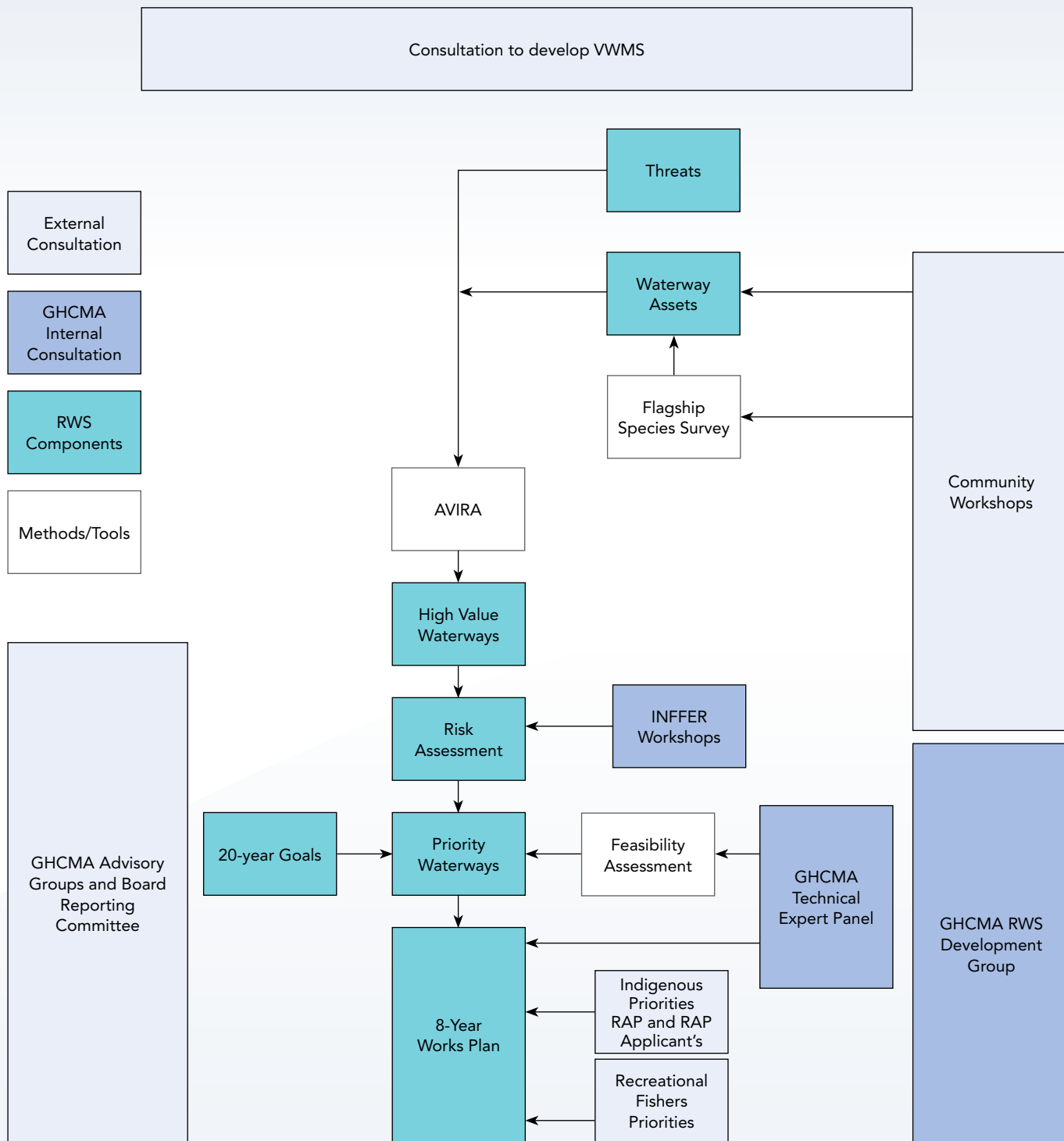


5 ACRONYMS

AVIRA	Aquatic Value Identification Risk Assessment database
CAMBA	China Australia Migratory Bird Agreement
CMA	Catchment Management Authority
DEPI	Department of Environment and Primary Industries
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GHWS	Glenelg Hopkins Waterway Strategy 2014-2022
GWMW	Grampians Wimmera Mallee Water
JAMBA	Japan Australia Migratory Bird Agreement
RCS	Glenelg Hopkins Regional Catchment Strategy 2013-2019
RCT	Resource condition target
ROKAMBA	Republic of Korea Australia Migratory Bird Agreement
RRHS	Regional River Health Strategy 2004-2009
VEWH	Victorian Environmental Water Holder
VWMS	Victorian Waterway Management Strategy 2013
WMA	Waterway Management Areas

6 APPENDICES

APPENDIX 1. SUMMARY OF CONSULTATION PROCESS USED TO DEVELOP GLENELG HOPKINS WATERWAY STRATEGY



APPENDIX 2. WATERWAY VALUES AND PRIORITIES IDENTIFIED IN CONSULTATION WITH REGISTERED ABORIGINAL PARTIES

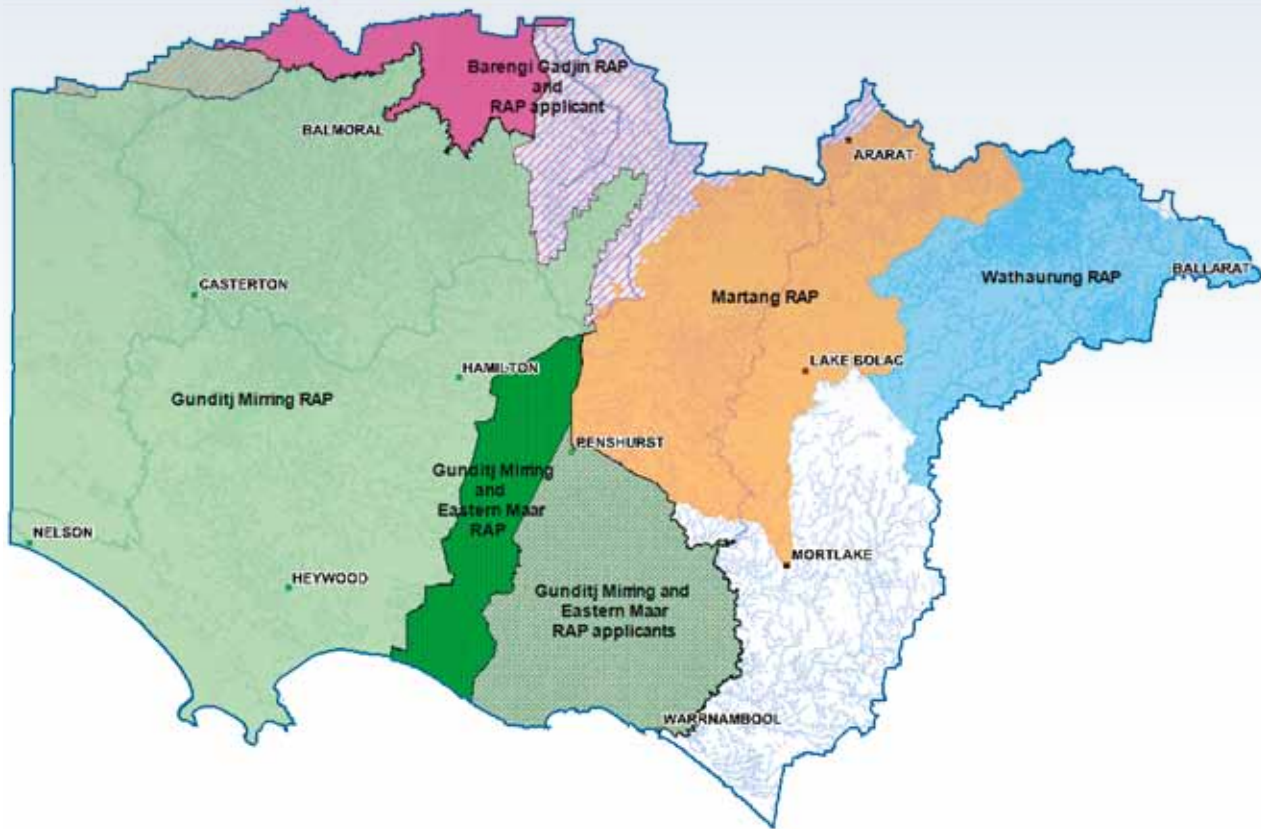


Figure 31. Registered Aboriginal Parties (RAPs) and RAP applicants in the Glenelg Hopkins CMA area

APPENDIX 2. (CONTINUED)

WATHAURUNG ABORIGINAL CORPORATION
WATERWAY VALUES AND ACTIONS

The following aspirations and actions regarding waterway management on Wathaurung Country were collated from discussion with Sean Fagan (Wathaurung Aboriginal Corporation) and members of Wadawurrung Traditional Owners Board.

Facilitate identification of cultural heritage features:

The Wathaurung Aboriginal Corporation (Wadawurrung) has commenced identifying cultural heritage features that are not formally recognised in Cultural Heritage Sensitivity Overlays. Property names in the language of traditional owners are an initial indication of a potential feature. Many early settlements were named after landscape features to enable Aboriginal guides to locate properties.

ACTION 6-1:

Support 'Country Mapping' activities either in a formal project or through informal contact with individual landholders and in community workshops to raise awareness of and record potential features

Lead: CMA, Wathaurung Aboriginal Corporation (Wadawurrung), Landcare and community groups

Facilitate access to private land: The Wadawurrung Traditional Owners would welcome access to private properties to identify new cultural sites. There could be arrangements for landholders undertaking environmental works to receive additional incentives if access is allowed and actions undertaken to protect any sites identified.

