

Companion Document to the
**Gippsland Natural Resources
Report Card 2008**

Gippsland Integrated Natural Resources Forum
June 2008

Gippsland's health, Gippsland's wealth

Please refer to the 2008 Report Card colour brochure for a graphic representation of the Environmental Condition and Stewardship Ratings for the Report Card's 18 natural assets.

Produced by the Gippsland Integrated Natural Resources Forum

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FORWARD

The Gippsland Natural Resources Report Card in this, its sixth year, presents an assessment of the environmental condition and stewardship of 18 key natural assets that symbolise the region's diversity.

Since the 2007 Report Card was published, Gippsland has experienced extreme rainfall events that compounded the affects of the 2006/2007 fires and long term drought. Despite the often severe impacts of these events, Gippsland's natural assets remain our regions cornerstones and the basis of our identity. Gippsland's response to the events of the past 12 months has demonstrated the region's cohesiveness and resilience. Government, industry and community have come together to work with the prevailing conditions.

The resilience and strength of partnerships within the Gippsland region are reflected in the assets' ratings this year. Despite a succession of natural disasters and degradation of the environmental condition of some assets, a strengthening of stewardship is clearly demonstrated.

Vegetation burnt during the 2006/2007 fires had not recovered prior to the extreme rainfall events of June 2007. Hence there was significant erosion, sediment transport and siltation of waterways. The floods, which caused landscape-scale impacts to natural values, also caused immediate and localised damage to property and infrastructure, such as buildings, roads and visitor facilities. The algal bloom in the Gippsland Lakes is a poignant example of how impact across multiple catchments and individual assets culminated, causing significant impact on a downstream asset.

The lessons learnt while responding to the 2003 bush fires enabled agencies to respond quickly and appropriately to the 2006/2007 fires. We were therefore well versed in emergency response by June 2007 when the first flood event occurred.

Agencies have recognised that their varying strengths can be complemented by others'. Partnerships have been strengthened, in some cases allowing funds from one organisation to be utilised by another's extension officers. These relationships are more than just symbiotic – both organisations and the natural assets have benefited.

There have been a number of steering committees, management teams, task forces and expert panels operating over the year, reflecting recognition of the benefits of involving all stakeholders in planning and implementation of projects – a maturation of relationships and relationship building.

The value of the strong stewardship demonstrated in our region becomes ever greater when viewed in light of the predicted affects of climate change. An increased frequency of 'extreme' weather conditions, sea level and temperature rises and the changed pressures on natural resources will all require a coordinated response from experienced communities. The partnerships that exist and are being developed in our region, coupled with the experience of drought, fire and flood response, give reason for our region to face the future feeling well armed.

Preparation of the Gippsland Natural Resources Report Card involves the support of many organisations and individuals – their efforts are gratefully appreciated. The coming year will see a major review of the Report Card's content, methodology and presentation. I welcome feedback on the Card's role and content as part of this review.

Keith Hamilton

Chair - Gippsland Integrated Natural Resources Forum

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1 INTRODUCTION

The Gippsland Integrated Natural Resources Forum (GINRF) is pleased to present the sixth Natural Resources Report Card for the Gippsland Region.

For 2008, the Report Card again presents eighteen natural assets, each of which has been selected to represent Gippsland's richness and natural diversity. The 2008 Report Card provides an update on achievements over the past twelve months and identifies future challenges in managing these eighteen natural assets. Each asset is rated both for its *environmental condition* and the level of *stewardship* – a measure of how well the community, government and industry are actively managing the natural asset in an integrated manner.

The purpose of the Gippsland Natural Resources Report Card is threefold (refer also to Section 7.1):

- Foster the strategic integration of natural resource management throughout Gippsland,
- Provide a credible, independent and regular evaluation of natural resource management in Gippsland, and
- Cultivate a strong regional identity for Gippsland based on natural resources.

The past 12 months have again been a significant challenge for much of the region with the impact of multiple extreme rainfall events occurring shortly after the Great Divide bushfires in 2007 (as reported in the 2007 Report Card). Of the 18 natural assets featured in the 2008 Report Card, six have changed in rating since last year – three for environmental condition and three for stewardship (refer to Section 4 for more detail).

This document serves as a companion to the 2008 Natural Resources Report Card colour brochure, providing additional detailed information about each natural asset, the Report Card methodology and the rationale behind stasis or change in the ratings.

Natural assets within the Corner Inlet and Gippsland Lakes catchments are differentiated with a fish or pelican symbol respectively.

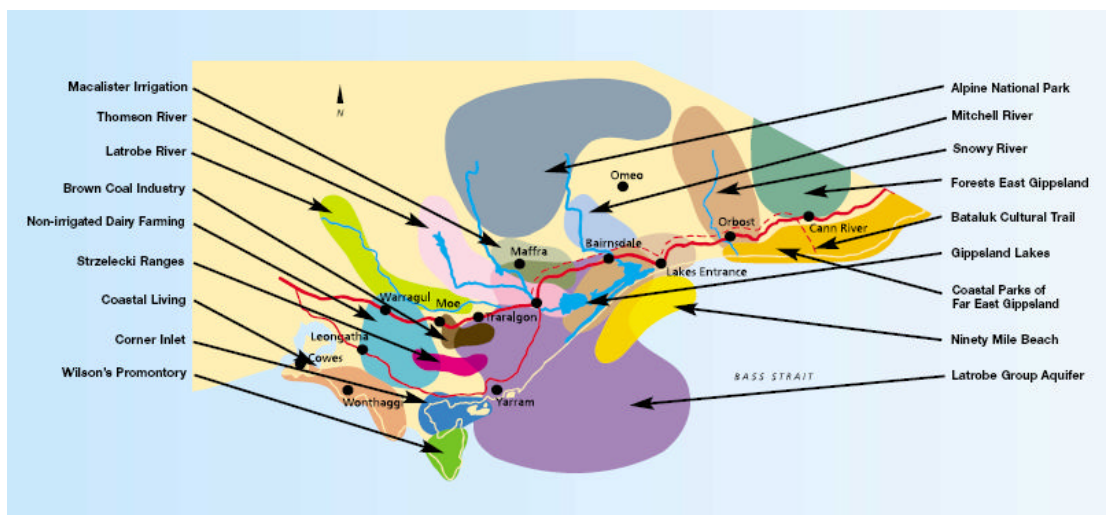
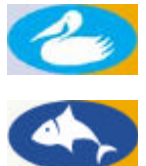


Figure 1 Report Card Asset Locations

2 WHAT HAS CHANGED SINCE 2007 REPORT CARD?

2.1 Fire, Rain and Floods

Last years 2007 Gippsland Natural Resources Report Card documented the impact of the 2006/2007 Eastern Victoria Great Divide Fires, but was published prior to the extreme rainfall events and subsequent flooding of June and November 2007.

Native vegetation throughout many of the catchments that were decimated by fire had not fully recovered prior to the extreme rainfall. The lack of ground cover resulted in very high runoff, severe catchment-wide erosion and enormous amounts of sediment transport down streams and rivers. Flood waters, estimated as a 1 in 300 year event (WGCMA), caused immediate and localised impacts to property and infrastructure, and long term catchment-wide impacts to soils, water quality, vegetation and landscape values. Impacts from the floods are the main feature of the 2008 Report Card.

2.2 Initiatives

In addition to the massive post fire and flood recovery programs, other significant initiatives across the eighteen natural assets covered by the 2008 Report Card include: (Source in brackets)

- Ecofire (vegetation type-specific fire regime) (DSE)
- East Gippsland Stream Crossing Audit complete and remediation occurring
- East Gippsland Forests Area Co-ordination Team (cross agency co-ordination)
- Gippsland Lakes Taskforce Expert Panel review of nutrient load targets
- Education and Practice Change in the MID (WGCMA)
- Developing MID publications and knowledge database (WGCMA)
- MID Channel Automation Projects, Stage 1 (Southern Rural Water/Commonwealth)
- MID 2030 Strategy implementation (Southern Rural Water)
- Irrigation Farm Plans - feed back to farmers
- New outlet installation, Glenmaggie Weir (allowing environmental flushes even during low water level) (Southern Rural Water)
- Waterway / Surrounds program (Southern Rural Water)
- Waterway Management in Mitchell River Basin initiative (EGCMA)
- Dairy Effluent Audit Program (EPA)
- Improving Environmental and Enterprise Management (GippsDairy)
- Green Cleaning (milk equipment washing impact reduction) (GippsDairy)
- Corner Inlet Coastal Catchment Initiative (multi agency) and steering committee
- Four Strzelecki Ranges Biodiversity Landscape Plans under development (WGCMA, HVP Plantations)
- Jack Albert River Restoration Committee (HVP Plantations)
- Macks Creek Warm Temperate Rainforest Restoration Project (HVP Plantations)
- 30,000ha (mostly Strzelecki Ranges) EVC mapping (HVP Plantations)
- Forests Stewardship Council Environmental Certification gained by HVP
- River restoration below Cowwarr (WGCMA)

- Thomson River Willow Control Program (Parks Victoria)
- Gorse control in Walhalla Historic Area - Coopers Creek (Parks Victoria)
- Yanakie Isthmus Adaptive Experimental Management (landscape scale restoration) (Parks Victoria)
- Wilson's Promontory Orchid recovery program (Parks Victoria)
- Estimation of coastal subsidence and storm wave inundation risk in the Gippsland basin (CSIRO)

2.3 Monitoring Programs

Significant monitoring programs undertaken across the eighteen natural assets covered by the 2008 Report Card include:

- Post flood assessment and mapping of riparian weeds along Wellington and Wonnangatta Rivers (Parks Victoria)
- Post fire and flood mossbed assessment for prioritisation for intervention (Parks Victoria).
- Pre and post fire monitoring of ten fire-ecology plots in Buchan Headwaters (Parks Victoria).
- Rabbit and deer monitoring in Suggan Buggan/upper Snowy River area (Parks Victoria).
- Wader and shorebird monitoring Cape Liptrap, Anderson Inlet and Bunurong (Parks Victoria);
- Baw Baw Frog and Owl Monitoring (Parks Victoria);
- Pre and post fire monitoring (ecological burn sites Cape Liptrap and Wonthaggi Heathland (Parks Victoria)
- High Value Rivers pest plant monitoring and mapping (Parks Victoria).
- Ecological Character Description - Corner Inlet RAMSAR Site - recording changes since 1982 RAMSAR listing (Parks Victoria)
- Seagrass community monitoring program (Parks Victoria)
- EPA Forest Audit (not specific to Gippsland) (report pending)
- Water quality monitoring of Gippsland Lakes and feeder catchment (Gippsland Coastal Board)
- Depth to water table maps production and nutrient monitoring, MID (WGCMA)
- Salinity monitoring (via groundwater) MID (Southern Rural Water)
- Macleods Morass monitoring (East Gippsland Water)
- Willow and riparian weed mapping (and small scale management), Upper Mitchell and rivers of far East Gippsland (EGCMA)
- Willow audit flyovers, Snowy River Catchment
- Bird census on specific restoration sites in the lower Snowy (EGCMA)
- Lyrebird and Owl monitoring, Strzelecki Ranges (Parks Victoria)
- Victorian Environmental Flows Monitoring and Assessment Program, Thomson River (WGCMA)

2.4 Management Plans and Strategies

Significant management and strategy plans prepared or under review for the eighteen natural assets covered by the 2008 Report Card include:

- 2003 Alpine Fire Area Prescribed Burning Guide (Parks Victoria)
- Draft Natural Environment Sustainability Strategy (Brown Coal industry)
- Morwell River Neighbourhood Environment Improvement Plan (Brown Coal industry, HVP Plantations)
- Cape Liptrap Landscape Unit Fire Management Plan (Parks Victoria)
- Draft Management Plan for Corner Inlet and Nooramunga Marine and Coastal Parks (Parks Victoria)
- Ecologically based fire management plans all of Gippsland's Fire Management Areas (DSE)
- Code of Practice for Fire Management, September 2006
- Draft Groundwater Management Plan, Latrobe Group Aquifer (Southern Rural Water)
- Dry In-flow Contingency Plan, Latrobe River (WGCMA)
- Macalister Land and Water Management Plan (WGCMA)
- Dry In-Flow contingency plan for Macalister River
- Development of Blue Green Algae Risk Management Plans for Lake Glenmaggie and MID channels (Southern Rural Water)
- Woodside - Stradbroke Local Biodiversity Action Plan under development (WGCMA)
- State-wide Guidelines for Management of Dairy Effluent
- West Gippsland Soil Erosion Management Plan (WGCMA)
- Mount Worth State Park Management Plan (NRE 1996) reviewed and re-endorsed (Parks Victoria)
- Strzelecki Fire Management Plan
- Tarra Bulga Management Plan (revision)
- Traralgon Creek Neighbourhood Improvement Plan (HVP Plantations)
- Morwell River Waterway Action Plan (Aug 07)
- Narracan Catchment Plan
- West Gippsland Regional Catchment Strategy and Priority Outcomes for 08/09
- Thomson River Dry In-flow contingency plan (WGCMA)
- Thomson River Emergency Response Plan (WGCMA)
- Wilson's Promontory Fire Management Plan (Parks Victoria)

3 MAJOR CHALLENGES FOR THE YEAR AHEAD

Gippsland as a region has, over the past several years, faced and successfully managed the affects of drought, fire and now floods. Nevertheless, the impact of these events will continue to be felt for many years to come. The year ahead is not only likely to present opportunities for improved management of Gippsland's natural resources, but will pose significant challenges across the region.

Fire and flood recovery/rehabilitation programs must be maintained despite the immediacy of the events' impacts fading. Burnt and flood-damaged catchments will continue to have major impacts on down stream assets and values until their condition returns to a pre-fire state. Until vegetation re-establishes, runoff from rainfall will be very high and sediments will continue to be mobilised on a large scale following relatively small rainfall events, affecting water quality, in-stream habitat and potable water supplies. Burnt catchments will have significantly altered hydrology for many years to come. Water yields will likely reduce over time as the catchments regenerate, reducing water availability for irrigation, potable supplies and environmental flows.

Climate change predictions for increased extreme/erratic weather events across Gippsland – increased number of hot days, increased storm frequency and severity, potential increased bushfire frequency and potential increased flooding – will further exacerbate already stressed catchments.

The region's emergency preparedness and response will remain an essential component of managing our natural resources and the communities that live and work within them.

Extreme nutrient loads discharged during the 2007 flood events will possibly have a lasting impact on receival waters, particularly Lake Glenmaggie and the Gippsland Lakes where there is a need to better understand the likelihood of increased algal bloom activity.

Opportunities exist for improved weed and pest animal control programs to be implemented in conjunction with rehabilitation works in flood (and fire) affected areas. There is also a need however, to balance priorities for restoration of severely degraded (often more visible) areas, with maintenance works in existing high quality natural assets that have not been as badly impacted upon in recent years.

Adequate environmental flows for the Snowy River have not been delivered and remain an outstanding priority.

Compliance requirements will continue to impact a number of industries utilising Gippsland's natural resources, particularly the timber harvesting, use of irrigation water and emissions targets for the brown coal energy industry.

Several major natural resource management strategies, including the Gippsland Sustainable Water Strategy and the Land and Biodiversity at a Time of Climate Change – Green Paper, will require considerable agency, stakeholder and public input to ensure Gippsland's view is adequately considered. Numerous other management plans and strategies need also to be reviewed and/or finalised.

Management of Gippsland's natural resources may in the future be influenced by altered policy priorities resulting from the recent change in Federal Government.

The Gippsland Natural Resources Report Card will be subject to a major review prior to development of the next report card. There is considerable scope to improve the Report Card by integration of other processes such as MERGe, the Regional Catchment Investment Plans and particularly the pending State of the Catchment Reports for west and east Gippsland. Better utilisation of quantitative data will create a more robust and defensible publication.

4 2008 REPORT CARD OVERVIEW

The 18 natural assets in this Report Card are readily recognisable and represent Gippsland's rich, diverse natural landscape. The Report Card focuses on the environmental condition of each natural asset and the integrated management of the natural resources themselves by government agencies, industry and community stakeholders (their stewardship).

In 2008, there are six natural assets with altered environmental condition ratings:

- ↓ The Gippsland Lakes;
- ↓ The Macalister Irrigation district; and
- ↓ The Mitchell River.

Three natural assets have altered stewardship ratings:

- ↑ Corner Inlet;
- ↑ The Latrobe Group Aquifer; and
- ↑ The Strzelecki Ranges.

Table 1 below presents a history of the Condition and Stewardship ratings for each asset. Assets are listed alphabetically for ease of reference.

Table 1 Asset Ratings History

Natural Asset	Condition Rating						Stewardship Rating					
	03	04	05	06	07	08	03	04	05	06	07	08
Alpine National Park	B	B-	B-	B-	C	C	★★ ★	★★ ★	★★ ★	★★ ★★	★★ ★★	★★ ★★
Batuluk Cultural Trail			B	B	B	B		★★ ★	★★ ★	★★ ★	★★ ★	★★ ★
Brown Coal based Energy Industry	D	D	D	D	D	D	★★ ★★	★★ ★★	★★ ★★	★★ ★★	★★ ★★	★★ ★★
Coastal Living	C	C	C	C	C	C	★★	★★	★★	★★	★★ ☆	★★ ☆
Coastal Parks of Far East Gippsland	A	A	A	A	A	A	★★ ★	★★ ★	★★ ★	★★ ★	★★ ★	★★ ★
Corner Inlet				C	C	C	★★ ★	★★ ★	★★ ★	★★	★★	★★ ★
Forests of East Gippsland	B	B	B	B	B	B	★★ ★★	★★ ★★	★★ ★★	★★ ★★	★★ ★★	★★ ★★
Gippsland Lakes	C	C+	C+	C+	C+	C	★★	★★ ★	★★ ★	★★ ★☆	★★ ★☆	★★ ★☆
Latrobe Group Aquifer				F	F	F				★★	★★	★★ ☆
Latrobe River		D	D	D	D	D		★★ ★	★★ ★	★★ ★	★★ ★	★★ ★
Macalister Irrigation District	D-	D	D+	D+	D+	D	★★ ★	★★ ★	★★ ★☆	★★ ★☆	★★ ★☆	★★ ★☆
Mitchell River	B	B	B	B	D	D-	★★ ★	★★ ★	★★ ★	★★ ★	★★ ★☆	★★ ★☆
Ninety Mile Beach		B	B	B	B	B		★★ ★	★★ ★	★★ ★	★★ ★	★★ ★
Non-irrigated Dairy Farming of W&S Gland	C	C	C	C	C	C	★★ ★	★★ ★	★★ ★	★★ ★	★★ ★	★★ ★
Snowy River	C	C	C	C	C	C	★★ ★	★★ ★★	★★ ★★	★★ ★★	★★ ★★	★★ ★★
Strzelecki Ranges			C	C	C	C			★★ ★	★★ ★	★★ ★	★★ ★☆
Thomson River	C-	C-	C-	C-	D	D	★★ ★	★★ ★	★★ ★☆	★★ ★★	★★ ★★	★★ ★★
Wilson's Promontory	B	B	B	A	A	A	★★ ★	★★ ★	★★ ★	★★ ★★	★★ ★★	★★ ★★

Corner Inlet was separated from Wilson's Promontory in the 2006 assessment.

