other examples of economic value associated with waterways include:

- In 2010/2011, the Gross Value of Irrigated Agricultural Production in Victoria was approximately \$3.9 billion⁵.
- In 2008/2009, approximately 721,000 Victorians participated in recreational fishing and made an estimated 8.7 million fishing trips, spending an average of \$250 each time⁶.
- Economic research into the value of healthy wetlands concluded the Hattah Lakes in northern Victoria provide an annual economic value of \$14.5 million through tourism, water filtration, habitat, flood control and water storage⁷.

2.1.2 Good waterway condition supports social, cultural and economic values

Good waterway condition provides the essential building blocks for regional growth, liveability and prosperity. Rivers provide water for Victoria's five million people and support agriculture, recreational fishing and commercial industries (see Box 2.2). A 2007 study conservatively estimated that Victoria's rivers provide \$986 million per year worth of services and benefits to the community⁴.

Waterways also provide significant social and cultural benefits for communities. Waterways have always been a place for recreation and are often a hub or meeting place for local communities. Fishing, swimming, canoeing and water-skiing are all popular recreational activities that occur on waterways and can make a significant contribution to local economies. Waterways have a special place in the memories of many individuals and are deeply associated with their 'sense of place' and 'belonging'. This is particularly true for Aboriginal communities, for whom rivers are a spiritual and living entity. Many cultural heritage sites occur alongside waterways and totem species may depend on healthy waterways. Fishing is an integral part of the cultural and economic life of many Aboriginal communities. It provides an important source of food and is part of cultural and ceremonial activities. The Aboriginal dreamtime story of the Murray Cod and the legend of the Man from Snowy River are defining elements of Australian culture.



Good waterway condition supports recreational fishing in Victoria. Courtesy DEPI

2.1.3 Environmental values of waterways

Rivers, estuaries and wetlands (see Box 2.3) are important natural assets that support diverse populations of animals and plants. Wetlands provide habitat for brolga that were once spread across much of Victoria and rivers provide habitat for threatened fish species such as Macquarie Perch and Murray Cod. Mammals such as platypus and rakali also depend on healthy waterways. Riparian vegetation alongside waterways, such as the River Red Gum forests in northern Victoria, provides habitat for many terrestrial animal species and a source of energy (via leaves and organic matter) for aquatic invertebrate species. Waterways and floodplains are also vital for the movement and cycling of sediment and nutrients and underpin the rich agricultural soils in many areas of the state. Riparian vegetation is increasingly valued for its role in carbon storage and as habitat corridors in fragmented landscapes.

Wetlands are important for storing and filtering water. Rivers and wetlands are an important interface between the surrounding catchments and the downstream receiving waters of marine ecosystems or terminal lakes. Estuaries are an especially important link between catchments and downstream waters and provide unique habitats of mangroves, coastal wetlands and marshes that are also vital spawning and nursery areas for fish. The location of different types of waterways in a catchment is shown in Figure 2.1.

