

Information Sheet on Ramsar Wetlands

Categories approved by Recommendation 4.7 of the Conference of the Contracting Parties.

1. Date this sheet was completed/updated:

May 1999

2. Country:

Australia

3. Name of wetland:

Gippsland Lakes, Victoria

FOR OFFICE USE ONLY.

DD	MM	YY

Designation date

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Site Reference Number

4. Geographical coordinates:

Latitude: 37° 49' to 38° 12'S;

Longitude: 147° 04' to 148° 08'E

5. Altitude:

Less than 20 metres above sea level.

6. Area:

60,015 ha

Note: This is a revised area figure based on GIS Mapping (1995) and does not represent any change to the Ramsar Site boundary.

7. Overview:

The Gippsland Lakes are a group of coastal lagoons in eastern Victoria, separated from the sea by sand dunes and fringed on the seaward side by the Ninety Mile Beach.

The Gippsland Lakes together form the largest navigable inland waterway in Australia. These features create a distinctive regional landscape of wetlands and flat coastal plains which is of considerable environmental significance in terms of its landforms, vegetation and fauna. They include a number of sites of national and international importance.

8. Wetland Type:

marine-coastal:	A	B	C	D	E	F	G	H	I	J	K
inland:	L	M	N	O	P	Q	R	Sp	Ss	Tp	Ts
	U	Va	Vt	W	Xf	Xp	Y	Zg	Zk		
man-made:	1	2	3	4	5	6	7	8	9		

9. Ramsar Criteria:

1a	1b	1c	1d	2a	2b	2c	2d	3a	3b	3c	4a	4b
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Please specify the most significant criterion applicable to the site: see point 12

10. Map of site included? Please tick *yes* -or- *no*.

11. Name and address of the compiler of this form:

Parks Victoria
378 Cotham Road
Kew VIC 3101 Australia

12. Justification of the criteria selected under point 9, on previous page.

1(a) The wetland is a particularly good representative example of a natural or near-natural wetland characteristic of the appropriate biogeographical region.

Gippsland Lakes forms the largest navigable inland waterway in Australia and has a distinctive regional landscape of wetlands and flat coastal plains which is of considerable environmental significance in terms of its landforms, vegetation and fauna.

3(a) Regularly supports 20,000 waterfowl
and

3(b) Regularly supports substantial numbers of waterfowl from particular groups

The Gippsland Lakes are particularly important in supporting large numbers of waterbirds as outlined below (ANCA 1996).

- Grey Teal (7,270 recorded in Lake King, Lake Victoria and Lake Wellington wetlands).
- Chestnut Teal (6,300 recorded in Lake King, Lake Victoria and Lake Wellington wetlands).
- Black Swans (10,000 recorded at Lake King wetlands, 1,700 at Lake Victoria wetlands, 10,000 at Lake Wellington wetlands).
- Australasian Grebe (4,500 recorded at Lake King wetlands).
- Eurasian Coot (10,000 recorded at Lake King wetlands, 1,000 at Lake Victoria wetlands, 2,000 at Lake Wellington wetlands).
- Great Cormorants (7,000 recorded at Lake Victoria wetlands, 440 at Lake Wellington wetlands).

3(c) Regularly supports 1% on the individuals in a population of one species or subspecies

The Lake King wetlands in the Ramsar site have supported 1% of the national population of the little Tern (*Sterna albifrons*), 5% of the Victorian population of the Common Tern (*Sterna Hirundo*), and 10% of the regional population of the Black Swan (*Cygnus atratus*) (ANCA 1996).

The Lake Victoria wetlands have supported 5% of the Victorian population of Great Cormorants and Great Crested Grebe (ANCA 1996).

The Lake Wellington wetlands have supported more than 5% of the Victorian population of the Common Tern and Australian Pelicans (ANCA 1996).

13. General location:

Eastern Victoria; a system of lakes and swampland extending eastward from Sale to Lake Tyers.

