

PART B

MANAGEMENT RESPONSES TO REGION-WIDE THREATS



Photo: Rob McPherson

PART B: MANAGEMENT RESPONSES TO REGION-WIDE THREATS

Part B provides an overview of management responses to issues that are relevant to the entire region. It notes policy direction provided by the Victorian Waterway Management Strategy and other relevant state and regional documents, describes current management arrangements and highlights improvements made within this strategy compared with the previous RRHS. Each section also identifies broad actions to be undertaken in the next eight years.

SUMMARY OF SECTIONS IN PART B

<h3>2.1 PEST PLANTS AND ANIMALS</h3>	<p>Identifies the main pest plants and animals in the region. Describes the approach used to prioritise treatment. <i>See page 34.</i></p>
<h3>2.2 WATERWAY MANAGEMENT</h3>	<p>Describes the values and potential threats to surface water. Describes Groundwater Dependent Ecosystems and possible threats. Describes planning and implementation for delivery of environmental water. Discusses the use of alternative sources of water for environmental purposes. <i>See page 37.</i></p>
<h3>2.3 CLIMATE CHANGE</h3>	<p>Outlines the potential impact of anticipated changes in waterway health as a result of climate change. <i>See page 42.</i></p>
<h3>2.4 EXTREME EVENTS</h3>	<p>Describes the management issues associated with responses to extreme events such as bushfire and flood. <i>See page 43.</i></p>
<h3>2.5 ESTUARY MANAGEMENT</h3>	<p>Describes issues associated with estuary management including management of artificial estuary openings. <i>See page 44.</i></p>

Below left: Bridgewater Lakes.

Below right: Wetlands are a key feature of the Glenelg Hopkins landscape.



SUMMARY OF SECTIONS IN PART B (CONTINUED)

<h2>2.6 WATER QUALITY</h2>	<p>Outlines water quality monitoring undertaken in the region.</p> <p>Outlines incident management in response to events such as blue-green algal blooms and mass fish death events.</p> <p>Describes management issues associated with coastal acid sulfate soils.</p> <p>See page 45.</p>
<h2>2.7 WETLANDS</h2>	<p>Provides an overview of wetland management issues.</p> <p>Describes management planning for Lake Bookar in the Western District Lakes Ramsar site.</p> <p>See page 46.</p>
<h2>2.8 RIVER CHANNEL</h2>	<p>Describes threats to river channels and appropriate management responses, including installation of large wood, sand extraction and fish barrier removal.</p> <p>See page 48.</p>
<h2>2.9 RIPARIAN LAND</h2>	<p>Describes management of riparian land, with a focus on land status and river access.</p> <p>See page 49.</p>
<h2>2.10 RECREATIONAL USE OF WATERWAYS</h2>	<p>Describes the value of waterways for recreation, with a focus on management for recreational fishing and duck hunting.</p> <p>See page 50.</p>

Below left: Waterways are important for recreational fishing.

Below right: Fishways are important for fish dispersal and migration.



2.1 PEST PLANTS AND ANIMALS

The Glenelg Hopkins Regional Invasive Animal Strategy (2010-2015)¹³ and Victoria’s Invasive Plants and Animals Policy Framework¹⁴ identify key assets for protection and guidance for stakeholders and the general community in tackling invasive species.

The documents follow a ‘biosecurity’ approach to prioritising invasive species management programs (see Figure 6). This approach gives priority to programs preventing the introduction or eradication of newly establishing species over containment programs which reduce the impact of established species on assets. The asset-based protection approach is adopted once species have become so widespread that prevention, eradication or containment are no longer feasible options. Efforts are focused on the protection of high value assets from the degrading impacts of the invasive species.

