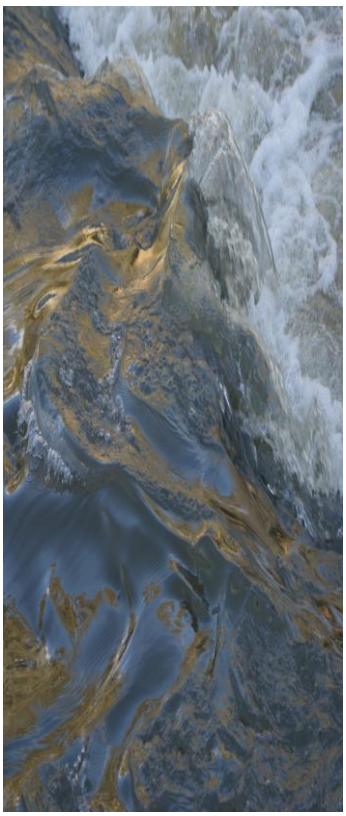
Goulburn Broken

Regional River Health Strategy

Addendum

2010 - 2013



GOULBURN BROKEN
CATCHMENT MANAGEMENT AUTHORITY

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Foreword

Victorian framework for managing river health

The *Victorian River Health Strategy* (VRHS) (2002) was the first comprehensive river health strategy to be developed by an Australian state and provided an over-arching framework for communities to work in partnership with Government to manage and restore Victorian rivers over the long term. The VRHS set the scene for managing Victorian rivers within an integrated catchment management context while ensuring the most effective river health benefits for the effort and resources invested.

The VRHS also provided a framework for the regional planning process which included the development of Regional River Health Strategies (RRHSs) for each Catchment Management Authority (CMA) region to act as umbrella strategies integrating all river-related management plans.

New policy directions and managing river health during drought

Since the completion of the RRHSs there have been numerous developments and new directions in Victorian water resource management policy with the delivery of important policy papers such as *Our Water Our Future* (2004), *Our Environment Our Future* (2006), regional Sustainable Water Strategies and the formal creation of the Environmental Water Reserve (EWR) in the *Water (Resource Management) Act* 2005. Even more recently, new policy directions for managing Victoria's water resources during drought have become necessary as the State experiences its 13th consecutive year of dry conditions. The current RRHSs are aimed at long term management during long-term average climate conditions, and do not adequately cover contingencies required to manage through extreme drought and/or dry years. To address this issue CMAs and Melbourne Water (MW) developed Environmental Drought Response Plans (EDRPs) each summers from 2006/07 through to 2009/2010. These plans identified the high value ecological assets seriously at risk during low flow periods and put in place work and emergency watering programs to protect these assets, increased monitoring programs and contingency actions where necessary.

The focus of these plans were to:

- avoid critical loss of species and communities;
- maintain key refuges to enable future recolonisation and recovery; and
- avoid catastrophic events (e.g., fish kills and algal blooms).

The EDRPs were used to develop Dry Inflow Contingency Plans (DICPs) and these documents show that, whilst long term river management objectives need to be set, the focus for management on an annual basis needs to be able to deal with climatic variability and the associated changes in river inflows. Hence, a more flexible management approach, where annual plans are based around the seasonal forecasts for that year and the natural conditions, were needed to enable the CMAs and MW to meet their long term objectives. This seasonally adaptive management approach was introduced to enable CMAs and MW to have an integrated river management program aimed at ensuring species and community survival through drought and dry periods and improving environmental condition during long

term average and wet years. Long term ecological objectives and targets will continue to be set in the RRHSs. However, the short term ecological aims and the focus of general river restoration activities and of EWR management will vary depending on the amount of water inflow into the system. In implementing a seasonally adaptive management approach, CMAs and MW will take account of the recent climate history, climate outlook and environmental water held in storage.

Moving forward: development of the second generation VRHS and RRHSs

It is now seven years since the VRHS was published and, despite being a groundbreaking document for Australian river management at the time, is now due to be revised and updated to reflect the release of new Victorian Government policy, advancements in managing the EWR and to address the challenges posed by managing rivers during times of drought, climate change and extreme natural events. A second generation VRHS is currently being developed and will be delivered in 2011 as the *Victorian Strategy for Healthy Rivers, Estuaries and Wetlands* (VSHREW). As part of this process a review of RRHSs has been undertaken and new guidelines will be prepared to assist the CMAs in developing their second generation RRHSs, to be completed by 2012.

Development of Addendums to the RRHSs

In the interim period between now and the completion of the second generation RRHSs, the priority management actions outlined in the original RRHSs may require revision to ensure they deliver optimal investment and river health outcomes in their regions. Additionally, changes in the regional environment (e.g. drought, bushfire, floods etc.) and the completion of new policies or major projects affecting river health (e.g. *Our Water Our Future,* regional Sustainable Water Strategies, Northern Victoria Irrigation Renewal Project etc.) may have altered priorities in some areas. In these cases there is a need to develop a short-term, contemporary addendum to the RRHSs to ensure that there is adequate direction of investment up until 2012 when the second generation RRHSs are finalised.

To address these issues the Goulburn Broken Catchment Management Authority has prepared this Addendum to the Goulburn Broken Regional River Health Strategy. This document will act as an interim guide to priorities and actions until the completion of VSHREW and the second generation RRHSs.

The intent of this Addendum is to:

- Identify and interpret the regional implications of new policy, changes in the local environment or new knowledge that might affect delivery of river health outcomes from the existing RRHSs;
- Identify priority actions that are still to be completed since the RRHS was written;
- Identify priority actions that have changed since the RRHS was written and re-prioritise these actions where necessary; and
- Identify new priority actions or reaches that were not included in the RRHS.

This addendum was developed in accordance with the *Guidelines for preparation of an Addendum to a Regional River Health Strategy.*

The Goulburn Broken Regional River Health Strategy

The Goulburn Broken Regional River Health Strategy (RRHS) was prepared and endorsed by the State Government in 2005, and provided the region with an overarching strategy for the protection and enhancement of the region's waterways.

The strategy provided a framework for communities, industries and Government to work in partnership with river health managers to restore and manage our rivers over the long term.

The river health strategy established regional priorities for river protection and restoration throughout the Goulburn and Broken River Basins from the headwaters in the Great Dividing Range through to the River Murray. It was developed through extensive community consultation, and is intended to be used by a wide range of stakeholders and community groups and steer river health investment.

The Addendum

The purpose of this Addendum is to realign the Regional River Health Strategy priorities and targets for the next three years 2010/11 to 2012/13 by incorporating new information, data or knowledge, and the implementation of recent Victorian Government policy and legislative amendments, and major projects that have been developed since the commencement of the RRHS.

The Addendum also reflects on the achievements of the River Health Strategy over the past five years.

2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Strategy Review 2004-2009					Transition Year	Addendum		
Section 2						Section 4		

The addendum sets a forward path for river health to achieve the objectives of:

- Enhancing and protecting rivers of high community value (environmental, social and economic) from any decline in condition;
- Maintaining the condition of ecologically healthy rivers;
- Achieving an 'overall improvement' in the environmental condition of the remainder of rivers; and
- Preventing damage from inappropriate development and activities

through established priority programs in key management units and stream reaches within the following broad program areas: water quality; riparian management, aquatic habitat, channel form, flow management, planning, monitoring and maintenance, stream health, investigations and research, community engagement and partnerships, and management of threatened species and communities.

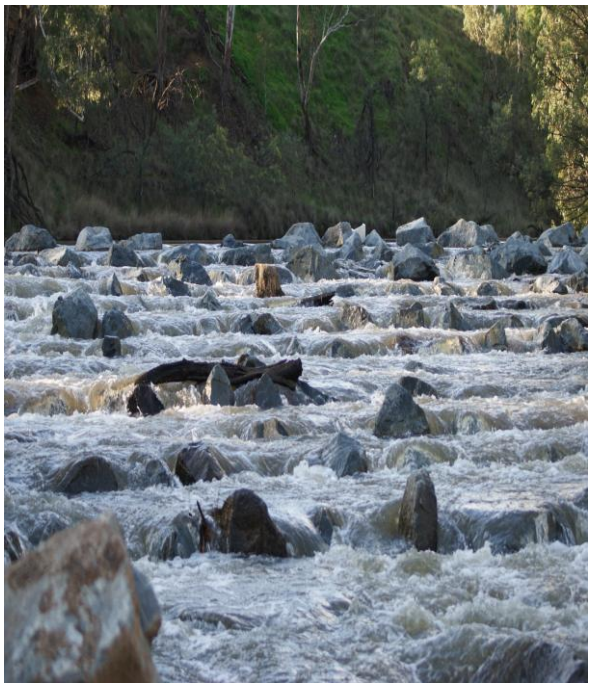
1. Introduction

The Goulburn Broken Catchment is home to 189,500 people and covers 2.4 million ha or 10.5 per cent of Victoria. It is part of the Murray Darling Basin and comprises the Goulburn and Broken River catchments and part of the Murray Valley

The Goulburn Broken Catchment stretches from the Murray River in the north of Victoria through to the outskirts of Melbourne in the south taking in the cities and towns of Kyabram, Tatura, Mooroopna, Shepparton, Numurkah, Cobram, Yarrawonga, Euroa, Benalla, Mansfield, Alexandra, Yea, and Kilmore (see Figure 1.1).

The mountainous upper catchment area is renowned for its beauty, history and recreational opportunities that draw increasingly large numbers of visitors and permanent residents to the region.

The dryland hills and plains through the middle of the Catchment support cropping, grazing, vineyards and horse studs, while irrigated dairy and horticultural enterprises and food processing industries dominate the Shepparton Irrigation Region (SIR).



The SIR community is ethnically diverse and includes a large population of Aboriginal people and new immigrants. Two main Traditional Owner groups occupied what is now the Goulburn-Broken Basin; the Kulin Nation group (Taungurung), whose traditional land radiated out from the headwaters of the Goulburn and Broken Rivers; and the Yorta Yorta-Nation group, whose traditional land radiated out onto the plains of the catchment, from the Goulburn and Murray River confluence.

The region is regarded by many as the 'food bowl' of the Murray Darling Basin.

From the irrigated Goulburn and Murray Valleys to the dryland grazing and cropping regions and high country, the Goulburn Broken catchment is the foundation of the Victorian and Murray Darling Basin water resources and economic wealth. Although only 2% of the Murray Darling Basin's land area, the catchment generates 11% of the basin's water resources. In addition the catchment generates 26% of the rural export earnings for the State of Victoria.

Water underpins the viability of our irrigation area that, in turn, is the foundation of the region's economy and community. Streams within the region are highly valued for a range of reasons including: irrigation, industry, potable water supply, stock and domestic water supply, recreation (both passive and active), the presence of threatened and vulnerable fish species, aesthetic beauty and biodiversity.

Stream health in the region is of vital importance, not only for the local region but also for communities over 500 km downstream and throughout the Murray Darling Basin.

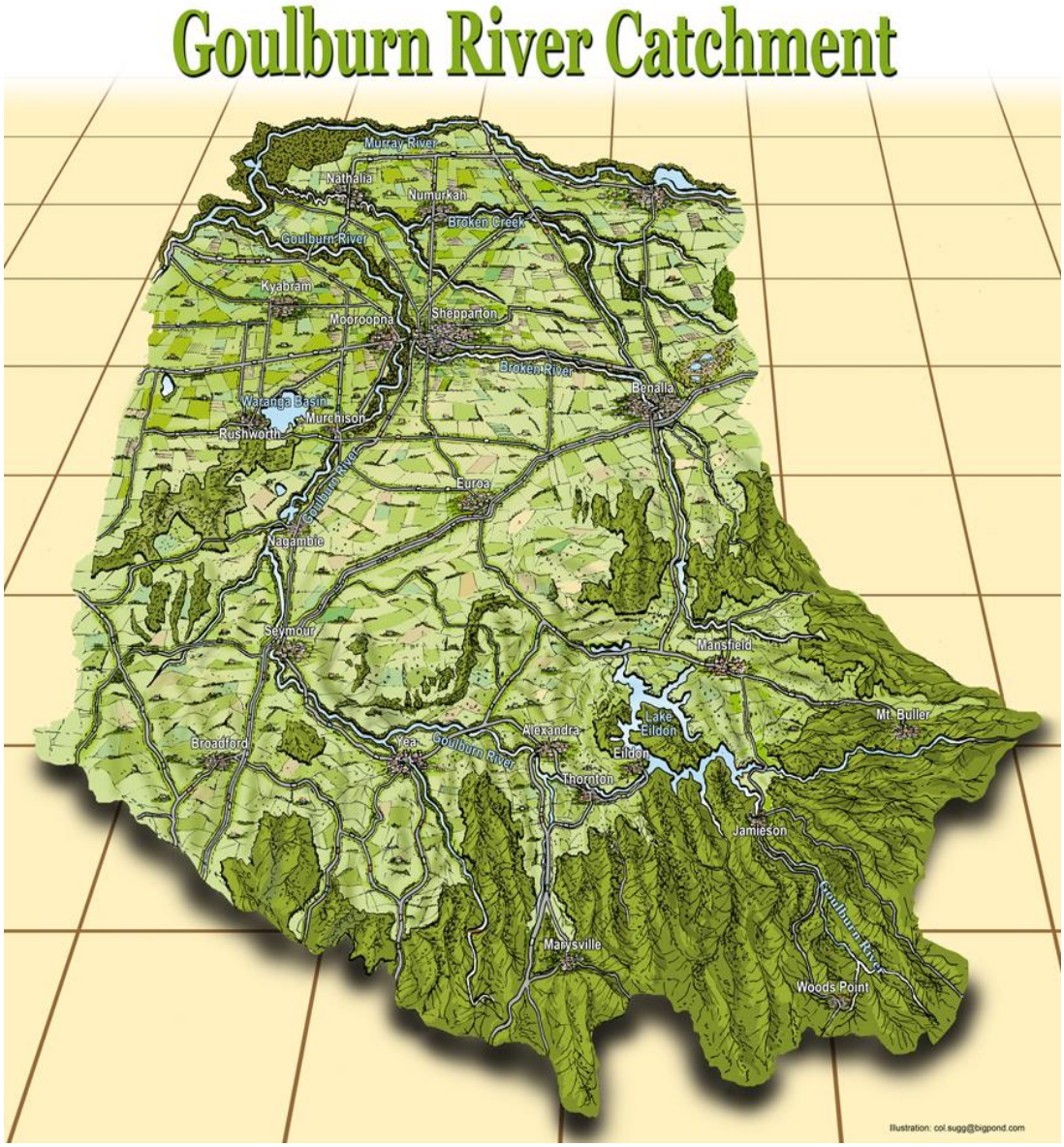


Figure 1.1 – The Goulburn Broken Catchment.

1.1 From Regional Catchment Strategy to Integrated sub strategies

The Goulburn Broken Catchment Management Authority was established in 1997 as the peak natural resource management body in the catchment to develop and oversee the implementation of the Regional Catchment Strategy.

The GBCMA is working to ensure land and water resources are protected and enhanced as well as improving the region's social wellbeing, environmental quality and productive capacity in a sustainable manner.

The GBCMAs vision is:

"…….Healthy, resilient and productive landscapes supporting vibrant communities…."

Since its establishment the Authority, together with our partners and community prepared a number of strategies to guide investment and implementation of NRM programs, with the Regional Catchment Strategy (RCS) being the over-arching document (Figure 1.2).

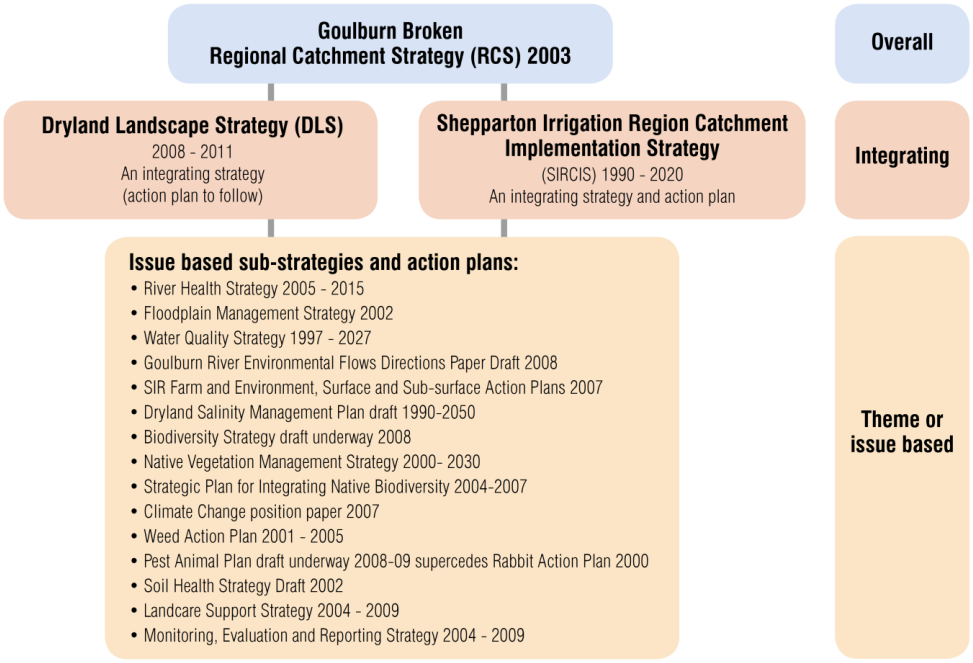


Figure 1.2 – Regional Strategy – Structure and Relationships.