5 RATING SYSTEM

5.1 Condition Rating System

An assessment is made about the overall environmental condition of each natural asset by assessing information against land, water, biodiversity and air indicators.

Each indicator theme is given a weighting to reflect the importance of that indicator on the overall value or condition of a particular asset. The weightings, established in 2003, therefore differ between assets. For example, the weighting of the Air Indicator for the Alpine National Park and Brown Coal assets is 0 and 40% respectively. Air quality is not a defining indicator in the national park while the condition of the Brown Coal industry is strongly linked to air emissions and monitoring.

The immediate locality of both the asset and offsite impacts is considered.

Table 2 Condition Rating Definitions

Rating	Description	Definition
A	Excellent	Environmental values are in good to excellent condition. No adverse offsite impacts.
B	Good	Most environmental values are good. Minimal offsite impact
C	Reasonable	Some environmental values are indicated as poor, but are recoverable. Some offsite impacts.
D	Poor	Many environmental values are poor. Asset needs improvement. Several adverse offsite impacts.
F	Degraded	Natural values are degraded. Extensive offsite impacts.

5.2 Stewardship Rating System

Stewardship may be defined as: "The careful and responsible management of the natural asset by a range of government, industry and community stakeholders entrusted with its care". Stewardship performance for each asset is measured against a simple adaptive management process (planning, implementing, evaluating and improving) and the level of effective partnership activity across community, government and industry.

Table 3 Stewardship Rating Definitions

Rating	Description	Definition
*****	Fully integrated	Stewardship process is complete with high quality, significantly impacting the asset condition. High level of government, community and industry engagement.
****	Mostly integrated	Complete with average/good quality of most parts of the stewardship process, having potential to improve the asset condition. Some evidence of partnership arrangements.
***	Some integration	Most parts of the stewardship process complete with average/poor quality, having unclear impacts on the condition. Government, community and industry engagement may be fragmented. Weak partnerships.
**	Little integration	Gap in one or more of the processes and low quality is hampering effective stewardship of the natural asset. There is danger of contributing to asset condition decline.
*	No integration	Significant gaps in the stewardship process. Contributing to decline in asset condition

Further information regarding the Report Card rating method was presented in the 2006 Report Card, and is available from Gippsland Integrated Natural Resources Forum (<http://www.ginrf.org.au/enquiry/edit.asp>).

6 CONDITION & STEWARDSHIP OF INDIVIDUAL ASSETS

Details of individual natural asset are provided in the following sections. Assets are listed in alphabetical order for ease of reference.

The evidence summaries in each section present information provided by the managing agencies. In some cases this evidence has not changed significantly over several years so the summaries reflect those of previous Report Cards. Some strategies or management plans listed were implemented a number of years ago however, they remain relevant to current day management of the asset.



6.1 ALPINE NATIONAL PARK

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
B	B-	B-	B-	C	C	★★★	★★★	★★★	★★★★	★★★★	★★★★

6.1.1 Asset Description

The Alpine National Park covers an area of 646,000 hectares. This Report Card refers predominantly to the Wonnangatta-Moroka and Bogong Units of the Alpine National Park (approximately 380,000 hectares). These areas include several Wilderness Zones, Heritage Rivers and Natural Catchment Areas (Parks Victoria, 2000). The Alpine National Park protects the State's highest mountains and extensive areas of highly diverse, often pristine, alpine and sub alpine ecosystems.

Bioregion reference: Victorian Alps and Highlands – Southern Fall

6.1.2 Condition Summary

The 2003 Eastern Victorian Fires burnt a combined total of 1.3 million hectares of National Park, State Forest and private land in the North Eastern and East Gippsland regions of Victoria and southern New South Wales. Approximately 60% of the Alpine National Park was affected (Victorian Government, 2003). The impact of the fires was widespread and diverse, including reduced water quality, fragmentation of vegetation, increased erosion and threats to endangered species in Gippsland's catchments.

The Great Divide Fires of 2006/2007 again burnt a significant area of the Alpine National Park and adjoining Avon Wilderness Park. The fires impacted many sensitive alpine species and communities. Catchment headwaters including alpine bogs were affected and erosion, stream sedimentation and impacts on water quality resulted. The varying intensities of the fire across the landscape led to a mosaic of burnt, re-burnt and unburnt floristic communities - adding further complexity to the existing diverse habitats.

Severe rainfall events in 2007 impacted areas that were recovering from the fires, mobilising sediment, ash and debris and reducing water quality of alpine and sub-alpine river systems. Landscape-scale changes to the Macalister River catchment have resulted (Parks Victoria, 2008). Many areas however, continued to improve after the fires and floods, the removal of stock grazing from the park in 2005/2006 and extensive pest plant and animal control programs (Parks Victoria, 2008).

Condition Evidence Summary

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
Land	Reasonable-Good	25	Soil erosion risk – water	SKM (2004), Recovery Status of Streams and Catchments in East Gippsland Affected by 2003 Fires Sheridan et al, in press	Post 2003 fire assessment
Water	Poor-Very poor	25	Water Quality – Phos & Turbidity	Report: SKM (2004) as above. Parks Victoria, 2007	Post 2003 fire assessment
Biodiversity	Reasonable - Excellent	50	Native vegetation extent and quality, fauna, pest plants & animals	Parks Victoria (2000) State of the Parks, Groves (1998) Grazing in the high country SKM (2004) as above Parks Victoria, 2008	State of the Parks Report issued in June 2007 Preparation of '2003 Alpine Fire Area Prescribed Burning Guide'
Air	NA	0			

Key Condition Summary Points

- Base condition is good to excellent due to long term protection of large areas.
- Large scale bush fires and subsequent extreme rainfall events have greatly impacted the Alpine National Park.
- The Alpine National Park as a whole did not experience a reduction in environmental condition this year.

6.1.3 Stewardship Summary

Management plans exist for all four management units within the Alpine National Park (Parks Victoria, 2000).

The East Gippsland Regional Catchment Strategy refers to Alpine National Park in the Parks asset class, noting that it is timely to update park management plans following the 2003 fires (EGCMA, 2005).

A Strategic Plan has been approved for the Australian Alps National Parks Co-operative Management Program (2004 – 2007), providing integrated management across Victorian, NSW and ACT Alpine National Parks (Australian Alps National Parks, 2004).

The Victorian Government removed cattle grazing from the Alpine National Park in May 2005 (Alpine Grazing Taskforce, May 2005).

Post fire and flood recovery programs were implemented representing maintenance of an already high level and rating of stewardship.

Several monitoring programs, including ten fire-ecology plots in Buchan Headwaters and pest animals in Suggan Buggan/upper Snowy River area, and further control works will continue into the future.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Good	<ul style="list-style-type: none"> - Alpine National Park Management Plan – Bogong, Wonnangatta-Moroka, Dartmouth, Cobberas-Tinagaringy Management Plans - Fresh start – a healthy future - removal of grazing from the Alpine NP (2005) & High Country Initiatives Package - Alpine National Park Fire Recovery Plan(s) (2003 and 2007) - Strategic Plan 2004-2007 for the Australian Alps National Parks Cooperative Management Program - 2003 Alpine Fire Area Prescribed Burning Guide (preparation)
Implement	Good	<ul style="list-style-type: none"> - Parks Victorian environmental works program (Wonnangatta Environmental Action Plan - 2003 Fire recovery plan implementation completed 2005 - pest plant and animal management in response to removal of grazing - Alpine Bog Restoration project - English Broom control partnership - Feral Horse Management Program
Evaluate	Reasonable	Post fire and flood monitoring projects (mapping and assessment of moss beds to direct intervention efforts; riparian weeds along Wellington and Wonnangatta Rivers; fire-ecology plots; pest animal monitoring).
Improve	Good	<p>DSE & PV October 2005 Post Wildfire Indigenous Heritage Survey – Summary Report - Improving future land management practices</p> <p>Investment in visitor infrastructure reconstruction, repair and maintenance.</p>
Partnerships	Good	<ul style="list-style-type: none"> - PV & DSE 2005 DVD - Dancing and the Devil Fire – Uncovering the hidden History of the Alps - English Broom control - Parks Victoria, Department of Sustainability and Environment, Department of Primary Industries, Friends of the Mitta Mitta, High Country Landcare Network, and private landholders

Key Stewardship Summary Points

- Cattle grazing removed from the Alpine National Park. Alpine grazing still occurs on public land in State Forests and private land.
- Fire and flood recovery programs planned and implemented following 2003 and 2006/2007 fires and 2007 floods.

6.1.4 For more information

- Parks Victoria Information Centre 13 1963 or visit www.parkweb.vic.gov.au
- Australian Alps National Parks www.australianalps.deh.gov.au

6.2 BATALUK CULTURAL TRAIL

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
	B	B	B	B	B		★★★	★★★	★★★	★★★	★★★

6.2.1 Asset Description

The Bataluk Cultural Trail follows routes that Koori people of East Gippsland have been travelling for over 18,000 years. The trail extends from Sale through to Cape Conran, on which there are 11 points where indigenous cultural heritage of the Gippsland region is highlighted. Established to maintain and promote key examples of aboriginal heritage, the Trail winds its way through places such as The Knob Reserve, Den of Nargun, Howitt Park, Krowathunkoolong, Aboriginal Keeping Place and Museum, Legend Rock, Buchan Caves, Burnt Bridge Reserve and Moogji Aboriginal Council.

6.2.2 Condition Summary

Indigenous cultural heritage values are recognised by the high concentration of sites that include artefact scatters, shell middens, scarred trees, massacre sites and axe grinding grooves (Bataluk Cultural Trail Brochure). Most of the cultural values are intact, but must be protected. Environmental condition is assumed to be good due to the protected locations of most of the Trail's sites although threats that apply to other protected areas, such as pest plants and animals, human impact and fire, do apply.

Key Condition Summary Points

- Good protection of cultural values and sites of significance.
- High cultural values mostly intact.
- Threats to the environmental and cultural values exist, such as pest plants and animals, uncontrolled access to sensitive sites

6.2.3 Stewardship Summary

Development of the Bataluk Cultural Trail was a joint initiative of the Far East Gippsland Aboriginal Corporation, Gippsland and East Gippsland Aboriginal Co-operative, Lake Tyers Aboriginal Trust, Moogji Aboriginal Council, Ramahyuck Aboriginal Corporation, Wellington Shire Council and East Gippsland Shire Council. Management arrangements are in place but there is a need to clarify responsibility and provide resources.

The Trail passes through West and East Gippsland Regional Catchment Management areas and covers a range of public land types, potentially requiring the cooperative management of a number of Government departments (Bataluk Cultural Trail Brochure).

Key Stewardship Summary Points

- Potential to improve cooperative partnerships between management agencies
- Potential to improve promotion of the trial amongst residents and tourists of East Gippsland

6.2.4 For more information

- Ramahyuck District Aboriginal Corporation (03) 5143 1644, <http://www.ramahyuck.org/community>
- Krowathunkooloong, the Keeping Place (03) 5152 1891 <http://www.gippslandinfo.com.au/Aboriginal/#>
- Maffra Community, Bataluk Cultural Trail, <http://www.maffra.net.au/bataluk/>

6.3 BROWN COAL BASED ENERGY INDUSTRY

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
D	D	D	D	D	D	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★

6.3.1 Asset Description

This asset is based in the Latrobe Valley where approximately 90% of Victoria's total electricity generation occurs. Coalfields extend over the Latrobe City and Wellington Shire municipal boundaries. Three electricity generation companies operate in this area namely, Loy Yang Power, TRUenergy Yallourn, and International Power Hazelwood.

Air monitoring is conducted in accordance with the National Environment Protection Measure by an independent consultant. The results are compared to the objectives of the State Environment Protection Policy (Ambient Air Quality) and reported hourly by the Environment Protection Authority Victoria (<http://www.epa.vic.gov.au/Air/Bulletins/aqbhour.asp>).

The Latrobe Valley Air Monitoring Network consists of air monitoring sites at Darnum North (October to March only), Rosedale South, Jeeralang Hill, Moe and Traralgon.

Bioregion reference: Strzelecki Ranges and Gippsland Plain

6.3.2 Condition Summary

Brown coal fired power stations in the Latrobe Valley account for over half of Victoria's total greenhouse gas emissions (SKM, 2003).

Greenhouse gas emissions from energy production in Victoria are reported to have risen by 30 per cent since 1990. This increase is mainly attributed to the Latrobe Valley brown coal-fired power stations (SBS, 2008) as a result of the opening of Loy Yang B and the improved performance of all four power stations (increased power production) (The Age, 2008).

Trends in air quality up to 2003 in the region indicate that harmful air pollutants are at acceptable levels. Visibility-reducing particles remain an issue but have been decreasing over the past 20 years and are often dependent on the incidence of fires and prevailing weather conditions.

Power stations are high users of both surface water and deep groundwater from Latrobe Group Aquifer (approx 25000ML/yr), along with offshore gas and oil miners, resulting in local land subsidence (SKM, 2003).

The Yallourn East Field mine wall collapse and subsequent flooding resulted from heavy rain and a breach in the Latrobe River bank. Although there was localised damage to equipment and the mine wall, long term condition of the asset was not impacted. (The associated diversion of the Latrobe River is addressed in Section 6.10 below.)

Condition Evidence Summary

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
Land	Poor	25	Subsidence Mine wall collapse	SKM (2003) Renewal of West Gippsland Regional Catchment Strategy – State of the Catchment	Description Buffer distances under review
Water	Poor	25	Index of Stream Condition for Morwell River, Traralgon Creek, Flynns Creek (2004) All reaches in the Moderate to Poor range. Groundwater Quantity – poor Latrobe River temporary diversion	DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition. CSIRO (2004) Falling Water levels in the Latrobe Aquifer, Gippsland Basin	Method different to 1999 ISC, not directly comparable. Reach # 4, 18, 15, 11 8 Refer Section 6.10
Biodiversity	Poor	10	Assumed		
Air	Poor	40	Greenhouse Gas emissions – 85% of Gippsland's emissions, 67% of Victoria's emissions from stationary energy production Air Quality	National Carbon Accounting System (NCAS) (2002)	Uses CO2 equivalent measure Carbon dioxide geo-sequestration and coal drying technologies being investigated.

Key Condition Summary Points

- High users of surface and ground water with land subsidence implications
- Main contributor to Gippsland and Victoria's greenhouse gas emissions
- Investigation into geo-sequestration and coal drying technologies occurring in recognition of the need to address climate change and greenhouse gas emissions.
- Yallourn East Field mine wall collapse and flooding resulted in temporary impact to infrastructure but no long term impact on the asset condition.

6.3.3 Stewardship Summary

The three electricity generation companies in the Gippsland region operate under accredited licences and Environmental Management Systems. The West Gippsland Regional Catchment Strategy refers to the brown coal based energy industry across three assets: Land, Atmosphere and Climate, and Production (WGCMA, 2003). The Regional Catchment Strategy draws targets related to greenhouse gas emissions from the Victorian Greenhouse Strategy (DNRE, 2002). As part of the Australian Government's Regional Minerals Program, the Latrobe Valley 2100 Coal Resource project (LV 2100) has developed a strategy to guide planning and sustainable mine development practices for brown coal in the Latrobe Valley (DPI, 2005).

Energy Summit, undertaken in recent years as part of the Gippsland Energy Challenge project, explores changes to the energy industry and their potential impacts on the Gippsland region. Priority areas identified include: Future of Brown Coal, Greenhouse, Geo sequestration of CO₂, Investment in New Energy plant, Gippsland's preparedness for expansion, Gippsland Engagement and Future Energy Summit. An Energy Policy for the Gippsland region has been endorsed by the Gippsland Local Government Network.

The brown coal power industry continues to reduce total water discharges to waterways.

The Eastern Water Recycling Proposal, if developed, would provide highly treated, recycled wastewater from an upgraded Eastern Treatment Plant at Curram in Melbourne, for possible use by industry such as the existing power stations if the treated water is of an acceptable standard.

The brown coal energy industry continues to implement Environmental Management Plans/Systems which meet necessary standards, and which set out an environmental policy, objectives and targets, and programs for environmental management.

The Morwell River Neighbourhood Environment Improvement Plan has been finalised, signed by all partners and published. This plan represents a developing partnership between community, industry and government.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Good	Gippsland Energy Policy LV2100 Coal Resources Project
Implement	Good-Reasonable	Traralgon Creek Rehabilitation Project Morwell River Diversion
Evaluate	Good-Excellent	Latrobe Valley Air Quality Monitoring Network Gippsland Regional Water Monitoring Partnership
Improve	Good-Excellent	Environmental Management Systems
Partnerships	Reasonable	Community partnerships such as Waterwatch Water and Air quality monitoring partnerships Morwell River Neighbourhood Environment Improvement Plan

Key Stewardship Summary Points

- Electricity generation companies operate under accredited licences and Environmental Management Plans/Systems
- Signing of the Morwell River Neighbourhood Environment Improvement plan a developing partnership between community, industry and government.

6.3.4 For more information

- Powerworks Energy Technology Centre www.powerworks.com.au
- Loy Yang Power www.loyyangpower.com.au
- TRUEnergy Yallourn www.truenergy.com.au/Production/Yallourn/index.xhtm
- International Power, Hazelwood www.hazelwoodpower.com.au
- Latrobe City www.latrobe.vic.gov.au

6.4 COASTAL LIVING

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
C	C	C	C	C	C	★★	★★	★★	★★	★★☆	★★☆

6.4.1 Asset Description

The Coastal Living asset includes Phillip Island and the coastal settlements of San Remo, Wonthaggi, Cape Paterson, Inverloch and Venus Bay. It also includes important coastal natural assets such as Bunurong Marine National Park, Churchill Island Marine National Park, Anderson Inlet and Cape Liptrap Coastal Park.

