

# West Gippsland **Waterway Strategy** 2014-2022





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## Acknowledgements

The development of this *West Gippsland Waterway Strategy* has involved the collective effort of a number of individuals and organisations. In particular:

Primary Author – Michelle Dickson (WGCMA)

Contributing Authors:

- Tracey Jones, Eleisha Keogh, Mandy Leggett, Rachael Millar (WGCMA)
- Mark Stacey (Alluvium Consulting)
- Geoff Park (Natural Decisions)
- Taylor Hunt (DEPI)

Technical input from WGCMA staff: Matt Bowler, Richard Allen, Dan Cook, Rod Johnston, David Stork, Tammy Logan.

Steering Group members: Ian Gibson and Ian Hill (WGCMA board), Martin Fuller, Kylie Debono, Dan Garlick, Adam Dunn.

Information on Aboriginal cultural and community values and the priorities of Traditional Owners was prepared by Mandy Leggett, Aboriginal Cultural Heritage Officer with WGCMA on behalf of the Gunaikurnai Land and Waterways Aboriginal Corporation (GLaWAC) and the BoonWurrung Foundation. It has contributions from GLaWAC elders, board, staff and community members.

BoonWurrung Foundation director Aunty Caroline Briggs and Anne Fildes.

## Acknowledgement of Country

We would like to acknowledge and pay our respects to the Traditional Land Owners and other indigenous people within the catchment area: the Gunaikurnai, The Bunurong and Boon Wurrung, and the Wurundjeri people. We also recognise the contribution of Aboriginal and Torres Strait Islander people and organisations in Land and Natural Resource Management.



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## Abbreviations

AVIRA	Aquatic Values Identification and Risk Assessment
BMP	Best Management Practice
CIFHA	Corner Inlet Fisheries Habitat Association
CMA	Catchment Management Authority
Cwlth	Commonwealth
ECD	Ecological Character Description
ESO	Environmental Significance Overlay
EWMP	Environmental Water Management Plan
DEPI	Department of Environment and Primary Industries
DSE	Department of Sustainability of Environment (now part of DEPI)
DPI	Department of Primary Industries (now part of DEPI)
GDE	Groundwater Dependent Ecosystem
INFFER	Investment Framework for Environmental Resources
IPA	Invasive Plant and Animal
LAC	Limit of Acceptable Change
LMP	Local Management Plan
MERI	Monitoring Evaluation Reporting and Improvement
RCS	Regional Catchment Strategy
RHS	River Health Strategy
VWMS	Victorian Waterway Management Strategy
VRHS	Victorian River Health Strategy
VROT	Victorian Rare or Threatened Species
WBCS	Waterway Benefit: Cost Scoring
WGCMA	West Gippsland Catchment Management Authority



# Chair's Foreword

The health of the waterways in West Gippsland is critical to the sustainability of our region. These waterways support the regional and state economy by providing water for agriculture, industry and for urban and rural communities, including part of Melbourne's water supply. Our iconic coastal wetlands and inlets including the Gippsland Lakes, Anderson Inlet and Corner Inlet attract tourists to our beautiful region. Waterways are also valued for the recreational opportunities they provide, their cultural values and their role in the landscape supporting a range of ecological processes.

This *West Gippsland Waterway Strategy* forms a sub strategy to the *West Gippsland Regional Catchment Strategy*, implements the policy framework from the *Victorian Waterway Management Strategy 2013* and builds on the achievements and learnings from the previous *West Gippsland River Health Strategy*. In framing this Strategy we are mindful of our obligations under the *Catchment and Land Protection Act 1994* and *Water Act 1989* as well as other relevant legislation for the management waterways in the region.

This Waterway Strategy identifies the priority waterways in the region and sets out a realistic eight year work program of management activities which are practical, feasible and cost effective. The priority waterways have been identified through a robust, evidence based process linking waterways to a set of Regional Goals through an analysis of their values and the risks to those values. Priorities have been identified for waterways at risk and those where values or past works are to be maintained.

However, activities may also be required outside these priorities, where there is strong community support, where action is required in order improve or maintain the values of a priority waterway or in responding to natural disasters such as bushfire and flood.

This Waterway Strategy is broader in scope than the previous *River Health Strategy*, by addressing rivers, wetlands and estuaries in an integrated approach. The Waterway Strategy has been prepared in cooperation with our partner organisations and a variety of communities across the West Gippsland region. We look forward to continuing to work with our regional stakeholders throughout the implementation of this Waterway Strategy for the improvement, resilience and management of our region's natural resource environment.

Angus Hume  
Chair



# Executive Summary

Waterways in the West Gippsland region provide a range of important community uses such as supply of water for industrial, agricultural and domestic use, recreational pursuits such as kayaking, bird watching, hunting and fishing, and providing habitat for plants and animals.