The Goulburn Broken Regional River Health Strategy fits into the broader government vision for the management of water in the State to ensure that rivers are managed in accordance with relevant Victorian Government policies. These include many Victorian catchment management arrangements, including the Victorian River Health Strategy, Regional Catchment Strategies, the State Environment Protection Policy (SEPP) (Waters of Victoria), the White Paper Our Water Our Future, the Victorian Biodiversity Strategy, and the Northern Sustainable Water Strategy.

In addition, the Goulburn Broken Regional River Health Strategy (and the Addendum) complements regional sub-strategies including the Water Quality Strategy and Goulburn Broken Biodiversity Strategy (2009, under development).

1.2 The Water Act

The Water Act 1989 presents the function of the Catchment Management Authority, with respect of waterway management:

(1) An Authority that has a waterway management district has the following functions in relation to designated waterways and designated land or works within that district-

(a) to identify and plan for State and local community needs relating to the use and to the economic, social, cultural and environmental values of land and waterways;

(b) to develop and to implement effective schemes for the use, protection and enhancement of land and waterways;

(ba) to-

(i) develop and implement plans and programs; and

(ii) carry out works and activities- to maintain the environmental water reserve in accordance with the environmental water reserve objective;

(bb) to-

(i) develop and implement plans and programs; and

(ii) carry out works and activities- to improve the environmental values and health of water ecosystems, including their biodiversity, ecological functions, quality of water and other uses that depend on environmental condition;

(c) to investigate, promote and research any matter related to its functions, powers and duties in relation to waterway management;

(d) to educate the public about any aspect of waterway management.

(2) In performing its functions under this Act, an Authority that has a waterway management district must have regard to the need to maintain the environmental water reserve in accordance with the environmental water reserve objective.

1.3 The Goulburn Broken Regional River Health Strategy

The Goulburn Broken Regional River Health Strategy (RRHS) was endorsed by the State Government in 2005, and provides the region with an overarching strategy for the protection and enhancement of the region's waterways.

The need to protect and enhance the condition of our river environments is widely recognised. The aim of this strategy was to identify rivers of high value for protection and enhancement and to identify opportunities for rehabilitation or improving the environmental condition of other rivers throughout the catchment.

The Strategy was the first attempt to combine all elements of river management under one umbrella document and provides direction for the protection and enhancement of the regions river systems.

The strategy provides a framework for communities, industries and Government to work in partnership with river health managers to restore and manage our rivers over the long term.

The river health strategy establishes regional priorities for river protection and restoration, through extensive community consultation, and is intended to be used by a wide range of stakeholders and community groups and to steer river health investment.

The Goulburn Broken Regional River Health Strategy aims to achieve four main objectives for the rivers and streams of the Goulburn Broken Catchment:

- Enhance and protect the rivers that are of highest community value (environmental, social,including cultural and economic) from any decline in condition;
- Maintaining the condition of ecologically healthy rivers;
- Achieving an 'overall improvement' in the environmental condition of the remainder of rivers;
- Preventing damage from inappropriate development and activities.

The Regional River Health Strategy identifies a number of High Priority Reaches within the Goulburn Broken catchment. These include rivers that are "of greatest value to the community", and rivers that are currently "ecologically healthy". For the Strategy, reaches of the highest community value in the Goulburn Broken Catchment are identified as:

- Heritage Rivers;
- Reaches associated with International or Nationally significant wetlands;
- Reaches classified as environmental Sites Of Significance;
- Regional Representative Rivers;
- Reaches with records of water-dependant nationally listed endangered flora and fauna species located within 100 m of the watercourse;
- Reaches classified as having very high overall environmental significance;
- Reaches classified as having very high overall social value; or
- Reaches classified as having very high overall economic value.

VISION: *'……..'Healthy rivers, streams, wetlands, floodplains and adjacent land that support a vibrant range and abundance of natural environments, provides water for human use, sustains our native flora & fauna and provides for our social, economic and cultural values……..'*

Forty-four High Priority Reaches were identified in the Goulburn Broken Catchment, based on the above criteria and rivers that are currently in an ecologically healthy condition.

Key environmental threats to high value assets in High Priority Reaches were identified using a risk based analysis. These threats determined the range of management actions to be implemented in various parts of the catchment.

The Strategy also identified 13 reaches within the catchment that can potentially be improved to ecologically healthy condition, and other opportunities for restoration or improving the environmental condition of other rivers throughout the catchment.

The Goulburn Broken Regional River Health Strategy is delivered in seven separate programs, targeting the four key elements outlined in the Strategy development, as well as monitoring and research, and community engagement:

- Program A – Protection and Enhancement of High Priority Reaches
- Program B – Protection of Ecologically Healthy Rivers
- Program C – Creating More Ecologically Healthy Rivers
- Program D – Improvements to other reaches
- Program E – Preventing damage from inappropriate development and other activities
- Program F – Community Engagement and Building Capacity
- Program G – Monitoring, Evaluating and Reporting

The forty four High Priority Reaches and their associated high value assets are listed in Table 1.3. A number of reaches have multiple high value assets. The primary objective of the Regional River Health Strategy is to protect and enhance the values in these High Priority Reaches (Programs A and B of the Regional River Health Strategy).

Table 1.3 Highest priority Reaches identified in the Goulburn Broken Catchment.

River	Reach	High value asset
		Goulburn Basin
Goulburn River	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	**Heritage River (1-14); Association with wetlands of national significance (1-8); High overall environmental significance (1, 3, 4, 7, 8) High overall social significance (5, 6, 8, 9) High overall economic significance (14) Murray cod (1-8); Silver perch (1-8); Macquarie perch (15); Ecologically healthy river (15); Barred galaxias (16); Spotted tree frog (16); Alpine bent (16).**
Seven Creeks	19	**Trout cod; Macquarie perch; Environmental Site of Significance.**
Seven Creeks	20	**Macquarie Perch**
Gobarup Creek	33	**Association with wetlands of national significance.**
Hughes Creek	37	**Macquarie perch; Murray cod.**
King Parrot Creek	51	**Macquarie perch.**
Yea River	55	**Macquarie perch.**
Acheron River	62	**Environmental Site of Significance.**
Taggerty River	64	**Ecologically Healthy River; Representative River; High overall environmental significance; Barred galaxias.**
Rubicon River	66	**Barred galaxias**
Big River	67	**Heritage River; Ecologically Healthy River; Spotted tree frog.**
Big River	68	**Heritage River; Ecologically Healthy River; Representative River.**
Howqua River	69	**Heritage River; High overall economic significance.**
Howqua River	70	**Heritage River**
Delatite River	71	**Murray cod.**
Delatite River	72	**High overall economic significance.**

	Broken Basin	
Broken River	1, 2, 3, 4, 5	**Association with wetlands of national significance (1, 2); Murray cod; Macquarie perch (3, 4, 5) Silver perch (1).**
Holland Creek	13	**Macquarie perch.**
Ryans Creek	17	**Ecologically Healthy River; Representative River.**
Broken Creek	**21, 22, 23, 24, 25, 26**	**Association with Ramsar wetlands (21); Murray cod (21-23); Association with wetlands of national significance (22-26).**

The additional thirteen reaches considered to be a high priority following their assessment as being close to the criteria for ecologically healthy rivers are listed in Table 1.4. A focus of the Regional River Health Strategy is to improve the status of these reaches to that of ecologically healthy rivers.

Table 1.4 Highest priority Reaches - Near Ecologically Health Status.

River	Reaches	High value asset
		Goulburn Basin
Goulburn River	16	
Bylands Creek	36	
Dry Creek	48	
Yea River	54-57	
Murrindindi River	59	**Near "Ecologically Healthy" status**
Acheron River	63	
Rubicon River	65	
Howqua River	69, 70	
		Broken Basin
Holland Creek	**15**	**Near "Ecologically Healthy" status**

For each of these, only a single measure or group of related issues need to be improved to move the reach to ecologically healthy status[1].

In addition, the River Murray is recognised as a High Priority area for the Regional River Health Strategy. While no specific actions are developed for the River Murray, actions in this Strategy will support existing plans for the River Murray.

River	High value asset
River Murray	**Internationally recognised for its significant red gum forests and wetlands; interacts with two Ramsar Wetlands, Murray Darling Basin Icon site, popular with recreational users who enjoy its natural beauty, camping, fishing and boating opportunities; Murray cod and Trout cod.**

[1] Key issues were identified from the ecologically healthy analysis (Appendix 9) and not from a risk-based assessment.

1.4 Implementation and Resource Condition Targets

This section of the Addendum describes the link between the implementation of on-ground works, planning and activities in producing an impact (protection or enhancement) on the natural environmental asset. This is often referred to as linking Implementation Targets to Resource Condition, and enables the program to forecast the impact of management intervention.

The aim of the addendum is to present the impact of delivery in terms of improved environmental protection and health of the regions waterways. Table 1.5 provides an example of linking works to outcomes.

Table 1.5 – Linking Implementation to performance

Implementation Target Area	**Performance Descriptor**	**Intermediate Outcome**
No. rivers with negotiated environmental flow regimes	Number of river reaches with improved environmental flow regimes	Improved environmental flows
No. rivers with improvements made to environmental flow regimes	Number of river reaches with improved environmental flow regimes	Improved environmental flows
No of sites with improved instream habitat	Length of in-stream habitat improved.	Habitat improved for biodiversity
Area of streamside land under management agreement ha	Additional area and length of habitat improved – riparian.	Habitat improved for biodiversity.
Kilometres of riparian land revegetated	Additional area and length of habitat improved – riparian.	Habitat improved for biodiversity.
	Estimated reduction in phosphorous. Estimated reduction in sediment	Improved water quality
Number of fish barriers removed	Additional length of fish passage provided	Habitat improved for biodiversity
Number of sites subject to bed and bank stabilisation	Length (km) of waterway stablilised	sediment movement controlled, critical aquatic habitat protected, improve water quality and asset protection
Kilometres of riparian land subject to weed management	Additional area and length of habitat improved – riparian.	Habitat improved for biodiversity.
No. of plans developed for Rivers and Creeks of high social value	Additional area and number of NRM group action plans developed and being implemented	Increased or maintained capacity of community groups and traditional owners to contribute to NRM and cultural heritage outcomes.
No. Reaches with community programs / engagemment initiatives		
Number of reaches with water quality improvements	Estimated reduction in phosphorous, sediments etc,	Improved water quality.
No. of investigations to fill data gaps (inc monitoring)		

2. Progress Report

This report presents the results of programs undertaken as part of a review of the Goulburn Broken Regional River Health Strategy 2005-2015.

The Regional River Health Strategy aims to protect and enhance the natural riverine features in the region, improve water quality, and the social and economic and cultural values they provide.

The program has inputs from a variety of stakeholders including Goulburn Broken Catchment Management Authority, Department of Primary Industries, Department of Sustainability and Environment, Landcare Networks, Landcare Groups, Local Government, Parks Victoria, traditional owner groups and landholders.

This review presents a progress report on the implementation of the Strategy during the period 2005 to 2009.

2.1 Method

In developing this Addendum to the Regional River Health Strategy a number of important tasks were undertaken.

A key action was an evaluation of the progress of the works and activities that have been delivered in the early years of the Strategy's implementation.

The regional implications of new policy, changes in the local environment or new knowledge that might affect delivery of river health outcomes from the existing RRHSs were also identified and interpreted.

Finally in consultation with partner agencies and our Implementation Committees we established a three year implementation program 2010 – 2013.

2.2 Review and Forward Look

The Scope of this Section of the Addendum presents a review of the achievement over the initial five years and a forward look for the years post the current (2009/2010) transitional year. This is shown in Figure 2.1 below.

Figure 2.1 – Scope of the Review

2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Strategy Review 2004-2009					Transition Year	Addendum		
Section 2						Section 4		

2.3 Proposed program review (2010)

The Regional River Health Strategy (2005) included a section on program review which noted:

"The Strategy contained within the document is dynamic, However, the fundamentals of the issues to be addressed are unlikely to change or priority areas for action. The Programs, Implementation Targets and Resource Condition Targets establish priority actions for the next ten years (2005-2015)".

A mid term review of this strategy (this Addendum) proposed a detailed evaluation of the progress towards the stated goals and objectives will be undertaken. This review will reflect on achievements made, whether progress is adequate, and consider whether there is new science and knowledge that needs to be taken into account and incorporated.

2.4 Targets vs. budgets

RRHS targets were developed against a notional funding provision. In reality, actual funding has been substantially less than original assumptions and expectations. Program managers have implemented works to match budget allocation. For the RRHS Addendum targets will be amended to reflect estimated budget allocations available to implement works through national, state and regional funding sources.

Protecting the Maccas

by Wayne Tennant, GB CMA

The Hollands Creek Demonstration Reach project protects and expands habitat for Macquarie perch.

A site with a remnant population of the fish was a priority for works in 2008-09. This built on works undertaken the year before by the GB CMA and the community.

Threats from loss of instream habitat, degraded stream frontage and poor water quality are targeted.

The Arthur Rylah Institute, with the support of a community and agency reference group, monitors the impact of works.

At a community and agency field day, participants saw stream improvement works and an electrofishing demonstration, were entertained by a Taungurung storyteller, and were fascinated by 'the bug man's' knowledge of stream life. An historic photo display and children's activities rounded out the day.

The project implements parts of the Goulburn Broken Regional River Health Strategy and Murray-Darling Basin Authority Native Fish Strategy.

Communities and individuals of the Tatong Valley and staff from the Department of Sustainability and Environment are crucial to the project's success.

Joanne Kearns and Fern Hames electro fishing at the Hollands Creek Demonstration Reach site. Photos: GB CMA

Macquarie Perch. Photo provided by Murray-Darling Basin Authority, taken by Gunther Schmida

2.5 Assessment of Achievements 2002-2009 (5 years)

Overall, a substantial program of works has been implemented across the catchment as detailed in Figure 2.2.

An assessment of the progress to date of all works related actions against targets indicates that a substantial number of works targets are significantly behind schedule with original targets being more aspirational based on the expectation of more resources. Progress towards achieving targets varies across management units (Figure 2.2).

A considerable volume of other works has been undertaken, for example the area of weeds on frontage treated and 730 kilometres of fencing has been erected along streams.

Ten year targets in Program D have almost been achieved indicating a need to refocus works towards priority reaches.

A substantial program of complementary initiatives has been implemented. These initiatives underpin works investment and assessment of long term effectiveness of works undertaken while many priority programs continue.

Figure 2.2 Achievements 2005-2009

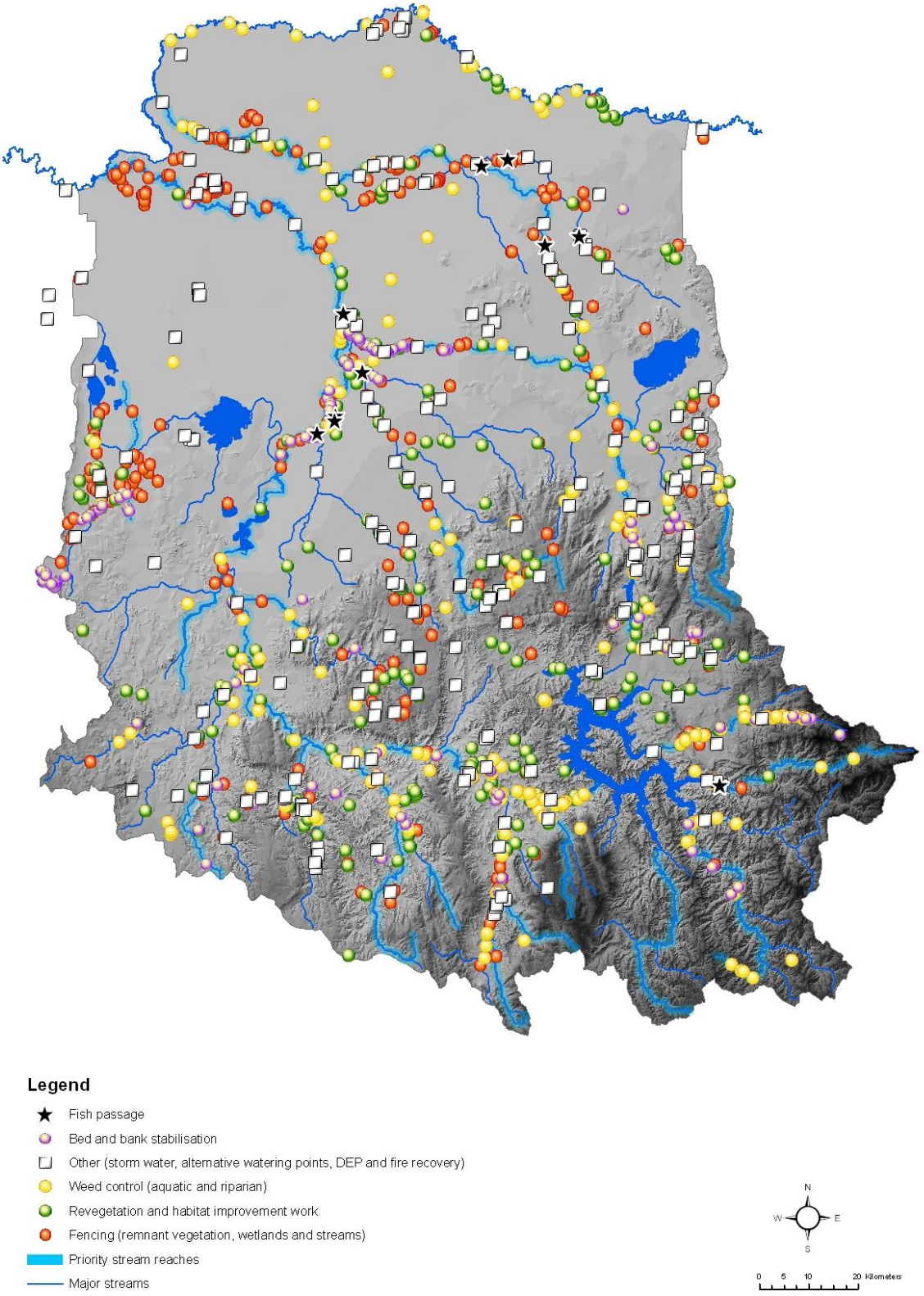
Work	Sum of Output 1	Sum of Output 2	Sum of Output 3
Alternative Water - Output 1=no. points, Output 2=0, Output 3=0	370	0	0
Bank Stabilisation - Output 1=stabilised (km), Output 2=structures (no), Output 3=protected (km)	25	185	48
Bed Stabilisation - Output 1=stabilised (km), Output 2=structures (no), Output 3=protected (km)	21	135	65
Fencing (Remnant Veg/Special Area) - Output 1=area fenced (ha), Output 2=fence length (km), Output 3=0	211	26	0
Fencing (River) - Output 1=area fenced (ha), Output 2=fence length (km), Output 3=stream length (km)	6319	730	809
Fencing (Wetland) - Output 1=area fenced (ha), Output 2=fence length (km), Output 3=0	2203	10	0
Fish Passage - Output 1=stream length (km), Output 2=no. fish barriers addressed (no), Output 3=0	214	17	1
G-M Water Channel & Drainage Weed Management – Output 1=area treated (ha), Output 2=0, Output 3=0	827	0	0
Habitat - Output 1=no. debris replaced/relocated (no), Output 2=habitat established (km), Output 3=0	483	17	2
Projects (e.g. debris realignment, rubbish removal, sign erection, fish death clean up) - Output 1=No projects, Output 2=0, Output 3=0	710	10007	0
Revegetation - Output 1=revegetation area (ha), Output 2=stream length (km), Output 3=plants (no)	1123	922	370774
Urban Stormwater - Output 1=no. systems installed (no), Output 2=0, Output 3=0	1	0	0
Weeds (Aquatic) - Output 1=stream length controlled/eradicated (km), Output 2=0, Output 3=0	392	3	0
Weeds (Frontage) - Output 1=area treated (ha), Output 2=stream length (km), Output 3=0	20193	1172	0