As a Report Card asset, Coastal Living includes the natural assets such as remnant vegetation between settlements, and the liveability of the coastal environment to those choosing to reside there.

Bioregion reference: Gippsland Plain and Strzelecki Ranges

6.4.2 Condition Summary

Coastal living areas hold many natural values, but increases in permanent and seasonal population brings with it pressure for development, potentially threatening land, water and biodiversity values. Issues of particular note include the management of wastewater, stormwater and sewerage; fragmentation of remnant native vegetation and dune erosion (Phillip Island and San Remo Design Framework 2003). Planning controls and community education and involvement are paramount to protecting the natural values of this asset.

The remnant vegetation along the coastal fringes is in good condition albeit under pressure from urbanisation and land use change. The environmental values and features found at Cape Liptrap Coastal Park indicate good condition (SKM 2003).

The 2004 Index of Stream Condition for Bass and Powlett Rivers rated all reaches in moderate to very poor condition.

Some dryland salinity has been mapped in the Wonthaggi/Inverloch region, including areas of high to very high salinity risk (SKM 2003).

Significant progress has been made in improving management of biodiversity assets with preparation of the Fire Management Plan for Liptrap, Bald Hills, Kings Flat and Waratah.

Implementation of the dog and horse control regulations in Bunurong, Kilcunda-Harmers Haven also aids protection of shorebirds and coastal habitat.

Revegetation of Wonthaggi Heathlands, Waratah Natural Features Reserve and Cape Liptrap was undertaken by Parks Victoria.

Condition Evidence Summary

Indicator Theme	Score	Weight%	Key Evidence	Evidence Source	Data Comment
Land	Reasonable	40	Assumed Revegetation programs	Parks Victoria, 2008	
Water	Poor	30	Index of Stream Condition for Bass and Powlett Rivers (2004) All reaches in the Moderate to Very Poor range. Water Quality Bass River – attainment of SEPP – nutrients: low, turbidity/suspended solids: high & physical parameters: low	DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition. Water Ecoscience (2002) Victorian Water Quality Monitoring Annual Report	Method different to 1999 ISC, not directly comparable.
Biodiversity	Reasonable-Good	30	Assumed Dog and horse control regulations	SKM (2003) Parks Victoria 2008	
Air	NA	0			

Key Condition Summary Points

- High population growth and development pressures threaten land, water and biodiversity values.
- Water quality poor in measured rivers.
- Remnant vegetation on coastal fringes in good condition.

6.4.3 Stewardship Summary

Stewardship is a complex yet urgent task for this asset. The complexity exists as a result of the number responsible agencies and their boundaries (Catchment Management Authorities, government departments and shire councils); and by the nature of the asset. The urgency reflects the rapid urban development being experienced in the area and the range of potentially competing interests.

Bass Coast Shire Council is participating in the National Sea Change Initiative. The Victorian Government Coastal Spaces project recommends that a comprehensive land use supply and demand study be undertaken for Bass Coast Shire (Victorian Coastal Council, 2006).

The Urban Design Frameworks (2006) pertaining to several settlements in Bass Coast and South Gippsland Shires, and the corresponding amendments to planning schemes, are in the process of being implemented. They will provide enhanced strategic planning guidance for coastal urban development and provide a structure under which Council's can enforce environmental protection.

The Bass Coast Shire Municipal Strategic Statement (MSS) recognises both the Port Phillip & Westernport Catchment Management Authority and the West Gippsland Catchment Management Authority as a means to achieving better integration between the MSS and Regional Catchment Strategies. The municipality also conducts a successful Land Management Biodiversity Incentive Scheme for private landholders (Bass Coast Shire Council, 2004).

The Gippsland Coastal Agencies Liaison Group provides a professional network for staff involved in the management of natural assets around the Gippsland coast. The group serves an important networking and information-sharing role for the management of the Coastal Living asset.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Reasonable-Good	Bass Coast Strategic Framework for Coastal Towns (2005) Review of the Municipal Strategic statement – Bass Coast Shire (2003) Bunurong Marine National Park Management Plan (2006) Urban Design Frameworks prepared by Bass Coast Shire and South Gippsland Shire (2006). Planning scheme amendments.
Implement	Reasonable	Coast Action/Coastcare Programs Land Management Biodiversity Incentive Scheme
Evaluate	Reasonable	Coastal Spaces Recommendations Report (2006) Land Management Biodiversity Incentive Scheme Review Monitoring of wader and shorebird populations at Cape Liptrap, Anderson Inlet and Bunurong; owl monitoring; and pre and post fire monitoring of ecological burn sites in Cape Liptrap and Wonthaggi Heathlands.
Improve	Poor	
Partnerships	Poor	Coastal Agencies Liaison Group

Key Stewardship Summary Points

- Implementation of Urban Design Frameworks for coastal settlements has commenced however changes in asset condition are not yet evident.
- Improved integration of land use planning and environmental management by community, industry and government.
- Local planning scheme amendments and land demand/supply study will increase protection of natural values.

6.4.4 For more information

- Bass Coast Shire Council www.basscoast.vic.gov.au (03) 5671 2211
- South Gippsland Shire Council www.southgippsland.vic.gov.au (03) 5662 9200
- Parks Victoria Information Centre 13 1963 or www.parkweb.vic.gov.au
- West Gippsland Catchment Management Authority (03) 5175 7800 or www.wgcma.vic.gov.au
- Port Phillip and Westernport Catchment Management Authority (03) 9785 0183 or www.ppwcm.vic.gov.au

6.5 COASTAL PARKS OF FAR EAST GIPPSLAND

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
A	A	A	A	A	A	★★★	★★★	★★★	★★★	★★★	★★★

6.5.1 Asset Description

The main feature of this area is the Cape Conran Coastal Park and the Croajingalong National Park, which is recognised for protecting a significant representation of East Gippsland's diverse lowland forest, heath and coastal ecosystems. The park is part of a designated Biosphere Reserve under the UNESCO 'Man and the Biosphere' program (Parks Victoria, 2000). This area also contains one of several Natural Catchment Areas identified in East Gippsland by the Heritage Rivers Act (1999) and has a high concentration of near pristine estuarine areas (DNRE 2001, 2002). The Point Hicks Marine National Park and Cape Howe Marine National Park adjoin Croajingalong National Park.

The 306 species of birds recorded in Croajingalong National Park alone represent over half of Victoria's and a third of Australia's total bird species. The area hosts habitats supporting 43 species of Threatened native fauna including the Little Tern, Ground Parrot, Eastern Bristle bird, Eastern Broad Nosed Bat and Australian Fur Seal.

Bioregion reference: East Gippsland Lowlands

6.5.2 Condition Summary

Available data indicates excellent stream condition over a significant proportion of river length in this area, reflecting the 'heritage' and 'ecologically healthy' status of many of the streams (EGCMA, 2004).

Land and biodiversity values are also high due to the relatively undeveloped nature of the area and the high proportion of public land in parks and reserves. The Coastal Heathland vegetation community is extremely species-rich, covering up to 10% of Croajingalong National Park. It contains highly significant coastal streams and catchments which are relatively undisturbed with an absence of introduced fish species and good populations of native fish (EGCMA, 2004). Pest plants and animals are regarded as the major threat to ecological health (Parks Victoria, 2000).

The area was relatively unaffected by the extreme rainfall events of 2007. Runoff caused some damage to roads and tracks however, only limited areas were inundated.

The Southern Ark predator control program and the associated population monitoring is indicating continued recovery of small mammal populations with, for instance, regular sightings of the Long-nosed Potoroo in the Cape Conran area.

Condition Evidence Summary

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
Land	Excellent	30	Wind erosion	East Gippsland RCS – Appendix 3, State of the Regional Environment	Descriptive evidence. No evidence for soil condition, salinity, acidity, contaminants or land use suitability
Water	Excellent	30	Index of Stream Condition for lower Bemm, Cann, Thurra, Wingan and Betka Rivers (2004)	DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition.	Method different to 1999 ISC, not directly comparable. Reach # 2, 3, 12, 24, 26, 29 in EG Basin
Biodiversity	Excellent	40	Extent & Quality of Native Veg (1996) Birds (1996) Pest Plants and Animals Southern Ark predator control program and small mammal recovery continues	Croajingalong National Park Management Plan East Gippsland RCS – Appendix 3, State of the Regional Environment Parks Victoria (2008)	Descriptive evidence. Population monitoring occurs as part of the Southern Ark program.
Air	NA	0			

Key Condition Summary Points

- Near pristine estuarine areas.
- Very good water quality.
- Excellent habitat values with high flora and fauna diversity.

6.5.3 Stewardship Summary

Parks Victoria plays the major role in the management of this asset, working from the Croajingalong National Park and Cape Conran Coastal Park management plan. The East Gippsland Regional River Health Strategy gives priority to the control of weeds in this area, to prevent them from spreading to currently weed-free areas (EGCMA, 2004)

The East Gippsland Catchment Management Authority conducted extensive surveys of the coastal parks during 2007 as part of the High Value Rivers initiative.

The Gippsland Estuaries Coastal Action Plan recommends high priority actions for Yeerung River, Dock, Sydenham and Tamboon Inlets, Thurra, Mueller, Wingan and Betka River estuaries and Mallacoota Inlet (GCB & WGCMA, 2006).

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Reasonable	<ul style="list-style-type: none"> - Croajingalong National Park Management Plan - Cape Conran Coastal Park Management Plan - Cape Howe Marine National Park Management Plan - Point Hicks Marine National Park Management Plan - Point Hicks Marine National Park Management Plan - East Gippsland Regional River Health Strategy - Gippsland Estuaries Coastal Action Plan
Implement	Good	Southern Ark predator control program
Evaluate	Reasonable	<ul style="list-style-type: none"> - Water quality, mammal population monitoring - High Value Rivers surveying
Improve	Reasonable	
Partnerships	Reasonable	Parks Victoria, NSW National Parks Service, Southern Rivers CMA (NSW) and East Gippsland CMA are currently undertaking cross border works to control feral pigs and weeds.

Key Stewardship Summary Points

- Management intensity is low due to minimal human impact – main protection activity is pest plant and animal control.
- Extensive surveying and predator control programs are significant however, these programs represent a continuation of the high level of stewardship associated with this asset.

6.5.4 For more information

- Parks Victoria Information Centre 13 1963 or www.parkweb.vic.gov.au
- East Gippsland Catchment Management Authority, 5152 0600, www.egcma.com.au



6.6 CORNER INLET

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
			C	C	C				★★	★★	★★★

* Included in Wilson's Promontory ratings in previous years

6.6.1 Asset Description

The Corner Inlet asset includes the Marine and Coastal Park and Marine Park of Corner Inlet, and Nooramunga Marine and Coastal Park. The area coincides with the boundaries of the declared RAMSAR convention wetland, some 67,000 hectares. The area is also listed under the UNESCO 'Man and the Biosphere' program as a biosphere reserve; the China Australia Migratory Bird Agreement (CAMBA) and the Japan Australia Migratory Bird Agreement (JAMBA). The area has significant fisheries, environmental and social values. There is a strong aboriginal cultural connection to the area and numerous historic shipwrecks.

Corner Inlet is the most southern marine bay and tidal mudflat system on mainland Australia. It supports the world's most southerly population of White Mangroves (*Avicennia marina*) and important feeding and breeding grounds for water and shorebirds. The area supports an impressive number of native plant and animal species (greater than 390 and 160 respectively) (DSE website, 2008).

Corner Inlet was separated from the Wilson's Promontory asset in the 2006 Report Card.

Bioregion reference: Wilson's Promontory and Gippsland Plain

6.6.2 Condition Summary

There has been significant loss of seagrass habitat within the bay in recent years (Parks Victoria, 2006) with the predominant cause sited as 'catchment impacts' or the need to reduce sediment and nutrient flows into the inlet (CSIRO, 2005). The presence of environmental weeds such as *Spartina* also potentially threatens biodiversity values.

The March 2008 Snake Island fire burnt a third of the island. Some parts of the island have now been burnt three times in 11 years. This frequency has adversely impacted large trees and canopy recovery and, as a consequence, koala browsing.

Indigenous cultural values are in part protected by Parks plans (SKM, 2003).

Condition Evidence Summary

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
Land	Reasonable	10	Assumed		No data found
Water	Reasonable	50	Index of Stream Condition for reaches entering Corner Inlet & Nooramunga (2004) Water Quality (2002) – nutrients poor, other parameters excellent (Turbidity, DO, Phos)	DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition. Water Ecoscience (2002) Victorian Water Quality Monitoring Annual Report West Gippsland Waterwatch Data Report (2003)	Method different to 1999 ISC, not directly comparable. Reach # 20, 21, 25, 27, 28, 33, 36 in SG Basin Interpreted data from monitoring stations leading into Corner Inlet
Biodiversity	Good	40	Shoreline Vegetation & Seagrass Marine Invertebrates Marine Pests – Spartina Fish	Corner Inlet RAMSAR Site Strategic Plan (1999). Parks Victoria Corner Inlet Marine National Park Management Plan (2005). Parks Victoria /WGCMA partnership Spartina control program FCC Annual Report 2003/04 & 2004/05	Description Description Catch & Effort Data for Commercial species past 20 years
Air	NA	0			

Key Condition Summary Points

- Reasonable environmental condition evidenced by fish stocks and some water quality parameters
- Serious concerns about nutrients and sediments entering Corner Inlet and the presence of environmental weeds (Spartina).
- Significant loss of seagrass habitat.

6.6.3 Stewardship Summary

Corner Inlet falls within the boundaries of South Gippsland Shire Council and West Gippsland Catchment Management Authority. The Corner Inlet Marine National Park Management Plan (Parks Victoria, 2005) emphasised the need for a collaborative approach to planning and management by responsible organisations, both in the immediate location and throughout the catchment. The plan recognised the West Gippsland Regional Catchment Strategy (WGCMA, 2004) and Integrated Coastal Planning for Gippsland - Coastal Action Plan (Gippsland Coastal Board, 2002) as two mechanisms to achieve integrated outcomes. A draft Management Plan for Corner Inlet and Nooramunga Marine and Coastal Parks is in preparation, due to be completed in July 2008. This document will provide sound scientific basis for park management, and the opportunity for community input and ongoing participation in management (Parks Victoria, 2008).

Significant investment has been made to the Corner Inlet Coastal Catchment Initiative (CCI) by various agencies. The establishment of the Corner Inlet CCI steering committee during 2007 represents significant progress in the stewardship of this asset – a large step in achieving the repeatedly recommended collaborative approach to its management.

The West Gippsland River Health Strategy identifies Corner Inlet and Nooramunga Marine and Coastal Park as high priority areas (WGCMA, 2005).

The CSIRO environmental audit conducted in 2005 made recommendations regarding better planning to improve land use management practices, drainage planning and improved monitoring and mapping of Corner Inlet (CSIRO, 2005).

An Ecological Character Description – Corner Inlet RAMSAR Site, recording changes to the area since the RAMSAR declaration in 1982, is being collated in accordance with the DSE Ecological Character Framework (DSE, 2005 under revision). This will provide the benchmark to monitor condition change in the future.

The National Parks Act now provides consent for Gippsland Ports to manage and maintain infrastructure within Corner Inlet and Nooramunga Marine and Coastal Parks, transferring the responsibility from Parks Victoria to an agency specialised in managing such infrastructure.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Reasonable	<ul style="list-style-type: none"> - Corner Inlet Marine National Park Management Plan (2005) - Corner Inlet RAMSAR Site Strategic Management Plan (2002) - West Gippsland River Health Strategy (2005) - Gippsland's Water Quality Action Plan (2005) - Gippsland Ports Safety and Environmental Management Plan – South Gippsland (2005) - Gippsland Estuaries Coastal Action Plan (2006) - South Gippsland Stormwater Management Plan - Corner Inlet Fisheries Habitat Association Environmental Management Plan (2004) - Draft Management Plan for Corner Inlet and Nooramunga Marine and Coastal Parks under preparation (due July 2008) - Barry Beach Port Environmental Management Plan and Environmental Committee.
Implement	Reasonable	<ul style="list-style-type: none"> - Spartina mapping and spraying - partnership project between Parks Victoria and West Gippsland CMA - River Health on-ground works program – South Gippsland - Achieving Water Quality Outcomes in South Gippsland through nutrient extension with dairy farmers
Evaluate	Poor	<ul style="list-style-type: none"> Corner Inlet Environmental Audit (2005) West Gippsland Waterwatch Nooramunga Corner Inlet Volunteer Monitoring Project Seagrass Monitoring project - State wide Sea Search monitoring program. Wader and Shoreline bird monitoring program Ecological Character Description – Corner Inlet RAMSAR site
Improve	Poor	
Partnerships	Poor	<ul style="list-style-type: none"> Coastal Agencies Liaison Group Spartina control program – Parks Victoria and West Gippsland CMA Parks Victoria providing advice to South Gippsland Shire Council on proposed dredging of Toora Boat Ramp Profile Partnerships Project, Parks Victoria and Museum Victoria promoting marine environment to the community. Parks Victoria and DSE conducting wader and shoreline bird monitoring program

Key Stewardship Summary Points

- Establishment of the Corner Inlet steering committee represents significant progress in the stewardship of this asset.
- Corner Inlet Character Description will provide a benchmark to assess and monitor environmental condition changes in the future.
- Revision of the Management Plan for Corner Inlet and Nooramunga Marine and Coastal Parks (due July 2008) will provide sound scientific basis for park management and provide opportunity community participation in management.

6.6.4 For more information

- Parks Victoria Foster (03) 5683 9007 or visit www.parkweb.vic.gov.au
- West Gippsland Catchment Management Authority (03) 5175 7800 or www.wgcma.vic.gov.au
- Department of Sustainability and Environment, Ecological Character Description - Corner Inlet RAMSAR Site.
<http://www.dse.vic.gov.au/DSE/nrence.nsf/LinkView/25C78F0422CD4887CA25729D0000B8A048DB09C3A9A254C5CA257297001AE7C0>

6.7 FORESTS OF EAST GIPPSLAND

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
B	B	B	B	B	B	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★

6.7.1 Asset Description

The Forests of East Gippsland cover 1.2 million hectares of mostly forested land that coincides with the boundaries of the East Gippsland Forest Management Area. The value of this area is two fold – biodiversity and resource utilisation. The area includes seven National Parks: Alpine (Cobberas – Tingaringy Unit), Snowy River, Errinundra, Coopracambra, Croajingalong, Alfred and Lind (CRA, 1996).