The purpose of the *West Gippsland Waterway Strategy* (the Strategy) is to ensure the future management of waterways provides the appropriate environmental conditions to support the range of identified values (environmental, social, cultural and economic).

The Strategy builds on the achievements and learnings from the previous *West Gippsland River Health Strategy* (2005), but is wider in its scope addressing rivers, estuaries and wetlands. It provides a framework for waterway management that is consistent with the *Victorian Waterway Management Strategy* (2013) and the *West Gippsland Regional Catchment Strategy* (2013).

The 50 year vision for the Strategy is: *Our rivers, estuaries and wetlands are well managed to provide connectivity across our landscape, and are widely valued and appreciated for the benefits they provide.*

The regional goals are listed below.

- Maintain and improve the habitat and condition of waterways to support water dependent animals and plants.
- Reduce future impacts to public infrastructure resulting from physical changes to a waterway associated with floods and storms.
- Maintain the ecological character of significant wetlands and estuaries.
- Provide system connectivity between rivers, estuaries and wetlands.
- Improve the condition of urban waterways in partnership with local government.
- Maximise the ecological outcomes from the available environmental water.
- Support community use, participation, advocacy and stewardship in the region's waterways.
- Maintain and improve the values of Heritage Rivers.
- Provide appropriate environmental conditions to support the economic values of waterways in the region.

The development of the Strategy has included the identification of high value waterways and the use of regional goals to help identify priority waterways for the eight-year planning period from 2014–2022.

A work program of management activities for priority waterways was developed to guide investment over this eight-year period. The Strategy also identifies priorities for environmental water management, together with the complementary management activities required at these sites.

Implementation of management activities will be based on a set of principles drawn from the *Victorian Waterway Management Strategy* (VWMS) including:

- using a partnership approach
- ensuring waterway management is considered within the context of integrated catchment management, using appropriate delivery mechanisms with consideration to public versus private benefits and the cost sharing principles set out in the *VWMS*
- ensuring value for money through investment
- taking a seasonally adaptive approach based on an understanding of short to medium term trends in climate
- using evidence-based decision making, drawing on local knowledge, science and expert opinion.

The regional work program provides clear direction to guide investment in waterway management. These work priorities will provide guidance to West Gippsland Catchment Management Authority (WGCMA), local, state and Australian governments, community groups and corporate or individual partners about where investment is required in the region over an eight year period.

This Strategy provides investors with confidence that their annual funding of management activities is linked to a longer term strategic plan and leads to improvements in waterway health.

The content required for waterway strategies was outlined in guidelines published by the Department of Environment and Primary Industries (DEPI) and guidance notes developed in partnership with CMA waterway managers.

## Document Structure

This Strategy is divided into four main sections – parts A, B, C and D.

Part A covers this introduction, the context of this Strategy and an overview of waterways in the West Gippsland region. This includes:

- the scope, vision and objectives of the Strategy
- an overview of the legislation and policy relevant to this Strategy
- an explanation of the roles and responsibilities of WGCMA
- a review of the *West Gippsland River Health Strategy* and its achievements
- an overview of rivers, wetlands and estuaries in West Gippsland, and their environmental, cultural, social and economic values.

Part B sets out a discussion of the major waterway threats in the region and the management responses to them including:

- riparian land
- water quality
- estuaries
- urban waterways and development
- works on waterways approvals
- environmental water
- groundwater dependent ecosystems
- invasive plants and animals
- flooding, storm and bushfire
- threatened plants and animals
- climate change.

Part C describes the approach taken for the prioritisation of waterways and the development of targets and a work program for these priorities. This includes:

- an overview of the approach taken including the guiding principles, the assets based approach and consultation undertaken
- the vision and goals of the Strategy
- a discussion of the identification of high value waterways, types of priorities, Aboriginal priorities and fishery management priorities.

Part D sets out the work program, how it will be implemented and evaluated. This includes:

- tables showing the regional work program from 2014 to 2022
- how the program will be implemented, resourced and the roles and responsibilities for each agency
- monitoring, evaluation and reporting on the work program
- the consultation process
- references
- appendices.



# Part A – Overview and Strategic Context

## 1 Context

This section describes the scope and outlines the policy and legislative context of this Strategy.

### 1.1 Scope

The Strategy focuses on the management of rivers, their associated estuaries and floodplain and non-riverine wetlands.

The focus for wetlands is largely on natural wetlands, although it is acknowledged that many constructed wetlands, particularly in urban settings, have important social values.

The Strategy does not include the shallow marine waters except for those listed as wetlands of National Importance or International Importance (Ramsar sites). The management of water resources (groundwater and surface water) with the exception of environmental water is not addressed in this Strategy. The management of floodplains and managing for flood risk is not within the scope of this strategy, these issues will be addressed in regional floodplain management strategies (when developed).