Figure 2.2 Activities by River Health Program (consolidated data from outputs spreadsheet dated 2 October 2009)[2]

Works undertaken	5 year target (50% of 10 year target)	Sum of Output to date
Program A		
Bank Stabilisation	32.5 km stream stabilised	22.2 km
Fencing (River))	618 km fenced	426.5 km
Fish Passage	1 fish way and 112.5 km of stream opened for fish passage	5 fish barriers addressed and 143.1 km stream opened
Habitat	142 km of habitat improvement works	11.3 km
Revegetation	618 km of frontage revegetated	540.1 km
Program B		
Fencing (River)	153 km fenced	13.6 km
Revegetation	39 km	8 km
Weeds (Frontage)	15 km with exotic veg controlled	17.95 km
Program D		
Fencing (River)	200 km	367.2 km
Weeds (Frontage)	12.5 km riparian weed control	433.8 km

[2] Table demonstrates works achived against targets set. Additional activities were undertaken and can be seen in Figure 2.2

Figure 2.3 Spatial based works across the catchment



Priority waterways shown in blue

2.6 Long Term Progress

The strategy review and the Goulburn Broken Catchment Management Authority annual report 2008/2009, reflected on progress made within the river health and aligned programs. The findings, implementation progress and catchment condition, is shown in Figure 2.4 (summary) and 2.5 (interpretation) below.

Figure 2.4 indicates that government funding trends in river health have increased over time, with opportunistic funding from a range of sources (ie Drought Employment Program, Sale of Environmental Water and Fire Recovery Initiatives) Overall progress is still below target as initial targets set within the RRHS were aspirational and based on higher levels of base funding.

Figure 2.4 – Implementation progress and catchment condition

Investment area	Long-term strategy implementation progress[i]			Catchment condition[i]		
	Strategy life[ii]	Progress	Gov't funding trend	1990[iii]	2009	Trend
2 River health						
2a Environmental flows and water supply	2004-	On target	↑	Poor	Very poor	↓
2b Riparian and instream habitat and channel form	2005-2015	Below target	↑	Poor	Satisfactory[iv]	↑
2c Water quality (nutrients) in rivers and streams	1996-2016	Exceeding target	●	Very poor	Satisfactory	↑

In summary there has been major progress in recent years towards improvement of riparian and floodplain lands and enhancement of water quality (see Figure 2.4).

Figure 2.5 Interpretation of long term progress

Theme	Long-term strategy implementation progress	Catchment condition	Implications for Management (The Future)
Environmental flows and water supply	Key planning is underway at Commonwealth, State and regional levels, including development of plans for lower inflows under expected drier conditions and supplying water according to plans. The Victorian Government, with the support from the GB CMA and its partners, are investing in water savings initiatives, through projects such as: the decommissioning of Lake Mokoan (contributing to savings of 44 gigalitres); and the Northern Victoria Irrigation Renewal Project (Foodbowl Modernisation); In recent years the Goulburn Broken Catchment has delivered environmental entitlements to streams, wetlands and floodplains to improve water quality, promote the growth and germination of native vegetation, promote and support waterbird breeding, provide drought refuge for aquatic dependent species, provide habitat for native fish, and to reduce the growth of nuisance aquatic plants.	Key streams are highly regulated in the region: Goulburn River below Lake Eildon, Broken River below Nillahcootie and Broken Creek below the Broken River distributary). Remainder of the key streams are unregulated. Drought conditions since 1996 have placed the environmental health of the Catchment's rivers, floodplains and wetlands under stress, including the aquatic dependent species they support. Stress to our native vegetation continues due to a drier period and the impact of large scale fire events. Water availability for agriculture, communities and rivers and wetlands has been very low. Further Environmental Water Reserve funding released in line with the Victorian Government's white paper, Our Water Our Future, in 2004.	There is again a very high risk of very low inflows to river systems in 2009-10. The GB CMA is involved in proposals to qualify rights and minimise risks to the river environment if river flows are reduced. Proposed increases in the Environmental Water Reserve will require active planning and complementary water for environmental water delivery to strategic wetlands under a range of scenarios. Local, regional, state and national institutional mechanisms are improving rapidly and adding further to our capacity to respond. General river health should have an opportunity to improve, providing, normal conditions return or more environmental water becomes available.

Theme	Long-term strategy implementation progress	Catchment condition	**Implications for Management (The Future)**
Riparian and instream habitat and channel form	Implementation targets for works are approximately double that which have been funded and expectations might need to be revised down. Although links between actions and resource condition targets have not been quantified, targets are not expected to be achieved until well beyond 2015 at current implementation rates and funding levels. Many non-works tasks might also need to be revised down.	The rating of condition does not consider water regime, which is considered in the 'Environmental flows and water supply' investment area. Extensive works programs have improved the state of the system for terrestrial and aquatic species and have contributed to improved water quality. The condition of waterways generally seems to have stabilised and overall stream condition no longer seems to be deteriorating. Sites targeted for works have generally improved in condition. Major impacts of the 2006/2007 and 2009 fires on riparian and instream health are being evaluated by the GB CMA.	The GB CMA will continue to improve long-term capacity to deliver changes, especially the filling of knowledge gaps. Maintenance and monitoring activities will need to be built into funding programs to ensure upkeep of structural works The GB CMA will continue to implement the Goulburn River – A National Icon project, a large-scale river restoration project that began in 2008-09. A major onground initiative in response to the Black Saturday fires called the Bushfire Recovery program will be undertaken. A mid-term review of the Goulburn Broken Regional River Health Strategy will be conducted in 2009-10 – This Addendum.
Water quality (nutrients) in rivers and streams	The review of the 1996 Water Quality Strategy has been completed. Targets have largely been met or exceeded. The region's wastewater management facilities upgrade targets were met by 2002. Irrigation system improvements are generally ahead of schedule (reuse systems are ahead of schedule and drains are on schedule). Significant levels of riparian and wetland grazing improvements such as fencing to buffer streams have been undertaken. Strategy development, implementation and review processes are closely aligned with best practices set out in the National Water Quality Management Strategy. Implementation has occurred in many ways. Strong relationships between major stakeholders have been developed, including a multi-agency memorandum of understanding.	The five year rolling average phosphorus load from the Goulburn Broken Catchment is below the long-term target The estimated total phosphorus load discharged from irrigation drains is still below the long-term target and the five year rolling average has levelled out and remains well below target. This correlates with substantially lower volumes of drain flows. Statistical and trend analysis of irrigation drainage water quality and quantity undertaken every two years shows significant declines in flows and nutrient loads leaving drains. Preliminary information indicates another low year for phosphorus from drains. Institutional arrangements to manage water quality threats have strengthened significantly.	There is a major focus on fire recovery programs following the unprecedented February 2009 bushfires in the upper Goulburn Catchment. A major real-time monitoring initiative as part of the Bushfire Recovery program to safeguard water quality is underway. The Goulburn Broken regional water quality forum will continue to meet and the Water and River Contingency Planning Group will continue to be supported. Key waterways in the region will be aligned with the State Environment Protection Policy (Waters of Victoria) following ecological risk assessments. Likely impacts of climate change on waterway values, in particular water quality, will be investigated. The assessment of ecological and water quality responses to water efficiency projects will be finalised. NVIRPs planned water saving initiatives and onfarm irrigation efficencies should further decrease the volume of irrigation drainage water entering waterways.

Land returned to Traditional Owners

by GB CMA's Gaye Sutherland and Wayne Tennant

Undera landholder Robin Knaggs handed over management of two hectares of Goulburn River frontage to the Yorta Yorta Nation Aboriginal Corporation (YYNAC) at a signing ceremony attended by 20 people in June 2009.

The area contains an Aboriginal burial site of great significance to the Yorta Yorta people.

The signed agreement represents the first Cultural Heritage Agreement to be reached with a private landholder in Victoria under the Aboriginal Heritage Act 2006 and will protect the area in perpetuity, allowing YYNAC to have a formal role in managing Yorta Yorta heritage.

The Goulburn Broken Catchment Management Authority worked with YYNAC, the Department of Sustainability and Environment, Aboriginal Affairs Victoria, and Robin to create a plan that was acceptable to all stakeholders.

The area has been under threat since skeletal remains were discovered in the 1960s when sand was removed to help create the Undera football oval. In recent times recreational vehicles have caused further damage, uncovering further remains.

The YYNAC will work with Goulburn Broken Catchment Management Authority to stabilise the area and prevent more remains from being exposed. Activities will include controlling weeds and pest animals and revegetating.

Management on adjacent crown land parcels by the Department of Sustainability and Environment has also been improved because of the project.

Protected site... Property owner Robin Knaggs (left), Yorta Yorta elder Denise Morgan-Bulled and Department of Sustainability and Environment Forest Manager David Harvey. Photo: Ray Sizer, Shepparton News

Shepparton and Mooroopna's RiverConnect

by Rod McLennan, Ken Sampson, Dianne Hanna and Renee Warren

More and more Shepparton and Mooroopna residents are enjoying their stunning riverine environment because of the RiverConnect project.

RiverConnect links the goodwill and energy of many and varied groups and individuals, enhancing existing activities and creating the opportunity to develop bigger, whole of community projects.

People from vastly different backgrounds are interacting through educational, recreational, artistic, cultural heritage and environmental activities.

RiverConnect resulted from a ground swell in understanding that the time had come to embrace the Goulburn and Broken Rivers and the opportunities they present. The RiverConnnect vision is for the riverine environment to be the heart and soul of Shepparton and Mooroopna.

RiverConnect encourages a sense of belonging to our place, fostering a sense of responsibility for this place and for each other.

The Goulburn Broken Catchment Management Authority drove RiverConnect from its inception in 2005 until 2008 when the Greater Shepparton City Council became the auspice body.

The Mayor chairs the strategic-level RiverConnect Community Advisory Committee, which includes representatives from Council staff, GB CMA, the Yorta Yorta Joint Body, education, Parks Victoria, Department of Primary Industries, Word and Mouth Project, Goulburn Murray Landcare Network and the general community.

Education, Aboriginal Participation, Land Management, and Communication Working Groups of RiverConnect involve more people

A comprehensive strategic plan is being prepared to take RiverConnect to the next level.

For further information on RiverConnect contact Renee Warren at the City of Greater Shepparton on (03) 5832 9714

Students from St Mel's participate in a river audit. Photo thanks to Wendy Darveniza, St Mel's Primary School.

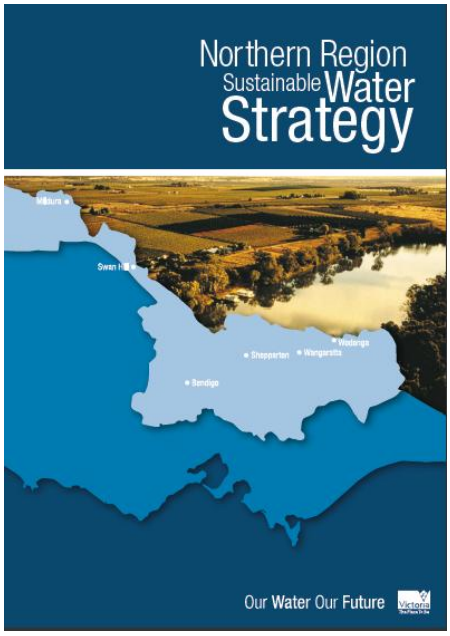
Eighteen of the nineteen schools in the RiverConnect area have 'adopted-a-reach'. Over 1,000 students participated in at least one activity on the banks of the Broken or Goulburn Rivers during semester 1 2009 and 39 teachers participated in a series of five workshops in 2009. Student activities included investigating water quality issues through the WaterWatch river rangers program, tree planting, the building, installing and monitoring of nesting boxes, cooking damper and learning from Aboriginal Elders.

3. Regional Context

This Section of the Addendum outlines the regional implications of major changes that have occurred since the completion of the Regional River Health Strategy that have, or are expected to alter priority management actions such as:

- *Changes to the regional environment*
- *Implementation of recent Victorian Government policy, legislative amendments or major projects*
- *Acquisition of new information, data or knowledge*

Wildfires – Reedy Creek (C Glassford, GB CMA)



The Northern Sustainable Water Strategy (DSE, 2009)

Table 3.1 presents the major regional context changes, implications of recent policies, environmental factors and knowledge that will influence the future management of natural resources, river health and water in the catchment. The Table also describes how the regional context is to be considered within the future (3-5years) of the river health program and this Addendum, based on a preliminary risk assessment (**L**iklihood, **C**onsequence and **R**isk).

Table 3.1 – Regional Context (Policy and Environment)

Policy		L	C	R	Policy incorporation in Addendum
The Commonwealth Water Act 2007 / Murray– Darling Basin Authority (MDBA) Basin Plan	The Commonwealth Water Act 20072 requires the Murray– Darling Basin Authority (MDBA) to prepare and oversee a Basin Plan. This plan is a legally enforceable document that provides for the integrated management of all the Basin's water resources. Some of the main functions of the Basin Plan will be to: set and enforce environmentally sustainable limits on the quantities of surface water and groundwater that may be taken from Basin water resources; set Basin wide environmental objectives, and water quality and salinity objectives; develop efficient water trading regimes across the Basin; set requirements that must be met by state water resource plans; and improve water security for all uses of Basin water resources. Key elements of the Basin Plan include: defining sustainable diversion limits (SDLs); an environmental watering plan; and a water quality and salinity management plan. The plan has identified 18 indicator sites, including the Barmah/Milewa Forest and the lower Goulburn River floodplain, to assist with the modelling for the determination of sustainable diversion limits. This plan will be prepared within the timeframe of the implementation of the Addendum but no direct influence.	H	L	L	Ensure harmonisation across RRHS and Basin Plan, providing input to Basin Plan, scope of water quality, Sustainable Diversion Limits (SDL's) and other plans

Northern Sustainable Water Strategy	The Northern Region Sustainable Water Strategy analysed all aspects of water management in the region and determined a fair and sustainable balance between urban, industrial, agricultural and environmental water needs for the future. In doing so the strategy: identifies and understands threats to water availability and quality, including the implications of climate change; assists regional communities to adjust to reduced water availability; ensure entitlements for towns, industry and environment are secure; encourages economically viable and sustainable agriculture; improves choice and flexibility for entitlement holders to manage the risks imposed by drought and climate change; protect and where possible, improves the health of rivers, wetlands and aquifers from the impacts of drought, climate change and other risks; and recognises and responds to indigenous and other cultural and heritage values associated with the region's river and catchment areas.	H	M	M	Development of operating strategies for priority systems that address management of the systems under current and future climate change scenarios have been included as priority actions under EWR priorities. Prepare drought management plans and dry inflow management plans will continue to be prepared. This information to be incorporated into regional refugia planning processes.
White Paper (Land and Biodiversity)	The White Paper aims to protect and enhance the environmental, economic and social values of Victoria's natural systems. Key priority areas have been established for management and investment. The focus on riparian management includes; bring all riparian lands up to new management standards with robust licensee or landholder agreements in place (by 2029), identify high priority Crown frontages that are occupied but not licensed and negotiate management agreements and license these areas by 2014. Five Natural Resource and Catchment Authorities will replace the ten Catchment Management Authorities (CMA).	H	L	M	Identification and delivery of integrated programs benefiting both river health and biodiversity. Align proprams to support aims of he White Paper. Increase focus on riparian land protection
Victorian Investment Framework	Targeted Investment called upon through the White Paper (Land and Biodiversity).	H	H	H	Identify high priority actions and projects within Flagship areas, biolinks and high priority waterways (see **Figure 3.1, Figure 4.2 and Section 4**) Priorities and targets reduced to be aligned with current funding levels, with clear targets established within priority

					reaches and management units (including the nature of target action).
Caring for our Country Funding	Targeted investment called upon through the Caring For Our Country (Business Plan)	H	H	H	Alignment of programs to Cfoc priorities
Landuse change / water use and population	The primary use of land is a significant determinant of what happens to river health, water quality and biodiversity within our landscape. There is ongoing change across the Catchment, with potential implications for the policy mechanisms and tools used to achieve resource condition outcomes (Miles et al., 2010).	H	H	H	Support water strategies, support water savings and educate community of the links between landuse change and water quality and river health through engagement programs.
Review of the Goulburn Broken Water Quality Strategy a risk assessment of various water quality threats (or hazards)	As part of the review of the Goulburn Broken Water Quality Strategy a risk assessment of various water quality threats (or hazards) was undertaken. The aim of a risk based assessment is to provide some objective measure of the risk to a particular asset or value (environmental, social or economic/beneficial use) by a particular threat imposed by climate change.	M	M	M	Complete findings from studies and incorporate into the program as appropriate on high priority waterways.
Victorian Strategy for Healthy Rivers, Estuaries and Wetlands (VSHREW)	The State Government is preparing the Strategy for Healthy Rivers, Estuaries and Wetlands as a blueprint for the management of the State's aquatic environment. This will provide direction for future investment, set policy and guide development of regional strategic, plans and onground programs.	H	H	H	Plan for a review of the Regional River Health Strategies prior to 2013 based on the direction of VSHREW. Strategy will be expanded to cover the proposed Northern Rivers Natural Resource and Catchment Authority region.