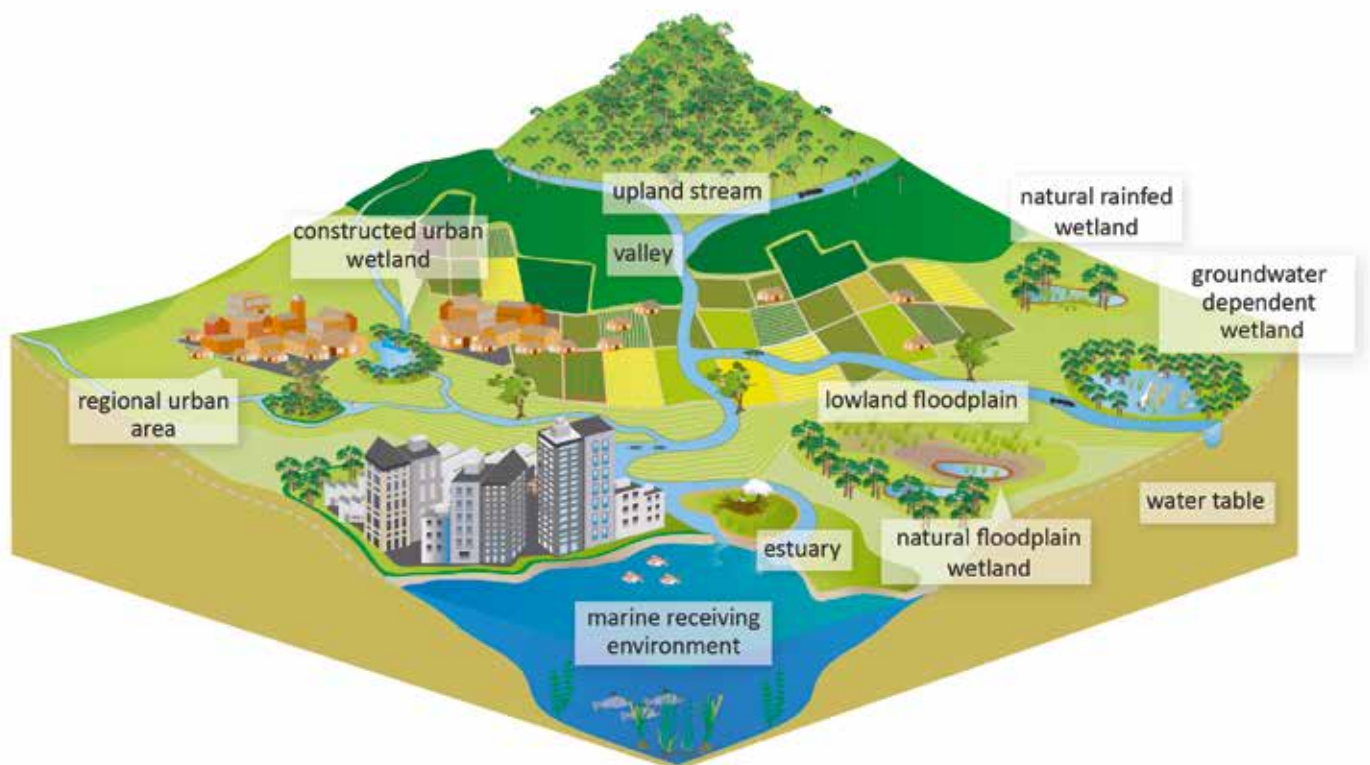


Figure 2.1: Rivers, estuaries and wetlands in a catchment.

Box 2.3: What are rivers, estuaries and wetlands?

The definition of a river encompasses rivers, streams and their tributaries and includes the water, the channel and surrounding land, known as riparian land. Riparian refers to land or vegetation that adjoins a river, creek, wetland or estuary.

Estuaries are where rivers meet the sea and the fresh river water mixes with the salt water of the ocean. The majority of Victoria's estuaries are brackish mouths of rivers and streams that flow directly into the ocean or into large marine bays (such as Western Port, Port Phillip Bay and Corner Inlet). There are more than 100 estuaries in Victoria; 83 of which exceed one kilometre in length. The definition of estuaries also includes coastal inlets (for example, Tamboon Inlet and Anderson Inlet), smaller bays (for example, Swan Bay and Limeburners Bay) and coastal barrier lagoons (for example, Jack Smith Lake and Lake Dennison). These inlets may also be classed as wetlands.

Wetlands are still-water environments, usually occurring where water collects in depressions in the landscape from either surface water or groundwater. Wetlands can include swamps, lakes and peatlands. Some wetlands are dependent on groundwater for their existence; others depend on surface water run-off or large floods from adjacent rivers. The 2013 inventory of Victorias wetlands recorded 23,739 natural wetlands covering 604,322 hectares and 11,060 artificial wetlands covering 170,613 hectares. Some wetlands naturally have water in them all the time, whilst others naturally dry out for short or long periods of time.



The Mitchell River, East Gippsland. Photographer: Cuc Chong

2.1.4 Understanding the factors that contribute to waterway condition

Over a long period of time, a strong knowledge base about the factors that influence waterway condition has been established. This knowledge has been gathered through observations, scientific studies, experiments and adaptive management. The knowledge base is continually being expanded and improved over time. However, our understanding of the scale of management activities required to improve waterway condition is still far from complete.

Scientific knowledge about waterways was initially based on research and theories from waterways in the northern hemisphere, many of which feature steep catchments with deciduous forests. By contrast, waterways in Australia often include long stretches of meandering channels that flow through wide floodplains with many associated wetlands. Waterways and surrounding catchments are dominated by eucalypt species. Leaves, bark and twigs from these plants have a very different composition than those from deciduous forests and the supply of leaves to Australian waterways lacks the strong seasonal patterns common in the northern hemisphere. Summer shading from riparian vegetation in Australia is also reduced (compared to deciduous trees) due to the shape of eucalypt leaves; this allows a greater role for algae and biofilm production.