The objectives of the Strategy are to:

- identify the region's high value waterways (environmental, social, cultural and economic values)
- determine a subset of priority waterways
- establish targets for priority waterways
- set out an eight-year work program that identifies management activities for priority waterways
- set out the management plan for Corner Inlet Ramsar Site
- establish a monitoring and evaluation framework to determine the success of implementing the Strategy.

## 1.2 Vision

The vision and regional goals for waterway management are central to the logic framework of this Strategy and are set out below. The Vision describes the long term aim of waterway management and the regional goals help to identify priority waterways.

*Our rivers, estuaries and wetlands are well managed to provide connectivity across our landscape, and are widely valued and appreciated for the benefits they provide.*

### Regional goals

- Maintain and improve the habitat and condition of waterways to support water dependent animals and plants.
- Reduce future impacts to public infrastructure resulting from physical changes to a waterway associated with floods and storms.
- Maintain the ecological character of significant wetlands and estuaries.
- Provide system connectivity between rivers, estuaries and wetlands.
- Improve the condition of urban waterways in partnership with local government.
- Maximise the ecological outcomes from the available environmental water.
- Support community use, participation, advocacy and stewardship in the region's waterways.
- Maintain and improve the values of Heritage Rivers.
- Provide appropriate environmental conditions to support the economic values of waterways in the region.

## 1.3 Scale of Management

The term 'reaches' is used to describe a section of river (generally 20-30 km long) or a section of an estuary and is the common planning unit for management.

The planning for wetlands has occurred at two different scales based on the approach used in the *West Gippsland Wetlands Plan*. Planning at the individual site scale has been used for those wetlands that have International or National significance. Planning for all other wetlands has been undertaken at the broader management unit levels with priorities based on the type of wetland. This means that the priority level of individual wetlands will need to be informed by site based assessments of condition and values.

The three river basins within West Gippsland defined by the Australian Water Resources Council (AWRC) are the Thomson, Latrobe and South Gippsland river basins. The Strategy considers all three river basins and their associated tributary systems. Each river basin has a direct influence on high value lakes and coastal environments including the Gippsland Lakes and Corner Inlet Ramsar sites and Anderson Inlet, Shallow Inlet and the Powlett River estuary.

Within the region a number of management units have been defined. Management units are aggregations of reaches and wetlands and have been defined by topographical data, land use, river form and process and local knowledge. The definition of boundaries has also been influenced by considering internal and external operational and reporting requirements. Unlike the previous sub-catchments defined for waterway management these management units are not aligned to the River Basins. Figure 1 shows the management units for West Gippsland.