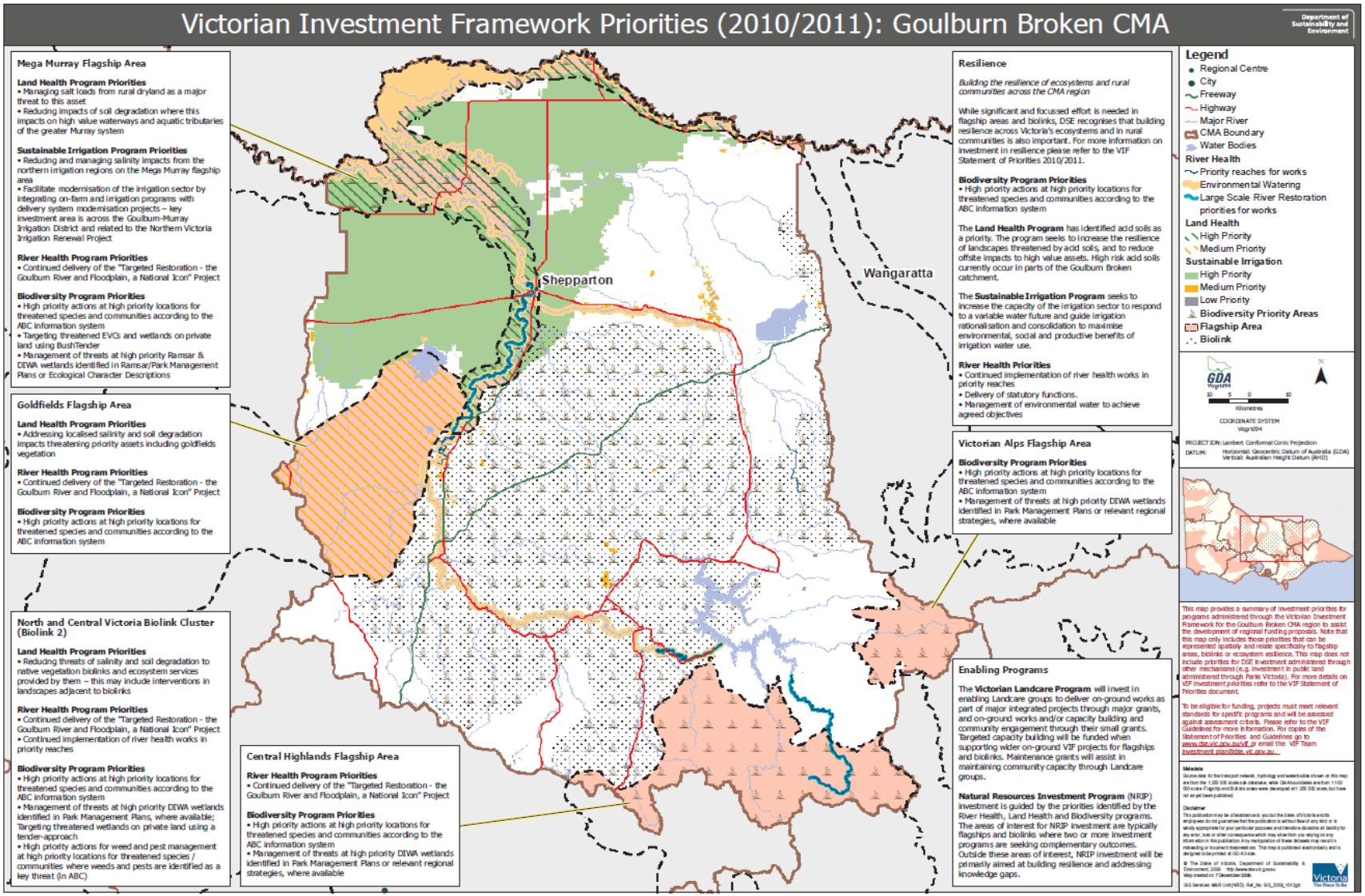
Environment					Incorporation in Addendum
Reconfiguration and Modernisation – water delivery to key wetlands	The Northern Victoria Irrigation Renewal Project (NVIRP) is required to deliver a modernised irrigation water supply network in the Goulburn Murray Irrigation District (GMID), following a $1 billion dollar investment by the Victorian Government in partnership with Melbourne Water and Goulburn-Murray Water and the Commonwealth. As well as supplying stock and domestic and irrigation water to farms, lifestyle properties and townships across the region, the irrigation water supply network also provides a vital link with the environment. The modernisation of the irrigation water supply network presents an opportunity to secure our ability to effectively and efficiently utilise irrigation infrastructure to protect natural assets through the availability to deliver environmental water saved through this project. The recommendations associated with infrastructure and issues to be addressed for each wetland are directed at agencies managing the implementation of modernisation works in the SIR and surrounding area	H	H	H	Plan and implement infrastructure upgrades to supply environmental water to priority wetlands. (MU's L1, L4 and L2).
Environmental Water Management (Rivers)	A number of priority initiatives have been identified throughout the EWR planning and strategies within the region which have implications on the management of local systems. These include: Establish clearly defined management objectives for the Goulburn River from Lake Eildon to Goulburn Weir. Improved understanding of the flooding requirements of floodplain wetlands along the Goulburn River, including identifying the location, ecological values, volumes, appropriate watering regimes and commence to flow levels. Further investigate how environmental water objectives for priority systems can be met using a range of different water sources. Further investigate how to manage Inter-Valley Transfers (IVT) to ensure that there is no net impact on river health. Ensure that appropriate environmental watering plans are in place, so as volumes of water become available, through Government purchases, The Living Murray and NVIRP, there is a clear	H	H	H	Develop local management rules to manage stream flows in priority river reaches / catchment (e.g. Yea River and King Parrot Creek). Support water strategies, support water savings and educate community of the links between landuse change and water quality and river health through engagement programs. Supports efforts to identify and monitor for potential threats (reduced flows, flow extraction) CMA maintains a strategic and ongoing role in projects to enhance knowledge base with respect of climate change and impact of dry inflows and incorporate findings as appropriate.

	understanding of the highest priority areas, the volume required and that the appropriate infrastructure is in place to be able to deliver the water. Continue to improve understanding of how environmental water delivery can be used to manage water quality and aquatic weeds in the lower Broken Creek. Improve monitoring in the Broken Creek system to allow proactive management. Support the development of Local Management Rules for priority unregulated rivers in the catchment. Maintain the diversity of wetland types across the catchment. (including spring soaks and bogs) Improve understanding of priority wetlands across the catchment including location, water dependent ecological values, cultural values, watering requirements, ecological thresholds and infrastructure requirements. Further investigate flexible options for delivering environmental water to priority wetlands.				
FFG and Threatened Species Recovery Plans	Threatened species are under significant risk as a result of drought, wildfires, population changes and development. There has been a need to support Threatened species recovery plans and enhance our understanding of the status of populations and trends over time.	H	M	M	Support Threated Species Recovery Plans in line with other priorities.
Catastrophic wild fires within the upper Goulburn River catchment between Kilmore/ Wandong and Alexandra (2009)	Catastrophic wild fires have impacted a significant area of the upper Goulburn River catchment. The largest of the fires, known as the Kinglake-Murrindindi Complex, has consumed over 220,000 ha of land and more than 550 homes and has resulted in significant loss of life - including those at St Andrews, Strathewen and nearby Kinglake. The fire followed a path across Victoria's central highlands, from Wandong, south as far as St Andrews and east and north through Marysville, Taggerty and Flowerdale towards the upper Goulburn Valley. This fire has been know as *"Australia's worst natural disaster*" with the loss of life, damaged to communities, destruction of manmade and natural infrastructure and assets.	VH	VH	VH	Catastrophic wild fires have destroyed a significant area of the upper Goulburn River catchment. Major focus on the rehabilitation and post fire recovery effort in priority management units (U2, U3, U4 and U6) and priority river reaches in transition Year and in the Addendum.

	The event has impacted significantly on cultural values and river related assets (vegetation, channel form, threatened aquatic fauna and water quality). In addition to the fires that affected the catchment in 2006, approximately 50% of the catchment's remnant vegetation has been burnt in the last four years.				
Climate variability and change (dry inflows, refugia and climate changes).	Climate change is expected to increase stress on streams and rivers by: reducing run off and stream flows; affecting habitat values for aquatic and riparian species, changes to water temperature, oxygenation, nutrient and pollution loads, salinity and other water chemistry; and increasing the likelihood of extreme rainfall events or extreme bushfire events.	H	H	H	CMA maintains a strategic and ongoing role in projects to enhance knowledge base with respect of climate change and impact of dry inflows and incorporate findings as appropriate. Foster regional refugia planning to identify future scenarios and opportunities for effective investment. Incorporated in to regional program (Strategic and EWR)
Acid sulphate soils	Sulphidic sediments (potential acid sulphate soils) are often considered to be only of concern in coastal regions. However, there is mounting evidence that they can be an issue in inland systems (Fitzpatrick *et al*. 1996; Sullivan *et al*. 2002). In a recent survey of eighty-one inland wetlands in the Murray-Darling Basin, more than 20% had evidence of the presence of sulphidic sediments at levels that could lead to ecological damage if the sediments are mismanaged and exposed to oxygen.	M	M	M	Supports efforts to identify and monitor for potential threats (acid sulphate soils, reduced flows, extraction) Ensure wetland managers are aware of the possibility of acid suphlate soils.
Actions to undertake ecological risk assessments based on an assessment of SEPP (WOV) attainment (in a time of Climate Change)	The Regional River Health Strategy included a series of actions to undertake ecological risk assessments based on an assessment of SEPP (WOV) attainment. This assessment was revisited by Feehan Consulting, (2008a) which recommended: data needs to be reviewed annually; and any ERA program based solely on biomonitoring results would concentrate on lowland parts of the catchment. As part of a larger project to undertake ecological risk assessments, DSE have provided funds for GBCMA to undertake a project looking at impacts of climate change on waterway values, in particular water quality.	M	M	M	Incorporate finding from statewide iniatives into program as appropriate. CMA maintains a strategic and ongoing role in projects to enhance knowledge base with respect of climate change and impact of dry inflows and incorporate findings as appropriate.

	The CMA has also undertaken ERAs for the Broken Creek and River, Seven Creeks and Sunday Creek catchments.				
Benefits of Program Integration (biodiversity and river health)		H	H	H	Identification and delivery of integrated programs benefiting both river health and biodiversity.

Figure 3.1 Victorian Investment Framework (River Health Priorities)



4. River Health Priorities 2010 - 2013

This section of the Addendum reflects on previous work (progress made 2005-2009), regional context and opportunities for program enhancement and identifies priority actions that have changed since the RRHS was developed and new priority actions or reaches that were not included in the RRHS. (Figure 4.1)

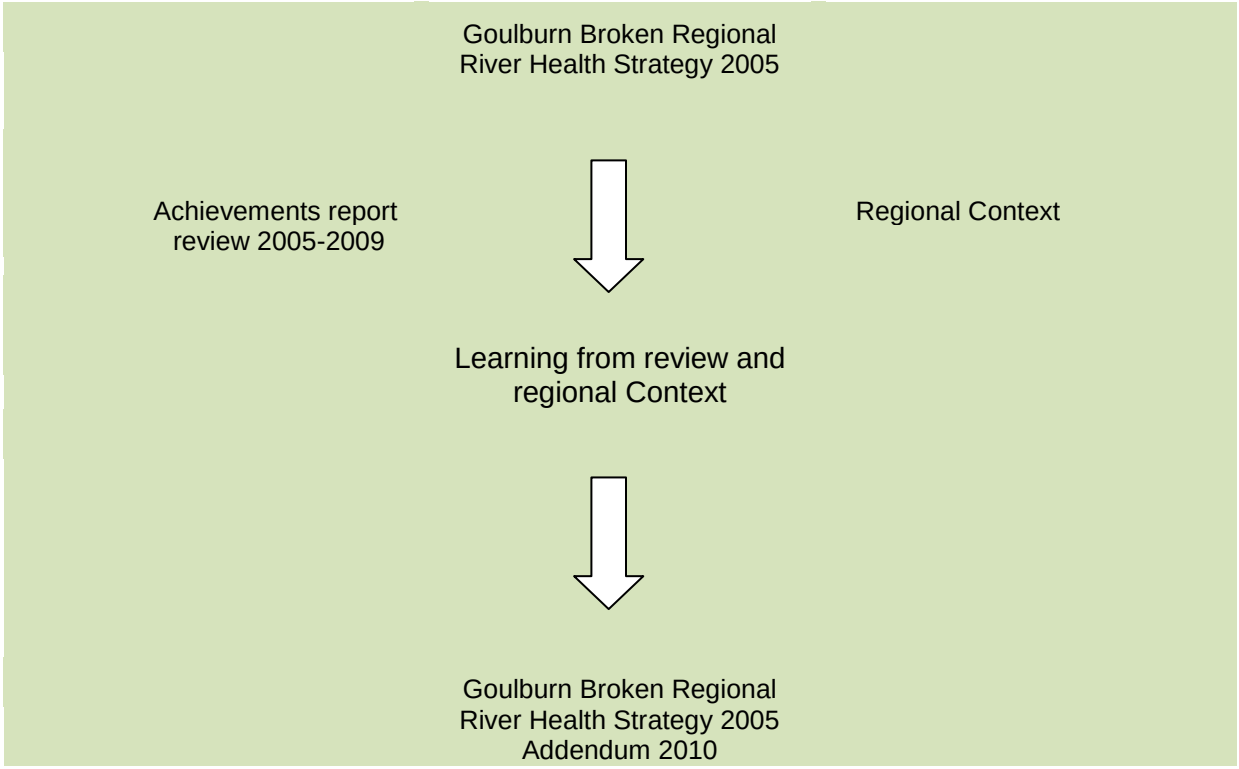


Figure 4.1 Development of the RRHS Addendum

4.1 Determining Priority Programs 2010-2013

Vision and Aim

The vision from the original Regional River Health Strategy

"……'*Healthy rivers, streams, wetlands, floodplains and adjacent land that support a vibrant range and abundance of natural environments, provides water for human use, sustains our native flora & fauna and provides for our social, economic and cultural values……..*'

is still considered current and appropriate for the term of the Addendum.

The Goulburn Broken Regional River Health Strategy Addendum[3] maintains the following aims:

• Enhancing and protecting rivers of highest community value (environmental, social and economic) from any decline in condition Maintaining the condition of ecologically healthy rivers	(Program A);
• Protecting and enhancing the conditions of other high priority waterways	(Program B);
• Achieving an 'overall improvement' in the environmental condition of the remainder of rivers • Preventing damage from inappropriate development and activities • Undertake recurrent maintenance and monitoring on investment.	(Program C, D)

4.2 Key Implications of the Regional Context and Strategy Review on River Health Priorities in the region.

To assess the impact of regional context on the health of the region's rivers and the current strategy a risk assessment was undertaken based on the framework contained within the Victorian River Health Strategy.

Table 4.1 summarises the major learnings from the review of the GB RHS and implications of recent policie, environmental factors and knowledge that will influence the future management of natural resources, river health and water in the catchment.

Table 4.1 - influence of reviews on the River Health Program.

	Influence and Method of Incorporation
Policy	Development of operating strategies for priority systems that address management of the systems under current and future climate change scenarios have been included as priority actions under EWR priorities. Prepare drought management plans and dry inflow management plans will continue to be prepared. This information to be incorporated into regional refugia planning processes. Plan and implement infrastructure upgrades to supply environmental water to priority wetlands. (MU's L1, L4 and L2). Identify high priority actions and projects within Flagship areas, biolinks and high priority waterways (see Figure 3.1, Figure 4.2 and Section 4)

[3] The assessment of streams in this condition or category will use information taken from RiVERS I.