The East Gippsland Regional Forest Agreement (between State and Federal government) was signed in 1997, the first agreement of its kind in Australia. Under the Agreement, some 350,000 hectares of State Forest are available for harvesting in the General Management Zone (CRA 1996). Important natural values in the Forest Management Area are protected in Special Protection Zones. The Agreement also sets aside almost half the region's 1.2 million hectares as reserve, excluded from logging.

Within the Parks there are examples of warm temperate rainforest, cool temperate rainforest, open and tall wet eucalypt forests (grey gum, messmate, silvertop ash, and alpine ash), coastal woodland, and coastal heathland.

Species of significance include various migratory seabirds and waders, the East Gippsland Waratah, the mountain plum pine (unique to the Errinundra Plateau), brush-tailed rock wallaby; threatened species including the Ground Parrot, Eastern Bristlebird, Smoky Mouse, Grey-headed Flying Fox and Australian Fur Seal.

Heritage Rivers are found in Coopracambra and Snowy River National Parks.

Bioregion reference: Victorian Alps, East Gippsland Uplands, East Gippsland Lowlands and Monaro Tablelands

6.7.2 Condition Summary

Coopracambra National Park is recognised as one of the largest areas of high quality wilderness in south eastern Australia (Parks Victoria, 2000).

Commercial timber harvesting occurs under the Regional Forest Agreement and the Code of Forest Practices. The Victorian State Government's 'Our Forests, Our Future' policy of 2002 reduced the estimated annual sustainable yield in the East Gippsland Forest Management Area by 43% in light of updated forest inventory data (State of Victoria 2002).

Areas of State forest affected by the 2003 Alpine bushfires have been salvage logged.

VicForests, the agency responsible for sustainable harvest and commercial sale of timber in Victoria, achieved certification under the Australian Forestry Standard in February 2007.

The forests of East Gippsland were not significantly affected by the major rain events of 2007 (DSE, 2008).

Condition Evidence Summary

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
Land	Good Excellent	- 40	Assumed Weed mapping complete and management of priority areas occurring.		
Water	Excellent	20	Index of Stream Condition for East Gippsland Basin (2004) Stream condition % length: 69% Excellent 30 % Good 1 % Moderate	DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition.	Method different to 1999 ISC, not directly comparable.
Biodiversity	Good Excellent	- 40	Assumed Southern Ark predator control program Ecofire vegetation type-specific fire regime x	DSE, 2008 Ecologically based fire management plans complete for entire Fire Management Area	In conjunction with native mammal and fox population monitoring program Landscape scale burns of low intensity at optimum frequency.
Air	NA	0			

Key Condition Summary Points

- Commercial timber harvesting in accordance with revised Code of Forest Practices for Timber Production.
- Significant proportion of forested area supports high land, water and biodiversity values.
- Several ecosystems in pristine condition protected by National Parks and Special Protection Zones.
- Ecologically based fire regime designed to enhance biodiversity by burning at vegetation-type-specific optimum intensity and frequency.

6.7.3 Stewardship Summary

Department of Sustainability and Environment is responsible for managing the public native forest in the East Gippsland Forest Management Area for multiple uses, working from the 1995 Forest Management Plan. Many actions from the East Gippsland Forest Management Plan have been completed and most actions are on-going (DSE, 2004).

VicForests is responsible for the sustainable harvest and commercial sale of Victoria's forest timber, as well as forest rehabilitation and silviculture.

The Environment Protection Authority appoints an independent auditor to conduct an annual review of timber harvesting compliance with the Code of Practice for Timber Production (2006). The audit report for the 2006/2007 audit has not been published at time of printing however, the draft audit indicates improvement in compliance from 2005/2006 (VicForests, 2007). Each year the compliance percentage has risen and initial findings suggest this year's rating of 94%.

The Regional Forest Agreement is due for review in 2008.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Good	East Gippsland Forest Management Plan Coopracambra National Park Management Plan Errinundra National Park Management Plan VicForests Sustainable Forest Management Policy Our Forests, Our Future 2002 Code of Practice for Fire Management Code of Practice for Timber Production
Implement	Good	DSE Forests, Vicforests Weed management in response to mapping program Stream crossing remediation in response to infrastructure audit.
Evaluate	Good	Victoria's State of the Forest Report Monitoring Annual Harvest Performance 03/04 (Expert Independent Advisory Panel, May 2005) East Gippsland Environment and Heritage Report - Prepared for Regional Forest Agreement process. Environment Protection Authority Forest Audit (2007 audit release pending) Weed mapping complete for substantial part of the Fire Management Area, Stream crossing audit complete
Improve	Good	Monitoring Annual Harvest Performance Code of Forest Practice for Timber Production Environment Policy for Victoria's State Forests (ISO 14001 Cert under development)

Indicator Theme	Score	Key Evidence
Partnerships	Reasonable	<p>DSE, Vicforests, Parks Victoria</p> <p>DSE, DPI And Parks Victoria In Delivery Of Southern Ark Program</p> <p>DSE, Parks Victoria, Country Fire Authority And Community Groups In Implementation Of Ecofire Burn Regime.</p> <p>Parks Victoria, DSE And Landcare groups in implementing weed management program.</p> <p>Area Coordination Team fosters cross agency coordination of programs</p>

Key Stewardship Summary Points

- Initial findings of the independent audit against the Code of Practice for Timber Production indicate 94% compliance.
- Improved cross agency coordination of programs with regular Area Coordination Team meetings.
- Agencies continue to work towards achieving a balance between utilisation of natural resources and protection of biodiversity values.
- Changes to the institutional and governance arrangements have occurred in recent years.
- The already high level of stewardship has been maintained.

6.7.4 For more information

- Department of Sustainability and Environment, Orbost, 51611222 www.dse.vic.gov.au/
- Parks Victoria Information Centre 13 1963 or www.parkweb.vic.gov.au
- VicForests – Bairnsdale, 5152 0400 www.vicforests.com.au/



6.8 GIPPSLAND LAKES

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
C	C+	C+	C+	C+	C	★★	★★★	★★★	★★★★☆	★★★★☆	★★★★☆

6.8.1 Asset Description

The Gippsland Lakes are the largest estuarine coastal lagoon system in Australia. Comprising three main lakes – Lake Wellington in the west, Lake Victoria, and Lake King in the east – the Lakes are the largest navigable estuarine lagoon system in Australia. The Lakes are approximately 70 kilometres long and 10 kilometres at the widest point. They are from Bass Strait by the narrow Ninety-Mile Beach and dune system. Until 1889, when a permanent opening to the sea was established, the Lakes were predominantly a freshwater and marsh system. The opening at Lakes Entrance caused an increase in the average salinity (Gippsland Lakes and Catchments Taskforce, 2004).

Fresh water enters the lakes from six major river catchments: the Latrobe, Thomson-Macalister, Avon, Mitchell, Nicholson and Tambo, which together drain a catchment area of 20,600 square kilometres. These rivers are the main source of fresh water and provide an important role in flushing the Lakes. The fresh water in-flow is also the source of most of the nutrient and sediment inputs to the Lakes.

The Gippsland Lakes maintain high recreation and tourism values while supporting more than 540 native plant and 300 native animal species (including five endangered species) (DSE, 2008). Some China- and Japan- Australia Migratory Bird Agreement species can be found on the Lakes.

The area is listed as a RAMSAR wetlands site, giving international recognition to the natural values and giving some indication of its ecological significance. The RAMSAR site is approximately 60,000 hectares. The Gippsland Lakes Coastal Park is within the asset boundary.

Bioregion reference: Gippsland Plain

6.8.2 Condition Summary

An environmental audit by CSIRO in 1999 concluded that the Gippsland Lakes system was approaching a level of severe environmental damage that may be difficult to reverse. Long term changes in ecological character in the Gippsland Lakes were primarily attributed to changed water and salinity regimes associated with the permanent artificial entrance from the sea, and reduced water quality and quantity associated with changed land and water use in the catchment. Severe and increasingly frequent algal blooms are the most noticeable symptom. The CSIRO audit also indicated that there are high sediment and nutrient levels entering the Lakes system, some degradation of hinterland flora and fauna, and some indication of decline in fish numbers and seagrass. Shoreline erosion continues due to loss of saline intolerant fringing vegetation. Dryland salinity occurs in low lying areas around Lake Wellington (Bengworden area, Kilmany/Pearsondale and Lake Coleman) (SKM 2003).

The State of the Gippsland Lakes report (2004), providing the first update since the CSIRO audit was conducted, indicated a more integrated and consistent monitoring program was required to understand the environmental condition of the Lakes (Gippsland Lakes and Catchments Taskforce, 2004).

The west end of the Gippsland Lakes Coastal Park has suffered severe erosion on its ocean beaches with steep dune cliffs (Parks Victoria website, 2008).

After several years of drier conditions and low river flows that resulted in increased lake salinity, the 2007 floods delivered approximately 80% of the annual nutrient load in a single event. This in turn resulted in an extensive and long lasting algal bloom.

Ongoing implementation of the Gippsland Lakes Future Directions and Action Plan (GLDS&AP) continues to result in nutrient load reductions and a reduced frequency of algal blooms. Projects in the feeding catchments are also working towards a reduction in nutrient and sediment load.

Condition Evidence Summary

Indicator Theme	Score	Weight%	Key Evidence	Evidence Source	Data Comment
Land	Reasonable	10	Shoreline Erosion	Shore Erosion and Revegetation Strategy, 2002	No recent monitoring, slow rate of decline. Trials on foreshore erosion techniques funded and commenced in 2006. Basis for long-term implementation of erosion control of foreshore areas.
Water	Reasonable-good	50	Water Quality Data – including algal blooms (1999-2003) Wetland Health Data (1999-2004)	State of the Gippsland Lakes Report 2004	Water quantity and biological water quality data EPA monitoring for 12 months to mid 2007 indicated reduction of 64% nitrogen and 73% phosphorus loads entering the Lakes – due largely to 51% reduction in volume of inflowing river water.
Biodiversity	Poor	40	Commercial Fish Stocks, Seagrass (1997) and Carp numbers	State of the Gippsland Lakes Report 2004	No additional data available. Missing seagrass and collated data for birds. More information about fish and the links to ecological health and habitat would be useful.
Air	NA	0			

Key condition summary points

- CSIRO (1999) concluded the condition of the Lakes was nearing severe environmental damage. State of the Gippsland Lakes report (2004) suggested more consistent and integrated data was required to diagnose the Lakes' health.
- After a period of reduced nutrient and sediment influx, a significant increase in sediment input and turbidity was experienced after the 2007 floods, primarily from the Mitchell and Macalister Rivers.
- The resulting algal bloom persisted for an extended period and affected recreational and environmental values.
- Initiatives under the GLDS&AP continue to decrease nutrient load and algal bloom frequency.

6.8.3 Stewardship Summary

The findings of the CSIRO audit prompted the Victorian Government funded Gippsland Lakes Rescue Package - \$12.8 million and the development of the Gippsland Lakes Future Directions and Actions Plan - an overarching plan to provide a high level and integrated approach to the management of the Gippsland Lakes and their catchments. The Action Plan aims to reduce nutrient input to the Lakes by 40% by 2022. The Gippsland Lakes and Catchments Taskforce has been coordinating the implementation of this Plan and undertook to determine the veracity of the target during 2007. It was determined that the target would remain with a continued focus on phytoplankton and hypoxia.

Taskforce membership includes government agencies and statutory authorities with responsibility in the Gippsland Lakes catchment. The implementation of the Future Directions and Actions Plan was independently, and favourably, evaluated in 2006 (URS Australia, 2006).

During 2007 the GLDS&AP included projects under the following 'themes':

- Nutrient and sediment reduction (agriculture, forestry and public land, urban nutrient);
- Capacity Building (community);
- Wetland (protection); and
- Planning (Lakes system water, Lakes Catchment, Planning evaluation).

The Gippsland Lakes area is shared by both East and West Gippsland Catchment Management Authority areas. Both East and West Gippsland Regional Catchment Strategies acknowledge that integrated catchment management is required to care for and protect the Gippsland Lakes. (WGCMA 2004), (EGCMA 2005).

The State of the Gippsland Lakes report (2004) provided the first update on environmental condition of the Lakes since the CSIRO environmental audit. The report concludes that while currently available data give some indication of Lakes health, a more integrated and consistent monitoring program is required to gain a better picture of the environmental condition of the Gippsland Lakes (Gippsland Lakes and Catchments Taskforce, 2004).

Trials on foreshore erosion techniques commenced in 2006 and will provide the basis for long-term implementation of foreshore erosion control measures.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Good	<ul style="list-style-type: none"> - Gippsland Lakes Future Directions & Actions Plan (2002) - Schedule F3 – SEPP Waters of Victoria – Gippsland Lakes and Catchment (1998) - Gippsland Lakes RAMSAR Site – Strategic Management Plan (2003) - Long Term Management Plan for Dredging Lakes Entrance 2005-2015 (2005) - Gippsland Ports Safety & Environmental Management Plan: East Gippsland Ports (2005) - The Lakes National Park and Gippsland Lakes Coastal Park Management Plan (1998) Gippsland's Water Quality Action Plan (2005) Gippsland Lakes Coastal Action Plan – subject to review Funding obtained for development of ecological monitoring program for Gippsland Lakes - Funding obtained for development of ecological characteristics of RAMSAR wetlands
Implement	Reasonable	<p>Ongoing investment in GLFD&AP projects by Taskforce</p> <p>Taskforce applied for State government committed a further \$6.0 million (over next three years) for ongoing implementation of the GLFD&AP (in addition to original Gippsland Lakes Rescue Package \$12.8 million over 5 years)</p> <p>Projects funded by Gippsland Lakes Rescue plus leverage from private/other funding in the range of \$0.85 – \$1.35 for every \$1 of State Government funding)</p> <p>Environmental Water Reserve – Gippsland Lakes</p>
Evaluate	Reasonable	<p>State of the Gippsland Lakes Report 2004</p> <p>Future Directions and Actions Plan Evaluation (2006).</p> <p>EPA Monitoring program (ongoing)</p>
Improve	Good	<p>Gippsland Lakes Research Program</p> <p>GL Taskforce commissioned four bodies of work to refine research investment strategy.</p>
Partnerships	Good	Gippsland Lakes & Catchment Taskforce.

Key Stewardship Summary Points

- Independent evaluation (URS, 2006) shows good progress towards understanding nutrient impacts on Lakes, dynamics of the Lakes themselves, and in raising community awareness.
- A broad range of initiatives is being implemented by a range of agencies. The Gippsland Lakes Taskforce continues to refine the knowledge and understanding of nutrient sources and activities and the ecological functioning of the Lakes.
- A collective agency approach was required to manage the extensive algal bloom after the 2007 floods.
- Continued implementation of the GLDS&AP represents a continued high level of stewardship.

6.8.4 For more information

- Gippsland Coastal Board, Gippsland Lakes Planning Officer, 5152 0400 or www.gcb.vic.gov.au

6.9 LATROBE GROUP AQUIFER

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
			F	F	F				★★	★★	★★☆

6.9.1 Asset Description

The Latrobe Group Aquifer is the deepest groundwater bearing rock layers within the Gippsland sedimentary basin. The aquifer contains good quality groundwater onshore and massive hydrocarbon resources offshore (Holdgate, 2003) where it is the main source of oil and gas in the Bass Strait oil fields. The salinity of the groundwater within the aquifer is typically below 500mg/L making it suitable for most uses, including potable water (Segment A under the State Environment Protection Policy (Groundwaters of Victoria)). Bore yields vary between five and 100 litres per second.

Significant groundwater recharge to the Latrobe Group occurs where it outcrops around the northern and western margins of the Gippsland Basin. Recharge to the aquifer also occurs through vertical leakage from overlying aquifers (eg. Balook Formation).

The Latrobe Group Aquifer supports a variety of industries across South and Central Gippsland. Total groundwater extraction from the aquifer is approximately 120,000ML per year. The largest portion of this stems from offshore oil and gas production, with extraction rates of approximately 90,000ML per year. Offshore oil and gas production is expected to cease by the year 2023, although additional reserves are being actively explored.

Extraction rates associated with the Latrobe Valley coalmine dewatering range from 20,000 to 30,000ML per year. In the Yarram area, approximately 5,000ML per year are used for irrigation purposes with a further 3,00ML/year for consumptive purposes (Australian Natural Resource Atlas website, 2008).

6.9.2 Condition Summary

Over the past 30 years, groundwater levels in the Latrobe Group Aquifer have declined by an average of approximately 1.1 meters per year (SKM, 2004). This decline is due to the extraction rate exceeding the rate of recharge to the aquifer. CSIRO (2004) states that recharge is in the order of 80,000ML per year while total extraction is approximately 120,000ML per year. The CSIRO investigation of falling groundwater levels in the Latrobe Group Aquifer suggests a continuing decline in the condition of the aquifer (supported by monitoring conducted by Southern Rural Water, (SRW, 2008)). A more recent CSIRO report (2007) has, for the first time, more accurately identified the likely location and extent of coastal subsidence (caused by extraction from the aquifer).

Impacts of declining groundwater levels include:

- Groundwater quality that is likely to decline due to human impact on the aquifer;
- Economic impacts on the Yarram irrigation industry as producers have to drill deeper bores for irrigation;
- Impacts on groundwater-surface water interaction where stream base flows could be reduced as they cross the near-surface Latrobe Group and Balook Formation. The loss of base flow during the summer months will be a significant issue because reduction of flow during low flow periods can impact significantly on river ecology. It could also impact on the reliability of surface water supplies for urban, stock and domestic and irrigation purposes;
- Salt water intrusion in the offshore and near shore areas due to a lowering of hydrostatic pressure; and
- Land Subsidence due to compaction of overlying strata associated with falling groundwater levels.