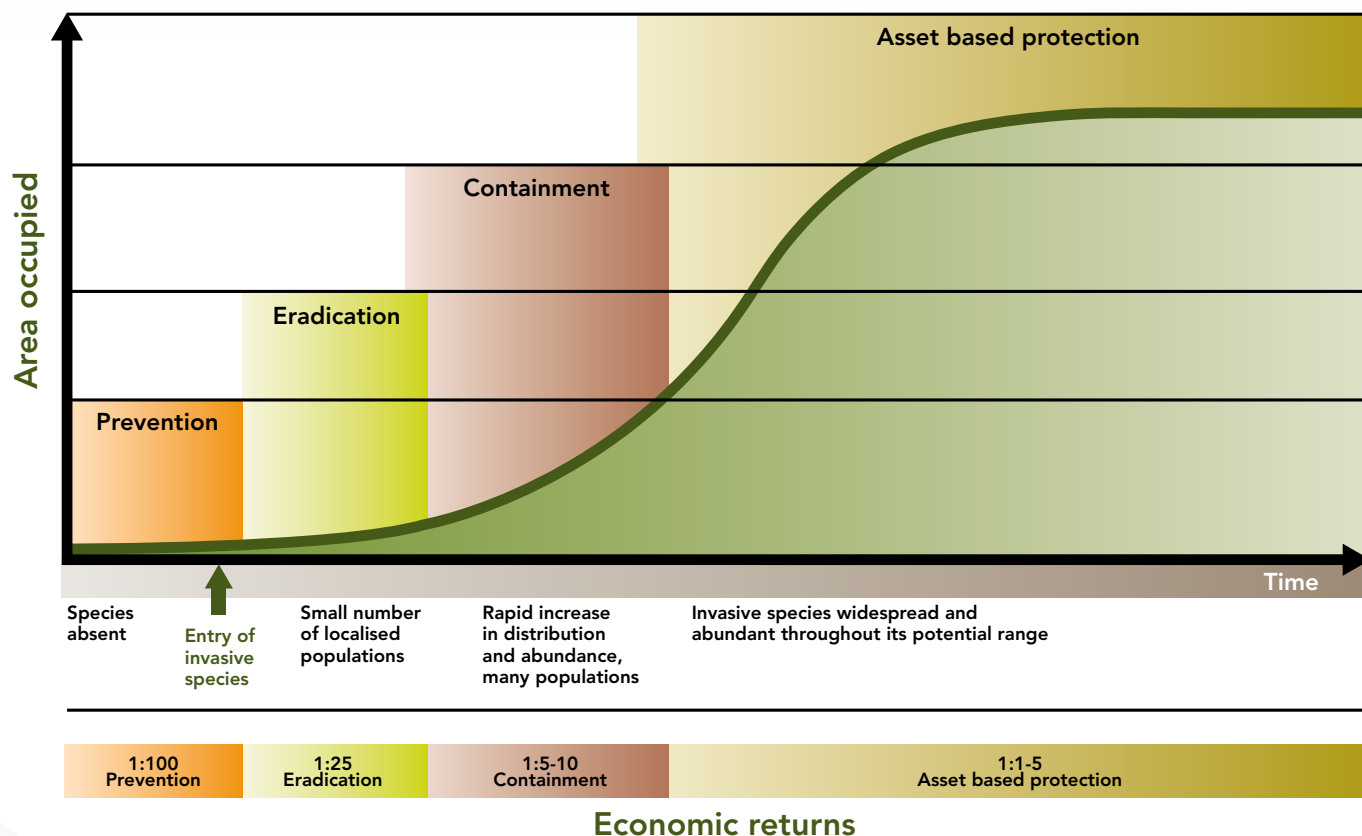


Figure 6. Generalised invasion curve showing actions appropriate to each stage¹⁵

Invasive animals declared under the *CaLP Act* such as rabbits and foxes are well established in the Glenelg Hopkins region. Feral goats and pigs are also present in the region but in smaller isolated populations. These declared invasive animals have caused widespread economic and environmental impact in the region and have significant potential for further impact through predation, over grazing and habitat destruction. Other invasive animals not declared under the *CaLP Act* such as feral cats, feral deer and carp also impact negatively on specific aquatic environments or native fauna and flora species associated with waterways. Carp monitoring efforts in the past have been restricted to a small number of sites along the Glenelg River. Although eradication efforts have removed some carp from the system, they have not been sufficient to prevent carp populations from increasing or carp from entering the high value lower reaches of the Glenelg River. A more targeted approach is required. Further research and monitoring will provide information about the behaviour of carp, which will enable more targeted and cost effective management of this species and a reduction of the threat it poses to waterway assets.

ACTION 2-1:

Research and monitoring will be undertaken on carp to understand any predictable behaviours that can be used to more effectively manage carp populations in the Glenelg River and reduce the risk to native fish populations

Who: CMA, research agencies, DEPI, angling groups

Weed species widespread in the regions include blackberry, cape tulip, polygala, and gorse. Pine wildlings are particularly prevalent in the Glenelg basin and willows are present along several waterways. Strong partnerships between agencies, community and (when applicable) industry, increase the effectiveness of weed management programs, particularly where weeds occur across different land tenures. Some recent examples of this successful approach include pine wildling removal in partnership with Parks Victoria, DEPI, Conservation Volunteers and timber companies; and Gorse control in partnership with the Upper Hopkins Land Management Group, DEPI, Victorian Gorse Taskforce and landholders..

Effective pest animal management requires a landscape-scale cross tenure approach. Glenelg Ark¹⁶ and Grampians Ark are examples of long-term fox control programs to protect populations of native mammal prey species such as southern brown bandicoot, long-nosed potoroo, common brushtail possum and brush-tailed rock-wallaby on public land. The CMA coordinated the complementary Glenelg Alliance project which extended the fox baiting program to additional public land and adjacent private land in the Lower Glenelg area.

Further opportunities will be sought to implement co-ordinated pest plant and animal control programs in the region.

ACTION 2-2:

Liaise with agencies, industry and community to develop integrated, cross-tenure pest plant and animal control programs

Who: DEPI, CMA, Parks Victoria, community groups, timber companies

Below left: Foxes have a significant impact on broilga chick survival.

Below right: Carp are being researched to more effectively control this species in the Glenelg River.



Awareness of aquatic invasive species is relatively low compared with that of widespread and clearly visible terrestrial pests. An increased level of awareness by the community and industry of the invasive species that affect waterways is important to:

- prevent new incursions (for example, to reduce accidental introductions through aquarium releases or transporting invasive species on fishing gear and/or boats)
- increase the capacity for surveillance of new invasive species
- assist in control of invasive species.

There is an opportunity for the CMA to work with DEPI and community groups (such as recreational fishing bodies, Fishcare Victoria, EstuaryWatch, Landcare networks and approved hunting organisations) to raise awareness of the benefits of managing invasive species in waterways, particularly in preventing their release and minimising their spread. The community can play a role in early detection and reporting of incursions, enforcement and monitoring, and supporting rehabilitation efforts. These groups also play a significant role in reducing the risk of spread through recreational activities (such as boating and fishing), by promoting good hygiene practices.

ACTION 2-3:

Increase community awareness regarding invasive species management in waterways

Who: CMA, DEPI, Parks Victoria, community groups

*Below left: Water hyacinth is a very invasive aquatic weed.
Below right: Willow removal.*



2.2 WATER MANAGEMENT

Water security will be a key driver for capital investment and land use change in the region. Sustainable management of the region's groundwater and surface water resources underpin the forecast residential, agricultural and industrial development of the region. As noted in the Western Region Sustainable Water Strategy¹⁸, 'The recent prolonged dry period and subsequent heavy flooding in many parts of the region demonstrated that water management needs to address climate variability'.

There may be significant pressures on future water use in the region from the combined impacts of population growth and climate change. Annual stream flows fell by 40, 56 and 65 per cent respectively in the Hopkins, Portland Coast and Glenelg basins during the 2004-2008 period of the drought. Drought remains a significant risk for the region and is likely to be more frequent than in the past. Other key pressures on water resources are from changing farm practices and altered land use in the region.

