

# Wetlands Directions Paper for the Goulburn Broken Catchment



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# Goulburn Broken Catchment Management Authority

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# Acronyms

CAMBA	China-Australia Migratory Bird Agreement
DOI	Department of Infrastructure
GBCMA	Goulburn Broken Catchment Management Authority
GMW	Goulburn Murray Water
EWA	Environmental Water Allocation
ISC	Index of Stream Condition
IC	Implementation Committee
JAMBA	Japan-Australia Migratory Bird Agreement
MAFRI	Marine and Freshwater Resources Institute
NAP	National Action Plan
NLWRA	National Land and Water Resources Audit
NRE	Natural Resources and Environment
RCS	Regional Catchment Strategy
RHWQC	River Health and Water Quality Committee
SIR	Shepparton Irrigation Region
VROTS	Victorian Rare or Threatened Species
	<b>A</b>

# 1 Introduction

#### 1.1 Why a Directions Paper?

This Directions Paper has been produced to ensure every important strategic issue affecting wetlands is addressed in the Regional Catchment Strategy. It is intended to provide Goulburn Broken Catchment stakeholders with sufficient information to feel comfortable with (broad) strategic decisions affecting wetlands.

Information from this directions paper will feed into the Goulburn Broken Riverine Health Strategy that is in preparation. The Riverine Health Strategy will cover on-stream and floodplain wetlands and will not address those wetlands in the catchment not associated with the riverine environment. Therefore a more comprehensive Wetlands Strategy for the Catchment will be produced over the next few months. The strategy will be more detailed than this directions paper and encompass all wetlands in the catchment.

		Draft	Final
٠	Wetlands Directions Paper	31 July 2002	30 September 2002
٠	Wetlands Strategy	31 October 2002	c. 31 December 2002
•	Regional Catchment Strategy	30 June 2002	c. 31 October 2002

#### Timelines (all are approximate)

#### 1.2 What is a wetland?

"Wetland" is the general and modern term for swamps, billabongs, lakes, saltmarshes, bogs, soaks, mudflats and mangroves. Wetlands are simply areas that have acquired special characteristics from being wet on a regular or semi-regular basis. The term also applies to depressions in the landscape of our more arid regions that only occasionally hold water but teem with life and become environmental focal points when they do.

The Ramsar Convention on Wetlands describes wetlands as:

"areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres....(These areas) may incorporate riparian and coastal zones adjacent to wetlands, and islands or bodies or marine water deeper than six metres at low tide lying within the wetlands."

#### 1.3 Our understanding of wetlands

While we have understood for over 20 years that wetlands have been significantly impacted on since European settlement, we have little knowledge of the extent of this impact. This is the first attempt to collate existing data on wetlands and use it to inform Catchment-scale decision-making.

Our knowledge on wetlands is not as good as it is for many other natural resource management issues. Indeed, we know much more about what is happening with native vegetation than we do for wetlands and that is not saying much!

We have a coarse understanding of the *extent* of different types of wetlands, but little information on *condition*. Some types of wetlands (and hence the species of native plants and animals that depend on them) have been significantly depleted. Other types have been favoured.

We need to gain a common understanding of what we want to achieve with natural resource management in terms of wetlands. This includes considering all costs and all benefits (not just nature conservation).

# 2 Legislation and Policy

There are numerous federal, State and regional legislation and policies that relate to the protection and management of aquatic environments in Australia. It is challenging to show how these link and which of these are the most important for wetlands in the Goulburn Broken. Figure 1 provides a snapshot of how the relevant policy and legislation fit for wetland management in Australia, Victoria and the region.

### 2.1 Relevant Legislation

#### Commonwealth Legislation

• Environmental Protection and Biodiversity Conservation Act (1999)

This Act promotes the conservation of biodiversity by providing strong protection for species, communities and protected areas. Actions that are likely to have significant impact on matters of national environmental significance are subject to a rigorous assessment and approval process. An action includes a project development, undertaking or an activity or series of activities. Matters of national environmental significance identified in the act relevant to wetlands of the Goulburn Broken include:

- Ramsar Wetlands;
- nationally threatened species and ecological communities; and
- migratory species.

#### Victorian Legislation

- Flora and Fauna Guarantee Act (1988) & Fisheries Act (1995) Provides a framework and management approach for the promotion and conservation of Victoria's biodiversity, the sustainable use of flora and fauna across the State and the management of potentially threatening processes.
- Water Act (1989)

Provides for the integrated management of all elements of the terrestrial phase of the water cycle and ensures that water resources are conserved and properly managed for sustainable use for the benefit of all Victorians. The Act promotes the orderly, equitable and efficient use of water resources.

• *Catchment and Land Protection Act* (1994) Establishes a framework for the integrated management and protection of catchments and encourages community participation in the management of land and water resources.

• *Planning and Environment Act* (1987)

Establishes a framework for planning the use, development and protection of land in Victoria in the present and long term interests of all Victorians. Land use and development is controlled by planning schemes established under this Act. These schemes set out policies and requirements for the use, development and protection of land relevant to wetlands including earthworks planning controls and the environmental rural zones, vegetation protection overlays and environmental significance overlays.

## 2.2 Relevant Policy

# International Conventions and Agreements

Ramsar Convention on Wetlands (1971) This intergovernmental treaty provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Commonwealth works with States and Territories to implement the Convention. The four main commitments of contracting parties are to designate wetlands of international importance and promote their conservation, consider wetlands in national land-use planning issues, establish nature reserves in wetlands and consult other contracting parties

• JAMBA (1974) and CAMBA (1986)

about the implementation of the convention.

The Japan-Australia Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA) are bilateral agreements which expect actions from designated countries for the protection of migratory birds, birds in danger of extinction and their environments.

- Convention on the Conservation of Migratory Species of Wild Animals (the 'Bonn Convention'). Australia is a currently a contracting party to this convention where countries are expected to come to agreements to protect species that regularly migrate across international boundaries.
- Asia-Pacific Migratory Waterbird Conservation Strategy (2001 2005) Aims to ensure the long-term conservation of migratory shorebirds in the East Asian-Australasian Flyway through recognition and appropriate management of sites that are internationally important for shorebirds.

#### Commonwealth Policies

- Wetlands Policy of the Commonwealth Government of Australia (1997) This policy aims to promote the conservation, repair, and wise use of wetlands and, within the broader context of environmental management, incorporate the conservation of wetlands into the daily business of the Commonwealth Government.
- National Wetlands Program (1989)

Administered by the Wetlands Unit of Environment Australia, this program provides a means for the Commonwealth Government to work with State and Territory governments to implement Australia's obligations under Ramsar and also supports international treaties (eg. JAMBA & CAMBA). The program promotes the conservation, repair and wise use of wetlands across Australia.