Highly variable flow regimes in Australia and the strong influence of global climate patterns, such as El Niño and La Niña⁸, have an overriding influence on the functioning of Australian waterways. Although waterways are located across a vast range of habitat types and land uses in Victoria, there are some fundamental principles from the knowledge base that must be considered when managing waterway condition. These include:

- **the importance of the catchment to waterway condition** – waterway condition is very strongly influenced by the characteristics, processes and actions in the surrounding landscape. For example, the type and extent of catchment and riparian vegetation, regional climate and land use, or landholder behaviour can all have a major influence on waterway condition. Estuaries are a critical link between catchments and the marine environment and poor health of catchments and waterways can affect these downstream environments.
- **recognising natural climate variability** – waterways in Australia experience naturally high levels of hydrological variability; some of the highest in the world. The strong influence of the El Niño has an overriding influence on rainfall patterns across much of eastern Australia. It is also strongly associated with the frequency of extreme events such as flood, and in some cases, bushfire. Communities and managers need to recognise and plan for this inherent variability and be flexible to account for extremes in temperature, rainfall and water availability.

- **maintaining physical and ecological processes** – waterway condition relies on maintaining a wide range of physical and ecological processes including appropriate rates of sediment transport, erosion, nutrient dynamics, processing of organic matter, carbon storage, the structure and functioning of food webs and two-way exchanges of organic material, energy and species between catchments and waterways.
- **understanding the role of connectivity** – human actions often fragment the natural landscape, but the long term survival of species and communities largely depends on their ability to move to different patches of habitat, food and mating partners when required. In waterways, many processes are reliant on the maintenance of water connectivity (longitudinal, lateral and horizontal) and managers must recognise connections between surface water, floodplains and groundwater. However, in some cases, human actions can create connections with negative impacts. The highly connected drainage systems of urban areas deliver large pulses of stormwater to waterways in urban areas with detrimental impacts on waterway condition.
- **facilitating resilience and resistance** – disturbance is a natural and common force affecting waterways, especially in the highly variable climate of Australia. Many species have evolved mechanisms to withstand the effects of disturbance (resistance) or to bounce back after a disturbance (resilience). Facilitating resilience through the identification and protection of refuges for species from disturbances such as drought, bushfire, predation and competition and maintaining connectivity, is vital for maintaining waterway condition. Improving riparian vegetation can help to restore resistance of waterways to events such as floods.
- **understanding patterns of species diversity and habitat requirements** – the occurrence and distribution of species across the landscape is regulated by a range of complex factors such as local catchment characteristics, species life history, competition, predation, colonisation ability and the lottery of species arrivals at new locations. The introduction of exotic species (for example, carp and mosquitofish) has long had serious impacts on native species. Different waterway species have very different habitat requirements and factors such as the location, structure, complexity and spatial arrangement of habitat can influence patterns of species abundance and distribution.
- **providing appropriate hydrological regimes** – altered patterns of flow (from dams, levees, water extraction, urbanisation and constructed drainage systems) can affect waterway condition. Maintaining (or improving) the quantity, quality and timing of water is a major factor for improving waterway condition. Changes in freshwater flows can have significant impacts on estuaries and cause changes to salinity regimes.
- **maintaining appropriate water quality** – the natural variability of the Australian climate results in highly variable water quality, which native plants and animals have evolved to cope with. Nonetheless, water quality can be limiting to their survival; this commonly occurs when salinity levels are too high or when oxygen levels drop too low. Within urban and agricultural environments, pollutants can also be a significant problem.



Growling Grass Frog. Courtesy Wimmera CMA



Salinity at Karadoc Swamp. Photographer: Brigid Hussey

2.1.5 Impacts of declining waterway condition

When waterway condition declines, the values that waterways provide can be degraded or lost. Values that are most dependent on environmental condition (such as clean drinking water) are lost first and those values with less reliance on condition are then gradually affected. Even irrigation water and drinking water for stock can become unusable if the water quality is too poor.