ACTION 6-2:

Investigate opportunities for the CMA to encourage landholders to both provide access to Indigenous project officers for site assessments and undertake work to protect sites

Lead: CMA, Wathaurung Aboriginal Corporation (Wadawurrung), Landcare and community groups

Provide capacity building opportunities: Encourage participation of Indigenous people in training programs to improve skills and increase employment opportunities in environmental programs.

ACTION 6-3:

Provide opportunities for Indigenous people to participate in environmental assessment training e.g. use of tools such as habitat hectares and Index of Wetland Condition

Lead: CMA, DEPI, Wathaurung Aboriginal Corporation (Wadawurrung)

Promote knowledge sharing: Wadawurrung Traditional Owners would like to be engaged in forums for information exchange and awareness raising, sharing experiences and knowledge about NRM and cultural heritage with other landholders.

ACTION 6-4:

Help co-ordinate and assist with opportunities for Indigenous people to exchange information and raise awareness of Indigenous cultural perspectives with other landholders in the region

Lead: CMA, DEPI, Wathaurung Aboriginal Corporation (Wadawurrung), Landcare and community groups

Encourage planting of endemic species of Indigenous significance: Wadawurrung Traditional Owners are concerned about a loss of plant species that are traditionally used as bush tucker or for medicinal purposes. CMA revegetation programs are an opportunity to encourage planting of these species.

ACTION 6-5:

Encourage propagation of plant species traditionally utilised by Indigenous people. Support planting of these species in revegetation programs. Develop and provide species lists of culturally important plants to inform revegetation programs

Lead: CMA, Wathaurung Aboriginal Corporation (Wadawurrung), Land care and community groups, nursery owners

APPENDIX 2. (CONTINUED)

Facilitate employment opportunities:

Green Teams: Wadawurrung People expressed an interest in establishing 'green teams' to participate in on-ground work programs such as weed control and revegetation projects – particularly planting species traditionally used by Aboriginal People.

ACTION 6-6:

Investigate opportunities to employ Indigenous people in on-ground work programs such as weed control and revegetation

Lead: Wathaurung Aboriginal Corporation (Wadawurrung), CMA; local government, DEPI, Parks Victoria

Cultural heritage advice: Wadawurrung people also have skills to undertake due diligence assessments. These assessments provide necessary information with regards to Country and are undertaken in the project planning phase and can be used as desktop assessments in Cultural Heritage Management Plans (CHMP). Wadawurrung people can also provide advice on statutory obligations, relating to particular projects, on how to manage risk and protect Aboriginal Cultural Heritage.

ACTION 6-7:

Utilise Wadawurrung peoples knowledge of their Country when requiring advice on statutory obligations or developing due diligence assessments and Cultural Heritage Management Plans

Lead: Wathaurung Aboriginal Corporation (Wadawurrung), CMA; local government, DEPI, Parks Victoria

Key Waterways: All waterways are significant and viewed as a priority for protection from threats by Wadawurrung people. Key waterways for focus of works in the next eight years are Lake Wongan, Mt Emu Creek and Lake Burrumbeet.

GUNDITJ MIRRORING TRADITIONAL OWNERS WATERWAY VALUES AND ACTIONS

The following values and actions were collated from discussion with Damein Bell and previous engagement with representatives of Gunditj Mirring Traditional Owners, which were documented in DSE (2009) Consultation with Indigenous Groups for the Development of the Draft Sustainable Water Strategy (Prepared by Effective Management Solutions).

Recognition of Cultural Flows: (Glenelg River and Lake Condah).

ACTION 6-8:

Ensure engagement of Gunditj Mirring Traditional Owners prior to development of Seasonal Watering Proposals

Lead: CMA

Support waterway health to enable customary catch of eels by Indigenous people:

Promote knowledge sharing: Gunditj Mirring Traditional owners are working with partners such as government agencies, research and tertiary education institutes to establish a program to promote knowledge of traditional and contemporary laws and practices.

Encourage planting of endemic species of Indigenous significance:**ACTION 6-9:**

Encourage propagation of plant species traditionally utilised by Indigenous people

Support planting of these species in revegetation programs

Develop and provide species lists of culturally important plants to inform revegetation programs

Lead: CMA

APPENDIX 2. (CONTINUED)

Support Traditional land management practices:**ACTION 6-10:**

Investigate opportunities to incorporate traditional land management practices in property management plans developed as part of incentive programs. Support promotion of these practices through engagement activities such as 'yarns on farms'

Lead: CMA, Gunditj Mirring Traditional Owner Group

Provide capacity building opportunities:**ACTION 6-11:**

Investigate opportunities to involve Indigenous people in training programs run by the CMA

Lead: CMA

Facilitate employment opportunities:**ACTION 6-12:**

Investigate opportunities to employ Indigenous people in on-ground work programs such as weed control and revegetation
Utilise Gunditj Mirring Traditional Owner knowledge of their Country when requiring advice on statutory obligations or developing due diligence assessments and Cultural Heritage Management Plans

Lead: CMA, Gunditj Mirring Traditional Owner

Key Waterways: All waterways are significant and viewed by Gunditjmarra as a priority for protection from threats. Increased priorities for investigation over the next eight years include Lake Gorrie, Sinclair wetlands, Kurtonitj wetlands and the Wannon River.

BARENGI GADJIN LAND COUNCIL WATERWAY VALUES AND PRIORITIES

The following aspirations and actions regarding waterway management were collated from discussion with Michael Stewart (Executive Officer) and members of Barengi Gadjin Land Council Aboriginal Corporation

Facilitate identification of cultural heritage features:

The Barengi Gadjin Land Council has commenced identifying cultural heritage features that are not formally recognised in Cultural Heritage Sensitivity Overlays.

ACTION 6-13:

Support 'Country mapping' activities either in a formal project or through informal contact with individual landholders and in community workshops to raise awareness of and record cultural features

Lead: CMA, Barengi Gadjin Land Council, Landcare and community groups

Promote knowledge sharing: Barengi Gadjin Land Council is keen to promote knowledge of traditional and contemporary laws and practices.

ACTION 6-14:

Support inclusion of traditional knowledge into waterway management

Lead: CMA, Barengi Gadjin Land Council

Encourage planting of endemic species of Indigenous significance:**ACTION 6-15:**

Encourage propagation of plant species traditionally utilised by Indigenous people

- Support planting of these species in revegetation programs
- Develop and provide species lists of culturally important plants to inform revegetation programs

Lead: CMA, Barengi Gadjin Land Council

APPENDIX 2. (CONTINUED)

Provide capacity building opportunities: Barengi Gadjin Land Council is interested in opportunities to increase skills of work crews e.g. use of cybertrackers for mapping cultural features.

ACTION 6-16:

Investigate opportunities to involve Indigenous people in training programs run by the CMA

Lead: CMA, Barengi Gadjin Land Council

Facilitate employment opportunities:

ACTION 6-17:

Investigate opportunities to employ Indigenous people in on-ground work programs such as weed control and revegetation

ACTION 6-18:

Use Barengi Gadjin Land Council and Indigenous knowledge of their country for advice on statutory obligations or when developing due diligence assessments and Cultural Heritage Management Plans

Lead: CMA, Barengi Gadjin Land Council

Key waterways: All waterways considered as significant by Barengi Gadjin Land Council. Many waterways form boundaries between different language groups. However, the following waterways have recognised features or particular cultural significance:

- Salt Creek (tributary of the Glenelg – confluence just south of Rocklands reservoir) – possible scar trees
- Muline Creek – significant density of Indigenous cultural features. Flows to Glenelg River to north of Rocklands Reservoir
- Muchong Creek – flows from Black Range to Glenelg River north of Rocklands Reservoir
- Two other significant waterways, Wimmera River, which is a key feature and an important trade and travel route, and Mosquito Creek are both in the Wimmera CMA region.

Key waterway species

Long-necked tortoises are an important food source and cultural indicator species for seasonal change.

Eels are culturally important species particularly in the south of the Barengi Gadjin area.

APPENDIX 3. GLENELG HOPKINS RECREATIONAL FISHERIES MANAGEMENT PRIORITIES

Fisheries Victoria and the CMA convened a workshop with key recreational fishing representatives on 19 November 2013 to identify key fisheries management priorities for the region. The following notes are a record of actions identified at that meeting.

Workshop attendees: John Hotchin and Martin Ellul (VRFish), Tim Curmi (Native Fish Australia), Ray White (Western District Association of Angling Clubs), Gary Cronin (South West Anglers Association and Camperdown Angling Club), Ray McLeod (Lake Bolac Angling Club), Ben Pohlner (Warrnambool Offshore and Light Game Fishing Club and Wannon Water), Brian Murrell (Casterton Angling Society), Steve Wickson, Helen Arundel and Adam Bester (Glenelg Hopkins Catchment Management Authority), Renae Ayres (Arthur Rylah Institute, Fish Habitat Network), Cameron McCallum, Anthony Forster and Taylor Hunt (Fisheries Victoria).

Workshop apologies: Australian Trout Foundation, Futurefish Foundation, Fishcare, Hamilton Angling Club, Allansford Angling Club, Koroit and District Angling Club and Warrnambool and District Anglers.

Background

Recreational fishing makes an important social and economic contribution to Victorian regional communities. In particular, the Glenelg Hopkins CMA 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 state 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.

Key recreational fisheries in the Glenelg Hopkins Catchment

The Glenelg Hopkins region includes many popular recreational fisheries. In 2012, a survey of recreational fishers they considered important fisheries in the region included the Glenelg River and estuary, Hopkins River and estuary, Rocklands Reservoir, Lake Bolac, Moyne River and Lake Burrumbeet.