• National Action Plan 2002 – 2005 for Communication, Education and Public Awareness to Promote Wise Use of Australia's Wetlands.

#### Victorian Policies

• Victoria's Biodiversity Strategy (1987)

Outlines the importance of wetlands in Victoria with a vision to promoting the conservation and wise use of all wetlands with a series of principle outcomes as follows:

- maximum retention and restoration of existing wetlands, as far as practicable;
- viable wild populations of native wetland-dependent flora, fauna and ecological communities;
- a representative selection of Victoria's wetland environments afforded protection in the State's protected area network of parks and reserves;
- a strong partnership between owners of wetlands on private land, catchment and coastal authorities and local and State government agencies that encourages wetland owners to use wetlands wisely and sustainably, restore degraded wetlands and protect wetland biodiversity;
- an increased awareness and appreciation of wetlands by the community leading to a higher level of active participation in wetland conservation and monitoring.
- Victorian River Health Strategy (2002)
   Provides a framework to enable Government, in partnership with the community, to make decisions on the management and restoration of Victoria's rivers, including the riparian environment and associated floodplains.

## 2.3 Other Relevant Legislation and Policies

## <u>Commonwealth</u>

- Native Title Act (1993)
- Aboriginal and Archaeological Relics Preservation Act (1972)
- Aboriginal and Torres Straight Islanders Act (1984)
- National Water Quality Management Strategy (1995)
- National Strategy for the Conservation of Australia's Biodiversity (1996)
- National Local Government Biodiversity Strategy (1998)
- National Management Strategy for Carp Control (2000-2005)
- National Weeds Strategy (1999)
- National Strategy for Ecologically Sustainable Development (1992)
- Floodplain Wetland Management Strategy for the Murray Darling Basin (1998) Aims to 'maintain and where possible enhance floodplain ecosystems in the MDB'.
- MDBC Salinity Management Strategy (2001)
- MDBC Water Quality Policy (1990)
- MDBC Fish Management Plan, draft (2002)
- MDBC Algal Management Strategy (1994)

#### Victorian

- Conservation, Forests and Lands Act (1987)
- Environment Protection Act (1970)
- *Forests Act* (1958)
- Heritage Rivers Act (1992)
- Local Government Act (1989)
- Wildlife Act (1975)
- Crown Land (Reserves) Act (1978)

- National Parks Act (1975)
- Victoria's Draft Native Vegetation Management Framework (2000)
- Victorian Flood Management Strategy (1998)
- Victorian Weed Management Strategy (2002)
- Draft Victorian Pest Management Framework (2002)
- Victorian State Environment Protection Policy Waters of Victoria (SEPP WoV) (draft 2002)
- Victorian Nutrient Management Strategy for Inland Waters (1995)

#### Regional

- Goulburn Broken Catchment Management Authority Regional Catchment Strategy (1997)
- Barmah-Millewa Forest Water Management Strategy (2000)
- Draft Goulburn Broken Native Vegetation Management Strategy (2000)
- Mid-Murray Forest Management Area Proposed Forest Management Plan (2002)
- Goulburn Eildon Fisheries Management Plan (Draft May 2001)
- Goulburn Broken Riverine Health Strategy (2002/2003 under preparation)
- Shepparton Irrigation Region Land and Water Management Plan (revised 2002)
- Goulburn Broken Dryland Salinity Management Plan (1995)
- Municipal Strategic Statements (local government planning schemes).





# 3. Snapshot of Wetlands in the Goulburn Broken

# 3.1 Wetland Values

Wetlands exist at the interface between land and water and play a key role in the maintenance of the hydrological, physical and ecological health of river systems. Wetlands perform numerous vital functions including water purification, nutrient processing and retention, maintenance of watertables, flood protection, erosion control and groundwater recharge. They provide habitat, refuge, breeding and nursery areas for many common and threatened species which are partially or wholly dependent on these habitats. Wetlands are a vital element of national and global ecosystems and economies. At the most fundamental level, wetlands are a key part of the water cycle, playing critical roles in maintaining the general health of Australia's rivers, estuaries and coastal waters. Wetlands protect our shoreline from wave action, mitigate the impacts of floods, absorb pollutants and provide habitats for animals and plants, including a number of species that are threatened or endangered.

Wetlands are important for a variety of environmental, social, cultural and economic reasons. They are popular for tourism and recreational activities, some may be valuable for forestry, grazing and as a water resource, and many represent important sites for education and research.

Wetlands are also critical to maintaining and improving our quality of life. They provide tangible benefits to the Australian economy, such as employment opportunities. Wetlands purify our water and are a focal point for recreational activities. They form nurseries for fish and other freshwater and marine life and as such are of critical importance to Australia's commercial and recreational fishing industries. In some areas, wetlands support grazing, forestry and cropping.

Table 1 summarises the benefits provided by wetlands. It should be noted however that assigning benefits to the 'triple bottom line' is a new field of endeavour. There are many links between environmental, social and economic assets which make it difficult to isolate them. However, this separation is necessary to help understand management issues for multiple benefits.

Technological advances in recent years now mean that purpose built wetlands can be constructed as management tools for dealing with the problems of wastewater management and pollution control. These constructed systems, while not duplicating natural wetlands will increasingly assist with water management in Australia and also serve some useful amenity and habitat functions.

## Table 1.Multiple benefits of Wetlands

		Env	ironm	ental			Soci	al				Econo	omic		
Benefit derived from wetland assets	Soil	Air	Water - quality	Water quantity	Biota	Community wellbeing	Cultural heritage	Recreation	sqor	Infrastructure	Flood mitigation	Real estate	Agriculture	Tourism	Industry
Supports an abundance and diversity of species, including threatened species.	~				✓	~								~	
Important habitat for taxa at certain stages in their life cycle or for drought refuge.					✓										
Biological productivity	✓		✓		✓								✓		
Provides representativeness of a bioregion.					✓										
Source of drinking water for humans and livestock.													✓		✓
Water storage, deliver and supply.												✓	✓		✓
Nutrient cycling, sediment capture and improved water quality.			✓		✓			✓					✓		✓
Aesthetic, landscape, cultural and heritage values							✓	✓	✓			✓		✓	
Replenishment of floodplain nutrients.	✓				√										
Flood mitigation through water storage and retention.				✓		✓				✓	✓		✓		
Provide recreational opportunities						$\checkmark$		$\checkmark$	$\checkmark$					$\checkmark$	
Provide opportunities for education and research.					✓		$\checkmark$		✓						✓
Foreshore protection from erosion and wave action.	✓									✓					
Maintain hydrological stability	✓										$\checkmark$		✓		✓
Grazing, forestry and fishing.								✓					✓		✓
Recharge groundwater.	✓												$\checkmark$		

### 3.1.1 Wetland Classification

There are several wetland classification systems used in Australia. Classification systems are based on criteria such as geomorphology and length of inundation; biological or ecological attributes such as threatened species supported; and/or cultural attributes. The systems described below focus on physical and biological attributes of a wetland.