Recreation and tourism industries are heavily reliant on healthy waterways. Declines in waterway condition can have flow-on effects for regional and urban economies. The recreational fishing industry alone contributed approximately 5,200 jobs in Victoria in 2008/2009. When poor water quality or reduced environmental flows impacts on fish numbers, the opportunities for recreational fishing also decline.

Declining waterway condition can also lead to direct economic costs for communities (see Box 2.4). Poor land management can result in a deterioration of water quality and hence high costs for water treatment. Poor water quality, in turn, can trigger algal blooms leading to costs associated with providing alternative water supplies, cessation of irrigation, closure of recreational lakes and loss of recreational and tourism revenue. Accelerated erosion of riverbeds and banks may cause loss of valuable land or public infrastructure, such as roads and bridges. Other costs will not be able to be measured in economic terms. For example, over extraction of water affects diversity and abundance of many native aquatic plants and animals.

Communities have become increasingly aware of environmental problems and they value improvements in environmental condition. Farmers, Landcare networks and other community action groups play a significant role in contributing to improvements in the environmental condition of waterways through better on-farm management practices, local planting days and pest plant and animal control. Some of the gains in environmental condition from restoration work can be measured in economic terms. A study in the Goulburn Broken region on the economic value associated with improvements to the health of rivers found that protecting 30 km of riparian vegetation along a large inland river would generate around \$12.5 million worth of environmental health benefits⁹.

Box 2.4: Economic costs associated with declining waterway condition

Declining environmental condition in waterways can have significant economic (and other) costs for regional and urban economies. Estimates of the economic costs of algal blooms show that:

- the direct economic impact on the tourism industry of the blue green algae bloom that built up in the Gippsland Lakes in late December 2007 and continued into 2008 was over \$18.2 million¹⁰. A study is currently being undertaken to determine the effects of the late 2011/early 2012 algal bloom in the Gippsland Lakes.
- the net employment impact on the Victorian economy from the 2008 Gippsland Lakes algal bloom was 90 jobs¹⁰.

Aquatic invasive species control can also be very expensive:

- approximately \$10 million is spent annually controlling willows in Victoria
- the management of carp in Australia has been conservatively estimated at \$15.8 million annually¹¹.

River erosion can result in the loss of valuable land, private assets and public infrastructure (for example, bridges and roads), particularly during floods:

- the cost of river-related flood recovery programs in Victoria from the 2010/11 floods was approximately \$23 million¹²
- the cost of river-related flood recovery programs in Gippsland from the 2007 floods was approximately \$11 million¹².

2.2 The types of waterways based on their environmental condition and values

The environmental condition of waterways in Victoria varies from excellent through to very poor (see Section 3.2), reflecting the fact that some waterways are largely unmodified but others are intensively used and highly modified.

The environmental condition of a waterway has a strong influence on the types of values present. A waterway with excellent environmental condition often has many natural values. Waterways in moderate environmental condition may have few natural values, but high social and recreational values. For management purposes, it is useful to consider the typical values associated with waterways in different environmental condition because this assists with setting realistic targets and objectives that reflect the level to which a waterway is modified. Simple conceptual groupings have been developed to describe these different types of waterways (see Figure 2.2), although these groups are not necessarily mutually exclusive and do not have clearly defined boundaries between them.

Near natural waterways

Waterways that are in a near natural state contain almost all of the naturally occurring environmental values and are likely to be found within largely unmodified catchments. These environmental values may include most species that would have been present prior to European settlement and a high degree of naturalness for bird, fish, aquatic invertebrate and plant communities due to limited human impacts. Near natural waterways may also have special environmental features such as drought refuges, or important bird habitat for internationally protected species.

These systems are generally unregulated with close to natural water regimes and water quality. They are usually formally recognised for their environmental significance. All the major habitat features are present and both lateral and longitudinal connectivity exists. Near natural waterways are in a natural state along their entire length (for example, from 'the source to the sea') and generally occur in National or State Parks. Near natural waterways are enjoyed by those pursuing recreation in remote natural areas. Many indirect services are provided by waterways in a near natural condition, including nutrient cycling and water filtration. Some examples of near natural waterways in Victoria are small coastal streams and wetlands contained within the Great Otway National Park and in far East Gippsland.