2.2.1 UNREGULATED SURFACE WATER

While unregulated rivers and wetlands are not affected by large water storages, their hydrology is altered by a range of diffuse impacts. Catchment clearing, construction of catchment dams, installation of drains and small weirs, and water extraction have dramatically impacted the flow dependent values of most waterways within the Glenelg Hopkins region. Managing the volume, rate, distribution and timing of water extraction from unregulated rivers, lakes and wetlands through Local Management Plans will help protect values within priority systems.

ACTION 2-4:

Participate in development or review of local management plans for surface water for unregulated river and wetland systems identified in the Western Region Sustainable Water Strategy

Who: CMA, DEPI, SRW

Below left: Rocklands Reservoir.
Below right: Blue gum plantation.



2.2.2 GROUNDWATER DEPENDENT ECOSYSTEMS

The catchment contains substantial reserves of groundwater used for a range of purposes. Regional-scale groundwater systems underlie the region, including the Otway, Murray, Highland and Dilwyn, with other shallow local aquifers present¹⁹. Groundwater supports a range of ecological and physical environmental assets such as rivers, wetlands and other groundwater dependent ecosystems. Groundwater Dependent Ecosystems (GDEs) rely wholly or partially on groundwater to maintain ecosystem function and community composition. Some examples of GDE types include the following:

- terrestrial vegetation – vegetation communities and dependent fauna that have seasonal or episodic dependence on groundwater
- river base flow systems – aquatic and riparian ecosystems that exist in or adjacent to streams that are fed by groundwater base flow
- aquifer and cave ecosystems – aquatic ecosystems that occupy caves or aquifers
- wetlands – aquatic communities and fringing vegetation dependent on groundwater-fed lakes and wetlands
- terrestrial fauna – native animals that directly use groundwater rather than rely on it for habitat
- estuarine and near-shore marine ecosystems – coastal, estuarine and near-shore marine plant and animal communities whose ecological function has some dependence on discharge of groundwater.

Groundwater extraction provides most of the water used within the Glenelg Hopkins region for irrigated agriculture, non-potable stock and domestic supply, heavy industry and geothermal power. Groundwater is also widely extracted for primary and reserve supply for towns. These activities can affect groundwater levels, flows, and quality, which in turn can potentially affect the health of GDEs. Understanding how these systems respond to a variable climate and land and water management is fundamental to protecting GDEs. Recent mapping of potential GDEs using remote sensing technologies has improved the knowledge of GDE distribution within the region²⁰. Further studies are also needed to determine groundwater requirements of GDEs in priority areas for input to Local Groundwater Management Plans.

ACTION 2-5:

Identify and prioritise types of high value GDEs in the Glenelg Hopkins region to inform regional planning processes and water allocation decisions

Who: DEPI, Southern Rural Water, GMMWater, CMA

ACTION 2-6:

Develop or review Local Groundwater Management Plans for management areas identified in the Western Regional Sustainable Water Strategy

Who: Southern Rural Water, DEPI, CMA

*Below left: Crawford River relies on a groundwater fed baseflow in the drier months.
Below right: Irrigation can impact on groundwater levels.*



2.2.3 ENVIRONMENTAL WATER ENTITLEMENTS

The Glenelg River and the upper reaches of the Wannon River are part of the Wimmera-Mallee headworks system. Environmental flows are currently provided to the Glenelg River at Rocklands Reservoir through allocations from the Wimmera and Glenelg Rivers Environmental Entitlement 2010. The environmental entitlement also sets out passing flow rules for Rocklands Reservoir and the diversion weirs on the upper Wannon River.

With regard to planning and delivery of environmental water, Glenelg Hopkins CMA undertakes the following activities:

- participates in the collaborative development of the Seasonal Watering Plan, and informs state-wide prioritisation of watering actions
- undertakes environmental water planning and delivery according to agreed operating arrangements
- increases community engagement and communication surrounding environmental water management
- manages shared risks in line with the Victorian Environmental Watering Partnership Risk Management Framework.

In addition, Glenelg Hopkins CMA contributes to monitoring and reporting by:

- undertaking data collection for state-wide condition monitoring (VEFMAP)
- reporting on environmental water delivery depth, rate, volume and ecological outcomes to the Victorian Environmental Water Holder as required.

This strategy identifies regional priorities for environmental watering over the eight-year planning period and incorporates actions into the work plans for relevant Waterway Management Areas. These priorities will also inform development of Environmental Water Management Plans and Seasonal Watering Proposals (see *Figure 7*) using recommendations from flow studies, learnings from monitoring and experience gained from implementing watering actions. In addition to identifying values and objectives for environmental water management, Seasonal Watering Proposals will aim to identify and manage a wide range of risks. Where watering actions are expected to inundate private property, consent will be obtained from landholders before the action is implemented.

Activities in the work plans (Part D) ensure:

- targeted use of environmental water to maximise ecological benefits within the Glenelg River
- water availability through further, more detailed planning
- necessary infrastructure is in place to enable or enhance environmental water delivery
- integration of non-watering actions with environmental watering.

Below left: Environmental flow release from the carp screens, Rocklands Reservoir.

Below right: Flows can be released further downstream at Five Mile Outlet on the Glenelg River.