**The Ramsar definition** is a detailed classification system that covers inland, costal and marine and man-made wetlands, and focuses on attributes such as the importance of a site for breeding species, its capacity to support native species, its historical and cultural significance. Under Ramsar, wetlands are divided into several system forms. Those relevant within the Goulburn Broken CMA include:

- Riverine (wetlands along rivers and streams)
- Lacustrine (wetlands associated with lakes)
- Palustrine (marshes, swamps and bogs)

**The Directory of Important Wetlands in Australia** (1995 – 2000). This inventory was undertaken to identify nationally important wetlands across Australia. The Directory uses similar classification to Ramsar but is modified slightly to suit Australian conditions. The system identifies 40 different wetland types in three categories – Marine and Coastal Zone Wetlands, Inland Wetlands and Human-made Wetlands.

**The National Land and Water Resources Audit** (NLWRA). A study was undertaken in early 2002 to identify significant wetlands on a subregional level. The NLWRA established a national framework for identifying biodiversity assets of bioregional significance. The audit used a similar set of criteria to classify wetlands to that used for the Directory of Important Wetlands in Australia. NRE undertook a preliminary desktop assessment of existing data, with no field validation, however not all criteria could be addressed with the existing desktop data. Where criteria could not be assessed with the existing data they were not addressed. The criteria used to identify significant wetlands is as follows:

- 1. Identified in State/Territory lists of important wetlands.
- 2. Significant for maintenance of ecological processes at a subregional scale.
- 3. Important for breeding, feeding, roosting, moulting or nursery areas, or refugia for animal taxa.
- 4. Support significant number of plant and animal taxa, including migratory species and/or support a significant abundance of some taxa.
- 5. Contains rare or threatened species/ecosystems.

It should be noted that the desktop study addressed the criteria in the NLWRA as follows:

- Criterion 2 was not addressed, as no data sets were available.
- Criterion 3 only the aspect of importance for breeding of colonially nesting waterbirds was addressed.
- Criterion 4 only the importance for migratory shorebirds was addressed.

#### Victorian Classification

Within Victoria all wetlands over 1 hectare in size were mapped and classified between 1980 and 1994 by the predecessors of the Department of Natural Resources and Environment. These wetlands were classified according to a system developed by Corrick (1981 and 1982). This definition focuses mostly on the period of inundation that a wetland experiences. The NRE Wetlands Database identifies six inland wetland categories (with subcategories of ecologically different wetlands within these types):

- **Freshwater meadows** shallow freshwater wetlands no more than 30cm deep that hold water for less than four months of the year
- **Shallow freshwater marshes** shallow freshwater wetlands that usually dry out in mid-summer and refill with the onset of winter rains. Deeper than freshwater meadows but less than half a metre.
- **Deep freshwater marshes** deep freshwater wetlands, usually between 1 2 metres deep, that remain flooded for most of the year but may dry out occasionally (approximately every 4 to 5 years).
- **Permanent open freshwater wetlands** deep freshwater wetlands that hold water permanently, usually deeper than a metre and include naturally occurring lakes.
- Semi-permanent saline wetlands saline wetlands less than two metres deep that are usually flooded for less than eight months of the year and have a salinity above 3,000 ppm. These wetlands include salt pans and salt meadows.
- **Permanent saline wetlands** saline wetlands deeper than two metres that rarely dry out, including tidal areas and saline inland lakes.

In addition to these six wetland types a further two types of wetlands were identified as part of the classification and mapping process in Victoria. These additional wetlands are artificially constructed wetlands that have developed some ecological values:

- Sewerage Ponds
- Salt works

**Shepparton Irrigation Region Salinity Program.** A classification system was developed in the early 1990's to link the flooding requirements of wetlands with engineering design principles. This was based on the Victorian classification where similar types of wetlands were combined to reduce the number of types.

#### 3.1.2 Extent of Wetlands in the Goulburn Broken - past and present

Since European settlement there has been a vast change in the distribution and abundance of wetland types in the catchments of the Goulburn and Broken Rivers.

# Under the Victorian classification system, within the Goulburn-Broken Catchment, there are 1,818 wetlands over one hectare in size that cover a total area of 82,181ha.

This total for the Goulburn Broken includes wetlands listed as important under the Directory of Important Wetlands in Australia and in the NLWRA, however they have been classified according to the Victorian system. It also includes man-made lakes and dams. As the NRE wetlands database was finalised in 1994 and added to the corporate library in 1996, it is probable that some figures have changed.

Most remaining wetlands in the catchment are freshwater meadows, followed closely by shallow freshwater marshes. The percentage of wetlands currently remaining in each category is represented in Figure 2.



#### Figure 2. Current distribution of wetland types in the Goulburn Broken Catchment (by number)

Almost half of the wetlands (47%) in the Goulburn Broken are small in size (1-5 hectares), while only 4% of wetlands are over 100 ha in size. However these large wetlands encompass 75% of the total area of wetlands in the catchment.

The majority of wetlands (73%) occur on public land with the remainder on private land.

Within the Goulburn Broken a total of 55,873 hectares of wetlands have been affected by drainage and altered water regimes and another 26,910 hectares lost (see Figure 3 below). While there has been an overall increase in the area of wetlands since European settlement, this primarily reflects a large increase in permanent open freshwater wetlands (797% increase). The large increase in open water areas is largely due to the construction of dams and permanent open waterbodies for commercial irrigation and domestic water supply purposes. More shallow and intermittent wetlands such as freshwater meadows have decreased considerably since European

settlement, largely due to the development of urban and agricultural areas, the conversion of watercourses to drainage lines and alteration to water flow pattern and quality through regulated dams, weirs and levee banks.