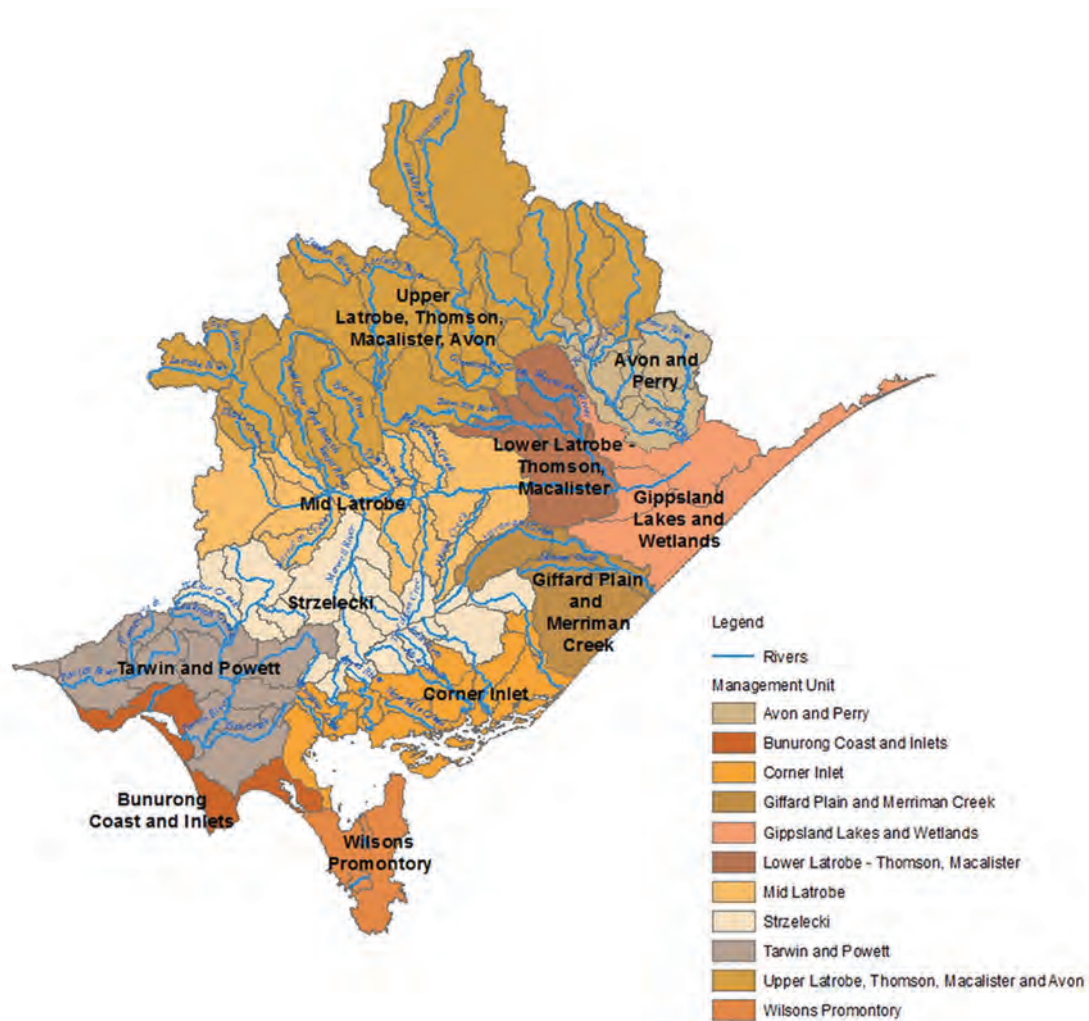


Figure 1 Waterway Management Units

## 1.4 Legislation and Policy

Preparing this Strategy for the West Gippsland region is a statutory requirement for WGCMA under the *Water Act 1989*. This Strategy replaces the *West Gippsland River Health Strategy*. It has been prepared in line with the *Victorian Waterway Management Strategy*, Department of Environment and Primary Industry guidance notes and relevant sustainable water strategies. It also complements relevant sub-strategies such as urban waterway management plans and the *Corner Inlet Water Quality Improvement Plan*.

The Strategy is part of the bigger picture of waterway management. It is consistent with the planning framework established through the *Regional Catchment Strategy (RCS) (2013)* and the *Victorian Waterway Management Strategy*, which updates the *Victorian River Health Strategy (2002)*.

The *RCS* includes a long term vision for the region, identifies regionally significant land, water and biodiversity assets and priorities, and sets 20 year condition objectives and six year management measures. Long term objectives in the *RCS* will be implemented through this Strategy.

The Strategy provides the framework to guide WGCMA in partnership with the community to manage our rivers, wetlands and estuaries to support environmental, social, cultural and economic values.

Central and Gippsland region sustainable water strategies investigate the range of potential changes to water availability under several climate change scenarios. They also examine future consumptive demand and environmental needs and set out proposed options to balance and secure water for all users.

The *Gippsland Regional Growth Plan* provides broad direction for land use and development across regional Victoria (GLGN and DTPLI 2014). The *Regional Growth Plan* has as one of its key principles to promote a healthy environment by valuing the region’s environmental and heritage assets, and by minimising the region’s exposure to natural hazards and risks. The *Regional Growth Plan* identifies a range of actions that aim to reduce the risks to waterways from future growth.

When finalised the *Victorian Floodplain Management Strategy* will provide a consistent statewide framework for the management of flood related issues and provide for the preparation of regional floodplain management strategies.



**Figure 2 The planning framework for the West Gippsland Waterway Strategy**

At the federal level, since 2004, water reform has been guided by the National Water Initiative (NWI). 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. The *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) provides the Australian government with a legal framework to protect and manage Ramsar sites, nationally and internationally important flora, fauna, ecological communities and heritage places defined in the Act as matters of national environmental significance.



*Pictured: Thomson River, near Horseshoe Bend*

The *Native Title Act 1993* (Cwlth) provides a framework for the protection and recognition of native title. The Act gives Aboriginal 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. The Victorian Government introduced the *Aboriginal Heritage Act 2006*. This Act replaces Part IIA of the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984* and the *State Archaeological and Aboriginal Relics Preservation Act 1972*. The Act links the protection of Aboriginal cultural heritage more directly with planning and land development processes.

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*. 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 entitlements.

The key state wide policy framework for water quality protection in Victoria is the *State Environment Protection Policy (Waters of Victoria)* (SEPP (WoV)). 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. Other relevant Victorian legislation is the *Flora and Fauna Guarantee Act 1988* (FFG Act) which legislates for the conservation of threatened species and communities and for the management of potentially threatening processes, and the *Coastal Management Act 1995* which establishes a framework for coordinated strategic coastal planning in Victoria and provides for the use, development and protection of coastal crown land.

At the regional level, the *Catchment and Land Protection Act 1994* establishes regional catchment strategies as the primary framework for integrated management of land, water and biodiversity in each of the ten catchment regions of Victoria.