2.2.3 (CONTINUED)

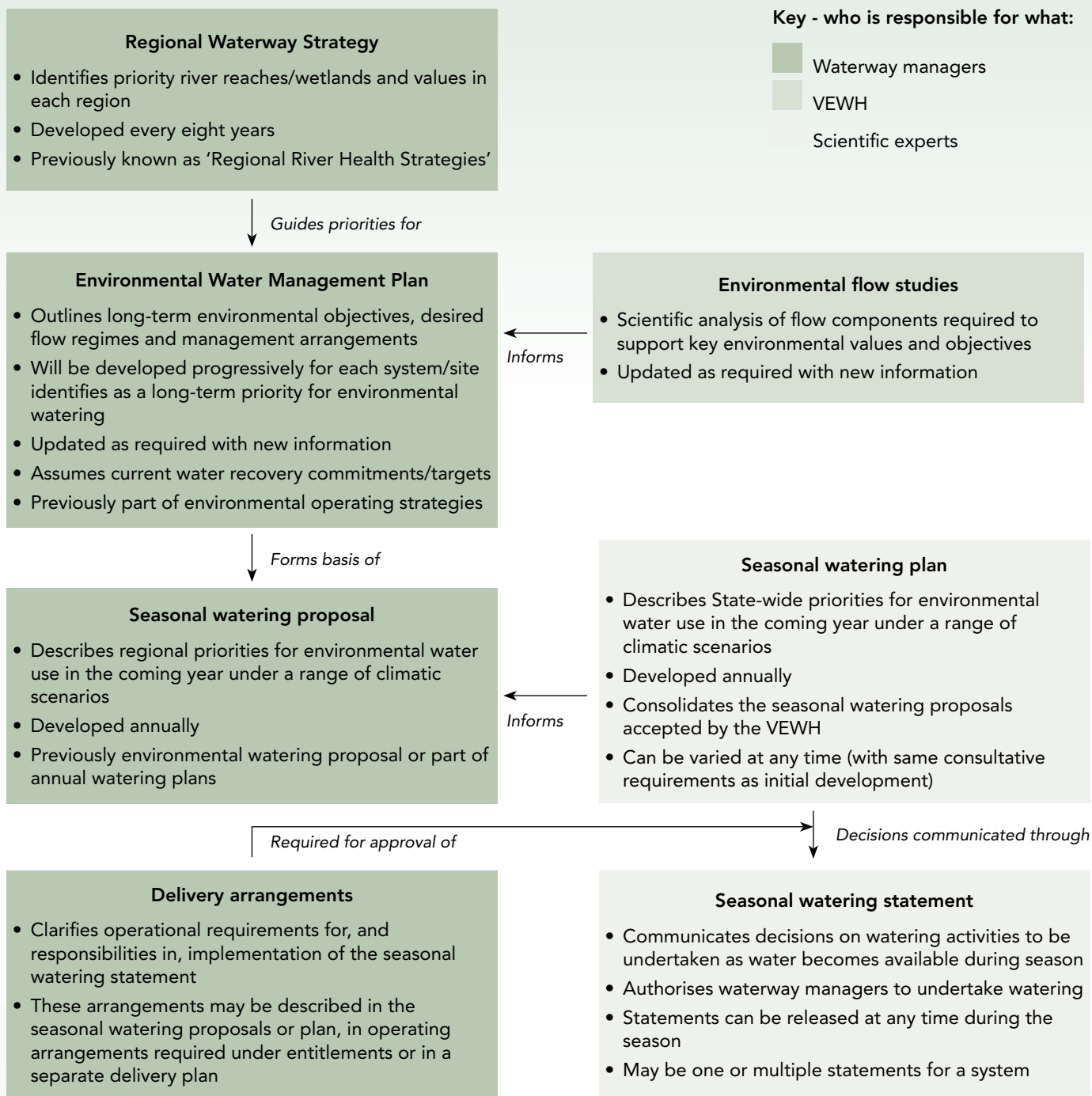


Figure 7. The Victorian Environmental Water Holder planning framework for decisions in environmental water management in Victoria

2.2.3 (CONTINUED)

ACTION 2-7:

Develop the Glenelg River Environmental Water Management Plan to provide clear guidance on the river's long-term environmental water management objectives and water requirements

Who: CMA, VEWH, DEPI, GWMWater, Wimmera CMA, Parks Victoria, Gunditj Mirring Traditional Owners Group

ACTION 2-8:

Develop Seasonal Watering Proposals annually

Who: CMA, VEWH, DEPI, GWMWater, Wimmera CMA, Parks Victoria, Gunditj Mirring Traditional Owners Group

The Victorian Environmental Flows Monitoring and Assessment Program (VEFMAP) is used to assess the ecological responses to environmental water delivery in the Glenelg River. This monitoring program enables continual improvement and more efficient water delivery. The current VEFMAP monitoring program does not extend to the estuary; as a result the impact of environmental water flows to the heritage reach within the Glenelg estuary is poorly understood. VEFMAP or a similar monitoring program should extend into the Glenelg estuary, particularly given its high environmental and recreational values.

ACTION 2-9:

Continue the VEFMAP (Victorian Environmental Flow Monitoring and Assessment Program) flow monitoring program

Who: CMA, DEPI, Melbourne University

ACTION 2-10:

Develop a monitoring program to monitor the ecological response of the Glenelg estuary to environmental watering

Who: CMA, VEWH, DEPI

ACTION 2-11:

Undertake further detailed work to determine the environmental watering needs and passing flow requirements for the Glenelg River downstream of Moora Moora Reservoir with a view to enhancing flows within this reach

Who: CMA, DEPI, VEWH, GWMWater, Parks Victoria

Who: CMA, VEWH, DEPI, Parks Victoria

2.2.4 USE OF ALTERNATIVE SOURCES OF WATER FOR ENVIRONMENTAL PURPOSES

Using alternative sources of water that are 'fit for purpose' that is, of an appropriate quality for its intended use, can help reduce reliance on water from our waterways. Examples of alternative water supplies include recycled water (treated water from sewage treatment plants) and urban stormwater.

Treated waste water from Wannon Water's treatment plants is released under EPA licence to the Glenelg River and other waterways. Such releases can potentially have environmental benefits, particularly during low flow conditions. New proposals to use recycled water must be assessed on a case-by-case basis to ensure there are no negative effects on the river system.