Wetland Type

#### Figure 3. Change in area of wetlands in the Goulburn Broken Catchment since 1750.

In terms of private land, there have been similar declines in freshwater meadows and shallow freshwater marshes, and an increase in deep freshwater marshes, permanent open freshwater wetlands and the alteration of existing freshwater wetlands to permanent saline wetlands (see Figure 4) The more dramatic decrease in freshwater meadows and shallow freshwater marshes (approximately 50% loss) is likely to reflect the drainage and conversion of these areas through agricultural activities. The remaining wetlands on private land are often managed within the context of broader agricultural land use.



#### Figure 4. Change in area of wetlands on private land in the Goulburn Broken Catchment since 1750.

The location of wetlands in the landscape is also important ecologically and for identifying management opportunities. Wetlands provide valuable habitat 'stepping stones' for many species. Wetland classification and mapping was undertaken across Victoria from 1980 onwards. This inventory provides data on the distribution of naturally occurring wetlands measuring over one hectare in size. However for smaller wetlands we do not have good information on their distribution.

#### 3.1.3 Condition of Wetlands

Although wetlands and their management is a topical issue there is surprisingly little data available to help catchment managers prioritise wetlands for management. Knowing the condition of a wetland is extremely valuable for prioritising wetlands for management and for monitoring the effectiveness of intervention activities. However in the Goulburn Broken and across Victoria we have little data available on the physical condition of many wetlands, the threats they face and management opportunities. There is no accepted standard measurement

of the condition of wetlands in Victoria. The development of a standardised condition assessment methodology is a priority of NRE at a Statewide level in 2002/2003. An accepted methodology will be of much use in ascertaining the baseline condition of wetlands in the catchment.

While Figures 3 and 4 show a decline in the total area of wetlands such as freshwater meadows, shallow freshwater marshes and deep freshwater marshes, they do not reflect the condition of the remaining wetlands in these categories. It is likely that a high proportion of many of the remaining wetlands in the catchment would be in moderate to poor condition. There is an urgent need to develop standardised criteria for the assessment of wetland condition in order to consistently assess remaining wetlands in the Goulburn Broken catchment.

#### 3.1.4 Important Wetlands in the Goulburn Broken

*The Directory of Important Wetlands in Australia* identifies 10 wetlands and systems in the Goulburn Broken Catchment as nationally important. The Barmah-Millewa Forests are further listed under the Ramsar Convention as a wetland of international importance and listed in the Regis ter of the National Estate. Several of the Directory's wetlands provide habitat for species that are listed under the Japan-Australia Migratory Birds Agreement (JAMBA) and / or the China-Australia Migratory Birds Agreement (CAMBA). These are detailed in Table 3.

#### National Land and Water Resources Audit (NLWRA)

Within the Goulburn Broken 113 significant wetlands have been identified in the National Land and Water Resources Audit. These wetlands are in addition to those significant wetlands listed in the Directory. Where a wetland was listed as important in the Directory it was not included in the NLWRA list.

Figure 5 shows the location of all wetlands in the Goulburn Broken Catchment including Ramsar sites, Directory Wetlands, NLWRA (bioregionally significant) wetlands and all other wetlands measuring over one hectare.

Wetland Name	Location	Area (ha)	Ramsar Listed	National Estate Register	JAMBA (J) / CAMBA (C)	Comments
Barmah - Millewa Forest	Murray River floodplain between Ulupna Island and Barmah.	29,500	Yes	Yes	Yes	Great egret (J & C), White-bellied Sea Eagle (C)
Broken Creek	8 km N N/W Benalla to Barmah Forest.	2,500	No	No	Yes	Great egret (J & C), White-bellied Sea Eagle (C). Includes Moodie Swamp.
Kanyapella Basin	13 km e S/E Echuca.	2,581	No	No	Yes	Great egret (J & C) – Managed as Kanyapella Wildlife Management Co- operative Area.
Lower Broken River	Between 8 km N N/W of Benalla & Shepparton.	1,268	No	No	No	Riparian habitat for Squirrel glider & Brush-tailed Phascogale – Large sections reserved as Public Land Streamside Reserves.
Lower Goulburn River Floodplain	150 km d/s Goulburn Weir to Murray confluence.	13,000	No	No	Yes	Lathams Snipe (J & C), White-bellied Sea Eagle (C)Listed as Victorian Heritage River, includes 2 State Wildlife Reserves (Gemmil Swamp & Reedy Swamp) & Loch Garry Wildlife Management Co-operative Area.
Muckatah Depression	11 km S/E of Yarrawonga to 2 km east Numurkah	2,909	No	No	Yes	Great egret (J & C) – Includes Dowdle Swamp gazetted as State Wildlife Reserve.
Wallenjoe Wetlands	10 km north Colbinabbin	303	No	No	Yes	Great egret, Lathams Snipe (J & C) – Includes Lake Cooper, Horseshoe Lake & Green Lake.
Central Highlands Peatlands	Upper Goulburn Catchment	33	No	No	No	Includes Oaks Ck., Poley Ck. Snobs Ck., Tom Burns & Storm Ck. – All sites within State Forests.
Big River	Upper Goulburn Catchment	1465	No	No	No	Heritage River, fills all six criteria for bioregionally important wetlands, recent inclusion.
Howqua River	Upper Goulburn Catchment	1520	No	No	No	Heritage River, fills five out of the six criteria for inclusion, recent inclusion to list.

# Table 3: Summary of Goulburn Broken Wetlands Listed in the Directory of Important Wetlands in Australia.

Figure 5: Wetlands in the Goulburn Broken Catchment



#### 3.2 Wetland Threats

Despite a growing understanding of their many values and functions, wetlands remain one of our most threatened assets. By far the greatest threat even today is a lack of understanding of the importance of wetlands and the roles they play. This is exacerbated in Australia where many wetlands are ephemeral, remaining dry for part or all of the year and only filling during wet seasons after rain. Wetlands continue to be regarded by many as wastelands and their degradation continues. Where wetlands were once abundant, they have often been degraded or altered without considering the long-term impacts.

Total or partial drainage is the main process contributing to wetland loss and degradation in Victoria. The areas most affected by drainage in Victoria are around Kerang and Shepparton. The change in appropriate water regimes can dramatically alter wetland appearance and functioning, disrupt natural productivity cycles and cause changes in vegetation and habitat. A significant factor affecting water regimes is river regulation, which has reduced the exchange of nutrients and organic matter between rivers and floodplains and led to changes in flooding regime. Rising groundwater levels can also impact on water regimes to wetlands. Grazing livestock in wetlands often contributes to degradation and run-off from urban and rural catchments can also result in declining water quality.