Condition Evidence Summary

Indicator Theme	Score	Weight%	Key Evidence	Evidence Source	Data Comment
Land	Poor-Reasonable	10	Potential subsidence	Comparison of 2007 survey results to 2002 baseline survey undertaken on behalf of Department of Primary Industries. No statistically valid subsidence is detectable CSIRO, 2008	CSIRO modelling suggests under a realistic scenario there is risk of up to 0.48m subsidence by 2056.
Water	Degraded	90	Sustained groundwater level decline averaging 1.1m/year region wide	Water level data from State Observation Bore Network	Spread of observation bores is adequate to conclude the groundwater level decline is sustained both spatially and temporally.
Biodiversity	NA	0			
Air	NA	0			

Key condition summary points

- Current groundwater quality high (less than 500mg/L total dissolved solids)
- Groundwater level decline in the Latrobe Group Aquifer averaging approximately 1.1m per year for last 30 years.
- Groundwater level decline impacts on groundwater based irrigators in the Yarram region, is likely to result in reduced base flow to streams in the Tarra River area.
- CSIRO (2007) modelling suggests under a realistic scenario there is risk of up to 0.48m land subsidence along Ninety Mile Beach by 2056.

6.9.3 Stewardship Summary

The 2007 CSIRO report has, for the first time, identified the most likely location and extent of coastal subsidence (caused by extraction from the aquifer). Detailed coastal inundation maps, which incorporate potential sea level rise, have been prepared. Detailed land surveys continue in an effort to detect coastal land subsidence related to changed aquifer conditions.

- On-shore management of aquifer and land subsidence

Victoria's approach to groundwater resources management is to define 'Groundwater Management Areas (GMA)' for aquifers with a high use/potential for high use. A geographic boundary and a vertical depth extent define GMAs that are assigned a 'Permissible Annual Volume (PAV)' - loosely a measure of the sustainable yield from the given aquifer. The PAV is based on the net annual recharge to the aquifer - usually calculated as the vertical recharge for "unconfined aquifers" connected to surface processes, and the volume of through flow for "confined aquifers" separated from surface processes. The PAV is a difficult parameter to estimate and there is generally a high degree of associated uncertainty.

The Rural Water Authorities use the PAV values to define the maximum allowable groundwater allocation within any one GMA. In some cases, the PAV figures were calculated too late to restrict allocations, resulting in some GMAs being over-allocated. Ideally, when the allocation in a GMA reaches 70% of the PAV, a 'Water Supply Protection Area (WSPA)' can be declared. A WSPA requires a government appointed management committee to compile a Groundwater Management Plan for the region to ensure long-term sustainability of the resource.

Southern Rural Water (SRW) is the agency responsible for the issuing and managing groundwater licences for on-shore extraction. Under the direction of the Department of Sustainability and Environment, SRW is also responsible for developing a formal groundwater management plan for the Yarram Water Supply Protection Area.

In recognition of the decline in aquifer condition financial assistance has been offered through the National Water Initiative to irrigators needing to deepen bores to maintain access to water. Although this supports the landholders by allowing continued extraction, it facilitates continued degradation of the asset.

CSIRO modelling on the extent of likely land subsidence in the Gippsland Basin was released in early 2008.

- Off-shore management of aquifer

The management of offshore gas, oil and groundwater extraction is a joint Commonwealth/State responsibility under the Commonwealth Petroleum Submerged Lands Act that covers the area greater than three nautical miles off-shore. The Department of Primary Industries is the State Government authority responsible for administering the State responsibilities as part of this Act.

Commonwealth funding of \$5.2 million for research was announced in early 2007.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence	Comment
Plan	Reasonable-Poor	Groundwater Management Plan currently being developed for the Yarram WSPA.	No formal management plan to manage effects of off-shore extraction. No formal management plan for Stratford GMA. Federal Govt. has allocated \$5.2M for a study into the declining water levels of the aquifer and the potential for subsidence.
Implement	Poor	Current actions restricted to freeze on additional licence in Yarram and Stratford GMAs.	No actions to mitigate effects of off-shore gas and oil extraction on the observed on-shore decline in groundwater levels
Evaluate	Reasonable	Adequate groundwater monitoring network. Commencement of subsidence monitoring with baseline survey in 2003 and follow up survey in late 2005.	
Improve	Poor	Monitoring used to assess the sustainability of the current extraction and potential for subsidence.	
Partnerships	Poor	Yarram WSPA community based committee formed and begun to develop the Yarram Groundwater Management Plan	

Key Stewardship Summary Points

- Groundwater Management Plan for the Yarram WSPA by a Government appointed community and agency group is in draft for consultation.
- CSIRO has reported, for the first time, the likely location and extent of coastal subsidence as a result of aquifer decline.
- Coastal inundation maps incorporating potential sea level rise have been prepared. ;

6.9.4 For more information

On-shore:

- Groundwater management: Southern Rural Water: (03) 5139 3100; Department of Sustainability and Environment: (03) 9637 8000

Subsidence:

- Department of Primary Industries: (03) 9637 8000; Gippsland Coastal Board www.gcb.vic.gov.au (03) 5152 0451

Off-shore:

- Department of Primary Industries: (03) 9637 8000



6.10 LATROBE RIVER

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
	D	D	D	D	D		***	***	***	***	***

6.10.1 Asset Description

The Latrobe River Basin includes the Latrobe, Tanjil, Tyers, Moe, Morwell, and Traralgon river systems. Rivers of the Latrobe rise on the southern side of the Great Dividing Range and the northern side of the Strzelecki Ranges, draining Lake Wellington, the westernmost of the interconnected Gippsland Lakes. Rivers of the Latrobe Basin are characterised by their large size and capacity, forested upper reaches, extensive floodplain areas in the middle reaches, and connectivity with freshwater marshes and the Lake Wellington (Gippsland Lakes) RAMSAR wetland environment in the lower reaches.

Bioregion reference: Highlands- Southern Fall, Gippsland Plain

6.10.2 Condition Summary

The Latrobe River has been identified as a stressed river system (WGCMA, 2004). Index of Stream Condition indicates moderate or poor condition for 65% of the length of the Latrobe River and reaches (DSE, 2005). The West Gippsland River Health Strategy identifies several high to very high risks to the river health of Latrobe including: bed instability, bank erosion, channel modification, flow deviation, water quality, exotic flora, degraded riparian vegetation, stock access, loss of in-stream habitat, wetland connectivity and introduced fauna. The Upper Latrobe River sub-catchment is recognised as a representative river within the Victorian River Health Strategy. The entire Latrobe system has a significant influence on the RAMSAR listed Gippsland Lakes area. There is high risk to river and lake health from regulation of environmental flows and outflows from Thomson and Macalister River systems (WGCMA, 2004).

Significant economic value is generated through the supply of water for residential areas, power and paper production and water for irrigation purposes.

The Morwell River diversion is underway and includes re-establishing the river bed (removing the cement pipes) and riparian planting. The works have been undertaken under the direction of the recently published Morwell River Neighbourhood Improvement Plan and will improve fish migration.

The Yallourn mine wall collapse on 14 November 2007 (refer to Section 6.3) resulted in the Latrobe River being diverted away from the mine. Although the diversion had localised impact on water quality and ecology, no long term environmental decline was experienced.

Condition Evidence Summary

Indicator Theme	Score	Weight%	Key Evidence	Evidence Source	Data Comment
Land	Poor	10	Assumed		
Water	Poor	60	<p>Index of Stream Condition for Latrobe River (2004)</p> <p>Stream condition % length:</p> <p>5% Excellent 30 % Good 35 % Moderate 30 % Poor</p> <p>Water Quality – Latrobe River attainment of SEPP – nutrients: low, turbidity/suspended solids: medium & physical parameters: medium-high</p>	<p>DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition.</p> <p>Water Ecoscience (2002) Victorian Water Quality Monitoring Annual Report</p>	Method different to 1999 ISC, not directly comparable.
Biodiversity	Poor	30	Assumed		
Air	NA	0			

Key Condition Summary Points

- Flow stressed river due to multiple domestic, industrial and agricultural uses
- 30% of river length rated as being in poor stream condition; 5% of length in excellent condition.
- Mine wall collapse resulted in short term diversion and impact on water quality and ecology.

6.10.3 Stewardship Summary

Management of the Latrobe River involves several large, intensive users including industry, residents and farmers. Some management plans and programs have achieved improvement in environmental condition, particularly through management of sewerage, wastewater and urban run-off, however, further integrated management effort is required to address the 'stressed river' status of the Latrobe.

The West Gippsland River Health Strategy gives high priority to five of the 11 reaches (total of 115 kilometres) in the Lower Latrobe, three to seven reaches (total of 60 kilometres) in the Upper Latrobe in addition to reaches on the Morwell River and Traralgon Creek, and Lake Wellington. An environmental flow assessment for the Latrobe downstream of Tanjil River confluence including Dowd and Heart Morasses and the Sale Common, is under review. The Central Region Sustainable Water Strategy (CRSWS) allows for a temporary allocation for seven years of 10,000ML per year for environmental flows from unallocated water in Blue Rock dam and unused entitlement at Lake Narracan, pending further research (DSE, 2006).

The annual audit of the CRSWS for 2006/2007 (PriceWaterhouseCooper, Dec 2007) reports that "West Gippsland Catchment Management Authority and DSE will conduct a seven year research program on the Latrobe River to confirm the water required to maintain river health and protect ecological assets and identify complementary river health works which could be used in conjunction with environmental flows to meet the river health targets for the river as set out in the West Gippsland Regional River Health Strategy".

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Reasonable	Central Region Sustainable Water Strategy West Gippsland Regional River Health Strategy Securing our Water Future Together – White Paper Gippsland's Water Quality Action Plan
Implement	Good	River Health On-ground Works Program – Latrobe Basin \$1.5 million over two years
Evaluate	Reasonable	Environmental Flow Assessment Gippsland Regional Water Monitoring Partnership
Improve	Reasonable	Central Region Sustainable Water Strategy Morwell River Environmental Improvement Plan
Partnerships	Reasonable	Gippsland Regional Water Monitoring Partnership

Key Stewardship Summary Points

- Research continues into environmental flows by WGCMA and DSE.
- Morwell River EIP released and restoration works commenced.
- Further integrated management effort is required to address the 'stressed river' status of the Latrobe

6.10.4 For more information

- West Gippsland Catchment Management Authority (03) 5175 7800 or www.wgcma.vic.gov.au
- Department of Sustainability and Environment – Central Region Sustainable Water Strategy www.dse.vic.gov.au



6.11 MACALISTER IRRIGATION DISTRICT

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
D-	D	D+	D+	D+	D	★★★	★★★	★★★☆	★★★☆	★★★☆	★★★☆

6.11.1 Asset Description

The Macalister Irrigation District (MID), located in central Gippsland, is the largest irrigation area south of the Great Dividing Range. The Macalister River is the main source of the district's irrigation water. The MID extends around the river for 53,000 hectares from Lake Glenmaggie to near Sale. Approximately 33,500 hectares are currently used for irrigation, and of this, 90% are under pasture.

The main town in the MID and its business heart is Maffra where Murray Goulburn Cooperative processes much of the milk produced by the district's dairy farmers. Other important centres include Stratford, Heyfield and Sale.

Bioregion reference: Gippsland Plain

The 2007 extreme rainfall and flood events cause extreme damage to the Macalister River catchment however, the condition of the MID Report Card asset was not affected. The Macalister River is not a nominated asset in its own right but is covered as subset of the Thomson River asset (refer Section 6.17).

6.11.2 Condition Summary

Intensive irrigated dairy farming and horticulture in the Macalister Irrigation District has resulted in poor environmental quality onsite and significant offsite impacts such as high nutrient loads entering the lower reaches of Macalister, Thomson and Latrobe Rivers. Significant irrigation-induced salinity exists (50,000 hectares where the water table is two metres or less), exacerbated by extensive clearing and draining of wetlands. Water quality is poor with elevated turbidity levels. There is an upward trend in conductivity/salinity and increasing acidity (SKM, 2003; Victorian Catchment Management Council, 2002).

Inflow to Lake Glenmaggie during 2006/7 was the lowest on record with a total of 65,000ML, compared with an average inflow of around 450,000ML (14.44% of average flow). In contrast, the 2007/2008 extreme inflows saw infrastructure damage and 55,000ML daily releases to the Macalister River. Prior to the floods, Lake Glenmaggie Weir stored approximately 100ML of the 195ML capacity. Inflows in November were approximately 315 ML in less than 24 hours. Flows at Glenmaggie Weir peaked at around 60,000 ML/day (35,000 ML/day is the major flood level) (DHS website, 2008).

The 2006/07 Great Divide bushfires affected approximately 159,400 hectares of vegetation in the upper catchment. The storm events of 2007 resulted in significant erosion, sediment and ash loads into Lake Glenmaggie.

The nutrient load for July to December 2007 was in excess of the full year's target. This did not only impact off site receptors, such as the Gippsland Lakes, as it reflects significant nutrient stripping from the district's farmland. Although the water received through the 2007 floods has increased productivity in the short term (after the initial inundation had subsided), the stripped nutrients will likely result in decreased condition in the long term.

During the 2006/2007 irrigation season there were extended and significant Blue Green Algae blooms in both Lake Glenmaggie and the irrigation channel network. After the massive nutrient load discharge as a result of the floods, the Gippsland Lakes experienced persistent blooms over Summer 2008.

Despite the extreme rainfall events and high weir discharge rates, no formal Environmental water releases occurred from Glenmaggie Weir from the Environmental Water Reserve (WGCMA, 2008) in 2006 or 2007. This has an impact on fish migration, water quality and geomorphology. A new outlet has been installed at Glenmaggie allowing environmental flushes to occur even when dam levels are too low for the original outlet. This will result in increased river health in the future.

The MID Channel Automation Projects aim to recover 25,000ML of water for the Environmental Water Reserve. State Government funding has been granted to generate 5,000ML for improved river health. Associated works commenced in 2006/2007.

The MID 2030 Strategy is in the early stages of implementation. Projects under this strategy will reduce average annual nutrient export to the Gippsland Lakes from over 40 tonne of phosphate to 10 tonne per year.

Condition Evidence Summary

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
Land	Poor	40	<p>Risk of Soil Erosion – water & wind</p> <p>Area affected by salinity</p> <p>Land suitability for purpose</p> <p>Phos levels greatly improved -unprecedented low flows and continued nutrient reduction activities.</p>	<p>SKM, Renewal of the West Gippsland Regional Catchment Strategy, State of the Catchment (2003)</p> <p>SKM, WGCMA West Gippsland Salinity Management Plan</p> <p>Creating Gippsland's Future 03</p> <p>West Gippsland CMA 2007.</p> <p>MID 2030 - Discussion Paper: Opportunity to maximise the full potential of the MID. 2007</p>	From Map
Water	Poor	40	<p>Index of Stream Condition for Macalister River (2004)</p> <p>All reaches in the Moderate to Poor range.</p> <p>Defined Environmental Flows</p> <p>Water Quality Macalister River – attainment of SEPP – nutrients: low, turbidity/suspended solids: medium & physical parameters: high.</p> <p>Very Poor water quality following 06/07 bush fires and subsequent storm events</p>	<p>DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition.</p> <p>Thomson Macalister Environmental Flows Task Force (2004)</p> <p>Water Ecoscience (2002) Victorian Water Quality Monitoring Annual Report</p> <p>West Gippsland Waterwatch Data report (2003)</p>	Method different to 1999 ISC, not directly comparable.

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
			Offsite impact – poor 23% of P loads discharged into Gippsland Lakes is from MID - less than 3% of catchment area	WGCMA DCIP, 2007 EPA, MID Dairy Farms (2003) GLTD, 2002	
Biodiversity	Poor	20	Assumed		
Air	NA	0			

Key Condition Summary Points

- Most natural values are poor with high offsite impacts due to the highly modified landscape and intensive irrigated farming.
- As a result of the floods, the nutrient load from the district during July to December 2007 was in excess of the full year target.
- Although farm productivity levels have risen, the nutrient stripping, as seen in the nutrient load between July and December, is likely to result in long term decline of the asset.
- Federally funded MID Channel Automation Projects will result in a greater Environmental Water Reserve once implemented.
- The new outlet installed at Glenmaggie weir will result in increased river health as environmental flushes will be possible during low dam levels.

6.11.3 Stewardship Summary

A Land and Water Management Plan has been finalised and is awaiting ministerial endorsement. The primary goal of the Macalister Land and Water Management Plan is to integrate the management of natural resource issues impacting on priority assets within and surrounding the area. The plan aims to design a sustainable landscape taking into account the current land use and offsite impacts on priority assets with the implementation of management actions and mechanisms. The Gippsland Lakes is a key consideration within the plan.

In excess of 250 farms participated in an incentive scheme during 2006/2007 to reduce offsite impacts from the Macalister Irrigation district by installing re-use dams or converting to spray irrigation. A large number of Irrigation Farm Plans were also completed during this period. Southern Rural Water has commenced providing feedback to farmers regarding these plans.

The MID 2030 Strategy is in the early stages of implementation and will result in the average annual nutrient export to Gippsland Lakes from over 40 tonne phosphate to 10 tonne per annum.

The Waterway/Surrounds program aims to establish a holistic approach to management and operation of Lake Glenmaggie waterway and surrounds, optimising community opportunities and management effectiveness.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Reasonable	<p>Macalister Land and Water Management Plan (finalised, awaiting ministerial endorsement)</p> <p>West Gippsland Salinity Management Plan</p> <p>MID 2030 Strategy</p> <p>MID Nutrient Reduction Plan</p> <p>West Gippsland Soil Erosion Plan (under development)</p> <p>West Gippsland Wetlands Management Plan</p> <p>Dry Inflow Contingency Plan</p> <p>Blue Green Algae Risk Management Plan</p>
Implement	Good	<p>Incentives and Extension activities – implementation of the MID NRP, Sustainable Irrigation programs</p> <p>Development of Whole Farm Plans & Effluent Management Plans</p> <p>Groundwater pumping</p> <p>Total Channel Control project</p> <p>Re-use systems and spray irrigation</p> <p>MID Channel Automation Projects</p>
Evaluate	Reasonable	<p>Effluent Management Compliance for dairy production systems in the MID – EPA Auditing</p> <p>‘An overview of Whole Farm Planning programs in irrigation areas in Victoria’</p> <p>Mid Term review into Water Smart Farms Funding (2005)</p> <p>Reuse Monitoring by DPI</p> <p>Gippsland Nutrient Extension Program Evaluation 2006</p> <p>MID NRP Annual Report 2005/6</p> <p>Depth to Water Table Maps</p> <p>Salinity Monitoring of 19 public groundwater control pumps and 322 shallow aquifer bores.</p>
Improve	Good	<p>Nutrient Loads per Drain Catchment Area</p> <p>Hydraulic Loading on farms</p> <p>Development of Irrigation Guidelines</p> <p>Variety of MID 2030 papers and projects</p> <p>Development of Whole Farm, Effluent Management, & Irrigation Farm Plans</p> <p>Education and Practice Change in the MID (community awareness)</p> <p>MID publications and knowledge database (under development)</p> <p>Dewatering undertaken to reduce salinity risk to ~16,000 hectares</p>

Indicator Theme	Score	Key Evidence
Partnerships	Reasonable	Nutrient Technical Working Group Wellington Community Salinity Working Group, DPI and WGCMA Macalister Customer Consultative Committees Wellington Community Consultative Committee Waterway/Surrounds program Education, tours and forums linking community and individuals

Key Stewardship Summary Points

- The Macalister Land and Water Management Plan has been finalised and is awaiting Ministerial endorsement.
- The MID 2030 Strategy has been launched and is in the early stages of implementation
- MID Channel Automation Projects represent the greatest investment in MID infrastructure since the 1950's.