A more complete assessment of Victoria's recreational fishing waters can be found in a Guide to Inland Angling Waters of Victoria at: www.dpi.vic.gov.au/fisheries/recreational-fishing/inland-angling-guide.

Strategic Priorities

Fisheries Victoria invests in the following strategic priorities for the management of inland fishing in Victoria:

1. Protect key fisheries assets
2. Advocate for fish habitat recovery works
3. Manage fish stocking
4. Encourage compliance with regulations
5. Improve angler access
6. Develop recreational fishing opportunities.

The first two of these strategic priorities fall within the scope of the Regional Waterway Strategy.

Fishery management priorities

The ideas and proposals from the workshop were reviewed by Fisheries Victoria against project feasibility criteria and are captured as fishery management priorities (*Table 1 page 208*). The outcomes of this workshop builds on past fishery management planning processes, in particular the 2006 Glenelg Hopkins Fishery Management Plan.

APPENDIX 3. (CONTINUED)

Table 1: Glenelg Hopkins Fishery Management Priorities

No.	Fishery management priorities
1	Investigate the feasibility of sand extraction on the Glenelg River at alternative downstream locations (Myaring bridge and Beddison road) by identifying potential access points in conjunction with contractor
2	Work with farmers and appropriate authorities to reduce point source dairy effluent draining into key waterways (e.g. Fitzroy River)
3	Work with land managers and CMA to rehabilitate native riparian vegetation at Grange Burn
4	Investigate the effectiveness of the fish ladder and potential improvement to the Bromfield/Wollaston weir on the Merri River
5	Work with recreational fishers and land holders to establish a habitat hotspot (in-stream and riparian habitat) on the Merri River from the Bromfield/Wollaston weir downstream
6	Raise awareness of efforts to control and manage carp, improve cross agency and community collaboration and develop a protocol for carp removal based on the results of the trial
7	Promote recreational fisher engagement in the design, implementation and monitoring of environmental flows
8	Investigate options to restore flows to the Wannon River and assess the requirement for diversions out of the Glenelg catchment
9	Investigate options for in-stream habitat restoration (wood, rocks, vegetation etc.) in the lower Hopkins river
10	Work with recreational fishers and local water authority to enhance Konongwootong Reservoir as a recreational fishery



APPENDIX 4. RELEVANT LEGISLATION

State

Under the *Water Act 1989*, the Victorian Government retains the overall right to the use, flow and control of all surface water and groundwater for both consumptive and environmental purposes. The *Water Act* 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*, as an independent statutory body responsible for making decisions on the most efficient and effective use of Victoria's environmental entitlements. The *Water Act* directs development of the Victorian and Regional Waterway Strategies.

The State Environment Protection Policy (Waters of Victoria) 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. It identifies beneficial uses of water and sets the environmental quality objectives and policy directions required to address higher risk impacts and activities.

The *Flora and Fauna Guarantee Act 1988 (FFG Act)* lists threatened species and ecological communities and is the key Victorian legislation for the conservation of these species and communities and for the management of potentially threatening processes. The *FFG Act* provides for the preparation of a Flora and Fauna Guarantee Strategy, which was launched as Victoria's Biodiversity Strategy 2010.

The *Coastal Management Act 1995* establishes a framework for co-ordinated strategic coastal planning in Victoria and provides for the use, development and protection of coastal Crown Land. The Act establishes the Victorian Coastal Council and the three Coastal boards: Western, Central and Gippsland. The Act provides for the preparation of the Victorian Coastal Strategy, Coastal Action Plans and management plans.

The *Planning and Environment Act 1985* provides a template (Victorian Planning Provisions) for the construction of consistent planning schemes across the state.

The *Aboriginal Heritage Act 2006* provides for the protection and management of Victoria's Aboriginal heritage. It establishes the Victorian Aboriginal Heritage Council to advise the Minister in the management of cultural heritage and registered Aboriginal parties. The Act also provides advice with regard to cultural heritage management plans, cultural heritage permits and agreements.

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. The Glenelg Hopkins CMA is responsible for preparing the Glenelg Hopkins RCS and co-ordinating and monitoring its implementation. The Glenelg Hopkins RCS is the overarching strategy, under which are a range of sub-strategies and action plans for the Glenelg Hopkins region. The long-term objectives and priorities for action in the Glenelg Hopkins RCS that relate to waterways will be implemented through this strategy.

Regional planning processes for waterway management were established in 2002 under the Victorian River health Strategy and implemented through the ten regional river health strategies (RRHSs). 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 exceeded their intended lifespan. The development of this strategy is a statutory requirement under the *Water Act* and will replace the RRHS.

The Western Region Sustainable Water Strategy (SWS) sets out long-term regional plans to secure water for regional growth, while safeguarding the future of its rivers and other natural water sources. It investigates the range of potential changes to water availability under several climate change scenarios. The Western Region SWS examines future consumptive demand and environmental needs and sets out proposed options to balance and secure water for all users.

APPENDIX 4. (CONTINUED)

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 Governments (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* is the Australian Government's central piece of environmental legislation. It 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* 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.

International

The Australian Government has ratified several international human rights instruments 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. 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*.

APPENDIX 5. MANAGEMENT PLANNING FOR LAKE BOOKAR IN THE WESTERN DISTRICT LAKES RAMSAR SITE

Table A: Limits of Acceptable Change for the Western District Lakes Ramsar site. (Source Hale, J. and Butcher, R., 2011)

Component, Process and Service	Baseline/Supporting Evidence	Limit of Acceptable Change	Confidence level
Critical components and processes			
Hydrology	<p>At the time of listing Western District Lakes comprised:</p> <ul style="list-style-type: none"> • Six permanent wetlands that had not been known to dry completely in European history (Lakes Bookar, Corangamite, Gnarpurt, Milangil, Murdeduke and Terangpom); • One permanent wetland that dried on occasion in the last 100 years, for a maximum period of six weeks (Lake Colongulac); and • Two temporary wetlands that dried seasonally (Lakes Beeac and Cundare). <p>Water levels varied seasonally in all lakes, with permanent wetlands changing in depth by approximately one metre annually (Coram 1996).</p> <p>LAC based on no change in hydrological type and local knowledge.</p>	<p>No change in wetland hydrological type for any given wetland. That is the following hydrological regimes maintained:</p> <ul style="list-style-type: none"> • Lakes Beeac and Cundare – intermittent wetlands drying seasonally but having water for at least a few months of each year; • Lake Colongulac – near permanent wetland drying for no more than twelve months in any five-year period; • Lakes Bookar, Corangamite, Gnarpurt, Milangil, Murdeduke and Lake Terangpom – permanent wetlands not drying for more than two months in any five-year period. 	High
Salinity	<p>Salinity within the wetlands varied on annual and inter-annual cycles (Decker and Williams 1988; Hose et al. 2008):</p> <p>Beeac 55 to 300 parts per thousand Bookar 11 to 17 parts per thousand Colongulac 8 to 12 parts per thousand Corangamite 27 to 36 parts per thousand Cundare 77 to 347 parts per thousand Gnarpurt 7 to 14 parts per thousand Milangil 6 to 7 parts per thousand Murdeduke 11 to 14 parts per thousand Terangpom 2 parts per thousand</p> <p>LAC based on no change in salinity category (for example fresh to saline, saline to hypersaline).</p>	<p>No change in salinity category for any given wetland. That is the following salinity regimes maintained:</p> <ul style="list-style-type: none"> • Lakes Beeac and Cundare – hypersaline (greater than 50 parts per thousand); • Lakes Bookar, Colongulac, Corangamite, Gnarpurt, Milangil and Murdeduke – saline (5 to 50 parts per thousand) • Lake Terangpom – fresh / brackish (less than three parts per thousand). 	High
Threatened flora	<p>At the time of listing, the site supported two threatened wetland dependent plant species:</p> <p>Spiny peppergrass – nine populations, total of 0.6 hectares (Carter and Walsh 2006); and</p> <p>Salt-lake tussock-grass – 97 plants were recorded along the eastern lunette of Lake Beeac and 107 plants at Lake Corangamite (DSE 2009).</p> <p>Variability in extent and population size is not known.</p>	<p>Presence of spiny peppergrass and salt-lake tussock-grass within the Ramsar site at least one-year in any five-year period</p>	Low

APPENDIX 5. (CONTINUED)

Component, Process and Service	Baseline/Supporting Evidence	Limit of Acceptable Change	Confidence level
Critical components and processes			
Waterbirds	At the time of listing, the Western District Lakes supported large numbers of waterbirds annually (Martindale 1988; Hewish 1988; Peter 1989 to 1992). In an attempt to incorporate the level of variability in shorebird counts, limits are determined based on mean minus one standard deviation.	Total waterbird numbers not less than 28,000 during summer in a minimum of three years in any five year period.	Medium
	At the time of listing the Western District Lakes regularly supported greater than one percent of the population of Australian shelduck, Australasian shoveler, chestnut teal and Eurasian coot (see sections 3.3.4 and 2.4.2). Mean abundance (1987 to 1992) was close to the current one percent population thresholds for each species. LAC is based on percentage of population to account for changes in the wider population of these species to be reflected in the LAC into the future.	Australian shelduck, Australasian shoveler, chestnut teal and Eurasian coot – not less than one percent of population (from latest Wetlands International population estimates) recorded at least once in every five year period.	Medium
	The site supports 20 species of migratory shorebird that are listed under international migratory bird agreements. Of these, three occur regularly in the site: curlew sandpiper, red-necked stint and sharp-tailed sandpiper (AWSG unpublished). Abundance however, is highly variable and insufficient data is available to determine a quantitative LAC.	Presence of curlew sandpiper, red-necked stint and sharp-tailed sandpiper within the Ramsar site in at least once in every five year period.	Low
Critical Services			
Diversity of wetland types	Wetland types (intermittent saline, permanent saline and permanent freshwater) are maintained by hydrology and salinity.	See LACs for hydrology and salinity.	Not applicable
Physical habitat	Physical habitat for waterbirds is maintained through wetland types and can be indicated by the numbers of waterbirds supported by the site.	See LACs for hydrology, salinity and waterbirds.	Not applicable
Priority wetland species	Priority species at the Western District Lakes Ramsar site are the 20 international migratory shorebirds.	See LACs for waterbirds.	Not applicable
Threatened species	The site supports two threatened plant species (spiny peppergrass and salt-lake tussock-grass).	See LACs for threatened flora.	Not applicable