At least nine potentially threatening processes listed under the *Flora and Fauna Guarantee Act* (1988) affect wetlands.

The distinction between wetland loss and wetland degradation is not absolute. Continued degradation may result in the complete loss of wetland functions and values. However, it is useful to make distinctions between loss, which is normally the result of deliberate intent, and degradation, which may be an indirect and unanticipated consequence of actions within wetlands and their catchments. Wetland loss results in the area no longer being able to function as a wetland, such as holding water, while a degraded wetland can still operate as a wetland but with reduced values.

Table 2 outlines the major threatening activities affecting wetlands in the Goulburn Broken Catchment.

Threatening Activity	Likelihood	Consequence	Key Impacts / Consequence
Inappropriately managed Grazing	Н	Н	<ul> <li>Changed vegetation structure – loss and dominance.</li> <li>Reduced regeneration.</li> <li>Weed invasion.</li> <li>Soil structural change – pugging, bank slumping.</li> <li>Damage to breeding sites.</li> <li>Increased sedimentation and nutrients – water quality.</li> <li>Proliferation of regeneration (from grazing elimination)</li> </ul>
Landforming / Agricultural development / cultivation.	Н	Н	<ul> <li>Wetland drainage / elimination.</li> <li>Increased flow to some wetlands – waterlogging.</li> <li>Fragmentation of systems.</li> <li>Reduction in vegetation.</li> <li>Weed invasion.</li> <li>Increased sedimentation – water quality.</li> </ul>
Poor Land Management (in surrounding catchment area)	Μ	М	<ul> <li>Salinisation.</li> <li>High watertables</li> <li>Waterlogging</li> <li>Increased nutrients / algal growth.</li> <li>Increased sedimentation.</li> <li>Acidification.</li> </ul>
Vegetation Clearance	M/L	М	<ul><li>Changes to catchment hyrdrology.</li><li>Loss of habitat</li></ul>
Levees and Floodplain development	М	Н	<ul> <li>Reduction in links between wetlands systems.</li> <li>Decreased area and condition of wetland habitat available.</li> <li>Fragmentation of systems both hydrological and ecological.</li> </ul>
Recreational Activities eg. boating, fishing, camping, trail bikes, 4WD.	M/H	L/M	<ul> <li>Loss of vegetation quality and quantity.</li> <li>Impact on breeding species.</li> <li>Removal of habitat (snag removal).</li> <li>Soil structural change/disturbance.</li> <li>Increased turbidity.</li> <li>Litter &amp; pollution.</li> </ul>
Timber Harvesting & Firewood Collection	М	М	<ul> <li>Change in habitat.</li> <li>Erosion and increased sedimentation.</li> </ul>
Water Regulation	Н	Н	<ul> <li>Altered flow regimes.</li> <li>Reduced connectivity between systems.</li> <li>Altered wetland ecology – change in breeding cycles and plant regeneration.</li> <li>Creation of artificial wetlands (eg. Sewage ponds).</li> <li>Altered temperature.</li> <li>Reduced migration.</li> </ul>
Introduced Flora & Fauna	Н	Η	<ul> <li>Loss of native species (competition &amp; predation)</li> <li>Competition with native species.</li> <li>Reduction in available habitat.</li> <li>Overgrazing.</li> <li>Spread of disease.</li> </ul>
Illegal Hunting	L	M/H	<ul> <li>Lead poisoning.</li> <li>Potential loss of threatened species.</li> </ul>
Rubbish Dumping	Н	М	<ul> <li>Weed invasion.</li> <li>Increased refuse.</li> <li>Contamination from industrial waste dumping.</li> </ul>
Changed Fire Regime	L	L	<ul> <li>Alteration of vegetation composition.</li> <li>Increased sedimentation.</li> </ul>

# Table 2 Major threatening activities affecting wetlands

## 3.3 **Priority Setting for Wetlands**

Two types of 'management action' need to be prioritised: 'works actions' and 'capacity building actions'.

- Works actions prioritising these is challenging because of incomplete data sets.
- Capacity building actions enable the information to be improved and also deliver physical changes .

Prioritising these actions is better done outside of the strategic level of this paper. This section considers both types of management actions and Section 5 lists capacity building actions in detail.

#### 3.3.1 Prioritising wetland assets

Within the Goulburn Broken Catchment identification of wetland assets has been through the Australian and Statewide registers of assets.

The prioritisation process for wetlands in the Goulburn Broken Catchment focuses primarily on the environmental value of wetlands. Priorities are determined using the following structure, starting with the most important:

- 1. Ramsar Wetlands
- 2. Wetlands listed under the 'Directory of Important Wetlands'
- 3. Significant bioregional wetlands (identified as part of the National Land and Water Resources Audit).
- 4. All other wetlands.

Within the Shepparton Irrigation Region, wetlands are also prioritised based on the activities of the SIR Surface Water Management Program Where surface water management works are planned within a sub-catchment all wetlands are identified, their management requirements are determined and management plans prepared. The Surface Water Management program has been a key driver in identifying wetlands where drain construction works can be combined with improving the surface water flow to wetlands. Wetland management plans are then developed ahead of the drainage program activities to ensure that the wetland function can be maintained or enhanced. Within the surface water program wetlands are prioritised based on their importance (eg. Wallenjoe Wetlands – Directory listed), key fauna habitat, presence of VROTS, and listing for JAMBA and CAMBA species.

#### **3.3.2 Prioritising threats to wetlands**

The Goulburn Broken CMA has contracted Arthur Rylah Institute to prepare a preliminary framework for prioritising wetlands in the catchment based on their values as listed above, the threats they face and management opportunities for works. This preliminary framework will be used by the GBCMA until an agreed Statewide framework is established. The preliminary framework will be available in early September 2002 and will be built into the Goulburn Broken Wetlands Strategy (in prep.).

#### 3.3.3 Decision making that can be influenced in the Short Term

#### • Protecting representative wetlands.

We know what types of wetlands need the most assistance (which types have declined most and where these types are most threatened), such as shallow freshwater meadows, especially on private land. Within the Goulburn Broken, both the Freshwater Meadow, Shallow Freshwater Marsh and Deep Freshwater Marsh categories have suffered the greatest decline since European settlement, therefore remaining examples of these types should be given high priority.