ACTION 2-12:

The use of recycled water for environmental purposes will be considered on a case-by-case basis and be consistent with the Victorian Government's policy on the use of recycled water

Who: Southern Rural Water, Grampians Wimmera Mallee Water, Wannon Water, CMA, DEPI, EPA

2.3 CLIMATE CHANGE

2.3.1 TRENDS AND PROJECTIONS

Climate change modelling indicates that we can expect increasingly hotter and drier conditions in the Glenelg Hopkins region. Average annual temperatures are projected to rise by between 0.5 and 1.1 degrees by 2030²¹. Winter rainfall is likely to decrease and summer rainfall is expected to increase. Despite an overall likely decrease in rainfall by up to 7 per cent by 2030, the intensity of extreme rainfall events is likely to increase²².

A decline in rainfall is anticipated to result in a subsequent decrease in runoff²³. For a 1 degree rise in annual temperature, annual runoff is expected to decline by between 2-22 per cent and for 2 degrees of temperature rise, the decline in runoff is approximately double²⁴. These changes to runoff and associated changes to stream flow have the potential to leave freshwater ecosystems increasingly vulnerable.

According to the latest Intergovernmental Panel on Climate Change (IPCC) report, global sea level rose by approximately 0.19 m between 1901 and 2010²⁵. The Victorian Government has established a policy of planning for sea level rise of not less than 0.8 m by 2100 but also notes the need to allow for the combined effects of tides, storm surges, coastal processes and local conditions when assessing risks and impacts²⁶.

2.3.2 ADAPTATION

Future strategies for conservation must take into account the long-term possible impacts of climate change in the planning stage. In early 2013, the Victorian Government released Victoria's first Climate Change Adaption Plan. The CCAP emphasises the need to embed resilience into all our strategies and plans²⁷. Conservation strategies must accommodate ecological change and loss; they must take into account considerable uncertainty in the extent and type of loss and the impacts of change on biodiversity^{28, 29}.

The adaptive capacity of waterways needs to be considered so they are better able to cope with the impacts of climate change. The main impacts of climate change to be contemplated in the management of waterways include:

- reduced rainfall, runoff and stream flow
- dry soil conditions
- bushfire – increased frequency and intensity
- heatwave – increased frequency and duration
- increased intensity of rainfall events leading to flooding.

The current practice of revegetating waterways and improving and maintaining water quality is important for both environmental and cultural values and will remain an important adaptation strategy under climate change to maximise both the resilience and adaptive capacity of these systems.

ACTION 2-13:

Develop Glenelg Hopkins NRM strategy for climate change to document strategies for regional waterways to adapt to climate change

Who: CMA, DEPI, Australian Government, Southern Slopes Climate Change Adaptation Research Program (SCARP)

Below left: River flows are likely to be reduced with climate change placing further pressure on waterway values.

Below right: Bushfires will become more frequent with climate change.



Photo: DEPI

2.4 EXTREME EVENTS

The environment has adapted to flood and fire cycles, however climate change and land use change are predicted to increase the severity of floods and bushfires which may make it more difficult for waterways to recover from these extreme events. Actions in this strategy need to consider the impacts of extreme events such as bushfire and flood on the environment and their impact on waterway management programs.

2.4.1 FLOODS

During periods of prolonged heavy rainfall, storm surges or high tides, water levels along rivers rise, often causing inundation of the surrounding landscape. While flooding can become a serious problem for the community if not adequately managed, it is a natural process and is important for the maintenance of biological diversity³⁰. A key future challenge will be to ensure the protection of life and property, while allowing rivers to maintain their natural flooding processes. Local flood management plans and studies help manage floodplains and outlying areas in the Glenelg Hopkins region that are at high risk of inundation. In 2011 the region experienced significant flooding events to key waterways such as the Hopkins River, Mt Emu Creek, Fiery Creek, Glenelg River, Wannon River and some other smaller tributaries. Communities were affected through flooding of property in a number of townships, damage to fencing and bridges, stock loss, as well as significant erosion along river banks and gullies in the upper catchments.

Glenelg Hopkins CMA received funding from the Australian and Victorian Governments to assist communities to repair this damage. The CMA delivered a Flood Recovery Employment Program which worked alongside community groups and local governments to repair damage in both rural and urban areas across the region. Funding was also received under the Natural Disaster Relief and Recovery Arrangements to repair damaged waterway infrastructure. The CMA will aim to undertake flood recovery activities, where it can, if significant flood damage occurs to the region's waterways in the future - pending funding availability.

ACTION 2-14:

Undertake flood recovery activities after significant flooding events, pending available funding

Who: CMA, DEPI, local government, Parks Victoria

ACTION 2-15:

Ensure flooding considerations are incorporated into work planning activities, including appropriate fencing setbacks off the floodplain, flood fencing design, large wood reinstatement and infrastructure projects (i.e. rock chutes, fish passage)

Who: CMA, DEPI, local government

2.4.2 BUSHFIRES

Large bushfires can impact on human life, property and the environment. Human life will be considered the highest priority over other considerations. Bushfires followed by heavy rainfall events can result in significant sediment build-up in waterways, which impacts on water quality and in-stream biodiversity. Waterway managers will play a role with working with other authorities to ensure waterways and their values are considered in bushfire management activities.

ACTION 2-16:

Waterway managers will work with DEPI and other fire management agencies to ensure waterway values are considered as part of the planning for bushfire management activities

Who: CMA, CFA, CMA, local government, Parks Victoria

ACTION 2-17:

Ensure fire considerations are incorporated into work planning activities, including gates on all waterway project sites to allow access for fire suppression vehicles

Who: CMA, DEPI, CFA, Parks Victoria

2.5 ESTUARY MANAGEMENT

Estuaries are highly valued for their recreational and cultural values. The proximity of estuaries to coastal settlements and high value farming land increases the risk to habitat values from activities associated with these uses, in particular, degradation of riparian vegetation from developments and stock access. Climate change impacts such as sea level rise, storm surges, and altered flows are also likely to affect estuary function and riparian vegetation communities.