APPENDIX 5. (CONTINUED)

Table B. Recommended monitoring to meet obligations under the Ramsar Convention and the EPBC Act with respect to the Western District Lakes Ramsar site (Source Hale, J. and Butcher, R., 2011)

Parameter	Purpose	Indicator	Locations	Frequency	Priority
Hydrology	Assessment against LAC	Water level	Each wetland	Monthly	Moderate
Water quality	Assessment against LAC and threat indicator	Salinity Nutrients	Each wetland	Monthly	Moderate
Threatened plant species	Assessment against LAC	Location, abundance, site hydrological conditions	Lakes Beeac, Corangamite and Terangpom	Annual	High
Aquatic Invertebrates	Knowledge gap	Community composition, abundance	Entire Ramsar site	Once in five years during spring	Moderate
Waterbirds	Assessment against LAC	Abundance and species identifications, breeding observations	Entire Ramsar site	Winter and summer	High
Vegetation (weeds)	Threat indicator	Location, extent	Lakes Beeac, Corangamite and Terangpom	Annual	High
Pest animals (foxes, rabbits)	Threat indicator	Abundance	Entire Ramsar site	Annual	Moderate

APPENDIX 6. AVIRA VALUES

ENVIRONMENTAL AVIRA

FORMALLY RECOGNISED SIGNIFICANCE

- International Significance
 - Ramsar Sites
 - East Asian-Australasian Flyway Sites
- National Significance
 - Nationally Important Wetlands
 - Living Murray Icon Sites
 - High Ecological Value Aquatic Ecosystems
 - National Heritage Sites
- State Significance
 - Heritage Rivers
 - Icon Rivers
 - Essentially Natural Catchments
 - Victorian Parks and Reserves
 - Victorian Heritage Sites

REPRESENTATIVENESS

- Representative Rivers
- Representative Wetlands*
- Representative Estuaries*

RARE OR THREATENED SPECIES/COMMUNITIES

- Significant Fauna (Invertebrates)
- Significant Fauna (Vertebrates)
- Significant Flora
- Significant Riparian EVCs
- Significant Wetland EVCs
- Significant Estuarine EVCs*

NATURALNESS

- Aquatic Invertebrate Community Condition
 - River Reaches
 - Wetlands
- Native Fish
- Riparian Vegetation Condition
- Wetland Vegetation Condition
- Estuary Vegetation Condition*

LANDSCAPE FEATURES

- Drought Refuges
- Important Bird Habitats
- Biosphere Reserves

SOCIAL AVIRA

ACTIVITY

- Recreational Fishing
- Non-Motor Boating
- Motor Boating
- Camping
- Swimming
- Beside Water Activities
 - Walking, Hiking, Cycling
 - Sightseeing
 - Picnics/Barbecues
- Game Hunting

PLACE

- Heritage
 - Pre-European (Indigenous) Heritage
 - Post-European Heritage
- Landscape

PEOPLE

- Community Groups
- Use of Flagship Species

ECONOMIC AVIRA

WATER

- Urban/Rural Township Water Sources
- Rural Water Sources for Production
- Water Storages
- Water Carriers
- Wastewater Discharges

POWER GENERATION

- Hydro-Electricity

OTHER RESOURCES

- Commercial Fishing
- Extractive Industries
- Timber Harvesting and Firewood Collection

APPENDIX 7. THREATS TO RIVERS, ESTUARIES AND WETLANDS CONSIDERED IN THE PRIORITY SETTING PROCESS USING AVIRA

RIVERS	WETLANDS	ESTUARIES
Altered water regimes <ul style="list-style-type: none"> – Altered flow regimes – Increase in low flow magnitude – Reduction in high flow magnitude – Increase in proportion of zero flow – Change in monthly streamflow variability – Altered streamflow seasonality 	Altered water regimes <ul style="list-style-type: none"> • Changed water regime 	Altered water regimes <ul style="list-style-type: none"> • Altered marine exchange (intermittently open estuaries) – Increase in low flow magnitude – Reduction in high flow magnitude – Increase in proportion of zero flow – Change in monthly streamflow variability – Altered streamflow seasonality • Altered marine exchange (permanently open estuaries)
Altered physical form <ul style="list-style-type: none"> • Bank instability • Bed instability (degradation) 	Altered physical form <ul style="list-style-type: none"> • Reduce wetland area • Altered wetland form 	Altered physical form <ul style="list-style-type: none"> • Bank instability • Reduced estuary extent
Poor water quality <ul style="list-style-type: none"> • Degraded water quality • Thermal water pollution • Disturbance of acid sulfate soils 	Poor water quality <ul style="list-style-type: none"> • Changed water properties • Disturbance of acid sulfate soils 	Poor water quality <ul style="list-style-type: none"> • Degraded water quality • Disturbance of acid sulfate soils
Naturalness <ul style="list-style-type: none"> • Aquatic invertebrate community condition • Native fish • Riparian vegetation condition 	Naturalness <ul style="list-style-type: none"> • Aquatic invertebrate community condition (TBD) • Native fish (TBD) • Wetland vegetation condition 	Naturalness <ul style="list-style-type: none"> • Native fish (TBD) • Estuary vegetation condition (TBD)
Degraded habitats <ul style="list-style-type: none"> • Degraded riparian vegetation <ul style="list-style-type: none"> – Large trees • Loss of in-stream habitat <ul style="list-style-type: none"> – Large wood – sedimentation • Livestock access 	Degraded habitats <ul style="list-style-type: none"> • Soil disturbance • Degraded buffer vegetation • Livestock access 	Degraded habitats <ul style="list-style-type: none"> • Degraded estuarine vegetation • Livestock access
Invasive flora and fauna <ul style="list-style-type: none"> • Invasive flora (riparian) <ul style="list-style-type: none"> – Trees – Shrub layer – Ground layer • Invasive flora (aquatic) • Invasive fauna (terrestrial) • Invasive fauna (aquatic) 	Invasive flora and fauna <ul style="list-style-type: none"> • Invasive flora (wetland) • Invasive fauna (terrestrial) • Invasive fauna (aquatic) 	Invasive flora and fauna <ul style="list-style-type: none"> • Invasive flora (riparian) <ul style="list-style-type: none"> – Trees – Shrub layer – Ground layer • Invasive flora (aquatic) • Invasive fauna (terrestrial) • Invasive fauna (aquatic)
Reduced connectivity <ul style="list-style-type: none"> • Barriers to fish migration • Reduced riparian connectivity <ul style="list-style-type: none"> – Longitudinal continuity – Vegetation width • Reduced floodplain connectivity 	Reduced connectivity <ul style="list-style-type: none"> • Reduced wetland connectivity (TBD) 	Reduced connectivity <ul style="list-style-type: none"> • Barriers to estuarine biota • Reduced floodplain and wetland connectivity

APPENDIX 8. AVIRA METRICS/CATEGORIES AND SCORES REQUIRED FOR WATERWAYS TO BE CLASSIFIED AS HIGH VALUE

Value type	High value category	AVIRA score / category
Environmental values		
Formally recognised – international significance	Ramsar Sites (wetlands only)	Yes
	East Asian-Australasian Flyway sites (wetlands / estuaries only)	Yes
Formally recognised – national significance	Nationally Important Wetlands	Yes
	Living Murray Icon Sites	Yes
	National Heritage Sites	Yes
	Heritage Rivers	Yes
	Icon Rivers	Yes
	Essentially Natural Catchments	Yes
	Victorian Parks and Reserves	Yes
	Victorian Heritage Sites	Yes
Representativeness	Representative Rivers	Yes
Rare or threatened species / communities	Significant fish	4-5
	Significant birds	4-5
	Significant amphibians (rivers/wetlands only)	4-5
	Significant invertebrates (rivers and wetlands only)	4-5
	Significant reptiles	4-5
	Significant mammals (rivers and wetlands only)	4-5
	Significant flora	4-5
	Significant riparian EVCs (rivers only)	5
	Significant wetland EVCs (wetlands only)	4-5
	Significant estuarine EVCs (estuaries only)	4-5
Naturalness	Aquatic invertebrate community condition (rivers / wetlands only)	4-5
	Native fish communities (rivers only)	4-5
	Riparian vegetation condition (rivers only)	4-5
	Wetland vegetation condition (wetlands only)	4-5
	Drought refuges	3,5
	Important bird habitat	5
	Biosphere reserves	Yes

APPENDIX 8. (CONTINUED)