#### • Developing an overview of wetlands systems where a difference can be made

Coarse information on wetlands was gathered in the early 1990s in the Dryland and Shepparton Irrigation Region (SIR) that began developing a sense of values and threats of different wetland systems. In the SIR, the list of wetlands systems has been used to determine the priority order for developing and implementing detailed management plans. ARI have determined a list of the top 10 priority wetlands in the dryland part of the catchment as part of developing the preliminary framework to prioritise wetlands. Management planning is only effective when it is closely linked with implementation.

#### **3.3.4** Information for Longer-term decision making.

#### **Refining Native Biota Priorities for Action**

The priority order for actions (and hence investment) is guided by the order for objectives. Once habitat is protected, the bias swings towards enhancement and ultimately establishment. For specific sites, the bias varies according to specific needs. Opportunities often arise when there is investment in an action because of benefits other than those for or from the native biodiversity asset, such as agricultural productivity benefits. This means that for relatively little extra investment, there can be significant opportunities to protect, enhance and establish habitat.

## • Criteria for Prioritising Broad Areas and Specific Sites

The broad objectives of protect, enhance and establish (restore) with targets provide a useful shared focus for what we want to achieve. We must then determine which general areas and specific sites we need to focus on to achieve these targets. This means that investment will be biased towards those sites that have the highest values.

Pri	oritisation Step	Questions	Tasks			
Step 1	Identify Value	What value is the natural asset?	List environmental, social and economic benefits. Rate benefits.			
Step 2	Identify Threats	What are the threats the natural asset is facing?	List biophysical threats (threatening activities and impacts). List socio-political threats.			
Step 3	Identify Risk	What is the risk to the natural asset of doing nothing (allowing existing processes to continue)?	Rate risks posed by threats against the value of the asset.			
Step 4	Identify Actions	What can be done about protecting, enhancing or establishing (restoring) the natural asset?	List opportunities for action with monetary costs. List multiple benefits of action. Rate multiple benefits of action. Rate risks posed by actions.			
Step 5	Identify Manageability	How manageable is the risk of the a initial threat b action? Do the benefits outweigh the risks?	Rate management options/			
Step 6	Implementation and Evaluation	What is the baseline condition of the natural asset? What are our management hypothesis? (eg. removal of grazing will improve vegetation condition) Are our actions making a difference?	Determine baseline condition. Develop hypothesis for implementation. Evaluate implementation actions (includes monitoring component).			

# 4 Goals and targets: what do we want to achieve?

If we are to ensure that we can enjoy the benefits that wetlands provide (as described previously), we must act to ensure that threats to them are managed. Before we act, we must have a common sense of purpose. This involves setting goals before agreeing what priorities for action are.

Wetlands are affected by many human pursuits, from building houses to fishing to tree planting. Goals for wetlands will therefore only be achieved if the needs of riverine ecosystems are integrated into these pursuits.

### 4.1 Catchment Context for Decision-making

Although this directions paper focuses on wetland ecosystems, goals and actions must be set in the context of broader needs of the Catchment. The Catchment Vision, Catchment Standard Practices and the GBCMA's Values provide this context (see Goulburn Broken Regional Catchment Strategy 2002).

#### 4.1.1 Catchment Vision: Where we are going.

The Board set the following vision in  $2002^{1}$ :

"A catchment that is recognised nationally and internationally for its clean and quality agricultural produce and where the community values and contributes to the benefits of abundant and well maintained environmental assets.

The environmental "footprint" of our irrigation and dryland farms will be significantly reduced and new opportunities will arise for generating environmental benefits and increasing the ecosystem services of the land retired from agriculture.

The region will have a robust regional economy where much of the agricultural produced is processed within the region and the employment and wealth creation opportunities generated are shared by the regional community who actively support and engage in natural resource management programs".

#### 4.1.2 Catchment Standard Practices: How we will get there?

Standard Practices describe how catchment management is done in the Goulburn Broken – no matter what the issue. These Standard Practices have been refined during our relatively long experience (almost two decades). (Details of the following Standard Practices are in the RCS.)

- 1. Partnerships fostered
- 2. Priorities rigorous
- 3. Costs shared fairly
- 4. Large scale focused on
- 5. Cultural heritage included
- 6. Accountabilities clear
- 7. Adaptive management systems at all scales

"Triple bottom line" (environment, social and economic) accountability is one of the key recurring themes in the Standard Practices. The three elements are highly connected, which makes accounting for separate parts of these elements very challenging.

#### 4.2 Biodiversity Context for Decision-making

#### **Biodiversity Goal**

The Goulburn Broken Biodiversity Committee developed the following goal (NAP "Aspirational Target") for native biota from its 1999 Mission and the Board adopted it as the catchment community's goal.

To protect and enhance ecological processes and genetic diversity to secure the future of native species of plants, animals and other organisms.

<sup>&</sup>lt;sup>1</sup> Draft Goulburn Broken Regional Catchment Strategy (22 August 2002 version).

#### "Protect, Enhance and Restore"

The objectives for native biota habitat management are similar to objectives for many human endeavours:

- 1. *protect* existing habitat
- 2. *enhance* existing habitat
- 3. *restore<sup>2</sup> (establish* new habitat)

Objective	Native biota	Typical Management Focus	Typical Actions*		
	habitat Outcome				
Protect existing habitat	<ul> <li>No further decline, or</li> <li>Reduced rate of decline</li> </ul>	Local threatening activities <ul> <li>Irrigation practices</li> <li>Grazing</li> </ul> Regional threatening activities <ul> <li>Clearing</li> </ul>	<ul> <li>Land-form</li> <li>Drain</li> <li>Fence</li> <li>Covenant</li> </ul>		
Enhance existing habitat	• Improved	<ul> <li>Spatial characteristics (proximity, size, shape, density)</li> <li>Condition (diversity, age structure)</li> <li>Watering regime</li> </ul>	<ul> <li>Revegetate (understorey)</li> <li>Weed control</li> <li>Water regime control structure</li> <li>Fish ladder.</li> <li>Reinstate environmental flows.</li> <li>Provision EWA.</li> </ul>		
Restore (establish new habitat)	Improved from zero	• Where biodiversity values can be incorporated into constructed wetland environments.	<ul> <li>Provide vegetation in and around farm dams and reuse systems.</li> <li>Create semi -natural habitats in created wetlands for stormwater management.</li> </ul>		

Table 3. Native biota habitat outcomes of Actions aimed at achieving Objectives

\*Actions can be a risk or an opportunity – depending on how well they are managed! Actions shown are typical for that objective, although actions can be applicable to all objectives.