Table 4.1 (cont..) influence of reviews on the River Health Program

Environment	Catastrophic wild fires have destroyed a significant area of the upper Goulburn River catchment. Major focus on the rehabilitation and post fire recovery effort in priority management units (U2, U3, U4 and U6) and priority river reaches in transition Year and in the Addendum. CMA maintains a strategic and ongoing role in projects to enhance knowledge base with respect of climate change and inpact of dry inflows and incorporate findings as appropriate. Foster regional refugia planning to identify future scenarios and opportunities for effective investment. Incorporated in to regional program (Strategic and EWR) Supports efforts to identify and monitor for potential threats (acid sulphate soils, reduced flows, extraction) Develop local management rules to manage stream flows in prioirty river reaches / catchment (Yea River and King Parrot Creek). Support water strategies, support water savings and educate community of the links between landuse change and water quality and river health through engagement programs.
Knowledge	Identification and delivery of integrtaed programs benefiting both river health and biodiversity. Plan for a revew of the Regional River Health Strategies prior to 2013 based on the direction of VSHREW. Strategy will be expandede to cover the proposed Northern Rivers Natural Resource and Catchment Authority region.
Assessment of Achievements	Overall, a substantial program of works has been implemented across the catchment. However, an assessment of progress of all works related actions to date against targets indicates that a substantial number of works targets are significantly behind schedule, with original targets being more aspirational with the expectation of more resources. A substantial program of complementary initiatives has been implemented. These initiatives underpin works investment and assessment of long term effectiveness of works undertaken. Many priority programs are continuing. Priorities, reduced tragets to be aligned with current funding levels. Clear targets established within priority reaches, management units (including the nature of target action). Alignment of programs to State and Federal priorities (biolinks, flagship and resiliance).

4.3 High Priority Reaches and Management Units

To seperate river reaches and management units into priorities there was consideration of the folowing existing p[rioritisation: past RRHS priorities, priorities for Investment (State and Federal) and the current needs to respond to key issues withing the region (on-going invetment, fire recovery and response). Subsequently Table 4.3 summarises the focus of work recommended for the period of the Addendum (2011-2013) and Figure 4.1 shows the Management Unit distribution across the catchment. Subsequent sections provide detail of the programs in priority Management Units (Programs A and B), overall support programs (under Program D) and key complimentary initiatives which will underpin the program (Strategic, Planning and Community Engagement).

Table 4.3. Highest priority Reaches identified in the Goulburn Broken Catchment.

River	MU	Reach	High value asset	Priority	Management Objectives 2010-2013	Program
Goulburn Basin						
Goulburn River	L1, U1 and U7	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	Heritage River (1-14); Association with wetlands of national significance (1-8); High overall environmental significance (1, 3, 4, 7, 8) High overall social significance (5, 6, 8, 9) High overall economic significance (14) Murray cod (1-8); Silver perch (1-8); Macquarie perch (15); Ecologically healthy river (15); Barred galaxias (16); Spotted tree frog (16); Alpine bent (16).	1	Protect values identified within Management units (L1, U1 and U7)	A
Seven Creeks	M7	19, 20	Trout cod; Macquarie perch; Environmental Site of Significance.	1	Support Threatened species recovery plans for key species. Develop long term goal for threatened species management	A
Gobarup Creek		33	Association with wetlands of national significance.	3	Protect values identified within Management units	B
Hughes Creek	U2	37	Macquarie perch; Murray cod.	1	Support Threatened species recovery plans for key species. Develop long term goal for threatened species management	A
King Parrot Creek	U4	51	Macquarie perch.	1	Support Threatened species recovery plans for key species. Develop long term goal for threatened species management. Fire recovery – river health, water quality and threatened species protection.	A
Yea River	U4	55	Macquarie perch.	1	Support Threatened species recovery plans for key species. Develop long term goal for threatened species management. Fire recovery – river health, water quality and threatened species protection.	A
Acheron River	U6	62	Environmental Site of Significance.	1	Fire recovery – river health, water quality and threatened species protection	A
Taggerty River	U6	64	Ecologically Healthy River; Representative River; High overall environmental significance; Barred galaxias.	1	Fire recovery – river health, water quality and threatened species protection. Target threats to Ecologically healthy state - monitor	A
Rubicon River	U6	66	Barred galaxias	1	Fire recovery – river health, water quality and threatened species protection	A
Big River	U7	67, 68	Heritage River; Ecologically Healthy River; Spotted tree frog. Representative River.	2	Target threats to Ecologically healthy state - monitor	B

River	MU	Reach	High value asset	Priority	Management Objectives 2010-2013	Program
Howqua River	U7	69, 70	Heritage River; High overall economic significance.	2		B
Delatite River	U7	71	Murray cod.	2		B
Delatite River	U7	72	High overall economic significance.	2		B

Broken Basin

River	MU	Reach	High value asset	Priority	Management Objectives 2010-2013	Program
Broken River	L5, M1 and M2	1, 2, 3, 4, 5	Association with wetlands of national significance (1, 2); Murray cod; Macquarie perch (3, 4, 5) Silver perch (1).	1	Protect values identified within Management units (l1, M1 and U7)	A
Holland Creek	M3	13	Macquarie perch.	1	Demonstration reach – supported Macquarie perch recovery plan	A
Ryans Creek	M3	17	Ecologically Healthy River; Representative River.	1	Target threats to Ecologically healthy state - monitor	A
Broken Creek	L2, M6	21, 22, 23, 24, 25, 26	Association with Ramsar wetlands (21); Murray cod (21-23); Association with wetlands of national significance (22-26).	2	Maintenance of previous investment Monitor	B

Murray River

River	MU	Reach	High value asset	Priority	Management Objectives 2010-2013	Program
River Murray	O	O	Internationally recognised for its significant red gum forests and wetlands; Interacts with two Ramsar Wetlands; Popular with recreational users who enjoy its natural beauty, camping, fishing and boating opportunities; Murray cod and Trout cod.	1	Protect the ecological character of Ramsar Wetland (Barmah) reduce threats from neighbouring waterways.	A

Other

River	MU	Reach	High value asset	Priority	Management Objectives 2010-2013	Program
Other rivers and streams	O	O	Varies	3	Net improvement in the remainder of rivers Preventing damage from inappropriate development and activities Undertake recurrent maintenance and monitoring on investment	C and D

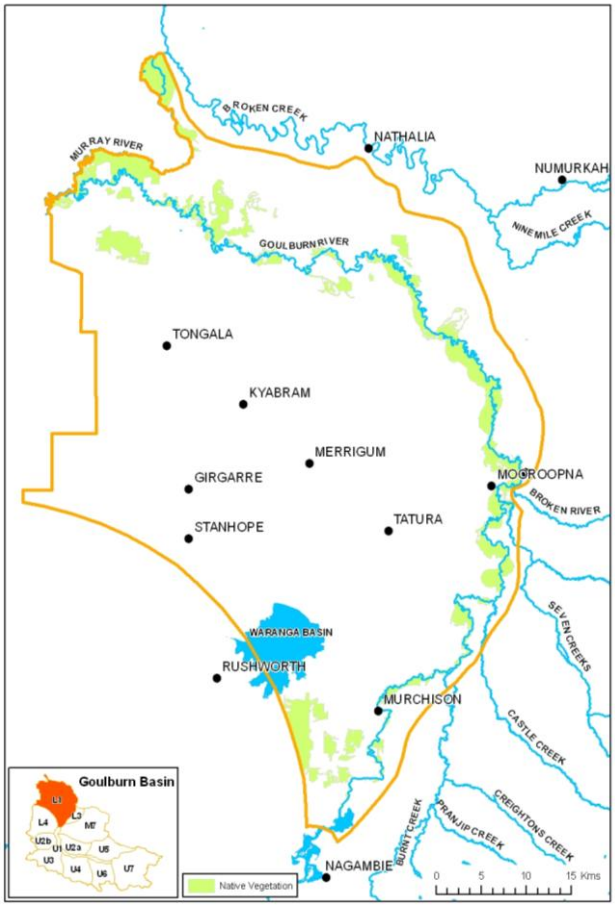
Figure 4.2 – Goulburn Broken Catchment (Management Units and Priority Programs)

Management Unit	No.
Lower Goulburn	L1

Management Unit L1 – Lower Goulburn River and Floodplain – covers the Goulburn River downstream of Goulburn Weir, a total length of stream of 195 km.

Priority Rivers and Streams	Reach No.
Goulburn River	1-8

Management Objectives
Protect values identified within Management units (L1, U1 and U7) - Heritage River (1-14); Association with wetlands of national significance (1-8); High overall environmental significance (1, 3, 4, 7, 8) High overall social significance (5, 6, 8, 9) High overall economic significance (14) Murray cod (1-8); Silver perch (1-8); Macquarie perch (15); Ecologically healthy river (15); Barred galaxias (16); Spotted tree frog (16); Alpine bent (16).



Three Year Implementation Target Area*	*Target*
No. rivers with negotiated environmental flow regimes	**1**
No. rivers/wetlands with improvements made to environmental flow regimes	**4**
No of sites with improved instream habitat	**6**
Area of streamside land under management agreement ha	**20**
Kilometres of riparian land revegetated	**30**
No. of fish barriers removed	**0**
No. of sites subject to bed and bank stabilisation	**5**
Kilometres of riparian land subject to weed management	**15**
No. of plans developed for rivers and creeks of high social value	**2**
No. of tributary reaches stabilised and wetlands protected	**1**
No. of reaches with water quality improvements	**2**
No. of investigations to fill data gaps (inc monitoring)	**1**
* Includes transitional year (Large Scale River Restoration Initiative).	

Importance:	High	
	Current	**Target**
Condition	Poor	Moderate
Social Value	High	High

Program A - River Health Strategy

Program for the Lower Goulburn Management Unit (L1)

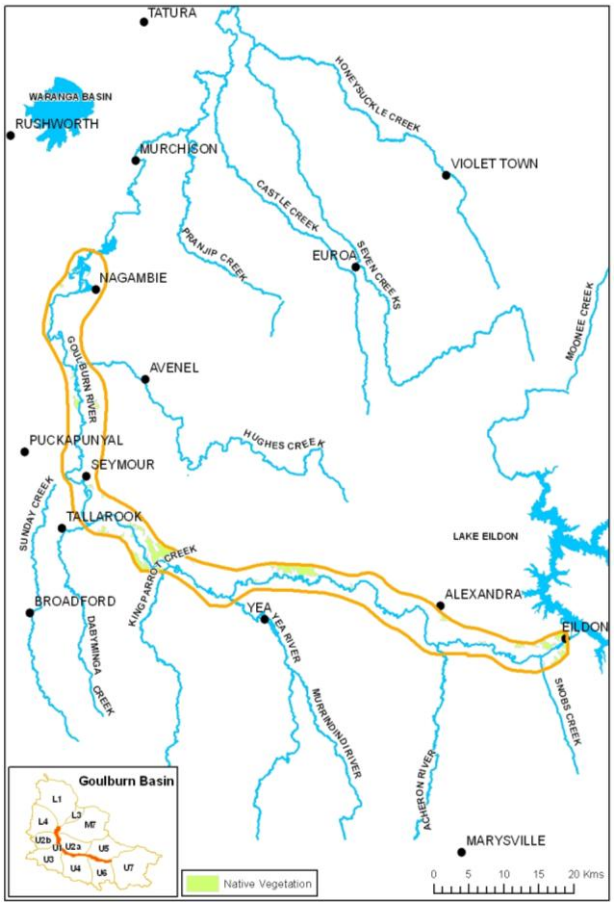
Program	Threat	Action	Lead Responsibility	Costs
Aquatic Habitat		Investigate opportunities for improving native fish habitat including investigation of the feasibility of reintroducing large woody debris and increasing diversity in channel habitats Implement recommendations.	GB CMA	$300,000
Flow Management	Flow deviation	Review the operating procedures of Goulburn Weir with a view to optimising water levels for the protection of the aquatic ecosystem	GB CMA, G-MW	$30,000
Riparian Management	Stock access	In partnership with government agencies, local land managers and community groups undertake riparian management	GB CMA, CLM, Parks Victoria, riparian landholders	$700,000
		Encourage land managers to adopt CRP for "Managing grazing in the riparian zone"		
Water Quality	Water quality (Nutrients)	Implement urban water quality initiatives and land based water quality initiatives (on-farm BMP and water re-use, sediment removal and nutrient stripping.)	Local Gov, GB CMA	$200,000
		Provide fencing and revegetation incentives in Management Unit L1, and tributaries of Management Units L3 (Euroa Strathbogie) and L5 (Lower Broken River) and U3 (Sunday/Dry Creeks – South West Goulburn) and other priorities identified through SEDNET modelling	Refer to related Management Units	
		Review (with partners) the implementation of key recommendations from Goulburn River Audit (2005)	GBCMA, G-MW, DSE, EPA	
Channel Form	Bed and Bank instability Water Quality	Stabilise near stream erosion using appropriate methods. Support riparian management in priority zones.	GB CMA	$150,000
Threatened Species		Support monitoring of threatened species in MU L1	GB CMA, DSE	$50,000
R&D		Undertake stream health investigations to fill data gaps	GB CMA	$50,000
Flow	Flow and Connectivity	Implement infrastructure upgrades required to supply environmental water to priority wetlands		$250,000
			TOTAL	$1,730,000
Wetlands	Wetland connectivity	Implement Lower Goulburn Floodplain management plan (Reach 1only)	CMA	($48,000,000 – not costed)
		Lower Goulburn fish community survey		$300,000
		Low inflow risk management monitoring		$100,000
		VEAC recommendation implementation (strategic planning)		$300,000

Management Unit	No.
Mid Goulburn River	U1

Management Unit U1 – Mid Goulburn River – covers the length of the Goulburn River between Eildon Reservoir and Goulburn Weir, a total length of stream of 145 km.

Priority Rivers and Streams	Reach No.
Goulburn River	9-14

Management Objectives
Protect values identified within Management units (L1, U1 and U7) - Heritage River (1-14); Association with wetlands of national significance (1-8); High overall environmental significance (1, 3, 4, 7, 8) High overall social significance (5, 6, 8, 9) High overall economic significance (14) Murray cod (1-8); Silver perch (1-8); Macquarie perch (15); Ecologically healthy river (15); Barred galaxias (16); Spotted tree frog (16); Alpine bent (16).



Three Year Implementation Target Area*	Target
No. rivers with negotiated environmental flow regimes	**0**
No. rivers with improvements made to environmental flow regimes	**0**
No of sites with improved instream habitat	**1**
Area of streamside land under management agreement ha	**15**
Kilometres of riparian land revegetated	**15**
No. of fish barriers removed	**0**
No. of sites subject to bed and bank stabilisation	**1**
Kilometres of riparian land subject to weed management	**5**
No. of plans developed for rivers and creeks of high social value	**0**
No. reaches with community programs / engagemment initiatives	**0**
No. of reaches with water quality improvements	**0**
No. of investigations to fill data gaps (inc monitoring)	**2**

*Includes transistional year (Large Scale River Restoration Initiative).

Importance:	High	
	Current	**Target**
Condition	Poor	Moderate
Social Value	High	High

Program for the Mid Goulburn River Management Unit (U1)

Program	Threat	Action	Lead Responsibility	Costs
Aquatic Habitat	Barriers to fish migration	Investigate options for Fish Barrier modifications at Goulburn Weir – complete economic evaluation of benefits. Support Goulburn Broken Fisheries Management Plan.	GB CMA	$N/A (included in CW)
	Instream habitat	Improving stream habitat	GB CMA	$100,000
Channel Form	Bank Erosion and Bed Instability	Stabilise near stream erosion	GB CMA	$50,000
Riparian Management / Water Quality		Provide fencing and revegetation incentives Encourage land managers to adopt CRP for "Managing grazing in the riparian zone" Encourage crown frontage licence holders to convert from agricultural to riparian management licence Control grazing on public waterfronts	GB CMA, CLM, Riparian landholders	$375,000
Riparian Management	Introduced flora	Control exotic vegetation on streams	GB CMA, CLM, riparian landholders	$50,000
Water Quality		Minimise nutrient discharge to rivers by reducing nutrient generation to wastewater facilities, and from urban environments.	GB CMA, Local Gov	
Threatened Species	Habitat / Flow	Optimise conditions for native species at zones of interaction between tributaries and MU U1 (assess status and develop plan)	GB CMA	$90,000
Flow Management		Review the operating procedures of Eildon Weir with a view to optimising water levels for the protection of the aquatic ecosystem. (Link to project above)		
People and Communities	Clear management objectives for the Goulburn River	Conduct deliberative forum with CMA, major stakeholders and community representatives to establish clear achievable environmental objectives for the Management Unit, which will provide direction for resolution of major widespread issues, particularly the migration of native fish upstream of Goulburn Weir, changes to the flow regime, reduced water temperatures and introduced species. (Phase 1 and 2 complete)	CMA (IC), G-MW	$125,000
			TOTAL	$790,000

Management Unit	No.
Upper Goulburn Catchment	U7

Management Unit U7 – upper Goulburn Catchment – covers the Goulburn River and major tributaries upstream of Eildon Reservoir, a total length of stream of 200 km. Eight reaches have been identified in the Management Unit, all of which are High Value Reaches.