Value type	High value category	AVIRA score / category
Social values		
Activity	Recreational fishing	5
	Non-motor boating	4-5
	Motor boating	4-5
	Camping	4-5
	Swimming	5
	Beside water activities: walking, hiking, cycling, sightseeing, picnics/barbecues	5
	Game hunting	5
	Heritage: Aboriginal cultural heritage, post-European heritage	known
	Landscape	3-5
People	Community groups	5
	Use of flagship species	5
Economic values		
Water	Urban/rural township water sources	3-5
	Rural water sources for production	3-5
	Water carriers (rivers/wetlands only)	5
	Waste water discharges	5
	Water storages (rivers/wetlands only)	3-5
Power generation	Hydro-electricity (rivers/wetlands only)	3-5
Other resources	Commercial fishing	5
	Extractive industries	5
	Timber harvesting and firewood collection	3,5

APPENDIX 9. HIGH VALUE RIVERS, ESTUARIES AND WETLANDS IN THE GLENELG HOPKINS REGION

Name	Number	Environmental Values				
		Formally Recognised Significance	Representativeness	Rare or Threatened Species / Communities	Naturalness	Landscape Features
HOPKINS RIVER	36-02				X	X
HOPKINS RIVER	36-03			X	X	X
HOPKINS RIVER	36-04				X	
HOPKINS RIVER	36-05				X	
HOPKINS RIVER	36-06		X	X	X	
HOPKINS RIVER	36-07	X			X	
HOPKINS RIVER	36-08	X			X	
HOPKINS RIVER	36-09	X			X	
HOPKINS RIVER	36-10	X		X	X	
HOPKINS RIVER	36-11			X	X	X
HOPKINS RIVER	36-12				X	
BRUCKNELL CREEK	36-13			X	X	X
DEEP CREEK	36-14				X	
MT EMU CREEK	36-15				X	X
MT EMU CREEK	36-16			X	X	X
MT EMU CREEK	36-17			X	X	
MT EMU CREEK	36-18				X	X
BATTLE CREEK	36-19				X	
BURRUMBEET CREEK	36-20					
BURRUMBEET CREEK	36-21			X		
MT EMU CREEK	36-22			X	X	X
TRAWALLA CREEK	36-23			X	X	X
BLIND CREEK	36-24			X	X	X
FIERY CREEK	36-25				X	X
FIERY CREEK	36-26			X	X	X
FIERY CREEK	36-27			X	X	X
FIERY CREEK	36-28			X	X	X
FIERY CREEK	36-29				X	X

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
X		X			
X		X			
X		X			
	X	X			
	X	X			
	X	X			
	X	X			
	X	X			
X	X	X			
X		X			
X	X	X			
X	X	X			X
	X	X			
	X	X			
X					
		X			
X		X			X
					X
		X			
		X			
X		X			
X		X			
X		X			

APPENDIX 9. (CONTINUED)

Name	Number	Environmental Values				
		Formally Recognised Significance	Representativeness	Rare or Threatened Species / Communities	Naturalness	Landscape Features
SALT CREEK	36-30			X	X	
MUSTON CREEK	36-31				X	
MUSTON CREEK	36-32			X	X	
BURCHETT CREEK	36-33				X	
GRAYS CREEK	36-34			X	X	
REEDY CREEK	36-35	X			X	
BACK CREEK	36-36	X			X	
GOOD MORNING BILL CREEK	36-37	X			X	X
MERRI RIVER	36-38	X		X	X	X
MERRI RIVER	36-39			X	X	X
SPRING CREEK	36-40			X	X	X
SPRING CREEK	36-41			X	X	X
SPRING CREEK	36-42			X	X	
DRYSDALE CREEK	36-43				X	
HOPKINS RIVER	36-44				X	X
WATTLE HILL CREEK	37-01			X	X	X
WATTLE HILL CREEK	37-02				X	X
SURRY RIVER	37-03				X	X
SURRY RIVER	37-04			X	X	X
SURRY RIVER	37-05			X	X	X
FITZROY RIVER	37-07			X	X	X
FITZROY RIVER	37-08			X	X	X
DARLOTS CREEK	37-09			X	X	X
DARLOTS CREEK	37-10			X	X	X
EUMERALLA RIVER	37-11			X	X	X
EUMERALLA RIVER	37-12			X	X	X
EUMERALLA RIVER	37-13				X	X
SHAW RIVER	37-14			X	X	X

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
		X			
	X				
	X	X			
		X			
	X	X			
X		X			
X	X				X
X					
			x		
			x		
			x		
		X			
X					X
		X			
X		X			
X		X			
X		X			
X		X	x		
X		X			
	X	X			
X	X	X			
X		X			
X		X			
X		X			

APPENDIX 9. (CONTINUED)

Name	Number	Environmental Values				
		Formally Recognised Significance	Representativeness	Rare or Threatened Species / Communities	Naturalness	Landscape Features
SHAW RIVER	37-15			X	X	X
MOYNE RIVER	37-16			X	X	X
MOYNE RIVER	37-17			X	X	X
BACK CREEK	37-18				X	X
GLENELG RIVER	38-02	X		X	X	X
GLENELG RIVER	38-03			X	X	X
GLENELG RIVER	38-04			X	X	X
GLENELG RIVER	38-05			X	X	X
GLENELG RIVER	38-06			X	X	X
GLENELG RIVER	38-07			X	X	X
GLENELG RIVER	38-08			X	X	X
GLENELG RIVER	38-09			X	X	X
GLENELG RIVER	38-10		X	X	X	X
GLENELG RIVER	38-11		X	X	X	X
GLENELG RIVER	38-12	X	X	X	X	X
GLENELG RIVER	38-13	X	X	X	X	X
MOLESIDE CREEK	38-14	X		X	X	X
CRAWFORD RIVER	38-15			X	X	X
CRAWFORD RIVER	38-16			X	X	X
CRAWFORD RIVER	38-17			X	X	X
SPRINGBURN CREEK	38-18				X	
KANGAROO CREEK	38-19			X	X	X
STOKES RIVER	38-20			X	X	X
STOKES RIVER	38-21			X	X	X
WANNON RIVER	38-22	X		X	X	X
WANNON RIVER	38-23	X		X	X	X
WANNON RIVER	38-24	X		X	X	X
WANNON RIVER	38-25	X		X	X	X

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
		X			
X	X				
X	X	X			
X		X			
X		X			X
X		X			X
X	X	X	x		X
X		X			X
X		X			X
X		X			
X	X	X	x		X
X	X	X	x		
X		X	x		
X		X			
X	X	X			X
X					
		X			
X	X	X			X
X	X	X			
X	X	X			
X	X	X			

APPENDIX 9. (CONTINUED)

Name	Number	Environmental Values				
		Formally Recognised Significance	Representativeness	Rare or Threatened Species / Communities	Naturalness	Landscape Features
WANNON RIVER	38-26	X		X	X	X
WANNON RIVER	38-27	X		X	X	X
WANNON RIVER	38-28	X		X	X	X
MIAKITE CREEK	38-29			X	X	X
MIAKITE CREEK	38-30			X	X	X
BRYANS CREEK	38-31				X	X
BRYANS CREEK	38-32				X	X
BRYANS CREEK	38-33			X	X	
KONONG WOOTONG CREEK	38-34				X	X
GRANGE BURN CREEK	38-35			X	X	X
GRANGE BURN CREEK	38-36				X	X
GRANGE BURN CREEK	38-37			X	X	X
GRANGE BURN CREEK	38-38				X	X
VIOLET CREEK	38-39				X	X
DWYER CREEK	38-40			X	X	X
DWYER CREEK	38-41			X	X	X
COX CREEK	38-42				X	X
BOONAWAH CREEK	38-43				X	X
WANDO RIVER	38-44			X	X	X
WANDO RIVER	38-45				X	X
STEEP BANK RIVULET	38-46				X	X
CHETWYND RIVER	38-47				X	
PIGEON PONDS CREEK	38-48				X	X
PIGEON PONDS CREEK	38-49				X	X
SALT CREEK	38-50				X	X
MATHERS CREEK	38-51				X	

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
X		X			
X	X	X			
X	X	X	x		
		X			
X		X			X
		X			X
		X			
		X			
X	X				
X					
			x		
	X	X			
X	X	X			
		X			X
		X			
		X			
		X			
		X			
		X			
		X			
		X			
X		X			X

APPENDIX 9. (CONTINUED)

Waterway			Environmental Values			
Basin	Name	Number	Formally Recognised Significance	Representativeness	Rare or Threatened Species/Communities	Naturalness
HOPKINS	Hopkins River	36~201			X	
HOPKINS	Merri River	36~238	X		X	
PORTLAND COAST	Wattle Hill Creek	37~201			X	
PORTLAND COAST	Surrey River	37~203			X	
HOPKINS	Merri River	36~238	X		X	
PORTLAND COAST	Wattle Hill Creek	37~201			X	
PORTLAND COAST	Surrey River	37~203			X	

Waterway	Environmental Values				
Number	Formally Recognised Significance	Representativeness	Rare or Threatened Species/Communities	Naturalness	Landscape Features
38~4~W12					
39~~W38					
20112	X				
20113	X				
20137	X				
20153	X				
20158	X		X		
20163	X				
20164	X				
20167	X				
20168	X				
20173	X				
20184	X				
20304	X				
20310	X				
20501	X		X		X
20502	X		X		X

APPENDIX 9. (CONTINUED)

Landscape Features	Social Values			Economic Values	
	Activity	Place	People	Water	Other Resources
X	X	X	X		
X	X	X	X		X
	X		X		
X	X		X		
X	X	X	X		X
	X		X		
X	X		X		

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
X					
X					X
X					
X					
X					
X		X			
X		X			
X					
X					
X		X			
X		X			
X		X			
X		X			
X					X
X					
X	X				
X					