6.11.4 For more information

- Department of Primary Industries, Maffra (03) 51470800
- West Gippsland Catchment Management Authority (03) 5175 7800 or www.wgcma.vic.gov.au
- Southern Rural Water (03) 5139 3100 www.srw.com.au



6.12 MITCHELL RIVER

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
B	B	B	B	D	D-	★★★	★★★	★★★	★★★	★★★★☆	★★★★☆

6.12.1 Asset Description

The Mitchell River is a Heritage River, recognised as having very high conservation value, predominantly natural flows, significant fish habitat, relatively intact throughout the entire river system and of significance to the Gippsland Lakes (DNRE, 2002). The Mitchell River is one of only two rivers in Victoria that reach from alpine to ocean. The Mitchell River basin also includes other rivers and creeks of significance such as the Wongungarra, Wonnangatta, Dargo and Wentworth Rivers.

Bioregion reference: Highlands – Southern Fall and Gippsland Plain

6.12.2 Condition Summary

The environmental condition of the Mitchell River suffered severely as a result of long term low river flows, the 2003 Alpine fires and the 2006/07 Great Divide Bushfires. River flows throughout the Mitchell River system were close to, or at historical lows in 2006/2007. Flows at Glenaladale dropped in early February 2007 to less than 3% of the long term average, and less than 0.5 ML per day above the historical minimum for that month. June 2007 saw the first extreme rainfall event which caused flood conditions and flows as high as 900% of the long-term June average (DSE website, 2008).

The Great Divide Bushfires affected a very large area of the catchment. Up stream of Glenaladale, 76% of the area was burnt. Localised severe thunderstorms in 2007 then mobilised sediment and cause severe gulying, in some instances right up to the ridgelines. The sediment and ash mobilised immediately after the fires smothered the substrate and caused high turbidity. Flooding along the water course and downstream then scoured the river bank and beds. Extensive damage to streamside vegetation, introduction of weeds and man made litter to streamside vegetation and deposition of excessive amounts of silt along the watercourse and downstream resulted (Parks Victoria, 2008).

Although significant post fire and flood restoration of degraded areas has been undertaken, the condition of the catchment is considered to be an improvement on that immediately after the floods but not of that immediately after the fires. The condition of the asset has therefore declined since the 2007 Report Card. A response to the revegetation efforts since the 2006/2007 fires will be seen within three years; the vegetation condition should be similar to pre fires within five years (EGCMA, 2008). Slow regeneration of vegetation results in massive erosion and sediment transport potential remaining. This poses significant risk to potable water supply.

An opportunity is presented after fires to control weeds while native vegetation re-establishes. EGCMA is therefore focusing on this aspect of land management to promote catchment and river health.

The East Gippsland Catchment Management Authority (EGCMA) is focusing on areas that are in good condition and can be preserved; and areas where adjacent land managers/owners/licensees are committed to fence maintenance. The exclusion of stock from the riparian zone is seen as essential to maintaining good condition or restoring degraded areas.

Water restrictions have been lifted from all towns and areas in the Mitchell River Supply District. (State-wide Permanent Water Saving Rules apply throughout Victoria.)

Catchment regeneration is likely to adversely affect water yields from the Mitchell River for decades.

Condition Evidence Summary

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
Land	Poor	10	Assumed Vegetation recovery poor after fires and floods resulting in continued potential for erosion and sediment transport. Programs focusing on weed control during native vegetation recovery.	EGCMA, 2008 Parks Victoria, 2008 EGCMA, 2008	Significant portion of catchment affected by 2006/07 Great Divide Bushfires; followed by 2007 floods. Lessons learnt from 2003 fire recovery.
Water	Poor	60	Index of Stream Condition for Mitchell River Basin (2004) Stream condition % length: 27% Excellent 43 % Good 25 % Moderate 5% Poor Water Quality – attainment of SEPP – nutrients: low, turbidity/suspended solids: high & physical parameters: medium Historically low river flows followed by record flow volumes carrying ash and sediment from burnt catchment slopes	DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition. Water Ecoscience (2002) Victorian Water Quality Monitoring Annual Report EGCMA DCIP, 2007	Significant portion of catchment affected by 2006/07 Great Divide Bushfires Method different to 1999 ISC, not directly comparable. 2003 Fires have affected ISC scores for upper reaches. Note this data pre-dates 2006/7 Great Divide fires.
Biodiversity	Poor - Reasonable	30	Assumed		Significant portion of catchment affected by 2006/07 Great Divide Bushfires
Air	NA	0			

Key Condition Summary Points

- Environmental condition of the Mitchell River suffered severely as a result of continued low river flows, the 2003 Alpine fires and the 2006/07 Great Divide Bushfires.
- Although its condition recovered to a degree after the fires, the June 2007 floods caused another significant fall in condition. The asset is now in better condition that it was immediately after the flood but is still not better than immediately post the fires.
- Vegetation recovery in the catchment is poor and the potential for weed invasion is high. Massive erosion and sediment transport potential remains.
- Likely reduced water yields as catchment regenerates.
- Implications for river health and the Gippsland Lakes.

6.12.3 Stewardship Summary

The Mitchell River has been identified by SRW as a priority for developing a Stream flow Management Plan, to protect its ecological integrity. The East Gippsland Water Quality Action Plan targets nutrient reduction from forest and pastureland uses in the catchment (EGCMA & WGCMA, 2005). The East Gippsland Regional River Health Strategy gives priority to all actions in the Lower Mitchell, with a view to improving water quality flows into the Gippsland Lakes (EGCMA, 2005). The Mitchell River appears under the Catchments Asset Class in the East Gippsland Regional Catchment Strategy (EGCMA 2005).

The level of stewardship throughout the Mitchell River catchment has been greatly enhanced as a result of co-operative and lasting efforts, by all asset managers and the community, stemming from the need to manage the combined impacts of prolonged low flow conditions, severe fire and fire fighting efforts, extreme rainfall events and the associated impacts of sediment/nutrient loads.

The Regional River Health and Victorian River Health programs umbrella the various initiatives of the asset managers. Resource allocation is now moving away from emergency response and focusing on the larger picture of catchment and river health.

The Waterway Management in Mitchell River Basin initiative involves establishing agreements under the Crown Lands Act such that landholders or custodians of the river and surrounds are bound to maintaining fencing and excluding stock from fenced areas. The agreements are now binding and are transferred with a transfer of title or grazing licence. The Crown Land Management division of DSE has the powers to enforce the licence conditions while the EGCMA has the funding allocated to develop, monitor and implement agreements.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Reasonable-Good	<p>Dry Inflow Contingency Plan</p> <p>Fire Recovery Plan(s)</p> <p>Gippsland Water Quality Action Plan</p> <p>East Gippsland River Health Strategy</p> <p>Mitchell River National Park Management Plan</p> <p>Waterway Management in Mitchell River Basin initiative (Land Management Agreements)</p>
Implement	Reasonable-Good	<p>Rehabilitation of cleared land to enhance threatened Mitchell River habitats</p>
Evaluate	Good	<p>Fire Recovery Plan(s)</p> <p>Water Quality monitoring</p> <p>Willow and riparian weed mapping and treatment where possible in upper catchment</p> <p>Index of Stream Condition</p> <p>Waterwatch</p> <p>Angus Vale and Glenaladale water monitoring</p> <p>CLM of DSE conducting review of land management agreement status</p>
Improve	Good	<p>Catchment-wide river health improvement works</p>
Partnerships	Good -Excellent	<p>East Gippsland Catchment Management Authority, East Gippsland Water, Parks Victoria, Department of Sustainability and Environment, Parks Victoria, Southern Rural Water and the community working together on Fire Recover</p> <p>Gippsland Regional Water Monitoring Partnership.</p> <p>CLM of DSE and EGCMA Partnered in implementing land management agreements</p> <p>Angus Vale and Glenaladale monitoring EGCMA and EG Water funding partnership</p>

Key Stewardship Summary Points

- Resource allocation refocused on big picture catchment and river health.
- Cooperation between agencies demonstrated in response to succession of natural events including 2003 and 2006/2007 fires and 2007 floods.
- DSE and EGCMA are working together to implement and manage Land Management Agreements under the Crown Lands Act to exclude grazing from sensitive riparian zones.
- The Land Management Agreements are now binding and are transferred with title or grazing licence transfer.

6.12.4 For more information

- East Gippsland Catchment Management Authority, (03) 5152 0600, www.egcma.com.au
- East Gippsland Water, 1300 720 700, 03 5150 4444 or www.egwater.vic.gov.au
- Southern Rural Water (03) 5139 3100 www.srw.com.au

6.13 NINETY MILE BEACH

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
	B	B	B	B	B		***	***	***	***	***

6.13.1 Asset Description

Ninety-Mile Beach extends from McLaughlin's Beach in the south to Lakes Entrance in the north. It is comprised of coastal dunes separating the ocean from the Gippsland Lakes, Jack Smiths Lake and Lake Denison. This asset encompasses the Gippsland Lakes Coastal Park (between Lakes Entrance and Sale) and the Ninety Mile Beach Marine National Park (five kilometres of coast south west of Seaspray). (The Lakes National Park is situated inland from Ninety Mile Beach.)

The sands of Ninety Mile Beach have been found to support the highest species diversity anywhere on earth. In ten square metres, 860 species were identified – 187 species in one square metre (Parks Victoria website, 2008).

Vegetation of the seaward, leached sand dunes includes coastal, swamp and heathy woodland. Sheltered from the wind and salt spray, the vegetation behind the dunes includes Coastal Tea-tree thickets and Coast Banksia woodlands (Parks Victoria website, 2008).

Ninety Mile Beach hosts a number of key infrastructure assets for the Gippsland region including Delray Beach Ocean Outfall, Saline Waste Outfall Pipeline to McGaurans Beach, Tasmanian Natural Gas Pipeline, Bass Strait oil/gas pipelines, and Basslink.

Bioregion Reference: Gippsland Plain and Twofold Shelf

6.13.2 Condition Summary

Ninety Mile Beach and the immediate hinterland has generally had very little disturbance and are in very good condition. Protection of environmental values is afforded through the Lakes National Park, Gippsland Lakes Coastal Park and Ninety Mile Beach Marine National Park.

There is concern regarding potential coastal subsidence resulting from reduced water, oil and gas levels in the Latrobe Aquifer (SKM, 2003, CSIRO, 2008).

There are also potential risks to coastal settlements and environments from climate change-induced higher sea levels, increased storm intensity and altered erosion patterns (CSIRO, 2006 and 2008).

The extreme rainfall events of 2007 caused extensive erosion of the dune system, risking inland wetland systems (West Gippsland Catchment Management Authority, 2008).

Condition Evidence Summary

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
Land	Good	30	Salinity and Acidity mapping	SKM (2003) Renewal of the West Gippsland Regional Catchment Strategy – State of the Catchment	
Water	Good-reasonable	40	Index of Stream Condition (2004) for lower Bruthen Creek (moderate - very poor), Monkey Creek (good), Merriman Creek (moderate) Water Quality data 2002, Merriman Creek Groundwater Quantity	DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition. Water Ecoscience (2002) Victorian Water Quality Monitoring Annual Report CSIRO Report (2004) Latrobe Aquifer	Method different to 1999 ISC, not directly comparable.
Biodiversity	Good - Excellent	30	Birds Fish Marine Mammals Marine Invertebrates Marine Flora Foreshore Vegetation	Ninety Mile Beach Marine National Park Management Plan	Collated from various studies – no formal monitoring program
Air	NA	0			

Key Condition Summary Points

- Generally good condition due to little disturbance and protection via National Park and Coastal Park status.
- Concern regarding potential for coastal subsidence due to reduced aquifer levels.
- Potential impact of sea level rise and storm surges associated with climate change.

6.13.3 Stewardship Summary

The challenge to protect the environmental values of the Ninety-Mile Beach is complex due to the mix of influences from both private and public sectors. Parks Victoria's management plans for the Lakes National Park, Gippsland Lakes Coastal Park and Ninety Mile Beach Marine National Park provide management guidelines. The Integrated Coastal Planning for Gippsland - Coastal Action Plan makes recommendations relevant to planning and development along the coast.

The Coastal Spaces initiative (recommendations published by DSE in April 2006) supports the Wellington Coast Subdivision Strategy of addressing the problem of old and inappropriate subdivisions along the Ninety Mile Beach. The strategy involves focussing development on the existing coastal settlements of Golden Beach/Paradise Beach and returning the areas in-between to either public land or management as large rural conservation lots.

Implementation of the Wellington Coast Subdivision Strategy will also consider the impact of sea level rise, dune erosion and flooding in lake Reeve.

An investigation of erosion history and future threats to Jack Smith Lake, Lake Denison and McGaurans Beach was completed in 2007.

To encourage coordinated effort from improved condition and management, the Woodside – Stradbroke Local Biodiversity Action Plan is underdevelopment.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Reasonable	Ninety Mile Beach Marine National Park Management Plan Lakes National Park Management Plan Gippsland Lakes Coastal Park Management Plan Wellington Coast Subdivision Strategy Coastal Spaces Project Country Towns Water Supply and Sewerage Program Wellington and East Gippsland Shires Domestic Wastewater MgtStrategy Gippsland Estuaries Coastal Action Plan Woodside – Stradbroke Local Biodiversity Action Plan (under development)
Implement	Reasonable	River Health On-ground works program – South Gippsland (Merriman Creek) 38,000 trees planted at Jack Smith Lake by Green Fleet in 2005 Jack Smith Lake fox and rabbit control Dune preservation works
Evaluate	Reasonable	Coastal Processes study - investigate dune erosion history along Beach Sea level rise and flooding impacts on Wellington coast subdivision area Climate Change Impacts Study for the Gippsland Coast
Improve	Reasonable	Wellington Coast Subdivision Strategy Coastal Spaces Project Wellington and East Gippsland Shires Domestic Wastewater Mgt Strategy
Partnerships	Reasonable	Coastal Agencies Liaison Group

Key Stewardship Summary Points

- Management of the Ninety Mile Beach environmental values is undertaken predominantly by Parks Victoria although DSE and Wellington Shire Council support appropriate development of the area.

6.13.4 For more information

- Parks Victoria Information Centre 13 1963 or www.parkweb.vic.gov.au
- Gippsland Coastal Board (03) 5152 0451 www.gcb.vic.gov.au

6.14 NON-IRRIGATED DAIRY FARMING OF WEST AND SOUTH GIPPSLAND



Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
C	C	C	C	C	C	★★★	★★★	★★★	★★★	★★★	★★★

6.14.1 Asset Description

Covering the western rolling hills of the Strzelecki ranges, this asset includes the farming districts and townships of Warragul, Drouin, Leongatha, Korumburra, Mirboo North, Thorpdale and Meenyan. It has historically high annual rainfall with little pasture irrigation. Most agricultural land is used for dairy farming with some horticulture and viticulture. As the metropolitan fringe of Melbourne extends eastward, the area is seeing an increase in population and urbanisation.

Bioregion reference: Strzelecki Ranges and Gippsland Plain

6.14.2 Condition Summary

A long history of extensive clearing has left between 10-50% of remnant vegetation in this area (Victorian Catchment Management Council, 2002). Most of the land is privately owned and primarily used for non-irrigated dairy farming and some horticulture.

Water quality varies across the area - several river reaches showing poor condition (ISC2, 2004). There is a high risk of water erosion and some evidence of soil contamination (Victorian Catchment Management Council, 2002; SKM, 2003)

The Environment Protection Authority conducts an audit program of dryland dairy farm effluent management systems. It is reported that 50 – 60% of systems require improvement on the initial audit with improvement in compliance over subsequent audits. In West Gippsland, audits have been conducted over several years, starting in 2003. No audits were conducted in the South Gippsland region prior to 2007/2008 and, due to lack of funding, only 78 of the target 200 farms have been attended. It can be assumed therefore that a percentage of farms within this asset have effluent management systems that do not comply with regulations for discharge. EPA suggest there is a correlation between catchment health and the number of Pollution Abatement Notices issued – where drought has affected productivity on farms in South and West Gippsland, funds are diverted from infrastructure upgrade.

The GippsDairy Dairying for Tomorrow program reported the following outcomes pertaining to Gippsland farms:

- A change in use of prescription blends of fertilisers from 34% to 53%;
- Farms where effluent is applied to land increased from 80% to 92% of farms;
- Responses indicating 'some' waterways fenced increased from 56% to 73% and 'all' fenced off increased from 19% to 34%;
- Number of dairy farmers involved in NRM groups increased from 33 to 57%.

These results suggest an increased in environmental management and awareness.