Most estuaries in the Glenelg Hopkins region intermittently close. When this occurs the resultant increase in water level has significant environmental benefits including flooding adjoining wetlands and fringing vegetation. However, there are also economic costs associated with flooding of highly productive agricultural land and infrastructure such as jetties and roads. Therefore, the decision to artificially open the estuary to relieve flooding requires consideration of a range of environmental, social and economic values. There are a number of potential consequences of artificially opening estuaries at inappropriate times, including fish deaths and the flushing of fish eggs and larvae out to sea. Glenelg Hopkins CMA uses the Estuary Entrance Management Support System (EEMSS) to consider the risks of artificially opening estuary mouths at different water levels and times of the year, and possible impacts on infrastructure and natural assets³¹.

EstuaryWatch is a community monitoring program that increases the community's participation in natural resource management while aiding estuary management decisions through the collection of information on water quality and estuary mouth condition. EstuaryWatch commenced in the Glenelg Hopkins region in 2013 and currently operates at the Hopkins and Merri River estuaries.

ACTION 2-18:

Review and update estuary management plans for the Glenelg, Surry, Wattle Hill Creek (Fawthrop Lagoon), Fitzroy, Eumerella (Yambuk Lake), Moyne, Merri and Hopkins River estuaries

Who: CMA, DEPI, Parks Victoria, local government

ACTION 2-19:

Implement a risk-based assessment process to inform estuary entrance management decisions

Who: CMA, DEPI, Parks Victoria, local government

ACTION 2-20:

Develop Memoranda of Understanding, which outlines the process and roles and responsibilities of partner agencies with responsibilities for artificially opened estuaries in the Glenelg Hopkins region

Who: CMA, DEPI, Parks Victoria, local government

ACTION 2-21:

Identify land or built assets regularly threatened with inundation from estuary closure and determine if actions, other than artificially opening the estuary, can be undertaken to minimise the long-term threat

Who: CMA, DEPI, Parks Victoria, local government

ACTION 2-22:

Review and update local planning schemes to include areas subject to inundation from estuary entrance closure

Who: CMA, DEPI, Parks Victoria, local government

ACTION 2-23:

Seek opportunities to continue support for EstuaryWatch

Who: CMA

ACTION 2-24:

Establish a policy framework to guide development of facilities in estuaries

Who: Western Coastal Board, local government, CMA

2.6 WATER QUALITY

Analysis of long-term water quality trends can help assess the effectiveness of water resource and catchment activities over time. The CMA is part of the south-west regional monitoring partnership, which has 17 surface monitoring sites in river reaches. In addition, telemetry stations monitor water level and other parameters in four estuaries in the region.

The VWMS identifies several issues with the current monitoring and reporting framework including lack of agreed objectives, adequacy of sites and parameters measured to assess water quality and applicability of data to planning and management decisions. Implementation of actions in the VWMS is a first step to improving accessibility to and usefulness of data.

2.6.1 WATER QUALITY INCIDENT MANAGEMENT

The VWMS recognises the need for greater integration at the state and regional levels and improved regional frameworks for planning and responding to 'natural' water quality incidents such as algal blooms and mass fish death events.

Development of stormwater management plans by local governments contributes to protection of waterways from both diffuse and point source input from regional centres. The control of point source pollution events is managed by the Environment Protection Authority (EPA).

ACTION 2-25:

Review regional waterway incident (fish death) response guideline and ensure roles and responsibilities of agencies and organisations in the Glenelg Hopkins region are clear

Who: DEPI, EPA, CMA, Parks Victoria, local government

ACTION 2-26:

Review regional waterway incident (algal bloom) response guideline and ensure roles and responsibilities of agencies and organisations in the Glenelg Hopkins region are clear

Who: DEPI, Wannon Water, committees of management, EPA, CMA, local government

2.6.2 ACID SULFATE SOILS

Acid sulfate soils are soils or sediments that contain (or once contained) high levels of reduced inorganic sulfur. When exposed to oxygen, the soils or sediments undergo a chemical reaction (called oxidation) that produces acid.

Disturbance of acid sulfate soils can result in fish deaths or other negative effects on waterways. The processes through which acid sulfate soils affect waterways are not well understood and their location and level of risk are often uncertain. Acid sulfate soils occur predominantly in the coastal area but are also found inland, for example, on the Dundas Tablelands (associated with permanently flowing springs) and in waterways affected by dryland salinity³².

An emerging issue for estuary management is the disturbance of coastal acid sulfate soils in estuarine wetlands and marshes. Management of coastal acid sulfate soils is guided by the Victorian Coastal Acid Sulfate Soil Strategy and the Victorian Best Practice Guidelines for Assessing and Managing Coastal Acid Sulfate Soils. The strategy maps potential acid sulfate soils and identifies locations where immediate action, protection or installation of detailed monitoring networks might be warranted.

2.7 WETLANDS

Regional guidance on wetland management for the Glenelg Hopkins region was provided by the Glenelg Hopkins Regional Wetland Status Report (2006) and the more recent RCS. Wetlands are a prominent feature in the Glenelg Hopkins landscape and are under increasing pressure from land use change, drainage and other threats.

Wetland types in the region are diverse and require different approaches for management. This strategy identifies priority wetlands for management action using approaches in line with state policy under the VWMS (see Part D). However, for a number of individual wetlands within complexes and wetland types, such as Seasonal Herbaceous Wetlands (see 3.5.2), there is not enough information to determine which wetlands are priorities for intervention at this stage.

ACTION 2-27:

Undertake risk assessments and prioritisation of additional wetlands in the region

Who: CMA, DEPI

ACTION 2-28:

Assess Seasonal Herbaceous Wetlands to determine management requirements

ACTION 2-29:

Initiate programs to improve condition of Seasonal Herbaceous Wetlands on private land

Who: CMA, DEPI

Glenelg Hopkins CMA will work with DEPI, local government and community groups to deliver regional programs aimed at maintaining or improving the wetland condition, reinstating wetland hydrology and improving wetland connectivity in the landscape. This program will include a combination of incentives, education and awareness and, in some cases, regulatory controls. Victoria has recently developed new native vegetation controls using a risk-based approach. In addition, regulatory controls exist for Seasonal Herbaceous Wetlands, listed under the EPBC Act. It is currently unclear how the regulatory controls will apply to wetland vegetation, and further information and guidance needs to be provided to local government, waterway managers and landholders.