Priority Rivers and Streams	Reach No.
Goulburn River	15, 16
Big River	67, 68
Howqua River	69, 70
Delatite River	71, 72

Management Objectives
Protect values identified within Management units (U7) Ecologically healthy river (15); Barred galaxias (16); Spotted tree frog (16); Alpine bent (16). Target threats to Ecologically healthy state - monitor

Three Year Implementation Target Area	*Target*
No. rivers with negotiated environmental flow regimes	**0**
No. rivers with improvements made to environmental flow regimes	**0**
No of sites with improved instream habitat	**0**
Area of streamside land under management agreement ha	**0**
Kilometres of riparian land revegetated	**10**
No. of fish barriers removed	**0**
No. of sites subject to bed and bank stabilisation	**0**
Kilometres of riparian land subject to weed management	**20**
No. of plans developed for rivers and creeks of high social value	**0**
No. reaches with community programs / engagemment initiatives (including TO's)	**3**
No. of reaches with water quality improvements	**0**
No. of investigations to fill data gaps (inc monitoring)	**2**
* Includes transitional year (Large Scale River Restoration Initiative)	

Importance:	High	
	Current	**Target**
Condition	Good	Good
Social Value	High	High

Program A - River Health Strategy

Program for the Upper Goulburn Catchment Management Unit (U7)

Program	Threat	Action	Lead Responsibility	Costs
Riparian Management	Stock access	Encourage land managers to adopt CRP for “Managing grazing in the riparian zone” Control grazing on public waterfronts, change licence conditions	GB CMA, CLM, riparian landholders	$50,000
Riparian Management	Introduced flora	Control exotic vegetation on streams and revegetate with native species	GB CMA, CLM, riparian landholders	$200,000
Water Quality	Water quality	Conduct an Ecological Risk Assessment for pH and EC in the Goulburn River Reach 15, using Guidelines for Environmental Management Risk-based Assessment of Ecosystem Protection to determine further work required	GB CMA	$45,000
Threatened Species		Monitor assets at risk from threat	GB CMA, DSE	$45,000
People		No. reaches with community programs / engagement initiatives (including TO's)	GB CMA, TCAC	$300,000
			TOTAL	$640,000

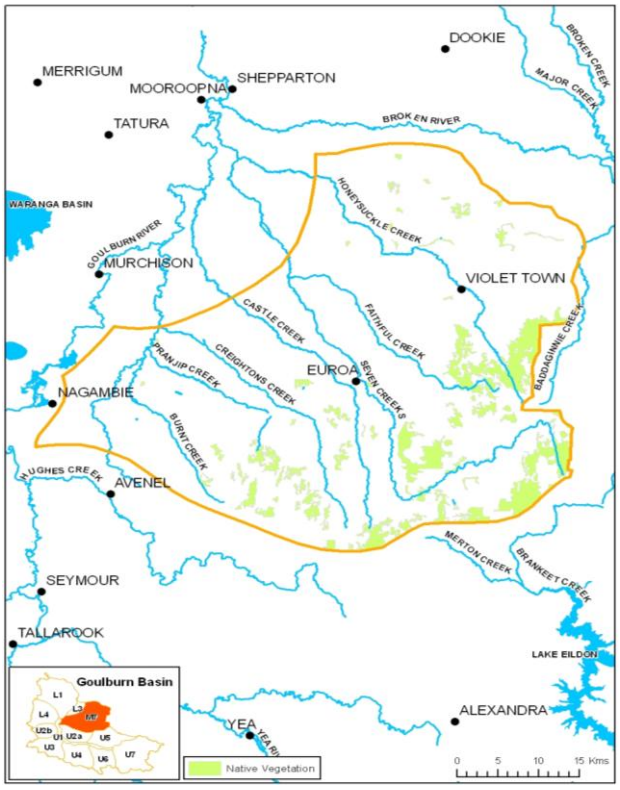
Management Unit	No.
Euroa Strathbogie	M7

Management Unit M7 – Euroa Strathbogie– covers the upper sections of eastern tributaries that flow into the Goulburn River downstream of Goulburn Weir, a total length of stream of 100 km.

Four reaches form the Management Unit, of which two (Seven Creeks Reaches 19 and 20) are classified as High Priority

Priority Rivers and Streams	Reach No.
Seven Creeks	19, 20

Management Objectives
Support Threatened species recovery plans for key species. Develop long term goal for threatened species management .



Three Year Implementation Target Area	*Target*
No. rivers with negotiated environmental flow regimes	
No. rivers with improvements made to environmental flow regimes	
No of sites with improved instream habitat	
Area of streamside land under management agreement ha	**10**
Kilometres of riparian land revegetated	**5**
No. of fish barriers removed	
No. of sites subject to bed and bank stabilisation	
Kilometres of riparian land subject to weed management	**5**
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagemment initiatives	
No. of reaches with water quality improvements	
No. of investigations to fill data gaps (inc monitoring)	**2**

** and ^ denotes action which covers multiple MUs counted as one target in the overall targets.*

Importance:	High	
	Current	**Target**
Condition	Moderate	Moderate
Social Value	Moderate	Moderate

Program A - River Health Strategy

Program for the Euroa Strathbogie Creeks Management Unit (M7)

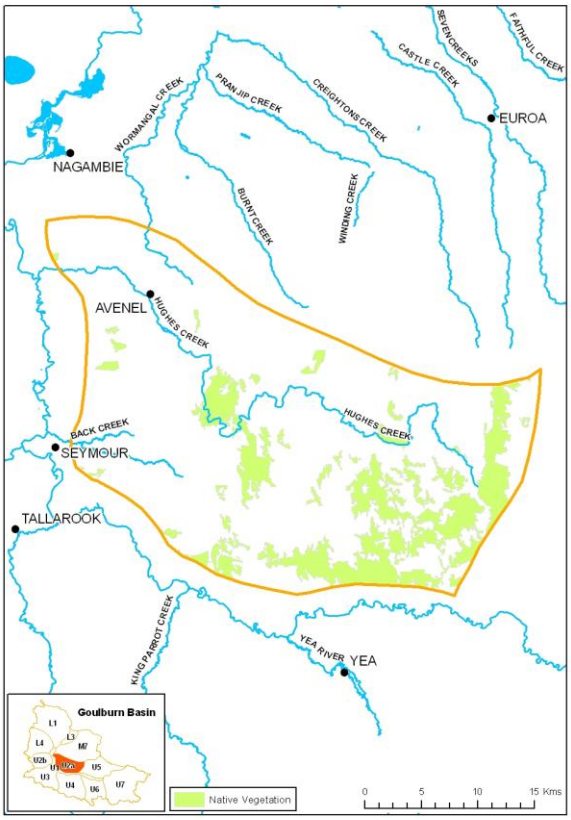
Program	Threat	Action	Lead Responsibility	Costs
Riparian Management / Water Quality	Stock Access	Provide fencing and revegetation incentives Encourage land managers to adopt CRP for "Managing grazing in the riparian zone"	CMA CMA / CLM	$250,000
	Degraded riparian zone	Provide incentive / support for management of riparian weeds	CMA	$50,000
Threatened Species	Various	Monitor and assess viability of Trout cod population in Reach 19 and Macquarie perch in reaches 19 and 20	CMA	$45,000
Threatened Species	Various	Repeat aquatic habitat surveys for Trout cod population in Reach 19 and Macquarie perch in reaches 19 and 20	CMA, ARI	$45,000
			TOTAL	$390,000

Management Unit	No.
Majors Creek and Hughes Creek	U2

Management Unit U2 – Majors Creek and Hughes Creek – covers the lower eastern and western tributaries of the Goulburn River between Eildon Reservoir and Goulburn Weir (Majors, Bylands, Hughes and Whitehead Creeks), a total length of stream of 132.5 km. Six reaches form the Management Unit, of which one is classified as a High Priority Reach.

Priority Rivers and Streams	Reach No.
Hughes Creek	37

Management Objectives
Support Threatened species recovery plans for key species. Develop long term goal for threatened species management .



Three Year Implementation Target Area	*Target*
No. rivers with negotiated environmental flow regimes	
No. rivers with improvements made to environmental flow regimes	
No of sites with improved instream habitat	**2**
Area of streamside land under management agreement ha	**10**
Kilometres of streamside land revegetated	**5**
No. of fish barriers removed	
No. of sites subject to bed and bank stabilisation	**2**
Kilometres of riparian land subject to weed management	
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagemment initiatives	
No. of reaches with water quality improvements	
No. of investigations to fill data gaps (inc monitoring)	**1**

Importance:	High	
	Current	**Target**
Condition	Poor	Moderate
Social Value	Moderate	Moderate

Base program only: Additional works which focus on the rehabilitation and post fire recovery effort in priority management units (U2, U3, U4 and U6) and Priority River reaches. (Tranistional and Year1) see Fire Recovery

Program A - River Health Strategy

Program for the Major and Hughes Creek Management Unit (U2)

Program	Threat	Action	Lead Responsibility	Costs
Riparian Management / Water Quality	Stock Access	Provide fencing and revegetation incentives Encourage land managers to adopt CRP for "Managing grazing in the riparian zone"	CMA CMA / CLM	$250,000
	Degraded riparian zone	Provide incentive / support for management of riparian weeds. Prevent siltation and erosion	CMA	$100,000
Threatened Species	Loss of instream habitat	Support threatened specie recovery plan for Macquarie perch	CMA	$100,000
R&D		Repeat aquatic habitat surveys for Macquarie perch population in Hughes Creek	CMA, ARI	$45,000
			TOTAL	$495,000

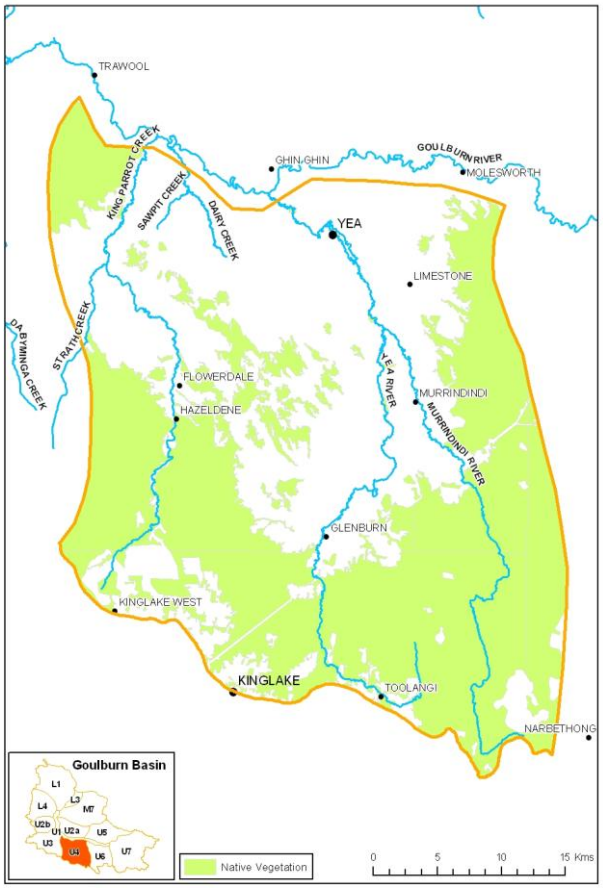
Management Unit	No.
King Parrot Creek/Yea River	U4

Management Unit U4 – King Parrot Creek/Yea River – covers a number of north flowing tributaries that flow into the Goulburn River downstream of Eildon Reservoir, a total length of stream of 167.5 km.

Nine reaches make up the Management Unit, of which two are classified as High Priority Reaches (both for the presence of Macquarie perch).

Priority Rivers and Streams	Reach No.
King Parrot Creek	51
Yea River	55

Management Objectives
Support Threatened species recovery plans for key species. Develop long term goal for threatened species management. Fire recovery – river health, water quality and threatened species protection.



Three Year Implementation Target Area	*Target*
No. rivers /wetlands with negotiated environmental flow regimes	**1**
No. rivers / wetlands with improvements made to environmental flow regimes	
No of sites with improved instream habitat	
Area of streamside land under management agreement ha	**15**
Kilometres of riparian land revegetated	**5**
No. of fish barriers removed	
No. of sites subject to bed and bank stabilisation	
Kilometres of riparian land subject to weed management	**10**
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagement initiatives (Traditional Owners and broarder community)	
No. of reaches with water quality improvements	
No. of investigations to fill data gaps (inc monitoring)	

Importance:	High	
	Current	**Target**
Condition	Moderate / Good	Good
Social Value	High	High

Base program only: Additional works which focus on the rehabilitation and post fire recovery effort in priority management units (U2, U3, U4 and U6) and Priority River reaches. (Tranistional and Year1) see Fire Recovery

Program A - River Health Strategy

Program for the King Parrot Creek Yea River Management Unit (U4)

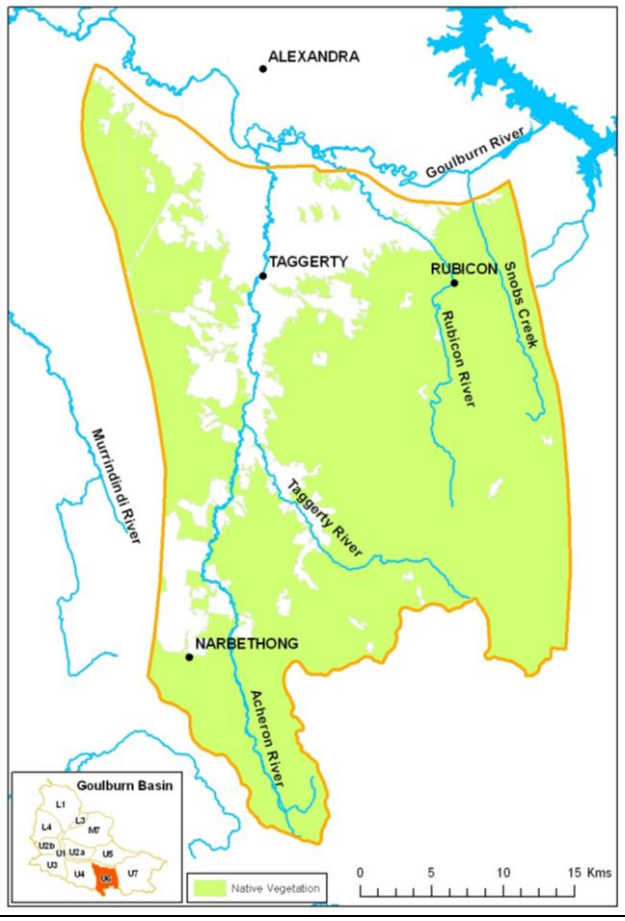
Program	Threat	Action	Lead Responsibility	Costs
Flow Management		Establish local management rules for enhanced protection of stream flows. Design programs (grants, incentive and education) Implement Management Rules for Yea River and King Parrot Creek		$30,000 $1,000,000
Riparian Management / Water Quality	Stock Access	Provide fencing and revegetation incentives Encourage land managers to adopt CRP for "Managing grazing in the riparian zone"	CMA CMA / CLM	$325,000
	Degraded riparian zone	Provide incentive / support for management of riparian weeds	CMA	$100,000
R&D		Repeat aquatic habitat surveys for Macquarie perch population in King Parrot Creek and Yea River	CMA, ARI	$45,000
			TOTAL	$1,500,000

Management Unit	No.
Acheron, Rubicon and Taggerty Rivers	U6

Management Unit U6 – Acheron, Rubicon and Taggerty Rivers – covers a number of north flowing tributaries that flow into the Goulburn River downstream of Eildon Reservoir, a total length of stream of 100 km. Five reaches form the Management Unit, of which three are classified as High Priority Reaches.

Priority Rivers and Streams	Reach No.
Acheron River	62
Taggerty River	64
Rubicon River	66

Management Objectives
Support Threatened species recovery plans for key species. Develop long term goal for threatened species management. Fire recovery – river health, water quality and threatened species protection. Target threats to Ecologically healthy state - monitor



Three Year Implementation Target Area	*Target*
No. rivers /wetlands with negotiated environmental flow regimes	
No. rivers / wetlands with improvements made to environmental flow regimes	
No of sites with improved instream habitat	**2**
Area of streamside land under management agreement ha	**15**
Kilometres of riparian land revegetated	**10**
No. of fish barriers removed	
No. of sites subject to bed and bank stabilisation	**3**
Kilometres of riparian land subject to weed management	**5**
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagement initiatives (Traditional Owners and broarder community)	
No. of reaches with water quality improvements	
No. of investigations to fill data gaps (inc monitoring)	**1**

** and ^ denotes action which covers multiple MUs counted as one target in the overall targets.*

Importance:	High	
	Current	**Target**
Condition	Good - Ex	Good - Ex
Social Value	High	High

Base program only: Additional works which focus on the rehabilitation and post fire recovery effort in priority management units (U2, U3, U4 and U6) and Priority River reaches. (Tranistional and Year1) see Fire Recovery

Program A - River Health Strategy

Program for the Acheron, Rubicon and Taggerty Rivers Management Unit (U6)

Program	Threat	Action	Lead Responsibility	Costs
Aquatic Habitat	Loss of in-stream habitat	Enhance aquatic refugia to protect instream habitat (protection zones)	GB CMA	$100,000
Riparian Management	Stock access	Provide fencing and revegetation incentives Encourage land managers to adopt CRP for "Managing grazing in the riparian zone" Control grazing on public waterfronts	GB CMA	$350,000
Riparian Management	Introduced fauna	Provide incentive / support for management of riparian weeds	GB CMA / CLM	$50,000
People and Communities		Support initiatives to enhance recreational experience along the waterways	GB CMA, Fish Clubs and Assoc.	(NC)
			TOTAL	$500,000

Management Unit	No.
Upper Goulburn Fire Recovery	U2,U3,U4 and U6

Management Unit U6 – Acheron, Rubicon and Taggerty Rivers – covers a number of north flowing tributaries that flow into the Goulburn River downstream of Eildon Reservoir, a total length of stream of 100 km. Five reaches form the Management Unit, of which three are classified as High Priority Reaches.