For the purposes of the Victorian Planning Provisions (at clause 12.03), this Waterway Strategy is considered an approved management plan and therefore must be considered in planning decisions. More information on how the Victorian Planning Provisions influence waterway management can be found in the Opportunities and Challenges section in this Strategy.

Other state and federal government legislation, policies and initiatives relevant to this Strategy are shown in Appendix one.



## 1.5 Waterways with Formally Recognised Significance

The *Convention on Wetlands of International Importance* (the Ramsar Convention) provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Convention encourages member countries to nominate sites containing representative, rare or unique wetlands, or that are important for conserving biological diversity, to the *List of Wetlands of International Importance* (Ramsar sites). Ramsar sites are a matter of national environmental significance under the *Environment Protection and Biodiversity Act 1999*.

The Gippsland Lakes and Corner Inlet are two of the 11 wetlands in Victoria listed under the Ramsar Convention in recognition of the significant coastal wetland values and features present. The Gippsland Lakes Ramsar Site extends into the East Gippsland Catchment Management Authority region whilst Corner Inlet is wholly within the WGCMA region.

As a Contracting Party to the Ramsar Convention, Australia is required to maintain the ecological character of its Ramsar sites at the time they were listed through conservation and wise use. The ecological character is defined by the Convention as “*the combination of the ecosystem components, processes and benefits/services that characterise the wetlands at a given point in time*”. A change in ecological character is the “*human induced adverse alteration of any ecosystem component, process and or ecosystem benefit/service.*”

An ecological character description has been completed for Corner Inlet and the Gippsland Lakes (BMT WBM 2011 and 2011a). The ecological character descriptions define limits of acceptable change (LACs) for ecosystem services/benefits (values) and physical, chemical and biological ecosystem components and processes that are considered critical to the ecological character of the Ramsar site. It also recommends monitoring needs for each Ramsar site.

Planning for the region’s two Ramsar sites has occurred concurrently with this Strategy. Management planning for the Corner Inlet Ramsar Site has been included in this document; however the Gippsland Lakes Ramsar Plan will be a stand-alone document and is being developed in partnership with the East Gippsland Catchment Management Authority, Gippsland Lakes Ministerial Advisory Committee, Department of Environment and Primary Industries and Parks Victoria.

## 1.6 Roles and Responsibilities

WGCMA coordinates the integrated management of land and water resources within the West Gippsland region under the *Catchment and Land Protection Act 1994*. It aims to achieve ecologically and economically sustainable development of natural resource based industries, protect land and water resources and conserve natural and cultural heritage.

WGCMA is an independent authority mandated by the Victorian Government. It operates mainly under the *Catchment and Land Protection Act 1994* and *Water Act 1989*.

Under Part 10 of the *Water Act 1989*, CMAs are also designated with specific responsibility for the management of waterways, drainage and floodplains.

Established in 1997, WGCMA has fulfilled its responsibilities by taking a partnership approach, working with communities, industries and government agencies to maintain and improve the condition of the region’s natural resource assets.

The goals of the Strategy will be achieved through a range of partnerships regardless of land tenure.



*Pictured: working in partnership with Landcare, landowners and community groups to improve the condition of natural resources.*

WGCMA works with the agencies responsible for managing public land including DEPI, Parks Victoria, water authorities, Traditional Owners and local government. WGCMA also works directly with private landholders and in partnership, industry bodies and community groups to ensure the successful completion of priority actions and the establishment of formal agreements to underpin these projects.

Further detail on the roles and responsibilities of partner agencies and community groups is contained in Appendix two.

## 1.7 Review of the West Gippsland River Health Strategy

The *Victorian River Health Strategy* (VRHS) (DNRE 2002) provided an over-arching framework for communities to work in partnership with government to manage and restore Victorian rivers over the long term.

The *VRHS* set out the regional planning process which included the development of regional river health strategies for each catchment management authority region to integrate all river-related management plans.

The purpose of the *West Gippsland River Health Strategy* (RHS) was to balance protecting, maintaining and enhancing the environmental values of natural river systems and the processes required to sustain river health, while maintaining or improving additional social and economic values important to the local community.