ACTION 2-30:

Prepare guidance to landholders on the appropriate use of wetlands and management options

Who: DEPI, CMA, community groups

ACTION 2-31:

Improve information about wetland vegetation and community types and develop guidance to assist local government in the application of native vegetation planning controls for wetland vegetation

Who: DEPI, CMA, Australian Government, local government

In recent times, natural resource management organisations have undertaken hydrological reinstatement of wetlands. Such works will continue to be supported where they have consent from the land owner and they are feasible and cost effective, while ensuring any potential impacts on community services and public and private assets can be mitigated.

ACTION 2-32:

Undertake hydrological reinstatement of wetlands where projects are feasible, cost effective, have community support and potential impacts on community services and public and private assets can be mitigated

Who: Nature Glenelg Trust, CMA, Parks Victoria, local government, community groups

2.7.1 RAMSAR WETLANDS

Lake Bookar is a permanent saline wetland near Camperdown. It is one of nine wetlands in the Western District Lakes (WDL) Ramsar site, which is recognised under the Ramsar Convention as wetlands of international importance^{33,34}. The *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* establishes a framework for managing Ramsar sites including preparation of site management plans. With the exception of Lake Bookar, the wetland complex is in the Corangamite CMA region and therefore more detailed management planning for the WDL Ramsar site is included in the Corangamite Regional Waterway Strategy.

The WDL Ramsar Site ecological character description (ECD)³⁵ describes the ecological character of the site as a whole and identifies critical components, processes and services at the site which contribute to both the site's character and the Ramsar criteria for which the site is listed.

At the time of listing (1982), the WDL site met five of nine Ramsar criteria including: it is a good representative example of a wetland type within the bioregion (permanent saline lake); it supports threatened plant species; it supports waterbirds at critical life stages including during migration breeding and moulting; it regularly supports over 20,000 birds; and it regularly supports over one per cent of the population for at least four bird species. Lake Bookar contributes particularly to the WDL site by meeting all criteria except for the presence of the threatened plant species.

The ECD establishes limits of acceptable change (LAC) for components, processes and services (see Appendix 5). These measures assist managers to identify suitable strategies to avoid change in ecological character and potential measures for programs to monitor compliance with the LAC.

Below: Lake Bookar part of Western District Lakes Ramsar site.



Threats outlined in the ECD, which potentially impact on Lake Bookar, are those associated with climate change particularly increased periods of wetland drying and impacts associated with agricultural land use and stock access including soil compaction; increased nutrient input; spread of weeds, including pasture grasses; erosion; and grazing and trampling of wetland vegetation. These threats have been considered in the AVIRA risk assessment for the lake and recommended actions to mitigate threats, where feasible, are included in Part D.

Monitoring and reporting on the state of the site's ecological character occurs through the national Ramsar site rolling review and Australia's national report to the triennial Conventions of Contracting Parties to the Ramsar Convention. The Glenelg Hopkins CMA will work with the Corangamite CMA, the land manager, Parks Victoria and DEPI to provide information necessary for the review focussing on the critical components, processes and services set out in Appendix 5.

ACTION 2-33:

Implement actions assigned to Glenelg Hopkins CMA for Lake Bookar nominated in the Corangamite Waterway Strategy

Who: CMA, Parks Victoria

The VWMS supports new listing of Ramsar sites where they meet certain criteria. There has been recent community support and a request to investigate the listing of the Lower Glenelg estuary and Long Swamp as a new Ramsar site. This site has many of the ecological values of the adjacent Piccaninnie Ponds Karst Wetlands in South Australia, which was recently designated as a Ramsar site.

ACTION 2-34:

Investigate listing of the Lower Glenelg estuary and Long Swamp as a new Ramsar site

Who: DEPI, CMA, Parks Victoria, Nelson Coastcare, Nature Glenelg Trust, Australian Government

2.8 RIVER CHANNEL

2.8.1 LARGE WOOD

Large wood is an important feature of the river channel, providing habitat for a range of aquatic fauna. It also plays a role in preventing bank erosion, slowing water velocity and capturing large sand deposits, particularly in waterways such as the Glenelg River. Historic removal of this wood has caused significant degradation of environmental and social values of many of our regional waterways. Previous large wood reinstatement programs have occurred at Harrow and Casterton along the Glenelg River. Given the findings of the state-wide large wood survey undertaken by DEPI, there are significant opportunities to undertake re-instatement programs in the majority of our waterways across our region, particularly the Glenelg River. However, re-instatement programs must consider the risk posed by large wood to human life and public infrastructure, particularly during flooding events. A risk treatment plan has been developed and implemented successfully for a site at Casterton and this can be adopted for use in other areas across the region, if deemed appropriate.

ACTION 2-35:

Identify priority sites for large wood reintroduction, taking into consideration the benefits and risks posed to the community

Who: CMA, DEPI, local government, angling groups

2.8.2 SAND EXTRACTION

Sand extraction occurs on a number of waterways in the Glenelg Hopkins region, particularly in the Glenelg basin. Sand extraction provides a number of benefits including managing sand slugs, and providing habitat holes for aquatic fauna. However, sand extraction needs to be carefully managed to avoid adverse impacts to the waterway. The CMA will work closely with sand extraction companies through its Works on Waterways functions, to ensure compliance with regulatory requirements. The CMA will also work with companies to identify opportunities for further sand extraction if significant benefits to the waterway values can be determined.