Ecologically healthy waterways

Ecologically healthy waterways have the major ecological features and functioning of ecosystems prior to European settlement and generally exist where surrounding catchment condition is not heavily impacted. However, some change from a near natural state has occurred due to the level of human use that has impacted on environmental condition. These systems still have many important environmental values, including some rare or threatened species. Bird, fish, aquatic invertebrate and plant communities may still have a relatively high degree of naturalness. The risk that these environmental values will be compromised in the future is generally low. Linkages between rivers, floodplains and associated wetlands are still present to an extent that they are able to maintain important ecological processes. Riparian vegetation exists along the majority of the system and few exotic species are present.

Ecologically healthy waterways are often found in National or State Parks and largely forested catchments and may provide clean water supplies and habitat for rare or threatened species present. These waterways might also be important drought refuges in the landscape and be more resistant to the effects of flooding, which means lower costs for repair and maintenance after flood events. They are often enjoyed for their natural scenic values and are generally more accessible for recreational and tourist activities than near natural waterways. Ecologically healthy waterways may support Aboriginal cultural values, such as totem species. A river may be ecologically healthy along part of its length, such as the upland section, and become highly modified in other sections (for example, downstream of a major dam).

Sustainable working waterways

Sustainable working waterways have lost some environmental values due to more intensive levels of human use and modification. However, many environmental values that are required for key ecosystem processes and functioning are maintained. The condition of surrounding catchments is likely to be moderate or poor. This is due to the level of human activities and use that have degraded the environmental condition of the waterway. Water regimes are likely to have been significantly altered. However, there is sufficient water to maintain plants and animals through dry times and to provide for recovery in wetter years. There may be some threats present from poor water quality, but it should be adequate to maintain the key values present in the waterway. Several exotic species may be present and in some areas the riparian zone may be significantly degraded.

The capacity for fish to move up and down rivers may be restricted in places by barriers such as weirs and road crossings. Some areas of the floodplain, including floodplain wetlands, may be disconnected from the river. However, overall, many important natural features and functions are still present. It is important to note, however, that the environmental values will often require ongoing management for them to persist into the future.

Sustainable working waterways often support important social and economic values, especially in regional Victoria, and are not necessarily unhealthy. Importantly, these systems do continue to support some environmental values. They often occur in agricultural or peri-urban landscapes and provide for many recreational pursuits, such as water sports, camping and picnicking. Sustainable working waterways also typically supply water for urban and rural uses, for hydro-power production, and act as water carriers and wastewater discharges. A balance of different values is retained in working waterways despite the fact that some elements of environmental condition have been traded off to accommodate a certain level of use human use or activities.

Highly modified waterways

In highly modified waterways, most environmental values are lost or are at risk of being compromised. Surrounding catchment condition is often poor or very poor and may be highly modified or urbanised. Both the water quality and water regimes are often insufficient to maintain environmental values in the long-term. Many threatening processes (such as a loss of connectivity and riparian vegetation) are severe. There is a high level of human activity that has impacted on the environmental condition, but some economic values are provided. Highly modified waterways generally occur in areas of intensive agriculture or in highly urbanised environments.

Social values, such as recreational pursuits and amenity, may be low in agricultural areas where access is limited. However, some highly modified urban systems may provide significant social values due to their proximity to areas of high human population density. In urban areas, highly modified waterways often provide important values, such as flood protection and drainage.