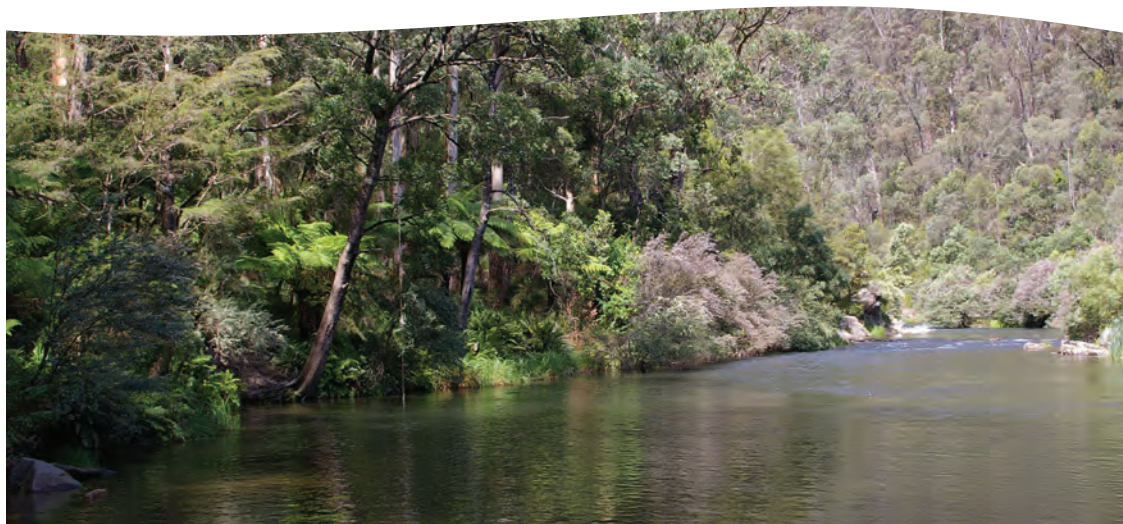
The *RHS* provided a plan to allow coordinated action to be taken over a five year period to maintain or improve the health of rivers.

A review of the *RHS* was completed in 2012 to inform this Strategy. The review found that overall, the *RHS* successfully guided river health work in the region for the WGCMA and some partner organisations. The adaptive management principle was applied with management approaches changing as a result of the experience and knowledge gained during implementation of the *RHS* and in response to unplanned events such as bushfire and flood. Improved knowledge of program logic and MERI processes can be applied to the development and implementation of this Strategy, and improved community engagement mechanisms can be incorporated into waterway activities and the design of the Strategy itself. Finally, an increased focus on communication of the Strategy with stakeholders throughout its life will result in higher levels of ownership, alignment of effort and resources, and an understanding of progress toward outputs and outcomes at any point in time.

The major achievements from the *RHS* from 2005 – 2012 are detailed below. More detail on the learnings from the *RHS* can be found in Appendix three.

- |                                 |  |
|---------------------------------|--|
| <b>Environmental flows</b>      | <ul style="list-style-type: none"> <li>• Delivery of annual seasonal watering program for the Thomson, Macalister and Latrobe rivers and Latrobe Wetlands.</li> <li>• Environmental flow assessments for the Tarra, Avon, Latrobe, Powlett and Tarwin rivers.</li> <li>• Environmental Risk Management arrangements implemented during drought conditions on the Thomson, Macalister, Tarwin, Powlett rivers and Easterbrook Creek where flows were qualified for critical human needs.</li> <li>• Identification of environmental flow requirements to inform management of the Gippsland Lakes and Corner Inlet Ramsar sites.</li> </ul> |
| <b>Stock exclusion</b>          | <ul style="list-style-type: none"> <li>• 310 ha riparian vegetation improved by 224 km fencing to exclude stock.</li> <li>• 405 off-stream watering points provided.</li> </ul>  |
| <b>Revegetation</b>             | <ul style="list-style-type: none"> <li>• 1,100 ha riparian land revegetated and fenced along 373km waterways.</li> </ul>   |
| <b>Wetland improvement</b>      | <ul style="list-style-type: none"> <li>• 205 ha wetlands fenced to exclude stock.</li> </ul>   |
| <b>Invasive species control</b> | <ul style="list-style-type: none"> <li>• 464 ha aquatic weeds (<i>Spartina</i>) controlled.</li> <li>• 1,585 ha riparian weed control (willow) and an additional 580 ha other woody weed control.</li> </ul>   |
| <b>Waterway stabilisation</b>   | <ul style="list-style-type: none"> <li>• 16 km of waterway stabilised through works to address bank erosion at 44 sites.</li> <li>• 46 km of streambed erosion addressed through construction of waterway structures.</li> </ul>   |





*Pictured: Thomson River*

## 2.2 Rivers and creeks

WGCMA is responsible for over 40,000 km of designated waterways across the region, including major rivers and creeks and the tributaries that flow into them. These waterways flow to the Victorian coast, discharging either through the Gippsland Lakes, to coastal inlets and embayments (Anderson Inlet, Shallow Inlet, Corner Inlet) or directly to Bass Strait and the Southern Ocean.

In the north of the region, the Thomson, Macalister and Avon and Perry rivers flow from alpine areas and the forested slopes of the Great Dividing Range. The Thomson and Macalister rivers have their flow regulated in the mid to upper catchments by the major storages of Thomson Reservoir (primarily for Melbourne's domestic supply) and Lake Glenmaggie (for the Macalister Irrigation District). Further downstream on the Thomson River, Cowwarr Weir also diverts water for the Macalister Irrigation District (MID).

