

# 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

FOR OFFICE USE ONLY.

DD	MM	YY

Designation date

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Site Reference Number

## 2. Country:

Australia

## 3. Name of wetland:

Port Phillip Bay (Western Shoreline) and  
Bellarine Peninsula

## 4. Geographical coordinates:

Latitude: (approx.) 37° 53' S to 38° 18' S; Longitude: (approx.) 144° 24' E to 144° 48' E

## 5. Altitude:

Less than 10 metres above sea level.

## 6. Area:

22, 897 hectares

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 site includes a variety of wetland types ranging from shallow marine waters to seasonal freshwater swamps and extensive sewage ponds which support a large and diverse population of migratory waders, seabirds and waterfowl; and demonstrate a range of geomorphic processes. Over 3 million people (70% if the State's population) live around the Bay which is used intensively for recreation.

The opening of the Bay (Port Phillip heads) is very narrow, reducing tidal amplitude within the bay compared with in Bass Strait. The intertidal mudflats, seagrass beds and saltmarshes support a very large and diverse range of migratory wading birds, seabirds and wildfowl.

## 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

Please specify the most significant criterion applicable to the site:

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

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

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**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.

The Ramsar site includes a range of marine and inland wetlands characteristic of the South East Coastal Plain bioregion as well as artificial wetlands.

1(b) The wetland is a particularly good representative example of a natural or near-natural wetland common to more than one biogeographical region.

The Ramsar site contains good examples of saltmarshes, estuarine wetlands and a shallow marine embayment and nearshore areas.

2(b) A wetland is of special value for maintaining the genetic and ecological diversity of a region because of the quality and peculiarities of its flora and fauna.

Lake Connemara State Game Reserve is the largest area of native vegetation remaining on the Bellarine Peninsula and Reedy Lake is the largest freshwater lake in central Victoria.

The Ramsar site is one of the most important sites in Victoria for migratory shorebirds. The vegetation of Lake Connemara State Game Reserve is very diverse, with 137 native plants being recorded. Forty-five (85%) of the 53 salt marsh species which occur in Victoria occur at Lake Connemara. Reedy lake also has outstanding significance due to its large size, floristic richness and structural diversity (Yugovic 1985). The range of habitats within the Reserve leads to a very diverse avifauna, with 135 species being recorded (Pescott 1983).

3(a) Regularly supports 20,000 waterfowl

Wetlands in the Ramsar site regularly support more than 20,000 waterfowl, including large numbers of migratory waders, thousands of Black Swans, ducks, ibis and cormorants.

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

The Avalon-Werribee Wetlands regularly support tens of thousands of Straw-necked Ibis. In 1983, 14% of the Australian population of Chestnut Teal were recorded at the Western Treatment Plant (part of these wetlands) (ANCA 1996).

Swan Bay, Mud Islands, Werribee-Avalon, Lake Connemara and Hospital Swamps are all recognised as wetlands of international importance to migratory waders (Watkins 1993).

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

Lake Connemara has supported international significant numbers of Curlew Sandpipers and Sharp-tailed Sandpipers. Hospital Swamp has also supported international significant numbers of Sharp-tailed Sandpipers and nationally significant numbers of Curlew Sandpipers, Red-necked Stints and Marsh Sandpipers (ANCA 1996).

One per cent of the known Australian population of four migratory wader species: Pacific Golden Plover, Grey Plover, Mongolian Plover and Ruddy Turnstone have been recorded at Mud Islands and the islands are used as a high tide roosting area by 5 % of the Victorian populations of Red Knots, Great Knots, Eastern Curlews and Bar-tailed Godwits. Nearly one quarter of the White-faced Storm Petrels in Victoria breed on Mud Islands (ANCA 1996).

One per cent of the known Australian population of four migratory wader species: Pacific Golden Plover, Grey Plover, Double-banded Plover and Eastern Curlew have been recorded at Swan Bay (ANCA 1996).

The Avalon Werribee Wetlands have supported more than 1% of the known Australian population of eight species of migratory waders and the largest Victorian breeding colony of Pied Cormorants.

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### **13. General location:**

(a) Parts of the shoreline, intertidal zone and adjacent wetlands of western Port Phillip Bay extending from Altona south to Limeburners Bay.

(b) Parts of the shoreline, intertidal zone and adjacent wetlands of the Bellarine Peninsula extending from Point Henry to Barwon Heads.