14. Physical features:

The Gippsland Lakes are a group of coastal lagoons separated from the sea by a broad sandy barrier known as the Ninety Mile Beach. The main lakes - Wellington, Victoria and King cover an area of 340 km² and have a shoreline of 320 km. The lakes are fed by a number of river systems. The largest of the rivers are the LaTrobe River and the Avon River (flowing into Lake Wellington), and the Mitchell River, Nicholson River and Tambo River (flowing into Lake King). The system is linked to the sea by an artificial entrance near the eastern end, opened in 1889, where the town of Lakes Entrance is now situated. Before 1889 the entrance moved during floods or storms and became restricted during periods of low river flow. The artificial entrance both lowered and reduced annual variation in lake levels.

There is one site of international geological/geomorphological significance, two of national significance and seven of state significance.

Site of International Geological/Geomorphological Significance

Mitchell River Delta - Eroded digitate delta

The Mitchell delta extends from the vicinity of Bairnsdale southwards along the western shoreline of Lake King to Eagle Point Bluff and then eastwards as long winding silt jetties bordering the Mitchell River. The silt jetties extend almost eight kms into the lake as low, narrow tongues of sediment that were formerly bordered by a wide zone of *Phragmites* reedswamp. The Mitchell delta is a classic form of digitate delta and must rank as one of the finest example of this type of landform in the world.

Sites of National Geological/Geomorphological Significance

Sperm Whale Head to Boole Poole Peninsula (including the Outer Barrier and Ninety Mile Beach, Relict Tidal Channels and Tidal Delta, Rotomah Island, Boole Poole Peninsula and Sperm Whale Head)

The barrier formations, dunes and dunes lakes, relict entrances channels and tidal delta islands are of major importance in illustrating the evolution of the barrier systems of the Gippsland Lakes. Many details still remain to be elucidated concerning the sequence of Pleistocene and Holocene depositional and erosional events, and the sites described could be the subject of major studies in geomorphology supported by stratigraphy, palynology and radiometric dating.

Cunninghame Arm (South-east of Lakes Entrance)

Cunninghame Arm is a remnant of the narrow channel that connected the Gippsland Lakes to the sea prior to the opening of the Entrance in 1889. This site demonstrates clearly some physiographic consequences of the opening of the Entrance. It provides a classic example of active lake-shore segmentation, i.e. the conversion of a long narrow lagoon into a series of smaller, rounded to oval shaped lakes divided by elongated supate spits.

Sites of State Geomorphological Significance

Lake Reeve and Outer Barrier - Paradise Beach

The area includes the widest section of the outer barrier of the Gippsland Lakes and the area with the greatest number of parallel dune ridges (10-13) found along the entire length of the Ninety Mile Beach.

Lake Reeve differs fundamentally from other lagoons in the Gippsland Lakes in its ecology as well as its geomorphology. The floor of Lake Reeve is of sand, shell and mud, and as large areas of the lagoon frequently dry up completely, extensive saltmarsh areas develop.

Tambo River Delta - Eroding cusped river delta

The delta has an elongated shape and protrudes 2.5 kms south-westward into Lake King. The delta has infilled a funnel-shaped embayment and continued sedimentation has extended the delta into Lake King.

Comparison of maps made during the 19th century and aerial photographs taken between 1940 and 1976 indicate that erosion of the delta is taking place. The southern arm has receded by approximately 500 metres since 1849 and detailed field mapping since 1970 has shown that some sectors are retreating at rates of up to 10 metres per year.

The critical factor in shoreline erosion here appears to be the die-back of fringing reedswamp as a result of salinity increase in the lakes since 1889. Other factors such as trampling by cattle grazing on river banks, access by anglers, and scouring by boat wash are of increasing importance as the reed fringe disappears.

This is a major example of the processes of delta growth and little detailed investigation has been undertaken here.

MacLeod Morass - Extensive backswamp, marginal bluff, relict gravel beach and spit

The Mitchell delta from Bairnsdale towards Eagle Point Bluff is surmounted by well-defined levee banks. These slope away from the river on the western side towards the abandoned cliff that marks the former shore of Lake King during the mid-Holocene when the sea reached its present level. At the foot of the abandoned cliff is a distinctive low ridge formed from an abandoned beach, a relic of a former high sea level. These beach deposits consist of sands and gravels eroded from the former cliff and reworked to form a beach extending from Skene Creek to the mouth of MacLeod Creek. There has been some quarrying of the beach deposits for gravel, if this is extended it will greatly reduce the value of this site.