Condition Evidence Summary

Indicator Theme	Score	Weight%	Key Evidence	Evidence Source	Data Comment
Land	Reasonable	40	Soil Erosion – Wind and Water	VCMC The health of our Catchments (2002)	
Water	Poor - Reasonable	40	<p>Index of Stream Condition for Tarwin River East & West Branches, Fish Creek & Tarago River (2004)</p> <p>All reaches in the Moderate to Poor range (2 very poor reaches).</p> <p>Water Quality – Tarwin River attainment of SEPP – nutrients: low, turbidity/suspended solids: high & physical parameters: high</p> <p>Lower Tarago River – low attainment of all SEPP</p>	<p>DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition.</p> <p>Water Ecoscience (2002) Victorian Water Quality Monitoring Annual Report</p>	Method different to 1999 ISC, not directly comparable.
Biodiversity	Poor	20	Native Vegetation Extent with reference to pre 1750	VCMC The health of our Catchments (2002)	From DSE GIS corporate database. Interpretation of map showing remnant cover by bioregion.
Air	NA	0			

Key Condition Summary Points

- Little remnant vegetation resulting in poor biodiversity values and high risk of erosion.
- Water quality poor with degraded riparian zones.
- Assumed low compliance rate of effluent management systems and therefore discharge to waterways.
- Funding shortage has resulted in only 40% of EPA audits have been undertaken in the South Gippsland area which likely means a low level of effluent system compliance and consequential impact at discharge points.
- GippsDairy Dairying for Tomorrow program outcomes suggest an increase in environmental awareness and management in the Gippsland region.

6.14.3 Stewardship Summary

This area mostly falls within the West Gippsland CMA region, with some falling within the Port Phillip and Westernport CMA region. South Gippsland and Baw Baw Shire Councils both have responsibilities in this area. The West Gippsland Regional Catchment Strategy recognises the dairying industry as part of the key 'Production' asset for the region and also refers to the agricultural uses of land and water (WGCMA, 2003).

Gippsdairy has developed a 'Regional Natural Resource Action Plan' for the Gippsland dairy industry as part of the national project: "Sustaining our Natural Resources – Dairying for Tomorrow" (NRM Consulting & Terry Makin & Associates, 2001). The action plan identifies whole farm planning, land use change and local planning, sustainable productivity, water use efficiency, nutrient management, effluent management, biodiversity and land protection as the key issues for action. The Natural Resource Action Plan (updated in 2006) divides issues impacting the dairy industry into water, land, and people and industry. Through this plan GippsDairy aims to achieve or support delivery of high priority actions not currently addressed by other agencies. Development of the program involved surveying farmers in 2001 and 2006 and reporting on change in use of prescription blends of fertilisers, effluent application to land; fencing of waterways and the number of dairy farmers involved in natural resource management groups.

Department of Primary Industries indicates partnership at government level is strong however, willingness by older farmers to adopt new management practices is slow.

The WGCMA and EPA have an integrated approach to dryland dairy effluent management, to change land practices to improve water quality. EPA is charged with conducting audits of the farm effluent systems and DPI offer follow up support in developing Effluent Management Plans.

State wide guidelines for management of dairy effluent have been developed by DairyGains.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Reasonable	GippsDairy Regional Natural Resource Action Plan (2001 under review) State wide guidelines for management of effluent developed by DairyGains
Implement	Good	River Health On-ground works program – South Gippsland GipRIP project (established 2002 – ongoing) (recently finished in West Gippsland) Murray Goulbourn piloting a project linking environmental management to web based farmer support system
Evaluate	Reasonable	Water quality monitoring EPA Dairy Effluent Auditing GipRIP project GippsDairy investigating options for pest management related to redheaded cockchafers GippsDairy supporting development of 3 dairy effluent management demonstration sites on farm GippsDairy 'Dairying for Tomorrow' surveyed farmers on various environmental aspects of their operations
Improve	Reasonable	EMS (Beef and Lamb) DPI Ellinbank nutrient research program GipRIP project Improving environmental and enterprise management of farms Gippsland Grows GREEN Grass (5 farmer discussion groups across Gippsland looking at pasture production improvement while minimising environmental impacts) Green Cleaning (project aiming to minimise environmental footprint of washing milk equipment, low temperature active 'detergents' in cold water and reuse of such without impact on hygiene standards) Burra Foods piloting inclusion of DairySAT into their quality assurance procedures Dairy Australia and GippsDairy 'Broadening Pathways to EMS' project in Gippsland. Professional development for farm consultants and milk company field staff - understanding climate change and the regional impacts.
Partnerships	Reasonable	GipRIP project Dairy Effluent System evaluation and management plan development (DPI, EPA) Dairy Australia and GippsDairy are delivering 'Broadening Pathways to EMS' project

Key Stewardship Summary Points

- GipRIP project demonstrates potential of integrated approach to environmental care on dairy farms.
- GippsDairy, DairyGains and the milk processing industry are conducting a significant number of projects aimed at improving environmental management or encouraging sustainable use of resources.
- Lack of EPA funding has compromised the audit and therefore improvement of dairy effluent systems.
- Financial impact of the drought is likely to have had an impact on infrastructure upgrade spending.
- GippsDairy Dairying for Tomorrow program outcomes suggest an increase in environmental awareness and management in the Gippsland region.

6.14.4 For more information

- DPI Ellinbank (03) 5624 2222
- Gippsdairy (03) 5622 6014, www.gippsdairy.org.au
- EPA Gippsland (03) 5173 9800, www.epa.vic.gov.au

6.15 SNOWY RIVER

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
C	C	C	C	C	C	★★★	★★★★	★★★★	★★★★	★★★★	★★★★

6.15.1 Asset Description

The Snowy River flows for over 500 kilometres through a broad range of landscapes from the slopes of Mount Kosciusko in NSW to Marlo on the East Gippsland coast. It is listed as a Heritage River under the Heritage Rivers Act 1992 however, reduced river flows due to the Snowy Mountains Hydro-electric Scheme, together with past land management practices, have significantly altered the Snowy River's ecology over recent decades (East Gippsland Catchment Management Authority, and Department of Sustainability & Environment, 2003).

The Snowy River National Park encompasses the river itself and a large portion of the upper portion of the Victorian catchment.

Bioregion reference: East Gippsland Uplands and East Gippsland Lowlands

6.15.2 Condition Summary

Rivers and creeks in the Snowy River system have 66% of their length in excellent or good condition and 32% in moderate to poor condition (ISC2). Most of the moderate to poor readings apply to the condition of the Snowy River itself, largely due to significantly reduced flows from the upstream extraction of water for the Snowy Hydro-electric Scheme (Victorian Government; Victorian Catchment Management Council, 2002).

Reduction of natural flows and the affect throughout the catchment of human activities has had a significant adverse impact on the ecological condition of the Snowy River in Victoria. Several studies have found all river health components of the Snowy to have altered flow regimes and reduced in-stream values, riparian values, wetland values and water quality (East Gippsland Catchment Management Authority & Department of Sustainability and Environment, 2003). The Snowy River National Park protects natural values along part of the river's length in East Gippsland.

By facilitating natural regeneration, extensive planting and replacing willows with indigenous vegetation, the East Gippsland Catchment Management Authority's Snowy River Project has successfully restored a highly degraded, 40 hectare area of rainforest and riparian vegetation. The project has contributed to the preservation of habitat, species and communities listed under the Environment Protection Biodiversity Conservation (EPBC) Act, the Flora and Fauna Guarantee Act, Rare or Threatened Australian and Victorian Species, East Gippsland Native Vegetation Plan Very High Conservation status, and Rainforest Dependent Migratory species.

Willow management by the East Gippsland Catchment Management Authority has now spanned the river length from the NSW border to Orbost. The upper reaches are now being retreated. As willows have the potential to modify the river form, this is a significant achievement. Blackberries will be the next species to be targeted as they have the potential to modify biodiversity of the river system.

DSE and East Gippsland Catchment Management Authority are working together to establish custodian agreements for the maintenance of fences along riparian zones. The exclusion of stock from the river frontage is crucial to preservation of these areas and the cooperation of the landholders or licencees is a necessity. The agreements, under the Crown Lands Act, are now binding and are transferred with a transfer of title or grazing licence. The Crown Land Management division of DSE has the powers to enforce the licence conditions while the EGCMA has the funding allocated to develop, monitor and implement agreements.

The 2003 Eastern Victorian Fires impacted upon the upper reaches of Snowy River National Park however, the Great Divide Fires of 2006/2007 did not reach this asset.

The major storm and flood event in June 2007 lead to extremely high river flows, flooding along the watercourse and downstream. This event lead to transport of silt along the watercourse and downstream, introduction of weeds, damage to streamside vegetation, and introduction of man made litter to streamside vegetation.

The purge of flood water did not substitute environmental flows required to sustain the natural river health. There remains a lack of base flow, that which mimics the natural snow melt flows of spring, required to improve the environmental condition of this asset.

6.15.3 Condition Evidence Summary

Indicator Theme	Score	Weight%	Key Evidence	Evidence Source	Data Comment
Land	Good	10	Assumed		
Water	Reasonable	60	<p>Index of Stream Condition for Snowy River (2004)</p> <p>All reaches are moderate to poor (1 very poor due to 2003 fires)</p> <p>Water Quantity – flows - poor</p> <p>Water Quality – attainment of SEPP – nutrients: low, turbidity/suspended solids & physical parameters: high</p>	<p>DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition.</p> <p>Assumed</p> <p>Water Ecoscience (2002) Victorian Water Quality Monitoring Annual Report</p>	<p>Method different to 1999 ISC, not directly comparable.</p> <p>2003 Fires have affected ISC scores for upper reaches.</p> <p>Note this is pre-fire data.</p>
Biodiversity	Reasonable	30	Assumed		
Air	NA	0			

Key Condition Summary Points

- Extremely modified flow regimes.
- Water quality poor in reaches affected by 2003 fires.
- Willow management program has reached Orbost and the upper reaches are now being retreated.
- 2007 floods resulted in infrastructure and vegetation damage, introduction of weeds and litter and sediment transport.
- Environmental flows not provided so limiting the environmental condition of the river.

6.15.4 Stewardship Summary

In December 2000, the Victorian, New South Wales and Commonwealth Governments agreed to increase Snowy River flows to 21% over the next 10 years, and committed to increase these flows to 28% in the longer term (EGCMA & Department of Sustainability and Environment, 2003). These flows have not been released.

In 2001, the Victorian Government committed to implementing a 10-year program of rehabilitation works on the Snowy River within Victoria. Snowy River Rehabilitation is a multifaceted, integrated program of rehabilitation works. It encompasses a diverse range of projects that will be implemented co-operatively by Government agencies, community groups and landowners. Snowy River Rehabilitation brings existing plans and strategies together with new initiatives aimed at improving the ecological health of the Snowy River.

Considerable work has already been completed by the former Snowy River Improvement Trust and more recently by the EGCMA, including: riparian revegetation; bank stabilisation; willow removal; and establishment of an in-stream rehabilitation trial.

Priority is given in the East Gippsland River Health Strategy to the rehabilitation of the lower Snowy River, associated with the continued return of an appropriate flow regime (EGCMA, 2004). To date, the agreed environmental flows have not been returned to the Snowy River.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Excellent	Snowy River Rehabilitation Project East Gippsland River Health and Victorian River Health Strategies Gippsland Estuaries Coastal Action Plan Gippsland Ports Safety and Environmental Mgt Plan – East Gippsland
Implement	Good	Snowy River Rehabilitation Project - Plan of Works Snowy River fencing & off-stream watering incentive project Removal of Deddick Catchment Willows (Major tributary of the Snowy) Lower Snowy River Riparian Restoration Project Snowy River Australian Bass stocking East Gippsland Catchment Protection (erosion rehabilitation) Waterway Management in the Snowy Basin School education program
Evaluate	Good	Lower Snowy River Riparian Restoration Project In-stream works changed to modelling program. Willow audit flyovers Bird census on low Snowy (specific restoration sites)
Improve	Reasonable	Snowy River Project (Rainforest and Riparian Restoration) Snowy River National Park Brush Tailed Rock Wallaby predator control Wild dog baiting, Pest plant control

Indicator Theme	Score	Key Evidence
Partnerships	Excellent	<p>Snowy River Rehabilitation Project</p> <p>Snowy River interstate Landcare Facilitation</p> <p>Snowy River Rehabilitation Engagement Plan</p> <p>EGCMA and DSE work together in region wide programs where often the CMA has funding the DSE the legislative tools of enforcement</p> <p>Orbost Angling Club and EGCMA in Bass project</p>

Key Stewardship Summary Points

- High level of intra- and inter-state, and interagency cooperation.
- Partnerships between DSE and EGCMA utilising organisations' strengths and resources.
- Community partnerships and involvement developing.
- Rehabilitation work on a project by project basis improving localised environmental condition.
- Despite significant financial and interagency stewardship, improvement in the environmental condition of the Snowy River is thwarted by the lack of environmental flows.

6.15.5 For more information

- East Gippsland Catchment Management Authority, (03) 5152 0600, www.egcma.com.au
- Department of Sustainability and Environment, Orbost (03) 51611222
- Snowy Project Team, Department of Sustainability and Environment 13 6186



6.16 STRZELECKI RANGES

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
		C	C	C	C			★★★	★★★	★★★	★★★☆

6.16.1 Asset Description

The Strzelecki Ranges Report Card asset is a subset of the Strzelecki Ranges Bioregion, and overlaps with a small portion of the Non-Irrigated Dairy Farming asset. Much of the region is private freehold land dominated by rural-residential living, agricultural land and private forestry. Small pockets of public land also exist.

Tarra Bulga National Park (1,522 ha) is recognised for its important remnant vegetation, characteristic of the Strzelecki Ranges prior to 1750; including fern gullies, excellent examples of mature forest and Cool Temperate Rainforest remnants (Parks Victoria 2000).

The Ranges have significant timber resources and biodiversity values.

Bioregion Reference: Strzelecki Ranges

6.16.2 Condition Summary

Large-scale clearing has left only approximately 26% of vegetation cover, with less than 2% of the bioregion in formal reserves (Biodiversity Action Planning, 2004). There is a high risk of water erosion (SKM 2003). Water quality is generally good except for high nutrient loads which have the potential to cause significant offsite impacts on rivers in the lower catchment, Corner Inlet and the Gippsland Lakes (Water Ecoscience Pty Ltd, 2002; James and Bliersch, 2004).

The extent/condition of remnant vegetation cover (poor), threatened flora species (good), threatened fauna species (poor), and pest plants and animals (poor) is described in Boyle and Lowe, 2004. A small amount of remnant vegetation is well reserved in Tarra Bulga National Park.

The Strzelecki Cores and Links Project (refer Section 6.16.3), whereby perpetual plantation leases are bought to create connected remnant vegetation stands, has been finalised.

Only 30% of replanting has been successful as a result of the drought followed by the floods of 2007. The floods caused significant stream banks erosion, vehicle tracks damage and short term saltation and reduced water quality (Parks Victoria, 2008).

An increase in native vegetation protection was reported and Ecological Vegetation Class mapping of 30,000 hectares was undertaken by HVP Plantations (HVP, 2008).

Condition Evidence Summary

Indicator Theme	Score	Weight%	Key Evidence	Evidence Source	Data Comment
Land	Reasonable	30	Water Erosion – high risk Multiple Outcomes for the Strzelecki Ranges 2007.	SKM (2003) WGCMA, 2007	
Water	Reasonable-Good	30	Index of Stream Condition (2004) for upper Franklin Creek, Albert, Jack & Tarra Rivers, Merriman & Bruthen Creeks, Upper Morwell river, middle Creek, Traralgon Creek (good to moderate) Water Quality data 2002, Upper Tarra River, nutrients (low), physical parameters (high), suspended solids/turbidity (high)	DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition. Water Ecoscience (2002) Victorian Water Quality Monitoring Annual Report	Method different to 1999 ISC, not directly comparable. Reaches 22, 26, 30, 32, 35, 41, 38 in South Gippsland Basin Reaches 20, 22, 12 in Latrobe Basin
Biodiversity	Reasonable-Poor	40	Remnant vegetation (poor), Threatened flora (good), Threatened fauna (poor), Pest plants and animals (poor) Cores and Links Buy-back of leases finalised Area of native vegetation protection increased	Boyle & Lowe (2004) Biodiversity Action Planning Strategic Overview for the Strzelecki Ranges Bioregion WGCMA, 2008 HVP Plantations, 2008	
Air	NA	0			

Key Condition Summary Points

- Extensive clearing over the past century has resulted in land erosion and reduction of biodiversity
- Area is crucial catchment for Corner Inlet and Gippsland Lakes
- Remnant vegetation is well reserved in Tarra Bulga National Park
- Core and Link Buy-back has been finalised
- Area of native vegetation protection has increased

6.16.3 Stewardship Summary

The Strzelecki Ranges Bioregion Action Plan provides a comprehensive regional overview of planning and management of native biodiversity. The plan also outlines management responses for public land (including State forest), local government and private land. More detailed action planning is required at the landscape and local area scales for this action plan to take effect (Boyle and Lowe 2004).

Partnership projects between private forestry, Greening Australia, private landholders and Monash University are making progress in restoration and protection. In addition, HVP Plantations (formerly Grand Ridge Plantations) has become the first major forest manager in Australia to receive Forest Stewardship Council certification, which recognises high standards and continuous improvement in forest management and environmental performance.

The West Gippsland Catchment Management Authority has developed the Grand Ridge Project Plan – Multiple Outcomes for the Strzelecki Ranges, in order to address threatening processes in the eastern Strzeleckis over the next 5 years. This plan will balance production and conservation in a manner and at a scale that is sustainable, while providing local employment and maintaining key “off-site” services, including recharge control, water filtration and carbon sequestration.