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### **14. Physical features:**

Port Phillip Bay lies in a sunkland formed by faulting and movement of the earth's surface during past geological eras. This low-lying area is a natural discharge point for the rivers draining southern central Victoria. It was a swampy lake even when sea levels were lower and the Yarra entered Bass Strait near Queenscliff. As the sea rose, it filled the sunkland, and wetlands formed further north at the deltas of a number of rivers and creeks.

The area contains five sites of State geomorphological significance:

#### Mud Islands - Ridges and Lagoons

Significance: This is the only known locality in Port Phillip Bay where consolidated dune rock is exposed above high water mark. The outcrop of cemented beach rock is the only known occurrence in Port Phillip Bay and is unusual on Victorian coasts. Mud Islands is the most obvious surface expression of the Port Phillip Sands, the shoal area overlying the Nepean Bay Bar. The islands are an unusual feature in Victoria and superficially resemble an atoll.

#### Hovells Creek - Mid-Holocene Sea Level Site

Significance: The site is one of a small number of dated marine shell beds on the Victorian coast that suggest a mid-Holocene sea level higher than the present level.

#### Limeburners Bay - Estuary

Significance: The site is an excellent example of a funnel-shaped, compound estuary. Many features typical of larger estuarine systems are here found in close proximity, such as active cliffs, marginal bluff, active and relict spits, mangrove and salt marsh zones, as well as terraces and other materials suggestive of higher sea level episodes. This is the best preserved estuary system in Port Phillip Bay and the most accessible one from Melbourne and Geelong. It is an outstanding site to demonstrate physiographical, hydrological, and ecological features of estuaries and coastal lagoons, and provides opportunity for studies into tidal circulation, salinity variation, sedimentation, shoreline evolution, and the dynamics of spit growth. It contains the most extensive stand of mangroves in Port Phillip Bay and probably the largest intact salt marsh complex. It is therefore a research and educational resource of considerable value.

#### Point Wilson - Shell Ridges

Significance: Adjacent to the Point Wilson jetty is an extensive belt of low, sparsely vegetated shelly ridges lying parallel to the coast and backed by a broad salt marsh. These ridges are an outstanding example of a shell-dominated coastal compartment and a rare example of actively prograding coastal ridges. The contrast in age, form and vegetation cover between the inner and outer ridges is of particular significance. The site has not been the subject of detailed geomorphological study and could form the basis of a major research project.

#### Sand Hummocks - Barrier Spits

Significance: The lagoon and barrier spits have no counterpart in Port Phillip Bay and are unusual features in the context of the Victorian coast. The scale of barrier development may be compared to that of the sand islands at Corner Inlet. It is an outstanding example of a tidal lagoon system not modified by land drainage but dominated by storm wave and tidal processes. The system constitutes a very significant site for the study of tidal and wave action in the formation and migration of barrier systems, and for sedimentation rates and processes in shallow lagoons. The marine and onshore components of the site include many features such as relict erosional and depositional landforms, sandy muddy and biogenic

sediments, and vegetation sequences, that are relevant for the study of Holocene and contemporary sea levels in Port Phillip Bay.

The annual rainfall is about 750 mm. The range of mean temperatures is from a mean maximum of 24°C in January and February to a mean minimum of 7°C in July.

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### 15. Hydrological values:

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### 16. Ecological features:

Important wetland areas on the western shore of Port Phillip Bay and the Bellarine Peninsula include freshwater lakes, estuaries, some with White Mangrove (*Avicennia marina*), saltmarshes, intertidal mudflats and seagrass beds. The Melbourne Water Corporation Sewage Farm and Western Treatment Plant at Werribee supports many waterbirds on its retention ponds.

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### 17. Noteworthy flora:

Pt. Cook Metropolitan Park is a site of State botanical significance. This is the only Reserve in the western region of Melbourne that contains examples of four vegetation types in proximity (dune vegetation, salt marsh, swamp and grassland). The salt marsh is an important habitat for the rare Orange-bellied Parrot. Several sites around the bay contain Grey Glasswort (*Halosarcia halocnemoides*) which more commonly occurs in north-western Victoria.

Limeburners Bay contains a zone of *Halosarcia halocnemoides* broader than that which is commonly found in Victorian coastal marshes. Where spit deposits raise the level of the marsh an assemblage of halophytes forms a low sward or type of saltmarsh meadow not as yet noted elsewhere in Victoria. Unlike most Victorian saltmarshes there is no broad zone dominated by *Sarcocornia quinqueflora*, and members of the Cyperaceae are comparatively unimportant. White Mangrove (*Avicennia marina*) occur.