MacLeod Morass is a freshwater swamp, now partly drained and confined as a backswamp of the Mitchell River between the sloping levee banks and the base of the marginal bluff.

The assemblage of factors described has been used as evidence that the Mitchell River silt jetties grew as a true deltaic form and are not submerged levees of a more extensive pre-Holocene flood plain system.

Point Turner - Banksia Peninsula

The cliffed shoreline near Point Turner is the best example of the composition and form of the prior barrier exposed in the Gippsland Lakes.

Outer Barrier near Seaspray

For approximately 5 kilometres north-east of Seaspray, the outer barrier is a single, high (5-8 metres) sand ridge usually steeply cliffed on the seaward edge. The dunes are very young and it is probable that most of the vertical growth of this section of the barrier has taken place since the introduction and spread of the dune grass *Ammophila* over the last 100 years.

This single high and grassy outer barrier ridge is unique in the Gippsland lakes region. It illustrates further the physiographic changes accompanying the introduction of *Ammophila*.

McLennans Isthmus and McLennans Strait

Lakes Victoria and Wellington are separated by a long broad tract of sandy and swampy terrain that represents an advanced stage of segmentation of a formerly larger lagoon. The lakes are now connected only by a narrow residual channel (McLennans Strait) and exhibit a marked contrast in hydrological and ecological conditions.

McLennans Isthmus is a long, sandy promontory that extends south-east from Roseneath Point as a narrow, gently curving beach, backed by low beach ridges crossed by numerous small blowouts and parabolic dunes.

The southern section of McLennans Isthmus is a compound recurving spit with several parallel ridges that terminate in the swampland north of McLennans Strait. McLennans Strait is a deep narrow channel that connects Lakes Wellington and Victoria and maintains sufficient current flow to prevent the extension of the sandspit and incursion by reedswamp that would result in complete closure of Lake Wellington.

This is a large scale example of the processes of lake fragmentation by growth of spits which eventually become oriented at right angles to the direction of approach of dominant waves.

LaTrobe Delta - Prograding Cuspate Delta

The LaTrobe River has a cuspate delta consisting of two silt jetties, an extension of natural river levees, that protrude over two kilometres into Lake Wellington. The delta is formed by reedswamp which is growing in the lake in water up to 1.5m deep. The reedswamp consists chiefly of *Phragmites*, *Cladium*, and *Typha*. The reedswamp traps river silt and the accumulation of this and decaying vegetation matter builds up the lake floor to a level that can be colonised by *Melaleuca ericifolia*.

The area demonstrates a mode of delta formation that is active only in the part of Lake Wellington where water salinity is below the tolerance level for regeneration of reedswamp.

15. Hydrological values:

Fringing wetlands are used for industrial and domestic waste disposal at several places around the Lakes, with the undesirable effects of increased sedimentation, nutrient addition and, in Lake Coleman, with the disposal of industrial pollutants, the possibility of ecological change.

Sale Common receives water from Flooding Creek and this water is known to contain pollutants from urban run-off, but further investigation is necessary to determine the extent of pollution and its impact on wetlands.

At MacLeod Morass, the Bairnsdale sewage treatment system is a known source of nutrients and other wastes. Run-off from the nearby rubbish tip and saleyards also contributes polluted wastewater.

16. Ecological features:

The permanence of the main lakes and the relatively regular flooding of the adjacent wetlands mean that this wetland system is an important drought refuge for many waterfowl.

The lakes and their associated swamps and morasses regularly support an estimated 40000 to 50000 ducks, swans, coots and other waterfowl.

Sale Common is a permanent freshwater marsh. Through management as a game refuge and the creation of a range of habitats, this marsh supports high populations of a variety of waterbirds, birds of prey and small mammals.