ACTION 2-36:

Work with sand extraction companies to ensure compliance with regulatory requirements and also identify opportunities for further sand extraction if significant benefits to waterway values can be determined

Who: CMA, DEPI, local government

2.8.3 FISH BARRIERS

A number of artificial barriers exist within our region's waterways and many of these can inhibit fish movement and biological processes. There may be opportunities to alter the design of existing structures, or in some case remove the barrier entirely from the waterway. In cases where the structure is to be altered, there needs to be clear guidance on cost and ownership arrangements. These arrangements will be in line with government policy under the VWMS (*refer to Policy 11.5*). The removal of in-stream barriers will also need to be consistent with Policy 11.6. For the construction of fish passages, any works need to be in line with the DEPI best practice guidelines to be developed in 2016.

ACTION 2-37:

Record location of fish barriers and investigate opportunities to remove or modify structures that impede fish movement

Who: CMA, DEPI, local government

2.9 RIPARIAN LAND

Riparian land management in Victoria is complex, due particularly to the presence of both Crown and private water frontages across Victoria, but also the current administrative arrangement for licensing of Crown frontages and competing land uses. The CMA will work with other government agencies to improve landholder understanding of rights and responsibilities on riparian land and reduce the complexity of riparian land management for landholders and other riparian users.

Glenelg Hopkins CMA will work with DEPI, local government and community groups to deliver regional programs that are aimed at maintaining and improving the condition of riparian land and improving riparian connectivity in the landscape. This will include a combination of incentive programs, education and awareness programs and, in some cases, regulatory controls.

DEPI, together with the CMA, has undertaken significant reforms and management of Crown frontages over recent years. These reforms have seen many landholders voluntarily convert their 'agricultural licence' to a 'riparian management' licence, resulting in a reduced licence fee. The CMA will continue to provide incentives to landholders on Crown frontages but only in combination with a conversion to a 'riparian management' licence. Grazing licences will continue to be managed through DEPI, with the aim of developing minimum standards for their management so landholders more clearly understand their roles and responsibilities for managing Crown frontages. If a landholder breaches conditions set in their licence or is occupying an unlicensed Crown frontage, the focus will be on education and negotiation with the landholders, with use of enforcement as a last resort.

ACTION 2-38:

Develop and distribute information to Crown frontage licensees about their roles and responsibilities and provide clear information about riparian management

Who: DEPI, CMA

ACTION 2-39:

Implement improved compliance approaches to Crown frontages, including stronger action for serious breaches of licence conditions and unauthorised occupations

Who: DEPI, CMA

In some cases, controlled grazing is allowed through CMA management agreements with landholders to control pasture grasses along riparian areas and help promote natural regeneration of indigenous woody vegetation. Guidelines have been developed by DEPI and waterway managers to assist with the decision making process.

ACTION 2-40:

Support controlled grazing activities along riparian areas within riparian management agreements where such grazing activities can show environmental benefit, do not compromise waterway values and is an accepted tool under the DEPI controlled grazing guidelines

Who: DEPI, CMA

Access to water is a critical consideration in fencing off riparian land. The CMA will continue to support development or utilisation of alternative water options for landholders under riparian management agreements and will fund the application fee for a new take-and-use licence for an adjoining Crown frontage if the landholder participates in a riparian management program with the CMA.

ACTION 2-41:

Support the development and utilisation of alternative water options for landholders under riparian management agreements

Who: CMA, Southern Rural Water, GWMWater, DEPI

2.10 RECREATIONAL USE OF WATERWAYS

Waterways are increasingly being valued for the recreational services they provide. Key recreational uses of waterways include fishing, hunting, boating, swimming and camping.

2.10.1 RECREATIONAL FISHING

Recreational fishing makes an important social and economic contribution to Victorian regional communities. It has been estimated that recreational fishing contributes \$184 million to the Victorian economy. In particular, the Glenelg Hopkins region provides popular native and trout recreational fishing opportunities.

DEPI (Fisheries Victoria) is focused on managing fisheries in a balanced way to ensure ecological sustainability and social and economic outcomes. Fisheries Victoria is also responsible for implementing Victorian Government initiatives to improve recreational fishing opportunities by supporting fish habitat recovery works, improving angler access and facilities, fish stocking, protecting fisheries resources and education and compliance activities.

Recreational fishing is highly dependent on the health of the environment including the availability of suitable habitat, water quality and water flow regimes to sustain productive fisheries. Recreational fishers acknowledged this critical dependency in surveys (2009 and 2012) that revealed 'repairing where fish live' was the most important recreational fishing investment priority. To improve habitat outcomes on the ground, there is mutual benefit in Fisheries Victoria and recreational fishers working with the CMA to identify and collaborate on habitat related projects that lead to better fishing outcomes.

The Glenelg Hopkins region includes many popular recreational fisheries. In 2012, a survey of recreational fishers highlighted that important fisheries in the region include the Glenelg River and estuary, Hopkins River and estuary, Rocklands Reservoir, Lake Bolac, Moyne River and Lake Burrumbeet. The Hopkins River estuary is one of three premier river reaches under the Go Fishing in Victoria Program, selected for their existing high recreational fisheries values.

A workshop was also held in 2013 with key angling groups in the region. The ideas and proposals from the workshop were reviewed by Fisheries Victoria against project feasibility criteria and are captured as fishery management priorities (see Appendix 3). The outcomes of this workshop builds on past fishery management planning processes, in particular the 2006 Glenelg Hopkins Fishery Management Plan.

ACTION 2-42:

Incorporate recreational fisheries priorities identified in the 2012 Glenelg Hopkins CMA regional survey and 2013 CMA/Fisheries Victoria workshop into the regional works program

Who: CMA, Fisheries Victoria, Arthur Rylah Institute, angling groups

2.10.2 GAME HUNTING

Many wetland reserves in the Glenelg Hopkins region allow duck hunting. Opportunities exist to work with game hunting organisations to conserve wetland habitat and restore wetlands.

ACTION 2-43:

Seek opportunities to work collaboratively with game hunting organisations to conserve wetland habitat. This may involve the development of Property Based Game Management (PBGGM) programs that will enhance game species and increase biodiversity

Who: CMA, game hunting organisations, DEPI, Parks Victoria (for State Game Reserves) Nature Glenelg Trust