Lake Connemare contains the most extensive example of *Wilsonia* herblands and *Distichlis* grassland in Victoria. Grey Glasswort (*Halosarcia halocnemoides*) and Tangled Lignum (*Muehlenbeckia cunninghamii*) reach their southern limit within the Reserve. The White Mangrove (*Avicennia marina*) reaches its westernmost limit in Victoria in the Barwon River estuary. A total of 137 native and 78 exotic vascular plants were recorded for the Reserve, indicating a very high species richness for wetland vegetation.

#### Threatened Species

##### Rare in Victoria

*Juncus revolutus* (Creeping Rush)

*Triglochin minutissimum* (Tiny Arrow Grass)

*Acacia retinodes* (Coast Wirilda)

##### Vulnerable in Victoria

*Glycine latrobeana* (Clover Glycine)

*Lepilaena marina* (Sea Water-mat)

##### Endangered in Victoria

*Cullen parvum* (Small Scurf-pea)

*Adriana quadripartita* (Rare Bitter-bush)

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### 18. Noteworthy fauna:

Port Phillip Bay is home to a vast number of birds dependent on its coastal wetlands and sheltered waters. The area is of international significance due to the presence of large numbers of migratory wading birds, seabirds and because of its importance to waterfowl the endangered Orange-bellied Parrot. It is the sixth most important area in Australia for migratory waders and the most important in Victoria. It is also of national significance due to the large number of different bird species (many of them relatively rare) and the large concentration of cormorants, Pied Oystercatchers, Banded Stilts and Red-necked Avocets. The presence of large numbers of terns, crakes, rails, coots, Great Crested Grebes, Straw-necked Ibis and Royal Spoonbills also give it State significance.

#### Seabirds

Seabirds are a prominent feature of the birdlife, particularly in southern waters where shearwaters, skuas, albatrosses, prions and petrels feed. About 5500 White-faced Storm-petrel, one-quarter of the Victorian population, breed on Mud Islands and nearby South Channel Fort Island.

Lake Borrie is the site of the largest breeding colony of Pied Cormorants in the State - at last count there were 320 active nests.

### Terns

Eleven species of tern have been recorded in the bay, including unusually large numbers of migratory Common Terns and lesser numbers of the rarer Arctic Tern. One of the largest breeding colonies (nearly a thousand) of Crested Terns in Victoria is situated on Mud Islands and a few Caspian Terns also nest there. Fairy Terns also breed at several locations including Mud Island, the Spit and Swan Bay.

### Gulls

Three species of gull occur in Port Phillip Bay, the Silver, Pacific and Kelp. The Silver Gull is the most conspicuous and breeds in the area, at Mud Islands. Its numbers have increased dramatically in the last thirty years, possible due to an increased availability of food associated with nearby urban areas and rubbish tips.

### Ibis, Herons, Spoonbills and Egrets

Tens of thousands of Sacred and Straw-necked Ibis roost at Lake Borrie. Yellow-billed and Royal Spoonbills occur regularly, particularly at the Spit, Avalon Saltworks and Swan Bay. Ibis and Spoonbill nest annually in Lake Connewarre Reserve.

### Waders

Waders are the most numerous of the birds of Port Phillip. Most spend the spring, summer and early autumn in the bay, and banding has shown that the same individuals return to the same part of the bay every spring. Between 48000 and 65000 waders feed on the shores of the bay during summer, making it the sixth most important site for these birds in Australia.

The bay holds more than 1% of the known Australian population of fourteen species: Pied Oystercatcher; Grey, Lesser Golden, Mongolian and Double-banded Plovers; Banded Stilt; Red-necked Avocet; Ruddy Turnstone; Eastern Curlew; Greenshank; Marsh, Sharp-tailed and Curlew Sandpipers and Red-necked Stint. It holds more than 5% of the Victorian population of another dozen species: Sooty Oystercatcher; Large Sand and Red-capped Plovers; Whimbrel; Wood and Common Sandpipers; Grey-tailed Tattler; Latham's Snipe; Bar-tailed and Black-tailed Godwits; and Great and Red Knots.

Most waders occur on the sites along the western side of the bay, where five of the wetlands - Altona, Werribee-Avalon, Point Henry, Swan Bay and Mud Islands - can be considered of international importance on the basis of their wader populations alone.

### Waterfowl (ducks and swans)

Waterfowl are another populous group. Swan Bay and the Altona and Werribee-Avalon wetlands hold particularly large populations.