APPENDIX 9. (CONTINUED)

Waterway		Environmental Values			
Number	Formally Recognised Significance	Representativeness	Rare or Threatened Species/Communities	Naturalness	Landscape Features
20533	X		X		
20542	X				
20546	X				
20561					X
20562	X		X		X
20563			X		X
20564			X		
20565	X		X		X
20568			X		
20576					
20578					
20580					
20613	X		X		X
20614	X		X		X
20911	X		X		
20930	X				
20939	X				
20942	X				
20965	X				
20983	X		X		
20987	X				
21015	X				
21044	X				
21046	X				
21063	X		X		
21069	X				
21073	X		X		
21076	X				
21079	X				
21088	X				

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
X					
X		X			
X		X			
X					
		X			
X					
X					1
X					
X					1
X		X			
X	X				
X					1
X					
X					
X					1
X					1
X		X			
X		X			
X					X
X		X			
X					X
X					
X		X			
X		X			
X					X
X		X			
X		X			X
X					X

APPENDIX 9. (CONTINUED)

Waterway		Environmental Values			
Number	Formally Recognised Significance	Representativeness	Rare or Threatened Species/Communities	Naturalness	Landscape Features
21089	X				
21090	X		X		
21094	X				
21102	X				
21103	X		X		
21108	X				
21109	X		X		
21118	X				
21121	X				
21131	X				
21132	X				
21136	X				
21137	X				
21140	X				
21141	X		X		
21146	X				
21151	X				
21152	X				
21154	X				
21157	X				
21158	X		X		
21166	X		X		
21167	X				
21170	X				
21172	X				
21175	X		X		
21180	X		X		
21181	X				
21182	X				
21186	X				

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
X					
X		X			
X		X			
X					
X					X
X		X			
X		X			
X					
X		X			
X					
X					
X		X			
X		X			
X		X			
X					
X		X			
X					
X					
X		X			
X		X			
X		X			
X		X			
X		X			
X		X			
X		X			
X		X			
X		X			
X		X			
X		X			
X		X			

APPENDIX 9. (CONTINUED)

Waterway		Environmental Values			
Number	Formally Recognised Significance	Representativeness	Rare or Threatened Species/Communities	Naturalness	Landscape Features
21187	X				
21188	X		X		
21191	X				
21196	X				
21203	X				
21207	X				
21215	X				
21217	X		X		
21224	X				
21229	X				
21232	X				
21239	X				
21243	X		X		
21246	X				
21252	X				
21267	X				
21270	X				
21271	X				
21281	X				
21284	X				
21300	X				
21313	X				
21354	X				
21472	X				
21485	X				
21489	X				
21506	X				
21554	X				
21561	X				
21611	X				
21651	X				

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
X		X			
X		X			
X		X			
X		X			
X					
X					
X					
X		X			
X		X			
X		X			
X		X			
X					
X					
X					
X		X			
X		X			
X					
X					
X		X			
X					
X					
X		X			
X					
X		X			
X		X			
X					
X		X			
X		X	X		
X		X			
X		X			
X		X			

APPENDIX 9. (CONTINUED)

Waterway		Environmental Values			
Number	Formally Recognised Significance	Representativeness	Rare or Threatened Species/Communities	Naturalness	Landscape Features
21657	X		X		
21670	X		X		
21688	X				
21720	X				
21748	X		X		
21749	X		X		
21752	X		X		
21753	X				
21765	X				
21771	X				
21783	X				
21789	X				
21804	X				
21811	X				
21827	X				
21830	X				
21833	X				
21839	X				
21842	X				
21843	X				
21844	X				
21847	X				
21850	X				
21851	X				
21852	X				
21853	X				
21854	X				
21858	X				
21898	X				
21909	X		X		

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
X					
X					
X					
X					
X					
X					
X		X			
X					
X					
X					
X		X			
X					
X					
X					
X					
X					
X					
X					
X					
X					
X					
X					
X					
X					
X		X			
X		X			
X		X			
X					
X					

APPENDIX 9. (CONTINUED)

Waterway		Environmental Values			
Number	Formally Recognised Significance	Representativeness	Rare or Threatened Species/Communities	Naturalness	Landscape Features
21915	X		X		
21916	X				
21920	X				
21921	X				
21924	X				
22902	X		X		
22909	X		X		
22910	X				
22912	X		X		
22921	X				
22924	X				
22925	X				
22929	X		X		
22930	X				
22932	X				
22933	X				
22934	X				
22935	X		X		
22937	X		X		
22938	X				
22941	X				
22942	X				
22944	X				
22946	X				
22948	X				
22949	X		X		
22953	X				
22955	X				
22957	X				
22963					

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
X					
X					
X					
X					
X					
X					
X					
X					X
X					
X					X
X		X			
X		X			X
X		X			
X					
X		X			
X					
X					
X		X			
X		X			
X		X			
X		X			
X		X			
X					
X		X			
X					
X					
X					
X		X			X

APPENDIX 9. (CONTINUED)

Waterway		Environmental Values			
Number	Formally Recognised Significance	Representativeness	Rare or Threatened Species/Communities	Naturalness	Landscape Features
22964					
22965					
22966					
22967	X				
22968	X				
22973	X				
22976					
22981	X				
22985	X		X		
22992	X				
22994	X				
22997	X				
22999	X				
23000	X				
23002	X				
23003	X				
23006	X				
23008	X				
23010	X				
23013	X				
23060	X				
23064	X				
23066	X				
23068	X				
23072	X				
23074	X				
23077	X				
23078			X		
23083	X		X		
23091	X				

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
X		X			X
X		X			X
X		X			X
X					
X					
X					
X		X			X
		X			
		X			
		X			
X		X			
X		X			
X		X			
X		X			
X		X			X
X					
X		X			
X		X			X
X		X			
X					
X					
X					
X					
X					
X					
X					
X					
X		X			
X					
X					

APPENDIX 9. (CONTINUED)

Waterway	Environmental Values				
	Formally Recognised Significance	Representativeness	Rare or Threatened Species/Communities	Naturalness	Landscape Features
23092	X				
23096	X				
23099	X				
23108	X		X		
23109	X				
25313					
25630	X		X		X
25632	X		X		X
25636	X		X		X
25638	X		X		X
26609			X		
26740	X		X		
26766	X		X		X
26815	X				X
26928					
27624			X		
27669	X		X		
27675	X		X		
28269					
28317	X		X		
29078	X		X		
29086	X		X		
29106	X				
31808	X		X		X
31816	X		X		X
32200	X		X		
32240	X		X		X
51464	X				

APPENDIX 9. (CONTINUED)

Social Values			Economic Values		
Activity	Place	People	Water	Power Generation	Other Resources
X					
X					
X					
X					
X					
X			X		
X	X		X		
X	X				
X	X				
X		X			
X		X			
X		X			
X			X		
X		X	X		
X			X		
X			X		
X			X		X
			X		
X	X				
X					
X					
X			X		
X		X			
X		X			
X	X	X			
X					
X		X	X		

APPENDIX 10. USING GOALS TO PRIORITISE RIVER AND ESTUARY REACHES

The values listed in AVIRA were used to assess each river reach and estuary against each 20-year goal. *Table A* (below) outlines the criteria used to identify the river reaches and estuaries which were consistent with regional goals.

Table A. Criteria for identifying rivers and estuaries linked to regional goals

GOAL	CRITERIA
Maintain heritage river values in the Glenelg River	River reach 38-2 and estuary reach 38-201 Within the heritage river reaches: Score of 5 for: <ul style="list-style-type: none"> • Significant EVCs • Landscape • Recreational fishing Score of 4 or 5 for: <ul style="list-style-type: none"> • Riparian vegetation condition • Significant flora terrestrial • Native fish (not for estuaries) • Non-motor boating
Protect or improve threatened fish populations in the Glenelg Hopkins region	Score of 4 or 5 for significant fish, with three or more species identified Presence of Glenelg spiny crayfish Presence of variegated pygmy perch
Maintain or improve significant waterway dependent species	Score of 5 for any of: <ul style="list-style-type: none"> • Significant amphibians • Significant birds riparian • Significant birds waterway • Significant reptiles aquatic • Significant reptiles riparian • Significant flora terrestrial • Significant EVC
Maintain or improve high value recreation fishing through habitat protection	Score of 5 for recreational fishing

APPENDIX 11. USING GOALS TO PRIORITISE WETLANDS

The values listed in AVIRA were used to assess wetlands against each 20-year goal. *Table B* (below) outlines the criteria used to identify the wetlands which were consistent with regional goals.