Dowd Morass and Heart Morass are both permanent freshwater marshes supporting significant breeding populations of waterbirds. Dowd Morass has supported up to nine species of colonial nesting waterbirds.

Clydebank Morass varies seasonally from fresh to saline, particularly close to the Lake Wellington shoreline. The floods of April 1990 have substantially increased the size of the opening between the wetland and Lake

Wellington; it is not known yet what effect this will have on the water regime in the wetland. Clydebank Morass carries substantial populations of waterbirds and wading birds but there are no substantial breeding colonies.

Blond Bay wetlands are generally shallow and intermittent. They include fresh, saline and hypersaline wetlands that support breeding waterfowl and migratory waders.

Lake Reeve is an extensive intermittent saline wetland providing a highly significant habitat for large numbers of migratory waders.

MacLeod Morass is the largest permanent freshwater marsh at the eastern end of the Gippsland Lakes. It supports large numbers and many species of colonial waterbirds including migratory waders.

Lake Wellington, Lake Victoria, Lake King are permanent deep saline wetlands supporting populations of migratory seabirds, including the Little and Fairy Terns and a range of waterfowl.

Jones Bay is a permanent shallow saline wetland supporting large numbers of waterfowl and migratory waders.

Lake Bunga is a relatively small coastal wetland that is fresh to brackish, supporting waterfowl, Little Tern, Hooded Plover and White-bellied Sea-Eagle.

The Gippsland Lakes offer a wide range of conditions for aquatic and emergent vegetation. The vegetation is highly variable for a number of reasons, including seasonal factors, penetration of light, salinity and availability of nutrients.

In low lying areas which are periodically inundated, the vegetation is a wet scrub type dominated by Swamp Paperbark, which occurs as dense thickets up to 10 metres tall. This wet scrub is fringed on the lake side by reed and reed mace. In the more saline parts of the swamps around the lakes there is salt marsh vegetation of Glasswort with Shore Rush, Sawsedge and Salt Grass. In some of the swamps around the lakes the swamp scrub is dying back and is being replaced by salt marsh, due largely to increased salinity.

17. Noteworthy flora:

Threatened Plants of the Lakes Environs

Endangered in Victoria

Veined Caladenia (*Caladenia reticulata*)
Bushy Hedgehog-grass (*Echinopogon caespitosus*)
Metalic Sun-orchid (*Thelymitra epipactoides*)

Vulnerable in Victoria

Limestone Blue Wattle (*Acacia caerulescens*)
Gilgali Blown Grass (*Agrostis billardierei* var. *filifolia*)
Coast Fescue (*Austrofestuca littoralis*)
Austral Moonwort (*Botrychium australe*)
Swamp Everlasting (*Bracteantha* sp. aff. *subundulata*)
Tiny-hair Bent-grass (*Deyeuxia microseta*) - Poorly Known in Australia
Swamp Diuris (*Diuris palustris*)
Purple Diuris (*Diuris punctata*)
Rough-grain Love-grass (*Eragrostis trachycarpa*)
Glossogyne (*Glossogyne tenuifolia*)
Dwarf Kerrawang (*Rulingia prostrata*) - Vulnerable in Australia

Rare in Victoria

Common Spleenwort (*Asplenium trichomanes*)
Small-leaf Star-hair (*Astrotricha parviflora*) - Rare in Australia
Wallaby Bush (*Beyeria lasiocarpa*)
Pinkwood (*Beyeria viscosa*)
Common Caladenia (*Caladenia patersonii*)
Veiled Fringe-sedge (*Fimbristylis velata*)
Spicy Everlasting (*Helichrysum argophyllum*)
Dark-flower Rush (*Juncus phaeanthus*)
Yellow Milk-vine (*Marsdenia flavescens*)
Coast Mistletoe (*Muellerina celastroides*)

Open Marshwort (*Nymphoides* sp. aff. *exifolia*)
Viscid Daisy-bush (*Olearia viscosa*)
Woolly Waterlily (*Philydrum lanuginosum*)
Limestone Pomaderris (*Pomaderris oraria* ssp. *calcicola*)
Coast Pomaderris (*Pomaderris oraria*)
Slaty Leek-orchid (*Prasophyllum frenchii*)
Tawny Leek-orchid (*Prasophyllum fuscum*)
Cobra Greenhood (*Pterostylis grandiflora*)
Ribbed Thryptomene (*Thryptomene micrantha*)
Pink Zieria (*Zieria veronicea*)