The Cores and Links Project, a partnership between HVP Plantations (formerly Grand Ridge Plantations), DSE, local government and community groups, aims to further improve protection and connectivity of core high biodiversity areas while balancing commercial timber production needs.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Reasonable	<p>Strzelecki Bioregion Action Plan</p> <p>Tarra Bulga National Park Management Plan</p> <p>West Gippsland Soil Erosion Management Plan (prioritising steep slopes))</p> <p>Strzelecki Ranges Biodiversity Landscape Plans x4</p> <p>Mount Worth State Park Management Plant (1996) reviewed and endorsed for further five years</p> <p>Fire Management Plan</p> <p>Tarra Bulga Management Plan (revision in progress)</p> <p>Strzelecki Ranges Bioregion Landscape Zone Plans (under development)</p> <p>Traralgon Creek Neighbourhood Environment Improvement Plan</p> <p>Morwell River Waterway Action Plan (Aug 2007) and Morwell River Neighbourhood Environment Improvement Plan (2007)</p> <p>Narracan Catchment Plan</p> <p>West Gippsland Regional Catchment Strategy & Priority Outcomes for 08/09</p>
Implement	Reasonable	<p>Revegetation of Steep Slopes project</p> <p>Cores and Links Project</p> <p>South Gippsland Indigenous Seedbank</p> <p>Strzelecki Ranges Multiple Outcomes Project</p>

Indicator Theme	Score	Key Evidence
Evaluate	Reasonable	Revegetation of Steep Slopes project Lyrebird and owl monitoring
Improve	Reasonable	HVP Plantations Forest Stewardship Council certification Phasing out of grazing, replanting 10 hectares and pest control programs under the Mount Worth State Park Management Plan Macks Creek Warm Temperate Rainforest Restoration Project
Partnerships	Reasonable	Multiple Outcomes for the Strzelecki Ranges Proj. Cores and Links Project Revegetation of Steep Slopes project Jack Albert River Restoration Committee

Key Stewardship Summary Points

- A broad range of initiatives and partnerships have been implemented or established
- The partnerships involve industry, a range of government agencies and the community

6.16.4 For more information

- Parks Victoria Information Centre 13 1963 or www.parkweb.vic.gov.au
- HVP Plantations (03) 5134 3433, www.hvp.com.au
- Greening Australia (South East Region – Victoria) (03) 5662 5201, www.greeningaustralia.org.au



6.17 THOMSON RIVER

Condition Rating						Stewardship Rating					
03	04	05	06	07	2008	03	04	05	06	07	2008
C-	C-	C-	C-	D	D	★★★	★★★	★★★★☆	★★★★★	★★★★★	★★★★★

6.17.1 Asset Description

The Thomson River flows from Mt Gregory in the Yarra Ranges National Park west of Warburton (3,200m) to Sale, where it joins the Latrobe River. The Thomson Reservoir is the largest structure in the catchment, with a capacity of over 1,100GL. From the Thomson Reservoir to Cowwarr Weir, the Thomson River is a fast flowing stream with a rock, gravel and sand bottom, flowing in a confined valley through steep forested terrain. The major natural features of the river in this section are the Narrows, where the river has formed a gorge, and the inflow of the Aberfeldy River. Downstream of Cowwarr Weir, the river flows through flatter, undulating country. Cowwarr Weir marks a major regulation point, with flows divided between two river channels – the 29 kilometre Old Thomson channel, and the shorter 14 kilometres section of Rainbow Creek – and diversion channels. Rainbow Creek was formed due to a channel avulsion during floods in 1952. Rainbow Creek and the Old Thomson River rejoin near Heyfield. From Cowwarr Weir to the Latrobe River, agriculture dominates the landscape, with several rural towns and major population centres lower in the catchment.

The Thomson is classed as a Heritage River (between Thomson Dam and Cowwarr Weir).

Bioregion reference: Highlands-Southern Fall and Gippsland Plain

6.17.2 Condition Summary

Normally exhibiting good water quality, the Thomson River has generally good stream substrate and in-stream habitat, and high quality riparian vegetation in the upper reaches (Sadler and Doeg, 1998). The middle to lower reaches contain high levels of phosphorus and turbidity, with increasing salinity in the lower reaches. Significant loss of riparian vegetation has occurred in the lower reaches, and water course and bed/bank stability is of concern (SKM, 2003). The Thomson Macalister Environmental Flows Task Force (2004) reported that health of the Thomson and Macalister Rivers has been degraded by human activity as evidenced by:

- reduction in abundance and distribution of native fish species throughout the catchment;
- reductions in the in-stream and riparian habitats;
- reductions in water quality in downstream reaches; and
- increases in the abundance and distribution of exotic fish species.

Storage levels in Thomson Reservoir during the 2006/2007 year, due to drought conditions, were the lowest on record, triggering the implementation of Stage 3a Restrictions for Melbourne water users from April 2007.

Passing flows were released from Thomson Reservoir in accordance with the Thomson River Bulk Entitlement and interim changes were made to the 2006/2007 Thomson River Annual Watering Plan for environmental water released from Thomson Reservoir. Melbourne Water manages the Thomson River while West Gippsland Catchment Management Authority manages the environmental flows associated with the bulk entitlement for the Thomson River Environment. Under this arrangement, continuous releases are made from Thomson Reservoir to satisfy nominated flow rates at three down stream locations. The bulk entitlement for the Thomson River Environment allows retention of 10,000 ML of inflow for release to the waterway at a time that would achieve optimal river health (Melbourne Water website, 2008).

Southern Rural Water (SRW) drew on their drought reserve water supply held in Thomson Reservoir during 2006/7 for the Macalister Irrigation District delivering over 16,000ML of irrigation water the Thomson system since November 2006. SRW manages the delivery of passing flows for the Lower Thomson River using an 'or natural' clause, resulting in passing flows below Maffra varying between 50ML/d and 125ML/d.

The 2006/07 Great Divide bushfires affected approximately 62,700 hectares of the catchment – the entire forested section from Thomson Bridget to Cowarr and 95% of Aberfeldy River catchment. The extreme rainfall events that followed resulted in significant stream bank and track erosion, spread of pest plants, short term siltation and reduced water quality, impact to riparian ecological vegetation classes, and loss of large trees and aquatic ecosystems. Significant resources were allocated to flood recovery works and river restoration below Cowarr.

The West Gippsland Catchment Management Authority's Dry In-Flow Contingency Plan 2007/08 reviews the Thomson River to ensure that environmental flows were delivered in a manner responsive to the prevailing conditions and in the most efficient manner to obtain priority ecological objectives. As the Environmental Water Reserve Manager, WGCMA has developed protocols for 'emergency' low flow situations, as indicated by monitoring programs.

Condition Evidence Summary

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
Land	Poor	10	Assumed Floods in 2007 impacted riparian vegetation and therefore bank stability and resulted in weed and litter invasion	Parks Victoria, 2008	
Water	Poor	60	Index of Stream Condition for Thomson River Basin (2004) Stream condition % length: Water Quality – and quantity poor due to drought and 2006/fires followed by rainfalls. Extreme rainfall in 2007 reduced water quality further	DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition. WGCMA DICP, 2007 Parks Victoria, 2008	Method different to 1999 ISC, not directly comparable.
Biodiversity	Poor	30	Assumed Floods impacted aquatic habitats and ecological vegetation classes in the riparian zone	Parks Victoria, 2008	
Air	NA	0			

Key Condition Summary Points

- First environmental flows (10,000ML) released between October 2006 and April 2007. Continuous releases are now made from Thomson Reservoir to satisfy nominated flow rates at three down stream locations
- Benchmark of environmental condition taken and ongoing monitoring planned to assess impact of flows.
- 2007 floods impacted stream condition, vegetation and short term water quality. Exacerbated by the drought conditions experienced until the extreme rainfall occurred.

6.17.3 Stewardship Summary

In 2004, the Thomson Macalister Task Force concluded that river health will further decline if no management changes were implemented; and that condition was unlikely to improve under current management practices. The Task Force identified the necessary environmental water requirements of the Thomson and Macalister Rivers and made recommendations regarding flows for both systems (Thomson Macalister Environmental Flows Task Force, 2004).

The Victorian Government responded in the White Paper “Securing our Water Future Together” (2004) which established the bulk water entitlement for environmental maintenance.

The West Gippsland River Health Strategy has given highest priority to the protection of two (of four) reaches of the Upper Thomson, covering 20km of the river (WGCMA, 2004).

Monitoring of the effectiveness of environmental flow releases is ongoing.

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Good	Central Region Sustainable Water Strategy West Gippsland Regional River Health Strategy Securing our Water Future Together – White Paper Gippsland’s Water Quality Action Plan Dry In-flow Contingency Plan Emergency Response Plan
Implement	Good	Improving environmental flows in the Thomson and Macalister Rivers River Health On-ground Works Program – Thomson Basin Grey Swallow Willow Control Program assisting recovery of Baw Baw Frog Gorse control in Walhalla Historic area (Coopers Creek)
Evaluate	Good	Water Quality and Quantity monitoring Victorian Environmental Flows Monitoring and Assessment Program, ISC Sentinel site data Monitoring of Baw Baw Frog, owls, Weed mapping in Thomson and Aberfeldy Rivers (post floods)
Improve	Reasonable	Thomson Macalister Environmental Flows
Partnerships	Reasonable	Thomson Macalister Environmental Flows Taskforce

Key Stewardship Summary Points

- Environmental flows now continually released in accordance with bulk entitlement.
- Benchmark of environmental condition taken and ongoing monitoring planned to assess impact of flows

6.17.4 For more information

- West Gippsland Catchment Management Authority (03) 5175 7800 or www.wgcma.vic.gov.au
- Melbourne Water www.melbournewater.com.au
- Southern Rural Water www.srw.com.au



6.18 WILSON'S PROMONTORY

Condition Rating						Stewardship Rating					
03*	04*	05*	06	07	2008	03	04	05	06	07	2008
B	B	B-	A	A	A	★★★	★★★	★★★	★★★★	★★★★	★★★★

* Included Corner Inlet rating

6.18.1 Asset Description

One of Victoria's oldest National Parks, Wilson's Promontory maintains 96% native vegetation cover. Less than one percent is cleared for visitor and staff facilities, largely at Tidal River. The Yanakie Isthmus supported some cattle grazing until it was phased out in 1992.

The Park is a declared Biosphere Reserve under the UNESCO Man and the Environment program and is on the National Estate registry. The promontory is described as Victoria's smallest bioregion but it supports 20% of the state's vascular plants (including ~30% of the State's orchids), approximately 50% the State's bird species and about 30% of the State's mammal species (DSE website, 2008). The catchments are currently free of introduced fish species.

Wilson's Promontory was separated from Corner Inlet in the 2006 Report Card.

Bioregion reference: Wilson's Promontory.

6.18.2 Condition Summary

Less than one percent of the National Park has been cleared or otherwise modified.

The 2005 fire in Wilson's Promontory National Park burnt from Tidal River to Waterloo Bay in the east and the Lighthouse station to the south. Approximately 6,200 hectares or 13% of the park was burnt. The fire and subsequent recovery has created a mosaic of unburnt, burnt and recovering vegetation (Parks Victoria 2005).

Of the fire-affected area, 90% has regenerated very well. Vegetation regeneration is slower in some areas, such as Norman Point, due to the exposure to harsh weather conditions.

Monitoring of pre and post fire vegetation is continuing at key sites, including the back of Oberon Bay, which is dominated by Coastal Dune Scrub Mosaic. Coastal Banksia Woodland ecological vegetation class is also being monitored due to slower regeneration. An orchid recovery program has also been implemented.

Pest plant and animal control and threatened species management programs are ongoing. Implementation of dog and horse regulations at Bunurong and Kilcunda-Harmers is increasing protection of shorebirds.

Threats to the biodiversity and excellent environmental condition of the Park include predator impact on threatened animals, pest plants and uncontrolled human impact on sensitive sites (DSE website, 2008).

Condition Evidence Summary

Indicator Theme	Score	Weight %	Key Evidence	Evidence Source	Data Comment
Land	Excellent	30	Assumed		
Water	Good	30	Index of Stream Condition for Tidal River and Barry Creek (2004) Barry Creek measures for EC, pH, Phos & Turbidity (2003) All catchments unmodified by clearing or engineering	DSE (2004) ISC2: Index of Stream Condition: The Second Benchmark of Victorian River condition. West Gippsland Waterwatch Data Report (2003) DSE website, 2008	Method different to 1999 ISC, not directly comparable. Reach # 23, 24 in Sth Gippsland Basin
Biodiversity	Excellent	40	Extent of Native Vegetation with reference to pre-1750 No introduced fish species Mammals	SKM (2003) Renewal of the West Gippsland Regional Catchment Strategy – State of the Catchment DSE website, 2008	Parks Victoria Wilson's Promontory Park Management Plan
Air	NA	0			

Key Condition Summary Points

- Less than one percent of the National Park has been cleared or otherwise modified..
- Good post-fire recovery of biological values.
- Maintenance of biodiversity values through pest plant and animal control programs and monitoring of significant flora and fauna.

6.18.3 Stewardship Summary

The majority of Wilson's Promontory is managed by Parks Victoria. The Wilson's Promontory National Park Management Plan was renewed in 2002, with an increased focus on integrated management and preventing inappropriate commercial development within the park (Parks Victoria, 2002). A management plan has also been prepared for the Wilson's Promontory Marine Protected Areas (Parks Victoria, 2004). Both plans emphasise the need for a collaborative approach to planning and management by responsible organisations, both in the immediate location and throughout the catchment. The plans recognise the West Gippsland Regional Catchment Strategy (WGCMA, 2003) and Integrated Coastal Planning for Gippsland - Coastal Action Plan (Gippsland Coastal Board, 2002) as two key mechanisms to achieve integrated outcomes.

Management activities were initiated or intensified following the 2005 fire. Monitoring of post fire recovery is ongoing at key sites and partnerships with indigenous communities have been strengthened.

Wilson's Promontory National Park has a Centre of Excellence that aims to develop best practices in park management systems, including on ground environmental management actions, staff training and education, nature based tourism, research and monitoring.

The Yanakie Isthmus Adaptive Experimental Management Plan outlines landscape scale restoration works through intensive fox baiting (Parks Victoria, 2004).

Stewardship Evidence Summary

Indicator Theme	Score	Key Evidence
Plan	Good	Wilson's Promontory Marine National Park, Marine Park & Marine Reserve Management Plan (2004) Wilson's Promontory National Park Management Plan (2002) Wilson's Promontory National Park Ecological Burn Plan Fire Management Plan (under development)
Implement	Good	Parks Victoria annual environmental planning and works program (Environmental Action Plan). Parks Victoria fox control program. Parks Victoria Wilson's Promontory rabbit control action plan 2003-2006 Orchid recovery program Pest Plant and Animal Control program
Evaluate	Reasonable	Post fire key vegetation community monitoring with South Gippsland Conservation Society. Yanakie Isthmus Adaptive Experimental Management (landscape scale restoration)
Improve	Good	Centre of Excellence - developing best practices in park management systems, including on ground environmental management actions, staff training and education, nature based tourism, research and monitoring. Ongoing scientific monitoring and evaluation of post fire ecological recovery.
Partnerships	Good	Post Fire Recovery Indigenous Working group

Key Stewardship Summary Points

- Strengthened monitoring and partnerships post-fire
- Centre of Excellence for National Park management

6.18.4 For more information

- Parks Victoria Information Centre 13 1963 or visit www.parkweb.vic.gov.au

7 REPORT CARD PURPOSE & DEVELOPMENT PROCESS

7.1 Report Card Purpose

The purpose of the report card is threefold:

1. Foster the strategic integration of natural resource management
 - Focus thinking, planning and action on collective natural assets that transcend organisational and geographical boundaries.
 - Provide a whole-of-Gippsland view of natural resource management
 - Evaluate the quality of existing strategic, management and research partnerships and identify synergies that would benefit from new partnership arrangements.
2. Provide a credible, independent and regular evaluation of natural resource management in Gippsland
 - Give an independent perspective on natural resource management in Gippsland
 - Provide accurate and timely information to members and other stakeholders
 - Identify gaps in knowledge, data, strategy and action
3. Cultivate a strong regional identity for Gippsland based on natural resources
 - Draw together existing information and present it in a useful and accessible format
 - Give a whole-of-Gippsland evaluation of performance against state, national and international indicators
 - Promote Gippsland's clean, green image to outsiders and to Gippslanders themselves

Key Stakeholders/Audience for the Report Card include:

- Members of the Gippsland Integrated Natural Resources Forum
- Victorian and Australian Government
- Investors in natural resource management throughout Gippsland
- Gippsland community
- Victorian community

7.2 Report Card Development Process

A small working party was formed to develop the first Natural Resources Report Card in March 2003, from open invitation to GINRF Reference Group members. Report card development followed an eight step process outlined in Environment Australia's "A Framework for Public Environmental Reporting", the Australian interpretation of the Global Reporting Initiative. The eight steps follow a plan, measure, report and review cycle. The review phase informed the development of the 2004 Report Card, adding three new assets and more detail to the condition and stewardship components of the companion document.

The 2005-2006 Report Cards development have followed the MERGe Framework developed by regional stakeholders to address monitoring, evaluation and reporting for Gippsland's natural resources (SKM, 2004). Preparation of the 2007 and 2008 Report Cards followed a similar process although far less quantitative data was obtained and hence the full MERGe Framework was not able to be applied.

7.3 About the Gippsland Integrated Natural Resources Forum

The Gippsland Integrated Natural Resources Forum is a whole-of-Gippsland approach to the management of the region's natural resources under the slogan Catchment Health – Gippsland's Wealth. The role of the Forum is to achieve a cooperative and strategic approach to natural resource management in the region.

The vision of the Forum is to: "Unify the efforts of Gippsland's natural resource managers, to ensure the cultural, economic and social activity of Gippsland is conducted in harmony with its environment."

The Forum has a membership of some sixty organisations including government departments, catchment management authorities, municipal councils, rural and urban water authorities, universities, private industry, regional development bodies, community based groups (such as Landcare), and cross agency groups (such as Gippsland Research Coordination Group). An Executive is drawn from the broader Forum membership, with a chair who is independent from member organisations: Mr. Keith Hamilton.

7.4 Future Review

Natural resource managers in the Gippsland region understand the importance of good information for good decision making. Project MERGe is addressing the information needs by implementing a Monitoring, Evaluation and Reporting Framework. The Framework has informed the development of this Report Card and the State of the Gippsland Lakes Report, and will be further implemented over the next twelve months.

A review of the Gippsland Natural Resources Report Card is proposed prior to preparation of the 2009 Report Card. Aspects that may be considered in undertaking the review could include

- re-examining which natural assets to include in the Report Card,
- greater consideration of and alignment to other natural resource management reporting processes – including the MERGe framework, existing Key Performance Indicators and / or Targets, and the outcomes of the State of the Catchment Reports (East and West Gippsland Catchment Management Authorities)
- Standardisation of the ratings such that peer assets can be compared with one another and their interconnectivity is reflected in ratings;
- Establishment of quantitative trigger or indicator values on measurable parameters where possible.

7.5 Feedback

The Gippsland Integrated Natural Resources Forum welcomes feedback on the Report Card development process.

Written submissions can be mailed to:

Gippsland Integrated Natural Resources Forum
16 Hotham Street
Traralgon 3844
Attn. Mr. Chris Barry, GINRF Executive Officer
Phone: 5175 7800 or 5152 0400
Email: chris.barry@dse.vic.gov.au

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