In 1983 14% of the Australian total of Chestnut Teal were on the Werribee sewage farm. On Lake Borrie alone, 50,00 Pink-eared Duck have been seen and nearly 10,000 Black Swan. Freckled Duck are also recorded regularly.

### Other waterbirds

Other waterbirds such as grebes, coots, crakes and rails also occur in large numbers around Port Phillip, but the lack of studies elsewhere prevents any assessment of the bay's importance for the survival of these groups. The same is true for many land birds that live in coastal scrubs and saltmarshes around the bay.

### Orange-bellied Parrot

The bay is crucial to the survival of one of the world's rarest and most endangered birds - the Orange-bellied Parrot. The total number in existence is estimated at 150 individuals, and about ninety of these parrots overwinter on saltmarshes around Port Phillip including Swan Bay, Pt Wilson and Lake Connewarre. After breeding in south-west Tasmania during the summer, they migrate north across Bass Strait via King Island. Some then go north-west to the Coorong in South Australia, but the majority head

east to Port Phillip Bay. Loss of saltmarsh, caused by construction of saltworks, port and industrial development and other activities, is thought to be one of the main reasons for the parrots' decline.

Swan Bay and Limeburners Lagoon are valuable fish breeding grounds for many of the commercial species caught in Port Phillip Bay.

#### Threatened Bird Species

Magpie Goose (*Anseranus semipalmata*) - was extinct in Victoria, but has been reintroduced.

#### Endangered in Victoria

Little Tern (*Sterna albifrons*)

Orange-bellied Parrot (*Neophema chrysogaster*)

Australian Bustard (*Ardeotis australis*)

#### Vulnerable in Victoria

Hooded Plover (*Charadrius rubricolis*)

Fairy Tern (*Sterna nereis*)

Plains-wanderer (*Pedionomus torquatus*) - also vulnerable nationally

#### Rare in Victoria

Little Bittern (

Freckled Duck (*Stictonetta naevosa*)

Cape Barren Goose (*Cereopsis novaehollandiae*)

Blue-billed Duck (*Oxyura australis*)

Grey Goshawk (*Accipiter novaehollandiae*)

White-bellied Sea-Eagle (*Haliaeetus leucogaster*)

Brolga (*Grus rubicundus*)

Eastern Curlew (*Numenius madagascariensis*)

Black Falcon (*Falco subniger*)

Ground Parrot (*Pezoporus wallicus*)

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

Lewin's Rail (*Rallus pectoralis*)

Painted Snipe (*Rostratula benghalensis*)

#### Insufficiently known (suspected Rare, Vulnerable or Endangered) in Victoria

Australasian Bittern (*Botaurus poiciloptilus*)

Baillon's Crake (*Porzana pusilla*)

Cox's Sandpiper (*Calidris paramelanotos*)

Red-chested Button-quail (*Turnix pyrrhothorax*)

Painted Snipe (*Rostratula benghalensis*)

#### Restricted colonial breeding or roosting sites in Victoria

White-faced Storm-petrel (*Pelagodroma marina*)

Australian Pelican (*Pelecanus conspicillatus*)

Pied Cormorant (*Phalacrocorax varius*)

Caspian Tern (*Hydroprogne caspia*)

Crested Tern (*Sterna bergii*)

Glossy Ibis (*Plegadis falcinellus*)

Royal Spoonbill (*Platalea regia*)

Intermediate Egret (*Ardea intermedia*)

Great Egret (*Ardea alba*)

#### Threatened fish species

##### Vulnerable in Victoria and nationally

Australian Grayling (*Prototroctes maraena*)

Yarra Pigmy Perch (*Edelia obscura*)

##### Rare in Victoria

Spotted Galaxias (*Galaxias truttaceus*)

#### Threatened mammals

Rare in Victoria  
Brush-tailed Phascogale (*Phascogale tapoatafa*)

Threatened reptiles

Rare in Victoria  
Swamp Skink (*Egernia coventryi*)

Vulnerable in Victoria and nationally  
Striped Legless Lizard (*Delma impar*)

Insufficiently known in Victoria and vulnerable nationally  
Leathery Turtle (*Dermochelys coriacea*)

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## **19. Social and cultural values:**

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### **20. Land tenure/ownership:**

The Melbourne Water Corporation manages the Werribee Sewage Farm and Western Treatment Plant. The coastline from the Spit to Limeburners Bay is vested in the Port of Geelong Authority and some of this is leased for salt production.