Priority Catchments
Acheron River
Taggerty River
Rubicon River
King Parrot Creek
Yea River
Sunday Dry Creek

Management Objectives
Fire recovery – river health, water quality and threatened species protection.

Three Year Implementation Target Area	*Target*
Repair or replace burnt or damaged riparian fencing (CMA/Landcare). (km)	**60**
Replanting of indigenous vegetation (ha)	**40**
No of sites targeted for protecting water quality and river health (sites)	**10**
Weed suppression and control (ha)	**50**
Employment	
Kilometres of riparian land subject to weed mgmnt	**62**
No. of sites subject to bed and bank stabilisation	**3**
Repair or replace burnt or damaged riparian fencing (CMA/Landcare). (km)	**58**
Planning and Coordination	**1**
Program needs to be integrated into base program within defined Management Units.	

Importance:	High	
	Current	**Target**
Condition	Poor	Poor+
Social Value	High	High

Focus on the rehabilitation and post fire recovery effort in priority management units (U2, U3, U4 and U6) (Tranistional and Year1)

Program for the Fire Recovery Program in Management Units (U2,3,4 and 6)

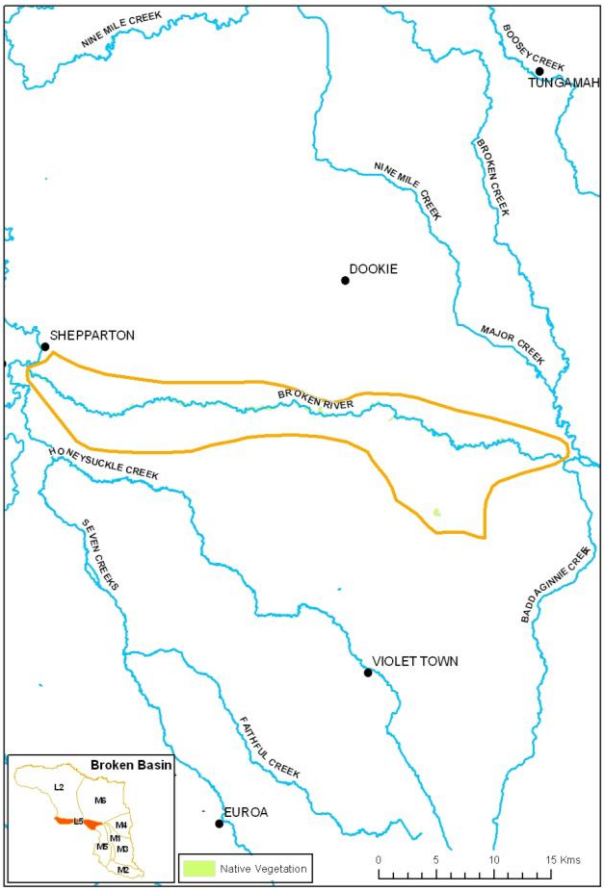
Program	Threat	Action	Lead Responsibility	Costs
Fire recovery	Loss of in-stream Habitat, Loss of riparian zone, weeds and water quality	Implement fire recovery program in partnership with other agencies and communities. Threatened Species Recovery	GB CMA	$3,400,000

Management Unit	No.
Lower Broken River	L5

Management Unit L5 – Lower Broken River – covers the lower Broken River, downstream from Casey's Weir through to the confluence with the Goulburn River. The total length of stream in the Management Unit is 62.5 km. Two reaches have been identified in the Management Unit, both of which are High Priority Reaches.

Priority Rivers and Streams	Reach No.
Broken River	1 - 2

Management Objectives
Protect values identified within Management units (L1, M1 and U7) . Association with wetlands of national significance (1, 2); Murray cod; Macquarie perch (3, 4, 5) Silver perch (1)..



Three Year Implementation Target Area	*Target*
No. rivers /wetlands with negotiated environmental flow regimes	
No. rivers / wetlands with improvements made to environmental flow regimes	**1**
No of sites with improved instream habitat	
Area of streamside land under management agreement ha	
Kilometres of riparian land revegetated	
No. of fish barriers removed	**0**
No. of sites subject to bed and bank stabilisation	
Kilometres of riparian land subject to weed management	**5**
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagement initiatives (Traditional Owners and broarder community)	
No. of reaches with water quality improvements	**1**
No. of investigations to fill data gaps (inc monitoring)	
No of research projects supported	**1**

Importance:	High	
	Current	**Target**
Condition	Moderate	Moderate - Good
Social Value	High	High

Program for the Lower Broken River Management Unit (L5)

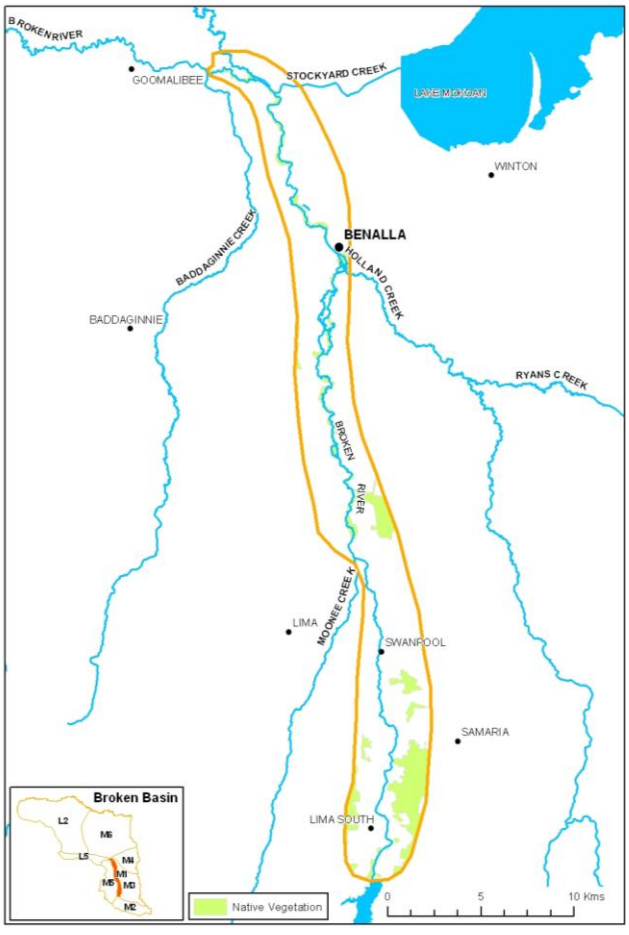
Program	Threat	Action	Lead Responsibility	Costs
Flow Management		Develop a Flow Rehabilitation Plan (Broken River) to support important wetlands and floodplains	GB CMA	$100,000
Riparian Management	Stock access	Encourage land managers to adopt CRP for "Managing grazing in the riparian zone" Control grazing on public waterfronts.	GB CMA, CLM	$125,000
	Weeds	Control the impact of the spread of Weeds of National Significance and key species impacting on river health.	GB CMA	$50,000
Aquatic Weeds	Introduced flora	Monitor the impact of potential spread of Weeds of National Significance and key species impacting on river health.	GB CMA, Loc Gov	(unfunded)
Water Quality	Water quality (Nutrients)	Implement BMP for urban drainage as outlined in the Urban Stormwater Management Program of the Water Quality Strategy	GB CMA, Loc Gov	$75,000
R&D		Monitor the influence of the "decommissioning of Lake Mokoan".		$50,000
			TOTAL	$400,000
Aquatic Habitat	Barrier to fish migration	Provide and monitor fish passage at Gowangardie Weir. Support monitoring of efficacy of fish movement at Casey's Weir	CMA	(unfunded)

Management Unit	No.
Mid Broken River	M1

Management Unit M1 – Mid Broken River – consists of the Broken River from downstream wall of Lake Nillahcootie to Casey's Weir. The total length of stream in the Management Unit is 55 km. Both of the reaches that make up the Management Unit are identified as High Priority Reaches due to the presence of Murray cod and Macquarie perch.

Priority Rivers and Streams	Reach No.
Broken River	3 - 4

Management Objectives
Protect values identified within Management units (L1, M1 and U7) . Association with wetlands of national significance (1, 2); Murray cod; Macquarie perch (3, 4, 5) Silver perch (1)..



Three Year Implementation Target Area	*Target*
No. rivers /wetlands with negotiated environmental flow regimes	
No. rivers / wetlands with improvements made to environmental flow regimes	**1**
No of sites with improved instream habitat	
Area of streamside land under management agreement ha	**5**
Kilometres of riparian land revegetated	
No. of fish barriers removed	
No. of sites subject to bed and bank stabilisation	
Kilometres of riparian land subject to weed management	
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagement initiatives (Traditional Owners and broarder community)	
No. of reaches with water quality improvements	**2**
No. of investigations to fill data gaps (inc monitoring)	**2**

Importance:	High	
	Current	**Target**
Condition	Moderate	Moderate-Good
Social Value	High	High

Program for the Mid Broken River Management Unit (M1)

Program	Threat	Action	Lead Responsibility	Costs
Aquatic Habitat	Aquatic Weeds	Continue to improve understanding and management of Cabomba. Undertake containment actions for aquatic weeds	CMA, G-MW, BRC and DPI	$300,000
Aquatic Habitat	Barrier to fish migration	Provide and monitor fish passage at Hollands Creek / Mokoan Inlet Support monitoring of efficacy of fish movement at Benalla Town Weir	CMA / DSE / GMW	(not costed)
Flow Management		Improve natural flow regimes within the Broken River.	GB CMA, G-MW	$20,000
Riparian Management	Stock access	Encourage land managers to adopt CRP for "Managing grazing in the riparian zone" Control grazing on public waterfronts.	GB CMA CLM	$100,000
Water Quality	Water quality (Nutrients)	Implement BMP for urban drainage as outlined in the Urban Stormwater Management Program of the Water Quality Strategy	GB CMA Loc Govt	$150,000
	Weeds	Control the impact of the spread of Weeds of National Significance and key species impacting on river health.	GB CMA	$50,000
	Temperature	Assess impact of Lake Nillahcootie on downstream temperature regimes. If significant, assess potential for modification of release water temperature in conjunction with modifications to the weir wall outlined in the White Paper.	GB CMA, G-MW	$30,000
R&D		Monitor the influence of the "decommissioning of Lake Mokoan".		$50,000
			TOTAL	$700,000

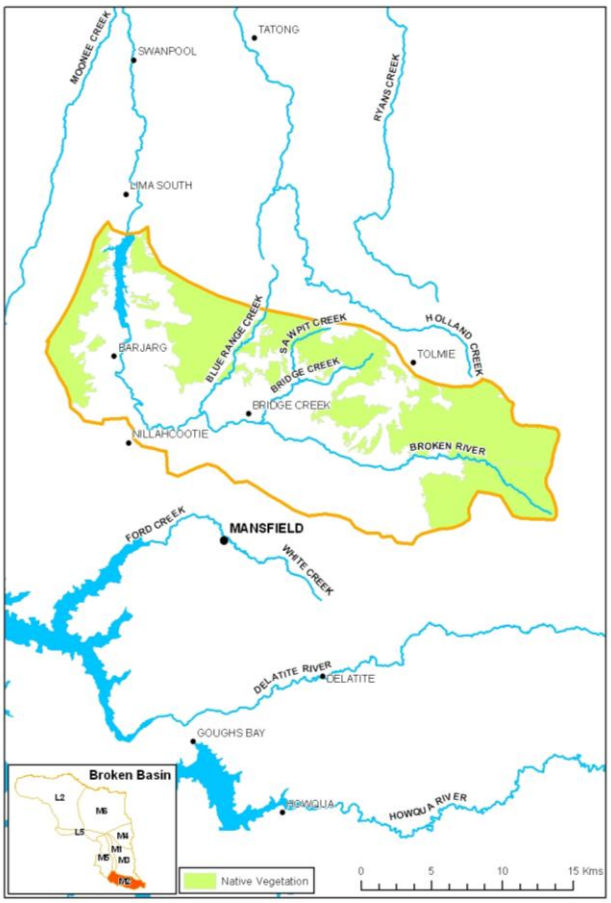
Management Unit	No.
Upper Broken River	M2

Management Unit M2 – Upper Broken River – consists of the Broken River upstream of Lake Nillahcootie and the major upstream tributaries of Halls Weir Creek and Sawpit Creek.

The total length of stream in the Management Unit is 52.5 km. Of the four reaches that make up the Management Unit only Reach 5, immediately upstream of Lake Nillahcootie, is recognised as a High Priority Reach, due to the presence of Murray cod and Macquarie perch.

Priority Rivers and Streams	Reach No.
Broken River	5

Management Objectives
Protect values identified within Management units (L1, M1 and U7) . Association with wetlands of national significance (1, 2); Murray cod; Macquarie perch (3, 4, 5) Silver perch (1)..



Three Year Implementation Target Area	*Target*
No. rivers with negotiated environmental flow regimes	-
No. rivers with improvements made to environmental flow regimes	
No of sites with improved in stream habitat	
Area of streamside land under management agreement ha	
Kilometres of riparian land protected	2
No. of fish barriers removed	
No. of sites subject to bed and bank stabilisation	
Kilometres of riparian land subject to weed management	2
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagement initiatives	
No. of reaches with water quality improvements	-
No. of investigations to fill data gaps (inc monitoring)	**1**

** and ^ denotes action which covers multiple MUs counted as one target in the overall targets.*

Importance:	High	
	Current	**Target**
Condition	Moderate	Moderate
Social Value	High	High

Program for the Upper Broken River Management Unit (M2)

Program	Threat	Action	Lead Responsibility	Costs
Aquatic Habitat	Barrier to fish migration	Explore opportunities to provide fish passage at Lake Nillahcootie in conjunction with modifications to the weir wall outlined in the White Paper	GB CMA DSE / G-MW	(uncosted)
Riparian Management	Stock access	Provide fencing and revegetation incentives and erosion control activities as identified through targeted SEDNET modelling	GB CMA CLM	(Program C)
		Encourage land managers to adopt CRP for "Managing grazing in the riparian zone".		
		Control grazing on public waterfronts		
Water Quality		(included in Riparian Management)		
Threatened Species	Flow, Habitat, Water Quality	Monitor and assess viability of Macquarie perch populations in R 5	GB CMA	$45,000
			TOTAL	$45,000

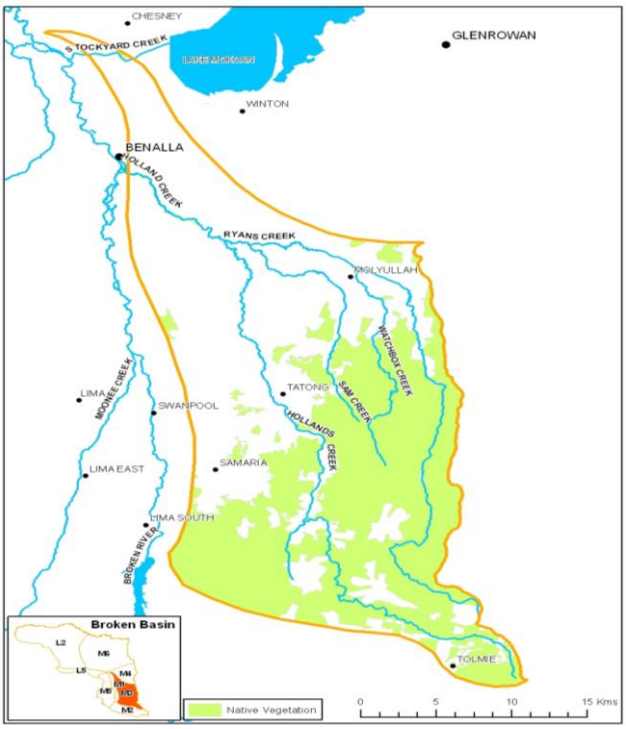
Management Unit	No.
Ryans and Hollands Creek	M3

Management Unit M3 – Ryan and Hollands Creeks – comprises the eastern tributaries of the Broken River, including Ryans and Hollands Creek with Sam Creek and Watchbox Creek.

The total length of stream in the Management Unit is 127.5 km. Seven reaches have been identified in the Management Unit, of which three are recognised as High Priority Reaches.

Priority Rivers and Streams	Reach No.
Holland Creek	13, 14
Ryans Creek	17

Management Objectives
Demonstration reach – supported Macquarie perch recovery plan; Macquarie perch.



Three Year Implementation Target Area	*Target*
No. rivers /wetlands with negotiated environmental flow regimes	
No. rivers / wetlands with improvements made to environmental flow regimes	
No of sites with improved instream habitat	**2**
Area of streamside land under management agreement ha	**8**
Kilometres of riparian land revegetated	
No. of fish barriers removed	
No. of sites subject to bed and bank stabilisation	
Kilometres of riparian land subject to weed mgmnt	
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagement initiatives (Traditional Owners and broader community)	
No. of reaches with water quality improvements	
No. of investigations to fill data gaps (inc monitoring)	**1**
** and ^ denotes action which covers multiple MUs counted as one target in the overall targets.*	

Importance:	High	
	Current	**Target**
Condition	Good	Good - Excellent
Social Value	Mod High	High

Program for the Ryans and Hollands Creek Management Unit (M3)

Program	Threat	Action	Lead Responsibility	Costs
Aquatic Habitat	Flow, Water Quality, Degraded instream and riparian zone	Continue to implement the Demonstration reach concept in Hollands Creek for the protection and enhancement of Macquarie perch populations.	CMA, ARI, Community	$360,000

Management Unit	No.
Murray River Floodplain	O

The Murray River is Australia's most iconic river. This management unit covers the reach from the confluence with the Ovens River at Bundalong to the Echuca townshop.