The Avon and Perry rivers in the far east of the region are unregulated. The upstream reaches of the Avon River flow through wilderness areas before entering land used for grazing and irrigated horticulture. The Perry River is a chain of ponds waterway and is ephemeral for much of its length. The Perry joins the Avon River upstream of the estuary and then flows to Lake Wellington.

In the central part of the region is the Latrobe River. The catchment of the Latrobe River features areas of remnant forest through the Strzelecki Ranges and the Great Dividing Range, where tributary streams rise and flow to the Latrobe River and ultimately to Lake Wellington. Although much of the land has been cleared for agriculture, the dominant land use is mining for brown coal, used at major thermal power stations – Loy Yang, Hazelwood and Yallourn – providing the majority of Victoria's electricity. Blue Rock Dam and Moondarra Reservoir are two major storages on tributaries of the Latrobe River, with Lake Narracan located on the Latrobe itself just upstream of the Yallourn power station.

In South Gippsland, the waterways are short and flow from the Strzelecki and Hedley Ranges through productive agricultural land as well as areas of high conservation value (including Wilsons Promontory and the Tarra Bulga National Park). The major rivers of South Gippsland include the Powlett, Tarwin, Franklin, Agnes, Albert and Tarra rivers. Further east are Bruthen and Merriman Creek. All South Gippsland rivers are unregulated; however there are a number of off-stream storages in the Tarwin and Powlett river catchments and off takes for domestic township water supply on a number of rivers and creeks.



## 2.3 Estuaries

The West Gippsland coast has over twenty estuaries; these include the brackish mouths of rivers and streams that directly flow into the ocean or a large embayment (including those that flow into Corner Inlet), there are also coastal barrier lagoons (Gippsland Lakes) and coastal inlets (Anderson and Shallow inlets).

A number of these estuaries fall within areas listed as nationally and internationally significant wetlands and have important environmental, social, cultural and economic values. Due to their location at the bottom end of catchments estuaries are influenced by a range of catchment processes including land use, development and extraction of water.

## 2.4 Wetlands

There are over 1,500 wetlands larger than one hectare in the West Gippsland region. Together they total more than 44,000 ha. Wetland loss in West Gippsland has been significant. The greatest losses have been to freshwater wetlands in particular freshwater meadows and deep freshwater marshes (WGCMA 2007).



*Pictured: Top – Tarwin River, Bottom – Heart Morass, near Sale*

## 2.5 Internationally and Nationally Significant Wetlands

The West Gippsland region has a number of significant wetlands and wetland complexes, including two internationally important Ramsar sites and eleven sites listed as nationally important under the Directory of Important Wetlands Australia.

Within the Thomson and Latrobe catchments there are five wetlands and wetland complexes listed as nationally important, these include: alpine and montane wetlands located in the upper catchments; Caledonia Fen and Lake Tarli Karng and the Billabong, a remnant floodplain wetland in the Perry River system. The lower Thomson and Latrobe catchments include part of the Gippsland Lakes Ramsar Site and the nationally listed Lake Wellington Wetlands and Lake Victoria Wetlands (WGCMA 2007).

In South Gippsland, Corner Inlet is a significant wetland of national and international importance. Four other wetlands of national importance in South Gippsland are: Bald Hills Wetland, a rehabilitated wetland of the once extensive floodplains of the Tarwin River system, the Powlett River estuary, Anderson Inlet and Shallow Inlet.



*Pictured: an aerial view of Bald Hills wetland*





## 2.6 Condition of Rivers in the Region

The condition of rivers in Victoria is assessed using the Index of Stream Condition (ISC). The ISC brings together data from a variety of sources to give a detailed overview of river and stream condition across the state. The ISC is made up of five sub-indices – hydrology, streamside zone, physical form, water quality and aquatic life. The ISC has been completed three times for rivers, in 1999, 2004 and 2010. The results of 2010 ISC benchmarking exercise for West Gippsland are summarised in Figure 4 and below.

- Over half (55%) of the stream length in the Thomson basin was found to be in good or excellent condition. Of the remainder, 41% of stream length was in moderate condition and just 3% and 1% in poor and very poor condition respectively (DEPI 2013b).
- One-third (34%) of the stream length in the Latrobe basin was in good or excellent condition, with a further 44% in moderate condition, 9% in poor condition and 13% in very poor condition (DEPI 2013b).
- Almost three-quarters (74%) of the stream length in the South Gippsland basin was in moderate condition. Of the remainder, 10% was in good condition, 10% was in poor condition and 5% was in very poor condition. Only 0.4% (representing 1 reach) of stream length was found to be in excellent condition (DEPI 2013b).