The remainder of the area is public land managed under the Victorian Department of Conservation and Environment Parks Program by Parks Victoria. The Spit, Lake Connewarre and Mud Islands are State Wildlife Reserves while Swan Bay and an area of water surrounding Mud Islands are marine reserves, recently re-reserved as Fisheries Reserves under the *Fisheries Act 1995*.

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### **21. Current land use:**

(a) **the site:** Recreation, nature conservation, sewage treatment, aquaculture, fishing salt production.

(b) **the surroundings/catchment:** Grazing, industry including oil refining, quarrying, salt production and Port facilities.

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

No significant ecological change has occurred at the Port Phillip Bay (Western Shoreline) and Bellarine Peninsular site since the Ramsar information sheet was last updated in 1992.

#### Werribee Sewage Farm and Western Treatment Plant

The Victorian EPA have proposed changes to the licence conditions in 2005 for discharge of waste water from the treatment plant to the Bay. The lower nutrient levels required under the new licence will benefit water quality in the Bay but, at a more localised level, may affect waterbird usage and abundance in the vicinity of Lake Borrie. Melbourne Water Corporation will commission studies in 1998/99 to investigate the likely impact of the changed licence conditions on the habitat of shorebirds and waterbirds in the Lake Borrie treatment system and along the adjacent shoreline. Variations on the operational parameters for achieving the licence conditions will be examined.

Other factors affecting the ecological character of the site at selected locations include pest plants and animals, livestock grazing and visitor impacts.

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### **23. Conservation measures taken:**

#### Environment Conservation Council Marine, Coastal and Estuarine Interim Report

The Environment Conservation Council of Victoria is carrying out an investigation of Victoria's marine, coastal and estuarine areas. In the Marine, Coastal and Estuarine Interim Report 1998 the Council

recommended a Port Phillip Heads Marine Park with Mud Islands and Swan Bay (part of the Port Phillip Bay and Bellarine Peninsula Ramsar site) recommended as Sanctuary Zones. The recommendation is currently being considered by Government.

#### Planning Provisions

Some wetlands in the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site have recently been placed on an environmental significance overlay in the City of Greater Geelong local planning scheme.

Swan Bay Marine and Wildlife Reserve Proposed Management Plan 1991 outlines strategies for the protection of the natural values of Swan Bay.

A fencing program has been undertaken to control livestock grazing of Lake Connewarre Wildlife Reserve.

The State Environmental Protection Policy (SEPP) (Waters of Port Phillip Bay) 1997 outlines measures to protect the water quality of Port Phillip Bay and has recommended the preparation of an environmental management plan for the Bay and its catchment.

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

- Orange-bellied Parrot (1993)
  - Little Tern (1994)
  - Hooded Plover (1996)
  - Plains Wanderer (1995)
  - White-bellied Sea-eagle (1994)
  - Brush tailed Phascogale (1997)
  - Stripped Legless Lizard (1994)
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#### **24. Conservation measures proposed but not yet implemented:**

An Environmental Management Plan is being prepared for Port Phillip Bay to establish strategies for the protection of the environmental values of the Bay.

In an integrated approach to planning at Ramsar sites, management strategies are being prepared for all Ramsar sites in Victoria, including the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula site, to provide general strategic direction and site specific strategies. The strategies will be completed by June 1999.

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#### **25. Current scientific research and facilities:**

Marine Science Laboratories (Department of Conservation and Environment) are located at Queenscliff.

Marine Studies Centre which is a joint Department of Conservation and Environment, University of Melbourne, Monash University and Royal Melbourne Institute of Technology research centre.

Studies of the impact of grazing on saltmarsh communities are being conducted at Pt Wilson and Murtcaim.

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#### **26. Current conservation education:**

The Victorian Institute of Marine Sciences centre at Queenscliff is used by school and public groups.

The whole of the Ramsar listed area has high potential for education because of its proximity to schools in Melbourne and Geelong.

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#### **27. Current recreation and tourism:**

The major recreation uses of Port Phillip Bay are swimming, power boating, sailing, fishing, picnicking, sightseeing and camping and caravanning.

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#### **28. Jurisdiction:**



**29. Management authority:**

Managed under the Department of Natural Resources and Environment Parks Program by Parks Victoria  
- 18,649 Ha (81%)

Natural Resources and Environment - 27 Ha (0.1%)

Private Freehold - 468 Ha (2%)

Commonwealth - 1,575 Ha (6.9%)

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**30. Bibliographical references:**

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