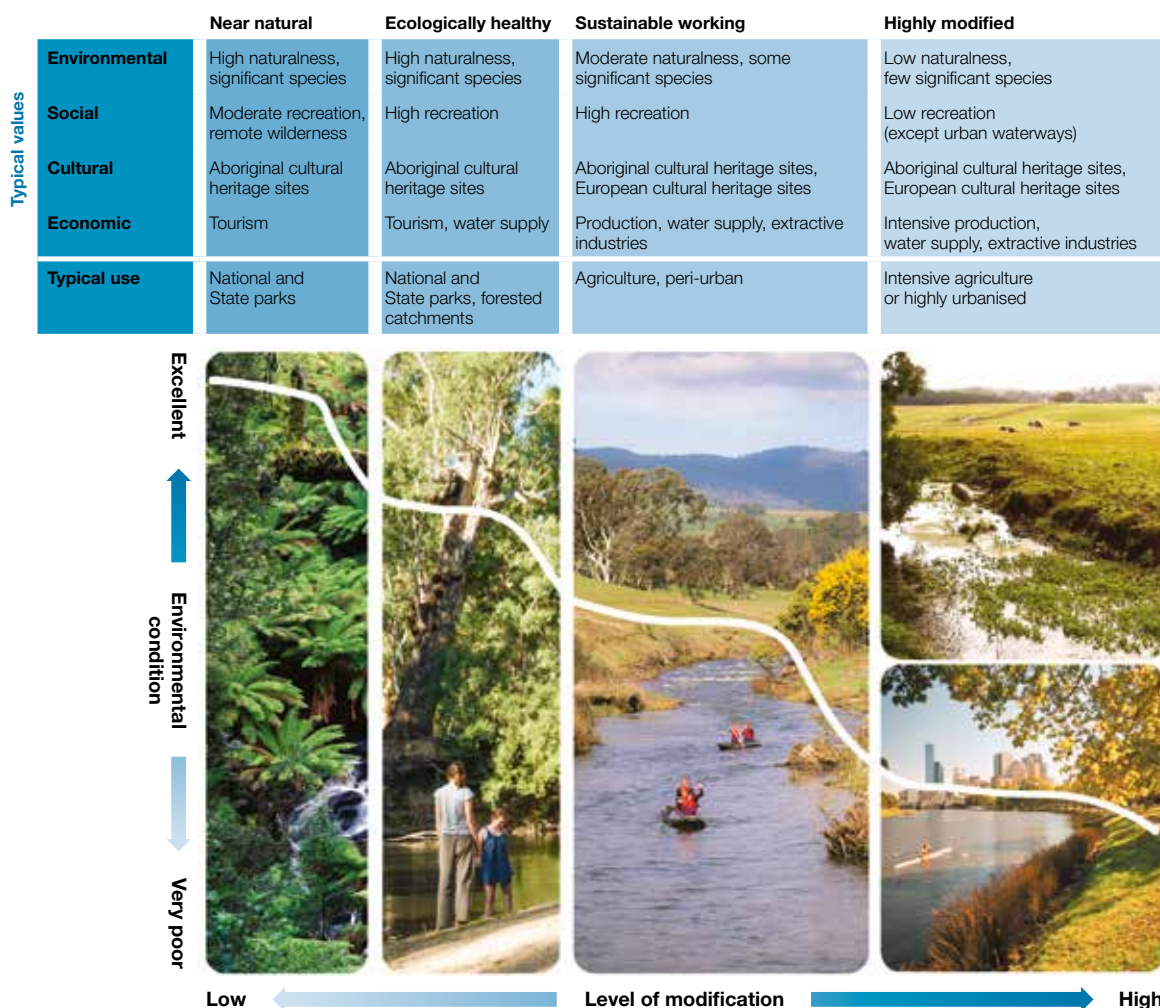


Figure 2.2: Types of waterways depending on their values, condition and typical uses.

2.3 Achievements of the Victorian River Health Program (2002–2012)

Over the past decade, the Victorian River Health Program has worked to improve river condition by undertaking a range of management activities including; environmental water management, improving instream habitat and revegetating or fencing off riparian areas through voluntary partnerships with landholders.

In Victoria these management activities are undertaken by waterway managers (that is, catchment management authorities and Melbourne Water in the metropolitan region) in partnership with government, landholders and community groups (see Section 3.6). Significant funding for these activities comes from water corporations, who are legally required to contribute towards initiatives to improve the sustainable management of water (called the Environmental Contribution). The Environmental Contribution (EC) provided \$54 million to undertake activities to improve waterway health from 2004–2008 and a further \$87 million for 2008–2012. The next phase (2012–2016) of committed funding from the EC is \$107 million, which will build on the success of past management efforts.

State government funding is also provided to waterway managers for undertaking statutory functions in relation to waterway management (see Section 18.4.1).

These fund sources are complemented by additional State government funding and federal initiatives, such as the Caring for our Country program (see Section 18.4 for further detail on funding arrangements).



Tree planting at Grangeburn Wetland. Courtesy Glenelg Hopkins CMA

Landholders and community groups also contribute, often by donating their own time and resources to undertake works, or applying for alternative sources of funding from local or federal government.