*Pictured: Top – Corner Inlet, Bottom – Aerial view of Avon River and Perry River delta, Clydebank Morass and Lake Wellington*



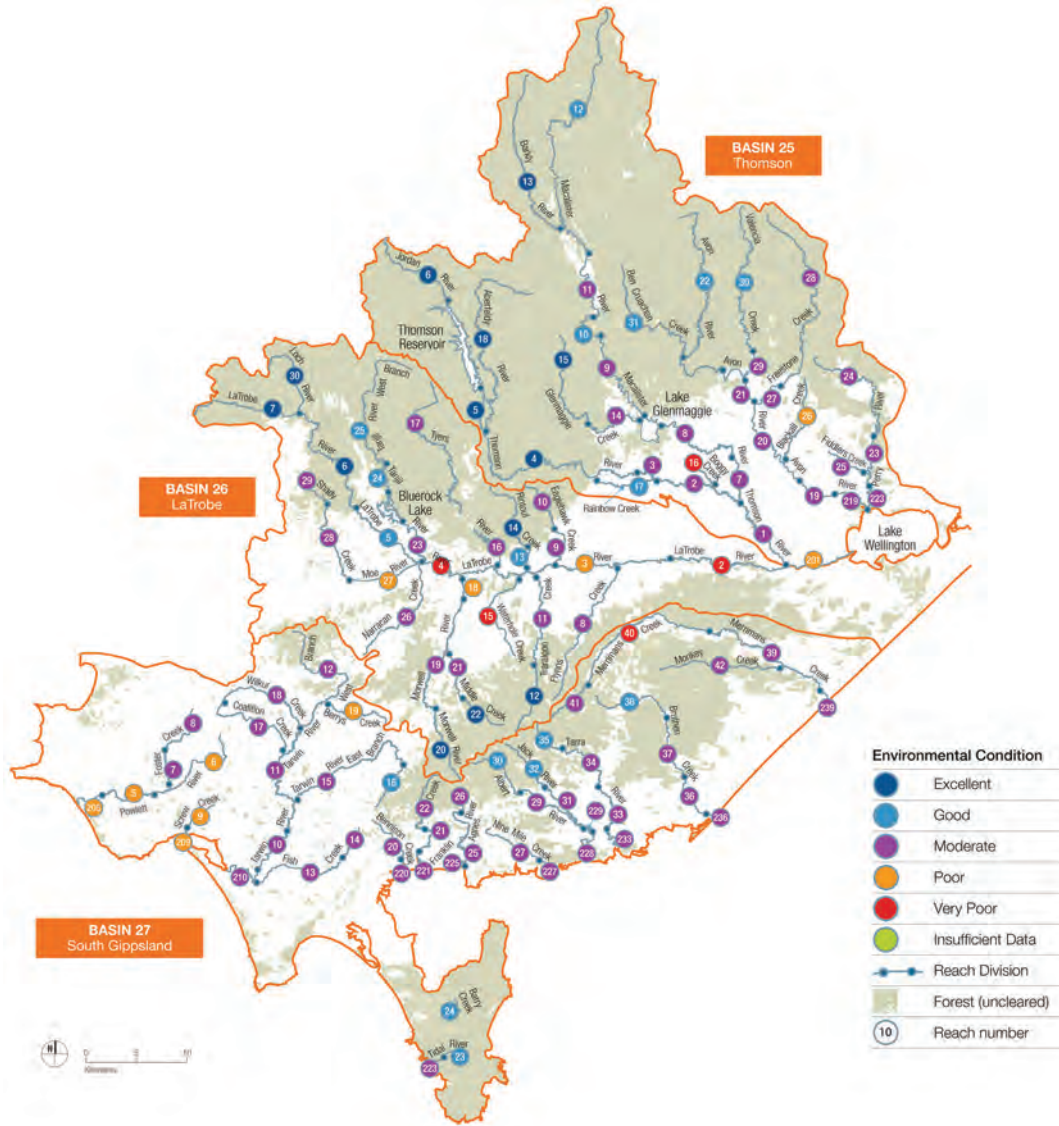


Figure 4 Index of Stream Condition Results (DEPI 2013b)

## 2.7 Condition of Wetlands in the Region

The Index of Wetland Condition (IWC) was developed to assess the condition of Victoria’s wetlands. The IWC has 13 variables that measure six aspects of wetland condition including; the wetland catchment, physical form, hydrology, water properties, soils and biota (Papas and Maloney 2012). Seventy-two wetlands in the West Gippsland region were assessed between 2009 and 2013 using the IWC, 26 of these were part of a statewide assessment of wetland condition and the remainder were completed to inform the selection and or monitoring for onground works.

Of the sites assessed, the majority were in moderate to good condition (18 and 29 respectively), 12 were in excellent condition and 15 were in poor to very poor condition. Wetlands in the moderate – very poor categories had much lower scores for the catchment and hydrology subindexes.