Insufficiently known

Narrow-head Love-grass (*Fragrostis leptostachya*)

18. Noteworthy fauna:

Lake Reeve is a site of international zoological significance. It attracts up to 12,000 migratory waders and is one of the five most important areas for waders in Victoria. The total concentration of waders at the south-western end of Lake Reeve fluctuates in response to local conditions of salinity, water depth and probably human disturbance.

The lake has supported the largest concentration (5000) of Red Knot (*Calidris canutus*) recorded in Victoria, as well as up to 3000 Sharp-tailed Sandpiper (*Calidris acuminata*) and up to 1800 Curlew Sandpiper (*Calidris ferruginea*).

Threatened Fauna

Birds

Was Extinct in Victoria but has been Reintroduced

Magpie Goose (*Anseranus semipalmata*)

Endangered in Victoria

Little Tern (*Sterna albifrons*)
Swift Parrot (*Lathamus discolor*)
Regent Honeyeater (*Xanthomyza phrygia*)

Vulnerable in Victoria

Hooded Plover (*Charadrius rubricolis*)
Fairy Tern (*Sterna nereis*)

Rare in Victoria

Brolga (*Grus rubicundus*)
Ground Parrot (*Pezoporus wallicus*)
White-bellied Sea-Eagle (*Haliaeetus leucogaster*)
Freckled Duck (*Stictonetta naevosa*)
Blue-billed Duck (*Oxyura australis*)
Grey Goshawk (*Accipiter novaehollandiae*)
Black Falcon (*Falco subniger*)
Little Bittern (*Ixobrychus minutus*)
Powerful Owl (*Ninox strenua*)
Eastern Curlew (*Numenius madagascariensis*)
Lewin's Rail (*Rallus pectoralis*)
Masked Owl (*Tyto novaehollandiae*)
Sooty Owl (*Tyto tenebricosa*)

Restricted Colonial Breeding or Roosting Sites in Victoria

Pacific Gull (*Larus pacificus*)
Royal Spoonbill (*Platyclea regia*)
Great Egret (*Egretta alba*)
Pied Cormorant (*Phalacrocorax varius*)
Intermediate Egret (*Ardea intermedia*)
Whisked Turn (*Chlidonias hybridus*)

Insufficiently known

Australasian Bittern (*Botaurus poiciloptilus*)
Ballion's Crake (*Porzana pusilla*)
Painted Snipe (*Rostratula benghalensis*)

Mammals

Endangered in Victoria

New Holland Mouse (*Pseudomys novaehollandiae*)

Rare in Victoria

Large-footed Myotis (*Myotis adversus*)

Restricted Colonial Breeding or Roosting Sites in Victoria

Common Bent-wing Bat (*Miniopterus schreibersii*)
Eastern Horseshoe Bat (*Rhinolophus megaphyllus*)

Amphibians

Indeterminate (Known to Rare, Vulnerable or Endangered) in Victoria

Giant Burrowing Frog (*Heleioporus australiacus*)

Fish

Endangered in Victoria

Freshwater Herring (*Potamalosa richmondia*)

Vulnerable in Victoria

Australian Grayling (*Prototroctes maraena*)

Rare in Victoria

Australian Bass (*Macquaria novaemaculata*)
Pouched Lamprey (*Geotria australis*)
Spotted Galaxias (*Galaxias truttaceus*)
Dwarf Galaxias (*Galaxiella pusilla*)
Broad-finned Galaxias (*Galaxias brevipinnis*)

Indeterminate (Known to be Rare, Vulnerable or Endangered) in Victoria

Striped Gudgeon (*Gobiomorphus australis*)
Cox's Gudgeon (*Gobiomorphus coxii*)

Invertebrates

Endangered in Victoria

Stonefly (*Thaumatoperla timmsi*)
Caddisfly (*Tanjistomella verma*)

Reptiles

Rare in Victoria

Swamp Skink (*Egernia coventryi*)

Insufficiently known

Leathery Turtle (*Dermochelys coriacea*)
Glossy Grass Skink (*Pseudemoia rawlinsoni*)

Insects

Endangered in Victoria

Small Ant-blue butterfly (*Acrodipsas myrmecophila*)

19. Social and cultural values:

There is a high concentration of archaeological sites in the Gippsland Lakes area including artefact scatters, shell middens, scarred trees, occupation sites, burials and axe-grinding grooves.