Table B. Criteria for identifying wetlands linked to regional goals

GOAL	CRITERIA
Restore hydrological and ecological values to high value drained wetlands and wetland systems	<p>Step 1: RCS wetlands – all wetlands included in the complexes of the RCS wetlands (note that a number of the RCS wetlands were not IWC 1 wetlands and therefore did not appear in AVIRA). The CMA sourced additional data to include these in the GHWS.</p> <p>Step 2: Within the RCS wetlands, measures relating to the DIWA listing for those wetlands were:</p> <ul style="list-style-type: none"> • Yes (drought refuge or important bird habitat) • Score of 5 for any of the significant species measures, and the score relates to an EPBC listed species or community • Yes for post European heritage
Maintain or improve significant waterway dependent species and communities	<p>Score of 5 for any of:</p> <ul style="list-style-type: none"> • Significant amphibians • Significant birds riparian • Significant birds waterway • Significant reptiles aquatic • Significant reptiles riparian • Significant EVCs and wetland vegetation condition

APPENDIX 12. PRIORITY WATERWAYS AND LINKS TO THE REGIONAL GOALS

Table A. Priority rivers and their links to the regional goals

Reach	Name	Maintain Heritage River values in the Glenelg River	Restore hydrological and ecological values to high value drained wetlands and wetland systems	Protect or improve threatened fish populations in the Glenelg Hopkins region	Maintain or improve significant waterway dependent species and communities	Maintain or improve high value recreation fishing through habitat protection
Coastal Waterway Management Area						
36-13	Brucknell Creek			X		
36-38	Merri River					X
37-03	Surry River					X
37-04	Surry River					X
37-05	Surry River				X	
37-07	Fitzroy River				X	
37-09	Darlots Creek			X		
37-11	Eumeralla River					X
37-16	Moyne River					X
38-02	Glenelg River	X		X		
38-14	Moleside Creek			X	X	
Lower Glenelg Waterway Management Area						
38-03	Glenelg River			X	X	
38-04	Glenelg River			X	X	
38-05	Glenelg River			X	X	
38-06	Glenelg River			X		
38-15	Crawford River			X		
38-16	Crawford River			X	X	
38-20	Stokes River			X		
38-21	Stokes River			X	X	

APPENDIX 12. (CONTINUED)

Reach	Name	Maintain Heritage River values in the Glenelg River	Restore hydrological and ecological values to high value drained wetlands and wetland systems	Protect or improve threatened fish populations in the Glenelg Hopkins region	Maintain or improve significant waterway dependent species and communities	Maintain or improve high value recreation fishing through habitat protection
Upper Glenelg Waterway Management Area						
38-07	Glenelg River			X		X
38-08	Glenelg River			X	X	
38-09	Glenelg River			X	X	
38-10	Glenelg River				X	
38-11	Glenelg River			X	X	
38-12	Glenelg River				X	
38-13	Glenelg River			X	X	
38-44	Wando River			X		
Upper Hopkins Waterway Management Area						
36-22	Mt Emu Creek				X	
36-23	Trawalla Creek					X
Volcanic Plain Waterway Management Area						
36-17	Mt Emu Creek				X	
Wannon Waterway Management Area						
38-22	Wannon River			X		
38-23	Wannon River			X		
38-24	Wannon River			X		
38-25	Wannon River				X	
38-26	Wannon River			X		
38-28	Wannon River			X	X	
38-30	Miakite Creek			X		
38-35	Grange Burn Creek			X		
38-37	Grange Burn Creek			X		
38-40	Dwyer Creek				X	

APPENDIX 12. (CONTINUED)

Table B. Priority estuaries and their links to the regional goals

Reach	Name	Maintain Heritage River values in the Glenelg River	Restore hydrological and ecological values to high value drained wetlands and wetland systems	Protect or improve threatened fish populations in the Glenelg Hopkins region	Maintain or improve significant waterway dependent species and communities	Maintain or improve high value recreation fishing through habitat protection
Coastal Management Area						
36-201	Hopkins River				X	X
36-238	Merri River				X	
37-201	Wattle Hill Creek				X	
37-203	Surry River				X	
37-206	Fitzroy River				X	
37-211	Lake Yambuk		X		X	
37-216	Moyne River				X	
38-201	Glenelg River	X			X	X

Table C. Priority wetlands and their links to the regional goals

Reach	Name	Maintain Heritage River values in the Glenelg River	Restore hydrological and ecological values to high value drained wetlands and wetland systems	Protect or improve threatened fish populations in the Glenelg Hopkins region	Maintain or improve significant waterway dependent species and communities	Maintain or improve high value recreation fishing through habitat protection
Coastal Waterway Management Area						
20501	Long Swamp (East)		X		X	
20502	Lake Bongbong		X		X	
20561	Unnamed (20561)		X			
20562	Bridgewater Lakes (North)		X			
20563	unnamed (20563)		X			
20565	Bridgewater Lakes (South)		X			
20613	McFarlanes Swamp		X			

APPENDIX 12. (CONTINUED)

Reach	Name	Maintain Heritage River values in the Glenelg River	Restore hydrological and ecological values to high value drained wetlands and wetland systems	Protect or improve threatened fish populations in the Glenelg Hopkins region	Maintain or improve significant waterway dependent species and communities	Maintain or improve high value recreation fishing through habitat protection
20614	Long Swamp (West)		X		X	
21141	Tulich Swamp				X	
25630	Tower Hill Lake (West)		X		X	
25632	Wagon Bay		X		X	
25638	Tower Hill Lake (East)		X		X	
Condah	Lake Condah		X		X	
Lower Glenelg Waterway Management Area						
20137	unnamed (20137)				X	
20158	Kaladbro Swamp				X	
20568	Grassy Flats Swamp				X	
20911	McCallums Swamp				X	
20965	Grannys Swamp				X	
21063	unnamed (21063)				X	
21088	unnamed (21088)				X	
21103	unnamed (21103)				X	
21131	unnamed (21131)				X	
21136	unnamed (21136)				X	
21166	unnamed (21166)				X	
21167	unnamed (21167)				X	
21180	Mill Swamp				X	
21186	unnamed (21186)				X	
21229	unnamed (21229)				X	
21243	unnamed (21243)				X	
21657	Kerr Swamp				X	
21752	Church Swamp				X	

APPENDIX 12. (CONTINUED)

Reach	Name	Maintain Heritage River values in the Glenelg River	Restore hydrological and ecological values to high value drained wetlands and wetland systems	Protect or improve threatened fish populations in the Glenelg Hopkins region	Maintain or improve significant waterway dependent species and communities	Maintain or improve high value recreation fishing through habitat protection
21852	Blackjack Swamp				X	
22935	unnamed (22935)		X		X	
22937	Nowackis Swamp		X		X	
22953	unnamed (22953)				X	
22957	unnamed (22957)				X	
Upper Glenelg Waterway Management Area						
22985	Smokey Swamp		X		X	
22994	unnamed (22994)		X		X	
23000	Sampey Swamp		X		X	
23003	unnamed (23003)		X		X	
23078	Beniagh Swamp				X	
27624	Victoria Lagoon				X	
27669	Moora Moora Reservoir				X	
27675	Rocklands Reservoir				X	
Upper Hopkins Waterway Management Area						
31808	Lake Muirhead		X		X	
31816	Mount William Swamp		X		X	
Cockajemmy	Cockajemmy		X		X	
Gooseneck	Gooseneck Swamp		X		X	

APPENDIX 12. (CONTINUED)

Reach	Name	Maintain Heritage River values in the Glenelg River	Restore hydrological and ecological values to high value drained wetlands and wetland systems	Protect or improve threatened fish populations in the Glenelg Hopkins region	Maintain or improve significant waterway dependent species and communities	Maintain or improve high value recreation fishing through habitat protection
Volcanic Plain Waterway Management Area						
29078	Lake Towanway		X		X	
29086	unnamed (29086)		X		X	
29106	unnamed (29106)		X		X	
32200	Lake Elingamite				X	
32240	Lake Bookar		X		X	
Nerrin Nerrin	Nerrin Nerrin		X		X	
Wannon Waterway Management Area						
26609	Bryan Swamp		X		X	
26740	Lake Kennedy		X		X	
26766	Lake Linlithgow		X		X	
26815	unnamed (26815)		X			
21154	unnamed (21154)				X	

APPENDIX 13. REGIONAL CONDITION TARGETS AND THEIR RELEVANT WATERWAY ASSETS

RCT REFERENCE	RCT	ASSETS CONTRIBUTING TO THE RCT
01	All extant populations of the Corangamite water skink are maintained in systems of reserves or areas managed specifically for their conservation, and are able to be maintained in the longer-term	36-17
02	By 2033, improve the condition of estuaries across the region	36-201, 36-238, 37-201, 37-203, 37-206, 37-211, 37-216 and 38-201
03	Guarantee that the brown toadlet survives and prospers in the wild, and maintains its potential to evolve	38-13
04	Maintain access to Glenelg heritage river corridor for canoeing and kayaking	38-201
05	Maintain the estuarine vegetation condition in excellent condition	38-201
06	Maintain the recreational fishing value of assets listed as popular fisheries in a Regional Fishery Management Plan or as a 'best fishing water' in A Guide to Angling Inland Waters of Victoria	36-201, 36-38, 37-03, 37-04, 37-11, 37-16, 38-07 and 38-201
08	Protect all known populations of variegated pygmy perch and take immediate action to ensure that suitable habitat is appropriately management in at least three locations	38-03, 38-04, 38-05, 38-06, 38-07, 38-08, 38-09, 38-15, 38-16, 38-20, 38-21, 38-22, 38-23, 38-24, 38-26, 38-30, 38-35, 38-37, and 38-44
09	Protect the Victorian broilga populations by ensuring that they can breed successfully to maintain and increase population sizes, and flock at consistently used sites without disturbance	20965, 21063, 21154, 21166, 21180, 21186, 21752, 22937, 22985, 23078, 26609, 26740, 26766, 27624, 31808, and 31816
10	Riparian vegetation condition is maintained in excellent condition	37-05, 38-12, 38-28
11	Secure extant populations of growling grass frog, particularly those occurring in known breeding habitats, and improve their viability through increases in size and/or area of occurrence.	20502, 21141, 22935, 25630, 25632, 25638, 26609, 27669, 27675, 36-22, 36-23, 37-07, 38-11, 38-25, 38-40
12	The riparian vegetation of the Glenelg River (38-2) remains in excellent condition	38-02
13	The wetland vegetation condition is increased from good to excellent at sites supporting the ancient greenling	20614
15	To ensure that salt-lake tussock-grass can survive, flourish and retain its potential for evolutionary development in the wild. To secure populations or habitat from potentially incompatible land use or catastrophic loss	26766
16	To ensure that swamp everlasting can survive, flourish and retain its potential for evolutionary development in the wild. To secure populations or habitat from potentially incompatible land use or catastrophic loss	20568