The direction of each of these objectives is consistent: better health compared with if nothing was done.

#### 4.3 Resource Condition Targets for Wetlands

As we progress down the decision-making hierarchy, we assume that achieving lower level targets will help achieve higher level targets. For example, we *assume* that by achieving targets for protecting wetland habitat, we will be "securing the future of native species of plants, animals and other organisms."

Targets define *how far* and *by when* we want to go in the direction set by an objective. From the core objectives for native biota (protect, enhance, restore (establish)), the following interim targets<sup>3</sup> for wetlands have been set. We need to set interim targets in the absence of detailed scientific data as a benchmark for the catchment until more rigorous data is available. The figures in these targets are likely to change in the next few years as our knowledge improves.

#### Protect

For all wetland types whose extent (area and number) has declined since European settlement, maintain their 2002 extent.

#### Enhance

Improve condition of 70% of wetlands by 2030, using 2003 as the benchmark for condition.

#### **Restore** (establish)

A target has not been set for 'restore' as it is not appropriate to emphasis e investment on recreating wetlands yet. For created systems we should however focus on incorporating biodiversity values in to areas where wetlands are constructed for other purposes such as for stormwater treatment or reuse systems.

<sup>&</sup>lt;sup>2</sup> "Restore" has been widely used in literature, although interpretation varies considerably.

<sup>&</sup>lt;sup>3</sup> These are "Achievable Resource Condition" Targets as defined in National Action Plan.

The following table indicates the relative benefits expected from the same level of investment in management actions. It does not necessarily apply to a specific wetland nor a specific type of wetland: it is an assessment of wetlands *in toto*.

MANAGEMENT ACTION	Benefits <i>to</i> Wetlands	Examples
Works – General	vv chanus	
Grazing managament	VII	Intensity and timing of livestock grazing according to
Grazing management	vп	ecological health requirements of wetland.
Revegetation	М	Understorey / herbs & graminoid / grass species planted.
Ũ		Revegetation of upstream catchment.
Cropping & pasture management	Н	Wetland body and perimeter not cultivated.
In-stream habitat management	L	Provision of environmental flows and reinstatement of
C		natural flows.
Sediment stabilisation (waterways)	L	Riparian and instream stabilisation to reduce sediment input
		to wetlands.
Floodway management	Н	Management of levees and drainage to ensure positive
		impact on wetlands.
Surface water management	VH	Water regime included in drain design.
		Provision of EWA to wetlands.
		Retaining natural flow paths to provide watering regime.
		Returning natural flows to a natural flow path.
Sub-surface groundwater	VH	Wetlands threatened by high water tables protected by
management	24	Installation of groundwater pump.
Urban stormwater management	M	Implementation of urban stormwater management plans to
		with urban runoff (ag. Cussons Park, Tatura)
Source treatment	Т	Provision of hebitat values in and around wastewater
Sewage treatment	L	management facilities. Pagespitter of sites important for
		threatened species
Intensive agriculture & local water	т	Containment of doiry / niggory offluent
quality management	L	Management of sentic systems for containment of waste on-
quanty management		site.
Pest plants controlled	М	Aquatic weeds controlled and agricultural pasture spread is
		limited.
Pest animals controlled	М	Fox / rabbit control to encourage bird breeding eg. Brolga.
Water storage Type 1^	VH	Management of releases from major storages eg. Eildon.
Water storage Type 2 <sup>^</sup>	Н	
Non-works Action (General)		
Management agreements	Н	Between relevant stakeholders to assign responsibility for
		management actions.
		Placing covenants over wetland systems.
Planning	М	Creation of wetland overlay highlighting threatened types,
		for planning schemes.
		Section 173 Agreement under Planning and Environment
		Act 1987
		Prioritisation of wetlands as part of Biodiversity Action
	**	Planning.
Clearance controlled	H	Enforcement of Native Vegetation Retention Controls
Enforcement of legislation	Н	Prosecution of wetland polluters.
		Control of works on waterways.
		regulations
Extension	ц	Eduction in to the importance of rate ining watland values on
	11	private land
Research and Development	М	Research into effects of salinity in order to change
in the Development	111	management regimes (eg. Flushing with freshwater if
		necessary). Also watertable effects in order to assess
		necessity of ground water pump installation.

Table 4	Actions that maintain and enhance the wetland asset

# 5 Building Capacity and Catchment Standards for Wetlands

Our goals will only be achieved if the community has the capacity to do so. The GBCMA has adopted a set of "Catchment Standards" with "Standard Practices" for *managing* all issues. These Standards direct the actions to build and maintain capacity. The Standards group the essential components for ease of management. The Standards and objectives are not mutually exclusive, which is typical with attempts to isolate components when holistically managing very complex systems.



These Standards and objectives include all "Best Practice Standards" listed in the National Action Plan Agreement (2001).

The following table is a first attempt to detail the major actions that need be undertaken in the catchment to achieve suitable wetland management. These actions will be developed further as part of the Wetlands Strategy with appropriate timelines and costs assigned to each action. Our priority action at this stage is to provide input into the Goulburn Broken Riverine Health Strategy and to develop a Wetlands Strategy for the catchment.

<b>Catchment Standard</b> <i>Objectives</i>		GB Catchment Standard Practice		Wetlands Capacity Building Action
<ol> <li>Partnerships fostered (strongly linked to 6 Accountabilities)</li> <li>Communication will be optimised.</li> </ol>	1	Involve agency and community stakeholders in key decision-making forums.	1 .	Achieve representation through existing Catchment processes such as Implementation Committees Co-ordination Committees Bulk water entitlement Committee. Community Interest Groups.
<ul> <li>Roles will be defined.</li> <li>Our diverse</li> </ul>	2	Tailor RCS actions for inclusion in community organisation and	2	Involve municipalities in developing approaches such as including priority wetlands in planning schemes amendments.
communities and agencies will be actively engaged.		government agency plans.	3	Agencies (including NRE, GMW, DOI, Local Government and the Commonwealth) involved in developing Wetlands Strategy with a view to incorporating goals into their policy and implementation and reporting of works.
	3	Include private industry sponsorship in natural resource management.	4	Assess opportunities for private industry, philanthropic trusts and other organisations such as 'Wetland Care Australia', Trust for Nature and Field & Game Association to invest in wetlands management.
	4	Develop staffing synergies between organisations implementing the RCS, recognising that overlap is acceptable if duplication is avoided.	5	Review staffing arrangements for those directly involved in management of wetlands in the Catchment for each organisation in (and outside of) the Catchment.
	5	Develop targeted awareness campaigns of natural resource management issues.	6	Develop Communication Action Plan for wetlands, which will have emphasis on building needs of wetlands into existing catchment communication processes.
	6	Prepare Operating Agreement that defines roles and responsibilities.	7	Develop list of responsibilities for all organisations involved in wetlands management.