The *Victorian River Health Program Report Card 2002–2009*¹³ showed that progress on implementing management activities in priority areas has been excellent. The river length accessible to native fish has increased, some improvements to river and floodplain linkages have been completed, processes for improving environmental flows in stressed river reaches have been put into place and thousands of kilometres of riparian vegetation have been protected (see Box 2.5). A recent survey of riparian works and landholder attitudes found that the majority of landholders involved in managing riparian land reported no loss of productivity across their property and felt the health of the waterway had improved as a result of the works¹⁴. Nearly all survey respondents were willing to recommend riparian works to other landholders¹⁴. Work on local priority areas by landholders and community groups across the catchment complements the work undertaken by the waterway managers and extends the reach of environmental works beyond that which government investment can achieve alone.

Box 2.5: Victorian River Health Program Report Card 2002–2009

Improving the condition of waterways across the state is a long-term goal that requires strategic planning and investment by government and community. Despite the drought, the *Victorian River Health Program Report Card 2002–2009* showed great progress was made over the past decade. Some of the key achievements highlighted in the report include:

- 402 gigalitres of water was recovered; improving environmental flows in 71 river reaches – far exceeding the 2011 target set for improvements to 20 river reaches
- fish passage has been provided at over 150 locations by removing obstructions and building fishways and allowing fish to move into 7,000 km of rivers and streams - tripling the overall target
- 6,473 management agreements with landholders were established and 7,066 km of riparian fencing and other protection measures improved the condition of 25,351 ha of high priority frontage
- more than 600 groups, comprising of 2,300 volunteers, regularly monitored rivers in more than 1,900 sites across the state.

Management activities outlined in the *Victorian River Health Program Report Card 2002–2009* were undertaken against the backdrop of challenging climatic conditions. This period coincided with a severe 13-year drought that affected rainfall and streamflow across south-eastern Australia and degraded the condition of waterways across the state. Management activities by waterway managers, landholders and community groups helped slow the rate of decline for many systems (see Section 3.2). A shift towards protecting drought refuges to avoid critical loss of species and habitats during the drought helped to improve the resilience of waterways. The last few years have seen a return of high flows, which have improved the environmental condition of many waterways and species that inhabit them. Large-scale riparian revegetation programs have also proven beneficial during recent flood events by reducing the occurrence and scale of flood related channel change¹².

While excellent progress has been achieved in undertaking management activities, there is likely to be a time lag before all the improvements in river condition will be seen. Depending on the activity and the scale at which it is undertaken, this can be anything from less than one year for the installation of a fishway, to 25-50 years for the full environmental benefit of riparian management programs. Nevertheless, we are starting to see the benefits of our efforts. For example, entire sub-catchments in East Gippsland have now undergone riparian improvement through fencing, revegetation and other complementary works (Figure 2.3a and 2.3b). Benefits from this work include improved habitat for birds, insects and mammals; reduction in erosion and channel change during flood events; shading and organic inputs to waterways from trees; and improved water quality.



Waterwatch volunteer monitoring, Kiewa River.
Courtesy North East CMA



a)



b)

Figure 2.3: Genoa River, East Gippsland in a) 1989 and b) 2009 following riparian management programs.

2.4 The next step: progressing the policy framework

Although the progress of waterway management in Victoria over the last decade has been positive, many challenges remain.

A review of the *Victorian River Health Strategy*¹⁵ highlighted several key improvements required to progress the state policy framework. This Strategy provides an updated framework for managing waterways in Victoria that incorporates those lessons learnt over the past decade.

2.4.1 Managing all waterways within a single framework

Victoria has a long history of integrated catchment management that recognises improvements in the environmental condition of land, water and biodiversity cannot be achieved in isolation from each other. Similarly, rivers should not be managed in isolation from the management of wetlands, estuaries and marine receiving waters. This requires the policy framework outlined in the *Victorian River Health Strategy*¹⁶ to be expanded and updated to incorporate the management of estuaries and wetlands and consideration of impacts on marine receiving waters; providing a single management framework for all waterways in Victoria (see Chapters 3 and 4).

2.4.2 Directing investment to regional priorities

Priority setting is a key task in waterway management. Government investment must be directed to activities that provide the most efficient and effective long-term improvements in waterway condition and the greatest community benefits. A clear process for setting regional priorities is required. It should consider the environmental, social, cultural and economic values of waterways (see Section 4.2.3) and the level of risk to those values.

2.4.3 Setting practical objectives for waterways

The objectives for waterway management need to be practical and recognise the types of values present in a given waterway. If a waterway is in very good environmental condition, then aspirations to protect the current condition are appropriate. If a waterway is highly regulated and modified, the proposed environmental objectives and outcomes should be based on the concept of a sustainable working waterway and management activities should focus on balancing the key values still present. Aiming to greatly improve the environmental values of highly regulated and modified systems may be unrealistic and not cost effective. It is recognised that there can be different management objectives for waterways depending on their current condition and future outlook.