20. Land tenure/ownership:

Clydebank Morass, MacLeod Morass, Blond Bay, Jones Bay, Heart Morass, Lake Gleman, Sale Common and Dowd Morass are State Wildlife Reserves.

Lakes Wellington, Victoria, Kings, Tyers and Bunga are Crown Land Reserves.

Lake Reeve is in the Gippsland Lakes Coastal Park and the Lakes National Park.

21. Current land use:

Parts of the Lakes system are heavily used for commercial and recreational fisheries and for other water-based recreation, while the immediate hinterland has been developed for agricultural uses and limited residential and tourism purposes.

22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects:

Long term changes in ecological character in the Gippsland Lakes are primarily attributed to changed water and salinity regimes associated with the permanent artificial entrance to the lakes opened in 1889 and reduced water quality associated with changed land use in the catchment. There has been no significant change in ecological character since the Ramsar information sheet was last updated in 1992.

Factors affecting ecological character at selected locations within the Ramsar site include:

- alteration to its ocean outlet, with consequent alteration of the salinity regime and gradient of the lakes;
- reduction of flooding frequencies and flooding duration for the major tributary rivers through water storage developments and water extraction;
- changes to water quality due to high nutrient input from catchment run-off;
- land drainage; residential development and recreational pressures.

The increasing problem of salinity has particularly affected the low-lying land and fringing wetlands around Lake Wellington. Some 10,000 ha of land are affected.

The effects of the intrusion of marine salinity into the Gippsland Lakes are:

- depletion of shoreline vegetation such as the Common Reed (*Phragmites australis*), leading to shoreline erosion and thus accelerated deposition in lakes;
- increased stress from wind-borne salt on vegetation near to the shoreline and above water level;
- wetland habitat degradation and loss through vegetation change, with a consequent loss of wetland fauna. The shift to saline conditions has restricted the available habitat for a number of bird species some of which are regarded as endangered (e.g. the Little Tern *Sterna albifrons*);
- loss of breeding habitat for fish (i.e. through loss of Ribbon Weed (*Vallisneria spiralis*), leading to fluctuations and declines in estuarine fish populations. The eastern lakes were important as breeding and nursery grounds for some species of fish, such as the commercially important Black Bream and the rare Australian Bass. Both species still breed in the Lakes or the inflowing rivers, whenever suitable temperatures and salinities occur. Many other species of fish - riverine, estuarine and marine - also make use of the lakes to breed, grow or feed; and
- formation of 'halocline stratification' producing a layer of deoxygenated water at the bottom of the lakes, contributing to fish kills and, through the release of phosphorus from the sediments and to algal blooms. There have been regular ongoing algal blooms in the Lakes in recent years. Major blooms have substantial effects on the biological systems of the lakes and on the tourism industry and local economy generally.

23. Conservation measures taken:

The East Gippsland and West Gippsland Regional Catchment Strategies 1996 outline actions to address water quality and salinity issues in the lakes and land management issues in the catchment.

Reservation of part of the Ramsar site under the *National Parks Act 1975 (Vic)* in the Lakes National Park and the Gippsland Lakes Coastal Park provides a legislative basis for protection of the natural values of these areas. Other parts of the site are reserved for the protection and management of wildlife.

The Gippsland Lakes Management Plan 1990 and the Lake Wellington Wetlands Draft Management Plan 1997 includes strategies to protect the environmental values of the lakes.

A project to map seagrass in the Gippsland Lakes has been completed. The mapping provides a baseline for future seagrass monitoring.