APPENDIX 13. (CONTINUED)

RCT REFERENCE	RCT	ASSETS CONTRIBUTING TO THE RCT
17	To ensure that swamp greenhood can survive, flourish and retain its potential for evolutionary development in the wild. To secure populations or habitat from potentially incompatible land use or catastrophic loss	20614
18	To ensure that the late helmet-orchid can survive, flourish and retain its potential for evolutionary development in the wild. To secure populations or habitat from potentially incompatible land use or catastrophic loss	20501
19	To ensure that the proud diuris can survive, flourish and retain its potential for evolutionary development in the wild. To secure populations or habitat from potentially incompatible land use or catastrophic loss	25630
20	To ensure that Callistemon wimmerensis can survive, flourish and retain its potential for evolutionary development in the wild	38-08, 38-09, 38-10, and 38-11
21	To ensure that identified drought refuges within the Glenelg Hopkins region continue to meet the listing criteria	20501, 20614, 25630, 25632, 25638, 26766, 26815, 31808, 31816, 32240 and 37-211
22	To ensure that listed important bird habitats within the Glenelg Hopkins region continue to meet the listing criteria	20501, 20502, 20613, 32240 and 37-211
23	To ensure that the blue-billed duck can survive, flourish and retain its potential for evolutionary development in the wild	20158, 20614, 21166, 21180, 21752, 22935, 23078, 25630, 25638, 26609, 26740, 26766, 27675, 31808, 31816, 32200 and 32240
24	To guarantee that the Glenelg spiny crayfish can survive, flourish and retain its potential for evolutionary development in the wild	37-09, 38-02, 38-03, 38-04, 38-06, 38-11, 38-13, 38-14, 38-26, 38-28 and 38-35
25	To guarantee that the river blackfish (upper Wannon form) can survive, flourish and retain its potential for evolutionary development in the Wannon River	38-22, 38-23 and 38-24
26	To maintain the existing population and to rehabilitate former breeding sites	37-07, 37-203, 37-206, 37-211, 37-201, 20614, 21141, 21180, 21657, 21752, 22937, 22985, 25630, 25632, 25638, 26609 and 27624
27	To maintain the wetland vegetation condition in excellent condition	20137, 20911, 20965, 21063, 21088, 21103, 21131, 21136, 21154, 21167, 21186, 21229, 21243, 21852, 22953, 22957, 22994, 23000, 23003, Condah, Gooseneck and Nerrin Nerrin

APPENDIX 13. (CONTINUED)

RCT REFERENCE	RCT	ASSETS CONTRIBUTING TO THE RCT
28	To minimise the probability of extinction and ensure long-term survival of dwarf galaxias in the wild and to increase the probability of important populations becoming self-sustaining the in the long-term	38-23
29	To minimise the probability of extinction and ensure long-term survival of Yarra pygmy perch in the wild and to increase the probability of important populations becoming self-sustaining the in the long-term	36-13, 38-23 and 38-24
30	To minimise the probability of extinction of the Australian grayling in the wild and to increase the probability of important populations becoming self-sustaining in the long-term	36-13
31	To protect high value wetlands known to be utilised by freckled duck	25630, 25632, 26740, 26766, 27675, 31808, 31816 and 32240
39	Maintain the recreational values of Lake Yambuk	37-211
40	To protect high value wetlands known to be utilised by musk duck	29086
41	By 2033, improve the condition of wetlands and maintain the diversity of wetland types	20614, 25630, 25632, 25638, 26609, 29078, 29086 and 29106

7 ENDNOTES

- 1 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 2 Glenelg Hopkins CMA, Wetland status report, Glenelg Hopkins CMA, Hamilton, 2006.
- 3 Department of Natural Resources and Environment, Western District Lakes Ramsar Site, Strategic Management Plan, State of Victoria, Melbourne, 2002.
- 4 Glenelg Hopkins CMA Glenelg Hopkins regional catchment strategy 2013-2019. Glenelg Hopkins CMA, Hamilton, 2013.
- 5 Glenelg Hopkins CMA Glenelg Hopkins wetland status report, Glenelg Hopkins CMA, Hamilton, 2006.
- 6 Department of Sustainability and Environment (2013). Indicative Assessment of Climate Change Vulnerability for Wetlands in Victoria. Department of Sustainability and Environment, East Melbourne, Victoria. www.depi.vic.gov.au/water/rivers-estuaries-and-wetlands/wetlands.
- 7 Department of Environment and Primary Industries, Victorian Resources Online Statewide Index of Stream Condition, 2013, http://vro.dpi.vic.gov.au/dpi/vro/vrosite.nsf/pages/stream_cond_index.
- 8 Department of Environment and Primary Industries, Third index of stream condition report, viewed 7 January 2014, www.depi.vic.gov.au/water/water-resource-reporting/Third-Index-of-Stream-Condition-report.
- 9 Glenelg Hopkins CMA, Glenelg Hopkins regional catchment strategy 2013-2019, Glenelg Hopkins CMA, Hamilton, 2013.
- 10 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 11 Department of Premier and Cabinet, Registered Aboriginal Parties, viewed 6 November 2013, www.dpc.vic.gov.au/index.php/aboriginal-affairs/registered-aboriginal-parties. (Barson 2013)
- 12 Department of Sustainability and Environment, Western region sustainable water strategy, Victorian Government, Melbourne, 2011.
- 13 Glenelg Hopkins CMA, Glenelg Hopkins regional invasive animal strategy 201-2015. Glenelg Hopkins CMA, Hamilton, 2010.
- 14 Department of Primary Industries, Invasive plants and animals policy framework, Victorian Government, Melbourne, 2010.
- 15 Department of Primary Industries, Invasive pest plant and animal policy framework, Victorian Government, Melbourne, 2011.
- 16 Robley, A., Gormley A., Triggs, B., Albert, R., Bowd, M., Hatfield, C., McDonald, R., Rowe, C., Scott, K., and Smith, A. (2014) Glenelg Ark 2005–2013: Evidence of the Benefits for Native Mammals of Sustained Fox Control. Arthur Rylah Institute for Environmental Research Technical Report Series. Department of Environment and Primary Industries, Heidelberg, Victoria.
- 17 Department of Sustainability and Environment, Western region sustainable water strategy. Victorian Government, Melbourne, 2011.
- 18 Department of Sustainability and Environment, Western region sustainable water strategy. Victorian Government, Melbourne, 2011.
- 19 Department of Sustainability and Environment, Western region sustainable water strategy, Victorian Government, Melbourne, 2011.
- 20 Southern Rural Water www.srw.com.au/Page/Page.asp?Page_Id=687&h=0 created 6 May 2014 viewed 4 June 2014.
- 21 CSIRO, Interim climate projection statement, CSIRO, 2013.
- 22 CSIRO, Interim climate projection statement, CSIRO, 2013.
- 23 CSIRO, Climate Change and water availability in south-eastern Australia: A synthesis of findings from phase 2 of the South Eastern Australian Climate Initiative (SEACI), CSIRO, 2012.
- 24 CSIRO, Climate Change and water availability in south-eastern Australia: A synthesis of findings from phase 2 of the South Eastern Australian Climate Initiative (SEACI), CSIRO, 2012.
- 25 IPCC, 5th Assessment report (AR5) Summary for policymakers, 2013.
- 26 The Victorian Coastal Strategy (2008). Victorian Coastal Council Melbourne.
- 27 Victorian Climate Change Adaptation Plan (2013), Victorian Government, Melbourne, 2013
- 28 M Dunlop, H Parris, P Ryan, & F Kroon, Climate-ready conservation objectives: a scoping study, National Climate Change Adaptation Research Facility, Gold Coast, 2013.
- 29 T Booth & K Williams, Developing biodiverse plantings suitable for changing climatic conditions 1: Underpinning scientific methods, 2012.
- 30 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 31 Estuary Entrance Management Support System, viewed 14 January 2014, www.ghcma.vic.gov.au/coast-and-marine/estuaries/estuary-publications-2/.
- 32 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 33 J Hale & R Butcher, Ecological character description for the Western District lakes Ramsar site. Report to the Department of Sustainability, Environment, Population and Communities, Canberra, 2011.
- 34 Department of Sustainability and Environment, Western District Lakes Ramsar Site strategic management plan, Victorian Government, Melbourne 2002.
- 35 J Hale & R Butcher, Ecological character description for the Western District lakes Ramsar site. Report to the Department of Sustainability, Environment, Population and Communities, Canberra, 2011.
- 36 Department of Sustainability and Environment, Monitoring, evaluation and reporting framework for land, water and biodiversity, Victorian Government, Melbourne, 2012.
- 37 GHD (2012) River and Estuary Conceptual Models to Support Development of Regional Waterway Strategies. Unpublished report to the Department of Sustainability and Environment, Victoria.
- 38 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 39 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 40 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 41 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 42 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 43 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 44 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 45 DEPI (2013) Improving our Waterways: Victorian Waterway Management Strategy. Victorian Government, Melbourne.
- 46 Department of Sustainability and Environment, Western Region Sustainable Water Strategy, Victorian Government, Melbourne, 2011.

Glenelg Hopkins



C M A

Protecting our future - Naturally

79 French Street, Hamilton, Vic 3300

T: 03 5571 2526 F: 03 5571 2935

www.ghcma.vic.gov.au