С	atchment Standard	<b>GB</b> Catchment		Wetlands			
	Objectives		Standard Practice		Capacity Building Action		
2 •	Priorities rigorous Priorities will be based on the best available scientific, economic and sociological information. Causes of problems will be targeted in geographic areas that maximise	7	Develop Catchment- scale perspective for each issue using tools such as Catchment-scale priority maps, Catchment-scale targets, and a list of opportunities.	8 • • 9	Refine approaches advanced in this Directions Paper for maps (Section 3?) (includes bioregional significance) targets (Section 4) Catchment-scale prioritis ation (Appendix 1). Work with DNRE to establish a Statewide framework for prioritisation of wetlands. Nominate other relevant wetlands in the Catchment for Directory listing as information becomes available		
•	community return on investment. Priorities for works will consider risks and multiple benefits.	8	Check feasibility of proposed actions through involvement of community in long and short-term priority setting processes.	11	Annual priority setting process through community based ICs to produce priorities document that includes wetlands.		
		9	Check feasibility of proposed actions through formalised risk and opportunity management process.	12	Develop decision checklist that includes multiple benefits and risk when planning and implementing wetlands projects.		
3 •	<b>Costs shared</b> <b>fairly</b> <i>Costs and benefits</i>	10	Develop cost-sharing arrangements by identifying	13	Include wetlands when reviewing cost-sharing arrangements for Environmental Management Grants.		
	will be shared transparently and equitably.	•	benefits and beneficiaries costs contributors to costs	14	Assess large-scale wetland projects on a case-by- case basis, as per Capacity Building Action 10.		
•	Triple bottom line accountability. Link with	11	Develop an investment plan by compiling	15	Compile an inventory of wetlands assets / values, threats and management opportunities. (Section 1 provides broad information on assets. The		
•	supporting legislation will be clear.		threats and opportunities.		Statewide Assets Identification Project will provide more information.)		
4	Large scale focused on Land use will	12	Develop options for large tracts of land where existing land-use is no	16	Include wetlands information in Local Area Planning, Biodiversity Action Planning and other planning processes (see also 33).		
	change so that it better matches land capability across		longer appropriate.	17	Include wetlands in catchment investigations into large-scale land use change using land capability mapping.		
	broad areas.			18	Implement Lower Goulburn Floodplain Rehabilitation Scheme (which has many benefits for wetlands) if given approval.		
5	Cultural heritage included Aboriginal and non-Aboriginal cultural values will be factored into all decisions.	13	Include cultural heritage values in risk and opportunity management processes.	19	Include cultural heritage values in site assessment of wetlands.		

С	atchment Standard Objectives		GB Catchment Standard Practice		Wetlands Capacity Building Action
•	Accountabilities clear (strongly linked to 1 Partnerships) Project proposals will align with the	14	Define roles and responsibilities of all partners, especially Commonwealth and state agencies.	20	Review Operating Agreements with partners in terms of wetlands and establish a framework that enables land managers (eg private land, Parks Victoria, DNRE Forests Victoria, G-MW) to demonstrate contributions to wetlands.
•	priorities of the RCS. Progress reports will clearly link to regional, state and national targets and needs.	15	Establish a system of short-term <i>accountable</i> <i>targets</i> and <i>actions</i> and long-term <i>aspirational</i>	21	Update interim targets (based on principles of "protect, enhance and restore") advanced in this Directions Paper and refine targets for general actions.
			<i>targets</i> and <i>actions</i> for each issue based on national and state guidelines.	22	Provide wetlands input into CMA Business Plan, IC Schedules and other funding processes.
		16	Produce progress reports that are regular, clear, meaningful, and link to regional, state and	22	Implementation Committees report quarterly to key stakeholders (Co-ordination Committees, CMA Board, Commonwealth, GMW and NRE) on budgets and outputs with respect to wetlands.
			national targets and needs.	23	Report annually against longer term outcomes (aspirational) listed in section 4. (See also 28.)
				24	Evaluate wetland outputs by linking accountable goals and accountable actions of annual business planning process with goals and actions listed in this Directions Paper
				25	Review the Wetlands Strategy every five years for inclusion in the 5 yearly review of the RCS
		17	Include data management issues in all projects, including data source, custodianship and gaps.	26	Collect, store and manage information on wetlands to facilitate reporting to stakeholders (RH&WQC, ICs, NRE, GMW, funding bodies and community) including the report on Catchment Condition.
		18	Identify duty of care for land and water managers and recommend changes where legislation is lagging community expectations.	27	List duty of care for land and water managers with respect to wetlands.
7	<ul> <li>Adaptive Management Systems at all scales</li> <li>Management systems will be in place for individuals, sub- catabasents, whole</li> </ul>	19	Include monitoring and evaluation as key components of all projects, including listing and analysis of assumptions.	28	Continue to develop monitoring and evaluation process including the documentation, analysis and review of assumptions with respect to wetlands.
•				29	Work with DNRE to develop Statewide survey and monitoring protocols, including investigation of extrapolation of other monitoring tools such as ISC.
<ul> <li>Of constraints</li> <li>Data optin</li> <li>Moninet</li> <li>Moninet</li> <li>Moninet</li> <li>Moninet</li> <li>Assurble</li> </ul>	of catchment and industries			30	Develop survey program for wetlands in the catchment.
	Databases will be optimised. Monitoring & evaluation programs will regularly review assumptions	20	The Board monitors, evaluates and modifies projects related to policy direction that has Catchment-wide implications, or delegates this responsibility to Co- ordination Committees.	31	RHWQC to provide Board with strategic advice with respect to wetlands (see also 22).

<b>Catchment Standard</b> <i>Objectives</i>		GB Catchment Standard Practice		Wetlands Capacity Building Action
underpinning RCS.	21	Use existing systems such as the Code of Forest Practice as a basis for progressing a systems approach, and develop similar systems where these don't exist.	32	Include wetlands in existing and developing 'systems' approaches (such as Environmental Management Systems for dairy farms).
	22	Individual site and property plans will reflect broader catchment needs.	33	Provide wetlands input into holistic environmental planning processes, such as bioregional planning, at the farm, local and sub- catchment levels (see also 16).

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