2.4.4 Using environmental water efficiently and effectively

Victoria has a clear framework for making decisions about water allocation and entitlements. This includes a share of water for the environment (see Section 8.1). The framework for making decisions about water allocation and entitlements has been strengthened in recent years with the development of the four regional Sustainable Water Strategies (SWSS) to plan for long-term water security across the state. This has been the main mechanism for making decisions about additional water required for environmental needs.

The key task for waterway management now, is to ensure that the water set aside for the environment is used as efficiently and effectively as possible and that its management is comprehensively integrated with other management activities. Efficient use of environmental water also means that less water recovery is required, which will help to reduce social and economic impacts on agricultural production and regional communities.

The establishment of the Victorian Environmental Water Holder and new planning processes for environmental water management are significant advances in this area (see Chapter 8).

2.4.5 Recognising working waterways need ongoing management

Whilst the protection of Victoria's few waterways that remain in excellent condition is vital, it must be recognised that the majority of onground works and active environmental water management will occur in systems where some decline in condition has occurred. Onground works include activities to improve habitat, water quality, water regimes and connectivity, such as riparian fencing and revegetation, erosion control, provision of fish passage, instream habitat improvements and the delivery of environmental water, where available. It is the waterways where trade-offs between human use and environmental condition have occurred that require high levels of ongoing management in order to prevent further degradation or improve their environmental condition where possible. Maintenance activities are also critical to ensure investment in onground works is protected over time (see Section 3.7).

2.4.6 Strengthening community partnerships in waterway management

Waterway management in Victoria is undertaken as a partnership between government, landholders and the community. The partnership approach will be further strengthened by providing opportunities for communities to participate in planning, implementing and monitoring regional work programs for waterways (see Chapter 5). Victorian Traditional Owners will be recognised as important partners in the regional management of land and water (see Chapter 6).

Community ownership and care of waterways are critical to maintaining waterway condition. Stewardship will continue to be encouraged and community engagement programs will build on the community's appreciation of the values that waterways provide. To assist in capacity building, access to knowledge will be provided by making data publicly available and through education programs.

2.4.7 Managing through droughts, bushfires and floods

The management framework outlined in the *Victorian River Health Strategy* did not have the flexibility to consider how priorities and management activities could be modified in response to events such as droughts, bushfires and floods. The recent prolonged dry period, followed by major flooding in many parts of the state in late 2010 and early 2011, proved very challenging to address under that framework. Drought, bushfires and floods have highlighted the need for a more flexible and adaptive approach that is robust under a range of conditions (see Section 4.2.5). Clearly defined response, funding and recovery mechanisms to address extreme bushfire and flood events are also required (see Chapter 15).

2.4.8 Planning for the potential impacts of climate change

The climatic conditions experienced in Victoria over the past 15 years included a severe 13-year drought but also some of the worst floods in the state's history. In the period 1997–2009, rainfall and runoff in south-eastern Australia

were reduced by more than 50 per cent in many areas¹⁷. This severe drought was followed by widespread flooding between September 2010 and February 2011, during one of the strongest La Niña events ever recorded. The range of current climate change scenarios show that Victorian waterways could be subject to longer and more frequent droughts punctuated with more severe large storms and floods. However, although climate scientists generally predict Victoria's climate will get drier and more variable, it is difficult to predict how climate change will affect long-term rainfall in individual catchments. It is important to plan for a full range of possible future climate scenarios and natural climate variability. Management objectives for waterways and regional work programs therefore need to consider the full range of possible climate conditions during planning phases (see Section 4.2.5).

2.4.9 Using new knowledge and an updated adaptive management approach

The current framework for the management of waterways in Victoria is an adaptive one. There is the capacity to change management strategies on the basis of improved knowledge, new research and better management processes. New baseline information on waterway condition and the Victorian community's perceptions of waterways will continue to be collected and inform waterway management decisions. Evidence-based logic models (see Section 17.2.1) will be used to identify the most appropriate management activities to reduce particular threats to waterways and highlight priority areas for further research (see Chapter 17).



The Wimmera Rowing racecourse during drought. Courtesy Wimmera CMA