The Murray River is a High Priority reach, which contains a significant floodplain and encompasses the Barmah forest (a Ramsar listed Wetland) which is soon to change land status from State Forest and State Park to National Park. Barmah Forest is also recognised as an Icon Site under the Murray-Darling Basin Authority's Living Murray initiative.

Priority Rivers and Streams	Reach No.
Murray River	N/A

Three Year Implementation Target Area	*Target*
No. rivers /wetlands with negotiated environmental flow regimes	1
No. rivers / wetlands with improvements made to environmental flow regimes	**1**
No of sites with improved instream habitat	
Area of streamside land under management agreement ha	
Kilometres of streamside land revegetated	
No. of fish barriers removed	**1**
No. of sites subject to bed and bank stabilisation	
Kilometres of riparian land subject to weed management	**150**
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagement initiatives (Traditional Owners and broader community)	**1**
No. of reaches with water quality improvements	
No. of investigations to fill data gaps (inc monitoring)	**5**

Importance:	Very High	
	Current	**Target**
Condition	Moderate	Moderate
Social Value	V-High	V-High

Program for the Murray River Management Unit (O)

Program	Threat	Action	Lead Responsibility	Costs
Flow Management	Flow deviation	Deliver Environmental Water to targeted icon sites (Barmah) Monitor the ecological response and effect of delivery	TLM	$550,000
Riparian Management	Stock access Weeds	Encourage land managers to adopt CRP for "Managing grazing in the riparian zone"	TLM, PV	$600,000
Communities	Varies	Undertaken key environmental program utilising traditional knowledge and with the support of indigenous partnerships. Engagement with traditional owners through knowledge exchange.	GB CMA, TLM, PV	$500,000
			TOTAL	$1,650,000

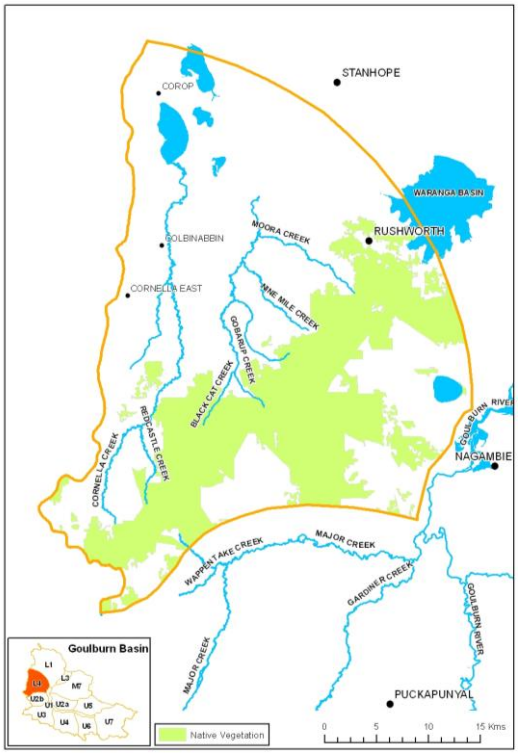
Management Unit	No.
Western Catchment	L4

Management Unit L4 – Western Catchment – covers a number of isolated waterways to the west of the Goulburn Basin, with a total length of 152 km.

Five reaches make up the management unit, of which one, Gobarup Creek Reach 33 is classified as a High Priority Waterway. Gobarup Creek is a tributary of Wanalta Creek which ultimately terminates in the Wallenioe Wetlands.

Priority Rivers and Streams	Reach No.
Gobarup Creek	33

Management Objectives
Association with wetlands of national significance.



Three Year Implementation Target Area	*Target*
No. rivers /wetlands with negotiated environmental flow regimes	
No. rivers / wetlands with improvements made to environmental flow regimes	
No of sites with improved instream habitat	
Area of streamside land under management agreement ha	5
Kilometres of riparian land revegetated	5
No. of fish barriers removed	
No. of sites subject to bed and bank stabilisation	
Kilometres of riparian land subject to weed management	
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagement initiatives (Traditional Owners and broader community)	
No. of reaches with water quality improvements	
No. of investigations to fill data gaps (inc monitoring)	

** and ^ denotes action which covers multiple MUs counted as one target in the overall targets.*

Importance:	Moderate	
	Current	**Target**
Condition	Moderate	Moderate
Social Value	Moderate	Moderate

Program B - River Health Strategy

Program for the Western Catchment Management Unit (L4)

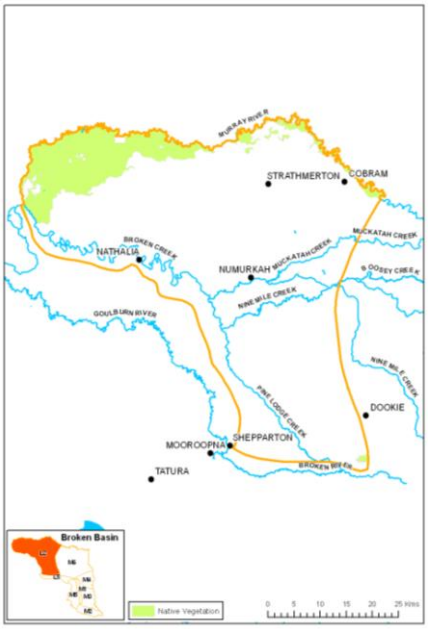
Program	Threat	Action	Lead Responsibility	Costs
Flow Management	Flow deviation	Investigate the potential impacts of flow deviation on wetland systems.	CMA, DPI	(un costed)
Riparian Management	Stock access	Provide fencing and revegetation incentives and erosion control activities as identified through targeted SEDNET modelling Provide fencing and revegetation incentives - Encourage land managers to adopt CRP for "Managing grazing in the riparian zone"	CMA, Community	$125,000
Wetlands	Flow and Connectivity	Implement infrastructure upgrades required to supply environmental water to priority wetlands	CMA, DPI	$150,000
			TOTAL	$275,000

Management Unit	No.
Upper Broken and Boosey Creeks	M6

Management Unit M6 – Upper Broken and Boosey Creeks – covers the upper catchment of Broken Creek, taking in all of the Boosey Creek sub-catchment, and the upper reach in Nine Mile Creek.

The total length of stream in the Management Unit is 200 km. Eight reaches have been identified in the Management Unit, of which 2 in the Broken Creek have been identified as High Priority Reaches.

Priority Rivers and Streams	Reach No.
Broken Creek	25, 26



Management Unit	No.
Lower Broken Creek	L2

Lower Broken Creek – covers the lower sections of Broken Creek downstream of Katamatite, as well as all of Pine Lodge Creek and the lower reach of Nine Mile Creek.

The total length of stream in the Management Unit is 210 km. Seven reaches have been identified in the Management Unit, of which the four reaches in the Broken Creek have been identified as High Priority Reaches.

Priority Rivers and Streams	Reach No.
Broken Creek	21-24

Three Year Implementation Target Area	*Target*
No. rivers /wetlands with negotiated environmental flow regimes	**1**
No. rivers / wetlands with improvements made to environmental flow regimes	**2**
No of sites with improved instream habitat	
Area of streamside land under management agreement ha	**5**
Kilometres of riparian land revegetated	
No. of fish barriers removed	**3**
No. of sites subject to bed and bank stabilisation	
Kilometres of riparian land subject to weed management	
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagement initiatives (Traditional Owners and broarder community)	
No.of reaches with water quality improvements	
No. of investigations to fill data gaps (inc monitoring)	**2**

Importance:	Moderate	
	Current	**Target**
Condition	Moderate	Moderate
Social Value	High	High

Program for the Broken and Boosey Creeks Management Units (M6 and L2)

Program	Threat	Action	Lead Responsibility	Costs
Aquatic Habitat	Degraded instream environment, Flow, Water Quality	Complete fishies enhancement plan for mid Broken Creek Implement priority actions	GB CMA	$150,000
		Aquatic habitat assessments – ecological monitoring including fishway efficiency monitoring	GB CMA	$200,000
Flow Management	Flow deviation	Develop a Flow Rehabilitation Plan (Broken Creek).	GB CMA	$220,000
		Implement Broken Creek environmental flow project, undertake risk analyses of values, threats and mitigation measures, and implement negotiated environmental flow regimes.		
Riparian Management	Stock access	Encourage land managers to adopt CRP for “Managing grazing in the riparian zone”	GB CMA, CLM	$100,000
Water Quality	Water quality (nutrients and turbidity)	Minimise nutrient runoff into irrigation drains by implementation of onfarm BMP by irrigators as outlined in the Irrigation Drainage Program of the Water Quality Strategy	GB CMA, DPI	
		Remove phosphorous from irrigation drains through water re-use, sediment removal and nutrient stripping, as outlined in the Irrigation Drainage Program of the Water Quality Strategy.		
		Flow Monitoring – research and responding to events	GB CMA	$100,000
		Continue to assess the growth, impact and management of aquatic weeds (azolla)		
Wetlands	Flow and Connectivity	Implement infrastructure upgrades required to supply environmental water to priority wetlands	GB CMA, NVIRP	$120,000
			TOTAL	$890,000

Program C - River Health Strategy

Management Unit	No.
Goulburn and Broken Catchments	N/A

Management Units and stream reaches outside of priority units described above.

The aim to: achieve an 'overall improvement' in the environmental condition of the remainder of rivers and prevent damage from inappropriate development and activities.

This combined program also includeds, strategic planning, capacity, education, engangement and statutory functions as described under the Water Act.

Management Objectives
Net improvement in the remainder of rivers Preventing damage from inappropriate development and activities Undertake recurrent maintenance and monitoring on investment

Three Year Implementation Target Area	*Target*
No. rivers with negotiated environmental flow regimes	
No. rivers with improvements made to environmental flow regimes	
No of sites with improved instream habitat	
Area of streamside land under management agreement ha	**10**
Kilometres of riparian land revegetated	**5**
No. of fish barriers removed	**3**
No. of sites subject to bed and bank stabilisation	
Kilometres of riparian land subject to weed management	**10**
No. of plans developed for rivers and creeks of high social value	
No. reaches with community programs / engagemment initiatives	
No. of reaches with water quality improvements	**1**
No. rivers with negotiated environmental flow regimes	

Program C – Net Improvement, Recurrent and Maintenance

General

Program	Threat	Action	Lead Responsibility	(Costs
Riparian Management	Stock access	Encourage land managers to adopt CRP for "Managing grazing in the riparian zone"	GB CMA CLM	$225,000
Aquatic Habitat	Barriers	Remove / remodel small priority barriers preventing the migration of native fish	GB CMA	$150,000
Aquatic Weeds	Introduced flora	Monitor the impact of potential spread of Weeds of National Significance and key species impacting on river health.	GB CMA Loc Gov	$100,000
Water Quality	Water Quality	Target improvements to water quality – influence priority reaches in Program A	GBCMA / DPI / Loc Gov / etc	$50,000
Maintenance		Provide allowance for maintenance / recurrent actions to protect the investment made in river health initiatives under the RRHS. (Estimated at $100k p.a.)	GB CMA	$300,000
			TOTAL	$825,000

Strategic, Planning and Community Programs within the River Health Strategy 2010-2013

Management Unit	No.
Goulburn and Broken Catchments	N/A

Management Units and stream reaches outside of priority units described above.

The aim to: achieve an 'overall improvement' in the environmental condition of the remainder of rivers and prevent damage from inappropriate development and activities.

This combined program also includeds, strategic planning, capacity, education, engangement and statutory functions as described under the Water Act.

Three Year Implementation Target Area	*Target*
Community Partnership programs (CW)	3
River Health Monitoring (agency and community)	3
Review River Health Strategy in line with VSHREW	1
River Health - Statutory and Governance (CW)	3
Management of the Environmental Water Reserve for the operational management of environmental water and input in to planning processes	1
Research Iniatives	3
Plans developed for creeks with high community value	2
Statutory Functions (WOW) Caretaker of river health	2
Traditional Owner Group Facilitation	1
Complete Traditional Owner NRM Plan and MOU's	2
Tradiditional knowedge and engagement	1

Program - Strategic, Planning and Community Engagement Programs

Action	(Costs
CMA maintains a strategic and ongoing role in projects to enhance knowledge base with respect of climate change and impact of dry inflows and incorporate findings as appropriate	$2,340,000
River Health Planning and Statutory roles	
Foster regional refugia planning to identify future scenarios and opportunities for effective investment. Incorporated in to regional program (Strategic and EWR)	
Input into the implementation of the Victorian Strategy for Healthy Rivers, Wetlands & Estuaries (VSHREW) and regional strategies for healthy rivers, wetlands and estuaries (RSHREWs)	
Development of a Regional Strategy for Healthy Rivers, Wetlands & Estuaries (RSHREW) including population of AVIRA database	
Continued emphasis on monitoring (before/after works monitoring method) and evaluation to improve program delivery	
Community engagement / Community partnership programs.	
Working on Country, with Traditional Owner Groups (including knowledge capture and exchange), Traditional Coordination, Cultural Heritage Planning	
Management of the Environmental Water Reserve for the operational management of environmental water and input in to planning processes	

River Health Strategy 2010-2013
Implementation Targets and Resource Impact

The following table provides an overview of Implementation Targets and their respective influence on Resource Condition

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Implementation Target Area	No	Assumption (from RRHS)	No	Performance Descriptor
No. rivers with negotiated environmental flow regimes	3		3	Number of river reaches with improved environmental flow regimes
No. rivers with improvements made to environmental flow regimes	8	Increase the Hydrology ISC rating. Influence instream habitat and aquatic life.	8	Number of river reaches with improved environmental flow regimes
No of sites with improved instream habitat	6		6	Length of instream habitat improved.
Area of streamside land under management agreement ha	80	Improve Streamside Zone ISC rating over 50% of the length of reach under management.	80	Additional area and length of habitat improved – riparian.
Kilometres of riparian land revegetated	40		40	Additional area and length of habitat improved – riparian.
		Improve water quality, particularly nutrients, by providing a buffer to filter nutrient input to streams and wetlands. Specifically: reduce total phosphorous inputs by 2.5-6.5 kg/km/yr	200kg/yr	Estimated reduction in phosphorous. Estimated reduction in sediment
No. of fish barriers removed	6	Improve native fish community values within all stream reaches upstream of the barrier to the next barrier in the system. Improve Physical Form ISC rating at reaches upstream of the barrier, by: increasing influence of artificial barrier indicator of ISC Physical Form sub-index	6	Additional length of fish passage provided

No. of sites subject to bed and bank stabilisation	5	Maintain Physical Form ISC rating	5	Length (km) of waterway stablilised
		Reduce sediment mobilisation from the banks. Specifically: reduce fine and coarse sediment mobilisation from bank profile by 60-612 t/km/yr and reduce total phosphorous inputs by 15-153 kg/km/yr.	300t/yr 75t/yr	Estimated reduction in phosphorous. Estimated reduction in sediment
Kilometres of riparian land subject to weed management	30	Improve riparian flora and fauna diversity Promote the regeneration of native species; Protect significant riparian flora and fauna species; Promote aquatic biodiversity and habitat; Improver water quality, particularly dissolved oxygen and temperature;	30	Additional area and length of habitat improved – riparian.
No. of plans developed for Rivers and Creeks of high social value	**0**		**0**	Additional area and number of NRM group action plans developed and being implemented
No. reaches with community programs / engagemment initiatives	**2**	Increase regional community understanding and knowledge about river health issues; Encourage greater community involvement in river management and restoration	**2**	
No. of reaches with water quality improvements	6		6	Estimated reduction in phosphorous, sediments etc,
No. of investigations to fill data gaps (inc monitoring)	**7**	Make comparisons over time and improve our understanding of resource response (following intervention)	**7**	

River Health Strategy 2010-2013
Implementation Targets and Resource Impact

Fire Recovery

Implementation Target Area	No	Assumption (from RRHS)	No	Performance Descriptor
Repair or replace burnt or damaged riparian fencing (CMA/Landcare). (km)	60	Maintain Streamside Zone ISC rating in 50% of reaches under management over the period of the Strategy Enhance Streamside Zone ISC rating in 50% of reaches under management over the period of the Strategy	60	Additional area and length of habitat improved – riparian.
Replanting of indigenous vegetation (ha)	40			Additional area and length of habitat improved – riparian.
No of sites targeted for protecting water quality and river health (sites)	10		10	Length of in-stream habitat improved.
Weed suppression and control (ha)	50	Improve riparian flora and fauna diversity, promote the regeneration of native species NOTE: 50% of work within targeted riparian sites	25	Additional area and length of habitat improved – riparian.
				.
Kilometres of riparian land subject to weed management	62	Improve riparian flora and fauna diversity, promote the regeneration of native species NOTE: 50% of work within targeted riparian sites	31	Additional area and length of habitat improved – riparian
Number of sites subject to bed and bank stabilisation	3	Reduce sediment mobilisation from the banks.	3	Length (km) of waterway stablilised
Repair or replace burnt or damaged riparian fencing (CMA/Landcare). (km)	58			Additional area and length of habitat improved – riparian
		Specifically: reduce fine and coarse sediment mobilisation from bank profile by 60-612 t/km/yr and reduce total phosphorous inputs by 15-153 kg/km/yr.	17.4t/yr	

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