A fisheries habitat assessment report has been completed.

A significant boundary fencing program has been undertaken at McLeods Morass to prevent uncontrolled access by grazing livestock along the wetland margins.

A joint initiative between Parks Victoria, the local council and the local water authority has commenced works at McLeods Morass to improve the water regime and water quality by better managing water flow and controlling nutrient input from treated sewage and saleyards runoff.

Action Statements under the Flora and Fauna Guarantee Act 1988 have been produced for the following fauna species which occur at the Ramsar site. The action statements outline conservation measures for the species.

- Little Tern (1994)
- Regent Honeyeater (1994)
- Hooded Plover (1992)
- White-bellied Sea-eagle (1994)
- New Holland Mouse (1996)
- Giant Burrowing Frog (1994)
- Small Ant-blue butterfly (1996)

24. Conservation measures proposed but not yet implemented:

A Coastal Action Plan is being prepared for the Gippsland Lakes which will review the existing Gippsland Lakes Management Plan (1990) addressing issues such as water quality and integrated catchment management.

In an integrated approach to planning at Ramsar sites, management strategies are being prepared for all Ramsar sites in Victoria, including Gippsland Lakes, to provide general strategic direction and site specific strategies. The strategies will be completed by June 1999.

25. Current scientific research and facilities:

Monitoring at Dowd Morass has been undertaken to collect baseline data for the implementation of a drying phase for the Morass hydrological regime.

A number of ongoing research and monitoring programs are being undertaken in Ramsar sites on a small scale:

- Pre and post duck season surveys
- Aerial surveys of waterbirds of the Gippsland Lakes
- Lake Wellington Little and Fairy Tern monitoring
- White-bellied Sea Eagle monitoring
- Monitoring of colonial breeding sites

26. Current conservation education:

There is a Royal Australasian Ornithologists Union Bird Observatory located at Rotamah Island.

Sale Common and MacLeod Morass are used for education and interpretation purposes; and ESSO and the Department of Conservation and Environment are jointly conducting an education project in the area.

27. Current recreation and tourism:

The Lakes waters and environs provide for a wide range of recreation activities, the main ones being boating and fishing. Research has indicated that 30% of visitors to the Lakes were attracted by boating opportunities, while 55% of visitors to the Lakes came for fishing. Over 250,000 anglers each year spend approximately 1.4 million hours each year to take over 1.5 million fish, mostly Black Bream, weighing around 400 tonnes, from the Lakes system. In financial terms tourism accounts for nearly 20% of the capital generated in the region each year and a large part of that stems, at least indirectly, from recreational fishing.

28. Jurisdiction:

Government of Victoria.

29. Management authority:

Managed under the Department of Natural Resources and Environment Parks Program by Parks Victoria - 58,108 Ha (97%)
Natural Resources and Environment - 1,600 Ha (2.5%)
Private Freehold - 192 Ha (0.3%)
Local Government - 115 Ha (0.2%)

30. Bibliographical references:

Beaglehole, A. C. (1981). *The Distribution and Conservation of Native Vascular Plants in the East Gippsland area, Victoria*. Western Victorian Field Naturalists Clubs Association, Portland.

Beaglehole, A. C. (1985). *The Distribution and Conservation of Native Vascular Plants in the Gippsland Lakes Hinterland area, Victoria*. Western Victorian Field Naturalists Clubs Association, Portland.

Department of Conservation and Environment. (1990). *Draft Gippsland Lakes Management Plan*. Department of Conservation and Environment, Victoria.

McRae-Williams, M. S., N. J. Rosengren and S. M. Kraemers. (1981). *Sites of Geological and Geomorphological Significance in East Gippsland, Victoria*. ESS No. 320, Ministry for Conservation, Victoria.

Norris, K. C. and I. M. Mansergh. (1981). *Sites of Zoological Significance in East Gippsland*. ESS No. 321, Ministry for Conservation, Victoria.

Rosengren, N. J. (1984). *Sites of Geological and Geomorphological Significance in Central Gippsland*. ESS No. 341, Ministry for Conservation, Victoria.